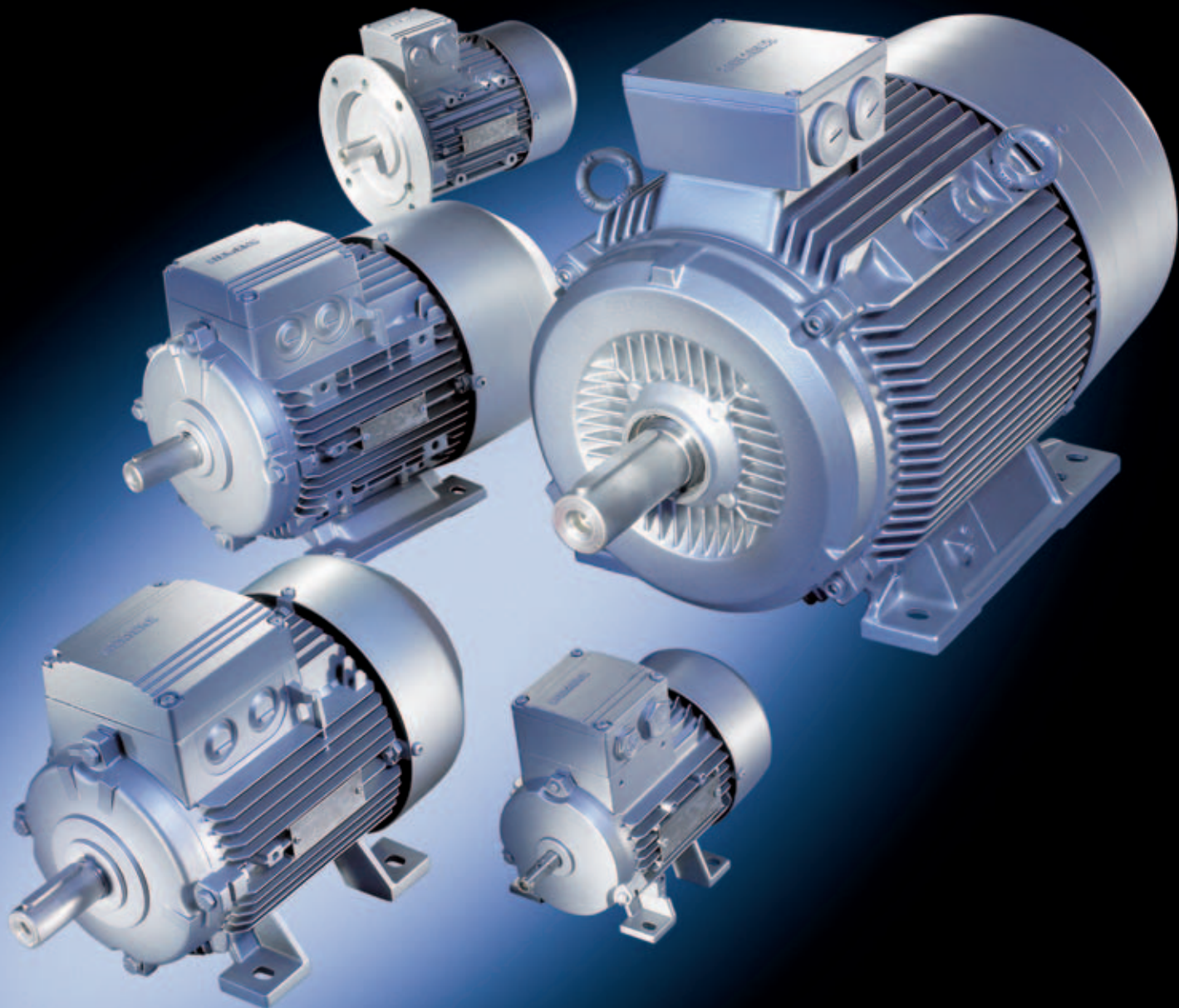




Low-Voltage MOTORS

IEC Squirrel-Cage Motors
Frame sizes 56 to 450
Power range 0.06 kW to 1250 kW

SIEMENS

Related catalogs

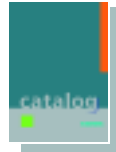
SINAMICS G110

Inverter chassis units
0.12 kW to 3 kW

D 11.1

Order No.:

E86060-K5511-A111-A2-7600



SINAMICS G130

Inverter chassis units

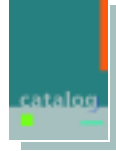
SINAMICS G150

Drive converter cabinet units

Order No.:

E86060-K5511-A101-A3-7600

D 11



MICROMASTER

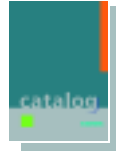
Inverters

MICROMASTER 410/420/430/440
0.12 kW to 250 kW

Order No.:

E86060-K5151-A121-A5-7600

DA 51.2



MICROMASTER/COMBIMASTER

MICROMASTER 411 inverter

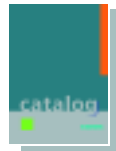
Distributed drive solutions

COMBIMASTER 411

Order No.:

E86060-K5251-A131-A2-7600

DA 51.3



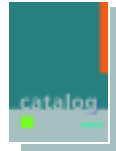
Industrial Communication for Automation and Drives

Part 6: ET 200 Distributed I/O ET
200S FC Frequency Converter

Order No.:

E86060-K6710-A101-B4-7600

IK PI

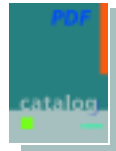


Geared motors

The catalog can be down-
loaded from the Internet at:

[http://www.siemens.com/
gearedmotors/printmaterial](http://www.siemens.com/gearedmotors/printmaterial)

M 15



Geared motors

The catalog can be down-
loaded from the Internet at:

[http://www.siemens.com/
gearedmotors/printmaterial](http://www.siemens.com/gearedmotors/printmaterial)

M 15
News

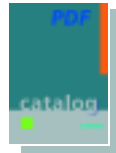


AC NEMA & IEC Motors

Further details available
on the Internet at:

<http://www.sea.siemens.com/motors>

D 81.2
U.S./
Canada



Catalog CA 01

The Offline Mall of
Automation and Drives

Order No.:

CD: E86060-D4001-A110-C5-7600

DVD: E86060-D4001-A510-C5-7600

CA 01



A&D Mall

Internet:

<http://www.siemens.com/automation/mall>



Additional documentation

You will find all information material, such as brochures, catalogues, manuals and operating instructions for standard drive systems up-to-date on the Internet at the address

<http://www.siemens.com/motors/printmaterial>

You can order the listed documentation or download it in common file formats (PDF, ZIP).

Catalogue CA 01 – Selection tool SD configurator

The selection tool **SD configurator** is available in combination with the electronic catalogue CA 01.



On CD 2 for the selection and configuring tools, you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 inverter chassis units and SIMATIC ET 200S FC frequency converters for distributed I/O, complete with:

- Dimension drawing generator for motors
- Data sheet generator for motors and inverters
- Starting calculation
- 3D models in stp. format
- Extensive documentation

Hardware and software requirements

- PC with 500 MHz CPU or faster
- Operating systems
 - Windows 98/ME
 - Windows 2000
 - Windows XP
 - Windows NT 4.0 (Service Pack 6 or higher)
- Internet Explorer 5.5 or higher
- 256 MB work memory (minimum)
- Screen resolution 800 x 600 pixels or higher (1024 x 768) recommended
- Small fonts
- 150 MB spare hard disk space (after installation)
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

You can install this catalogue directly from the CD-ROM as a partial version or full version on your hard disk or in the network.

Low-Voltage Motors

IEC Squirrel-Cage Motors

Catalog D 81.1 · 2006

Supersedes:
Catalogue M 11 · 2003/2004

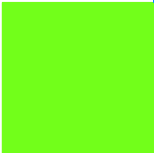
The products described in this catalog
also appear in
the electronic catalog CA 01
Order No.:
E86060-D4001-A110-C5-7600 (CD-ROM)
E86060-D4001-A510-C5-7600 (DVD)

For details, please contact your
Siemens representative.

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The products and systems described in this catalog are manufactured under application of a quality management system certified by DQS in accordance with EN ISO 9001 (Certificate Registration No. DE-000357 QM). The certificate is recognized in all IQ Net countries.



SIEMENS

Introduction

1

Standard motors up to frame size 315 L

2

Non-standard motors
frame size 315 and above

3

Explosion-proof motors

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Motors operating with frequency converters

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Pump motors

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Fan motors

7

Compressor motors

8

Smoke-extraction motors

9

Marine motors

10

Appendix

11

Welcome to Automation and Drives

We would like to welcome you to Automation and Drives and our comprehensive range of products, systems, solutions and services for production and process automation and building technology worldwide.

With Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners.

They will be glad to assist you.





Totally Integrated Automation – innovations for more productivity

With the launch of Totally Integrated Automation, we were the first ones on the market to consistently implement the trend from equipment to an integrated automation solution, and have continuously improved the system ever since.

Whether your industry is process- and production-oriented or a hybrid, Totally Integrated Automation is a unique “common solution” platform that covers all the sectors.

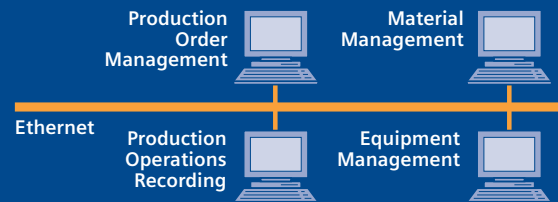
Totally Integrated Automation is an integrated platform for the entire production line - from receiving to technical processing

ERP
Enterprise
Resource
Planning



Ethernet

MES
Manufacturing
Execution
Systems



Control

SIMATIC NET
Industrial
Communication

SINAUT Telecontrol
System

SIMATIC
Sensors

SIMATIC
Software

SIMATIC Controllers/
Automation System

PROFINET

Industrial
Ethernet

Safety Integrated

PC-based Automation

PROFIBUS

AS-Interface

KNX/EIB

GAMMA *instabus*

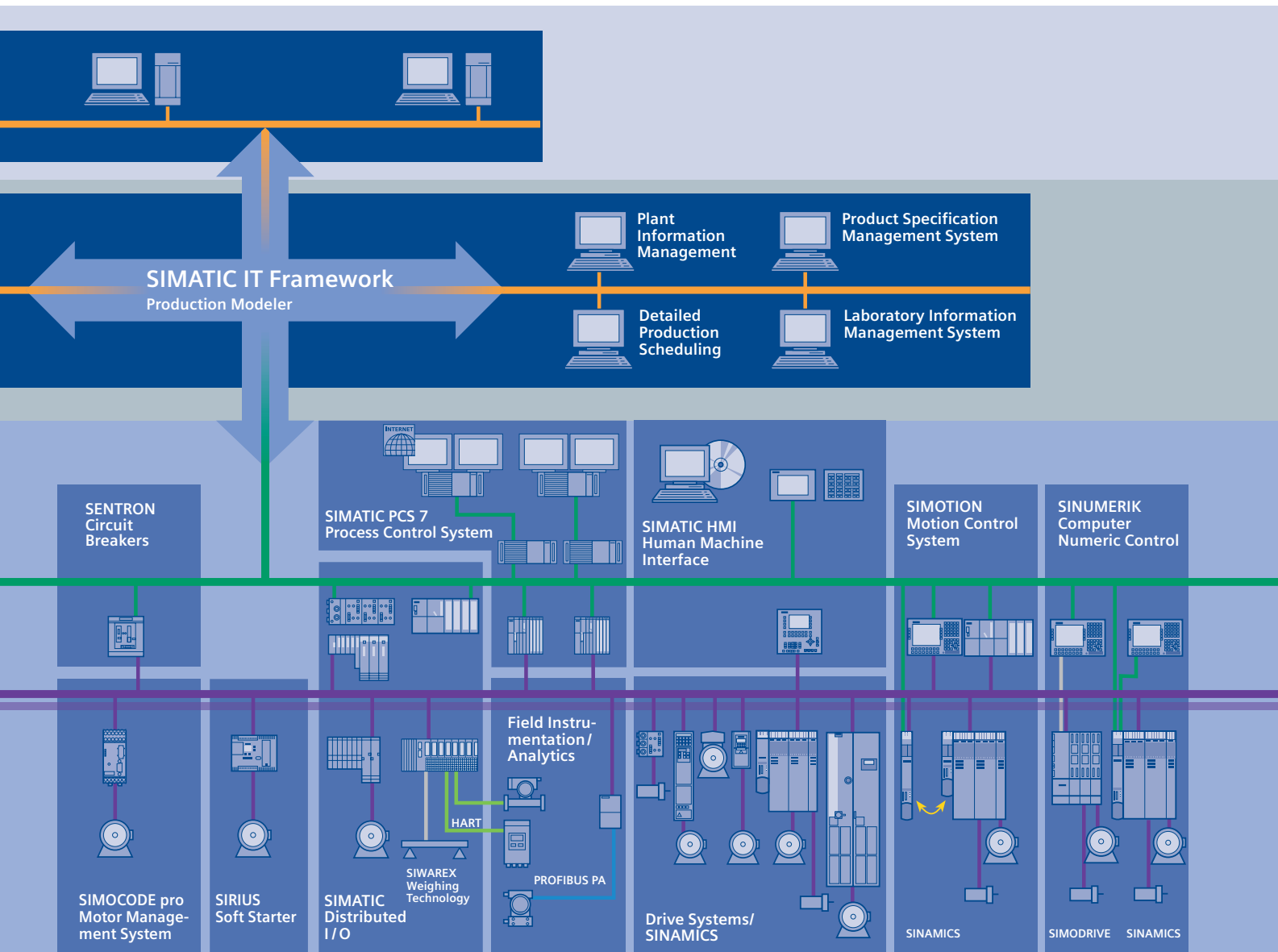
Building
Technology

Micro-Automation and
Aktor-Sensor Interface Level

ECOFAS IP65
Distributed
Automation System

and production areas to shipping. Thanks to the system-oriented engineering environment, integrated, open communications as well as intelligent diagnostics options, your plant now benefits in every phase of the life cycle.

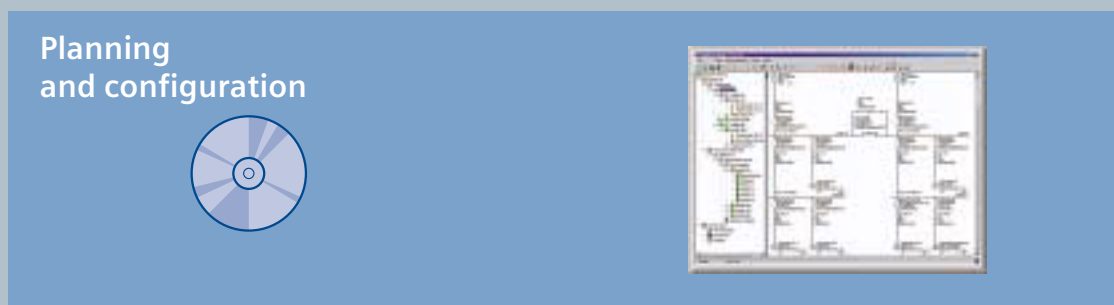
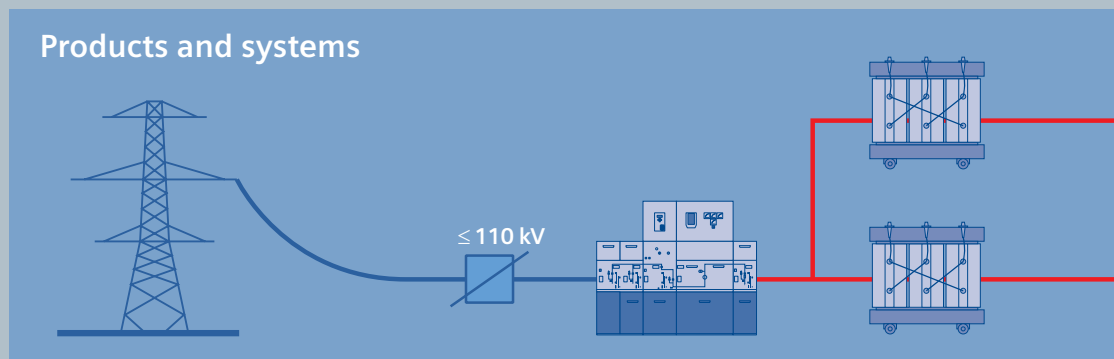
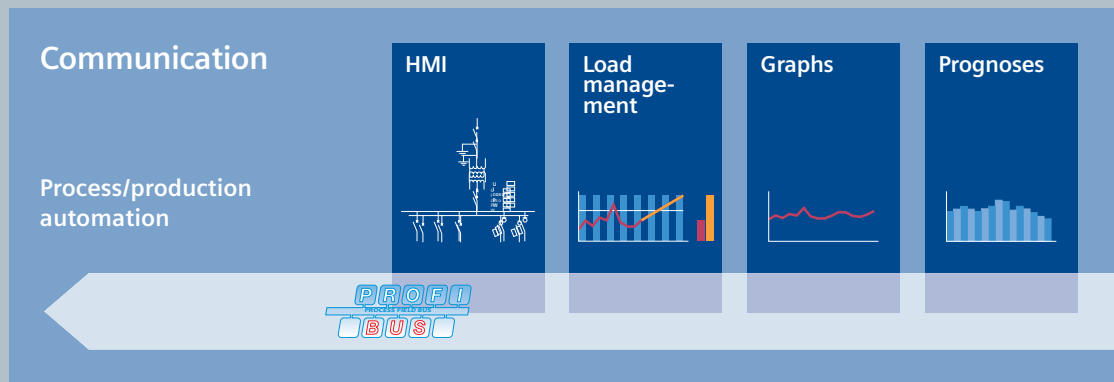
In fact, to this day we are the only company worldwide that can offer a control system based on an integrated platform for both the production and process industry.



Totally Integrated Power – energy distribution and management from one source

Totally Integrated Power by Siemens offers integrated solutions for energy distribution in functional and industrial buildings covering everything from medium-high voltage to power outlets.

Totally Integrated Power is based on integration in planning and configuration as well as coordinated products and systems. In addition, it features communications and software modules for connecting power distribution systems to industrial automation and building automation, thereby offering a substantial savings potential.





Introduction

1



1/2	Guide to selecting and ordering the motors
1/2	Overview
1/2	• Recommendations for drive selection
1/3	• Order number code
1/4	• Determining the motor type according to type of cooling, degree of protection and frame design
1/7	• Special versions
1/11	Planning notes
1/11	Overview
1/11	• SD configurator
1/11	• Energy-saving program SinaSave
1/12	• SINAMICS MICROMASTER SIZER
1/13	General technical data
1/13	Overview
1/13	• Cut-away diagram of a low-voltage motor
1/14	• Designs in accordance with standards and specifications
1/16	• Colours and paint finish
1/19	• Packaging, safety notes, documentation and test certificates
1/21	• Voltages, currents and frequencies
1/27	• Outputs
1/28	• Efficiency, power factor, rated torque, rated speed and direction of rotation
1/29	• Rating plate and extra rating plates
1/30	• Ambient temperature and site altitude
1/31	• Windings and insulation
1/33	• Motor protection
1/35	• Heating and ventilation
1/37	• Motor connection and connection boxes
1/51	• Types of construction
1/53	• Mechanical design and degrees of protection
1/55	• Balance and vibration severity
1/55	• Shaft and rotor
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1/74	• Modular technology
1/74	– 1XP8 001 rotary pulse encoder
1/75	– Separately-driven fan
1/76	– Brakes
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IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

Overview

These “recommendations for drive selection” guide you step-by-step through this catalog to the required motor.

Step 1		Technical requirements for the motor	
Determine the required product profile, the following are required:	Rated frequency and rated voltage	3 AC 50/60 Hz, 400, 500 or 690 V	
	Duty	Standard duty (continuous duty S1 according to DIN EN 60034-1)	
	Degree of protection or type of explosion protection required	IP..	
	Rated speed (No. of poles)	$n = \dots\dots\dots$ rpm	
	Rated output	$P = \dots\dots\dots$ kW	
	Rated torque	$M = P \cdot 9550/n = \dots\dots\dots$ Nm	
	Type of construction	IM..	
Step 2		Environmental requirements for the motor	
Determine the installation conditions	Ambient temperature	≤40 °C	>40 °C
	Site altitude	≤1000 m	>1000 m
	Factors for derating	None	Determine the factor for derating (for derating factor, see “Technical information” – “Ambient temperature and site altitude”)
Step 3		For preliminary selection of the motor, ⇒see subsequent pages and the corresponding “Preliminary selection of the motor” tables in the various different sections of the catalog	
Determine the range of possible motors	Select the frame size and therefore the possible motors on the basis of the following parameters: cooling method, degree of protection, rated output, rated speed and rated torque range. Note: The standard temperature range of the motors is from –20 to +40 °C.		
Step 4		Detailed selection of the motor	
Determine the basic Order No. of the motor	Determine the motor Order No. according to the following parameters: rated output, rated speed, rated torque and rated current from the “Selection and ordering data” for the motors that have already been identified as possibilities.		
Step 5		Selection of the special versions (see under “Special versions”)	
Complete the motor Order No.	Determine special versions and the associated Order codes (e. g. special voltages and types of construction, motor protection and degrees of protection, windings and insulation, colors and paint finish, mountings and mounting technology, etc.) .		
Step 6			
Selection of the frequency converter, if required	For Order No. of the converter as well as its selection, see Catalogs D 11, D 11.1 , DA 51.2 and DA 51.3.		

Note on using this catalog

Due to the wide range of possible versions of low-voltage motors, the special features of the various motor series are not explained in detail in each case in this section of the catalog. The availability of individual technical designs can be established from Sections 2 to 10.

Guide to selecting and ordering the motors

Order No. code

The Order No. comprises a combination of letters and numbers and for clarity it is subdivided into two blocks which are connected by hyphens, e. g.

1LA5223-4AA19-Z
M1F + A11 + G17

The first block (positions 1 to 7) identifies the motor type; further characteristics of the version are coded in the second (positions 8 to 12).

For deviations in the second block from the catalog codes, either **-Z** or **9** should be used as appropriate.

Ordering data:

- Complete Order No. and order code(s) or plain text.
- If a quotation has been requested, please specify the quotation number in addition to the Order No.
- When ordering a complete motor as a spare part, please specify the works serial No. for the previously supplied motor as well as the Order No.

Structure of the Order No.:		Position:	1	2	3	4	5	6	7	-	8	9	10	11	12
IEC squirrel-cage motors, surface-cooled															
Positions 1 to 3: Digit, letter, letter	• Self-cooled by fan mounted on and driven by rotor, aluminium or cast-iron housing	1	L	A											
	• Self-cooled by fan mounted on and driven by rotor, cast-iron housing	1	L	G											
	• Self-cooled by fan mounted on and driven by rotor, increased safety, type of protection EEx de II	1	M	A											
	• Self-cooled by fan mounted on and driven by rotor, explosion-proof enclosure, type of protection EEx de IIC	1	M	J											
	• Self-cooled with through-ventilation, cast-iron housing	1	L	L											
	• Self-cooled without fan, aluminium and cast-iron housing	1	L	P											
	• Forced-air cooled by air flow from the fan to be driven, aluminium or cast-iron housing	1	P	P											
	• Forced-air cooled by separately-driven fan, cast-iron housing	1	P	Q											
Position 4: Digit	Type series 4					4									
	Type series 5					5									
	Type series 6					6									
	Type series 7					7									
	Type series 8					8									
	Type series 9					9									
Positions 5 to 7: 3 digits	Motor frame size (frame size comprising shaft height and construction length, codes from 050 to 457)														
Position 8: Digit	Number of poles														
Positions 9 to 10: Letter	Version														
Position 11: Digit	Voltage, circuit and frequency														
Position 12: Digit	Type of construction														
	Special order versions: Coded – Order code also required Not coded – Plain text also required														- Z

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with improved efficiency, IP55 degree of protection, aluminium housing	1LA5□□□-□□□□□
Motor frame size/No. of poles/speed	4-pole/1500 rpm	1LA5223-4AA□□
Rated output	45 kW	
Voltage and frequency	230 VΔ/400 VY, 50 Hz	1LA5223-4AA1□
Type of construction	IM V5 with protective cover	1LA5223-4AA19 M1F
Special versions	3 PTC thermistors	1LA5223-4AA19-Z M1F A11
	Mounted separately-driven fan	1LA5223-4AA19-Z M1F A11 G17

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

Determine the motor type according to cooling method, degree of protection and frame design
(for further selection according to speed or number of poles, rated output, rated torque, rated speed and rated current, see the relevant "Preselection of the motor" tables in chapters 2 to 10)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz																						
				Motor frame sizes (shaft heights) 56 63 71 80 90 100 112 132 160 180 200 225 250 280 315 355 400 450																						
Standard motors (up to frame size 315 L)																										
Energy-saving motors with improved efficiency (Improved Efficiency EFF 2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW										1LA5 11 ... 45 kW												
		IP55	Cast iron						1LA6 0.75 ... 18.5 kW					1LG4 11 ... 200 kW												
Pole-changing motors with improved efficiency	Self-ventilated	IP55	Aluminum	1LA7 0.15 ... 17 kW										1LA5 18 ... 31 kW												
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LA9 0.06 ... 37 kW																						
		IP55	Cast iron											1LG6 11 ... 200 kW												
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9 0.14 ... 53 kW																						
		IP55	Cast iron											1LG4 15 ... 110 kW												
Motors without external fans	Self-cooled	IP55	Aluminum	1LP7 0.045 ... 7 kW										1LP5 5.5 ... 16.5 kW												
		IP55	Cast iron											1LP4 3.7 ... 67 kW												
Non-standard motors (frame size 315 and above)																										
Motors for mains-fed operation	Self-ventilated	IP55	Cast iron																				1LA8 160 ... 1000 kW			
Motors for converter-fed operation	Self-ventilated	IP55	Cast iron																				1LA8 145 ... 1000 kW			
Motors with externally mounted fan for converter-fed operation	Forced-air cooled	IP55	Cast iron																				1PQ8 145 ... 1000 kW			
Motors with through-ventilation for mains-fed operation	Self-ventilated	IP23	Cast iron																				1LL8 200 ... 1250 kW			
Motors with through-ventilation for converter-fed operation	Self-ventilated	IP23	Cast iron																				1LL8 200 ... 1250 kW			
Explosion-proof motors																										
Motors in Zone 1 with type of protection "e" (Zone 1 EExe II T3)	Self-ventilated	IP55	Aluminum	1MA7 0.12 ... 16 kW																						
		IP55	Cast iron						1MA6 1.3 ... 165 kW																	
Motors in Zone 1 with type of protection "d" (Zone 1 EExde IIC T4)	Self-ventilated	IP55	Cast iron/steel	1MJ6 0.25 ... 37 kW										1MJ7 + 1MJ8 18.5 ... 400 kW												
														1MJ1 90 ... 950 kW												
Motors in Zone 2 with type of protection "n"	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW																						
		IP55	Aluminum	1LA9 0.06 ... 37 kW																						
		IP55	Cast iron						1LA6 0.75 ... 18.5 kW					1LG4/1LG6 11 ... 200 kW												
														1LA8 145 ... 1000 kW												
Motors in Zone 21 with explosion protection	Self-ventilated	IP65	Aluminum	1LA7 0.09 ... 18.5 kW										1LA5 11 ... 45 kW												
		IP65	Aluminum	1LA9 0.06 ... 37 kW																						
		IP65	Cast iron											1LG4/1LG6 11 ... 200 kW												
Motors in Zone 22 with explosion protection	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW										1LA5 11 ... 45 kW												
		IP55	Aluminum	1LA9 0.06 ... 37 kW																						
		IP55	Cast iron						1LA6 0.75 ... 18.5 kW					1LG4/1LG6 11 ... 200 kW												
														1LA8 145 ... 1000 kW												

Guide to selecting and ordering the motors

Determining the motor type according to cooling method, degree of protection and frame design (continued)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz		Motor frame sizes (shaft heights)																	
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450		
Motors operating with frequency converters																							
Surface-cooled motors with standard insulation for voltages ≤500 V																							
For standard motors, non-standard motors, explosion-proof motors and fan motors, see Section 5 of the catalogue.																							
Motors with special insulation for voltages up to 690 V (standard motors)	Self-ventilated	IP55	Aluminum	1LA7 1.5 ... 18.5 kW		1LA5 15 ... 45 kW																	
		IP55	Cast iron	1LG6 11 ... 200 kW																			
Motors with special insulation for voltages up to 690 V (non-standard motors)	Self-ventilated	IP55	Cast iron																	1LA8 145 ... 980 kW			
Motors with externally mounted fan with special insulation for voltages up to 690 V	Forced-air cooled	IP55	Cast iron																	1PQ8 145 ... 980 kW			
Pump motors																							
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW		1LA5 11 ... 45 kW																	
		IP55	Cast iron	1LA6 0.75 ... 18.5 kW										1LG4 11 ... 200 kW									
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9 0.14 ... 53 kW																			
		IP55	Cast iron													1LG4 15 ... 110 kW							
Fan motors																							
Motors in pole-changing version	Self-ventilated	IP55	Aluminum	1LA7 0.15 ... 17 kW				1LA5 18 ... 31 kW															
		IP55	Cast iron					1LG4 4.5 ... 83 kW															
Motors without external fan and without fan cover	Forced-air cooled	IP 55	Aluminum	1PP7 0.09 ... 18.5 kW				1PP5 11 ... 37 kW															
		IP55	Cast iron					1PP4 11 ... 200 kW															
Compressor motors																							
Energy-saving motors with high efficiency	Self-ventilated	IP55	Aluminum	1LA9 0.06 ... 37 kW																			
		IP55	Cast iron													1LG6 11 ... 200 kW							
Motors with increased output	Self-ventilated	IP55	Aluminum	1LA9 0.14 ... 53 kW																			
		IP55	Cast iron													1LG4 15 ... 110 kW							
Non-standard motor for mains-fed and converter-fed operation	Self-ventilated	IP55	Cast iron																	1LA8 160 ... 1000 kW			
Smoke extraction motors																							
Temperature/time class F200, F300	Self-ventilated	IP55	Aluminum	1LA7 0.37 ... 18.5 kW (0.09 ... 3.85 kW pole-changing)				1LA5 15 ... 45 kW (4.05 ... 8.6 kW pole-changing)															
		IP55	Cast iron									1LG6 37 ... 200 kW											
	Forced-air cooled	IP55	Aluminum	1PP7 0.37 ... 18.5 kW (0.09 ... 3.85 kW pole-changing)				1PP5 15 ... 45 kW (4.05 ... 8.6 kW pole-changing)															
		IP55	Cast iron													1PP6 37 ... 200 kW							
Temperature/time class F400	Self-ventilated	IP55	Cast iron					1LA6 1.5 ... 18.5 kW (0.3 ... 3.45 kW pole-changing)				1LG6 15 ... 200 kW											
	Forced-air cooled	IP55	Cast iron					1PP6 1.5 ... 200 kW (0.3 ... 3.45 kW pole-changing)															

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

Determining the motor type according to cooling method, degree of protection and frame design (continued)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Motor type (Positions 1 to 3 of the Order No.) + type series (Position 4 of the Order No.) Rated output at 50 Hz																				
				Motor frame sizes (shaft heights)																				
				56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450			
Marine motors (motors for drives on ships below deck)																								
Type approved standard motors up to frame size 315 L - Energy-saving motors with improved efficiency (Improved Efficiency EFF 2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW										1LA5 11 ... 45 kW										
		IP55	Cast iron								1LA6 0.75 ... 18.5 kW			1LG4 11 ... 200 kW										
Type approved standard motors up to frame size 315 L - Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LA9 0.06 ... 37 kW																				
		IP55	Cast iron											1LG6 11 ... 200 kW										
Type approved, explosion-proof motors up to frame size 315 L - Motors in Zone 1 with type of protection "e" (Zone 1 EExe II T3)	Self-ventilated	IP55	Aluminum	1MA7 0.12 ... 16 kW																				
		IP55	Cast iron								1MA6 1.3 ... 165													
Type approved, explosion-proof motors up to frame size 315 L - Motors in Zone 1 with type of protection "d" (Zone 1 EExde IIC T4)	Self-ventilated	IP55	Cast iron						1MJ6 0.25 ... 37 kW										1MJ7 18.5 ... 132 kW					
Type approved, explosion-proof motors up to frame size 315 L - Motors in Zone 2 with type of protection "n"	Self-ventilated	IP55	Aluminum	1LA7 0.09 -18.5 kW																				
		IP55	Aluminum	1LA9 0.06 ... 37 kW																				
		IP55	Cast iron								1LA6 0.75 ... 18.5 kW			1LG4/1LG6 11 ... 200 kW										
Explosion-proof motors up to frame size 315 L - Motors in Zone 21 with protection against dust explosions	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW															1LA5 11 ... 45 kW					
		IP55	Aluminum	1LA9 0.06 ... 37 kW																				
		IP55	Cast iron											1LG4/1LG6 11 ... 200 kW										
Explosion-proof motors up to frame size 315 L - Motors in Zone 22 with protection against dust explosions	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW															1LA5 11 ... 45 kW					
		IP55	Aluminum	1LA9 0.06 ... 37 kW																				
		IP55	Cast iron								1LA6 0.75 ... 18.5 kW			1LG4/1LG6 11 ... 200 kW										
Type approved fan motors - Motors in pole-changing version	Self-ventilated	IP 55	Aluminum						1LA7 0.15 ... 17 kW					1LA5 18 ... 31 kW										
		IP 55	Cast iron											1LG4 4.5 ... 83 kW										
Type approved fan motors - Motors without external fan and without fan cover	Forced-air cooled	IP 55	Aluminum	1PP7 0.09 ... 18.5 kW										1PP5 15 ... 37 kW										
		IP 55	Cast iron											1PP4 11 ... 200 kW										
Non-standard motor frame size 315 and above - Motors for mains-fed and converter-fed operation	Self-ventilated	IP55	Cast iron																			1LA8 145 ... 1000 kW		
Non-standard motors frame size 315 and above - Forced-air cooled motors with mounted separately driven fan for converter-fed operation	Forced-air cooled	IP55	Cast iron																			1PQ8 145 ... 1000 kW		
Non-standard motors frame size 315 and above - Self-ventilated motors with through-ventilation for mains-fed and converter-fed operation	Self-ventilated	IP23	Cast iron																			1LL8 180 ... 1250 kW		
Non-standard motors frame size 315 and above - Water-cooled motors for mains-fed and converter-fed operation	Forced-air cooled	IP55	Steel																					1)
Explosion-proof motors frame size 315 and above - Self-ventilated motors in Zone 2, 22 with type of protection "n" or protection against dust explosions	Self-ventilated	IP55	Cast iron																			1LA8 160 ... 1000 kW		

1) 1LH8 motor frame size 450, rated output 485 ... 1150 kW

Guide to selecting and ordering the motors

Overview of "special versions"

The order codes are assigned to the individual motor series in the "Selection and ordering data".

For voltages, see "Voltages, currents and frequencies" in the "Introduction" as well as in the individual catalogue sections. For types of construction, see "Types of construction" in the "Introduction" as well as in the individual catalogue sections.

Order code	Special versions	For further information, see Page
Motor protection		
A10	With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22	1/34, 4/79
A11	Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping	1/33, 1/37
A12	Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	1/34
A15	Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping	1/34, 4/3, 4/79
A16	Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping	1/34, 4/3, 4/79
A23	Motor temperature detection with embedded temperature sensor KTY 84-130	1/34
A25	Motor temperature detection with embedded temperature sensors 2 x KTY 84-130	1/34
A31	3 temperature detectors for tripping	1/33
A60	Installation of 3 PT 100 resistance thermometers in stator winding	1/35
A61	Installation of 6 PT 100 resistance thermometers in stator winding	1/35
A72	Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	1/35
A78 <i>New!</i>	Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	1/35
A80 <i>New!</i>	Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	1/35
Motor connection and connection boxes		
G55	ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY	1/49, 1/50
G56	ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY	1/49, 1/50
K06	Two-part plate on connection box	1/38
K09	Connection box on RHS	1/37
K10	Connection box on LHS	1/37
K11	Connection box on top, feet screwed on	1/37
K15 <i>New!</i>	Connection box in cast-iron version	1/37, 1/46 ...
K53 <i>New!</i>	Explosion-proof connection box, EEx d IIC type of protection	1/37, 1/47 ...
K54 <i>New!</i>	Cable entry, standard configuration	1/38
K55 <i>New!</i>	Cable entry, maximum configuration	1/38
K57 <i>New!</i>	Cable entry DIN 89280, maximum configuration	1/38
K83	Rotation of the connection box through 90°, entry from DE	1/38
K84	Rotation of the connection box through 90°, entry from NDE	1/38
K85	Rotation of connection box through 180°	1/38
L00 <i>New!</i>	Next larger connection box	1/37
L01 <i>New!</i>	Undrilled entry plate	1/39
L13	External earthing	1/37
L44 <i>New!</i>	3 cables protruding, 0.5 m long	1/39
L45 <i>New!</i>	3 cables protruding, 1.5 m long	1/39
L47 <i>New!</i>	6 cables protruding, 0.5 m long	1/39
L48 <i>New!</i>	6 cables protruding, 1.5 m long	1/39
L49 <i>New!</i>	6 cables protruding, 3 m long	1/39
L51	Protruding cable ends - right side	1/39
L52	Protruding cable ends - left side	1/39
L97 <i>New!</i>	Auxiliary connection box 1XB3 020	1/48, 1/49
M46	Stud terminal for cable connection, accessories pack (3 items)	1/48
M47	Saddle terminal for connection without cable lug, accessories pack (6 items)	1/48
M50 <i>New!</i>	Auxiliary connection box 1XB9 016	1/48, 1/49
M58 <i>New!</i>	Next larger connection box 1XB1 621	1/37
M64 <i>New!</i>	Connection box on NDE	1/37
M69 <i>New!</i>	Terminal strip for main and auxiliary terminals	1/48
M88 <i>New!</i>	Auxiliary connection box 1XB9 014 (aluminium)	1/48, 1/49
Windings and insulation		
C11	Temperature class F, used acc. to F, with service factor (SF)	1/31
C12	Temperature class F, used acc. to F, with increased power rating	1/31
C13	Temperature class F, used acc. to F, with increased ambient temperature	1/32
C18 <i>New!</i>	Temperature class H at rated output and max. KT 60 °C	1/32
C19 <i>New!</i>	Increased air humidity/temperature with 30 to 60 g water per m³ of air	1/32
C22 <i>New!</i>	Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	1/32
C23 <i>New!</i>	Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	1/32
C24 <i>New!</i>	Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	1/32
C25 <i>New!</i>	Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	1/32
C26 <i>New!</i>	Increased air humidity/temperature with 60 to 100 g water per m³ of air	1/32
Y52	Temperature class F, used acc. to F, other requirements	1/32

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

Overview of "Special versions" (continued)

Order code	Special versions	For further information, see Page
Colours and paint finish		
K23	Unpainted (only cast-iron parts primed)	1/16
K24	Unpainted, only primed	1/16
K26	Special finish in RAL 7030 stone grey	1/17
K27	Special finish in RAL 6011 mignonette green	1/17
K28	Special finish in RAL 7031 bluish grey	1/17
L42	Special finish in RAL 7032 pebble grey	1/17
L43	Special finish in RAL 9005 jet black	1/17
M16	Special finish in RAL 1002 sand yellow	1/17
M17	Special finish in RAL 1013 pearl white	1/17
M18	Special finish in RAL 3000 flame red	1/17
M19	Special finish in RAL 6021 pale green	1/17
M20	Special finish in RAL 7001 silver grey	1/17
M21	Special finish in RAL 7035 light grey	1/17
M22	Special finish in RAL 9001 cream	1/17
M23	Special finish in RAL 9002 grey white	1/17
Y51 <i>New!</i>	Special finish in special RAL colours	1/16, 1/18
Y53	Standard finish in other standard RAL colours	1/16, 1/17
Y54	Special finish in other standard RAL colours	1/16, 1/17
Modular technology - Basic versions		
G17	Mounting of separately-driven fan	1/75
G26	Mounting of brake	1/76 ...
H57	Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	1/74
H58	Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	1/74
Modular technology - Combinations of basic versions		
H61	Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	1/83
H62	Mounting of brake and 1XP8 001-1 rotary pulse encoder	1/83
H63	Mounting of brake and separately-driven fan	1/83
H64	Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder	1/83
H97	Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	1/83
H98	Mounting of brake and 1XP8 001-2 rotary pulse encoder	1/83
H99	Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder	1/83
Modular technology - Additional versions		
C00	Brake supply voltage 24 V DC	1/82
C01	Brake supply voltage 400 V AC	1/82
C02 <i>New!</i>	Brake supply voltage 180 V DC, for operation on MM411-ECOFAS	1/82
K82	Manual brake release with lever	1/82
Special technology		
H15	Prepared for mounting MMI	1/15, 1/84
H47 <i>New!</i>	Mounting of brake NFA (Stomag)	1/84
H70	Mounting of LL 861 900 220 rotary pulse encoder	1/84
H71	Mounting of LL 861 900 220 rotary pulse encoder to be provided	1/84
H72	Mounting of HOG 9 D 1024 I rotary pulse encoder	1/85
H73	Mounting of HOG 10 D 1024 I rotary pulse encoder	1/86
H74	Mounting of HOG 9 rotary pulse encoder to be provided	1/85
H75	Mounting of HOG 10 rotary pulse encoder to be provided	1/86
H78	Prepared for mounting LL 861 900 220	1/84
H79	Prepared for mounting HOG 9 D 1024 I	1/85
H80	Prepared for mounting HOG 10 D 1024 I	1/86
M68	Mechanical protection for encoder	1/84
Y70	Mounting a special type of rotary pulse encoder	1/84
Mechanical design and degrees of protection		
K17	Drive-end seal for flange-mounting motors	1/53
K32	With two additional eyebolts for IM V1/IM V3	1/53
K37	Low-noise version for 2-pole motors with clockwise direction of rotation	1/54
K38	Low-noise version for 2-pole motors with anticlockwise direction of rotation	1/54
K50	IP65 degree of protection	1/53
K52 <i>New!</i>	IP56 degree of protection (non-heavy-sea)	1/53
L03	Vibration-proof version	1/54
L12 <i>New!</i>	Condensation drainage holes	1/53
M27 <i>New!</i>	Non-rusting screws (externally)	1/54
M44	Earth brushes for converter-fed operation	1/54

Overview of "Special versions" (continued)

Order code	Special versions	For further information, see Page
Ambient temperature and site altitude		
D02	Ambient temperature -50 to +40 °C	1/31
D03	Ambient temperature -40 to +40 °C	1/31
D04	Ambient temperature -30 to +40 °C	1/31
D11 <i>New!</i>	Ambient temperature 45 °C, derating 4%	1/31
D12 <i>New!</i>	Ambient temperature 50 °C, derating 8%	1/31
D13 <i>New!</i>	Ambient temperature 55 °C, derating 13%	1/31
D14 <i>New!</i>	Ambient temperature 60 °C, derating 18%	1/31
Designs in accordance with standards and specifications		
D01	CCC China Compulsory Certification	1/16
D30	Electrical according to NEMA MG1-12	1/15
D31	Design according to UL with "Recognition Mark"	1/15
D32 <i>New!</i>	Ex certification for China	4/80
D40	Canadian regulations (CSA)	1/15, 1/16
Design for Zones 2, 21 and 22 according to ATEX		
C27 <i>New!</i>	Stamping of EEx nA II on VIK rating plate	4/80
K30	VIK design (comprises Zone 2 for mains-fed operation, without EEx nA II marking on rating plate)	4/80
M34	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	4/4, 4/79
M35	Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	4/4, 4/79
M38	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	4/4, 4/80
M39	Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	4/4, 4/80
M72	Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15	4/4, 4/79
M73	Design for Zone 2 for converter-fed operation, derating Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15	4/4, 4/80
V68 <i>New!</i>	Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110 or ET 200 S FC)	4/79
Marine version - Basic marine version		
E00	Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F, used in accordance with F	10/4 ...
E11	With/without type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	10/4 ...
E21	With/without type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	10/4 ...
E31	With/without type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	10/4 ...
E51	With/without type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	10/4 ...
E61	With/without type test certificate according to ABS (American Bureau of Shipping), USA, KT50 °C, temperature class F, used in accordance with F	10/4 ...
E71	With/without type test certificate according to CCS (Chinese Classification Society), China, KT45 °C, temperature class F, used in accordance with F	10/4 ...
E80	Motor for use in shipping, higher ambient temperature and/or used as F in accordance with B	10/10 ...
Marine version - Acceptance/certification		
E09 <i>New!</i>	Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	10/4 ...
E10 <i>New!</i>	Individual acceptance by marine classification society	10/4 ...
F83 <i>New!</i>	Type test with heat run for horizontal motors, with acceptance	10/6 ...
F93 <i>New!</i>	Type test with heat run for vertical motors, with acceptance	10/20 ...
Standardline		
B20 <i>New!</i>	Standardline version	3/9
Bearings and lubrication		
G50 <i>New!</i>	Measuring nipple for SPM shock pulse measurement for bearing inspection	1/57
K20	Bearing design for increased cantilever forces	1/57, 1/61 ...
K36 <i>New!</i>	Special bearing for drive-end and non-drive-end, bearing size 63	1/57, 1/62 ...
K40	Regreasing device	1/57
K94	Located bearing DE	1/57
L04	Located bearing NDE	1/57
L27	Insulated bearing cartridge	1/57
Balance and vibration severity		
L68	Full key balancing	1/55
K01	Vibration severity level R	1/55
K02 <i>New!</i>	Vibration severity grade S	1/55

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

Overview of "Special versions" (continued)

Order code	Special versions	For further information, see Page
Shaft and rotor		
K04 <i>New!</i>	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	1/56
K16	Second standard shaft extension	1/55
K42 <i>New!</i>	Shaft extension with standard dimensions, without featherkey way	1/56
L39 <i>New!</i>	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	1/56
M65 <i>New!</i>	Standard shaft made of non-rusting steel	1/56
Y55 <i>New!</i>	Non-standard cylindrical shaft extension	1/56
Heating and ventilation		
H17 <i>New!</i>	Fan cover for textile industry	1/36
K34 <i>New!</i>	Cast-iron fan cover	1/36
K35 <i>New!</i>	Metal external fan	1/36
K45	Anti-condensation heaters for 230 V	1/35
K46	Anti-condensation heaters for 115 V	1/35
L36	Sheet metal fan cover	1/36
Y81 <i>New!</i>	Separately-driven fan with non-standard voltage and/or frequency	1/36
Rating plate and extra rating plates		
K31	Second rating plate, loose	1/29
Y80 <i>New!</i>	Extra rating plate or rating plate with deviating rating plate data	1/29
Y82	Extra rating plate with customer data	1/29
Y84 <i>New!</i>	Additional information on rating plate and on package label	1/29
Packaging, safety notes, documentation and test certificates		
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	1/20
B01	Complete with one set of safety and commissioning notes per wire-lattice pallet	1/20
B02	Acceptance test certificate 3.1 according to EN 10204	1/20
B21 <i>New!</i>	Operating instructions on CD	1/20, 3/46 ...
B30 <i>New!</i>	Document - EU manufacturer's declaration	1/20, 3/46 ...
B31 <i>New!</i>	Document - Electrical data sheet	1/20, 3/46 ...
B32 <i>New!</i>	Document - Order dimension drawing	1/20, 3/46 ...
B33 <i>New!</i>	Document - Routine test certificate	1/20, 3/46 ...
B37 <i>New!</i>	Document - Load characteristics	1/20, 3/46 ...
F01 <i>New!</i>	Standard test (routine test) with acceptance	1/20, 3/47 ...
F03 <i>New!</i>	Visual acceptance and report handover with acceptance	1/20, 3/47 ...
F04 <i>New!</i>	Temperature-rise test, without acceptance	1/20, 3/47 ...
F05 <i>New!</i>	Temperature-rise test, with acceptance	1/20, 3/47 ...
F28 <i>New!</i>	Noise measurement during idling, no noise analysis, no acceptance	1/20, 3/47 ...
F29 <i>New!</i>	Noise measurement during idling, no noise analysis, with acceptance	1/20, 3/47 ...
F34 <i>New!</i>	Recording of current and torque curves with torque metering shaft during starting, without acceptance	1/20, 3/47 ...
F35 <i>New!</i>	Recording of current and torque curves with torque metering shaft during starting, with acceptance	1/20, 3/47 ...
F52 <i>New!</i>	Measurement of the locked-rotor torque and locked-rotor current, without acceptance	1/20, 3/47 ...
F53 <i>New!</i>	Measurement of the locked-rotor torque and locked-rotor current, with acceptance	1/20, 3/47 ...
F62 <i>New!</i>	Noise analysis, without acceptance	1/20, 3/47 ...
F63 <i>New!</i>	Noise analysis, with acceptance	1/20, 3/47 ...
F82 <i>New!</i>	Type test with heat run for horizontal motors, without acceptance	1/20, 3/47 ...
F83 <i>New!</i>	Type test with heat run for horizontal motors, with acceptance	1/20, 3/47 ..., 10/6, 10/11 ...
F92 <i>New!</i>	Type test with heat run for vertical motors, without acceptance	1/20, 3/47 ..., 10/20 ...
F93 <i>New!</i>	Type test with heat run for vertical motors, with acceptance	1/20, 3/47 ...
L99	Wire-lattice pallet	1/19
M32 <i>New!</i>	Connected in star for dispatch	1/19
M33 <i>New!</i>	Connected in delta for dispatch	1/19

Overview

SD configurator

SD configurator (on CD2 "Configuration" of catalogue "CA 01 – The Siemens A&D Offline Mall")



More than 100,000 products with approx. 5 million possible product variants for drive engineering applications are listed in the interactive catalog CA 01 – The Offline Mall of Siemens Automation and Drives (A&D).

To make the selection of the suitable motor and/or converter from the diverse A&D SD range easier, the **SD configurator** has been developed which is integrated into the catalogue as a "selection aid".

The **SD configurator** makes it easier to find the right drive solution. It supplies the correct order number as well as the corresponding documentation.

Operating instructions, factory test certificates, connection box documentations, etc. can be displayed and data sheets, dimension drawings and a starting calculation can be generated to the respective products.

It is also easy to assign a suitable converter to the selected motor.

The extensive help function not only explains the program function, it also contains extensive technical background material.

SD configurator product range:

Low-voltage motors (energy-saving motors, explosion-proof motors) with corresponding documentation and dimension drawings, low-voltage converters of the MICROMASTER 4 product series, SINAMICS G110 converter chassis units, and much more.

The interactive CA 01 catalogue can be ordered from your local Siemens sales representative or on the Internet at <http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order No. for CA 01 10/2006, english international:
CD-ROM: **E86060-D4001-A110-C5-7600**
DVD: **E86060-D4001-A510-C5-7600**

Energy-saving program SinaSave

The energy-saving program **SinaSave** is designed for applications with motors for **mains-fed operation** (fixed speed) and **converter-fed operation** (variable speed). In mains-fed operation, you can calculate the cost savings as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors with the three bases of comparison outlined below. In comparison to ...

- Siemens EFF2 energy-saving motors – **Case 1**
- Individually selected known motors – **Case 2**
- Known motors within an overall plant analysis – **Case 3**

The individual applications are:

Case 1

Calculation of the savings in energy costs as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors as compared to the Siemens EFF2 energy-saving motors.

In this case, the motor data for the Siemens energy-saving motors have already been stored complete with their order numbers. In addition, you are told how long it will take until the additional cost for an energy-saving motor will pay for itself.

Case 2

Calculation of the savings in energy costs as well as the amortization time for the additional cost of the Siemens EFF1 energy-saving motors in comparison with other known motors.

The calculation, however, requires exact knowledge of the technical specifications of the motor which is to be used for comparison.

Case 3

Calculation of the savings in energy costs as well as the amortization time for the additional cost of Siemens EFF1 energy-saving motors in comparison with any number of other known motors – plant analysis.

In **converter-fed operation**, SinaSave takes into account all the necessary plant-specific parameters. Values required for the process such as pumping flowrate and height for pumps, mass flowrate and total pressure difference for fans as well as the density of the transported medium are taken into account in addition to the efficiency of the fan, pump or compressor, the electrical efficiency and the overall efficiency of the plant. Other basic data for the program include the number of working days and work shifts as well as the medium transport profile that decides the extent of the energy-saving effect throughout the day and the year.

From the entered plant-specific basic data, the program first obtains the drive system with the appropriate output and the price of the corresponding frequency converter. In a further step, the program determines the energy requirements of the variable-speed drive system for the specific application and compares it to the calculated values for all alternative concepts that can be considered for the plant in question; including for example, throttle valves, bypass, pre-forming control or pole-changing motors. The energy-saving is obtained from the difference in kilowatt hours which the program then converts into a cash saving using the currently applicable energy purchasing price for the plant.

The program calculates the amortization time from the price of the frequency converter, the decisive energy-saving and other cost-reducing effects of variable-speed operation that have also been taken into account, such as an improved power factor and smoother running of equipment.

The program can be downloaded from the Internet using the following link:

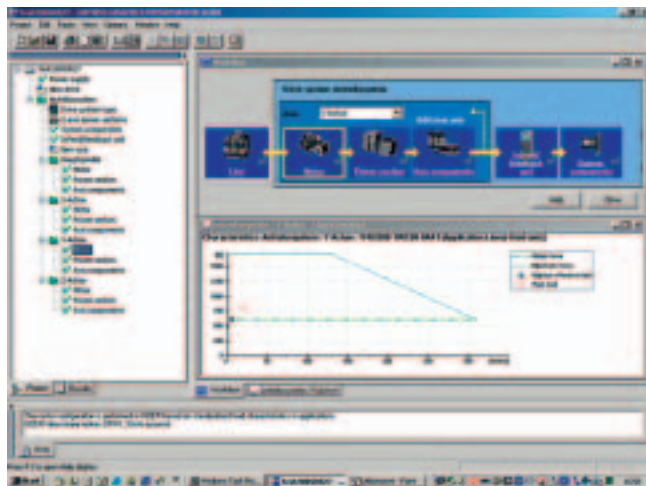
<http://www.siemens.com/energysaving>

IEC Squirrel-Cage Motors

Introduction

Planning notes

SINAMICS MICROMASTER SIZER



The **SINAMICS MICROMASTER SIZER** configuration tool is used for easy configuring of the **SINAMICS** and **MICROMASTER 4** drive families as well as those of the CNC control SINUMERIK solution line. It provides support when setting up the technologies involved in the hardware and firmware components required for a drive task. **SIZER** supports the complete configuration of the drive system, from simple individual drives to complex multi-axis applications.

SIZER supports all of the engineering steps in a workflow:

- Selection of the power supply
- Motor design as a result of load configuring
- Calculation of the drive components
- Selecting the required accessories
- Selection of the line-side and motor-side power options.

When **SIZER** was being designed, particular importance was placed on a high degree of user-friendliness and a universal, function-based approach to the drive task. The extensive user guidance makes using the tool easy. Status information continuously indicates the progress in the configuration process. The user interface of **SIZER** is implemented in English and German.

The drive configuration is saved in a project. In the project, the components and functions used are displayed in a hierarchical tree structure.

The project view supports:

- The configuration of a number of drive devices
- The copying/pasting/modification of existing drives that have already been configured.

The configuration process produces the following results:

- A parts list of the components required
- Technical data
- Characteristics
- Comments on system reactions
- Location diagram and dimension drawings

These results are displayed in a results tree and can be reused for documentation purposes.

User support is provided by a technical online help, which provides the following information:

- Detailed technical data
- Information about the drives and their components
- Decision-making criteria for the selection of components

Minimum hardware and software requirements

Programming device or PC with Pentium II 400 MHz (Windows 2000), Pentium III 500 MHz (Windows XP)

256 MB RAM (512 MB recommended)

At least 675 MB of free hard disk space

An additional 100 MB of free hard disk space on Windows system drive

Monitor resolution 1024×768 pixels

Windows 2000 SP2, XP Professional SP1, XP Home Edition SP2

Microsoft Internet Explorer 5.5 SP2

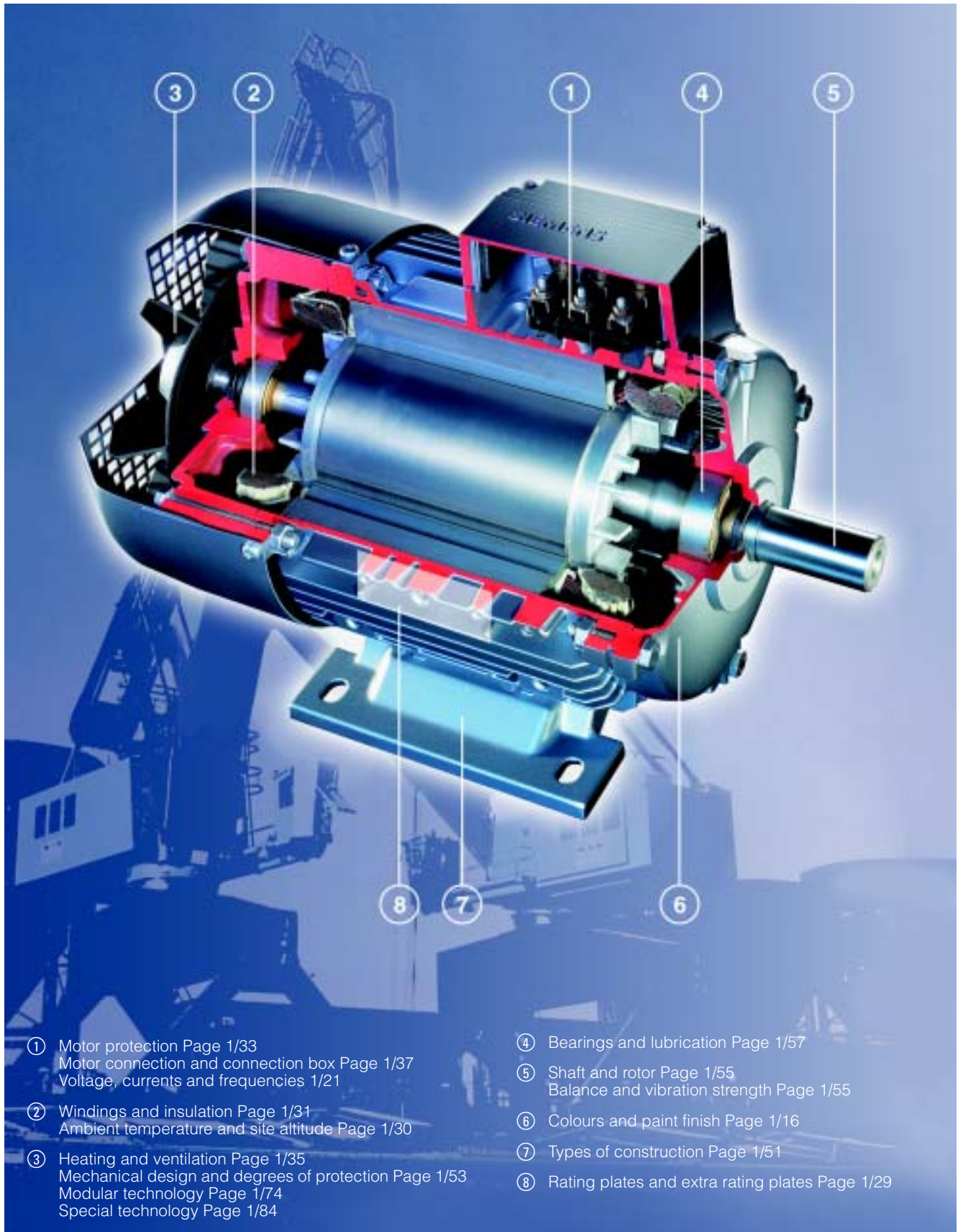
SINAMICS MICROMASTER SIZER configuring tool, English/German

Order No.

6SL3070-0AA00-0AG0

Overview

Cut-away diagram of a low-voltage motor



IEC Squirrel-Cage Motors

Introduction

General technical data

Designs in accordance with standards and specifications

Applicable standards and specifications

The motors comply with the appropriate standards and regulations, especially those listed in the table below.

Title	IEC	DIN/EN
General specifications for rotating electrical machines	IEC 60034-1, IEC 60085	DIN EN 60034-1
Specification of the losses and efficiency of rotating electrical machines	IEC 60034-2	DIN EN 60034-2
Asynchronous AC motors for general use with standardized dimensions and outputs	IEC 60072 fixing only	DIN EN 50347
Restart characteristics for rotating electrical machines	IEC 60034-12	DIN EN 60034-12
Terminal designations and direction of rotation for electrical machines	IEC 60034-8	DIN EN 60034-8
Designation for type of construction, installation and terminal box position	IEC 60034-7	DIN EN 60034-7
Entry to terminal box	–	DIN 42925
Built-in thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values for rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods for rotating electrical machines	IEC 60034-6	DIN EN 60034-6
Vibration severity of rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection of rotating electrical machines	IEC 60034-5	DIN EN 60034-5
In addition, the following applies to EEx motors:		
General regulations	IEC 60079-0	DIN EN 50014
Explosion-proof enclosure "d"	IEC 60079-1	DIN EN 50018
Increased safety "e"	IEC 60079-7	DIN EN 50019
Type of protection "n" (non sparking)	IEC 60079-15	DIN EN 60079-15
Areas containing flammable dust	IEC 61241	DIN EN 50281

National standards

The motors comply with the IEC or European standards listed above. The European standards replace the national standards in the following European countries: Germany (VDE), France (NF C), Belgium (NBNC), Great Britain (BS), Italy (CEI), Netherlands (NEN), Sweden (SS), Switzerland (SEV) etc.

The motors also comply with various national standards. The following standards (with the exception of non-standard motors) have been harmonized with IEC publication 60034-1 or replaced with DIN EN 60034-1 so that the motors can be operated at standard rated output.

AS 1359	Australia (higher output assignment than stated in DIN EN 50347 for frame size 250 M and above)
CSA C22.2, No. 100	Canada
IS 325	India
IS 4722	
NEK – IEC 60034-1	Norway

Explosion-proof motors:

Since these comply with the European standards EN 50014, EN 50018, EN 50019 and Directive 94/9/EG (ATEX 95), test certificates issued by authorized testing agencies (PTB, DMT, etc.) are accepted by all member states of the EU. The remaining members of CENELEC, Switzerland in particular, also accept the certificates.

Tolerances for electrical data

According to DIN EN 60034, the following tolerances are permitted: Motors which comply with DIN EN 60034-1 must have a voltage tolerance of $\pm 5\%$ / frequency tolerance of $\pm 2\%$ (Design A), if utilized, the permitted limit temperature of the temperature class may be exceeded by 10 K.

A tolerance of $\pm 5\%$ also applies to the rated voltage range in accordance with DIN EN 60034-1.

Efficiency η for

$$P_N \leq 150 \text{ kW: } -0.15 \cdot (1 - \eta)$$

$$P_N > 150 \text{ kW: } -0.1 \cdot (1 - \eta)$$

with η being a decimal number.

$$\text{Power factor} = \frac{1 - \cos \varphi}{6}$$

- Minimum absolute value: 0.02
- Maximum absolute value: 0.07

Slip $\pm 20\%$ (for motors $< 1 \text{ kW}$ $\pm 30\%$ is permissible)

Locked-rotor current $+20\%$

Locked-rotor torque -15% to $+25\%$

Breakdown torque -10%

Moment of inertia $\pm 10\%$

 1MA motors:

Add 10 % to the certified values for the locked-rotor current.

Energy-saving motors with European efficiency classification in accordance with EU/CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics)

Low-voltage motors in the output range of 1.1 to 90 kW, 2-pole and 4-pole are marked in accordance with the EU/CEMEP agreement with the efficiency class EFF2 (Improved Efficiency) or EFF3 (High Efficiency).

So that the requirements of efficiency classes EFF1 and EFF2 are fulfilled, the active parts of the motor have been optimized. The procedure for calculating the efficiency is based on the loss-summation method according to IEC 60034-2.

Motors for the North American market

For motors which comply with North American regulations (NEMA, CSA, UL, etc.), it must always be checked whether the motors will be used in the US or Canada and whether they are subject to state laws.

Minimum efficiencies required by law

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT = Energy Policy Act). An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all low-voltage three-phase motors exported to the USA or Canada must comply with the legal requirements on efficiency.

The law requires minimum efficiencies for 2, 4 and 6-pole motors with a voltage of 230 and 460 V/60 Hz, in the output range of 1 to 200 HP (0.75 to 160 kW). Explosion-proof motors must also be included. 1LA9 and 1LG6 are also available in the design for Zones 2, 21 and 22.

According to EPACT, the following are excluded from the efficiency requirements, for example.

- Motors whose frame size output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors without feet
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

For more information on EPACT:

<http://www.eren.doe.gov/>

Special requirements for the USA: Energy Policy Act

The act lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law: Nominal efficiency (service factor SF 1.15), design letter, code letter, CONT, CC-Nr. CC 032A (Siemens) and NEMA MG1-12.

Special requirements for Canada: CSA – Energy Efficiency Verification

These motors fulfill the minimum efficiency requirements laid down by the CSA standard C390. These motors are available as 1LA9 or 1LG6 and can be ordered with order code **D40** and are also marked with the CSA-E verification on the rating plate.



NEMA – Order code D30

The motors with increased efficiency according to EPACT are designed to meet the NEMA MG1-12 electrical standard and are marked accordingly. The mechanical design of all motors is compliant only to IEC, not to NEMA dimensions.

All motors in the **D30** version correspond to NEMA Design A (i. e. standard torque characteristic in accordance with NEMA and no starting current limitation).

For Design B, C and D, a special version is required (on request). According to NEC-ANSI-C1, Division 2, Class I, Group A, B, D, all 1LA/1LG motors that comply with Zone 2 can be used.

All other 1LA/1LG motors must be ordered with order code **D30**. Data on the rating plate: Rated voltage (voltage tolerance of $\pm 10\%$), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

UL approval – Order code D31

The motors based on the 1LA/1LG basic series are listed for up to 600 V by Underwriters Laboratories Inc. ("Recognition Mark" = R/C).

For Zones 2, 21, 22 and EEx e motors or EEx de motors as well as marine motors, there is no listing.

The motors must be ordered with order code **D31**, voltage code "9" and the order code for voltage and frequency.

According to UL, motor voltages are only certified up to 600 V, i. e. voltage codes 1, 3, 4 or 5. For this reason, voltage code "6" for example is omitted (400 V Δ /690 VY/ 50 Hz or 460 V Δ /60 Hz). Voltages 400 V Δ and 460 V Δ , for example, should be ordered as follows:

Voltage	Voltage code
400 V Δ /50 Hz or 460 V Δ /60 Hz (50 Hz output)	9 with L1U ¹⁾
460 V Δ /60 Hz (50 Hz output)	9 with L2T
460 V Δ /60 Hz (60 Hz output)	9 with L2F

The "UL Recognition Mark" is included on the rating plate of the motor.



In addition, the motor is designed to meet the NEMA MG1-12 electrical standard (with the exception of non-standard motors) and includes the following data on the rating plate: Rated voltage (voltage tolerance of $\pm 10\%$), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

Externally or internally mounted components such as

- Motor protection
- Heating element
- Separately-driven fan
- Brake
- Encoder
- Power connection
- Plug connector

are UL-R/C, CSA or C-US listed or used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application.

The motors can be operated with a frequency converter – separate converter or built-on (**1UA7**/order code **H15**) – with 50/60 Hz.

Deviating frequency settings must be tested at final acceptance.

The external fans for 1LA8 and 1LL8 motors must be made of metal.

The following versions are possible:

- 2-pole²⁾ motors, only in combination with K37 or K38
- 4, 6 and 8-pole motors, only in combination with K35

¹⁾ Only applicable to non-standard motors.

²⁾ Frame size 450 in 2-pole version, on request.

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For 1PQ8 motors, UL listed motors with separately-driven fan (400 V Δ 50 Hz/460 V Δ 60 Hz) are used. Other voltages up to 600 V and/or other frequencies must be ordered using the order code **Y81** and plain text. For 1LA8 and 1PQ8 motors of frame size 315, when option **D31** is ordered, connection box gt 640 will be automatically replaced at no extra charge with connection box 1XB1 621. The connection boxes are designed with an un-drilled cable entry. UL-R/C cable glands must be used for cable entry.

CSA approval – Order code D40

Motors based on the 1LA/1LG basic series are approved for up to 690 V in accordance with the Canadian regulations of the "Canadian Standard Association" (CSA). Externally or internally mounted components which are used are listed by CSA or are used by manufacturers in accordance with regulations. It may have to be decided whether the motor is suitable for the application. For Zones 2, 21, 22 and EEx e motors or EEx de motors as well as marine motors, there is no approval.

The motors must be ordered with the order code **D40**, voltage code **"9"** and order code for voltage and frequency. The CSA mark and the rated voltage (voltage tolerance of $\pm 10\%$) are included on the rating plate.



When energy-saving motors (1LA9, 1LG6) are ordered, they also include the CSA-E mark on the rating plate.



Other versions:

For versions and certification of explosion-proof motors in compliance with directive 94/9/EU (ATEX) as well as VIK versions, see Section 4 "Explosion-proof motors".

For versions for use in shipping, see Section 10 "Marine motors".

Export of low-voltage motors to China

CCC - China Compulsory Certification – Order code D01

"Small power motors" which are exported to China must be certified up to a rated output of:

2-pole: ≤ 2.2 kW

4-pole: ≤ 1.1 kW

6-pole: ≤ 0.75 kW

8-pole: ≤ 0.55 kW

The **1LA7, 1LA9, 1MA7 and 1MJ6 motors which must be certified** have been certified by the CQC (China Quality Cert. Center). When ordered with the D01 order code, the "CCC" logo and "Factory Code" are included on the rating plate and packaging.



Factory Code:

A005216 = Works Bad Neustadt

A010607 = Works Mohelnice

Note:

Chinese customs checks the need for certification of imported products by means of commodity code.

The following do not need to be certified:

- Motors imported to China which have already been installed in a machine
- Repair parts

Colours and paint finish

Version	Suitability of paint finish for climate group in accordance with DIN IEC 60721, Part 2-1	
Standard finish	Moderate (extended) for indoors and outdoors under a roof not directly subjected to weather conditions	Briefly: up to 120 °C Contin.: up to 100 °C
Special finish	Worldwide (global) for outdoor use in direct sunlight and/or weather conditions. Suitable for use in the tropics for <60% relative humidity at 40 °C	Briefly: up to 140 °C Contin.: up to 120 °C Also: for aggressive atmospheres up to 1% acid and alkali concentration or permanent dampness in sheltered rooms

All motors are painted with RAL 7030 (stone gray) if the color is not specified.

Other colors can be ordered with standard finish using order code **Y53** and the RAL number in plain text for a price supplement.

Other colors in special finish must be ordered with defined order codes (e.g. **M16**) or order code **Y51/Y54** and the RAL number in plain text.

For very corrosive environments, the 1LG4, 1LP4, 1PP4 and 1LG6 motors can be painted with off-shore paint CERAM-KOTE 54 (only on request).

All paint finishes can be painted over with commercially available paints. Special paint with increased layer thickness available on request.

If required, the motors can also be supplied coated in primer, order code **K24**, or unpainted (cast-iron parts in primer) using order code **K23**.

Standard finish in other standard RAL colors – Order code **Y53**
(RAL number is required in plain text)

RAL No.	Colour name	RAL No.	Colour name
1002	Sand yellow	6011	Mignonette green
1013	Pearl white	6019	Pastel green
1015	Light ivory	6021	Pale green
1019	Grey beige	7000	Squirrel grey
2003	Pastel orange	7001	Silver grey
2004	Pure orange	7004	Signal grey
3000	Flame red	7011	Iron grey
3007	Black red	7016	Anthracite grey
5007	Brilliant blue	7022	Umber grey
5009	Azure blue	7031	Blue grey
5010	Gentian blue	7032	Pebble grey
5012	Light blue	7033	Cement grey
5015	Sky blue	7035	Light grey
5017	Traffic blue	9001	Cream
5018	Teal blue	9002	Grey white
5019	Capri blue	9005	Jet black

Special finish in standard RAL colours with defined order codes
(exception: For non-standard motors, order the RAL number in plain text with order code **Y54**)

For 1LA5, 1LA6, 1LA7, 1LA9, 1MA7, 1MA6, 1MJ6, 1PP5, 1LP5, 1PP7 and 1LP7 motors up to frame size 200 L, the special finish is in RAL 7030 stone grey (order code **K26**) standard version.

RAL No.	Colour name	Order code
1002	Sand yellow	M16
1013	Pearl white	M17
3000	Flame red	M18
6011	Mignonette green	K27
6021	Pale green	M19
7001	Silver grey	M20
7030	Stone grey	K26
7031	Blue grey	K28
7032	Pebble grey	L42
7035	Light grey	M21
9001	Cream	M22
9002	Grey white	M23
9005	Jet black	L43

Special finish in other standard RAL colors – Order code **Y54**
(RAL number is required in plain text)

RAL No.	Colour name	RAL No.	Colour name
1015	Light ivory	5017	Traffic blue
1019	Grey beige	5018	Teal blue
2003	Pastel orange	5019	Capri blue
2004	Pure orange	6019	Pastel green
3007	Black red	7000	Squirrel grey
5007	Brilliant blue	7004	Signal grey
5009	Azure blue	7011	Iron grey
5010	Gentian blue	7016	Anthracite grey
5012	Light blue	7022	Umber grey
5015	Sky blue	7033	Cement grey

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General technical data

Special finish in special RAL colors – Order code **Y51** (RAL number is required in plain text)

RAL No.	Colour name	RAL No.	Colour name	RAL No.	Colour name	RAL No.	Colour name
1000	Green beige	3013	Tomato red	6002	Leaf green	7037	Dusty grey
1001	Beige	3014	Antique pink	6003	Olive green	7038	Agate grey
1003	Signal yellow	3015	Light pink	6004	Blue green	7039	Quartz grey
1004	Golden yellow	3016	Coral red	6005	Moss green	7040	Window grey
1005	Honey yellow	3017	Rose	6006	Grey olive	7042	Traffic grey A
1006	Maize yellow	3018	Strawberry red	6007	Bottle green	7043	Traffic grey B
1007	Daffodil yellow	3020	Traffic red	6008	Brown green	7044	Silk grey
1011	Brown beige	3022	Salmon pink	6009	Fir green	7045	Tele grey 1
1012	Lemon yellow	3024	Luminous red	6010	Grass green	7046	Tele grey 2
1014	Dark ivory	3026	Luminous bright red	6012	Black green	7047	Tele grey 4
1016	Sulfur yellow	3027	Raspberry red	6013	Reed green	7048	Pearl mouse grey
1017	Saffron yellow	3031	Orient red	6014	Yellow olive	8000	Green brown
1018	Zinc yellow	3032	Pearl ruby red	6015	Black olive	8001	Ocher brown
1020	Olive yellow	3033	Pearl pink	6016	Turquoise green	8002	Signal brown
1021	Rape yellow	4001	Red lilac	6017	May green	8003	Clay brown
1023	Traffic yellow	4002	Red violet	6018	Yellow green	8004	Copper brown
1024	Ochre yellow	4003	Heather violet	6020	Chrome green	8007	Fawn brown
1026	Luminous yellow	4004	Claret violet	6022	Olive drab	8008	Olive brown
1027	Curry	4005	Blue lilac	6024	Traffic green	8011	Nut brown
1028	Melon yellow	4006	Traffic purple	6025	Fern green	8012	Red brown
1032	Broom yellow	4007	Purple violet	6026	Opal green	8014	Sepia brown
1033	Dahlia yellow	4008	Signal violet	6027	Light green	8015	Chestnut
1034	Pastel yellow	4009	Pastel violet	6028	Pine green	8016	Mahogany
1035	Pearl beige	4010	Tele magenta	6029	Mint green	8017	Chocolate
1036	Pearl gold	4011	Pearl violet	6032	Signal green	8019	Grey brown
1037	Sun yellow	4012	Pearl blackberry	6033	Mint turquoise	8022	Black brown
2000	Yellow orange	5000	Violet blue	6034	Pastel turquoise	8023	Orange brown
2001	Red orange	5001	Green blue	6035	Pearl green	8024	Beige brown
2002	Vermilion	5002	Ultramarine	6036	Pearl opal green	8025	Pale brown
2005	Luminous orange	5003	Sapphire blue	7002	Olive grey	8028	Terra brown
2007	Luminous bright orange	5004	Black blue	7003	Moss grey	8029	Pearl copper
2008	Bright red orange	5005	Signal blue	7005	Mouse grey	9003	Signal white
2009	Traffic orange	5008	Grey blue	7006	Beige grey	9004	Signal black
2010	Signal orange	5011	Steel blue	7008	Khaki grey	9006	White aluminium
2011	Deep orange	5013	Cobalt blue	7009	Green grey	9007	Grey aluminium
2012	Salmon orange	5014	Pigeon blue	7010	Tarpaulin grey	9010	Pure white
2013	Pearl orange	5020	Ocean blue	7012	Basalt grey	9011	Graphite black
3001	Signal red	5021	Water blue	7013	Brown grey	9016	Traffic white
3002	Carmine red	5022	Night blue	7015	Slate grey	9017	Traffic black
3003	Ruby red	5023	Distant blue	7021	Black grey	9018	Papyrus white
3004	Purple red	5024	Pastel blue	7023	Concrete grey	9022	Pearl light grey
3005	Wine red	5025	Pearl gentian	7024	Graphite grey	9023	Pearl dark grey
3009	Oxide red	5026	Pearl night blue	7026	Granite grey		
3011	Brown red	6000	Patina green	7034	Yellow grey		
3012	Beige red	6001	Emerald green	7036	Platinum grey		

Packaging, safety notes, documentation and test certificates

Connected in star for dispatch – Order code **M32**

The terminal board of the motor is connected in star for dispatch.

Connected in delta for dispatch – Order code **M33**

The terminal board of the motor is connected in delta for dispatch.

Packing weights and packing dimensions

Packing weights		For land transport			Types of construction IM B5, IM V1		
For motors	Type	Type of construction IM B3					
Frame size	1LA5 ..., 1LA7 ..., 1LA6 ..., 1LA9 ..., 1LG4 ..., 1LG6 ..., 1LP4 ..., 1LP5 ..., 1LP7 ..., 1MA6 ..., 1MA7 ..., 1MJ6 ..., 1MJ7 ..., 1PP4 ..., 1PP5 ..., 1PP7 ...	In box Tare	On battens Tare	In crate Tare	In box Tare	On battens Tare	In crate Tare
		kg	kg	kg	kg	kg	kg
56 M	... 050/053	0.65	–	–	0.65	–	–
63 M	... 060/063	0.65	–	–	0.65	–	–
71 M	... 070	0.65	–	–	0.65	–	–
	... 073	0.65	–	–	0.65	–	–
80 M	... 080	0.65	–	–	0.65	–	–
	... 083	0.65	–	–	0.65	–	–
90 S	... 090	0.65	–	–	0.65	–	–
90 L	... 096/097	–	–	0.65	–	–	–
100 L	... 106/107	1.3	–	–	1.3	–	–
112 M	... 113	1.5	–	–	1.5	–	–
132 S	... 130/131	4.7	–	–	5.2	–	–
132 M	... 133/134	4.7	–	–	5.2	–	–
160 M	... 163/164	4.8	–	–	5.7	–	–
160 L	... 166	4.8	–	–	5.7	–	–
180 M	... 183	13.0	–	–	13.4	–	–
180 L	... 186	13.0	–	–	13.4	–	–
200 L	... 206/207	13.5	–	–	13.5	–	–
225 S	... 220	13.7	7	20	13.7	10	20
225 M	... 223	13.7	7	20	13.7	10	20
250 M	... 253	–	20	36	–	20	40
280 S	... 280	–	20	36	–	20	40
280 M	... 283	–	20	36	–	20	40
315 S	... 310	–	20	38	–	20	45
315 M	... 313	–	20	38	–	20	45
315 L	... 316/317/318	–	22	40	–	22	45

Values for type 1MJ1/1MJ8 and 1PP6 motors on request.

Data apply for individual packaging. For frame sizes 56 to 180 L, wire-lattice pallets can be used, order code **L99**.

Packing weights and packing dimensions for 1LA8, 1PQ8 and 1LL8 motors

For motors		Packing weights			
Frame size	Type 1LA8 ..., 1PQ8 ..., 1LL8 ...	Land transport on battens		Sea transport in wooden cases	
		Type of construction IM B3	Type of construction IM V1	Type of construction IM B3	Type of construction IM V1
		Tare	Tare	Tare	Tare
		kg	kg	kg	kg
315	... 315/317	30	55	270	310
355	... 353/355/357	40	65	320	365
400	... 403/405/407	45	75	390	445
450	... 453/455/457	50	85	450	510
Maximum motor dimensions		Allowances for maximum motor dimensions (packing dimensions = motor dimensions + allowance)			
		Land transport on battens		Sea transport in wooden cases	
		Type of construction IM B3	Type of construction IM V1	Type of construction IM B3	Type of construction IM V1
		approx. mm	approx. mm	approx. mm	approx. mm
Length		+250	+250	+250	+250
Width		+200	+300	+200	+200
Height		+200	+250	+500	+500

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General technical data

Safety notes

The motors are supplied without safety and commissioning notes for most motor types and frame sizes. A customer's declaration of renouncement is required.

Without safety and commissioning note – Order code B00

The motors are supplied with only one set of safety and commissioning notes per wire-lattice pallet for most motor types and frame sizes.

Complete with one set of safety and commissioning notes per wire-lattice pallet – Order code B01

Documentation

The documentation for non-standard motors contains as standard:

- Safety and commissioning notes (paper)
- Operating instructions (on CD)
- EU manufacturer's declaration (on CD)
- Acceptance test certificate 3.1 according to EN 10204 (by e-mail)
- Routine test certificate (by e-mail)

The following documents are optionally available:

- Document - Electrical data sheet – Order code **B31**
- Document - Order dimension drawing – Order code **B32**
- Document - Load characteristics – Order code **B37** (on request, only available for motors for line-fed operation)

Test certificates

Acceptance test certificate 3.1 according to EN 10204 – Order code B02

An acceptance test certificate 3.1 according to EN 10204 can be supplied for most motors.

The tests listed below are mainly intended for non-standard motors (Part 3). The assignment of order codes to motor types can be found in the "Special versions" section of the relevant catalogue sections.

Standard test (routine test) with acceptance – Order code F01

Standard routine testing of the motor, but with acceptance by an external representative (e.g. customer). The routine test is required to check the correct functioning of a motor where the characteristic data are known and were determined on a machine of the same type in a detailed type test. For a routine test, characteristic variables are determined, which after being converted to the basic data, are compared with the reference values for this machine type.

Visual acceptance and report handover with acceptance – Order code F03

Visual acceptance of the motor by an external representative (e.g. customer) and handover of the routine test report to the external representative (e.g. customer).

Temperature-rise test without acceptance – Order code F04

For the temperature-rise test, the temperature rise of a motor is measured in continuous duty. To do this, the motor is connected to a load (dynamometer), and operated with the rated power.

Temperature-rise test with acceptance – Order code F05

As for order code F04, but with acceptance by an external representative (e.g. customer).

Noise measurement during idling, no noise analysis, no acceptance – Order code F28

The A-rated sound pressure level L_{pA} is measured during idling at rated voltage. The number of measuring points and their locations are specified in the test certificate.

Noise measurement during idling, no noise analysis, with acceptance – Order code F29

As for order code F28, but with acceptance by an external representative (e.g. customer).

Recording of current and torque curves with torque metering shaft during starting, without acceptance – Order code F34

The measurement is used to determine the starting response of a motor. By comparison with the load torque characteristic, the acceleration torque can be calculated. This can be used to check that a complete machine set has started correctly. This measurement is only meaningful for motors that are directly line-fed and is not offered for motors that are designed for converter-fed operation.

Recording of current and torque curves with torque metering shaft during starting, with acceptance – Order code F35

As for order code F34, but with acceptance by an external representative (e.g. customer).

Measurement of the locked-rotor torque and locked-rotor current without acceptance – Order code F52

The torque and current are determined when the rotor is locked. This measurement is only meaningful for motors that are directly line-fed and is not offered for motors that are designed for converter-fed operation.

Measurement of the locked-rotor torque and locked-rotor current with acceptance – Order code F53

As for order code F52, but with acceptance by an external representative (e.g. customer).

Noise measurement during idling, with noise analysis, without acceptance – Order code F62

As for F28, but a noise analysis is also performed. The signal is divided up into frequency bands and the level is determined in each band.

Noise measurement during idling, with noise analysis, with acceptance – Order code F63

As for order code F62, but with acceptance by an external representative (e.g. customer).

Type test with heat run for horizontal motors, without acceptance – Order code F82

During the type test, a temperature-rise test is performed; no-load, short-circuit and load characteristics are recorded; the iron losses and friction losses are determined and the efficiency is calculated from the summed losses. This option is only applicable to motors with a horizontal type of construction.

Type test with heat run for horizontal motors, with acceptance – Order code F83

As for order code F82, but with acceptance by an external representative (e.g. customer, classification society).

Type test with heat run for vertical motors, without acceptance – Order code F92

As for order code F82, but only for motors with a vertical type of construction.

Type test with heat run for vertical motors, with acceptance – Order code F93

As for order code F92, but with acceptance by an external representative (e.g. customer, classification society).

Voltages, currents and frequencies

Standard voltages

EN 60034-1 differentiates between Category A (combination of voltage deviation $\pm 5\%$ and frequency deviation $\pm 2\%$) and Category B (combination of voltage deviation $\pm 10\%$ and frequency deviation $+3/-5\%$) for voltage and frequency fluctuations. The motors can supply their rated torque in both Category A and Category B. In Category A, the temperature rise is approx. 10 K higher than during normal operation.

According to the standard, longer operation is not recommended for Category B. See Page 1/30 for details of the rating plate inscriptions and examples. The selection and ordering data state the rated current at 400 V and where applicable 690 V. The DIN IEC 60038 standard specifies a tolerance of $\pm 10\%$ for line voltages of 230 V, 400 V and 690 V. The rating plates of motors with voltage code 0, 1 or 6 also include a rated voltage range in addition to the rated voltage (see table).

The rated currents at 420 V and for 1LA8/1PQ8/1LL8 motors 660 V or 725 V are listed in the table on Pages 1/25, 1/26 and on the rating plate.

The tolerance laid down by DIN EN 60034-1 applies to all converter-fed 1LA8 motors as well as to 1LA5, 1LA7, 1LG6, 1PQ8 and 1LL8 motors with special 690 V insulation, i.e. no rated voltage range is specified on the rating plate.

For 1LA and 1LG motors, type of protection "n" (Zone 2), a rated voltage range is not specified.

Line voltages	Rated voltage range	Voltage code
1LA, 1LG, 1MJ, 1PQ8 and 1LL8 motors		
230 V Δ /400 VY, 50 Hz	220 ... 240 V Δ /380 ... 420 VY, 50 Hz	1 ¹⁾
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /660 ... 725 VY, 50 Hz	6
500 VY, 50 Hz	–	3
500 V Δ , 50 Hz	–	5
1LA and 1LG motors		
Second rating plate with 50 and 60 Hz data, frame sizes 56 to 315 M for 1LA9 and 1LG6 with output at 60 Hz additionally in HP		
460 V, 60 Hz	440 ... 480V, 60 Hz	1, 6
1MA motors		
230 V Δ /400 VY, 50 Hz	218 ... 242 V Δ /380 ... 420 VY, 50 Hz	1
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /655 ... 725 VY, 50 Hz	6

1MA motors:

For non-standard frequencies, the t_E times and, where applicable, the rated output, may differ from those specified in the selection tables; in this case, a new or supplementary certificate is needed. For Δ connection, overload protection with phase-failure protection must be provided.

Non-standard voltages and/or frequencies

The tolerance laid down by DIN EN 60034-1 applies to all non-standard voltages.

Order codes have been allocated for a number of non-standard voltages at 50 or 60 Hz. They are ordered by specifying the code digit 9 for voltage in the 11th position of the Order No. and the appropriate order code.

L8Y Standard winding

Winding in accordance with voltage codes 0, 1, 3, 5, 6, 7 or 8; rating plate is stamped with order details.

The rated voltage is permitted to deviate up to $\pm 5\%$ from the medium voltage of the defined voltage codes (0, 1, 3, 5, 6, 7 or 8). Order code **L8Y** does not apply to explosion-proof motors, converter-fed motors, smoke extraction motors and motors for the North American market (in connection with order codes D30, D31 or D40).

L1Y Non-standard winding for voltages between 200 V (380 V for 1LA8, 1PQ8 and 1LL8 motor series) and 690 V and rated output up to the maximum rated output of the basic version. For voltages and rated outputs outside the range, please enquire.

Motor series	Frame size	Rated voltages for L1Y that can be supplied	
		Lowest / highest voltage in V for	
		Delta	Star
1LA7, 1LA9, 1LP7, 1MA7, 1MJ6, 1PP7	56 . . . 90	200 / 500 ²⁾	250 / 690 ³⁾
1LA6, 1LA7, 1LA9, 1LP7, 1MA6, 1MA7, 1MJ6, 1PP6, 1PP7	100 . . . 160	200 / 690	250 / 690
1LA5, 1LA9, 1LP5, 1MA6, 1MJ6, 1PP5, 1PP6	180 . . . 200	200 / 690	250 / 690
1LA5, 1LP5, 1PP5	225	200 / 690	250 / 690

L3Y Non-standard winding Y/ Δ starting at low speed (only possible for 1LA7 and 1LA5 pole-changing motors).

When ordering, state in plain text:

Voltage, frequency, connection and required rated output in kW.

Order codes for other rated voltages in the relevant sections of the catalogue

For converter-fed motors and smoke extraction motors, only order code **L1Y** is possible. For non-standard motors, order code **L8Y** is also possible for converter-fed operation.

The order codes listed below are possible for other motors; see the relevant sections of the catalogue.

¹⁾ Only applicable to non-standard motors.

²⁾ Highest voltage in delta circuit for 1MA7 060-2 and 1MA7 063-4 290 V as well as for 1MA7 060-4 230 V.

³⁾ Highest voltage in star circuit for 1MA7 060-2 and 1MA7 063-4 500 V as well as for 1MA7 060-4 400 V.

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Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing) ¹⁾	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY)	50 Hz output	L1R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY)	50 Hz output	L1L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
415 VY (395 ... 435 VY)	50 Hz output	L1C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
400 VY (380 ... 420 VY)	50 Hz output	L1A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 VΔ/380 VY	50 Hz output	L2A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
220 VΔ/380 VY	60 Hz output	L2B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
380 VΔ/660 VY	50 Hz output	L2C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
380 VΔ/660 VY	60 Hz output	L2D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
440 VY	50 Hz output	L2Q	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
440 VY	60 Hz output	L2W	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
440 VΔ	50 Hz output	L2R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
440 VΔ	60 Hz output	L2X	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
460 VY	50 Hz output	L2S	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
460 VY	60 Hz output	L2E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
460 VΔ	50 Hz output	L2T	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
460 VΔ	60 Hz output	L2F	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
575 VY	50 Hz output	L2U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
575 VY	60 Hz output	L2L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
575 VΔ	50 Hz output	L2V	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L
575 VΔ	60 Hz output	L2M	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors multi-voltage	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
230 VYY/460 VY 60 Hz	50 Hz output	L3E	56 ... 200	–	56 ... 200	–	63 ... 200	–
230 VYY/460 VY 60 Hz	60 Hz output	L3F	56 ... 200	–	56 ... 200	–	63 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	50 Hz output	L3G	100 ... 200	–	100 ... 200	–	100 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	60 Hz output	L3H	100 ... 200	–	100 ... 200	–	100 ... 200	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors pole-changing	Frame sizes for motors					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 V	50 Hz output	L4A	63 ... 200	–	–	–	–	–
220 V	60 Hz output	L4B	63 ... 200	–	–	–	–	–
380 V	50 Hz output	L4C	63 ... 200	–	–	–	–	–
380 V	60 Hz output	L4D	63 ... 200	–	–	–	–	–
440 V	50 Hz output	L4G	63 ... 200	–	–	–	–	–
440 V	60 Hz output	L4E	63 ... 200	–	–	–	–	–
460 V	50 Hz output	L4J	63 ... 200	–	–	–	–	–
460 V	60 Hz output	L4H	63 ... 200	–	–	–	–	–
575 V	50 Hz output	L4N	63 ... 200	–	–	–	–	–
575 V	60 Hz output	L4M	63 ... 200	–	–	–	–	–

¹⁾ For order codes L1A, L1C, L1D, L1L, L1R and L1U, a rated voltage range is also included on the rating plate.

Further voltages for non-standard motors

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors		
			1LA8	1PQ8	1LL8
220 VΔ/380 VY	50 Hz output	L2A	–	–	–
220 VΔ/380 VY	60 Hz output	L2B	–	–	–
380 VΔ/660 VY	50 Hz output	L2C	315 ... 450	315 ... 450	315 ... 450
380 VΔ/660 VY	60 Hz output	L2D	315 ... 450	315 ... 450	315 ... 450
440 VY	50 Hz output	L2Q	–	–	–
440 VY	60 Hz output	L2W	–	–	–
440 VΔ	50 Hz output	L2R	315 ... 450	315 ... 450	315 ... 450
440 VΔ	60 Hz output	L2X	315 ... 450	315 ... 450	315 ... 450
460 VY	50 Hz output	L2S	–	–	–
460 VY	60 Hz output	L2E	–	–	–
460 VΔ	50 Hz output	L2T	315 ... 450	315 ... 450	315 ... 450
460 VΔ	60 Hz output	L2F	315 ... 450	315 ... 450	315 ... 450
575 VY	50 Hz output	L2U	–	–	–
575 VY	60 Hz output	L2L	–	–	–
575 VΔ	50 Hz output	L2V	315 ... 450	315 ... 450	315 ... 450
575 VΔ	60 Hz output	L2M	315 ... 450	315 ... 450	315 ... 450

Further voltages for explosion-proof motors

Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing) ¹⁾	Frame sizes for motors							
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1MA6, 1MA7	1MJ6	1MJ7	1MJ8, 1MJ1
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY)	50 Hz output	L1R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY)	50 Hz output	L1L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 L	–
415 VY (395 ... 435 VY)	50 Hz output	L1C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 L	–
400 VY (380 ... 420 VY)	50 Hz output	L1A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	–	–	–
400 VΔ (380 ... 420 VΔ)	50 Hz output	L1B ²⁾	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	–	–	–
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	–	–	–
400 VΔ (only 4-8-pole)	87 Hz output	L3A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	–	–	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors							
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1MA6, 1MA7 ³⁾	1MJ6	1MJ7	1MJ8, 1MJ1
220 VΔ/380 VY	50 Hz output	L2A	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
220 VΔ/380 VY	60 Hz output	L2B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M	315 ... 450
380 VΔ/660 VY	50 Hz output	L2C	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M	–
380 VΔ/660 VY	60 Hz output	L2D	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M	315 ... 450
440 VY	50 Hz output	L2Q	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
440 VY	60 Hz output	L2W	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M	315 ... 450
440 VΔ	50 Hz output	L2R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M	–
440 VΔ	60 Hz output	L2X	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M	315 ... 450
460 VY	50 Hz output	L2S	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
460 VY	60 Hz output	L2E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M	315 ... 450
460 VΔ	50 Hz output	L2T	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M	–
460 VΔ	60 Hz output	L2F	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M	315 ... 450
575 VY	50 Hz output	L2U	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M	–
575 VY	60 Hz output	L2L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	–	71 ... 200	225 ... 315 M	315 ... 450
575 VΔ	50 Hz output	L2V	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	63 ... 315 L	71 ... 200	225 ... 315 M	–
575 VΔ	60 Hz output	L2M	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	–	71 ... 200	225 ... 315 M	315 ... 450

¹⁾ For order codes **L1A**, **L1C**, **L1D**, **L1L**, **L1R** and **L1U**, a rated voltage range is also included on the rating plate, with the exception of versions in Zone 2 type of protection "n" or (E) Ex n II T3.

²⁾ For converter-fed operation, the converter output for a voltage according to the table is included on the rating plate.

³⁾ A special certificate is required.

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Further voltages for fan motors

Voltage at 50 Hz	Required output at 50 Hz	Order code for 50 Hz constant-speed motors (not pole-changing) ¹⁾	Frame sizes for motors	
			1PP5, 1PP7	1PP4
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY)	50 Hz output	L1R	63 ... 200	180 ... 315 M
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY)	50 Hz output	L1L	63 ... 200	180 ... 315 L
415 VY (395 ... 435 VY)	50 Hz output	L1C	63 ... 200	180 ... 315 M
415 VΔ (395 ... 435 VΔ)	50 Hz output	L1D	63 ... 200	180 ... 315 L
400 VY (380 ... 420 VY)	50 Hz output	L1A	63 ... 200	180 ... 315 M
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ)	50 Hz output	L1U	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz constant-speed motors (not pole-changing)	Frame sizes for motors	
			1PP5, 1PP7	1PP4
220 VΔ/380 VY	50 Hz output	L2A	63 ... 200	180 ... 315 M
220 VΔ/380 VY	60 Hz output	L2B	63 ... 200	180 ... 315 M
380 VΔ/660 VY	50 Hz output	L2C	63 ... 200	180 ... 315 L
380 VΔ/660 VY	60 Hz output	L2D	63 ... 200	180 ... 315 L
440 VY	50 Hz output	L2Q	63 ... 200	180 ... 315 M
440 VY	60 Hz output	L2W	63 ... 200	180 ... 315 M
440 VΔ	50 Hz output	L2R	63 ... 200	180 ... 315 L
440 VΔ	60 Hz output	L2X	63 ... 200	180 ... 315 L
460 VY	50 Hz output	L2S	63 ... 200	180 ... 315 M
460 VY	60 Hz output	L2E	63 ... 200	180 ... 315 M
460 VΔ	50 Hz output	L2T	63 ... 200	180 ... 315 L
460 VΔ	60 Hz output	L2F	63 ... 200	180 ... 315 L
575 VY	50 Hz output	L2U	63 ... 200	180 ... 315 M
575 VY	60 Hz output	L2L	63 ... 200	180 ... 315 M
575 VΔ	50 Hz output	L2V	63 ... 200	180 ... 315 L
575 VΔ	60 Hz output	L2M	63 ... 200	180 ... 315 L

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors, multi-voltage	Frame sizes for motors	
			1PP5, 1PP7	1PP4
230 VYY/460 VY 60 Hz	50 Hz output	L3E	63 ... 200	–
230 VYY/460 VY 60 Hz	60 Hz output	L3F	63 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	50 Hz output	L3G	100 ... 200	–
230 VΔΔ/460 VΔ 60 Hz	60 Hz output	L3H	100 ... 200	–

Voltage at 60 Hz	Required output at 60 Hz	Order code for 60 Hz motors, pole-changing	Frame sizes for motors	
			1LA5, 1LA7	1LG4
220 V	50 Hz output	L4A	80 ... 200	180 ... 280
220 V	60 Hz output	L4B	80 ... 200	180 ... 280
380 V	50 Hz output	L4C	80 ... 200	180 ... 280
380 V	60 Hz output	L4D	80 ... 200	180 ... 280
440 V	50 Hz output	L4G	80 ... 200	180 ... 280
440 V	60 Hz output	L4E	80 ... 200	180 ... 280
460 V	50 Hz output	L4J	80 ... 200	180 ... 280
460 V	60 Hz output	L4H	80 ... 200	180 ... 280
575 V	50 Hz output	L4N	80 ... 200	180 ... 280
575 V	60 Hz output	L4M	80 ... 200	180 ... 280

¹⁾ For order codes **L1A**, **L1C**, **L1D**, **L1L**, **L1R** and **L1U** a rated voltage range is also included on the rating plate.

Rated currents for rated voltage range 380 V to 420 V at 50 Hz

	Currents for voltage and number of poles							
	380 V 2-pole A	420 V A	380 V 4-pole A	420 V A	380 V 6-pole A	420 V A	380 V 8-pole A	420 V A
1LA7, 1LA5 motors								
1LA7 050	0.27	0.26	0.21	0.21	–	–	–	–
1LA7 053	0.33	0.32	0.30	0.31	–	–	–	–
1LA7 060	0.52	0.53	0.42	0.44	–	–	–	–
1LA7 063	0.68	0.70	0.56	0.57	0.48	0.5	–	–
1LA7 070	1.05	1.02	0.80	0.77	0.66	0.64	0.36	0.36
1LA7 073	1.38	1.41	1.07	1.06	0.80	0.80	0.51	0.52
1LA7 080	1.75	1.79	1.50	1.50	1.18	1.25	0.73	0.80
1LA7 083	2.45	2.50	1.90	1.92	1.62	1.66	1.01	1.10
1LA7 090	3.40	3.35	2.60	2.60	2.10	2.15	1.15	1.18
1LA7 096	4.70	4.65	3.50	3.50	3.0	2.95	1.63	1.60
1LA7 106	6.25	6.15	4.8	4.8	4.0	4.1	2.25	2.2
1LA7 107	–	–	6.5	6.8	–	–	3.0	3.0
1LA7 113	8.2	7.7	8.4	8.3	5.4	5.3	4.1	4.2
1LA7 130	10.6	10.4	11.4	11.9	7.3	7.5	5.9	6.0
1LA7 131	14.1	13.8	–	–	–	–	–	–
1LA7 133	–	–	15.4	15.5	9.5	9.7	7.9	7.9
1LA7 134	–	–	–	–	13.0	13.1	–	–
1LA7 163	21.0	20.5	22.3	21.5	17.5	17.3	9.9	10.6
1LA7 164	28.0	26.0	–	–	–	–	13.1	13.4
1LA7 166	34.0	32.0	29.5	28.5	24.8	24.7	17.6	18.4
1LA5 183	40	38	36	35	–	–	–	–
1LA5 186	–	–	42	41	32.7	31	26.5	23.5
1LA5 206	55	52	–	–	40	38.5	–	–
1LA5 207	67	64	57	54	46.5	45.5	34	31
1LA5 220	–	–	69	64	–	–	40	37
1LA5 223	81	76	84	78	64	63	47	43
1LA6, 1LG4 motors								
1LA6 106	6.25	6.15	4.8	4.8	4.0	4.1	2.25	2.2
1LA6 107	–	–	6.5	6.8	–	–	3.0	3.0
1LA6 113	8.2	7.7	8.4	8.3	5.4	5.3	4.1	4.2
1LA6 130	10.6	10.4	11.4	11.9	7.3	7.5	5.9	6.0
1LA6 131	14.1	13.8	–	–	–	–	–	–
1LA6 133	–	–	15.4	15.5	9.5	9.7	7.9	7.9
1LA6 134	–	–	–	–	13.0	13.1	–	–
1LA6 163	21.0	20.5	22.3	21.5	17.5	17.3	9.9	10.6
1LA6 164	28.0	26.0	–	–	–	–	13.1	13.4
1LA6 166	34.0	32.0	29.5	28.5	24.8	24.7	17.6	18.4
1LG4 183	41.5	40	36	35	–	–	–	–
1LG4 186	–	–	42.5	41.5	30.5	28.5	25.5	25
1LG4 188	56	54	59	60	38.5	37	34.5	34.5
1LG4 206	56	52	–	–	37	37	–	–
1LG4 207	67	63	57	55	45	42.5	33.5	32
1LG4 208	82	77	70	69	61	60	40.5	39
1LG4 220	–	–	72	65	–	–	40.5	36.5
1LG4 223	83	75	85	77	60	54	46.5	42
1LG4 228	100	90	104	94	73	66	64	58
1LG4 253	100	93	104	98	73	68	60	57
1LG4 258	134	128	138	134	87	81	73	69
1LG4 280	136	126	144	132	87	80	76	70
1LG4 283	162	150	168	156	106	97	92	84
1LG4 288	196	182	204	190	146	134	112	102
1LG4 310	198	188	205	194	142	136	110	104
1LG4 313	230	215	245	230	170	162	146	136
1LG4 316	280	255	295	275	205	190	174	164
1LG4 317	345	315	360	330	245	225	210	198
1LG4 318	–	–	–	–	295	275	250	240

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	Currents for voltage and number of poles							
	380 V	420 V	380 V	420 V	380 V	420 V	380 V	420 V
	2-pole A	A	4-pole A	A	6-pole A	A	8-pole A	A
1LG6, 1LA8 motors								
1LG6 183	40.5	37.5	36	34.5	–	–	–	–
1LG6 186	–	–	42.5	40.5	30.5	29	24.5	23
1LG6 206	54	51	–	–	37	35.5	–	–
1LG6 207	66	62	56	54	44	40.5	32.5	30.5
1LG6 220	–	–	70	64	–	–	38	34.5
1LG6 223	81	73	84	76	59	53	45	41
1LG6 253	97	90	99	94	72	67	59	55
1LG6 280	134	124	138	128	85	79	75	69
1LG6 283	158	146	166	154	104	96	91	83
1LG6 310	192	174	200	184	142	134	106	100
1LG6 313	230	210	235	215	166	156	142	136
1LG6 316	275	250	285	265	205	190	170	158
1LG6 317	340	305	355	330	245	225	205	194
1LG6 318	–	–	–	–	290	275	250	230
1LA8 315	435	400	450	425	360	340	310	295
1LA8 317	540	495	560	530	450	420	385	365
1LA8 353	620	570	640	590	–	–	–	–
1LA8 355	690	630	720	680	570	530	480	455
1LA8 357	860	790	880	820	720	670	600	560
1LA8 403	950	880	990	930	810	760	680	640
1LA8 405	1080	990	1100	1040	890	840	760	720
1LA8 407	690 ¹⁾	640 ²⁾	710 ¹⁾	670 ²⁾	1000	940	850	810
1LA8 453	780 ¹⁾	730 ²⁾	810 ¹⁾	750 ²⁾	1160	1060	960	910
1LA8 455	880 ¹⁾	810 ²⁾	910 ¹⁾	860 ²⁾	740 ¹⁾	690 ²⁾	1080	1020
1LA8 457	970 ¹⁾	890 ²⁾	1000 ¹⁾	940 ²⁾	830 ¹⁾	770 ²⁾	1200	1140

The rating plates of 1MJ6 motors specify the maximum current in the voltage range in addition to the rated current. This maximum is approximately 5% higher than the rated current.

¹⁾ Only available for 690 V, see chapter 3 "Non-standard motors frame size 315 and above".

²⁾ Only available for 725 V, see chapter 3 "Non-standard motors frame size 315 and above".

Outputs

The outputs and the rated outputs are listed in the selection tables and in the separate catalog sections for 50 Hz and in most Table of rated output at 60 Hz for single-speed motors

Motor type		Maximum output at 60 Hz for voltages between 220 V or 380 V and 725 V			
		2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LA6, 1LG4, 1LG6, 1LA7, 1MJ6, 1MJ7 motors					
1LA7 050	–	0.105	0.07	–	–
1LA7 053	–	0.14	0.105	–	–
1LA7 060	–	0.21	0.14	–	–
1LA7 063	–	0.29	0.21	0.1	–
1LA7 070	–	1MJ6 070	0.43	0.29	0.21
1LA7 073	–	1MJ6 073	0.63	0.43	0.29
1LA7 080	–	1MJ6 080	0.86	0.63	0.43
1LA7 083	–	1MJ6 083	1.3	0.86	0.63
1LA7 090	–	1MJ6 096	1.75	1.3	0.86
1LA7 096	–	1MJ6 097	2.55	1.75	1.3
1LA7 106	1LA6 106	1MJ6 106	3.45	2.55	1.75
1LA7 107	1LA6 107	1MJ6 107	–	3.45	–
1LA7 113	1LA6 113	1MJ6 113	4.6	4.6	2.55
1LA7 130	1LA6 130	1MJ6 130	6.3	6.3	3.45
1LA7 131	1LA6 131	1MJ6 131	8.6	–	–
1LA7 133	1LA6 133	1MJ6 133	–	8.6	4.6
1LA7 134	1LA6 134	1MJ6 134	–	–	6.3
1LA7 163	1LA6 163	1MJ6 163	12.6	12.6	8.6
1LA7 164	1LA6 164	1MJ6 164	17.3	–	–
1LA7 166	1LA6 166	1MJ6 166	21.3	17.3	12.6
1LA5 183	1LG . 183	1MJ6 183	24.5	21.3	–
1LA5 186	1LG . 186	1MJ6 186	–	25.3	18
–	1LG . 188	–	33.5	34.5	22
1LA5 206	1LG . 206	1MJ6 206	33.5	–	22
1LA5 207	1LG . 207	1MJ6 207	41.5	34.5	26.5
–	1LG . 208	–	51	42.5	36
1LA5 220	1LG . 220	1MJ7 220	–	42.5	–
1LA5 223	1LG . 223	1MJ7 223	51	52	36
–	1LG . 228	–	62	63	44.5
–	1LG . 253	1MJ7 253	62	63	44.5
–	1LG . 258	–	84	86	54
–	1LG . 280	1MJ7 280	84	86	54
–	1LG . 283	1MJ7 283	101	104	66
–	1LG . 288	–	123	127	90
–	1LG . 310	1MJ7 310	123	127	90
–	1LG . 313	1MJ7 313	148	152	108
–	1LG . 316	–	180	184	132
–	1LG . 317	–	224	230	158
–	1LG . 318	–	–	–	192

Table of rated output at 60 Hz for pole-changing motors

At 60 Hz, the output can be increased in accordance with the factors listed in the table below. The output is increased separately for each number of poles, i.e. for 6/4-pole motors, frame sizes 180 to 315, 60 Hz, the 6-pole output can be increased by 20% and the 4-pole output can be increased by 15%.

Possible versions of 2-pole motors

Frame size	Horizontal type of construction			Vertical type of construction		
	50 Hz with foot	60 Hz with foot	50 Hz with flange	60 Hz with flange	50 Hz	60 Hz
56 to 315 M	•	•	•	•	•	•
315 L	•	•	–	–	•	•
315	•	•	•	•	•	•
355 and 400	•	•	•	•	•	–
450	•	–	•	–	•	–

¹⁾ Only available as 690 V.

cases also for 60 Hz. For 60 Hz, the rated output values must, in some cases, be increased, e.g. for pole-changing motors.

Motor type		Maximum output at 60 Hz for voltages between 380 V and 725 V			
		2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LA8 motors					
1LA8 315	–	280	288	230	184
1LA8 317	–	353	362	288	230
1LA8 353	–	398	408	–	–
1LA8 355	–	448	460	362	288
1LA8 357	–	560	575	460	362
1LA8 403	–	616	644	518	408
1LA8 405	–	693	725	575	460
1LA8 407	–	–	817	644	518
1LA8 453	–	–	–	725	575
1LA8 455	–	–	–	–	644
1LA8 457	–	–	–	–	725
1MJ8, 1MJ1 motors					
1MJ1 313	–	185	180	132	100
1MJ1 314	–	–	–	150	120
1MJ1 316	–	220	220	170	145
1MJ1 318	–	275	275	220	175
1MJ8 356	–	355	315	280	225
1MJ8 357	–	400	355	315	–
1MJ8 358	–	450	400	355	280
1MJ8 350	–	–	450	–	–
1MJ1 357	–	–	500	400	315
1MJ1 358	–	–	500	560	450
1MJ1 404	–	–	–	–	400
1MJ1 405	–	560	630	500	–
1MJ1 407	–	630	710	560	450
1MJ1 408	–	710 ¹⁾	800	–	500
1MJ1 453	–	–	–	630	–
1MJ1 455	–	710 ¹⁾	900	710	560
1MJ1 457	–	800 ¹⁾	1000 ¹⁾	800	630
1MJ1 458	–	900 ¹⁾	O. R. ¹⁾	900	710
1MJ1 450	–	–	–	–	750

O. R. On request

The speed increases to approx. 120% in relation to 50 Hz motors.

Higher outputs/voltages are available on request!

Frame size	Number of poles	Factor for increased output at 60 Hz for voltages between 220 or 380 and 725 V
56 to 160	2 to 8	1.15
180 to 315	2	1.12
	4	1.15
	6 and 8	1.2

IEC Squirrel-Cage Motors

Introduction

General technical data

Efficiency, power factor, rated torque, rated speed and direction of rotation

Efficiency and power factor

The efficiency η and power factor $\cos \varphi$ for each rated output are listed in the selection tables in the individual sections of this catalog.

For EFF1 and EFF2 motors, the 3/4 load efficiency is also indicated.

Part-load efficiency % at 1/4	1/2	3/4	4/4	5/4
of full load				
93	96	97	97	96.5
92	95	96	96	95.5
90	93.5	95	95	94.5
89	92.5	94	94	93.5
88	91.5	93	93	92.5
87	91	92	92	91.5
86	90	91	91	90
85	89	90	90	89
84	88	89	89	88
80	87	88	88	87
79	86	87	87	86
78	85	86	86	85
76	84	85	85	83.5
74	83	84	84	82.5
72	82	83	83	81.5
70	81	82	82	80.5
68	80	81	81	79.5
66	79	80	80	78.5
64	77	79.5	79	77.5
62	75.5	78.5	78	76.5
60	74	77.5	77	75
58	73	76	76	74
56	72	75	75	73
55	71	74	74	72
54	70	73	73	71
53	68	72	72	70
52	67	71	71	69
51	66	70	70	68
50	65	69	69	67
49	64	67.5	68	66
48	62	66.5	67	65
47	61	65	66	64
46	60	64	65	63
45	59	63	64	62
44	57	62	63	61
43	56	60.5	62	60.5
42	55	59.5	61	59.5
41	54	58.5	60	58.5

The part-load values stated in the tables below are averages; precise values can be provided on request.

Part-load power factor at 1/4	1/2	3/4	4/4	5/4
of full load				
0.70	0.86	0.90	0.92	0.92
0.65	0.85	0.89	0.91	0.91
0.63	0.83	0.88	0.90	0.90
0.61	0.80	0.86	0.89	0.89
0.57	0.78	0.85	0.88	0.88
0.53	0.76	0.84	0.87	0.87
0.51	0.75	0.83	0.86	0.86
0.49	0.73	0.81	0.85	0.86
0.47	0.71	0.80	0.84	0.85
0.45	0.69	0.79	0.83	0.84
0.43	0.67	0.77	0.82	0.83
0.41	0.66	0.76	0.81	0.82
0.40	0.65	0.75	0.80	0.81
0.38	0.63	0.74	0.79	0.80
0.36	0.61	0.72	0.78	0.80
0.34	0.59	0.71	0.77	0.79
0.32	0.58	0.70	0.76	0.78
0.30	0.56	0.69	0.75	0.78
0.29	0.55	0.68	0.74	0.77
0.28	0.54	0.67	0.73	0.77
0.27	0.52	0.63	0.72	0.76
0.26	0.50	0.62	0.71	0.76

Rated torque

The rated torque in Nm delivered at the motor shaft is

$$M = \frac{9.55 \cdot P \cdot 1000}{n}$$

P Rated output in kW
 n Speed in rpm

Note:

If the voltage deviates from its rated value within the allowed limits, the locked-rotor torque, the pull-up torque and the breakdown torque vary with the approximate square of the value, but the locked-rotor current varies approximately linearly.

In the case of squirrel-cage motors, the locked-rotor torque and breakdown torque are listed in the selection tables as multiples of the rated torque.

The normal practise is to start squirrel-cage motors directly on line. The torque class indicates that with direct-on-line starting, even if there is - 5% undervoltage, it is possible to start up the motor against a load torque of

- 160% for CL 16
- 130% for CL 13
- 100% for CL 10
- 70% for CL 7
- 50% for CL 5

of the rated torque.

The individual torque characteristics are available in the SD configurator. In addition, it is possible to perform calculations with the supplied start-up program.

 For type 1MA motors in the standard design for T1/T2 and T3 and different rated outputs, the torque class specified for the higher output applies.

General technical data

Rated speed and direction of rotation

The rated speeds are applicable for the rated data. The synchronous speed changes proportionally with the line frequency. The motors are suitable for clockwise and counter-clockwise rotation.

This does not apply to the following 2-pole motors:

- 1LA8, 1LL8 frame size 355 and above for clockwise rotation only; alternatively order code **K38** for counter-clockwise rotation only
- 1LA8, 1MJ8, 1MJ6, 1MJ1, 1MA6 and 1LG4 in VIK version from frame size 315 and above.

If U1, V1, W1 are connected to L1, L2, L3, clockwise rotation results as viewed onto the drive-end shaft extension. Counter-clockwise rotation is achieved by swapping two phases (see also "Heating and ventilation").

Rating plate and extra rating plates

DIN EN 60034-1 lays down that the approximate total weight for all motors from frame size 90 (from approx. 30 kg) is indicated on the rating plate.

An extra rating plate can be supplied loose for all motors, order code **K31**. Supplementary data can be indicated on the rating plate and on the packaging label, order code **Y84**.

An extra rating plate can also be supplied for the customer's data, order code **Y82**.

An extra rating plate or a rating plate can also be ordered with different rating plate data, order code **Y80**.

In the standard version, the rating plate is available in international format or in the English/German language. The language for the rating plate can be ordered by specifying in plain text. An overview of the languages that can be ordered, at additional cost in some cases, is provided by the table below.

 In addition, for 1MA motors:

With the exception of 2-pole motors from frame size 225 M or larger, all motors are suitable for both T1/T2 and T3 (uniform design).

If the rated output for T1/T2 differs from that of T3, the data for both output values is stated separately.

Overview of the languages on the rating plate

Motor type	Frame size	Rating plate							Russian (ru)	Double rating plate 50/60 Hz data for	
		Inter-national	German (de)	English (en)	German (de)/ English (en)	French (fr)/ Spanish (es)	Italian (it)	Portuguese (pt)		500 VY and 575 VY	400 V/ 690 V and 460 V
1LA5	180 ... 225	□		○						□	□
1LA6	100 ... 160	□		○						□	□
1LA7	56 ... 160	□		○						□	□
1LA8	315 ... 450				□	○	○	○			
1LA9	56 ... 200	□		○						□	□
1LG4	180 ... 315				□				✓		□
1LG6	180 ... 315	□							✓		□
1LL8	315 ... 450				□	○	○	○			
1LP4	180 ... 315				□				✓		□
1LP5	63 ... 160	□		○						□	□
1LP7	180 ... 200	□		○						□	□
1MA6	100 ... 180			○	□						
1MA6	180 ... 200			○	□						
1MA6	225 ... 315			○	□	○	○	○	✓		
1MA7	63 ... 160	□		○							
1MJ1	315 ... 450		□			✓	✓	✓	✓		
1MJ6	71 ... 200	□		○							
1MJ7	225 ... 315				□	○	○	○	✓		
1MJ8	355		□			✓	✓	✓	✓		
1PP4	180 ... 315				□				✓		□
1PP5	180 ... 200	□		○						□	□
1PP6	100 ... 315				□				✓		□
1PP7	63 ... 160	□		○						□	□
1PQ8	315 ... 450				□	○	○	○			

- Standard version
- With no extra charge
- ✓ With extra charge

IEC Squirrel-Cage Motors

Introduction

General technical data

Examples of rating plates

See the section of the catalog "Non-standard motors" for rating plates for motor series 1LA8, 1PQ8 and 1LL8.

Factory number		Temperature class	
Weight	Order No.		
SIEMENS D-91056 Erlangen 50 Hz 400/690 VΔ/Y 18.5 kW 32.5/18.8 A cos φ 0.91 2940/min 380-420/660-725 VΔ/Y 34.0-32.0/19.6-18.5 A 60 Hz 460 VΔ 21.3 kW 32.0 A cos φ 0.92 3540/min 440-480 VΔ 33.5-31.0 A 3~Mot. 1LA7166-2AA60 E0107/471101 01 001 IEC/EN 60034 93kg IM B3 160L IP55 Th.Cl.F EFF2 H CE			
50 Hz data		Frame size	60 Hz data
Date of manufacture YY MM		Type of construction	Degree of protection

SIEMENS 3~Mot. 1LA9166-2KA60 (EFF1) (H) CE D-91056 Erlangen E0107/471101 01 002 IEC/EN 60034 120 kg IM B3 160L IP55 Th.Cl.F AMB 40°C			
50 Hz 400/690 VΔ/Y 18.5 kW 31.5/18.2 A cos φ 0.92 2940/min 380-420/660-725 VΔ/Y 34.0-30.5/19.6-17.6 A	60 Hz 460 VΔ 18.5 kW 27.7 A PF 0.92 3550RPM NEMA NOM.EFF 91.0% 25.0HP DESIGN A CODE J CC 032 A MG1-12 SF1.15 CONT		

SIEMENS 3~Mot. 1LG6 186-4AA60-Z (EFF1) CE D-91056 Erlangen UC 0202 /012415501 180 kg IM B3 180L IP55 Th.Cl.F AMB 40 °C			
50 Hz 400/690 VΔ/Y 22 kW 40.5/24 A cos φ 0.84 1470/min 380-420/660-725 VΔ/Y 42.5-40.5/24.5-23.5 A IEC/EN 60034	60 HZ 460 VΔ 22 KW 36.5 A PF 0.83 1775RPM NEMA NOM.EFF 92.4% 30.0HP DESIGN A CODE K CC 032 A MG1-12 SF1.15 CONT		

SIEMENS 3~Mot. 1MJ6166-2CA60-Z (H) CE D-91056 Erlangen E0107/471101 13 003 IEC/EN 60034 160 kg IM B3 160L IP55 Th.Cl.F			
50 Hz 400/690 VΔ/Y 18.5 kW 32.5/18.8 A cos φ 0.91 2940/min 380-420/660-725 VΔ/Y 34.0/19.6 A	VIK II 2 G EEx de II C T4 34.0/19.6 A PTB 01 ATEX 1093 IA/IN 7.0		

Ambient temperature and site altitude

The rated output specified in the selection tables is applicable for continuous duty in accordance with DIN EN 60034-1 at a frequency of 50 Hz, a coolant temperature or ambient temperature (AT) of 40 °C and a site altitude (SA) or up to 1000 m above sea level.

For higher ambient temperatures and/or site altitudes higher than 1000 m above sea level, the specified motor output must be reduced using the factor k_{HT} .

Depending on the frame size of the motor or the number of poles, special windings may be added to the motors for the different operating conditions.

This results in a maximum output of the motor of:

$$P_{\max.} = P_{\text{rated}} \cdot k_{HT}$$

If the maximum motor output is no longer adequate for the drive, it should be checked whether the motor with the next higher rate output fulfills the requirements.

Abbrevia- tion	Description	Units
$P_{\max.}$	Maximum motor output	kW
P_{rated}	Rated output	kW
k_{HT}	Factor for abnormal ambient temperature and/or site altitude	

The motors are designed for temperature class F and used in temperature class B. Under non-standard operating conditions, if they are to be used in class B, the maximum output must be determined from the tables below.

If explosion-proof motors are to be used (with the exception of 1MJ6) at ambient temperatures that exceed 40 °C and site altitudes higher than 1000 m above sea level, the appropriate correction factors must be requested.

Reduction factor k_{HT} for different site altitudes and/or ambient temperatures

Site altitude above sea level	Site altitude above sea level Ambient temperature					
m	<30 °C	30 °C ... 40 °C	45 °C	50 °C	55 °C	60 °C
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.90	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Ambient temperature and site altitude are rounded-off to 5 °C or 500 m.

For the following outputs, rms values are specified for ambient temperatures (AT) of 45 °C and 50 °C that must be specified when ordering.

Power (kW)	Maximum output at 50 Hz	
	For AT 45 °C	For AT 50 °C
kW	kW	kW
11	10.5	10
15	14.5	13.8
18.5	17.8	17
22	21	20
30	29	27.5
37	35.5	34
45	43	41.5
55	53	51
75	72	69
90	86	83
110	106	101
132	127	122
145	139	133
160	153	147
180	173	166
200	192	184
250	240	230
280	269	258
315	302	290
355	340	325
400	384	368
450	432	414
500	480	460
560	538	515
630	605	580
710	682	663
800	768	736
900	864	828
1000	960	920

For details of derating for use in class F, see "DURIGNIT IR 2000" insulation system.

Motors for ambient temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class B, must always be ordered with the supplementary order code **"-Z"** and plain text. In the case of extreme derating, the operating data for the motors will be less favourable due to partial utilization.

The following versions are possible for 1LG4, 1LG6, 1LP4, 1PP4 and 1LA8 motors:

- Motors for ambient temperatures from -50 to +40 °C order code **D02**
- Motors for ambient temperatures from -40 to +40 °C order code **D03**
- Motors for ambient temperatures from -30 to +40 °C order code **D04**

For 1LA6, 1LA7, 1LP7 and 1PP7 motors, versions D03 and D04 are possible on request.

The following special versions are possible for 1LA8, 1PQ8 and 1LL8 motors:

- Motors for 45 °C ambient temperature, 4% derating, order code **D11**
- Motors for 50 °C ambient temperature, 8% derating, order code **D12**
- Motors for 55 °C ambient temperature, 13% derating, order code **D13**
- Motors for 60 °C ambient temperature, 18% derating, order code **D14**

For details of order codes for use in temperature class F, see "DURIGNIT IR 2000 insulation system" under "Windings and insulation".

The following applies to all motors:

The motors can withstand 1.5 times the rated current at rated voltage and frequency for two minutes (DIN EN 60034).

Ambient temperature:

All motors can be used in the standard version at ambient temperatures between -20 and +40 °C.

Motors can be used in temperature class F

- at 40 °C with service factor 1.1, i.e. the motor can be continuously overloaded with 10% of the rated output (for motors of 1LG6 and 1LA9 series, with the exception of 1LA9 with increased output, with service factor 1.15, i.e. 15% of the rated output)
- above 40 °C at rated output.

When motors are used in temperature class B for higher ambient temperatures and site altitudes, derating occurs in accordance with the table "Reduction factor k_{HT} for different site altitudes and/or ambient temperatures".

For motors ex-stock, the service factor is indicated on the rating plate.

For other temperatures, special measures are necessary.

When brakes are to be mounted on motors intended for operation at temperatures below freezing, please contact your local Siemens office.

Windings and insulation

DURIGNIT IR 2000 insulation system

The DURIGNIT IR 2000 insulation system comprises high-grade enameled wires and insulating sheet materials combined with solvent-free impregnating resin.

The system ensures a high level of mechanical and electrical strength as well as good serviceability and a long motor life.

The insulation system protects the winding against aggressive gases, vapours, dust, oil and increased air humidity. It can withstand the usual vibration stressing.

The insulation is suitable up to an absolute air humidity of 30 g water per m³ of air. Moisture condensation should be prevented from forming on the winding. Please contact your local Siemens office if higher values are present.

Please enquire about extreme applications.

Winding and insulation design with regard to temperature class and air humidity

All motors are designed for temperature class F.

At rated output with line-fed operation, the motors can be used in temperature class B.

Temperature class F, used in accordance with F, with service factor (SF)

For all 1LA motors (with the exception of 1LA9 with increased output), 1LG, 1LL8 and 1PP motors for line-fed operation in frame sizes 56 to 355 for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified (for 1LA9 and 1LG6 SF = 1.15) and 1.05 for frame sizes 400 and 450.

Order code **C11**.

Temperature class F, used in accordance with F, for increased output

For motors supplied from stock (with the exception of 1LA9 with increased output) and 1LA8 motors, the service factor is indicated on the rating plate as standard. For use in accordance with temperature class F, the rated output according to the selection and ordering data can be increased by 10% (15% for 1LA9, with the exception of 1LA9 with increased output, and 1LG6) and by 1.05 for frame sizes 400 and 450.

Order code **C12**.

IEC Squirrel-Cage Motors

Introduction

General technical data

Temperature class F, used in accordance with F, with increased ambient temperature

At the output specified in the catalogue under line-fed operation, the ambient temperature can be increased to 55 °C (50 °C for frame sizes 400 and 450) with the exception of 1LA9 with increased output.

Order code **C13**

The service factor (SF) is not indicated on the rating plate for order codes C12 and C13.

For converter-fed operation at the output specified in the catalogue, the motors are used in accordance with temperature class F. Order codes C11, C12 and C13 are not possible. This applies to motors up to 500 V and to motors up to 690 V.

Temperature class F, used in accordance with F, other requirements

For 1LA5, 1LA6, 1LA7, 1LA9, 1LG4, 1LG6, 1PP4, 1PP5 and 1PP7 standard motors and fan motors as well as 1MA6 and 1MA7 explosion-proof motors, a version can be ordered designed for temperature class F, for use in accordance with temperature class F with different customized requirements, by specifying the information in plain text. Certification costs may be charged in the case of 1MA6 and 1MA7 motors.

Order code **Y52**

Temperature class H for rated output and maximum ambient temperature (AT) 60 °C

For motor series 1LA5, 1LA6, 1LA7, 1PP5 and 1PP7, use in accordance with temperature class H is permitted at rated output and at a maximum ambient temperature of 60 °C. This does not apply to explosion-proof motors of Zones 2, 21 and 22 and to motors with UL approval (order code D31). The specified grease life applies at an ambient temperature of 40 °C. For a 10 K increase in ambient temperature, the grease life or lubrication interval is halved.

Order code **C18**

Temperature class F, used in accordance with B, ambient temperature 45 °C, approx. 4% derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class F, for use in accordance with temperature class B at a maximum ambient temperature of 45 °C at 4% derating.

Order code **C22**

Temperature class F, used in accordance with B, ambient temperature 50 °C, approx. 8% derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class F, for use in accordance with temperature class B at a maximum ambient temperature of 50 °C at 8% derating.

Order code **C23**

Temperature class F, used in accordance with B, ambient temperature 55 °C, approx. 13% derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered that is designed to temperature class F, for use in accordance with temperature class B at a maximum ambient temperature of 55 °C at 13% derating.

Order code **C24**

Temperature class F, used in accordance with B, ambient temperature 60 °C, approx. 18% derating

For motors of series 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version can be ordered designed for temperature class F, for use in accordance with temperature class B at a maximum ambient temperature of 60 °C at 18% derating.

Order code **C25**

Increased air temperature/humidity with 30 to 60 g water per m³ of air

For motors of series 1LA5, 1LA6, 1LA7, 1LA9, 1LP5, 1LP7, 1MA6, 1MA7, 1PP5 and 1PP7, a version can be ordered for increased air humidity of between 30 and 60 g water per m³ of air depending on the temperature as listed in the table below. In this case, the external bolts are supplied in rust-proof material (includes order code M27).

This option does not include any condensation protection, so an anti-condensation heater (order code K45/K46) must be ordered separately if required.

Order code **C19**.

Please contact your local Siemens office if order code C19 is to be combined with additional mountings.

Increased air temperature/humidity with more than 60 g up to 100 g water per m³ of air

For motors of series 1LA5, 1LA6, 1LA7, 1LA9, 1LP5, 1LP7, 1MA6, 1MA7, 1PP5 and 1PP7, a version can be ordered for increased air humidity of between more than 60 g and 100 g water per m³ of air depending on the temperature as listed in the table below. In this case, the external bolts are supplied in rust-proof material (includes order code M27). This option does not include any condensation protection, so an anti-condensation heater (order code K45/K46) must be ordered separately if required.

Order code **C26**.

Please contact your local Siemens office if order code C26 is to be combined with additional mountings.

Absolute/relative conversion of air humidity

Relative humidity	Temperature							
	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C	90 °C
10%	2	3	5	8	13	20	29	42
15%	3	5	8	12	19	30	44	63
20%	3	6	10	17	26	39	58	84
25%	4	8	13	21	32	49	73	105
30%	5	9	15	25	39	59	87	126
35%	6	11	18	29	45	69	102	146
40%	7	12	20	33	52	79	116	167
45%	8	14	23	37	58	89	131	188
50%	9	15	26	41	65	98	145	209
55%	10	17	28	46	71	108	160	230
60%	10	19	31	50	78	118	174	251
65%	11	20	33	54	84	128	189	272
70%	12	21	36	58	91	138	203	293
75%	13	23	38	62	97	148	218	314
80%	14	24	41	66	104	157	233	335
85%	15	26	43	70	110	167	247	356
90%	16	27	46	74	117	177	262	377
95%	16	29	49	79	123	187	276	398
100%	17	30	51	83	130	197	291	419

The values in the table with a blue background are covered by the standard version (up to 30 g water per m³ of air).

The values in the table with a light grey background are covered by order code **C19** (30 to 60 g of water per m³ of air).

The values in the table with a dark grey background are covered by order code **C26** (60 to 100 g of water per m³ of air).

Please contact your local Siemens office regarding requirements exceeding 100 g water per m³ of air

Restarting against residual field and opposite phase

All motors can be reclosed against 100% residual field after a line voltage failure.

Motor protection

A distinction is made between current-dependent and motor-temperature-dependent protection devices.

Current-dependent protection devices

Fuses are only used to protect mains cables in the event of a short-circuit. They are not suitable for overload protection of the motor.

The motors are usually protected by delayed overload protection devices (circuit-breakers for motor protection or overload relays).

This protection is current-dependent and is particularly effective in the case of a locked rotor.

For standard duty with short start-up times and starting currents that are not excessive and for low numbers of switching operations, motor protection switches provide adequate protection. Motor protection switches are not suitable for high starting duty or large numbers of switching operations. Differences in the thermal time constants for the protection equipment and the motor results in unnecessary early tripping when the protection switch is set to rated current.

Protection devices that are motor temperature sensitive

Temperature monitors installed in the motor winding are suitable protection devices in the case of slowly rising motor temperature.

When a limit temperature is reached, these **bimetal switches** (NC contacts) can deactivate an auxiliary circuit. The circuit can only be reclosed following a considerable fall in temperature. When the motor current rises quickly (e.g. with a locked rotor), these switches are not suitable due to their large thermal time constants.

3 temperature detectors for tripping

Order code **A31**

The most comprehensive protection against thermal overloading of the motor is provided by **PTC thermistors (thermistor motor protection)** installed in the motor winding. Due to its low heating capacity and excellent thermal contact with the winding, the winding temperature can be closely monitored. When a limit temperature is reached (nominal tripping temperature), the PTC thermistor undergoes a step change in resistance. This is evaluated by a tripping unit and can be used to open auxiliary circuits. The PTC thermistors themselves cannot be subjected to high currents and voltages. This would result in destruction of the semiconductor. The switching hysteresis of the PTC thermistor and tripping unit is low, which supports fast restarting of the drive. Motors with this type of protection are recommended for high duty starting, switching duty, extreme changes in load, high ambient temperatures or fluctuating supply systems.

Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping.

In the connection box, 2 auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection boxes". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values. For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection boxes").

Order code **A11**

IEC Squirrel-Cage Motors

Introduction

General technical data

For pole-changing motors with two separate windings, the number of temperature sensors must be doubled.

Two sets of three temperature sensors are used if a warning is required before the motor is shut down (tripped). The warning is normally set to 10 K below the tripping temperature.

Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm.

In the connection box, 4 auxiliary terminals are required.

Order code **A12**

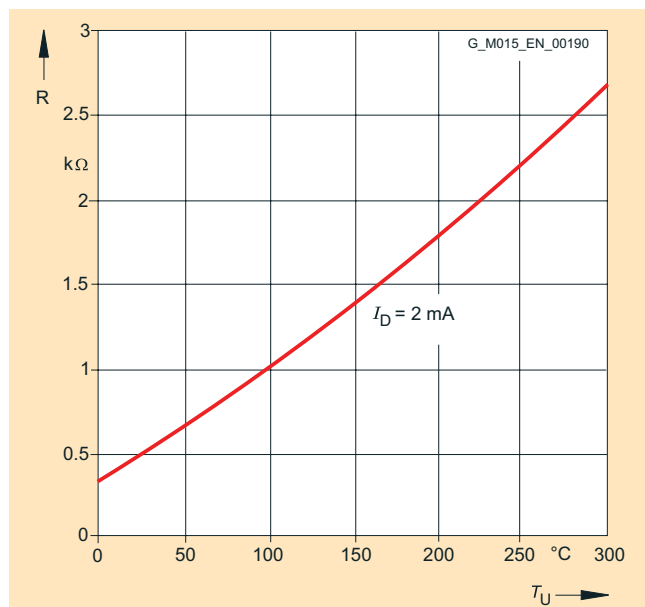
- All 1LA8 motors are equipped in the standard version with 6 PTC thermistors for alarm and tripping.
- For 1LA, 1MJ and 1LG motors, the tripping temperature corresponds to PTC thermistors for temperature class F.
- For 1LA8, 1LL and 1PQ motors, the tripping temperature corresponds to PTC thermistors for temperature class F, also for 1LA8 in Zone 22.
- For 1LA and 1LG motors for Zones 2, 21, 22 or VIK thermistors temperature class B for Zone 2 and VIK (see catalogue section "Motors operating with frequency converters").

In order to achieve full thermal protection it is necessary to combine a thermally delayed overcurrent release and a PTC thermistor. For full motor protection implemented only with PTC thermistors, please enquire.

Motor temperature detection with converter-fed operation

KTY 84-130 temperature sensor

This sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84-130 temperature sensor characteristic

Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

Motor temperature detection with embedded temperature sensor KTY 84-130.

In the connection box, 2 auxiliary terminals are required.

The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection boxes". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values. For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection boxes").

Order code **A23**

For 1LA8 motors, the standard PTC thermistors are omitted when ordering with order code **A23**.

OR

Motor temperature detection with embedded temperature sensors 2 x KTY 84-130.

In the connection box, 4 auxiliary terminals are required.

Order code **A25**

The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor. Evaluation is performed, for example, in the converter.

For line-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalogue LV 1, Order No.: E86060-K1002-A101-A4.

Motor protection

1LA and 1LG motors for Zones 2, 21 and 22 for converter-fed operation already have a PTC thermistor for tripping as standard. For converter-fed operation, a PTC thermistor for alarm can be ordered additionally.

PTC thermistor for alarm for converter-fed operation in Zones 2, 21 and 22.

In the connection box, 2 auxiliary terminals are required.

Order code **A10**

1MJ motors:

PTC thermistors must always be used if the duty is not S1 (continuous operation) in accordance with IEC 60034-1/ DIN EN 60034-1.

If 1MJ motors are operated with converters, the PTC thermistor in the winding is essential. For 1MJ6/1MJ7 motors, an additional PTC thermistor is installed in the connection box.

Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping

In the connection box, 2 auxiliary terminals are required.

Order code **A15**.

or

Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping.

In the connection box, 4 auxiliary terminals are required.

Order code **A16**.

For versions with temperature sensors, in some cases, anti-condensation heaters cannot be mounted or can only be mounted for certain frame sizes. See "Special versions" in the corresponding sections of the catalogue.

If thermistor protection is required, 3 PTC thermistors connected in series are embedded in the stator winding of the motor.

The 3RN1 temperature monitoring device that is part of the protection equipment must be ordered separately - it is PTB certified. For further details about mode of operation, circuit and prices, see Catalogue LV 1, Order No.: E86060-K1002-A101-A4.

Motor temperature detection with resistance thermometers

The resistance thermometers are embedded in the stator winding or in the rolling contact bearings or bearing plates of the motors. The following possibilities can be implemented:

Stator winding:

3 or 6 PT 100 resistance thermometers are embedded in the stator winding in 2-wire connection. The two connections for each resistance thermometer are routed through the main connection box. In the connection box, 6 or 12 auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection boxes". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values.

For an additional charge, the connections can be routed through a separate auxiliary connection box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection boxes"); 3-wire or 4-wire connection (from the terminal strip) is also possible (please enquire).

The resistance thermometer embedded in the winding head is calibrated to 100 Ω at 0 °C. The base values for the resistances (i.e. the relationship between the resistance and temperature) as well as the permissible deviations are laid down in DIN IEC 751. The changes in temperature are transferred to a display device in the form of changes in resistance.

The display devices are not included in the price and are not included in the delivery package.

Installation of 3 PT 100 resistance thermometers in stator winding.

In the connection box, 6 auxiliary terminals are required.

Order code **A60**

Installation of 6 PT100 resistance thermometers in stator winding.

In the connection box, 12 auxiliary terminals are required.

Order code **A61**

Note regarding non-standard 1LA8 motors: When A61 is ordered, the PTC thermistors installed as standard in the motor are omitted.

Rolling contact bearings or bearing plates:

The bearing thermometers are screwed into the bearing plates of the drive end (DE) and non-drive-end (NDE). The wires are routed through the main connection box.

In the connection box, auxiliary terminals are required. The maximum number of auxiliary terminals in the main connection box of the motor is specified under "Number of auxiliary terminals" in the section "Motor connection and connection boxes". An auxiliary connection box is required when the total number of auxiliary terminals in the connection box of the motor exceeds the specified values.

For an additional charge, the connections can be routed through a separate auxiliary terminal box (order code L97, M50 or M88, see "Auxiliary connection box" in the section "Motor connection and connection boxes"). The changes in temperature are transferred to a display device in the form of changes in resistance. The display device is not included in the price and is not included in the delivery package.

Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings.

In the connection box, 4 auxiliary terminals are required.

Order code **A72**

Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings.

In the connection box, 6 auxiliary terminals are required.

Order code **A78**

Installation of 2 PT 100 double screw-in resistance thermometers (basic circuit) for rolling-contact bearings.

In the connection box, 12 auxiliary terminals are required.

Order code **A80**

Heating and ventilation

Anti-condensation heaters

Line voltage 230 V (1~)

Order code **K45**

Line voltage 115 V (1~)

Order code **K46**

Motors whose windings are at risk of condensation due to the climatic conditions, e.g. inactive motors in humid atmospheres or motors that are subjected to widely fluctuating temperatures can be equipped with anti-condensation heaters.

An additional cable entry M16 x 1.5 or M20 x 1.5 (M20 x 1.5 or M25 x 1.5 for 1LA8, 1PQ8 and 1LL8 motor series) is provided for the connecting cable.

Anti-condensation heaters must not be switched on during operation.

1MJ6 motors:

For 1MJ6 motors up to frame size 160 L, a built-in anti-condensation heater is not possible for versions with PTC thermistors.

For 1MA and 1LA motors In designs for Zone 21:

Built-in anti-condensation heaters are not possible up to frame size 200L.

For 1LA motors in designs for Zones 2 and 22:

Built-in anti-condensation heaters are available on request.

For 1LA8 and 1PQ8 motor series in designs for Zone 2, the anti-condensation heater can only be switched on after the motor has been switched off for one hour.

Instead of an anti-condensation heater, another possibility (at no extra cost) is connection of a voltage that is approximately 4 to 10% of the rated motor voltage to stator terminals U1 and V1; 20 to 30% of rated motor current is sufficient to heat the motor (this does not apply to 1MA6 frame sizes 225 M to 315 L, 1LA8, 1PQ8 and 1LL8).

Motor series	Frame size	Heater output in Watt (W)	
		Line voltage at 230 V Order code K45	115 V Order code K46
1LA5, 1LP5, 1PP5, 1LA6, 1LA7, 1LP7, 1PP7, 1LA9, 1MJ6	56 ... 80	25	25
	90 ... 112	50	50
	132 ... 200	100	100
	225	100	100
1LG4, 1LP4, 1PP4, 1LG6, 1MA6, 1MJ7	180 ... 200	55	55
	225 ... 250	92	92
1LG4, 1LG6 in designs for Zone 2	180 ... 200	48	48
	225 ... 250	92	92
	280 ... 315	105	105
1MA6	280 ... 315	105	105
1LG4, 1LP4, 1PP4, 1LG6, 1MJ7	280 ... 315	109	109
1LA8, 1PQ8, 1LL8	315 ... 450	200	183
1MJ8	355	200	200
1MJ1	315	100	100
	355	250	250
	400	250	250
	450	280	280

IEC Squirrel-Cage Motors

Introduction

General technical data

Fans/Separately-driven fans

Motors of frame sizes 63 to 450 have radial-flow fans in the standard version that cool regardless of the direction of rotation of the motor (cooling method IC 411 acc. to DIN EN 60034-6, IC01 for 1LL8 motor series). The air flow is forced from the non-drive-end (NDE) to the drive end (DE).

Motors of frame size 56 do not have a fan (IC 410).

For details of separately-driven fans for frame sizes 100 to 315, see also Page 1/75.

1MJ1 and 1MJ8 (frame size 355) 2-pole and 4-pole motors have an axial-flow fan for clockwise rotation in the standard version. The fan can be subsequently reinstalled for anti-clockwise rotation.

Exception: 1MJ1 motors, frame size 450, 2-pole.

1LA8 and 1LL8 (frame size 355) 2-pole motors have an axial-flow fan for clockwise rotation in the standard version. The fan can be subsequently reinstalled for anti-clockwise rotation. Motors of the 1LA8 series are also available in a version with a separately driven fan (cooling method IC 416 – 1PQ8 series) and in a version with through-ventilation (cooling method IC 01, IP23 degree of protection – 1LL8 series).

1PQ8 motors have separately-driven fans that cool regardless of the speed of the main motor (IC416).

Line voltages for 1PQ8 separately-driven fans:

230 VΔ/400 VY ±10%, 50 Hz, 460 VΔ ±10%, 60 Hz.

Other voltages/frequencies can be ordered by specifying in plain text with order code **Y81** (price supplement).

Line voltage of separately-driven fan for 1LG motors:

The line voltage of the 1PP9 motors with separately-driven fan is adapted for voltages outside the rated voltage range to the voltage of the 1LG motor.

The line voltage tolerance for the separately-driven fan is ±10%.

When the motor is mounted and the air intake is restricted, then it must be ensured that a minimum clearance is maintained between the fan cover and the wall. This clearance is calculated from the difference between the protective cover and the fan cover (dimension LM - L) or is specified in the detail dimension drawing.

For design of the fan/separately-driven fan and the fan cover, see the tables below.

Metal external fan impeller

The standard fan impeller made of plastic can be replaced with a fan impeller made of metal. This version can be supplied for motor series 1LA5, 1LA6, 1LA7, 1LA8, 1LA9, 1LG4, 1LG6, 1MA6, 1MA7, 1MJ6, 1MJ7 and 1LL8.

For motor series 1LA5, 1LA6, 1LA7, 1LA9, 1LG4 and 1LG6, the metal external fan can also be used with converter-fed operation.

A metal external fan is not possible for the low-noise version.

Up to frame size 160, the metal external fan impeller is manufactured from sheet aluminium or steel and up to frame size 180 it is manufactured from cast iron or sheet steel.

Order codes **K35**

Fan cover for textile industry

For motors 1LG4 and 1LG6, the fan cover can be used in the standard version for the textile industry.

For motor series 1LA5, 1LA6, 1LA7 and 1LA9, a version of the fan cover can be supplied specially for the textile industry. This has a protective cover and is made of non-corrosive sheet steel. Order code **H17**

Cast-iron fan cover

For 1MA6 motor series, frame sizes 225 to 315, the fan cover can be supplied in cast-iron instead of plastic.

Order code **K34**

Sheet metal fan cover

For 1LG4 and 1LG6 motor series, the fan cover can be supplied in sheet metal instead of plastic.

Order code **L36**

For 1LA8, 1PQ8 and 1LL8 motor series, the sheet-metal fan cover is supplied as standard.

Design of fan and fan cover for standard motors, explosion-proof motors, motors operating with frequency converters, fan motors and smoke extraction motors:

Motor series	Frame size	Fan material ¹⁾	Fan cover material ¹⁾
1LA5, 1LA7	63 ... 225	Plastic	Non-corrosive sheet steel
1LA9	63 ... 200		
1LA6	100 ... 160		
1MA7	63 ... 160		
1MA6	100 ... 315		
1MJ6	71 ... 200		
1MJ7	255 ... 315		
1LG4, 1LG6	180 ... 315	Plastic	Glass fiber strengthened plastic ²⁾
1MJ8	355	Sheet steel welded ³⁾	Non-corrosive sheet steel
1MJ1	315 ... 450		

¹⁾ The plastic fan can be used at ambient temperatures of up to 70 °C. For designs for Zones 21 and 22 and VIK, other materials are used in some cases.

²⁾ For designs:
for Zones 2, 21 and 22 VIK (order code **K30**),
CSA (order code **D40**)
UL (order code **D31**)
a fan cover is used that is made of non-corrosive sheet steel.

³⁾ For 1MJ1 motor series, frame size 315, 2-pole as well as 1MJ1 313 and 1MJ1 316, 4-pole the fan is supplied in aluminium.

Design of the fan/separately-driven fan and the fan cover for non-standard motors

Motor series	Frame size	Fan material ¹⁾ Number of poles	Number of poles	Fan cover material
		2	4 ... 8	
1LA8, 1LL8	315	Radial-flow fan, plastic	Radial-flow fan, plastic	Non-corrosive sheet steel
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel	
1LA8, 1LL8	355 ... 400	Axial-flow fan, cast aluminium	Radial-flow fan, plastic	
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel	
1LA8, 1LL8	450	Axial-flow fan, hub: cast aluminium, vane: plastic	Radial-flow fan, plastic	
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel	

Motor connection and connection boxes

Connection, circuit and connection boxes

Location of the connection box

The connection box of the motor can be mounted in four different locations or positions. The position of the connection box must always be viewed from the drive end (DE). The standard position of the connection box is on top, with the exception of non-standard motors in which case the standard position of the connection box is on the right-hand side.

Connection box on right-hand side – Order code **K09**

Connection box on left-hand side – Order code **K10**

If rotation of the connection box is possible later for motors that are supplied as standard with cast feet, it is recommended that the version "Connection box on top, feet screwed on" is recommended.

Order code **K11**

The number of winding ends depends on the winding design. Three-phase motors are connected to the three phase conductors L1, L2 and L3 of a three-phase system. The rated voltage of the motor in the running connection must match the phase conductor voltages of the network.

When the three phases are operating in a time sequence and are connected to the terminals of the motor in alphabetical order U1, V1 and W1, clockwise rotation is established as viewed from the motor shaft. The direction of rotation of the motor can be reversed if two connecting leads are interchanged.

Labeled terminals are provided to connect the protective conductor.

A protective earth terminal is provided in the connection box for earthing. An earth terminal is located on the outside of the motor housing (special version in the case of 1LA5, 1LA6, 1LA7 and 1LA9 motors. Order code **L13**).

If a brake control system or thermal protection is installed, the connections will also be in the connection box.

The motors are suitable for direct connection to the line supply.

Design of the connection box

Connection boxes for motors to (E)Exn (Zone 2) type of protection and for protection against dust explosions (Zone 21) differ from the basic version. For dust explosion protection (Zone 22), the connection boxes of the basic version are used.

For 1LG4 and 1LG6 motors, frame sizes 180 to 225 and 1MA6 motors frame sizes 180 to 200, 1MJ6 frame sizes 71 to 160 M and frame sizes 180 to 200 L, a connection box is available in cast iron.

Order code **K15**

For 1LA6 and 1MA6 frame size 100 – 160, 1MJ6 frame size 160 L and 1MJ7, 1MA6 frame size 225 – 315 standard version. Not possible for 1LA7 and 1MA7.

For 1MJ motors:

The connection boxes are designed to EEx e type of protection. The ends of the windings for motors up to frame size 160 are routed through a shared explosion-proof leadthrough into the connection box; for frame size 180 and above, they are routed through single leadthroughs.

For 1MJ motors, an explosion-proof connection box with EEx d II C type of protection is available.

Order code **K53**

For motor series 1LA8, 1PQ8 and 1LL8, the ends of the windings are routed through single leadthroughs into the connection box.

The number of terminals and the size of the connection box is designed for standard requirements. For special requirements or if the customer requires a larger connection box, the connection box for the next larger frame size can be supplied.

For all motors except for non-standard motors, 1MJ6 and 1MJ7 motors:

Next larger connection box

Order code **L00**

For non-standard motors (motor series 1LA8, 1PQ8 and 1LL8)

Next larger 1XB1 621 connection box

Order code **M58**

Next larger 1XB1 631 connection box

Order code **L00**

Detailed assignment of connection boxes, see page 1/42.

If the necessary installation angle of the motor would cause machine components to collide with the connection box, the connection box can be moved from the drive end (DE) to the non-drive end (NDE).

Order code **M64**

Not possible for explosion-proof motors.

Motor connection

Line feeder cables

The line feeder cables must be dimensioned acc. to DIN VDE 0298. The number of required feeder cables, if necessary in parallel, is defined by:

- The max. cable cross-section which can be connected
- The cable type
- Routing
- Ambient temperature and the corresponding maximum current in accordance with DIN VDE 0298

Parallel feeders

Some motors must be fitted with parallel feeders due to the maximum permissible current per terminal. These motors are indicated in the selection and ordering data in the respective chapters. With 1XB7 connection boxes, 2 parallel feeders are possible; with 1XB1 631 connection boxes, up to 4 parallel feeders are possible; and with GT640 and 1XB1 621 connection boxes, 2 parallel feeders are possible.

For motors with an upper connection box section and auxiliary terminals (e.g. with order code **A11**), an M16 x 1.5 or M20 x 1.5 cable gland with plug is additionally available.

For further details, see the data sheet function in SD configurator.

¹⁾ The plastic fan can be used at ambient temperatures of up to 70 °C. For designs for Zones 21 and 22, VIK and UL, other materials are used in some cases.

IEC Squirrel-Cage Motors

Introduction

General technical data

1LA7 and 1LA9 in frame size 100 L to 160 L

The connection box is integrated into the frame. Two knock-outs are provided at each side for boltings. The nuts for the boltings are supplied with the connection box.

Cable entry on connection box

Unless stated otherwise, the cable entry is located in the standard position as shown in the illustration below.

The connection box can also be rotated such that the cable entry is located

- Towards the drive end (DE)
(rotation of connection box by 90°, entry from DE)
Order code **K83**
- Towards the non-drive end (NDE)
(rotation of connection box by 90°, entry from NDE)
Order code **K84**

With options **K83** and **K84**, 1LA7 motors of frame sizes 100 to 160 require an additional connection box upper section. This measure results in increased height of the connection box. The dimension AD increases by approx. 30 mm, dimension AF changes depending on the frame size by between 45 and 47 mm. For the precise values of AD and AF, see "Dimension drawings" in the corresponding sections of the catalogue.

If the cable entry is rotated by 180°, special measures are required for 1LA7 and 1LA5 motors of frame sizes 63 to 90 as well as 180 to 225 (without a change in dimensions). (Rotation of the connection box by 180°)

Order code **K85**

From frame size 100 to 160, the break-outs in the connection box can be used.

The dimensions of the connection box are listed in the relevant sections of the catalogue in accordance with the frame size and the "Dimension drawings".

If the position of the connection box (connection box RHS, LHS or above) is changed, the position of the cable entry must be checked and, if necessary, it can be ordered with the corresponding order codes (**K83**; **K84**; **K85**).

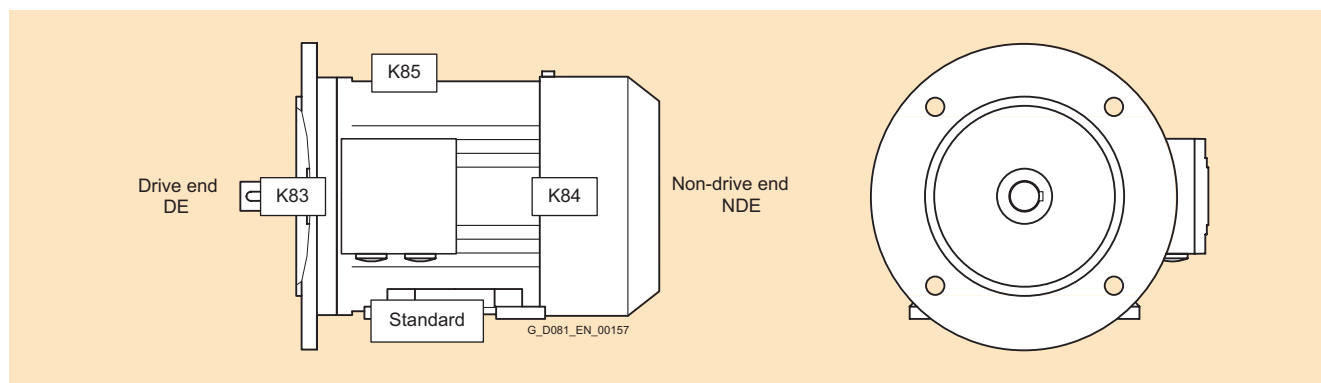
Ordering example

Connection box RHS (Order code **K09**):

If no other order code is specified: Cable entry from below the motor.

With additional order code **K85**:

Cable entry from drive end (DE)



For cable entry to a standard connection box, a **cable gland** can be ordered for motor connection.

Cable entry, standard configuration

Order code **K54**

For cable entry to a connection box with the options of motor protection or anti-condensation heating, **two cable glands** will be supplied.

Cable entry, maximum configuration

Order code **K55**

For non-standard motors (motor series 1LA8, 1PQ8 and 1LL8), the cable entry can be implemented in accordance with DIN 89280 for the maximum possible configuration of cable entries in the connection box.

Order code **K57**

A two-part plate on the connection box can be supplied if required.

Order code **K06**

For special requirements for which the standard holes for the cable entries are inadequate, too large or when the routing must be implemented differently, an undrilled entry plate can be supplied to allow holes to be drilled as required on assembly.
Order code **L01**

Protruding cable ends

For confined spaces, protruding cable ends can be ordered, without a connection box with cover plate.

For protruding cable ends for smoke extraction motors, see the "Smoke extraction motors" section of the catalogue.

The following lengths of protruding cables can already be ordered using order codes on request:

- 3 cables protruding, 0.5 m long
Order code **L44**
- 3 cables protruding, 1.5 m long
Order code **L45**
- 6 cables protruding, 0.5 m long
Order code **L47**
- 6 cables protruding, 1.5 m long
Order code **L48**
- 6 cables protruding, 3.0 m long
Order code **L49**

It is also possible to rotate the position of the three protruding cables:

- Cable connection on right side, as viewed from drive end (DE)
Order code **L51**
- Cable connection on left side, as viewed from non-drive end (NDE)
Order code **L52**

For 1LG4/1LG6/1LP4/1PP4 motors, it is also possible to order the length of protruding cable in plain text with order codes **L51** and **L52**.

In combination with winding monitoring (Order code **A11**, **A12**, **A15**, **A16**, **A23**, **A25** or **A31**) or anti-condensation heating (Order code **K45** or **K46**), option **L44**, **L45**, **L47**, **L48** or **L49** must be specified twice on ordering.

Position of protruding cables

Motor series 1LA7

Frame sizes 56 to 160:

As standard, above at drive end (DE).

Motor series 1LA6

Frame sizes 100 to 160:

As standard, above at drive end (DE).

Motor series 1LA5

Frame sizes 180 to 225:

As standard, above at drive end (DE).

Motor series 1LA9

Frame sizes 56 to 90:

As standard, above at drive end (DE).

Frame sizes 100 to 160:

Viewed from drive end, as standard at drive end (DE) on right.

Frame sizes 180 to 200:

As standard, above at drive end (DE).

Motor series 1LG4/1LG6/1LP4/1PP4

Frame sizes 180 to 315:

As standard, above at drive end (DE).

Optionally left or right at drive end (DE)

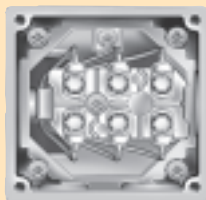
IEC Squirrel-Cage Motors

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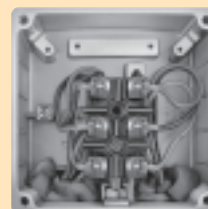
General technical data

Connection, circuit and connection boxes

Type gk 030



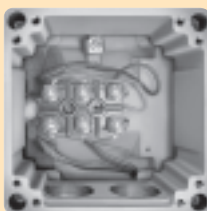
Type gk 127

Type gk 130, gk 230, gk 330
(for 1LA5, 1LG4, 1LG6 only)

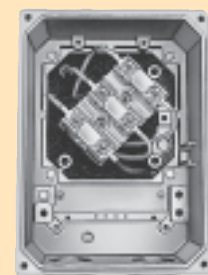
Type gk 330 (for 1LA5, 1LG4, 1LG6)



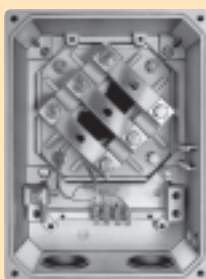
Type gk 135, gk 235, gk 335



Type gk 430, gk 431



Type 1XB7 222



Type gt 520, gt 540, gt 620, gt 640



Type 1XB7 422, 1XB7 522



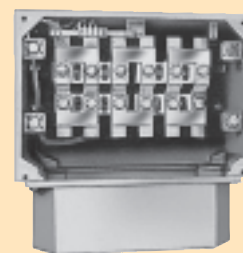
Type 1XB7 622



Type 1XB1 621



Type 1XB1 631



General technical data

Type gk 465



Type 1XC1 270, 1XC1 380



Type 1XC1 480, 1XC1 580



Type 1XB7 322



Connection boxes for 1LA, 1LG, 1LP and 1PP motors

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LA7, 1LA9 1LP7, 1PP7	56 ... 71	2 cable glands incl. Plugs	Aluminum alloy	Without cable lug or with cable lug
	80 ... 90			
	100 ... 160	2 holes 180° apart, 4 break-out openings sealed with cast iron skin (2 left, 2 right), connection box is moulded		
1LA5, 1LA9 1LP5, 1PP5	180 ... 225	2 holes with plugs	Cast iron	Without cable lug With cable lug
1LA6	100 ... 160			
1LG4, 1LG6 1LP4, 1PP4, 1PP6	180 ... 200 225			
	250 ... 315			
1LA8, 1PQ8, 1LL8	315 ... 355 ^{2) 3)}		Cast iron	
	400 ... 450	4 holes with plugs		

Possible positions of connection boxes for 1LA, 1LG, 1LP and 1PP motors

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		top	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	
1LA5, 1LA7, 1LA9 1LP5, 1LP7 1PP5, 1PP7	56 ... 71	○	–	–	○	○	Yes
	80 ... 90	○	○	–	○	○	Yes
	100 ... 160	○	○	–	– ⁵⁾	○	Yes
	180 ... 225	○	○	–	○	○	Yes
1LA6	100 ... 160	○	○	–	○	○	Yes
1LG4, 1LG6 1LP4, 1PP4, 1PP6	180 ... 315	○	○	– ⁶⁾	○	○	Yes
1LA8	315	○	○ ²⁾	–	○	○	–
	355	○	○ ²⁾	–	○	○	–
	400, 450	○	○ ²⁾	–	○	○	–

○ Available version

For further details of 1LA8 motors, see “Dimensions”, “1LA8”.

¹⁾ Connection box in cast-iron version **K15**.

²⁾ 15° to the vertical in each case

³⁾ Frame sizes 357-2 and 357-4 as for frame sizes 400 and 450

⁴⁾ The position of the cable entry must be specified when ordering.

⁵⁾ Design for 1LA7 motors available on request.

⁶⁾ Retrofittable with screwed on feet (order codes **K09**, **K10** and **K11**).

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General technical data

Connection boxes for 1LA, 1LG, 1LL, 1LP, 1PP and 1PQ motors in standard version and for Zone 22

See the next section of the catalogue for connection boxes for 1LA8, 1PQ8 and 1LL8.

Frame size	Connection box	Number of terminals	Contact screw thread	Max. conductor size	Sealing range	Cable entry ^{1) 2)}	Two-part plate ³⁾
Type				mm ²	mm	Size	Max. outer cable diameter mm
1LA5, 1LA7, 1LA9, 1LP5, 1LP7, 1PP5 and 1PP7							
56	gk 030	6	M4	1.5	9 ... 17	M25 x 1.5	–
63	(gk 127) ⁴⁾			(2.5 with cable lug)	4.5 ... 10	M16 x 1.5	
71							
80							
90							
100	gk 130	6	M4	4	11 ... 21	M32 x 1.5	–
112							
132	gk 230	6	M4	6	11 ... 21	M32 x 1.5	–
160	gk 330	6	M5	16	19 ... 28	M40 x 1.5	–
180							
200	gk 430	6	M6	25	27 ... 35	M50 x 1.5	–
225	gk 431	6	M8	35	27 ... 35	M50 x 1.5	–
1LA6							
100	gk 135	6	M4	4	11 ... 21	M32 x 1.5	–
112							
132	gk 235	6	M4	6	11 ... 21	M32 x 1.5	–
160	gk 335	6	M5	16	19 ... 28	M40 x 1.5	–
1LG4, 1LG6, 1LP4, 1PP4 and 1PP6							
180	gk 330	6	M5	16	19 ... 28	M40 x 1.5	–
200	gk 430	6	M6	25	27 ... 35	M50 x 1.5	–
225	gk 431	6	M8	35	27 ... 35	M50 x 1.5	–
250	gt 520	6	M10	120	34 ... 42	M63 x 1.5	–
280							
315	gt 620	6	M12	240 ⁵⁾	38 ... 45	M63 x 1.5	–

The connection box table does not apply to pole-changing motors with three speeds.

Connection boxes for 1LA8 and 1PQ8 motors in standard version

Line-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ⁶⁾	Cable gland option K57 ⁷⁾	Auxiliary lead Outer cable diameter	Cable entry	Two-part plate option K06	Permissible outer cable diameter	Cable entry	Auxiliary lead outer cable diameter
Type				mm ²	mm	Size	Size	mm	Size	mm	mm	Size	mm
1LA8 ... 1PQ8 ...													
... 315	gt 640	6	M12	185	41.0 ... 56.5	2 x M72x2 + 2 x M20x1.5	2 x M72x2	7 ... 13	2 x M20x1.5	–	–	–	–
... 317	(8) 9) 11)												
... 353	1XB1 621	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 70	2 x D80 + 2 x M25x1.5	11.5 ... 15.5	11.5 ... 15.5
... 355	(8) 10)												
... 357-6													
... 357-8													
... 357-2	1XB1 631 ¹⁰⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 75	4 x D80 + 2 x M25x1.5	11.5 ... 15.5	11.5 ... 15.5
... 357-4	1XB1 634 ¹⁰⁾												
... 40													
... 45													

¹⁾ Designed for cable glands with O-ring.

²⁾ For 1LA7 motors frame sizes 100 to 160, speed nuts are enclosed for the cable glands.

³⁾ A two-part plate is available. Order code **K06**. Standard version for 1XB1 631 connection box. For frame size 250 M and above, with strain relief.

⁴⁾ (gk 127) For frame sizes 63 to 90, with additional installation of several temperature sensors, order code **A12** or a brake, a larger connection box will be necessary. The specified values do not change.

⁵⁾ With cable cross-sections $\geq 240 \text{ mm}^2$, it is recommended that the next larger connection box is used (Order code **L00**). Alternatively, order a two-part plate (Order code **K06**).

⁶⁾ Others available on request.

⁷⁾ With option **K57**, the cable glands can be supplied.

⁸⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections $\geq 240 \text{ mm}^2$).

⁹⁾ Cable entry without removable plate, cable entry in connection box casing.

¹⁰⁾ Cable entry with removable plate or supports.

¹¹⁾ With option **M58**, the motor can be supplied with the 1XB1 621 connection box (recommended for cable cross-sections $> 185 \text{ mm}^2$).

General technical data

Converter-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ²⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ²⁾
Type				mm ²	mm	Size	Size	mm	Size
1LA8 ... 1PQ8 ...									
... 315 ... 317	gt 640 ^{3) 4) 6)}	6	M12	185	41.0 ... 56.5	2 x M72x2 + 2 x M20x1.5	2 x M72x2	9 ... 13	2 x M20x1.5
... 353 ... 355	1XB1 621 ^{3) 5)}	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11 ... 16	2 x M25x1.5
... 357-6 ... 357-8	1XB1 634 ^{3) 5)}								
... 357-2 ... 357-4 ... 40 ... 45	1XB1 631 ⁵⁾ 1XB1 634 ⁵⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11 ... 16	2 x M25x1.5

Connection boxes for 1LL8 motors in standard version

Line-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ⁷⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ⁷⁾	Two-part plate option K06 Permissible outer cable diameter	Cable entry	Auxiliary lead outer cable diameter
Type				mm ²	mm	Size	Size	mm	Size	mm	Size	mm
1LL8 ...												
... 31 ... 35 ... 40 ... 45	1XB1 621 ^{8) 5)} 1XB1 631 ⁵⁾ 1XB1 634 ⁵⁾	6 12	M16 M16	240 240	56.0 ... 68.5 56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5 4 x M80x2 + 2 x M25x1.5	2 x M80x2 4 x M80x2	11.5 ... 15.5 11.5 ... 15.5	2 x M25x1.5 2 x M25x1.5	40 ... 70 40 ... 75	2 x D80 + 2 x M25x1.5 4 x D80 + 2 x M25x1.5	11.5 ... 15.5 11.5 ... 15.5

Converter-fed operation

Frame size	Connection box	Number of terminals	Contact screw thread	Max. rec. conductor cross-section	Outer cable diameter (sealing range)	Cable entry ¹⁾	Cable gland option K57 ²⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ²⁾
Type				mm ²	mm	Size	Size	mm	Size
1LL8 ...									
... 31 ... 35 ... 40 ... 45	1XB1 621 ^{8) 5)} 1XB1 631 ⁵⁾ 1XB1 634 ⁵⁾	6 12	M16 M16	240 240	56.0 ... 68.5 56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5 4 x M80x2 + 2 x M25x1.5	2 x M80x2 4 x M80x2	11 ... 16 11 ... 16	2 x M25x1.5 2 x M25x1.5

¹⁾ Others available on request.

²⁾ Shielded cable (EMC); with option **K57**, the cable glands can be supplied.

³⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections ≥ 240 mm²).

⁴⁾ Cable entry without removable plate, cable entry in connection box casing.

⁵⁾ Cable entry with removable plate or supports.

⁶⁾ With option **M58**, the motor can be supplied with the 1XB1 621 connection box (recommended for cable cross-sections > 185 mm²).

⁷⁾ With option **K57**, the cable glands can be supplied.

⁸⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box.

IEC Squirrel-Cage Motors

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General technical data

Connection boxes for 1MA6 and 1MA7 explosion-proof motors and for 1LA6/7/9 and 1LG4/6 motors in (E) Ex n version or for Zone 2 and Zone 21

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MA7, 1LA7, 1LA9	56 ¹⁾ ... 90	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	Without cable lug ²⁾ or with cable lug
	100 ... 160	4 holes incl. 1 certified cable gland with sealing washer and 3 certified plugs		
1MA6, 1LA6	100 ... 160	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Cast iron	
1MA6, 1LA9	180 ... 200	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	
	225	2 holes with 2 certified cable glands with sealing washer	Cast iron	
	250 ... 315			
1LG4, 1LG6	180 ... 225	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	
	250 ... 315	2 holes with 2 certified cable glands with sealing washer	Cast iron	

Connection boxes for 1LA8 and 1PQ8 explosion-proof motors in (E) Ex version or for Zone 2 and Zone 22

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LA8, 1PQ8	315, 355 ^{3) 4)} 400, 450	Undrilled cable entry	Cast iron	With cable lug

Connection boxes for 1LA8 and 1PQ8 explosion-proof motors in (E) Ex version or for Zone 2 and Zone 22

Frame size	Connection box	Number of terminals	Contact screw thread	Recommended max. conductor cross-section	Cable entry ⁵⁾	Two-part plate option K06		
	Type			mm ²	Size	Max. outer cable diameter mm	Cable entry Size	Auxiliary lead outer cable diameter mm
1LA8 ... 1PQ8 ...								
... 315 ... 317	1XB1 621 ^{6) 7)}	6	M16	240	Undrilled cable entry	40 ... 70	2 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 353 ... 355 ... 357-6 ... 357-8	1XB1 621 ^{6) 8)}	6	M16	240	Undrilled cable entry	40 ... 70	2 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 357-2 ... 357-4 ... 40 ... 45	1XB1 631 ⁸⁾	12	M16	240	Undrilled cable entry	40 ... 75	4 x D80 + 2 x M25x1.5	11.5 ... 15.5

Possible positions of connection boxes for 1MA6 and 1MA7 explosion-proof motors and for 1LA6 and 1LA7 motors in (E) Ex n version or for Zone 2 and Zone 21

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90° ⁹⁾	180° ⁹⁾	
1MA7 and 1LA7 in Zone 2, 21	56 ¹⁰⁾ ... 71	○	—	—	○	○	Yes
	80 ... 90	○	○	—	○	○	Yes
	100 ... 160	○	○	○	—	○ ¹¹⁾	Yes
1MA6 and 1LA6 in Zone 2, 21	100 ... 160	○	○	○	○	○	Yes
	180 ... 225	○	○	—	○	○	Yes
	250 ... 315	○	○	—	○	○	Yes

○ Available version

¹⁾ 1MA7 motor series as well as 1LA7/1LA9 motor series in Zone 2, only frame size 63 and above.

²⁾ The components required for connection without cable lugs are supplied with motors of frame size 225 and above as an accessory pack in the connection box.

³⁾ 15° to the vertical in each case.

⁴⁾ Frame sizes 357-2 and 357-4 as for frame sizes 400 and 450.

⁵⁾ Others available on request.

⁶⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box (recommended for cable cross-sections $\geq 240 \text{ mm}^2$).

⁷⁾ Cable entry without removable plate, cable entry in connection box casing.

⁸⁾ Cable entry with removable plate or supports.

⁹⁾ The position of the cable entry must be specified when ordering.

¹⁰⁾ 1MA7 motor series as well as 1LA7 motor series in Zone 2, only frame size 63 and above.

¹¹⁾ From Size 100 upwards.

General technical data

Standard connection boxes for 1MA6, 1MA7 explosion-proof motors and for 1LA6, 1LA7, 1LA9, 1LG4 and 1LG6 motors in (E) Ex n, VIK version, Zone 2 and Zone 21

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾ Size	Two-part plate Max. outer cable diameter mm
1MA7, LA7, 1LA9							
56 ²⁾	gk 130	6	M4	4	9 ... 17	M25 x 1.5	–
63					4.5 ... 10	M16 x 1.5	
71							
80							
90							
100					14 ... 21	M32 x 1.5	–
112							
132	gk 230	6	M4	6	14 ... 21	M32 x 1.5	–
160	gk 330	6	M5	16	19 ... 28	M40 x 1.5	–
180	1XB7 222	6	M6	10	19 ... 28	M40 x 1.5	–
200	1XB7 322	6	M8	50	26 ... 35	M50 x 1.5	–
1MA6, 1LA6							
100	gk 135	6	M4	4	14 ... 21	M32 x 1.5	–
112							
132	gk 235	6	M4	6			
160	gk 335	6	M5	16	19 ... 28	M40 x 1.5	–
180	1XB7 222	6	M6	10	19 ... 28	M40 x 1.5	–
200	1XB7 322	6	M8	50	26 ... 35	M50 x 1.5	–
225							
250	1XB7 422	6	M10	120	34 ... 42	M63 x 1.5	–
280							
315	1XB7 522	6	M12	240	38 ... 45	M63 x 1.5	–
1LG4, 1LG6							
180	gt 351	6	M6	16	19 ... 27	M40 x 1.5	–
200	gt 451	6	M8	50	24 ... 35	M50 x 1.5	–
225							
250	gt 540	6	M10	120	34 ... 42	M63 x 1.5	–
280							
315	gt 640	6	M12	240	38 ... 45	M63 x 1.5	–

With 1MA motors, unused drilled holes must be sealed in accordance with EN 50014.

Connection boxes in EEx de IIC type of protection for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MJ6	71 ... 160 M	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Aluminum alloy	Without cable lug ³⁾ or with cable lug
	160 L		Cast iron	
	180 ... 200		Aluminum alloy	
1MJ7	225	2 holes with 2 certified cable glands with sealing washer	Cast iron	
	250 ... 315			
1MJ8	355	2 entry threads without cable glands	Cast iron	
1MJ1	315 ... 450		Welded steel	

Possible positions of the connection boxes in EEx de type of protection for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	
1MJ6	71 ... 200	○	○	–	○	○	Yes
1MJ7	225 ... 315	○	○	–	○	○	Yes
1MJ8	355	○	○	–	○	○	Yes
1MJ1	315 ... 450	○	○	–	○	○	Yes

○ Available version

¹⁾ Designed for cable glands with O-ring.

²⁾ 1MA7 motor series as well as 1LA7/1LA9 motor series in Zone 2, only frame size 63 and above.

³⁾ The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.

⁴⁾ The position of the cable entry must be specified when ordering.

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General technical data

Standard connection boxes in EEx de type of protection for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾ Size
1MJ6, 1MJ7						
71	gk 330	6	M4	4	9 ... 17	Standard: 1 x M25x1.5 Version with PTC thermistor: 1 x M25x1.5 1 x M16x1.5
80						
90	gk 420	6	M4	6	9 ... 17	
100					11 ... 21	Standard: 1 x M32x1.5 Version with PTC thermistor: 1 x M32x1.5 1 x M16x1.5
112	gk 420	6	M4	6	11 ... 21	
132						
160 M	gk 420	6	M4	6	19 ... 28	Standard: M40 x 1.5 Version with PTC thermistor: 1 x M40x1.5 1 x M16x1.5
160 L	gk 465	6	M5	16		
180	1XC1 270	6	M6	25	19 ... 28	M40x1.5
200	1XC1 380	6	M8	50	26 ... 35	M50x1.5
225						
250	1XC1 480	6	M10	120	34 ... 42	M63x1.5
280						
315	1XC1 580	6	M12	240	38 ... 45	M63x1.5
1MJ8						
355	No designation	6	M16	120 ... 300	35 ... 75 ³⁾	M63x1.5 ²⁾
1MJ1						
315	No designation	6	M16	95 ... 300	35 ... 75	M63x1.5
355	No designation	6	M16	35 ... 300	35 ... 75	M63x1.5
400	No designation	6	M16	35 ... 300	35 ... 75	M63x1.5
450	No designation	6	M20	70 ... 300	35 ... 75	M75x1.5

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Version with explosion-proof connection box is available, with the exception of frame sizes 180 and 200.

Connection boxes in cast iron version (Order code K15) for motors 1LG4, 1LG6 and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1MJ6	71 ... 160 M 180 ... 200	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Cast iron	Without cable lug ³⁾ or with cable lug
1LG4, 1LG6, 1MA6, 1MJ7	180 ... 225	2 holes incl. 2 certified cable glands with sealing washer and 1 certified plug	Cast iron	

Possible positions of the connection boxes in cast iron version (Order code K15) for 1LG4, 1LG6 motors and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Motors	Frame size	Connection box position			Rotation of connection box		
		Above	Side, right or left	Retrofitting possible	90° ⁴⁾	180° ⁴⁾	Retrofitting possible
1MJ6	71 ... 80	○	–	–	○	○	Yes
	90 ... 160 M	○	○	–	○	○	Yes
	180 ... 200	○	○	–	○	○	Yes
1LG4, 1LG6, 1MA6, 1MJ7	180 ... 225	○	○	–	○	○	Yes

○ Available version

¹⁾ Designed for cable glands with O-ring.

²⁾ Standard version with cable entry glands split lengthwise for 35 to 75 mm and strain relief.

³⁾ The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.

⁴⁾ The position of the cable entry must be specified when ordering.

Connection boxes in cast iron version (Order code K15) for motors 1LG4, 1LG6 and 1MA6, 1MJ6, 1MJ7 explosion-proof motors

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry ¹⁾ Size
1MJ6						
71	gk 065	6	M4	4	9 ... 17	M25x1.5
80						
90				6		
100	gk 065	6	M4	6	11 ... 21	M32x1.5
112	gk 265	6	M4	6	11 ... 21	M32x1.5
112	gk 465	6	M4	6	11 ... 21	M32x1.5
132						
160 M	gk 465	6	M4	6	19 ... 28	M40x1.5
160 L ²⁾	gk 465	6	M5	16	19 ... 28	M40x1.5
180	1XC1 290	6	M6	25	24 ... 35	M50x1.5
200	1XC1 390	6	M8	50	24 ... 35	M50x1.5
1LG4, 1LG6						
180	gt 320	6	M5	16	19 ... 28	M40x1.5
200	gt 420	6	M6	25	24 ... 35	M50x1.5
225	gt 421	6	M8	25	24 ... 35	M50x1.5
1MA6						
180	1XB7 323	6	M8	50	24 ... 35	M50x1.5
200	1XB7 323	6	M8	50	24 ... 35	M50x1.5

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Explosion-proof connection boxes in EEx d IIC type of protection (Order code K53) for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection ³⁾
1MJ6	71 ... 160	In standard version: 1 certified plug In versions with PTC thermistors: 2 certified plugs	Cast iron	Without cable lug ⁴⁾ or with cable lug
1MJ7	225 250 ... 315	2 certified plugs	Welded steel	
1MJ8	355	2 entry threads without cable glands	Cast iron	
1MJ1	315 ... 450		Welded steel	

Possible positions of the explosion-proof connection boxes in EEx d IIC type of protection (Order code K53) for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90° ⁵⁾	180° ⁵⁾	
1MJ6	71 ... 80	○	–	–	○	○	Yes
	90 ... 160	○	○	–	○	○	Yes
1MJ7	225 ... 315	○	○	–	○	○	Yes
1MJ8	355	○	○	–	○	○	Yes
1MJ1	315 ... 450	○	○	–	○	○	Yes

○ Available version

¹⁾ Designed for cable glands with O-ring.

²⁾ With 1MJ6 frame size 160 L, option **K15** is the standard version. The connection box corresponds to the standard connection box.

³⁾ The number of cables and their outer cable diameter must be specified when ordering.

⁴⁾ The components required for connection without cable lugs are supplied with 1MJ7 motors of frame size 225 M and above as an accessory pack in the connection box.

⁵⁾ The position of the cable entry must be specified when ordering.

IEC Squirrel-Cage Motors

Introduction

General technical data

Explosion-proof connection boxes in EEx d IIC type of protection (Order code K53) for explosion-proof motors 1MJ6, 1MJ7, 1MJ8 and 1MJ1

Frame size	Connection box Type	Number of terminals	Contact screw thread	Max. connectable cross-section mm ²	Sealing range mm	Cable entry Size
1MJ6, 1MJ7						
71	gk 065d	6	M4	4		Standard: 1 x M25x1.5 ¹⁾ Version with PTC thermistor: 1 x M25x1.5 1 x M20x1.5
80						
90				6		
100	gk 065d	6	M4	6		Standard: 1 x M32x1.5 ¹⁾ Version with PTC thermistor: 1 x M32x1.5 1 x M20x1.5
112				6		
132				6		
160 M	gk 465d	6	M4	6		Standard: 1 x M40x1.5 ¹⁾ Version with PTC thermistor: 1 x M40x1.5 1 x M20x1.5
160 L				16		
225	1XC3 32.	6	M8	50		2 x M55x1.5 or 1 x M55x1.5 + 1 x M20x1.5 ²⁾
250	1XC3 42.	6	M10	120		2 x M63x1.5 or 1 x M63x1.5 + 1 x M20x1.5 ²⁾
280						
315	1XC3 52.	6	M12	240		2 x M80x2 or 1 x M80x2 + 1 x M20x1.5 ²⁾
1MJ8						
355	No designation	6	M16	16 ... 300	40 ... 57	2 x M63x1.5 ¹⁾
1MJ1						
315	No designation	6	M16	120 ... 300	40 ... 57	2 x M63x1.5 ¹⁾
355	No designation	6	M16	16 ... 300	40 ... 57	2 x M63x1.5 ¹⁾
400	No designation	6	M16	16 ... 300	40 ... 57	2 x M63x1.5 ¹⁾
450	No designation	6	M20	16 ... 300	56 ... 68	2 x M75x1.5 ¹⁾

With 1MJ motors, unused drilled holes must be sealed in accordance with EN 50014.

Terminal connection

The terminal board accommodates the terminals that are connected to the leads to the motor windings. The terminals are designed so that up to frame size 225, the external (line) connections can be made without the need for cable lugs. With frame size 250 and above, standard connection is with cable lugs.

For the 1LG4/1LG6/1LP4/1PP4 motor series, for frame sizes 250 to 315, stud terminals are available for connection using cable lugs (accessory pack, 3 items).

Order code **M46**

With frame size 250 and above, if connection without cable lugs is required, the appropriate saddle terminals for connection without cable lugs (accessory pack, 6 items) must be ordered.

Order code **M47**

For EExe and EExde motors, connection is generally without cable lugs.

The terminal board is permanently mounted on the housing for all motors so that if the connection box is rotated, rotation of the connections for the motor windings is prevented.

Exception:

With connection boxes 1XB1 621 and 1XB1 631, the terminal support is mounted on the lower section of the connection box.

For motor series 1LA7/1LP7/1PP7 frame sizes 63 to 90, a terminal strip can be supplied for the main and auxiliary terminals.

Order code **M69**

¹⁾ Designed for explosion-proof cable glands. The drilled holes for cable entry are closed with plugs certified for explosion-proof applications.

²⁾ Maximum number of cable glands.

Number of auxiliary terminals for 1LA, 1LG, 1LL, 1LP, 1PP and 1PQ motors – Standard version

Motor series 1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1PP5, 1PP7 have no auxiliary terminals in the standard version.

The maximum number of auxiliary terminals in the main connection box of the motor is specified. An auxiliary connection box is required when the total number of auxiliary terminals exceeds the specified values. The connections can be routed through a separate auxiliary connection box.

For motor series

- 1LA8, 1PQ8 and 1LL8 frame sizes 315 to 450
- 1MA6 frame sizes 225 to 315
- 1MJ7 frame sizes 225 to 315

the 1XB3 020 connection box is available.

Order code **L97**

For non-standard motors (1LA8, 1PQ8 and 1LL8 motor series), the following can be supplied:

1XB9 016 auxiliary connection box – Order code **M50**

1XB9 014 auxiliary connection box (aluminium) – Order code **M88**

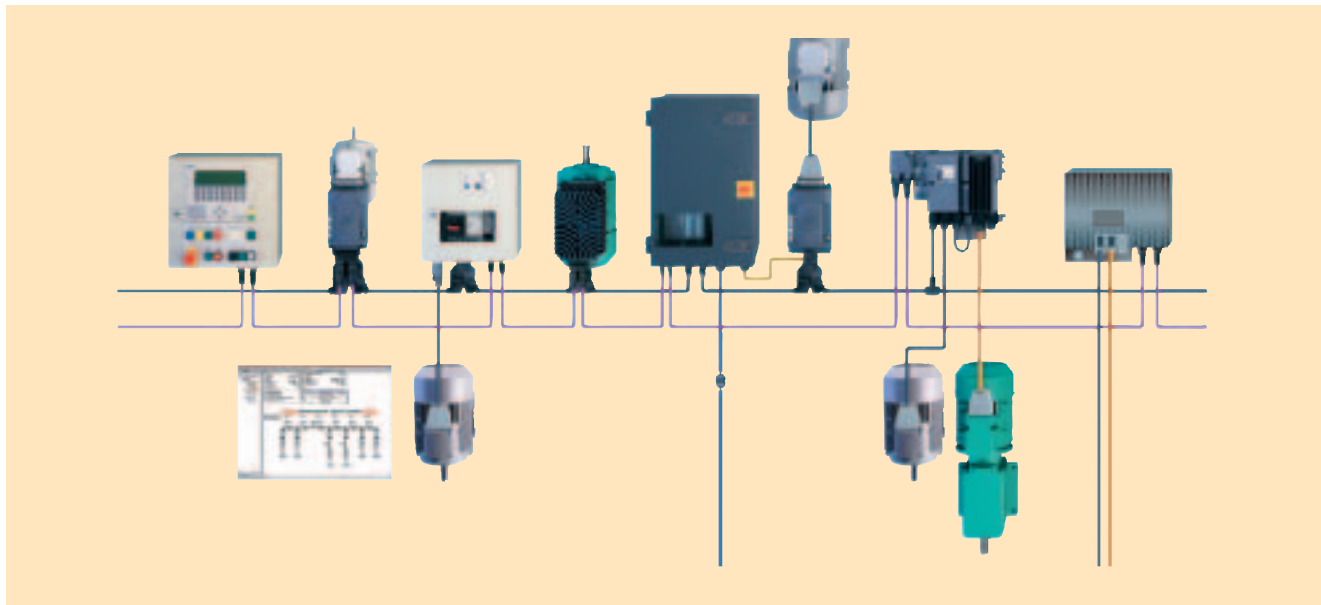
Type series	Frame size	Main connection box	Maximum No. of auxiliary terminals
1LG4, 1LG6, 1LP4, 1PP4, 1PP6	180	gk 330	4
	200	gk 430	10
	225	gk 431	10
	250	gt 520	12
	280		
1MA6	315	gt 620	16
	225	1XB7 322	8
	250	1XB7 422	12
	280		
	315	1XB7 522	12
1MJ7	225	1XC1 380	4
	250	1XC1 480	
	280		
	315	1XC1 580	6
1LA8, 1PQ8, 1LL8	315	gt 640	6
	355	1XB1 621	12
	400	1XB1 631	24
	450		

IEC Squirrel-Cage Motors

Introduction

General technical data

ECOFAST system



ECOFAST is a system which permits extensive decentralization and a modular structure for installation elements on the component level.

The following motor connectors are available for the separate MICROMASTER 411 frequency converter:

- ECOFAST motor connector Han Drive 10e for 230 VΔ/400 VY
Order code **G55**
- ECOFAST motor connector EMC Han Drive 10e for 230 VΔ/400 VY
Order code **G56**

In the basic version, cable entry for the ECOFAST connector is towards the non-drive end (NDE). The dimensions of the ECOFAST motor connector depend on the motor frame size and can be read from the dimension drawing generator for motors in the "SD configurator for low-voltage motors" tool. It is particularly important to check the dimensions when a brake with a manual release lever is used towards the non-drive end (NDE) due to possible collision of the motor connector and manual release lever as well as in the direction of the drive end (DE) due to possible collision with drive units such as coupling or gear wheels.

Advantages:

The main advantages of the ECOFAST motor connector over a terminal strip are as follows:

- Fast assembly of I/O devices (e.g. motor starters) from the ECOFAST system.
- Reduction of assembly and repair times at the end user
- No wiring errors due to connector technology
- Replacement of motor without intervention in the electronics

Main features of the ECOFAST motor connector (with separate MICROMASTER 411 frequency converter):

The motor connector is mounted at the factory and replaces the connection box with terminal board. The connector is mounted towards the non-drive end (NDE). It comprises an angled motor connection casing that can be rotated by $4 \times 90^\circ$. A 10-pole (+ earth) male insert is used in the housing. In the plug-in connector, the winding connections are connected and optionally the power supply for the brake and the signal leads for the temperature sensors. The ECOFAST motor connector is compatible with the products of the ECOFAST field device system. Further information can be found in Catalog IK PI.

The mounting dimensions of this casing match those of standard industrial connectors, so it is possible to use a complete series of different standard inserts (such as Han E, ES, ESS from Harting). The motor circuit (star or delta connection) is selected in the mating connector for motor connection. The relevant jumpers are inserted by the customer in the mating connector. As a casing for the mating connector, all standard sleeve casings with lengthwise locking, frame size 10B (e.g. from Harting) can be used.

Note:

Only one sensor (temperature sensor or PTC thermistor) can be connected. The maximum permissible line voltage at the motor connector is ≤ 500 V

Availability of the ECOFAST motor connector

The ECOFAST motor connector can be supplied for the following motor versions with the exception of the explosion-proof motors:

- Frame sizes 56 M to 132 M
- Output range 0.06 to 5.5 kW (7.5 kW on request)
- Direct on-line starting: Voltage code **1** for 230 VΔ/400 VY, 50 Hz
- Star-delta starting: Voltage code **9** with order code **L1U** 400 VΔ, 50 Hz

Further details:

Further information can be found in Catalogue IK PI and in Catalogue DA 51.3 "Distributed Drive Solutions MICROMASTER 411 COMBIMASTER 411" as well as on the Internet at:

<http://www.siemens.com/ecofast>

Frame sizes

Standard frame sizes and special frame sizes

Frame size acc. to DIN EN 60034-7		Frame size	Code 12th position	Order code
Without flange				
IM B3		56 M to 450	0 ⁴⁾	–
IM B6/IM 1051, IM B7/IM 1061, IM B8/IM 1071	  	56 M to 315 L	0	–
IM V5/IM1011 without protective cover		56 M to 315 M 315 L	0 ⁵⁾ 9 ^{1) 5)}	– M1D
IM V6/IM 1031		56 M to 315 M 315 L	0 9 ¹⁾	– M1E
IM V5/IM 1011 with protective cover		63 M to 315 L	9 ^{1) 7)}	M1F
With flange				
IM B5/IM 3001		56 M to 315 M	1 ²⁾	–
IM V1/IM 3011 without protective cover		56 M to 315 M 315 L to 450	1 ^{2) 3) 5)} 8 ^{1) 4) 5)}	– –
IM V1/IM 3011 with protective cover		63 M to 450	4 ^{1) 2) 3) 7)}	–
IM V3/IM 3031		56 M to 160 L 180 M to 315 M	1 9 ^{2) 3)}	– M1G
IM B35/IM 2001 ⁶⁾		56 M to 450	6 ⁴⁾	–

In the DIN EN 50347 standard, flange FF with through holes and flange FT with tapped holes are specified.

- 1) For 2-pole 1LG4 and 1LG6 motors, of frame size 315 L, a 60 Hz version is possible on request.
- 2) 1LG4/1LG6, 1MA6 and 1MJ7 motors in frame sizes 225 S to 315 L are supplied with two screw-in eyebolts (four eyebolts for 1LG6 318) in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 3) For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state Order No. suffix "Z" and order code **K32**.
- 4) Frame size 450, 2-pole, 60 Hz is not possible.

- 5)  For explosion-proof motors:
For types of construction with shaft extension pointing downwards, the version "with protective cover" is mandatory. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 6) In the case of 1LA8, the corresponding flange diameter is greater than twice the shaft height.
- 7) A second **K16** shaft extension is not possible.

IEC Squirrel-Cage Motors

Introduction

General technical data

Frame size acc. to DIN EN 60034-7			Frame size	Code 12th position	Order code	
With standard flange						
IM B14/IM 3601, IM V19/IM 3631, IM V18/IM 3611 without protective cover				56 M to 160 L	2 ^{2) 4)}	–
IM V 18/IM 3611 with protective cover				63 M to 160 L	9 ^{1) 2)}	M2A
IM B34/IM 2101				56 M to 160 L	7 ^{2) 4)}	–
With special flange						
IM B14/IM 3601, IM V19/IM 3631, IM V18/IM 3611 without protective cover				56 M to 160 L	3 ^{3) 4)}	–
IM V18/IM 3611 with protective cover				63 M to 160 L	9 ^{1) 3)}	M2B
IM B34/IM 2101				56 M to 160 L	9 ³⁾	M2C

In DIN EN 50347, standard flanges are assigned to the frame sizes as FT with tapped holes. The special flange was assigned as a large flange in the previous DIN 42677.

The dimensions of the following types of construction are identical:

IM B3, IM B6, IM B7, IM B8, IM V5 and IM V6
IM B5, IM V1 and IM V3
IM B14, IM V18 and IM V19

Motors in the standard output range can be ordered in basic types of construction IM B3, IM B5 or IM B14 and operated in mounting positions IM B6, IM B7, IM B8, IM V5, IM V6, IM V1, IM V3 (up to frame size 160 L) or IM V18 and IM V19. Eyebolts are available for transport and installation in a horizontal position. In conjunction with the eyebolts, for the purpose of stabilizing the position when the motor is arranged vertically, additional lifting straps (EN 1492-1) and/or clamping bands (EN 12195-2) must be used. If mounting position IM V1 is ordered, eyebolts are supplied for vertical mounting.

- For this reason, they are normally designated only with the basic type of construction on the rating plate.
- If motors of frame size 180 M in a type of construction with feet are mounted on the wall, it is recommended that the motor feet are supported.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

In the case of all types of construction with shaft end down, the version "with protective cover" is urgently recommended, see the section "Degrees of protection".

Motor series 1LA8, 1PQ8 and 1LL8 are available in types of construction IM B3, IM V1 with and without cover, as well as IM B35.

Frame design

Motors in the types of construction with feet have, in some case, two fixing holes at the non-drive end (NDE), see dimension tables. A code is cast into the motor close to the retaining holes to identify the frame size.

¹⁾ A second **K16** shaft extension is not possible.

²⁾ For 1MJ6 motors, only possible up to frame size 90.

³⁾ For 1MJ6 motors, only possible up to frame size 80.

⁴⁾  For explosion-proof motors:
For types of construction with shaft extension pointing downwards, the version "with protective cover" is mandatory. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

Mechanical design and degrees of protection

Preparation for gear mounting

The flange-mounting motors can be equipped with a radial sealing ring in order to mount gearing.
Order code **K17**.

It must be ensured that the sealing ring is lubricated using grease, oil mist or oil spray (it is not permissible to use pressurized oil).
We recommend that the permissible bearing loads are carefully checked.
Please enquire about gear mounting for 1LA8 non-standard motors.

Eyebolts and transport

1LA7, 1MA7 and 1LA5 motors of frame size 100 L and above have two horizontal eyebolts in the horizontal type of construction. For motors in vertical type of construction, two rotatable eyebolts are also supplied.

1LA6 and 1MA6 motors are supplied in a horizontal type of construction with feet complete with one eyebolt.

Horizontal types of construction for flange-mounting in frame sizes 100 to 160 are supplied with one eyebolt. With vertical types of construction, a rotatable eyebolt is also supplied. All flange-mounting types of construction in frame sizes 180 M to 315 L are supplied with two diagonal eyebolts. They can be rotated for vertical types of construction.

1LG4 and 1LG6 motors are supplied in a horizontal type of construction with two diagonal eyebolts. For vertical types of construction, the eyebolts can be rotated.

All the available eyebolts specifically provided for the type of construction must be used during transport.
1MA6, 1MJ6 and 1MJ7 motors of frame size 180 M and above have one eyebolt in type of construction IM B3 in the standard version and two eyebolts in type of construction IM B5. If type of construction IM V1 is used, one of the eyebolts must be rotated whereby it is important to note that forces perpendicular to the ring plane are not permitted.

1LA8, 1PQ8 and 1LL8 motors have two diagonally fixed eyebolts. The IM V1 types of construction have hinged eyebolts.

1MJ6 motors, frame sizes 90 L to 132 M have two eyebolts, frame sizes 160 M and 160 L have one eyebolt.

For frame sizes 180 M to 225 M, 1LA5 motors can be supplied with two additional eyebolts for types of construction IM V1/IM V3.
Order code **K32**

Frame material			
Type series	Frame size	Frame material	Frame feet
1LA5, 1LA7, 1LA9	56 to 100 ¹⁾ 112 to 225	Aluminium alloy Aluminium alloy	Cast screwed on
1MA7	63 to 100 ¹⁾ 112 to 160	Aluminium alloy Aluminium alloy	Cast screwed on
1LG4, 1LG6	180 M to 315 L	Cast iron	Cast ²⁾
1LA6, 1MA6	100 to 200 225 to 315 M 315 L	Cast iron Cast iron Cast iron	Screwed on Cast Screwed on
1MJ6	71 and 80 90 to 200	Cast iron Cast iron	Cast screwed on
1MJ7	225 to 315	Cast iron	Screwed on
1LA8	315 to 450	Cast iron	Cast
1MJ1	315	Cast iron	Screwed on
1MJ8	315 to 355	Welded steel	Welded
1MJ1	355 to 450		

¹⁾ Frame sizes 80, 90 and 100 in the version "Connection box on LHS/RHS"
Order code **K09/K10** have feet that are screwed on.

²⁾ Basic version, cast feet: Special version "screwed on feet" for order codes **K09, K10** and **K11**.

Degrees of protection

All motors are designed to IP 55 degree of protection. They can be installed in dusty or humid environments. The motors are suitable for operation in tropical climates. Guide value <60% relative air humidity at KT 40 °C. Other requirements are available on request.

1LL8 motors are available to IP23 degree of protection and are of a similar construction to 1LA8 motors. IP23 degree of protection is achieved by opening the internal cooling circuit and supplying it with external cooling air. Motors of the 1LL8 type series are only intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

Most motors can be supplied in IP56 and IP65 degrees of protection on request.

Brief explanation of the degrees of protection

IP55: Protection against harmful dust deposits, protection against water jets from any direction.

IP56 (non-heavy-sea):

Protection against harmful dust deposits, protection against water jets from any direction.

Order code **K52**

DIN EN 60034-5 defines protection level 6 for water protection as: "Protection against water due to heavy seas or water in a powerful jet". IP56 non-heavy-sea degree of protection can only be used with the requirement "Protection against a powerful jet" and not for the requirement "Protection against heavy sea".

This is not possible in combination with modular technology.

IP65: Complete protection against dust deposits, protection against water jets from any direction.

Order code **K50**

In DIN EN 60034-5, the code 6 for protection against the ingress of foreign bodies and touch hazard protection for electrical machines is not listed – Data for code 6 (protection against the ingress of dust) is given in EN 60529.

Not possible in combination with modular technology.

DIN EN 60529 contains a comprehensive description of this degree of protection as well as test conditions.

With motors that have a vertical shaft extension, the end user must prevent an ingress of fluid along the shaft.

For motors with shaft extension pointing downwards, the version "with protective cover" is urgently recommended, see "Types of construction".

With flange-mounting motors, for IM V3 type of construction, collection of fluid in the flange basin can be prevented by drainage holes (on request).

Drainage holes are usually available in 1MA6 and 1MA7 motors of frame size 225 and above and in all 1LG4 and 1LG6 motors.

1LG4, 1LG6, 1LA8, 1LL8, 1PQ8 motors and 1MA6 motors of frame size 225 and above have condensation drainage holes that are sealed with plugs.

Motors for Zones 2 and 21 (1MA6 of frame size 225 and above and 1LG4 and 1LG6) have condensation drainage holes that are sealed with screws.

Condensation drainage holes can also be implemented in motors designed for Zones 2, 21 and 22.

The condensation drainage holes at the drive end (DE) and non-drive end (NDE) are sealed (IP55) on delivery. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

Order code **L12**

IEC Squirrel-Cage Motors

Introduction

General technical data

When the motors are used or are stored outdoors (not 1LL8) we recommend that they are kept under some sort of cover so that they are not subject to direct intensive solar radiation, rain, snow, ice or dust over a long period of time. In such cases, technical consultation may be appropriate.

When the motors are used outdoors or in a corrosive environment, it is recommended that non-rusting screws are used externally.

Order code **M27**

Vibration-proof version

A load of 1.5g in all 3 planes for up to 1% of the service life of the motor is possible.

Order code **L03**

Noise levels for line-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-weighted measuring-surface sound pressure level L_{pA} in dB (A).

This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level is also specified as L_{WA} in dB (A).

The specified values are valid at 50 Hz (see the selection and ordering data in the appropriate sections of the catalog). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please enquire about the noise levels for pole-changing motors, motors with increased output or converter-fed motors.

To reduce noise levels, 2-pole motors with frame size 132 S and above and 1LA8 and 1LL8 2-pole motors of frame size 315 can be fitted with an axial-flow fan that is only suitable for one direction of rotation. The values can be taken from the table "Low-noise version" below and for 1LA8 or 1LL8 2-pole motors from the selection and ordering data in the catalogue section "Non-standard motors of frame size 315 and above".

Clockwise rotation

Order code **K37**

Anti-clockwise rotation

Order code **K38**

The motors up to frame size 315 L are up to 80 mm longer than normal.

A second shaft extension and/or mounting of an encoder are not possible (see "Special versions" in the relevant sections of the catalogue).

Low-noise version			
Type series	Frame size	2-pole motors	
		L_{pA} dB (A)	L_{WA} dB (A)
1LA5, 1LA6, 1LA7, 1MA7, 1MA6, 1MJ6, 1MJ7	132	64	76
	160	64	76
	180	63	76
	200	63	76
	225	68	80
	250	70	82
	280	72	84
	315	74	86
1LG4, 1LG6¹⁾	180	65	78
	200	70	83
	225	68	81
	250	70	83
	280	72	85
	315	74	87
1MJ8	355	69	84
1MJ1	315	Available soon	
	355		
	400		
	450		

Earth brushes are available for converter-fed operation for 1LG4 and 1LG6 motors.

Order code **M44**

Only available on request.

¹⁾ Not necessary for 1LG6 motors because these motors are already noise optimized.

Balance and vibration severity

All of the rotors are dynamically balanced with half key. This corresponds to vibration severity grade N (normal). The vibrational characteristics and behaviour of electrical machinery is specified in DIN EN 60034-14. "Half key balancing" is specified here based on DIN ISO 8821.

The balancing type is stamped on the face of the drive-end (DE) shaft extension.

F = Balancing with full key
H = Balancing with half key
N = Balancing without key

Motors up to frame size 80 have the type of balancing marked on the rating plate.

Full key balancing can be supplied if order code **L68** is specified (extra charge).

Low-vibration versions can be supplied to fulfill stricter requirements on smooth running (extra charge).

Limits of vibration severity in mm/s Effective shaft height H in mm						
Vibration severity grade	Rated speed rpm	Free suspension				Rigid installation H > 400
		56 < H ≤ 132	132 < H ≤ 225	225 < H ≤ 400	H > 400	
N	600 ... 3600	1.8	2.8	3.5	3.5	2.8
R	600 ... 1800	0.71	1.12	1.8	2.8	1.8
	>1800 ... 3600	1.12	1.8	2.8	2.8	1.8
S	600 ... 1800	0.45	0.71	1.12	–	–
	>1800 ... 3600	0.71	1.12	1.8	–	–

It must be noted that the measured values can deviate by ±10% from the actual values.

Shaft and rotor

Shaft extension

60° centre hole to DIN 332, Part 2 with M3 to M24 tapped hole depending on the shaft diameter (see dimension tables in the corresponding chapters)

Second standard shaft extension.

Order code **K16**.

The second shaft extension can transmit the full rated output via an output coupling up to frame size 315 M (please enquire about reduced transmitted power for frame sizes of 315 L and above). For motor series 1LA8 and 1LL8, the second shaft extension can transmit 50% of the rated output with an output coupling. (Please contact your local Siemens office if higher values are required.) The full rated output is not applicable for 1LA motors, frame sizes 90 S to 112 M. These motors can only transmit the rated output of the next lower size.

Vibration severity grade R (reduced).
Order code **K01**.

Vibration severity grade S (special).
Not possible with parallel roller bearings.
Order code **K02**.

The limits stated in the table below are applicable to freely suspended motors running uncoupled and at no load as well as to rigidly installed 1LA8 motors, frame size 450.

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: Max. speed).

For further details, see the online help in SD configurator.

Low-vibration versions of pole-changing motors are available in accordance with DIN EN 60034-14.

Please also enquire about the transmitted power and maximum cantilever force if belt pulleys, chains or gear pinions are used on the second shaft extension.

A second shaft extension is not available if a rotary pulse encoder and/or separately-driven fan is mounted (also applicable to motor series 1PQ8). Please enquire if a brake is mounted. For motor series 1LA8 and 1LL8, the second standard shaft extension is only available on request for 2-pole motors – please specify the weight of the coupling and type of lever arm.

The non-drive end (NDE) of frame sizes 100 L to 225 M has an M8 centre hole, DR form, for mounting the 1XP8 001 rotary pulse encoder or for fitting and extraction tools.

The non-drive end (NDE) of the 1LG4 and 1LG6 motors of frame sizes 180 M to 315 L, has an M16 centre hole, DS form.

Shaft extension (DE)	
Diameter	Thread
mm	mm
7 ... 10	DR M3
>10 ... 13	DR M4
>13 ... 16	DR M5
>16 ... 21	DR M6
>21 ... 24	DR M8
>24 ... 30	DR M10
>30 ... 38	DR M12
>38 ... 50	DS M16
>50 ... 85	DS M20
>85 ... 130	DS M24

Dimensions and tolerances for keyways and keys are in designed to DIN EN 50347. The motors are always supplied with a key inserted in the shaft.

IEC Squirrel-Cage Motors

Introduction

General technical data

Shaft extension with standard dimensions, without featherkey way

For motor series 1LA8, 1PQ8 and 1LL8, the standard shaft extension can be ordered with standard dimensions without a featherkey way.

Order code **K42**

Other motor series must be ordered with order code **Y55**.

Standard shaft made of non-rusting steel

For motor series 1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1PP5 and 1PP7, a standard shaft made of non-rusting steel (material X20Cr13V) can be ordered. This is only possible for shaft extensions of standard dimensions. For non-standard shaft dimensions, there will be an additional charge!

Order code **M65**

Please enquire about other non-rusting materials.

Please enquire regarding motor series 1LG4 and 1LG6.

Non-standard cylindrical shaft extension

The non-standard cylindrical shaft extension can be used on the drive end (DE) or non-drive end (NDE). The featherkey is always supplied with it.

Order code **Y55**

When motors are ordered that have a longer or shorter shaft extension as standard, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The location of the featherkey way is in the centre of the shaft extension and, in the case of non-standard

motors, 5 mm from the shaft extension. The length is defined by the manufacturer normatively.

Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals, etc.), hollow shafts.

For the version "Drive-end shaft extension (DE) without featherkey way", order code Y55 must also be used.

For 1MJ motors with longer shaft extensions than standard, the maximum cantilever force must be reduced accordingly. This will ensure that the shaft does not sag more than with the standard shaft extension (please enquire).

For order code **Y55** and second standard shaft extension **K16** (see previous page):

- Dimensions D and DA must be less than or equal to the inner diameter of the roller bearing (see dimension tables under "Dimensions" in the relevant chapters)
- Dimensions E and EA must be smaller than or equal to 2 x length E (standard) of the shaft extension

A non-standard cylindrical shaft extension can be supplied for the motor series listed in the table "Permissible changes to shaft extension" below up to the specified maximum lengths and diameters as compared to the standard shaft.

It is the responsibility of the customer to ensure that the maximum cantilever forces are reduced in accordance with the non-standard shaft extension.

Permissible changes to the shaft extension:

Motor series	Frame size	Number of poles	Shaft extension length E in mm		Shaft extension diameter D in mm	
			Standard	Up to max.	Standard	Up to max. ¹⁾
1LA6, 1LA7, 1LA9, 1MA6, 1MA7, 1LP7, 1PP7	56	2 ... 8	20	40	9	12
	63		23	46	11	
	71		30	60	14	15
	80		40	80	19	20
	90		50	100	24	25
	100		60	120	28	30
	112					
	132		80	160	38	40
	160		110	220	42	45
					48	48
1LA5, 1LA9, 1LG4, 1LG6, 1MA6, 1LP4, 1LP5, 1PP4, 1PP5	180	2 ... 8			55	55
	200					60
	225	2				
		4 ... 8	140	280	60	
	250	2				70
		4 ... 8			65	
	280	2				75
		4 ... 8			75	80
	315	2			65	
		4 ... 8	170	340	80	90
1LA8, 1PQ8	315	2	140	280	65	70
		4 ... 8	170	340	85	85
	355	2	140	280	75	80
		4 ... 8	170	340	95	95
	400	2			80	80
		4 ... 8	210	420	110	115
	450	2	170	340	90	90
		4 ... 8	210	420	120	125

Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors

The following are specified in DIN 42955 with Tolerance N (normal) and Tolerance R (reduced):

1. Concentricity tolerances for the shaft extension
2. Coaxiality tolerances for the shaft extension and flange centering
3. Linear movement tolerances for the shaft extension and flange surface

The concentricity of the shaft extension, coaxiality and linear movement according to DIN 42955 Tolerance R for flange-mounting motors can be ordered using order code **K04**.

This order code can be combined for motors with deep-groove bearings of series 60..., 62... and 63... This cannot be supplied in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake or encoder mounting.

Concentricity of the shaft extension can be ordered according to DIN 42955 Tolerance R for types of construction without a flange with order code **L39**.

¹⁾ At maximum permissible diameter, a step increase in shaft diameter is not possible.

Bearings and lubrication

Bearing lifetime (nominal lifetime)

The nominal bearing lifetime is defined acc. to standardized calculation procedures (DIN ISO 281) and, for 90% of the bearings is reached or even exceeded when the motors are operated in the compliance with the data provided in the catalogue.

Under average operating conditions, a lifetime (L_{h10}) of 100,000 hours can be achieved.

Generally, the bearing lifetime is defined by the bearing size, the bearing load, the operating conditions, the speed and the grease lifetime.

Bearing system

The bearing lifetime of motors with horizontal type of construction is at least 40,000 hours if there is no additional axial loading at the output coupling and at least 20,000 hours with the maximum permitted loads.

This assumes that the motor is operated at 50 Hz. The nominal bearing lifetime is reduced for converter-fed operation at higher frequencies.

For the maximum vibration values measured at the bearing plate, evaluation zones A and B specified in ISO 10816 are applicable in order to achieve the calculated lifetime under continuous duty. If higher vibration speeds will occur under the operating conditions, special arrangements will be necessary (please enquire).

For standard motors applies the following:

In the basic bearing system, the floating bearing is situated at the drive end (DE) and the located bearing (axially located from frame size 160 and above) is situated at the non-drive end (NDE). On request, the located bearing can also be supplied at the drive end (DE) (Fig. 3, Page 1/63).

For 1LA8, 1PQ8 and 1LL8 non-standard motors applies the following:

In the basic bearing system, the floating bearing is situated at the non-drive end (NDE) and the located bearing is situated at the drive end (DE).

On request, the located bearing can also be supplied at the non-drive end (NDE).

For ordering all standard and non-standard motors quote order code **K94**.

The bearing system is axially preloaded with a spring element to ensure smooth running of the motor without play.

This is not the case in versions with parallel roller bearings. The bearings of these motors must always run under adequate radial force (motors must not be operated on a testbed without additional radial loads).

Motors of series 1LA6, 1LA7, 1LA9 and 1MA7 up to and including frame size 132 have a "floating" bearing arrangement (see Fig. 1, Page 1/63).

Up to frame size 132, an additional axially-secured located bearing can be supplied on the non-drive end (NDE) complete with a retaining ring (see Figure 2, Page 1/63).

Order code **L04**

For frame size 160 and above, bearings are usually axially located (see Figures 2, 4 and 5, Page 1/63).

For increased cantilever forces (e.g. belt drives), reinforced bearings can be used at the drive end (DE).

Order code **K20**

Motors 1LG4/6 in frame sizes 180 to 315, 2-pole, can be supplied with reinforced deep-groove bearings (size range 03).

Special bearings for DE and NDE, bearing size 63

Order code **K36**

A measuring nipple for SPM shock pulse measurement is mounted to check bearing vibration. The motors have 1 or 2 tapped holes per bearing plate and a measuring nipple with a protective cap. If a second tapped holes is provided, it is fitted with a sealing cap.

Order code **G50**

Bearing arrangement for increased cantilever forces on Pages 1/61 and 1/62 – maximum loading on Pages 1/66 and 1/67.

Insulated bearings

To prevent damage as a result of bearing currents, insulated bearings can be supplied at the non-drive end NDE from frame size 225 to 315 and are recommended for frame size 225 and above. This bearing design is also possible for 1MJ7 motors from frame size 250 to 315.

Order code **L27**

The insulated bearing is standard for all 1LA8, 1PQ8 and 1LL8 motors which are identified for converter-fed operation.

Permanent lubrication

For permanent lubrication, the bearing grease lifetime is matched to the bearing lifetime. This can, however, only be achieved if the motor is operated in accordance with the catalogue specifications.

In the basic version, the motors up to and including shaft height 250 have permanent lubrication.

Regreasing

For motors which can be re-greased at defined re-greasing intervals, the bearing lifetime can be extended and/or unfavourable factors such as temperature, mounting conditions, speed, bearing size and mechanical load can be compensated.

From a shaft height of 280 upwards, regreasing with an M10 x 1 flat greasing nipple to DIN 3404 is provided.

It is possible to regrease motors, shaft heights 100 to 250.

A lubricating nipple is optionally provided.

Order code **K40**

Mechanical stress and grease lifetime

High speeds that exceed the rated speed with converter-fed operation and the resulting increased vibrations alter the mechanical running smoothness and the bearings are subjected to increased mechanical stress. This reduces the grease lifetime and the bearing lifetime (please enquire where applicable).

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{max} at maximum supply frequency f_{max} is essential, see the section "Motors operating with frequency converters".

IEC Squirrel-Cage Motors

Introduction

General technical data

Grease lifetime and regreasing intervals for horizontal installation

Permanent lubrication ¹⁾				
Type series	Frame size	Type	Number of poles	Grease lifetime up to KT40 °C ²⁾
All	56 to 250		2 to 8	20000 h or 40000 h ³⁾
Regreasing (basic version) ¹⁾				
Type series	Frame size	Type	Number of poles	Regreasing interval up to KT40 °C ²⁾
1LA6, 1PP6	100 to 160	 10 . to 16 .	2 to 8	8000 h
1LA5, 1LP5, 1PP5 1LA7, 1LP7, 1PP7 1LA9	100 to 225	 10 . to 22 .	2 to 8	8000 h
1LA8.. 1PQ8..	315 to 400	 31 . to 40 .	2	4000 h
		 31 . to 40 .	4 to 8	6000 h
	450	 45 .	2	3000 h
		 45 .	4 to 8	6000 h
1LL8..	315	 31 .	2	4000 h
		 31 .	4 to 8	8000 h / 4000 h ⁴⁾
	355 to 450	 35 . to 45 .	2	4000 h
		 35 . to 45 .	4 to 8	6000 h / 3000 h ⁴⁾
1LG4, 1LP4, 1PP4 1LG6, 1PP6	180 to 280	 18 . to 28 .	2	4000 h
			4 to 8	8000 h
	315	 31	2	3000 h
			4 to 8	6000 h
1MA6	100 to 200	 10 . to 20 .	2 to 8	8000 h
			2	4000 h
	225 to 280	 22 . to 28 .	2	4000 h
			4 to 8	8000 h
	315	 315	2	3000 h
			4 to 8	6000 h
1MA7 1MJ6, 1MJ7 1MJ8 1MJ1	100 to 160	 10 . to 16 .	2 to 8	8000 h
	180 to 200	 18 . to 20 .	2 to 8	8000 h
	225 to 280	 22 . to 28 .	2	4000 h
			4 to 8	8000 h
	315	 315	2	4000 h
			4	8000 h
			6 and 8	11000 h / 8000 h ⁵⁾
			2 and 4	2000 h
	355 to 450	 35 . to 45 .	2 and 4	2000 h
			6 and 8	4000 h

¹⁾ For special uses and special greases, please enquire about grease lifetime and regreasing intervals.

²⁾ If the coolant temperature is increased by 10 K, the grease lifetime and regreasing interval are halved.

³⁾ 40000 h applies for horizontally installed motors without additional axial loads.

⁴⁾ Regreasing interval for IM V1 type of construction.

⁵⁾ 8000 h applies for motor series 1MJ7.

Bearing selection table for 1LA5, 1LA6, 1LA7, 1LA9, 1LG, 1LP, 1MA and 1PP motors – basic version

The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the serial number or can be read from the lubrication plate on 1LA8 motors.

When deep-groove ball bearings with sideplates are used, the side plate is on the inside. For located bearings on drive end DE for 1LA5, 1LA7, 1LA9, 1MA6 and 1MA7 motors, see special version in Figure 3 (Page 1/63).

For motors frame size	Type	Number of poles	Drive end (DE) bearing	Vertical type of construction	Non-drive end NDE bearing	Vertical type of construction	Figures on Pages 1/63 and 1/64
			Horizontal type of construction		Horizontal type of construction		
1LA5 . . . , 1LA6 . . . , 1LA7 . . . , 1LA9 . . . , 1LP5 . . . , 1LP7 . . . , 1MA6 . . . , 1MA7 . . . , 1PP5 . . . , 1PP7 . . .							
56 M	 05 .	2 to 8	6201 2ZC3	6201 2ZC3	6201 2ZC3	6201 2ZC3	Fig. 1
63 M	 06 .	2 to 8	6201 2ZC3	6201 2ZC3	6201 2ZC3	6201 2ZC3	
71 M	 07 .	2 to 8	6202 2ZC3	6202 2ZC3	6202 2ZC3	6202 2ZC3	
80 M	 08 .	2 to 8	6004 2ZC3	6004 2ZC3	6004 2ZC3	6004 2ZC3	
90 S/L	 09 .	2 to 8	6205 2ZC3	6205 2ZC3	6004 2ZC3	6004 2ZC3	Fig. 2
100 L	 10 .	2 to 8	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	
112 M	 11 .	2 to 8	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	
132 S/M	 13 .	2 to 8	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	
160 M/L	 16 .	2 to 8	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 4
180 M/L	 18 .	2 to 8	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾	
200 L	 20 .	2 to 8	6212 ZC3 ²⁾	6212 ZC3 ²⁾	6212 ZC3 ²⁾	6212 ZC3 ²⁾	
225 S/M	 22 .	2 to 8	6213 ZC3 ²⁾	6213 ZC3 ²⁾	6212 ZC3 ^{2) 5)}	6212 ZC3 ^{2) 5)}	
250 M	 25 .	2 to 8	6215 ZC3 ²⁾	6215 ZC3 ²⁾	6215 ZC3 ²⁾	6215 ZC3 ²⁾	Fig. 5
280 S/M	 28 .	2 4 to 8	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3	
315 S/M	 310 313	2 4 to 8	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	
315 L	 316 317 318	2 4 to 8	6217 C3 6319 C3	6217 C3 6319 C3	6217 C3 6319 C3	7217 BEP 6319 C3	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . . , 1PP6 . . .							
180 M/L	 18 .	2 to 8	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	6210 ZC3 ⁴⁾	Fig. 4
200 L	 20 .	2 to 8	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	
225 S/M	 22 .	2 to 8	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	6213 ZC3 ⁴⁾	
250 M	 25 .	2 to 8	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	6215 ZC3 ⁴⁾	
280 S/M	 28 .	2 4 to 8	6217 C3 6317 C3	6217 C3 6317 C3	6217 C3 6317 C3	6217 C3 6317 C3	Fig. 5
315 S/M	 310 313	2 4 to 8	6219 C3 6319 C3	6219 C3 6319 C3	6219 C3 6319 C3	6219 C3 6319 C3	
315 L	 316 317 318	2 4 to 8	6219 C3 6319 C3	6219 C3 ³⁾ 6319 C3	6219 C3 6319 C3	7219 BEP ³⁾ 6319 C3	

¹⁾ Deep-groove bearings are used for regreasable versions (order code **K40**).

²⁾ Deep-groove bearings are not used for regreasable versions (order code **K40**) of 1MA6 motors of frame sizes 180 M to 250 M.

³⁾ Only at 50 Hz.

⁴⁾ Deep-groove bearings are not used for regreasable versions (order code **K40**).

⁵⁾ For 1MA6 motors frame size 225 S/M bearing 6213 ZC3 at the non-drive end NDE (BS).

IEC Squirrel-Cage Motors

Introduction

General technical data

Bearing selection table for 1LA8, 1PQ8 and 1LL8 motors – basic version

For motors frame size	Type	Number of poles	Drive end (DE) bearing	Non-drive end NDE bearing		Figures on Pages 1/63 and 1/64
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	
1LA8 ... , 1PQ8 ...						
315	 31 .	2	6218 C3	6218 C3	6218 C3	Fig. 6 and Fig. 7
		4 to 8	6218 C3	6218 C3	6218 C3	
355	 35 .	2	6218 C3	7218 B + 6218 C3	6218 C3	
		4 to 8	6220 C3	7220 B + 6220 C3	6220 C3	
400	 40 .	2	6218 C3	7218 B + 6218 C3	6218 C3	
		4 to 8	6224 C3	7224 B + 6224 C3	6224 C3	
450	 45 .	2	6220 C3	7220 B + 6220 C3	6220 C3	
		4 to 8	6226 C3	7226 B + 6226 C3	6226 C3	
1LL8 ...						
315	 31 .	2	6218 C3	6218 C3	6218 C3	No figure
		4 to 8	6220 C3	7220 B + 6220 C3	6218 C3	
355	 35 .	2	6218 C3	6218 C3	6218 C3	
		4 to 8	6224 C3	7224 B + 6224 C3	6220 C3	
400	 40 .	2	6218 C3	6218 C3	6218 C3	
		4 to 8	6226 C3	7226 B + 6226 C3	6224 C3	
450	 45 .	2	6220 C3	6220 C3	6220 C3	
		4 to 8	6228 C3	7228 B + 6226 C3	6228 C3	

1LA8, 1PQ8 and 1LL8 non-standard motors are transported horizontally. They can be transported vertically at an additional charge on request.

Bearing selection table for 1MJ motors – basic version

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figure on Page 1/64
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
71 M	1MJ6 07 .	2 to 8	6202 ZC3	6202 ZC3	6202 ZC3	6202 ZC3	Fig. 8
80 M	1MJ6 08 .	2 to 8	6004 ZC3	6004 ZC3	6004 ZC3	6004 ZC3	Fig. 9
90 S/L	1MJ6 09 .	2 to 8	6205 C3	6205 C3	6205 C3	6205 C3	
100 L	1MJ6 10 .	2 to 8	6206 C3	6206 C3	6206 C3	6206 C3	Fig. 10
112 M	1MJ6 11 .	2 to 8	6306 C3	6306 C3	6306 C3	6306 C3	
132 S/M	1MJ6 13 .	2 to 8	6308 C3	6308 C3	6308 C3	6308 C3	Fig. 11
160 M/L	1MJ6 16 .	2 to 8	6309 C3	6309 C3	6309 C3	6309 C3	
180 M/L	1MJ6 18 .	2 to 8	6210 C3	6210 C3	6210 C3	6210 C3	Fig. 12
200 L	1MJ6 20 .	2 to 8	6212 C3	6212 C3	6212 C3	6212 C3	
225 S/M	1MJ7 22 .	2 to 8	6213 C3	6213 C3	6213 C3	6213 C3	Fig. 12
250 M	1MJ7 25 .	2 to 8	6215 C3	6215 C3	6215 C3	6215 C3	
280 S/M	1MJ7 28 .	2 to 8	NU 216	NU 216	6216 C3	6216 C3	Fig. 12
315 S/M	1MJ7 31 .	2	NU 217	NU 217	6217 C3	6217 C3	
		4 to 8	NU 218	NU 218	6218 C3	6218 C3	No figure
315	1MJ1 31 .	2	6316 C3	6316 C3	6316 C3	6316 C3 ¹⁾	
		4 to 8	6219 C3	6219 C3	6219 C3	6219 C3	Fig. 13
355	1MJ8 35 .	2	6316 C3	6316 C3	6316 C3	6316 C3	
		4 to 8	6320 C3	6320 C3	6320 C3	6320 C3	
355	1MJ1 35 .	2	6316 C4	6316 C4	6316 C4	7316 B	
		4 to 8	6320 C3	6320 C3	6320 C3	7320 B	
400	1MJ1 40 .	2	6317 C4	6317 C4	6317 C4	7317 B	
		4 to 8	6322 C3	6322 C3	6322 C3	7322 B	
450	1MJ1 45 .	2	6318 C4	6318 C4	6318 C4	7318 B	
		4 to 8	6324 C3	6324 C3	6324 C3	7324 B	

¹⁾ For the 60 Hz vertical type of construction, the bearing 6316 C4 is used.

General technical data

Bearing selection table for 1LA5, 1LA6, 1LA7, 1LA9, 1LG, 1LP, 1MA and 1PP motors – Bearings for increased cantilever forces – Order code **K20**

Please enquire about noise and vibration data.

For NU bearings, in contrast to standard bearings, a minimum cantilever force is required.

The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory

by quoting the serial number or can be read from the lubrication plate on 1LA8 motors.

When deep-groove ball bearings with sideplates are used, the side plate is on the inside.

1MJ8 motors at 60 Hz on request.

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figure on Page 1/63
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LA5 . . . , 1LA6 . . . , 1LA7 . . . , 1LA9 . . . , 1LP5 . . . , 1LP7 . . . , 1MA6 . . . , 1MA7 . . . , 1PP5 . . . , 1PP7 . . .							
100 L	 10 .	2 to 8	6306 ZC3	6306 ZC3	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	No figure
112 M	 11 .	2 to 8	6306 ZC3	6306 ZC3	6205 2ZC3 ¹⁾	6205 2ZC3 ¹⁾	
132 S/M	 13 .	2 to 8	6308 ZC3	6308 ZC3	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	
160 M/L	 16 .	2 to 8	6309 ZC3	6309 ZC3	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	
180 M/L	 18 .	2 to 8	6310 ZC3	6310 ZC3	6210 ZC3	6210 ZC3	
200 L	 20 .	2 to 8	6312 ZC3	6312 ZC3	6212 ZC3	6212 ZC3	
225 S/M	 22 .	2 to 8	NU 213 E ^{2) 3)}	NU 213 E ^{2) 3)}	6212 ZC3 ⁴⁾	6212 ZC3 ⁴⁾	
250 M	 25 .	2 to 8	NU 215 E ²⁾	NU 215 E ²⁾	6215 ZC3	6215 ZC3	
280 S/M	 28 .	2	NU 216 E	NU 216 E	6216 C3	6216 C3	
		4 to 8	NU 317 E	NU 317 E	6317 C3	6317 C3	
315 S/M	 310 313	2	NU 217 E	NU 217 E	6217 C3	6217 C3	
		4 to 8	NU 319 E	NU 319 E	6319 C3	6319 C3	
315 L	 316 317 318	2	NU 217 E	–	6217 C3	–	
		4 to 8	NU 319 E	NU 319 E	6319 C3	6319 C3	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . .							
180 M/L	 18 .	2 to 8	NU 210	NU 210	6210 C3	6210 C3	Fig. 4
200 L	 20 .	2 to 8	NU 212	NU 212	6212 C3	6212 C3	
225 S/M	 22 .	2 to 8	NU 213	NU 213	6213 C3	6213 C3	
250 M	 25 .	2 to 8	NU 215	NU 215	6215 C3	6215 C3	
280 S/M	 28 .	2	NU 217	NU 217	6217 C3	6217 C3	Fig. 5
315 S/M	 310 313	4 to 8	NU 317	NU 317	6317 C3	6317 C3	
		2	NU 219 ⁵⁾	NU 219 ⁵⁾	6219 C3	6219 C3	
315 L	 316 317 318	4 to 8	NU 319	NU 319	6319 C3	6319 C3	
		2	NU 219 ⁵⁾	NU 219 ⁵⁾	6219 C3	6219 C3	
		4 to 8	NU 319	NU 319	6319 C3	6319 C3	

¹⁾ Deep-groove bearings are used for regreasable versions (order code **K40**).

²⁾ Deep-groove bearings of size range 03 are also possible (order code **K36**).

³⁾ For 1LA5 motors frame size 225 S/M bearing 6313 ZC3 at the non-drive end. Bearing 6313 ZC3.

⁴⁾ For 1MA6 motors frame size 225 S/M bearing 6213 ZC3 at the non-drive end.

⁵⁾ Only at 50 Hz.

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Bearing selection table for 1LA8, 1PQ8 and 1LL8 motors – bearings for increased cantilever forces – Order code **K20**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LA8 ... , 1PQ8 ...							
315	 31 .	4 to 8	NU 320 E	On request	6218 C3	On request	No figure
355	 35 .	4 to 8	NU 322 E	On request	6220 C3	On request	

Please enquire about noise and vibration data. For NU bearings, in contrast to standard bearings, a minimum cantilever force is required. The bearing selection tables are only intended for planning purposes. Binding statements about the bearings for motors which have already been shipped can be requested. Please specify the serial number.

The motors are transported horizontally; they can be transported vertically at additional cost on request. Reinforced bearings are available for frame sizes 400 and 450 as well as IM V1 types of construction as well as for 1LL8 motors on request. Please specify cantilever force and dimension x. Reinforced bearings cannot be supplied for 2-pole motors.

Bearing selection table for 1MJ6 and 1MJ7 motors – Bearings for increased cantilever forces – Order code **K20**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1MJ6 ...							
180 M/L	 18 .	2 to 8	NU 210	NU 210	6210 ZC3	6210 ZC3	No figure
200 L	 20 .	2 to 8	NU 212	NU 212	6212 ZC3	6212 ZC3	
1MJ7 ...							
225 M/L	 22 .	2 to 8	NU 213	NU 213	6213 C3	6213 C3	No figure
250 M	 25 .	2 to 8	NU 215	NU 215	6215 C3	6215 C3	

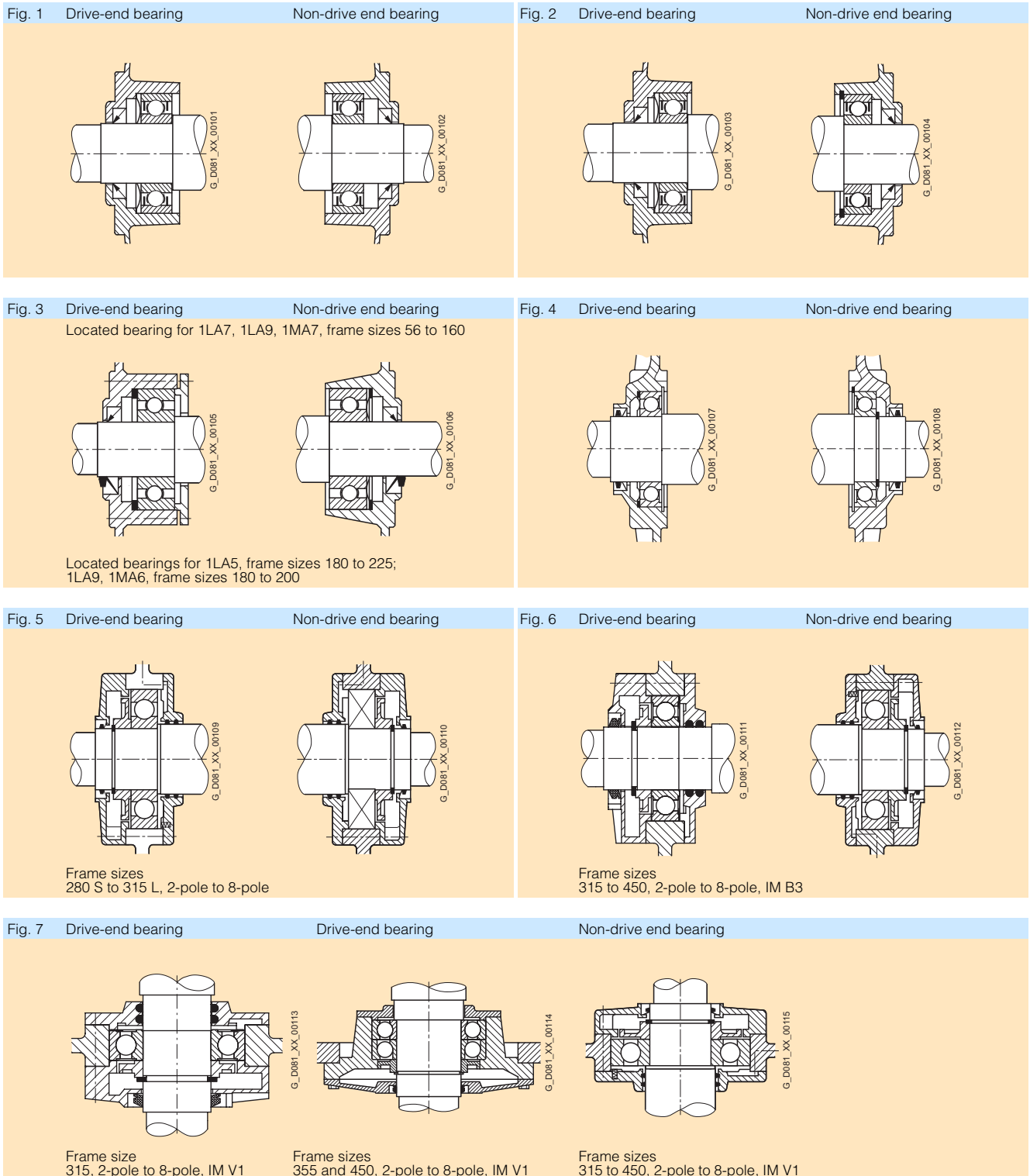
Bearing selection table for 1LG4, 1LG6, 1LP4 and 1PP4 motors – Deep-groove bearings reinforced at both ends – Order code **K36**

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figure on Page 1/63
			Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LG4 . . . , 1LG6 . . . , 1LP4 . . . , 1PP4 . . .							
180 M/L	 18 .	2 to 8	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	6310 ZC3 ¹⁾	Fig. 4
200 L	 20 .	2 to 8	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾	6312 ZC3 ¹⁾	
225 S/M	 22 .	2 to 8	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾	6313 ZC3 ¹⁾	
250 M	 25 .	2 to 8	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾	6315 ZC3 ¹⁾	
280 S/M	 28 .	2 4 to 8	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	6317 C3 6317 C3 ²⁾	Fig. 5
315 S/M/L	 31 .	2 4 to 8	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾	6316 C3 6319 C3 ²⁾	

¹⁾ Deep-groove bearings are not used for regreaseable versions (order code **K40**).

²⁾ As for basic version.

Diagrams of bearings



IEC Squirrel-Cage Motors

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Fig. 8 Drive-end bearing

Non-drive end bearing

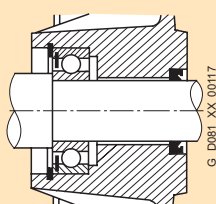
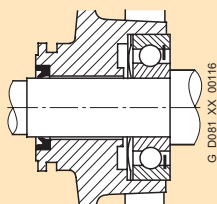


Fig. 9 Drive-end bearing

Non-drive end bearing

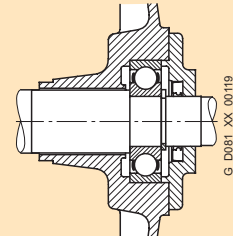
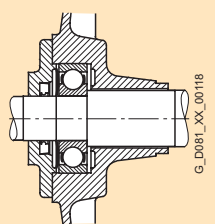


Fig. 10 Drive-end bearing

Non-drive end bearing

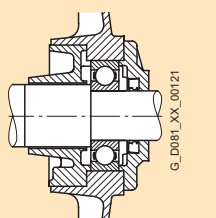
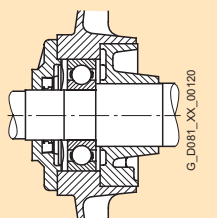


Fig. 11 Drive-end bearing

Non-drive end bearing

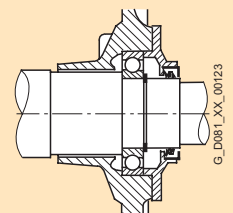
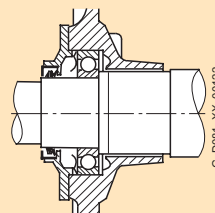


Fig. 12 Drive-end bearing

Non-drive end bearing

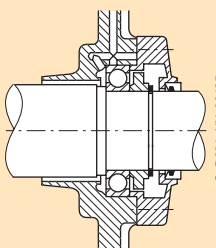
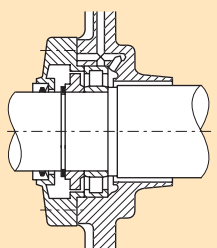
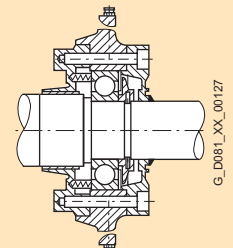
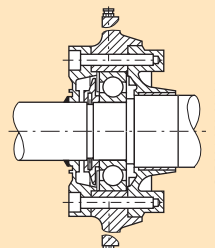


Fig. 13 Drive-end bearing

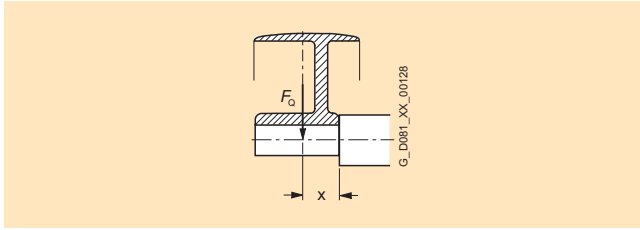
Non-drive end bearing



Drive-end and non-drive-end bearings
frame size 355 and above
Outer bearing seal
for frame sizes 400 and 450
with labyrinth gland

Maximum cantilever forces

Maximum cantilever forces, basic version



In order to calculate the maximum cantilever forces for a radial load, the line of force (i.e. the centreline of the pulley) of the cantilever force F_Q (N) must lie within the free shaft extension (dimension X).

Dimension x [mm] is the distance between the point of application of force F_Q and the shaft shoulder. Dimension x_{max} corresponds to the length of the shaft extension.

Total cantilever force $F_Q = c \cdot F_u$

The pre-tension factor c is a value gained from experience from the belt manufacturer. The following approximate value can be assumed:

For normal flat leather belts with an idler pulley $c = 2$;
for V-belts $c = 2$ to 2.5;
for special synthetic belts (depending on the type and load) $c = 2$ to 2.5.

The circumferential force F_u (N) is calculated using the following equation

$$F_u = 2 \cdot 10^7 \frac{P}{n \cdot D}$$

F_u circumferential force in N

P rated motor power (transmitted power) in kW

n Fan speed in rpm

D pulley diameter in mm

The pulleys are standardized acc. to DIN 2211, Sheet 3.

The maximum cantilever forces at 60 Hz are approx. 80% of the 50 Hz values (please enquire).

Maximum cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors	Frame size	Number of poles	Maximum cantilever force for x_0			Maximum cantilever force for x_{max}		
			Type	N	N	Type	N	N
				1LG4	1MA6		1LG4	1MA6
				1LG6	1MJ7		1LG6	1MJ7
250 M		2		3190	3650	3650	2530	2950
		4		4000	4400	4400	3350	3600
		6		4700	5350	5350	3900	4350
		8		5200	5700	5700	4400	4700
280 S 280 M		2		4000	3350	8100	3250	2800
		4		8400	8400	9700	7000	7200
		6		9700	10000	11700	8100	8900
		8		10750	11000	12800	9000	9850
315 S 315 M		2		4750	3950	9000	3890	3350
		4		9100	9900	13100	7300	8100
		6		10700	12100	15600	8700	9900
		8		11600	13300	16900	9600	10900
315 L		2		4000	3100	8800	3280	2700
		4		8400	8800	24000	7500	7450
		6		9700	11400	25000	9100	9600
		8		11100	12500	26000	10200	10500

Maximum cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors	Frame size	Number of poles	Maximum cantilever force for x_0			Maximum cantilever force for x_{max}		
			Type	N	N	Type	N	N
				1LA5	1LG4		1LA5	1LG4
				1LA7	1LG6		1LA7	1LG6
				1LA9	1LP4		1LA9	1LP4
				1MA6	1PP4		1MA6	1PP4
				1MA7	1PP6		1MA7	1PP6
				1LA6			1LA6	
				1LP5			1LP5	
				1LP7			1LP7	
				1PP5			1PP5	
				1PP7			1PP7	
56 M		2		270	—	—	240	—
		4		350	—	—	305	—
		6		415	—	—	360	—
63 M		2		270	—	—	240	—
		4		350	—	—	305	—
		6		415	—	—	360	—
71 M		2		415	—	415	355	—
		4		530	—	530	450	—
		6		630	—	630	535	—
80 M		2		485	—	485	400	—
		4		625	—	625	515	—
		6		735	—	735	605	—
90 S 90 L		2		725	—	725	605	—
		4		920	—	920	775	—
		6		1090	—	1090	910	—
100 L		2		1230	—	1230	1030	—
		4		1310	—	1310	1060	—
		6		1550	—	1550	1250	—
112 M		2		1010	—	1680	830	—
		4		1270	—	1960	1040	—
		6		1520	—	2140	1240	—
132 S 132 M		2		1490	—	2250	1180	—
		4		1940	—	2720	1530	—
		6		2260	—	3100	1780	—
160 M 160 L		2		2500	—	3400	1980	—
		4		2800	—	2800	1210	—
		6		2040	—	3330	1590	—
180 M 180 L		2		2330	—	3750	1820	—
		4		2660	—	3750	2080	—
		6		2000	1780	2000	1550	1410
200 L		2		2350	2240	2350	1950	1820
		4		2800	2550	2800	2250	2120
		6		3050	2860	3050	2500	2330
225 S 225 M		2		2550	2380	2550	2100	1930
		4		3350	3050	3350	2750	2530
		6		3900	3500	3900	3200	2930
		2		4150	3800	4150	3450	3210
		4		3050	2820	3050	2550	2290
		6		3750	3500	3750	2950	2760
		2		4550	4050	4550	3600	3240
		4		4850	4500	4850	3900	3500

Table continues overleaf

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Maximum cantilever forces for the basic 50 Hz version

Valid are: x_0 values for $x = 0$ and $x_{\max}$ values for $x = l$ (l = shaft extension)

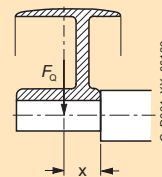
For motors		Maximum cantilever force for x_0	Maximum cantilever force for $x_{\max}$
Frame size	Number of poles	Type	Type
		N	N
		1LA8, 1PQ8, 1MJ8 ¹⁾	1LA8, 1PQ8, 1MJ8 ¹⁾
315	2 ... 8	See diagrams Page 1/68	See diagrams Page 1/68
...			
450		1MJ1 ²⁾	1MJ1 ²⁾
		N	N
315 S	2	6200	5400
315 M	4	6800	5800
	6	7700	6700
	8	8700	7500
315 L	2	5900	5300
	4	6200	5700
	6	7000	6300
	8	8000	7200

For 1LA8 motors in horizontal type of construction, the maximum cantilever forces are specified with regard to the axial forces.

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported. Both feet must be secured for foot-mounting types of construction.

Refer to pages 1/66 to 1/69 if the cantilever forces are higher than those listed above.

Bearing design for increased cantilever forces



Maximum cantilever forces at 50 Hz for 1LA, 1MA, 1MJ, 1LP and 1PP motors

Deep-groove ball bearings at the drive end (DE) – Order code K20

For motors			Maximum cantilever force F_Q	
Frame size	Type	Number of poles	at x_0	at $x_{\max}$
			N	N
			1LA5 ..., 1LA6 ..., 1LA7 ..., 1LA9 ..., 1MA6 ..., 1MA7 ..., 1MJ6 ..., 1MJ7 ..., 1LP5 ..., 1LP7 ..., 1PP5 ..., 1PP7 ...	
100	 10 .	2	1680	1490
		4	1960	1580
		6	2140	1720
		8	2450	1950
112	 113	2	1680	1490
		4	1960	1580
		6	2140	1720
		8	2450	1950
132	 13 .	2	2250	1820
		4	2720	2170
		6	3100	2420
		8	3400	2700
160	 16 .	2	2800	2250
		4	3330	2600
		6	3750	2900
		8	3750	2900
180	 18 .	2	3700	3000
		4	4450	3600
		6	5100	4150
		8	5550	4500
200	 20 .	2	5200	4300
		4	6450	5350
		6	7300	6100
		8	7900	6550
225	1LA522 .	2	5200	4300
	1LP5 ...	4	6450	5350
	1PP5 ...	6	7300	6100
		8	7900	6550

¹⁾ Data for 1LL8 is available on request.

²⁾ Data for 1MJ1 frame sizes 355 to 450 will be available soon.

General technical data

Maximum cantilever forces at 50 Hz for 1LG motors

Parallel roller bearings at the drive end (DE) – Order code K20

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors Frame size	Type	Number of poles	Maximum cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1LG4 ... , 1LG6 ... , 1LP4 ... , 1PP4 ...				
180 M, 180 L	 18 .	2	4550	3600
		4	5650	4050
		6	6350	4050
		8	6950	4050
200 L	 20 .	2	6600	5350
		4	8200	6850
		6	9300	6300
		8	10100	7400
225 S, 225 M	 22 .	2	7500	6250
		4	9150	7200
		6	10400	7400
		8	11300	7350
250 M	 25 .	2	9100	7300
		4	11300	9300
		6	12800	10500
		8	14100	10500
280 S ¹⁾ , 280 M ¹⁾	 28 .	2	11400	9350
315 S ¹⁾ , 315 M ¹⁾	 310	2	14700	12300
315 L ¹⁾	 316	2	14600	12700
	 317			

Maximum cantilever forces at 50 Hz for 1MA and 1MJ motors

Parallel roller bearings at the drive end (DE) – Order code K20

For motors

Frame size	Type	Number of poles	Maximum cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1MA6 ... 1MJ7 ...				
225	 22 .	2	8100	6800
		4	9800	7800
		6	11200	8800
		8	12200	9700
250	 25 .	2	9600	7900
		4	11600	9600
		6	13200	10800
		8	14400	11800
280 ^{1) 2)}	 28 .	2	10000	8400
315 S ^{1) 2)}	 310	2	12000	10200
315 M ^{1) 2)}	 313			
315 L ^{1) 2)}	 316	2	11800	10200
	 317			

1LA8 1PQ8				

315 to 355 2 to 8 See diagrams Page 1/69

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6 the belt tension is only permitted to act parallel to the mounting plane or towards the mounting plane and the feet must be supported.

Maximum cantilever forces at 50 Hz for 1LG motors

Deep-groove bearings reinforced at both ends DE/NDE – Order code K36

Valid are: x_0 values for $x = 0$ and x_{max} values for $x = l$ (l = shaft extension)

For motors Frame size	Type	Number of poles	Maximum cantilever force F_Q	
			at x_0	at x_{max}
			N	N
1LG4 ... 1LG6 ...				
180 M, 180 L	 18 .	2	3280	2600
		4	4150	3430
		6	4750	3950
		8	5250	4050
200 L	 20 .	2	4350	3500
		4	5550	4550
		6	6350	5350
		8	7000	5900
225 S, 225 M	 22 .	2	4850	3950
		4	6100	4850
		6	7050	5650
		8	7750	6150
250 M	 25 .	2	5800	4600
		4	7400	6050
		6	8500	7050
		8	9350	7850
280 S, 280 M	 28 .	2	–	–
315 S, 315 M	 310	2	5650	4650
315 L	 316	2	5450	4650
	 317			

¹⁾ Maximum cantilever forces for 1LG4, 1LG6, 1LP4, 1PP4 and 1MA6 frame sizes 280 to 315 L in 4-pole to 8-pole version, see Page 1/69.

²⁾ Not applicable to 1MJ motors with frame sizes 280 to 315, because this is the standard version.

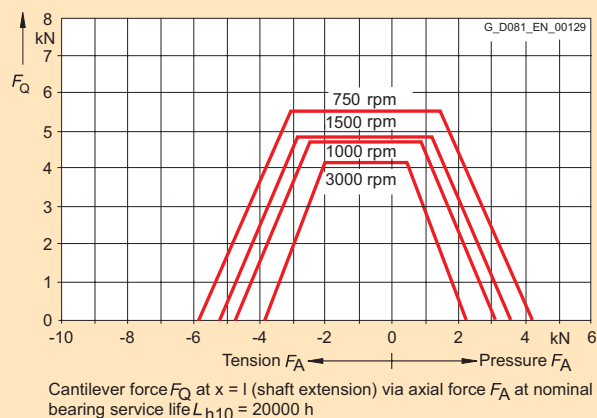
IEC Squirrel-Cage Motors

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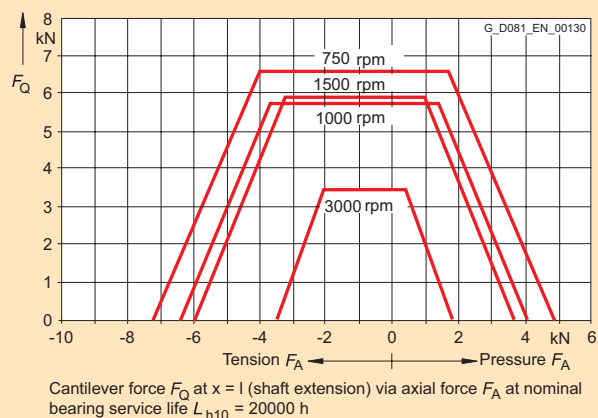
General technical data

Maximum cantilever forces at 50 Hz for 1LA8 and 1PQ8 motors – basic version

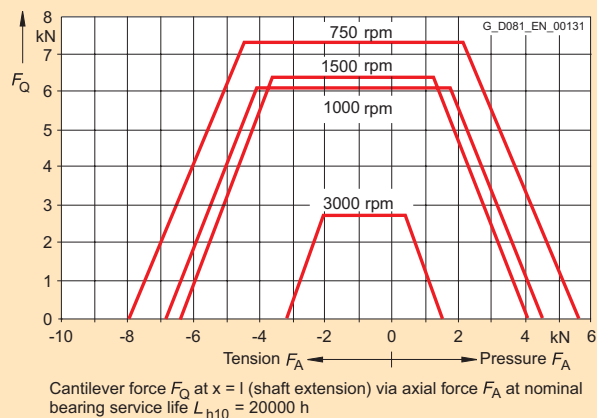
Frame size 315, 1LA8 and 1PQ8 – Type of construction IM B3



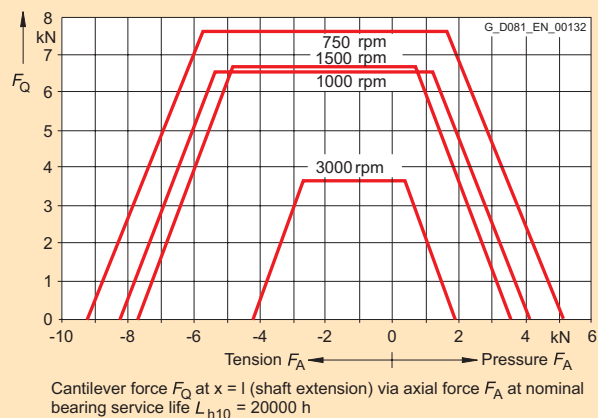
Frame size 355, 1LA8 and 1PQ8 – Type of construction IM B3



Frame size 400, 1LA8 and 1PQ8 – Type of construction IM B3

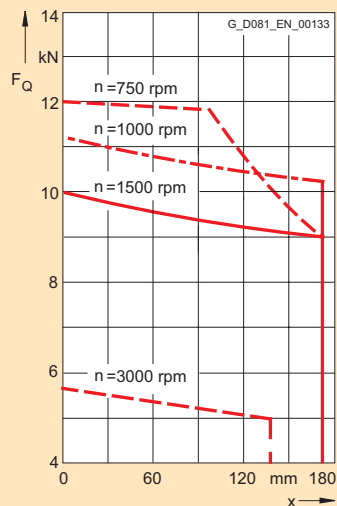


Frame size 450, 1LA8 and 1PQ8 – Type of construction IM B3



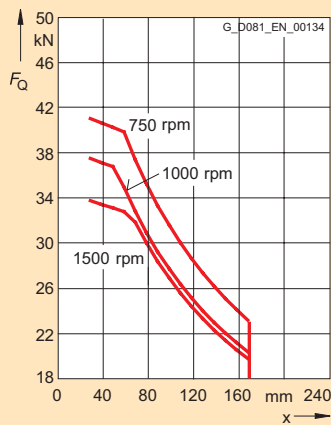
Maximum cantilever forces at 50 Hz for 1MJ8 motors – Basic version

Frame size 355, 1MJ8

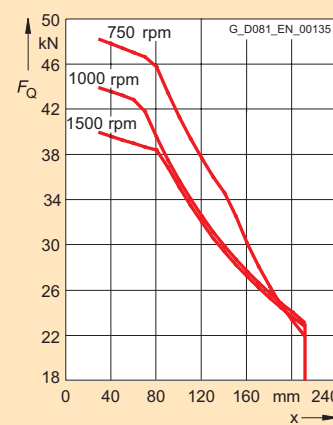


Maximum cantilever forces at 50 Hz for 1LA8 and 1PQ8 motors – Bearings for increased cantilever forces – Order code **K20**

Frame size 315, 1LA8 and 1PQ8 – Type of construction IM B3



Frame size 355, 1LA8 and 1PQ8 – Type of construction IM B3

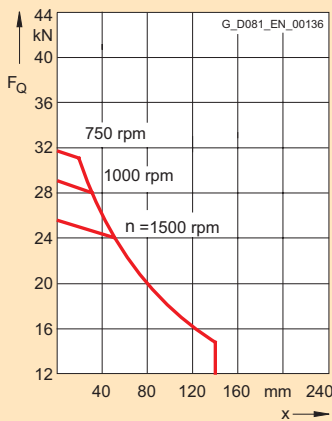


At 60 Hz, the maximum cantilever force must be reduced to 80%.

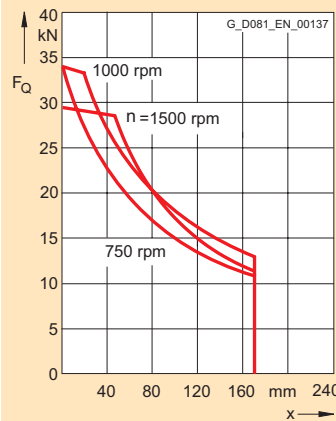
For all motors of frame sizes 400 and 450, IM V1 and 1LL8 motors with reinforced bearings available on request. Please specify cantilever force and lever arm.

Maximum cantilever forces at 50 Hz for 1LG motors – Bearings for increased cantilever forces – Order code **K20**

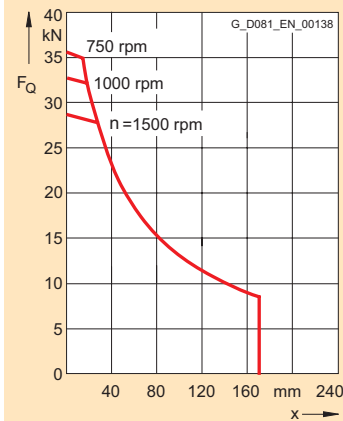
Frame size 280, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4



Frame size 315, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

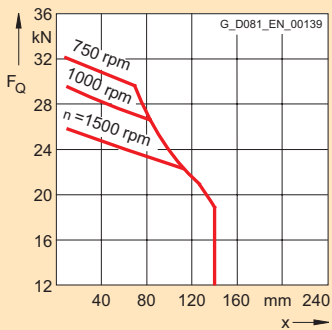


Frame size 315 S/M, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

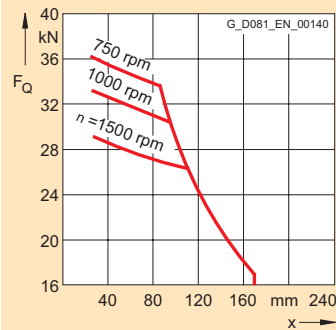


Maximum cantilever forces at 50 Hz for 1MA motors – Bearings for increased cantilever forces – Order code **K20**

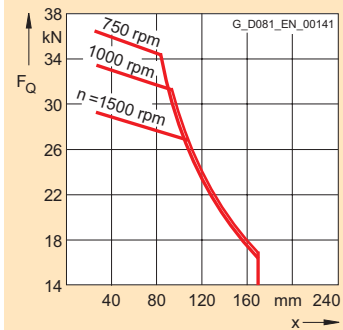
Frame size 280, 4-pole to 8-pole, 1MA6



Frame size 315 S/M, 4-pole to 8-pole, 1MA6



Frame size 315 L, 4-pole to 8-pole, 1MA6



IEC Squirrel-Cage Motors

Introduction

General technical data

Maximum axial load

1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ1, 1MJ6, 1MJ7, 1MJ8, 1PP5, 1PP6, 1PP7 motors in vertical type of construction – basic version

Frame size	Shaft extension pointing															
	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
56	80	245	230	95	80	330	310	95	80	410	390	95	–	–	–	–
63	80	245	230	95	80	330	310	95	80	410	390	95	–	–	–	–
71	105	365	335	130	90	380	440	130	90	590	550	130	90	700	660	130
80	110	425	360	160	100	540	480	165	100	650	590	165	100	760	700	165
90	110	440	360	180	100	680	580	190	100	920	820	190	100	1150	1050	190
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140 (140)*	710 (1050)*	550 (800)*	300 (300)*	130 (130)*	1000 (1350)*	820 (1100)*	310 (300)*	130 (130)*	1290 (1720)*	1110 (1500)*	310 (310)*	130 (130)*	1570 (2000)*	1390 (1850)*	310 (310)*
132	200 (1500)*	1200 (1550)*	950 (1300)*	470 (470)*	180 (1500)*	1680 (2100)*	1200 (1600)*	470 (470)*	180 (280)*	1900 (2400)*	1600 (2100)*	470 (470)*	190 (290)*	2200 (2800)*	1900 (2400)*	440 (440)*
160	1500 (2000)*	1400 (1720)*	950 (1300)*	1900 (2500)*	1900 (2500)*	1800 (2400)*	1300 (1720)*	2200 (2800)*	2200 (2800)*	2200 (2800)*	1600 (2130)*	2700 (3600)*	2700 (3600)*	2700 (3600)*	1950 (2600)*	2900 (3700)*

For motors		Shaft extension downwards															
Frame size	Type	3000 rpm				1500 rpm				1000 rpm				750 rpm			
		Load down		Load up		Load down		Load up		Load down		Load up		Load down		Load up	
		1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...	1LA5...	1MJ6...
		1LA5...	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6	1MJ7	1MA6
		1MA6...	1LP5		1LP5		1LP5		1LP5		1LP5		1LP5		1LP5		1LP5
		1MJ6...	1PP5		1PP5		1PP5		1PP5		1PP5		1PP5		1PP5		1PP5
		1MJ7...															
		1LP5...															
		1PP5...															
		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
180 M	...	183	1150	1150	1900	1900	1400	1400	2350	2350	–	–	–	–	–	–	–
180 L	...	186	–	–	–	–	1400	1400	2400	2400	1700	1700	2850	2850	2000	2000	3150
200 L	...	206	1650	1650	2750	2750	–	–	–	–	2550	2550	3950	3950	–	–	–
	...	207	1550	1550	2800	2800	2000	2000	3350	3350	2400	2400	3950	3950	2800	2800	4500
225 S	...	220	–	–	–	–	2300	2300	3020	3020	–	–	–	–	3200	3200	4080
225 M	...	223	1890	1890	2190	2190	2180	2180	3060	3060	2700	2700	3500	3500	3040	3040	4120
250 M	...	253	1750	1750	2790	2790	2160	2160	3760	3760	2740	2740	4340	4340	2990	2990	4890
280 S	...	280	380	1150	4480	3850	3830	1350	8790	4950	5340	2350	10000	5650	6280	2850	11000
280 M	...	283	180	900	4580	3900	3550	1000	8910	5000	5000	2000	10100	5700	5930	2450	11100
315 S	...	310	210	900	5270	4500	3700	1700	10200	6400	5150	2300	11700	7050	6520	3400	13000
315 M	...	313	100	650	5350	4550	3330	1600	10400	6900	4740	2050	11700	7500	5800	2800	13000
315 L	...	316	9270	–	770	–	2330	–	10400	–	3650	–	11700	–	4630	–	13000
	...	317	9270	–	840	–	1370	–	10800	–	2990	–	11600	–	3760	–	13000
	...	318	9270	–	840	–	1370	–	10800	–	2990	–	11600	–	3760	–	13000

The values shown do not assume a cantilever force on the shaft extension.

The maximum loads are valid for operation at 50 Hz; for 60 Hz, please enquire.

The calculation of the maximum axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalogue "Accessories and spare parts".

Please enquire regarding 1MJ8 and 1MJ1 motors.

Please enquire if the load direction alternates.

* The values in brackets for frame sizes 112 to 160 apply to 1MJ6 motors.

General technical data

1LA5, 1LA6, 1LA7, 1LP7, 1MA6, 1MA7, 1MJ1, 1MJ6, 1MJ7, 1MJ8, 1PP6, 1PP7 motors in horizontal type of construction –
Basic version

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Tensile load N	Thrust load (N) with radial load at		without radial load N	Tensile load N	Thrust load (N) with radial load at		without radial load N	Tensile load N	Thrust load (N) with radial load at		without radial load N	Tensile load N	Thrust load (N) with radial load at		without radial load N
		x_0 N	$x_{max.}$ N			x_0 N	$x_{max.}$ N			x_0 N	$x_{max.}$ N			x_0 N	$x_{max.}$ N	
56	90	120	90	240	90	140	110	320	90	170	120	400	–	–	–	–
63	90	120	90	240	90	140	110	320	90	170	120	400	–	–	–	–
71	120	150	120	350	120	210	150	460	120	260	180	570	120	300	210	680
80	140	190	150	400	140	300	260	510	140	330	280	620	140	340	290	730
90	150	300	280	400	150	400	360	630	150	480	430	870	150	550	500	1100
100	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
112	220 (220)*	450 (850)*	350 (700)*	630 (1050)*	220 (220)*	600 (1150)*	500 (1000)*	910 (1350)*	220 (220)*	650 (1300)*	550 (1150)*	1200 (1720)*	220 (220)*	750 (1450)*	650 (1300)*	1480 (2000)*
132	350 (350)*	650 (1000)*	520 (900)*	1200 (1550)*	350 (350)*	850 (1250)*	700 (1150)*	1600 (2100)*	350 (350)*	1020 (1500)*	890 (1400)*	1900 (2400)*	350 (350)*	1150 (1750)*	1020 (1650)*	2200 (2800)*
160	1500 (2100)*	850 (1280)*	720 (1100)*	1500 (2100)*	1500 (2100)*	1050 (1680)*	920 (1700)*	1800 (2350)*	1500 (2100)*	1250 (2050)*	1120 (1920)*	2200 (2900)*	1500 (2100)*	1350 (2400)*	1220 (2200)*	2600 (3300)*

For motors		3000 rpm		1500 rpm		1000 rpm		750 rpm	
Frame size	Type	Loading direction		Loading direction		Loading direction		Loading direction	
		Tension	Thrust	Tension	Thrust	Tension	Thrust	Tension	Thrust
	1LA5 . . . 1MA6 . . . 1MJ6 . . . 1MJ7 . . . 1LP5 . . . 1PP5 . . .	N	N	N	N	N	N	N	N
180 M	 183	1400	1400	1700	1700	–	–	–	–
180 L	 186	–	–	1700	1700	2050	2050	2400	2400
200 L	 206	2000	2000	–	–	3000	3000	–	–
	 207	1950	1950	2450	2450	2900	2900	3400	3400
225 S	 220	–	–	2980	1960	–	–	3880	2860
225 M	 223	2390	1370	2900	1880	3380	2360	3810	2790
250 M	 253	2450	1655	3070	2270	3620	2820	4000	3200
280 S	 280	1330 (3700)*	2900 (2100)*	5080 (4200)*	6740 (2600)*	6410 (5000)*	8070 (3400)*	7390 (5550)*	9050 (3950)*
280 M	 283	1200 (3600)*	2800 (2000)*	4990 (4000)*	6650 (2400)*	6260 (4800)*	7920 (3200)*	7220 (5350)*	8880 (3750)*
315 S	 310	1500 (3800)*	3160 (2200)*	5350 (4900)*	7450 (3300)*	6740 (5500)*	8810 (3900)*	8010 (6500)*	10110 (4900)*
315 M	 313	1400 (3650)*	3180 (2050)*	5260 (4900)*	7360 (3300)*	6560 (5450)*	8660 (3850)*	7690 (6250)*	9790 (4650)*
315 L	 316	1080	2740	4580	6680	5770	7870	6820	8920
	 317	940	2600	4170	6270	5410	7510	6410	8510
	 318	940	2600	4170	6270	5410	7510	6410	8510

The values shown do not assume a cantilever force on the shaft extension.

The maximum loads are valid for operation at 50 Hz; for 60 Hz, please enquire.

The calculation of the maximum axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalogue "Accessories and spare parts". Please enquire regarding 1MJ8 and 1MJ1 motors.

Please enquire if the load direction alternates.

* The values in brackets for frame sizes 112 to 160 apply to 1MJ6 motors and frame sizes 280 S to 315 M apply to 1MJ7 motors.

IEC Squirrel-Cage Motors

Introduction

General technical data

1LG4, 1LG6, 1LP4, 1PP4 and 1PP6 motors in vertical type of construction – Basic version

For motors									
Frame size	Type	3000 rpm		1500 rpm		1000 rpm		750 rpm	
	1LG4 ...	Load	Load	Load	Load	Load	Load	Load	Load
	1LG6 ...	down	up	down	up	down	up	down	up
	1LP4 ...								
	1PP4 ...								
	1PP6 ...	N	N	N	N	N	N	N	N
Shaft extension downwards									
180 M	... 183	1140	1150	1500	1600	–	–	–	–
180 L	... 186	–	–	1380	1630	1650	2000	2020	2250
	... 188	1140	1190	1390	1650	1640	2030	1880	2280
	... 206	1610	1480	–	–	2420	2550	–	–
200 L	... 207	1510	1530	2030	2100	2220	2610	2610	2970
	... 208	1510	1590	1990	2120	2210	2680	2600	3060
	... 220	–	–	2110	2690	–	–	2830	3710
225 S	... 220	–	–	2110	2690	–	–	2830	3710
	... 223	1540	1990	1920	2770	2260	3300	2620	3770
225 M	... 228	1540	2070	1950	2840	2240	3430	2610	3880
	... 253	1680	2760	2110	3740	2740	4350	3070	4920
250 M	... 258	1660	2870	2110	3960	2740	4520	3070	5160
	... 280	390	4670	3190	8200	4510	9290	5510	10300
280 S	... 283	100	4780	2790	8340	4210	9450	5200	10400
	... 288	100	4950	2700	8570	4170	9600	5160	10600
315 S	... 310	840	6330	3380	10200	4760	11500	5860	12600
315 M	... 313	530	6490	2870	10500	4200	11800	5420	12900
315 L	... 316	8830	590	2450	11000	3680	12300	4800	13400
	... 317	8410	690	1800	11400	3100	12800	4410	13900
	... 318	8170	800	1620	12000	2690	13400	3820	14300
Shaft extension pointing upwards									
180 M	... 183	1900	390	2260	840	–	–	–	–
180 L	... 186	–	–	2140	870	2410	1240	2780	1490
	... 188	1900	430	2150	890	2400	1270	2640	1520
	... 206	2760	330	–	–	3570	1400	–	–
200 L	... 207	2660	380	3180	950	3370	1460	3760	1820
	... 208	2660	440	3140	970	3360	1530	3750	1910
	... 220	–	–	3130	1670	–	–	3850	2690
225 S	... 220	–	–	3130	1670	–	–	3850	2690
	... 223	2560	970	2940	1750	3280	2280	3640	2750
225 M	... 228	2560	1050	2970	1820	3260	2410	3630	2860
	... 253	2480	1960	2910	2940	3540	3550	3870	4120
250 M	... 258	2460	2070	2910	3160	3540	3720	3870	4360
	... 280	1960	3100	4760	6630	6080	7720	7080	8730
280 S	... 283	1670	3210	4360	6770	5780	7880	6770	8830
	... 288	1670	3380	4270	7000	5740	8030	6730	9030
315 S	... 310	2410	4760	5380	8200	6760	9500	7860	10600
315 M	... 313	2100	4920	4870	8500	6200	9800	7420	10900
315 L	... 316	10400	–	4450	9000	5680	10300	6800	11400
	... 317	9980	–	3800	9400	5100	10800	6410	11900
	... 318	9740	–	3620	10000	4690	11400	5820	12300

Values shown without assuming a cantilever force on the shaft extension.

The maximum loads apply to operation at 50 Hz; please enquire about 60 Hz.

The figures for the maximum axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant section of the catalogue "Accessories and spare parts".

Please enquire if the loading direction alternates.

1LG4, 1LG6, 1LP4, 1PP4 and 1PP6 motors in horizontal type of construction – Basic version

For motors Frame size	Type	3000 rpm		1500 rpm		1000 rpm		750 rpm	
		Loading direction		Loading direction		Loading direction		Loading direction	
		Tension	Thrust	Tension	Thrust	Tension	Thrust	Tension	Thrust
	1LG4 ...								
	1LG6 ...								
	1LP4 ...								
	1PP4 ...								
	1PP6 ...	N	N	N	N	N	N	N	N
180 M	... 183	1550	790	1950	1190	–	–	–	–
180 L	... 186	–	–	1890	1130	2220	1460	2470	1710
	... 188	1550	790	1900	1140	2220	1460	2460	1700
200 L	... 206	2150	990	–	–	3090	1940	–	–
	... 207	2130	970	2670	1520	3030	1880	3410	2260
	... 208	2130	970	2630	1480	3020	1870	3410	2250
225 NO	... 220	–	–	2950	1920	–	–	3820	2790
225 M	... 223	2320	1290	2910	1880	3360	2330	3760	2740
	... 228	2320	1290	2910	1880	3350	2320	3760	2730
250 M	... 253	2510	1710	3150	2350	3750	2950	4180	3380
	... 258	2510	1710	3140	2340	3750	2950	4170	3370
280 NO	... 280	1790	3360	4970	6540	6180	7750	7170	8740
280 M	... 283	1720	3290	4860	6430	6110	7680	7090	8660
	... 288	1720	3290	4850	6420	6100	7670	7080	8650
315 NO	... 310	2610	4180	5520	7520	6830	8830	7940	9940
315 M	... 313	2500	4070	5320	7320	6520	8520	7850	9850
315 L	... 316	2450	4020	5230	7230	6370	8370	7520	9520
	... 317	2320	3890	5050	7050	6110	8110	7350	9350
	... 318	2300	3870	4950	6950	5950	7950	7080	9080

1LA8 and 1PQ8 motors in vertical type of construction – Basic version

For motors Frame size	Type	Shaft end facing downwards							
		3000 rpm		1500 rpm		1000 rpm		750 rpm	
		Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
	1LA8 ...								
	1PQ8 ...								
	1LL8 ...	N	N	N	N	N	N	N	N
315	... 315	1900	5240	2790	6930	3060	8600	3850	9390
	... 317	1440	5680	2280	7420	2390	9230	3190	10030
355	... 353	8480	5570	14550	7900	–	–	–	–
	... 355	8180	5860	14200	8240	15690	10650	17840	11650
	... 357	7530	6500	13400	9030	14540	11780	16690	12780
400	... 403	6780	7260	17640	11160	19500	14160	22260	15330
	... 405	6330	7700	17040	11750	18750	14910	21510	16070
	... 407	5930	8100	16340	12440	17900	15750	20660	16910
450	... 453	5330	9650	17720	13020	19950	16250	23040	17550
	... 455	4730	10250	17020	13720	19050	17140	22140	18440
	... 457	4130	10840	16270	14460	18000	18180	21090	19480

For 1LA8 and 1PQ8 motors in a horizontal type of construction, the maximum cantilever forces are specified with regard to the axial forces, see Page 1/68.

Data is available for 1LL8 motors on request.

Values shown without assuming a cantilever force on the shaft extension.

The maximum loads apply to operation at 50 Hz; please enquire about 60 Hz.

The figures for the maximum axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant section of the catalogue "Accessories and spare parts".

Please enquire if the loading direction alternates.

IEC Squirrel-Cage Motors

Introduction

General technical data

Modular technology

Basic versions

The range of potential applications for the 1LA and 1LG motors can be broadened considerably by mounting the following modules (e.g. the motors can be used as brake motors).

- **1XP8 001** rotary pulse encoder, frame sizes 71 M to 315 L
- Separately driven fan, frame sizes 100 L to 315 L
- Brake, frame sizes 63 to 315 L

The brake must always be mounted in the factory for safety reasons. The rotary pulse encoder and/or the separately driven fan can also be retrofitted.

The degree of protection of the motors with modular technology is IP55. Higher degrees of protection on request.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

1XP8 001 rotary pulse encoder



1XP8 001 rotary pulse encoder

The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 001-1** with order code **H57** or in a TTL version as **1XP8 001-2** with order code **H58**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension or protective cover cannot be supplied.

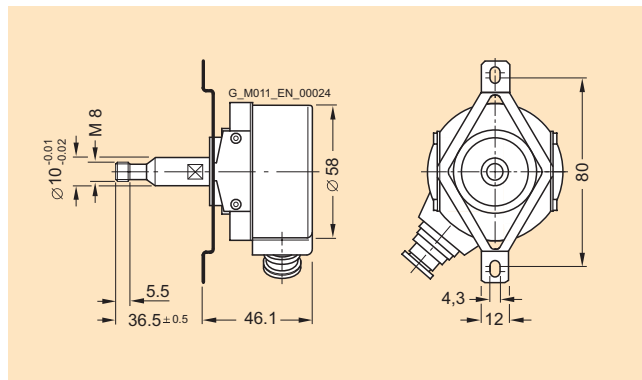
It can also be ordered separately and retrofitted (please enquire beforehand), Order No. **1XP8 001-1** or **1XP8 001-2** (see the section "Standard motors", "Accessories and spare parts").

The 1XP8 001 rotary pulse encoder is suitable for standard applications. For further encoders, see "Special technology" from Page 1/84.

All 1LA5, 1LA6 and 1LA7 motors with frame sizes 100 L to 225 M that are listed in the catalogue are prepared for fitting a rotary encoder on the non-drive end (NDE) with an M8 centre hole, form DR.

All 1LG4 and 1LG6 motors that are listed in the catalogue have an M16 centre hole, form DS on the non-drive end (NDE). When a rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of plastic. A protective cover made of non-corrosive sheet steel is available for 1LA5, 1LA6 and 1LA7 motors, see "Mechanical protection for encoders", order code **M68**, under "Special technology".



Mounting dimensions of 1XP8 001 rotary pulse encoder

Technical data of rotary pulse encoders		
Supply voltage U_B	1XP8 001-1 (HTL version) +10 V to +30 V	1XP8 001-2 (TTL version) 5 V $\pm 10\%$
Current input without load	200 mA	150 mA
Maximum load current per output	max. 100 mA	max. 20 mA
Pulses per revolution	1024	1024
Outputs	2 square-wave pulses A, B – 2 inverted square-wave pulses A, B Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	90° $\pm 20\%$	90° $\pm 20\%$
Output amplitude	$U_{\text{High}} > U_B - 3.5 \text{ V}$ $U_{\text{Low}} < 3 \text{ V}$	$U_{\text{High}} > 2.5 \text{ V}$ $U_{\text{Low}} < 0.5 \text{ V}$
Minimum edge interval	0.8 μs at 160 kHz	0.45 μs at 300 kHz
Edge steepness (without load or cable)	t_+ , $t_- \leq 200 \text{ ns}$	t_+ , $t_- \leq 100 \text{ ns}$
Maximum frequency	160 kHz	300 kHz
Maximum speed	9000 rpm	12000 rpm
Temperature range	-20 to +80 °C	-20 to +100 °C
Degree of protection	IP66	IP66
Maximum radial cantilever force	60 N	60 N
Maximum axial force	40 N	40 N
Termination system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

General technical data

Separately driven fan

The use of a separately driven fan is recommended to increase motor utilisation at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please enquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted, order code **G17**.

It can also be ordered separately and retrofitted. For selection information and order numbers, see the section "Standard motors", "Accessories and spare parts"). A rating plate listing all the

important data is fitted to the separately driven fan. The supply voltage of the 1PP9 motors with mounted separately driven fan is adapted to the voltage of the 1LG motor for voltages outside the rated voltage range. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Ambient temperature AT_{max} . 50 °C, please enquire for higher ambient temperatures.

When a separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

Technical data of the separately driven fan

Frame size	Rated voltage range V		Frequency Hz	Rated speed rpm	Power consumption kW	Rated current A
100	1 AC	200 to 277	50	2790	0.070	0.25
	3 AC	200 to 290 Δ	50	2830	0.086	0.267
	3 AC	346 to 500 Y	50	2830	0.083	0.156
	1 AC	200 to 277	60	3280	0.088	0.25
	3 AC	200 to 332 Δ	60	3490	0.093	0.271
	3 AC	346 to 575 Y	60	3490	0.093	0.157
112	1 AC	200 to 277	50	2720	0.073	0.26
	3 AC	200 to 290 Δ	50	2770	0.085	0.269
	3 AC	346 to 500 Y	50	2770	0.082	0.151
	1 AC	200 to 277	60	3000	0.107	0.31
	3 AC	200 to 332 Δ	60	3280	0.094	0.273
	3 AC	346 to 575 Y	60	3280	0.094	0.158
132	1 AC	200 to 277	50	2860	0.115	0.39
	3 AC	200 to 290 Δ	50	2880	0.130	0.442
	3 AC	346 to 500 Y	50	2880	0.138	0.24
	1 AC	200 to 277	60	3380	0.185	0.52
	3 AC	200 to 332 Δ	60	3470	0.148	0.407
	3 AC	346 to 575 Y	60	3470	0.148	0.235
160 to 225 ¹⁾	1 AC	200 to 277	50	2780	0.225	0.84
	3 AC	200 to 290 Δ	50	2840	0.218	0.713
	3 AC	346 to 500 Y	50	2830	0.220	0.401
	3 AC	200 to 332 Δ	60	3400	0.280	0.798
	3 AC	346 to 575 Y	60	3400	0.280	0.461
250 M to 280 M	3 AC	220 to 240 Δ	50	2720	0.450	2.00
	3 AC	380 to 420 Y	50	2720	0.450	1.15
	3 AC	440 to 480 Y	60	3320	0.520	1.05
315 2-pole	3 AC	220 to 240 Δ	50	2750	0.650	2.85
	3 AC	380 to 420 Y	50	2750	0.650	1.64
	3 AC	440 to 480 Y	60	3365	0.750	1.60
315 4, 6, 8-pole	3 AC	220 to 240 Δ	50	2720	0.450	2.00
	3 AC	380 to 420 Y	50	2720	0.450	1.15
	3 AC	440 to 480 Y	60	3320	0.520	1.05

* Separately driven fans with order numbers **1PP...** are used for 1LG motors of frame size 225 and above. The values for frame sizes 250 M to 280 M are then applicable.

IEC Squirrel-Cage Motors

Introduction

General technical data

Mounting of separately driven fan and rotary pulse encoder with separately driven fan for 1LA5, 1LA6, 1LA7 and 1LG motors

Version	Frame size	Number of poles	Order No.
Separately driven fan incl. mounting parts ¹⁾	100	all	2CW2 180-8RF54-1AB0
	112	all	2CW2 210-8RF54-1AB1
	132	all	2CW2 250-8RF54-1AB2
	160	all	2CW2 300-8RF54-1AB3
	180	all	2CW2 300-8RF54-1AB4
	200	all	2CW2 300-8RF54-1AB5
	225 ²⁾	all	2CW2 300-8RF54-1AB6
	250	all	1PP9 063-2LA12-Z A11+K50 ³⁾
	280	all	1PP9 063-2LA12-Z A11+K50 ³⁾
	315	2	1PP9 070-2LA12-Z A11+K50 ³⁾
Separately driven fan and rotary pulse encoder 1XP8 001 incl. mounting parts ¹⁾	315	4 to 8	1PP9 063-2LA12-Z A11+K50 ³⁾
	100	all	2CW2 180-8RF54-2AB0
	112	all	2CW2 210-8RF54-2AB1
	132	all	2CW2 250-8RF54-2AB2
	160	all	2CW2 300-8RF54-2AB3
	180	all	2CW2 300-8RF54-2AB4
	200	all	2CW2 300-8RF54-2AB5
	225 ²⁾	all	2CW2 300-8RF54-2AB6

Brakes

Spring-operated disk brakes are used for the brakes with order code **G26**. Depending on the selected motor, brake types **2LM8** or **KFB** are used. In the standard version, the brakes are supplied for connection to 230 V with rectifier. The supply voltage for brakes is explained under "Modular technology – Additional versions".

For the design of each brake type, the braking time, run-on revolutions, braking energy per braking procedure as well as the service life of the brake linings, see "Configuration of motors with brakes".

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights". When a brake is mounted on a 1LA7 motor, a larger connection box (GK 127) is used for frame sizes 63 to 90.

2LM8 spring-operated disk brake

This brake is mounted on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in the frame sizes 180 to 200 as standard.

The 2LM8 brake has IP55 degree of protection.

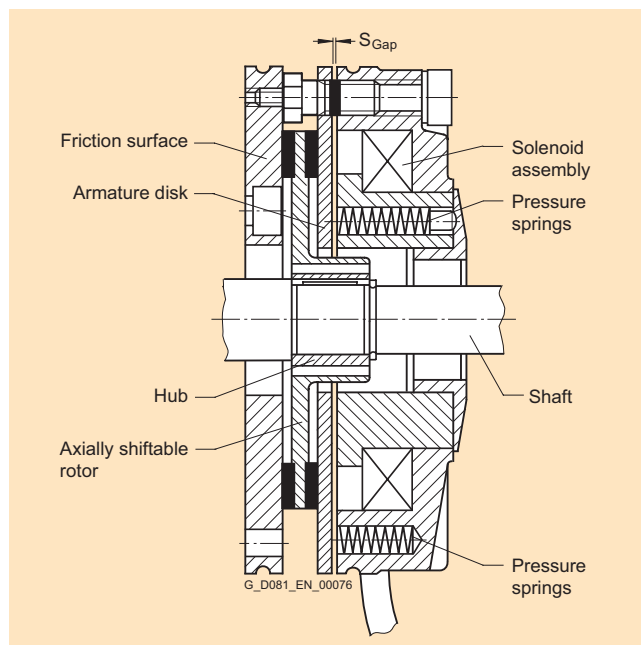
Please enquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times.

Design and mode of operation

The brake takes the form of a single-disk brake with two friction surfaces.

The braking torque is generated by friction when pressure is applied by one or more pressure springs in the de-energized state. The brake is released electromagnetically.

When the motor brakes, the rotor which can be axially shifted on the hub or the shaft is pressed via the armature disk against the friction surface by means of the springs. In the braked state, there is a gap S_{Gap} between the armature disk and the solenoid component. To release the brake, the solenoid is energized with DC voltage. The resulting magnetic force pulls the armature disk against the spring force on to the solenoid component. The spring force is then no longer applied to the rotor which can rotate freely.



Design of the 2LM8 spring-operated disk brake

Rating plate

The motors have a second rating plate on the opposite side to the motor rating plate. The brake data is indicated on this second rating plate.

¹⁾ The separately driven fan **2CW2 ...** comprises a complete fan unit with impeller, the separately driven fan **1PP9 ...** only comprises the fan motor without mounting components and impeller.

²⁾ For 1LG motors with separately driven fan with Order No.. **1PP9 063-2LA12-Z A11+K50** (weight 4.37 kg).

³⁾ For replacement purposes only.

General technical data

Operating values for spring-operated brakes with standard excitation

For motor frame size	Brake type	Rated braking torque at 100 rpm	Rated braking torque in relation to rated braking torque at 100 rpm in % for the following speeds			Voltage	Current/power input ¹⁾		Brake application time $t_2^{2)}$	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Service capability of the brake	
			1500 rpm	3000 rpm	Max. speed		A	W					Lifetime of brake lining L	Air gap adjustment required after braking energy L_N
		Nm	%	%	%	V			ms	ms	kg m ²	dB (A)	Nm · 10 ⁶	Nm · 10 ⁶
63	2LM8 005-1NA10 2LM8 005-1NA60 2LM8 005-1NA80	5	87	80	65	AC 230 AC 400 DC 24	0.1 0.11 0.83	20	25	56	0.000013	77	105	16
71	2LM8 005-2NA10 2LM8 005-2NA60 2LM8 005-2NA80	5	87	80	65	AC 230 AC 400 DC 24	0.1 0.11 0.83	20	25	56	0.000013	77	105	16
80	2LM8 010-3NA10 2LM8 010-3NA60 2LM8 010-3NA80	10	85	78	65	AC 230 AC 400 DC 24	0.12 0.14 1.04	25	26	70	0.000045	75	270	29
90	2LM8 020-4NA10 2LM8 020-4NA60 2LM8 020-4NA80	20	83	76	66	AC 230 AC 400 DC 24	0.15 0.17 1.25	32	37	90	0.00016	75	740	79
100	2LM8 040-5NA10 2LM8 040-5NA60 2LM8 040-5NA80	40	81	74	66	AC 230 AC 400 DC 24	0.2 0.22 1.67	40	43	140	0.00036	80	1350	115
112	2LM8 060-6NA10 2LM8 060-6NA60 2LM8 060-6NA80	60	80	73	65	AC 230 AC 400 DC 24	0.25 0.28 2.1	53	60	210	0.00063	77	1600	215
132	2LM8 100-7NA10 2LM8 100-7NA60 2LM8 100-7NA80	100	79	72	65	AC 230 AC 400 DC 24	0.27 0.31 2.3	55	50	270	0.0015	77	2450	325
160	2LM8 260-8NA10 2LM8 260-8NA60 2LM8 260-8NA80	260	75	68	65	AC 230 AC 400 DC 24	0.5 0.47 4.2	100	165	340	0.0073	79	7300	935
180	2LM8 315-0NA10 2LM8 315-0NA60 2LM8 315-0NA80	315	75	68	65	AC 230 AC 400 DC 24	0.5 0.56 4.2	100	152	410	0.0073	79	5500	470
200, 225	2LM8 400-0NA10 2LM8 400-0NA60 2LM8 400-0NA80	400	73	68	65	AC 230 AC 400 DC 24	0.55 0.61 4.6	110	230	390	0.0200	93	9450	1260

¹⁾ For 400 V AC and for 24 V DC, the power can deviate by up to +10% as a function of the selected supply voltage.

²⁾ The specified switching times are valid for switching on the DC side with a rated release travel and with the coil already warm. They are average values which may vary depending on factors such as the rectifier type and the release travel. The brake application time for switching on the AC side, for example, is approximately 6 times longer than for switching on the DC side.

IEC Squirrel-Cage Motors

Introduction

General technical data

Lifetime of the brake lining

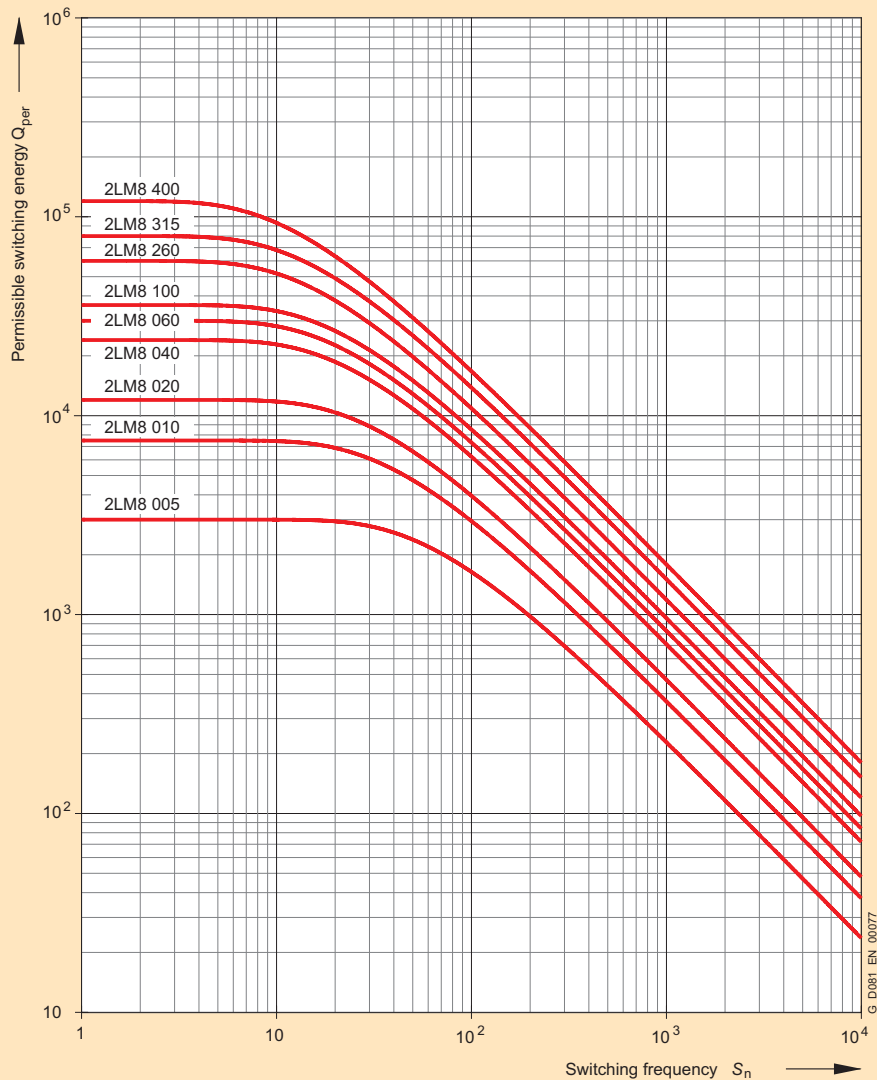
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the operating frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value for the friction energy until readjustment that is valid for all operating conditions.

The specific wear on the friction surfaces (volume of wear per unit of friction energy) is approximately 0.05 to 2 cm³/kWh when the brake is used as a service brake.

Maximum speeds

The maximum speeds from which emergency stops can be made, are listed in the table. These speeds should be considered as recommended values and must be checked under actual operating conditions.

The maximum permissible friction energy depends on the operating frequency and is shown for the various brakes in the figure "Maximum operating energy as a function of the operating frequency". Increased wear can be expected when the brakes are used for emergency stops.



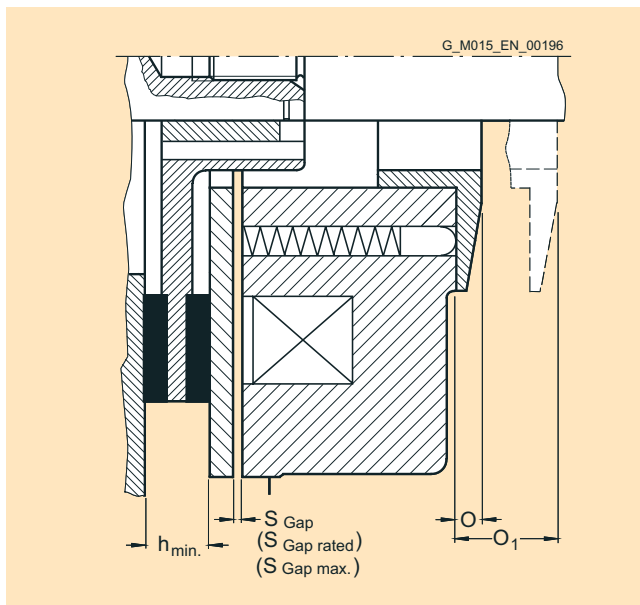
For motor frame size	Brake type	Maximum speeds			Changing the braking torque			Readjusting the air gap		
		Max. operating rpm if max. operating energy utilised	Max. no-load rpm with emergency stop function		Reduction per notch	Dim. "O ₁ "	Min. braking torque	Rated air gap S _{Gap Rated}	Max. air gap S _{Gap max.}	Min. rotor thickness h _{min.}
		rpm	Horizontal mounting rpm	Vertical mounting rpm	Nm	mm	Nm	mm	mm	mm
63	2LM8 005-1NA ..	3000	6000	6000	0.17	7.0	3.7	0.2	0.4	4.5
71	2LM8 005-2NA ..	3000	6000	6000	0.17	7.0	3.7	0.2	0.4	4.5
80	2LM8 010-3NA ..	3000	6000	6000	0.35	8.0	7.0	0.2	0.45	5.5
90	2LM8 020-4NA ..	3000	6000	6000	0.76	7.5	18.2	0.2	0.55	7.5
100	2LM8 040-5NA ..	3000	6000	6000	1.29	12.5	21.3	0.3	0.65	8.0
112	2LM8 060-6NA ..	3000	6000	6000	1.66	11.0	32.8	0.3	0.75	7.5
132	2LM8 100-7NA ..	3000	5300	5000	1.55	13.0	61.1	0.3	0.75	8.0
160	2LM8 260-8NA ..	1500	4400	3200	5.6	17.0	157.5	0.4	1.2	12.0
180	2LM8 315-0NA ..	1500	4400	3200	5.6	17.0	178.4	0.4	1.0	12.0
200, 225	2LM8 400-0NA ..	1500	3000	3000	6.15	21.0	248.7	0.5	1.5	15.5

Changing the braking torque

The brake is supplied with the braking torque already set. For 2LM8 brakes, the torque can be reduced to the dimension O₁ by unscrewing the adjusting ring with a hook spanner. The braking torque changes by the values shown in the above table for each notch of the adjusting ring.

Readjusting the air gap

Under normal operating conditions, the brake is practically maintenance-free. The air gap S_{Gap} must only be checked at regular intervals if the application requires an extremely large amount of frictional energy and readjusted to the rated gap S_{Gap Rated} at the latest when the maximum air gap S_{Gap max} is reached.



KFB spring-operated brake

This brake is the standard brake for 1LG motors in frame sizes 225 to 315. For frame sizes 180 and 200, apart from the standard brake 2LM8, KFB brakes can also be supplied. Special brake selections are available on request.



KFB spring-operated brake

The KFB solenoid double-disk spring-operated brake is a safety brake which brakes the motor if the supply is disconnected (power failure, emergency stop). The KFB brake, IP65 degree of protection, is mainly used for electric motors for traversing, cross-traversing and lifting gear in cranes as well as for special industrial applications.

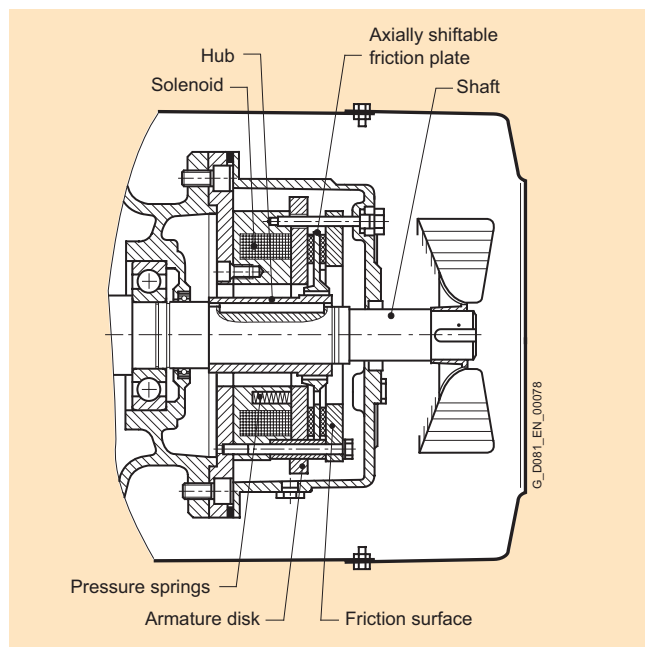
Design and mode of operation

When the brake current is switched on, an electromagnetic field develops which overcomes the spring force of the brake. The corresponding modules, including the motor shaft, can rotate freely. The brake is released. If the brake current is switched off or if there is a power failure, the electromagnetic field of the brake disappears. The mechanical braking energy is transferred to the motor shaft. The motor is braked.

IEC Squirrel-Cage Motors

Introduction

General technical data



Rating plate

The motors have a rating plate that indicates the brake data on the opposite side to the motor rating plate.

Other characteristics of the KFB brake

- High IP65 degree of protection
- Corrosion-resistant in seawater and in the tropics.
- The brake is a dynamic brake, not simply a holding brake. For this reason there is less wear, especially in the case of emergency stops (commissioning).
- High wear reserves – repeated stepless air gap readjustment is possible. This results in extremely long operating times and low service and operating costs.
- The function and wear can be monitored with microswitches and proximity switches. Microswitch On/Off is standard for LG motors. Anti-condensation heating is possible as an option.
- Fully functional brake for enclosure acceptance test. Visual inspection of brake is possible during operation.
- The brake (air gap) can be adjusted in the factory, for example, and mounted on the motor without further adjustments.

The wear parts can be replaced without great outlay. After the housing has been opened (three screws), it is easy to replace the friction plate. It is not necessary to disassemble the entire brake.

Overview of brake selection for 1LG motors

		For motor Frame size					
		180 ¹⁾	200 ¹⁾	225 ²⁾	250 ²⁾	280 ²⁾	315 ²⁾
Number of poles		2 to 8	2 to 8	2 to 8	2 to 8	4 to 8	4 to 8
NDE bearing		6310C3	6312C3	6313C3	6215C3	6317C3	6319C3
Flange bearing plate for NDE brake mounting		A300	A350	A350	A400	A450	A550
Max. diameter for 2nd. shaft extension		48k6	55m6	55m6	48m6	65m6	70m6
Brake type		KFB 25	KFB 40	KFB 40	KFB 63	KFB 100	KFB 160
Braking torque	Nm	250	400	400	630	1000	1600
n_{max} – IM B3	rpm	6000	5500	5500	4700	4000	3600
n_{max} – IM V1	rpm	6000	5500	5500	4700	4000	3600
Output at 110 V DC	W	158	196	196	220	307	344
Current at 230 V AC (207 V coil voltage)	A	0.77	0.91	0.91	1	1.53	1.64
Current at 400 V AC (180 V coil voltage)	A	0.8	1.18	1.18	1.25	1.8	2.1
Current at 110 V DC	A	1.44	1.78	1.78	2	2.79	3.13
Current at 24 V DC	A	5.21	6.92	9.62	8.17	12.2	12.8
Application time t_2	ms	70	80	80	110	125	180
Release time	ms	240	250	250	340	370	500
Brake moment of inertia	Kg m ²	0.0048	0.0068	0.0068	0.0175	0.036	0.050
Lifetime of brake lining L	Nm · 10 ⁶	3600	3110	3110	4615	7375	10945
Air gap adjustment required after braking energy L_N	Nm · 10 ⁶	810	935	935	1185	2330	3485

¹⁾ The standard brake for frame sizes 180 and 200 is the 2LM8 brake. KFB brake on request.

²⁾ The standard brake for frame sizes 225 to 315 is the KFB brake.

General technical data

Configuration of motors with brakes

Braking time

The time it takes the motor to come to a standstill comprises two components:

- The application time of the brake t_2
- The braking time t_{Br}

$$t_{Br} = \frac{J \cdot n_{rated}}{9.55 \cdot (T_B \pm T_L)}$$

t_{Br} Braking time in s

J Total moment of inertia in kgm^2

n_{Rated} Rated speed of the motor with brake in rpm

T_B Rated braking torque in Nm

T_L Average load torque in Nm (if T_L supports braking, T_L is positive)

Braking energy per braking operation Q_{max}

The braking energy per braking operation in Nm comprises the energy of the moments of inertia to be braked Q_{Kin} and the energy Q_L , which must be applied in order to brake against a load torque.

$$Q_{max} = Q_{Kin} + Q_L$$

- The energy of the moments of inertia in Nm

$$Q_{Kin} = \frac{J \cdot n_{rated}^2}{182.4}$$

n_{Rated} Rated speed before braking in rpm

J Total moment of inertia in kgm^2

- The braking energy in Nm against a load torque:

$$Q_L = \frac{\pm T_L \cdot n_{rated} \cdot t_{Br}}{19.1}$$

T_L average load torque in Nm

T_L is positive if it acts against the brake

T_L is negative if it supports the brake

Run-on revolutions U

The number of run-on revolutions U of the motor with brake can be calculated as follows:

$$U = \frac{n_{rated}}{60} \left(t_2 + \frac{t_{Br}}{2} \right)$$

t_2 Brake application time in ms

Lifetime of the brake lining L and readjustment of the air gap

The brake lining wears due to friction which increases the air gap and the release time for the brake at standard excitation.

When the brake lining is worn out, it can be replaced easily.

In order to calculate the lifetime of the brake lining in terms of operations S_{max} , then the lifetime of the brake lining L in Nm must be divided by the braking energy Q_{max} :

$$S_{max} = \frac{L}{Q_{adm}}$$

The interval between adjustments N in can be calculated in terms of operations by dividing the braking energy L_N which the brake can output until it is necessary to readjust the working air gap by Q_{max} :

$$N = \frac{L_{rated}}{Q_{adm}}$$

IEC Squirrel-Cage Motors

Introduction

General technical data

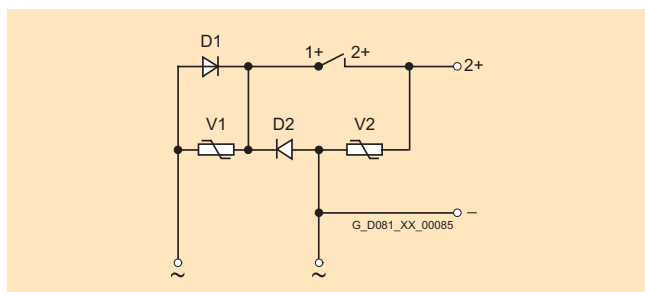
Additional versions

Depending on the selected motor, brake types 2LM8 or KFB are used.

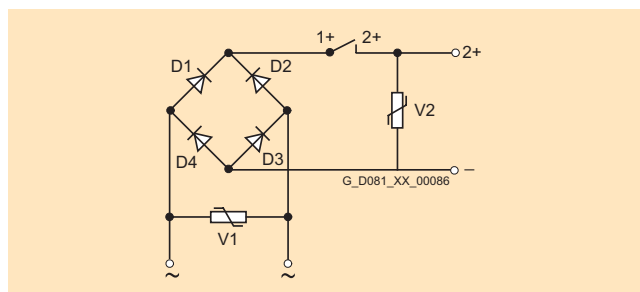
2LM8 spring-operated disk brake	KFB spring-operated brake
Motor series This brake is mounted on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in the frame sizes 180 to 200 as standard.	This brake is the standard brake for 1LG motors in frame sizes 225 to 315.
Voltage and frequency The solenoids and the rectifiers of the brakes are designed for connection to the following voltages: 1 AC 50 Hz 230 V $\pm 10\%$ or 1 AC 60 Hz 230 V $\pm 10\%$ When 60 Hz is used, the voltage for the brake must not be increased! The brake can also be supplied for other voltages: • Brake supply voltage: 24 V DC Order code C00 • Brake supply voltage: 400 V AC (directly at the terminal strip) Order code C01 • Brake supply voltage: 180 V DC, for operation on MM411 ECOFAST (directly at the terminal strip) Order code C02 Order codes C00 , C01 and C02 may only be used in conjunction with order code G26 .	The solenoids and the rectifiers of the brakes are designed for connection to the following voltages: 1 AC 50 Hz 230 V $\pm 10\%$ When 60 Hz is used, the voltage for the brake must not be increased! The brake can also be supplied for other voltages: • Brake supply voltage: 24 V DC Order code C00 • Brake supply voltage: 400 V AC (directly at the terminal strip) Order code C01 The codes C00 and C01 may only be used in conjunction with Code G26 .
Connections Labeled terminals are provided in the main connection box of the motor to connect the brake. The AC voltage for the brake excitation winding is connected to the two free terminals of the rectifier block (~). The brake can be released when the motor is at a standstill by separately exciting the solenoid. In this case, an AC voltage must be connected at the rectifier block terminals. The brake remains released as long as this voltage is present. The rectifier is protected against overvoltages by varistors in the input and output circuits. For 24 V DC brakes, the brake terminals are directly connected to the DC voltage source. See the circuit diagrams below.	The motors are equipped with an additional connection box on the side of the main connection box that is used specifically for connection of the brake. KFB brakes are connected through a standard bridge or half-wave rectifier. See the circuit diagrams below. A special circuit is not required. Optimal switching times are achieved without the need to use special circuits.
Fast brake application If the brake is disconnected from the line supply, the brake is applied. The application time for the brake disk is delayed as a result of the inductance of the solenoid (shutdown on the AC side). This results in a considerable delay before the brake is mechanically applied. In order to achieve short brake application times, the circuit must be interrupted on the DC side. To realize this, the wire jumpers, located between contacts 1+ and 2+ at the rectifier are removed and replaced by the contact of an external switch (see circuit diagrams below). For 1LG motors with a 2LM8 brake, "Fast application of the brake" is not possible in the standard version. Please contact your local Siemens office for advice.	Not available for the KFB brake.
Manual brake release with lever The brakes can be supplied with a mechanical manual release with lever. Order code K82 . The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.	The brake can be released manually with screws as standard. Mechanical manual release with a lever can be ordered with Order code K82 . The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.

Bridge rectifier / half-wave rectifier

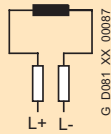
Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 or KFB brake. See the circuit diagrams below.



Half-wave rectifier 400 V AC



Bridge rectifier, 230 V AC



Brake connection for 24 V DC

Combinations of basic versions

The following combinations of modular technology can be supplied by the factory when ordered using the predefined order codes:

Mounting of brake and 1XP8 001 rotary pulse encoder

The brake (order code G26) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H62**.

The brake (order code G26) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H98**.

Mounting of separately driven fan and 1XP8 001 rotary pulse encoder

The separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H61**.

The separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H97**.

Mounting of brake and separately-driven fan

The brake (order code G26) and separately driven fan (order code G17) can be supplied already mounted in combination.

Order code **H63**.

Mounting of brake, separately driven fan and 1XP8 001 rotary pulse encoder

The brake (order code G26), the separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-1 HTL (order code H57) can be supplied already mounted in combination.

Order code **H64**.

The brake (order code G26), the separately driven fan (order code G17) and the rotary pulse encoder 1XP8 001-2 TTL (order code H58) can be supplied already mounted in combination.

Order code **H99**.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

IEC Squirrel-Cage Motors

Introduction

General technical data

Special technology

Prepared for mounting MICROMASTER Integrated (MMI)

Converter mounting is possible for motor series 1LA7 frame sizes 56 to 132 for 230 VΔ/400 VY if the MICROMASTER DA 51.3 type is specified. Not possible for motors with special insulation for 690 V.

Order code **H15**

Brake (specially for 1LA8 motor series)

For motor series 1LA8, a solenoid double-disk spring-operated brake of type NFA (from Stromag) can be supplied at the drive end (DE). The brake can only be used as a holding brake. See the table below for values for the holding brake torque.

Order code **H47**

For motors	Brake size	Holding brake torque T_H Nm
	NFA	
1LA8 31	160/250	2500
1LA8 35	160/250	2500
	250/400	4000
1LA8 40	250/400	4000
	400/630	6300
1LA8 45	400/630	6300
	630/1000	10000

When a brake is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

The brake is generally procured and mounted by the factory.

Further information is available on request.

The "Special technology" comprises rotary pulse encoders for frame sizes 100 L to 450 of 1LA5, 1LA6, 1LA7, 1LA8 and 1LG4/6 motors. Please enquire about the specified rotary pulse encoders for 1LA9 motors.

The order codes listed under "Special technology" cannot be combined in the case of 1LA motors with order codes from the modular technology range.

For 1LG motors, order codes **G17** (mounting of separately driven fan), **G26** (mounting of brake) and **H63** (mounting of brake and separately driven fan) from the modular technology range can be combined with the "Special technology" rotary pulse encoders.

When a rotary pulse encoder is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see "Modular technology", "Dimensions and weights".

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of plastic, with the exception of 1LG motors. A protective cover made of non-corrosive sheet steel is available for 1LA5, 1LA6 and 1LA7 motors, see "Mechanical protection for encoders".

Order code **M68**

LL 861 900 220 rotary pulse encoder



With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration and has insulated bearings.

The LL 861 900 220 rotary pulse encoder can be supplied already mounted.

Order code **H70**.

The LL 861 900 220 rotary pulse encoder can be provided by the customer and mounted by Siemens.

Order code **H71**.

The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, order code **H78** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied. For motors in Zone 2 (EEx n), a special rotary pulse encoder can be supplied (please enquire).

The version of the rotary pulse encoder with a diagnostics system (ADS) can be supplied by Leine and Linde.

Manufacturer:

Leine and Linde (Germany) GmbH

73430 Aalen

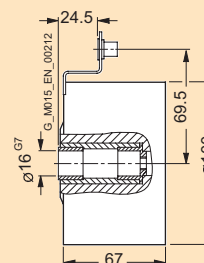
Bahnhofstraße 36

Tel. +49 (0)73 61-78093-0

Fax +49 (0)73 61-78093-11

<http://www.leinelinde.de>

e-mail: info@leinelinde.de



Mounting dimensions of LL 861 900 220 rotary pulse encoder

Technical data for LL 861 900 220 (HTL version)

Supply voltage	$U_B + 9 \text{ V to } +30 \text{ V}$
Current input without load	max. 80 mA
Maximum load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0'
Pulse offset between the two outputs	$90^\circ \pm 25^\circ \text{ el.}$
Output amplitude	$U_{\text{high}} > 20 \text{ V}$ $U_{\text{low}} < 2.5 \text{ V}$
Mark space ratio	1:1 $\pm 10\%$
Edge steepness	50 V/μs (without load)
Maximum frequency	100 kHz for 350 m cable
Maximum speed	4000 rpm
Temperature range	-20 to +80 °C
Degree of protection	IP65
Maximum radial cantilever force	300 N
Maximum axial force	100 N
Termination system	Terminal strips in encoder, cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

Mounting a special type of rotary pulse encoder

For motor series 1LA8, 1PQ8 and 1LL8, if the encoder designation is specified in the order, a special type of rotary pulse encoder can be supplied already mounted, provided the technical executability is given. In this case, the encoder is procured by the factory. When ordering, specify the rotary pulse encoder in plain text.

Order code **Y70**.

General technical data

HOG9 D 1024 I rotary pulse encoder



The encoder is fitted with insulated bearings.

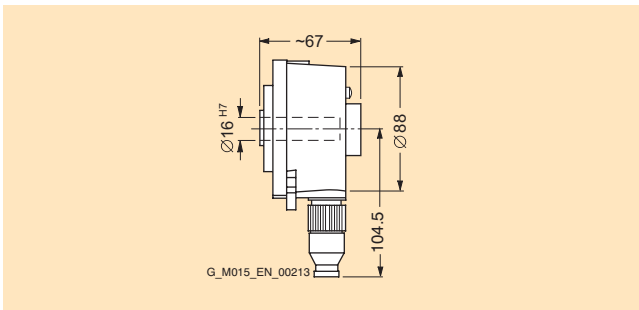
The HOG9 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **H72**.

The HOG9 D 1024 I rotary pulse encoder can be provided by the customer and mounted by Siemens.
Order code **H74**.

The HOG9 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, order code **H79** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied.

Manufacturer:
Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

<http://www.huebner-berlin.de>
e-mail: info@huebner-berlin.de



HOG9 D 1024 I rotary pulse encoder

Technical data for HOG9 D 1024 I rotary pulse encoder

Supply voltage U_B	+9 V to +30 V
Current input without load	50 to 100 mA
Maximum load current per output	60 mA, 300 mA (peak)
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	90° ±20%
Output amplitude	$U_{High} \geq U_B - 3.5 V$ $U_{Low} \leq 1.5 V$
Mark space ratio	1:1 ±20%
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to +100 °C
Degree of protection	IP56
Maximum radial cantilever force	150 N
Maximum axial force	100 N
Termination system	Radial right-angle plug (mating connector is part of the scope of supply)
Mech. design acc. to Hübner Ident. No.	73 522 B
Weight	Approx. 0.9 kg

IEC Squirrel-Cage Motors

Introduction

General technical data

HOG10 D 1024 I rotary pulse encoder



This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG10 D 1024 I rotary pulse encoder can be supplied already mounted.

Order code **H73**.

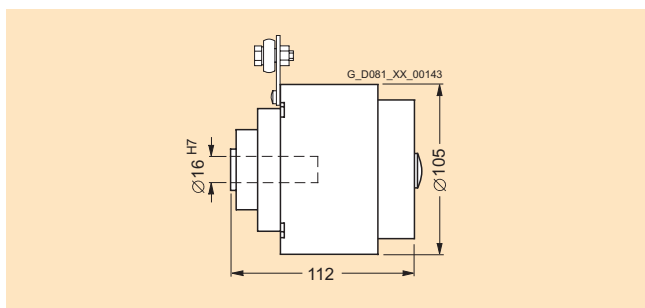
The HOG10 D 1024 I rotary pulse encoder can be provided by the customer and mounted by Siemens.

Order code **H75**.

The HOG10 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, order code **H80** must be specified. The rotary pulse encoder is not part of the scope of supply in this case. The mounting components required will be supplied.

Manufacturer:
Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

<http://www.huebner-berlin.de>
e-mail: info@huebner-berlin.de



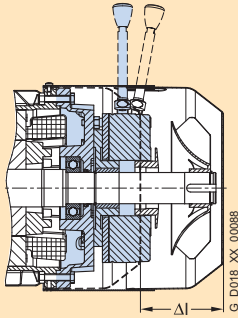
HOG10 D 1024 I rotary pulse encoder

Technical data for HOG10 D 1024 I (HTL version)

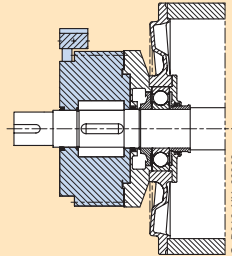
Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Maximum load current per output	60 mA, 300 mA (peak)
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	$90^\circ \pm 20\%$
Output amplitude	$U_{High} \geq U_B - 3.5 V$ $U_{Low} \leq 1.5 V$
Mark space ratio	1:1 $\pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to +100 °C
Degree of protection	IP66
Maximum radial cantilever force	150 N
Maximum axial force	80 N
Termination system	Terminals, cable connection
Mech. design acc. to Hübner Ident. No.	74 055 B
Weight	Approx. 1.6 kg

Dimensions and weight

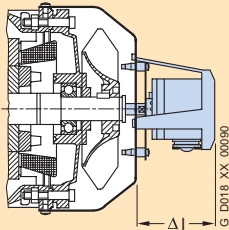
- 1** Brake
Order code **G26**
[optionally with manual release, order code **K82**]



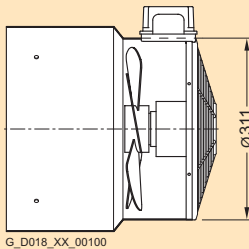
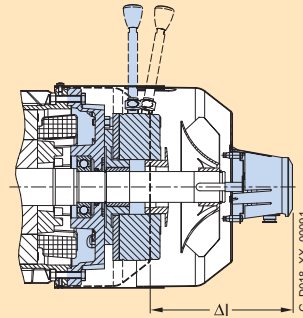
- 2** Brake for 1LA8 motor series at drive end (DE)
Order code **H47**



- 3** Rotary pulse encoders (on cowl)
Order codes **H57, H58, H70, (H71), H72, H73, (H74), (H75), (H78), (H79), (H80)**



- 4** Brake and rotary pulse encoder (on cowl) 1XP8 001
Order codes **H62, H98**
[optionally with manual release, order code **K82**]



For motor series 1LA5 frame sizes 180 to 225 with separately driven fan, the fan attachment becomes narrower on the non-drive end (NDE) of the motor housing.

IEC Squirrel-Cage Motors

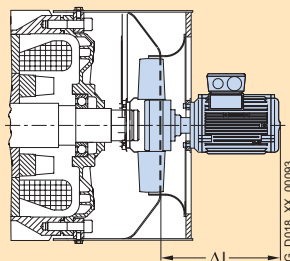
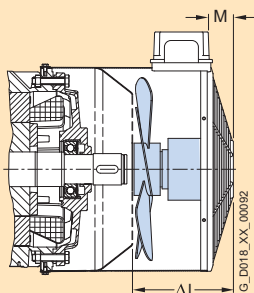
Introduction

General technical data

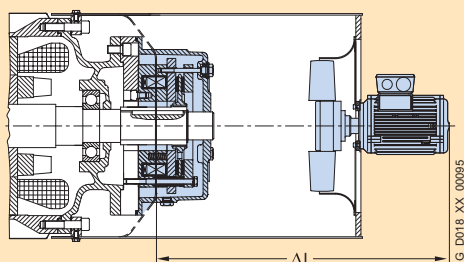
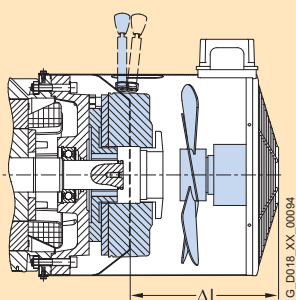
1LA frame sizes 100 to 225,
1LG frame sizes 180 and 200

1LG frame size 225 and above

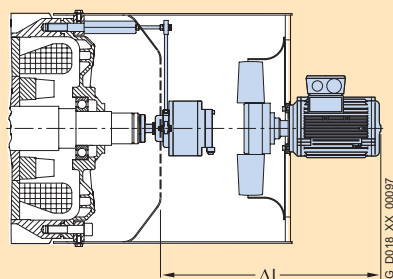
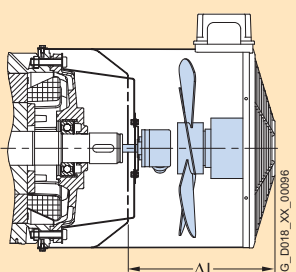
- 5 Separately driven fan
Order code **G17**



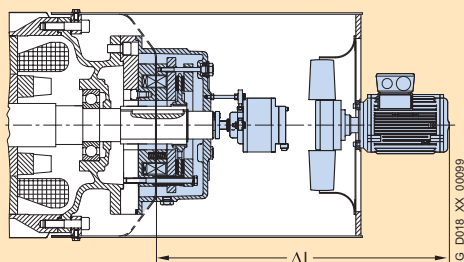
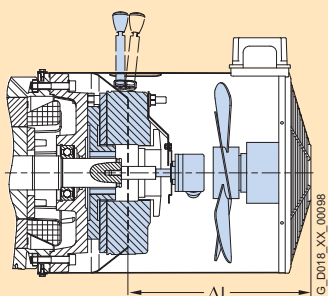
- 6 Brake and separately driven fan
Order code **H63**
[optionally with manual release **K82**]



- 7 Rotary pulse encoder (under cowl) 1XP8 001 and separately driven fan
Order codes **H61, H97**



- 8 Brake, rotary pulse encoder (under cowl) 1XP8 001 and separately driven fan
Order codes **H64, H99**
[optionally with manual release (**K82**)]



General technical data

Relevant diagram												
Frame size	1 Brake Order code G26		2 Brake Order code H47		3 Pulse encoder 1XP8 001 Order code H57, H58		LL 861 900220 Order codes H70, H71		HOG9 D 1024 I Order codes H72, H74		HOG10 D 1024 I Order codes H73, H75	
	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg
1LA7, 1LA5												
63	51	1	–	–	–	–	–	–	–	–	–	–
71	51	1	–	–	–	–	–	–	–	–	–	–
80	54	2	–	–	–	–	–	–	–	–	–	–
90	75	4	–	–	–	–	–	–	–	–	–	–
100	78	6	–	–	78	0.3	91	1.3	89	0.9	134	1.6
112	87	8	–	–	78	0.3	91	1.3	89	0.9	134	1.6
132	106	12	–	–	78	0.3	91	1.3	89	0.9	134	1.6
160	129	26	–	–	78	0.3	91	1.3	89	0.9	134	1.6
180	137	27	–	–	78	0.3	91	1.3	89	0.9	134	1.6
200	142	41	–	–	78	0.3	91	1.3	89	0.9	134	1.6
225	142	41	–	–	78	0.3	91	1.3	89	0.9	134	1.6
1LA6												
100	–	–	–	–	78	0.3	91	1.3	89	0.9	–	–
112	–	–	–	–	78	0.3	91	1.3	89	0.9	–	–
132	–	–	–	–	78	0.3	91	1.3	89	0.9	–	–
160	–	–	–	–	78	0.3	91	1.3	89	0.9	–	–
1LG4, 1LG6												
180	125	22	–	–	63	0.3	86	1.3	72	0.9	116	1.6
200	137	32	–	–	63	0.3	86	1.3	72	0.9	116	1.6
225	239	63	–	–	63	0.3	86	1.3	72	0.9	116	1.6
250	225	83	–	–	63	0.3	86	1.3	72	0.9	116	1.6
280	227	118	–	–	63	0.3	86	1.3	72	0.9	116	1.6
315	265	255	–	–	63	0.3	86	1.3	72	0.9	116	1.6
1LA8, 1PQ8												
315	–	–	205	120	–	–	125	1.3	–	–	125	1.6
355	–	–	225	165	–	–	125	1.3	–	–	125	1.6
400	–	–	251	220	–	–	125	1.3	–	–	125	1.6
450	–	–	270	325	–	–	125	1.3	–	–	125	1.6
1LL8												
315	–	–	–	–	–	–	125	1.3	–	–	125	1.6
355	–	–	–	–	–	–	125	1.3	–	–	125	1.6
400	–	–	–	–	–	–	125	1.3	–	–	125	1.6
450	–	–	–	–	–	–	125	1.3	–	–	125	1.6

IEC Squirrel-Cage Motors

Introduction

General technical data

Frame size	Relevant diagram											
	4		5			6		7		8		Diameter of the fan cowl
	Brake and rotary pulse encoder (on cowl) 1XP8 001		Separately driven fan ¹⁾			Brake and separately driven fan ¹⁾		Rotary pulse encoder (under the cowl) 1XP8 001 and separately driven fan ¹⁾		Brake, rotary pulse encoder (under the cowl) 1XP8 001 and separately driven fan ¹⁾		
	Order codes H62, H98		Order code G17			Order code H63		Order codes H61, H97		Order codes H64, H99		
Δl	Weight, approx.	Δl	M	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.	Δl	Weight, approx.		
	mm	kg	mm	mm	kg	mm	kg	kg	kg	mm	kg	mm
1LA7, 1LA5												
63	–	–	–	–	–	–	–	–	–	–	–	–
71	–	–	–	–	–	–	–	–	–	–	–	–
80	–	–	–	–	–	–	–	–	–	–	–	–
90	–	–	–	–	–	–	–	–	–	–	–	–
100	156	6.3	141	30	4.0	141	10.0	226	4.3	226	10.3	202
112	165	8.3	158	30	4.5	158	12.5	226	4.8	226	12.8	227
132	184	12.3	177	40	5.5	177	17.5	247	5.8	247	17.8	226
160	207	26.3	227	40	7.0	227	33.0	289	7.3	289	33.3	320
180	215	27.3	269	40	10.0	269	37.0	269	10.3	269	37.3	311 (358)
200	220	41.3	272	40	11.0	272	52.0	272	11.3	272	52.3	311 (398)
225	220	41.3	272	40	11.0	272	52.0	272	11.3	272	52.3	311 (398)
1LA6												
100	–	–	141	30	4.0	–	–	226	4.3	–	–	202
112	–	–	158	30	4.5	–	–	226	4.8	–	–	227
132	–	–	177	40	5.5	–	–	247	5.8	–	–	226
160	–	–	227	40	7.0	–	–	289	7.3	–	–	320
1LG4, 1LG6												
180	203	22.3	269	40	10.0	269	32	269	10.3	269	32.3	356
200	215	32.3	272	40	11.0	272	43	272	11.3	272	43.3	396
225	317	63.3	235	0	22.0	576	85	425	22.3	576	85.3	439
250	303	83.3	235	0	25.0	578	108	425	25.3	578	108.3	489
280	305	118.3	235	0	28.0	550	146	425	28.3	550	146.3	539
315	343	255.3	247	0	36.0	577	291	437	36.3	577	291.3	604

The values in brackets () refer to the diameter of the motor flange because this is larger than the diameter of the fan cowl (see figure on Page 1/87).

¹⁾ For frame sizes 100 to 200 and for 1LA5 up to frame size 225, the dimensions of the connection box for the separately driven fan, length x width x height, are 95 mm x 105 mm x 54 mm. For motor series 1LG4/1LG6 (frame sizes 225 to 315), the dimensions of the connection box for the separately driven fan, length x width x height, are 75 mm x 75 mm x 38 mm.

Standard motors up to frame size 315 L

2



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2/10 Selection and ordering data

2/22 Self-ventilated energy-saving motors with high efficiency, aluminium series 1LA9

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2/34 Self-ventilated motors with increased output, aluminium series 1LA9

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2/38 Self-ventilated energy-saving motors with increased efficiency, cast-iron series 1LA6 and 1LG4

2/38 Selection and ordering data

2/46 Self-ventilated motors with increased output, cast-iron series 1LG4

2/46 Selection and ordering data

2/48 Self-ventilated energy-saving motors with high efficiency, cast-iron series 1LG6

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2/58 Self-cooled motors without external fan, aluminium series 1LP7 and 1LP5

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2/62 Self-cooled motors without external fan, cast-iron series 1LP4

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IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview



Standard motors from Siemens are characterised by their flexibility, ruggedness and energy efficiency. In general, all motors are suitable for converter-fed operation with line voltages of up to 500 V +10%. The motors are designed to fulfill the requirements of the European and International markets with an output range from 0.06 to 200 kW.

Standard motors for use worldwide.

IEC motors for the European and International market

The standard motors comply both electrically and mechanically with the applicable IEC/EN standards. For exporting to China, CCC certified motors (China Compulsory Certification) can be supplied.

IEC motors for the North American market

Motors are also available to the NEMA specification (National Electrical Manufacturers Association), with UL approval (Underwriters Laboratories Inc.) and CSA certification (Canadian Standard Association) for exporting to NAFTA states (USA, Canada and Mexico). The mechanical design of all motors is compliant only to IEC/EN, not to NEMA dimensions.

NEMA motors for the North American market

Low-voltage motors are manufactured to the NEMA standard for compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico). This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels. The NEMA motor series provide the highest operating reliability for maximum service life.

Further information regarding NEMA motors is available on the Internet:

<http://www.sea.siemens.com/motors>

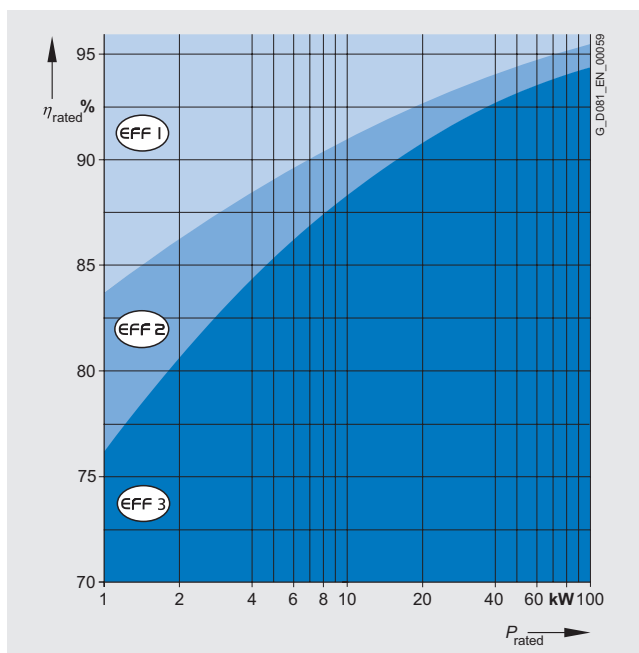
Classified energy-saving motors for an efficient energy balance

Depending on requirements, energy-saving motors are available for an efficient energy balance – for EU requirements in accordance with CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics) and for the North American market in accordance with EPACT (US Energy Policy Act).

Efficiency requirements according to CEMEP

CEMEP classifies efficiency levels for 2-pole and 4-pole motors with outputs of 1.1 to 90 kW. Three efficiency classes are defined:

- **EFF1** (High Efficiency motors – referred to below as “Motors with high efficiency”)
- **EFF2** (Improved Efficiency motors – referred to below as “Motors with improved efficiency”)
- **EFF3** (Conventional Efficiency motors)



At a glance: EU/CEMEP for Europe

- Status
Voluntary compliance with efficiency classification
- Covers
2-pole, 4-pole 50 Hz squirrel-cage motors from 1.1 to 90 kW (at 400 V and 50 Hz)
- Required marking
Efficiency class on the motor rating plate
 η_N , $\eta_{3/4}$ load and efficiency class in the documentation

Overview (continued)

Efficiency requirements according to EPACT

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT).

An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all three-phase low-voltage motors imported into the USA or Canada must comply with the legal efficiency requirements. The law demands minimum efficiency levels for motors with a voltage of 230 and 460 V at 60 Hz, in the output range of 1 to 200 HP (0.75 to 160 kW) with 2, 4 and 6 poles. Explosion-proof motors must also be included.

The EPACT efficiency requirements exclude, for example:

- Motors whose frame size output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

EPACT lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law:

- Nominal efficiency
- Design letter
- Code letter
- CONT
- CC No. CC 032A (Siemens) and NEMA MG1-12.

At a glance: EPACT/CSA for North America

- Status
Minimum efficiencies required by law
- Covers
2-, 4- and 6-pole 60 Hz squirrel-cage motors from 1 to 200 HP (0.75 to 150 kW) for 230 V and/or 460 V 60 Hz
- Required marking
Efficiency η_N on the motor rating plate

Energy-saving motors from Siemens according to CEMEP or EPACT

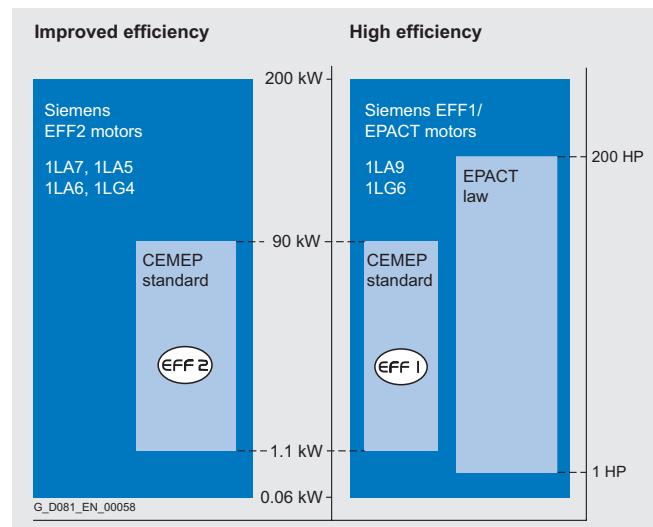
The product range of standard motors exclusively comprises motors in the EU efficiency classes EFF1 "High Efficiency" or EFF2 "Improved Efficiency". The active parts of the motor have been optimized so that the requirements of the CEMEP efficiency classes EFF1 and EFF2 are fulfilled. The procedure for determining the efficiency is based on the summation of losses in accordance with IEC 60034-2. With these energy-saving motors a significant reduction in energy costs can be achieved as compared to conventional motors according to EFF3.

EPACT motors from Siemens are available CC certified, marked with the number CC032A on the rating plate and optionally also according to UL with the recognition mark. Siemens offers motors with the CSA Energy Efficiency Verification Mark specially for the Canadian market.

At a glance: Energy-saving motors from Siemens according to CEMEP EFF1/EFF2, EPACT and CSA

SIEMENS 3-Mot. 1LA9166-2KA60-Z	
D-91056 Erlangen	E0107/471101 01 002 IEC/EN 60034
120 kg IM B3 160L IP55 Th.CI.F AMB 40°C	EFF1 (H)
50 Hz 400/690 V Δ/Y	60 Hz 460 V Δ
18.5 kW 31.5/18.2 A	18.5 kW 28 A
cos φ 0.92 2940/min	PF 0.92 3550RPM
380-420/660-725 V Δ/Y	NEMA NOM.EFF 91.0% 25.0HP
34.0-30.5/19.6-17.6 A	DESIGN A CODE J CC 032 A
	MG1-12 SF1.15 CONT

SIEMENS 3-Mot. 1LG6 186-4AA60-Z	
D-91056 Erlangen UC 0202 /012415501	EFF1 (H)
180 kg IM B3 180L	IP55 Th.CI.F AMB 40 °C
50 Hz 400/690 V Δ/Y	60 HZ 460 V Δ
22 kW 40.5/24 A	22 KW 36.5 A
cos φ 0.84 1470/min	PF 0.83 1775RPM
380-420/660-725 V Δ/Y	NEMA NOM.EFF 92.4% 30.0HP
42.5-40.5/24.5-23.5 A	DESIGN A CODE K CC 032 A
IEC/EN 60034	MG1-12 SF1.15 CONT



IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview (continued)

Standard motors with increased output and compact construction

Standard motors with increased output and compact construction can be used to advantage in confined spaces. For a slightly longer overall length, the output is at least as high as that of the next largest shaft height. These compact motors are also optimised for efficiency and therefore reduce the operating costs.

Standard motors with reduced output without external fan

Self-cooled motors with surface cooling without external fan are suitable for the following operating conditions:

- Types of duty with adequate cooling times (e.g. temporary duty for positioning drives)
- Environmental conditions that demand compact installation space (e.g. in motors with a stopping function)
- Conditions under which an external fan has an adverse effect (e.g. simple cleaning in the food industry, textile industry)

Standard motors that can be supplied from stock with an extremely short delivery time

The most commonly used basic versions of standard motor series 1LA7, 1LA5 and 1LG4 can be supplied from stock – some of these are already marked with “CCC” (China Compulsory Certification) for export to China. Apart from these, a so-called “Sector version” is available for some of the motors available from stock. These include a located bearing at the drive end (DE), PTC thermistor and screwed on feet for the IM B35 type of construction.

The normal delivery time for motors from stock is 1 to 2 days from the time of clarification of the order at the factory until delivery from the factory. To determine the time of arrival at the customer site, the appropriate shipping time must be added.

Advantages

Standard motors from Siemens offer the user numerous advantages:

- The motors are approved and certified for worldwide use and meet high quality standards (confirmed, for example, by CSA ¹⁾, UL ²⁾, EXAM ³⁾, PTB ⁴⁾, CQC ⁵⁾)
- The ruggedness and lack of complexity of the components guarantee an extremely long service life
- Complete product spectrum for energy-saving motors according to EU/CEMEP and EPACT
- Extremely easy selection of energy-saving motors due to the efficiency classification (EFF1/EFF2)
- Energy-saving motors in motor series 1LA9 and 1LG6 meet both the EFF1 and EPACT efficiency levels.
- Reduction in operating costs thanks to a high degree of efficiency with EFF1
- Higher motor service life thanks to lower winding temperature in EFF1 and EPACT motors with rated load and supply
- Reduced environmental impact due to CO₂ reduction
- High overload reserves under continuous duty (SF 1.15 for motor series 1LA9/1LG6)
- Suitable for universal applications worldwide
- Standard motors with increased output and extremely compact construction
- Short delivery times for motors from stock
- The module mounting concept supports rapid modification by the customer
- A fast and comprehensive service is provided by factories and modification partners distributed throughout the world

Field of application

The numerous available options enable standard motors from Siemens to be used in every area of industry and every sector. They are suitable both for special environmental conditions such as those that predominate in the chemical or petrochemical industry as well as for most climatic requirements such as those of offshore applications. Their large range of line voltages enables them to be used all over the world.

The wide field of implementation includes the following applications:

- Pumps
- Fans
- Compressors
- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

¹⁾ Canadian Standard Association

²⁾ Underwriters Laboratories Inc.

³⁾ EXAM BBG Prüf und Zertifizier GmbH
(previously BVS = Bergbau Versuchsstrecke)

⁴⁾ Physikalisch-Technische Bundesanstalt

⁵⁾ China Quality Certification

Integration

MICROMASTER 411/ COMBIMASTER 411 distributed drive solutions

The MICROMASTER 411/COMBIMASTER 411 series is included in Catalogue DA 51.3 which contains the complete product spectrum with ordering data, technical details and explanations.

Application

MICROMASTER 411 and COMBIMASTER 411 are the ideal solution for distributed drive applications that require a high degree of protection. The devices are designed for a wide drive range – for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems. The ECOFAST versions of the MICROMASTER 411/COMBIMASTER 411 frequency converter series contain plug-in cables for the power supply, communications interface and motor connections. They support fast and problem-free replacement in time-critical applications and are completely compatible with the ECOFAST technology systems. They are based on the universal MICROMASTER 420 converter series and are characterised by customer-oriented performance and ease of use.

Structure

The modular structure allows MICROMASTER 411/COMBIMASTER 411 products and their accessories to be individually selected, e.g. electromechanical brake control module or PROFIBUS module.

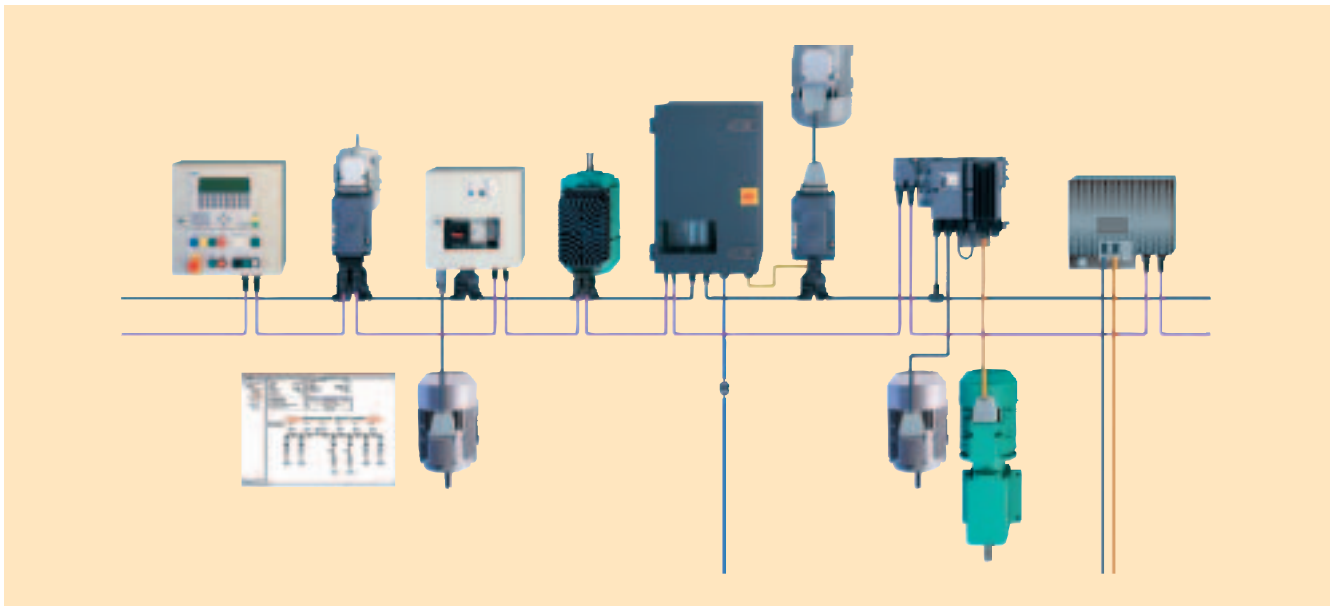
Main features:

- Output range: 0.37 to 3.0 kW, 400 V, 3AC
- IP66 degree of protection (MICROMASTER 411), self-cooling
- Electrical isolation between the electronics and the connection terminals
- Parameter sets for fast startup and cost savings
- Modular structure with numerous accessories
- Operation without operator panel possible (using jumpers and/or control potentiometer)
- Integrated control potentiometer accessible from outside.

Accessories (overview):

- Basic Operator Panel (BOP) for parameterising the converter
- Plain text Advanced Operator Panel (AOP) for MICROMASTER 411 and COMBIMASTER 411 with multiple-language display
- PROFIBUS module
- AS-Interface module
- DeviceNet module
- REM module (dynamic brake and control module for electro-mechanical brake)
- EM module (electromechanical brake control module)
- PC connection kit
- Mounting kits for installing the operator panels
- PC startup programs

ECOFAST system



ECOFAST is a system which permits extensive decentralisation and a modular structure for installation elements on the component level.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

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Integration (continued)

Advantages

The main advantages of the ECOFAST motor connector over a terminal strip are as follows:

- Fast assembly of I/O devices (e.g. motor starters) from the ECOFAST system
- Reduction of assembly and repair times at the end user
- No wiring errors due to connector technology
- Replacement of motor without intervention in the electronics

Main features of the ECOFAST motor connector (with separate MICROMASTER 411 frequency converter)

The motor connector is mounted in the factory and replaces the connection box with terminal board. The connector is mounted towards the non-drive end (NDE). It comprises an angled motor connection casing that can be rotated by $4 \times 90^\circ$. A 10-pole (+ earth) male insert is used in the housing. In the plug-in connector, the winding connections are connected and optionally the power supply for the brake and the signal leads for the temperature sensors.

The ECOFAST motor connector is compatible with the products of the ECOFAST field device system. Further information can be found in Catalogue IK PI.

The mounting dimensions of this casing match those of standard industrial connectors, so it is possible to use a complete series of different standard inserts (such as Han E, ES, ESS from Harting). The motor circuit (star or delta connection) is selected in the mating connector for motor connection. The relevant jumpers are inserted by the customer in the mating connector. As a casing for the mating connector, all standard sleeve casings with lengthwise locking, frame size 10B (e.g. from Harting) can be used.

Only one sensor (temperature sensor or PTC thermistor) can be connected.

Maximum permissible line voltage on motor connector: ≤ 500 V

Availability of the ECOFAST motor connector

The ECOFAST motor connector can be supplied for the following motor versions with the exception of the explosion-proof motors:

- Frame sizes 56 M to 132 M
- Output range 0.06 to 5.5 kW (7.5 kW on request)
- Direct on-line starting: Voltage code 1 for 230 V Δ /400 VY, 50 Hz
- Star-delta starting: Voltage code **9** with order code **L1U** 400 V Δ , 50 Hz

Further information

Further information is available in the catalogues IK PI and DA 51.3 "MICROMASTER 411/COMBIMASTER 411 distributed drive solutions" as well as on the Internet at:

<http://www.siemens.com/ecofast>

Technical specifications

The following table lists the most important technical specifications. For further information and details, see the "Introduction" section of the catalogue.

Technical specifications at a glance

Type of motor	IEC squirrel-cage motor
Connection types	Star connection/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8, pole-changing for constant load torque (pole-changing for fans, see the section "Fan motors")
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated output	0.06 ... 200 kW
Rated torque	0.25 ... 1700 Nm
Insulation of the stator winding to EN 60034-1 (IEC 60034-1)	Temperature class F, used acc. to temperature class B DURIGNIT IR 2000 insulation system
Degree of protection according to EN 60034-5 (IEC 60034-5)	IP55 as standard
Cooling according to EN 60034-6 (IEC 60034-6)	Self-cooled (motor series 1LA, 1LG) Frame sizes 63 to 315 (IC 411), Frame size 56 (IC 410) Self-cooled (motor series 1LP) Frame sizes 63 to 315 (IC 410)
Maximum ambient temperature and site altitude	-20 °C ... +40 °C as standard, site altitude 1000 mm above sea level. See "Ambient temperature and site altitude" in the section "Introduction".
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 230 V, 400 V, 500 V, 690 V The voltage used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7):	Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover With flange: IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 With standard flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34 With special flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Paint finish Suitability of paint finish for climate group according to IEC 60721, Part 2-1	Standard: Color RAL 7030 stone gray Climate group "worldwide" with special finish Climate group "moderate" with standard finish See "Paint finish" in the "Introduction" section.
Vibration severity level according to EN 60034-14 (IEC 60034-14)	Level N (normal) See "Balance and vibration severity" in the "Introduction" section.
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing See "Balance and vibration severity" in the "Introduction" section.
Sound pressure level to DIN EN ISO 1680 (tolerance +3dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Mechanical limit speeds	The limit speed for the required motor can be found on Page 5/6.
Packaging weights and dimensions	See "Packing weights and packing dimensions" in the "Introduction" section.
Rating plates	Fixed to the motor See "Rating plate" in the "Introduction" section.
Connection and connection boxes	See "Connection, circuit and connection boxes" in the "Introduction" section.
Bearing design	See "Bearings" in the "Introduction" section.
Cantilever forces	See "Maximum cantilever forces" in the "Introduction" section.
Options	See the selection and ordering data for "Special versions"

General note

All the data listed in the catalogue is applicable for a 50 Hz line supply. With converter-fed operation, the reduction factors for constant torque and drives for fans, pumps and compressors must be observed. Noise values for motors operating with a converter at frequencies other than 50 Hz are available on request.

Mechanical limit speeds

When the motor is operated at its rated frequency, it is important to note that the maximum speeds are limited by the limits for the roller bearings, critical rotor speed and rigidity of the rotating parts.

Ventilation/noise generation (converter-fed operation)

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors. To increase motor utilisation at low speeds it is recommended that forced-air cooled motors are used.

Mechanical stress and grease lifetime (converter-fed operation)

High speeds that exceed the rated speed and the resulting increased vibrations alter the mechanical running smoothness and the bearings are subjected to increased mechanical stress. This reduces the grease lifetime and the bearing lifetime. More detailed information on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated energy-saving motors with increased efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1LA7 and 1LA5 (motors with external fan)						
3000, 2-pole	56 M ... 225 M	0.09 ... 45	2830 ... 2960	0.30 ... 145	0.26 ... 78	2/10 ... 2/11
1500, 4-pole	56 M ... 225 M	0.06 ... 45	1350 ... 1470	0.42 ... 292	0.2 ... 80	2/12 ... 2/13
1000, 6-pole	63 M ... 225 M	0.09 ... 30	850 ... 978	1 ... 293	0.44 ... 61	2/14 ... 2/15
750, 8-pole	71 M ... 225 M	0.09 ... 22	630 ... 724	1.4 ... 290	0.36 ... 44.5	2/16 ... 2/17
1500/3000, 4/2-pole	63 M ... 200 L	0.1 ... 26	1330 ... 1465	0.72 ... 169	0.41 ... 48.5	2/18 ... 2/19
750/1500, 8/4-pole	90 S ... 200 L	0.35 ... 17	675 ... 730	5.1 ... 223	1.19 ... 40.5	2/20 ... 2/21
Cast-iron series 1LA6 and 1LG4 (motors with external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 200	2890 ... 2982	9.9 ... 641	6.1 ... 325	2/38 ... 2/39
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1420 ... 1496	15 ... 1285	4.7 ... 340	2/40 ... 2/41
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 988	15 ... 1547	3.9 ... 285	2/42 ... 2/43
750, 8-pole	100 L ... 315 L	0.75 ... 132	679 ... 738	11 ... 1708	2.15 ... 245	2/44 ... 2/45

Self-ventilated energy-saving motors with high efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW/HP	rpm	Nm	A	Page
Aluminium series 1LA9 (motors with external fan)						
For implementation according to CEMEP						
3000, 2-pole	56 M ... 200 L	0.09 ... 37	2830 ... 2950	0.3 ... 120	0.24 ... 64	2/22 ... 2/23
1500, 4-pole	56 M ... 200 L	0.06 ... 30	1380 ... 1465	0.42 ... 196	0.22 ... 53	2/24 ... 2/25
1000, 6-pole	90 S ... 200 L	0.75 ... 22	925 ... 975	7.7 ... 215	2 ... 45	2/26 ... 2/27
For implementation in the North American market according to EPACT						
3600, 2-pole	56 M ... 200 L	0.12 ... 50	3440 ... 3555	0.25 ... 100	0.23 ... 57	2/28 ... 2/29
1800, 4-pole	56 M ... 200 L	0.08 ... 40	1715 ... 1770	0.33 ... 161	0.18 ... 47	2/30 ... 2/31
1200, 6-pole	90 S ... 200 L	1 ... 30	1140 ... 1175	6.2 ... 182	1.78 ... 40	2/32 ... 2/33
Cast-iron series 1LG6 (motors with external fan)						
For implementation according to CEMEP						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	38.5 ... 320	2/48 ... 2/49
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	34.5 ... 340	2/48 ... 2/49
1000, 6-pole	180 M ... 315 L	15 ... 160	975 ... 990	147 ... 1543	29.5 ... 280	2/50 ... 2/51
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 740	145 ... 1704	23.5 ... 240	2/50 ... 2/51
For implementation in the North American market according to EPACT						
3600, 2-pole	180 M ... 315 L	30 ... 300	3560 ... 3591	60 ... 595	34 ... 320	2/52 ... 2/53
1800, 4-pole	180 M ... 315 L	25 ... 300	1775 ... 1792	100 ... 1193	31 ... 335	2/54 ... 2/55
1200, 6-pole	180 M ... 315 L	20 ... 200	1178 ... 1192	121 ... 1195	25.5 ... 235	2/56 ... 2/57

Self-ventilated motors with increased output

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1LA9 (motors with external fan)						
3000, 2-pole	56 M ... 200 L	0.2 ... 53	2830 ... 2944	0.67 ... 172	0.51 ... 95	2/34 ... 2/35
1500, 4-pole	56 M ... 200 L	0.14 ... 43	1384 ... 1465	0.97 ... 280	0.44 ... 80	2/36 ... 2/37
Cast-iron series 1LG4 (motors with external fan)						
3000, 2-pole	180 M ... 280 M	30 ... 110	2950 ... 2975	97 ... 353	54 ... 184	2/46 ... 2/47
1500, 4-pole	180 L ... 280 M	30 ... 110	1465 ... 1488	196 ... 706	59 ... 198	2/46 ... 2/47
1000, 6-pole	180 L ... 280 M	18.5 ... 75	970 ... 985	182 ... 727	37.5 ... 136	2/46 ... 2/47
750, 8-pole	180 L ... 280 M	15 ... 55	720 ... 735	199 ... 715	34 ... 106	2/46 ... 2/47

Selection and ordering data (continued)

Self-cooled motors without external fan

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1LP7 and 1LP5 (motors without external fan)						
3000, 2-pole	63 M ... 200 L	0.12 ... 16.5	The electrical data can be calculated and supplied on receipt of order.			2/58
1500, 4-pole	63 M ... 200 L	0.07 ... 12				2/59
1000, 6-pole	63 M ... 200 L	0.045 ... 8.5				2/60
750, 8-pole	63 M ... 200 L	0.045 ... 7.5				2/61
Cast-iron series 1LP4 (motors with external fan)						
3000, 2-pole	180 M ... 315 L	7.3 ... 67	2945 ... 2984	24 ... 214	0.068 ... 2.09	2/62
1500, 4-pole	180 M ... 315 L	6.2 ... 67	1465 ... 1488	40 ... 430	0.099 ... 3.46	2/63
1000, 6-pole	180 L ... 315 L	5 ... 44	970 ... 990	49 ... 424	0.175 ... 4.02	2/64
750, 8-pole	180 L ... 315 L	3.7 ... 37	725 ... 740	49 ... 477	0.169 ... 3.95	2/65

More information

For more information, please contact your local Siemens contact
– see “Siemens contacts worldwide” in the Appendix.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

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Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz		
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.09	0.11	56 M	2830	0.3		63	62	0.81	0.26	1LA7 050-2AA□□	3
0.12	0.14	56 M	2800	0.41		65	64	0.83	0.32	1LA7 053-2AA□□	3
0.18	0.21	63 M	2820	0.61		63	62	0.82	0.5	1LA7 060-2AA□□	3.5
0.25	0.29	63 M	2830	0.84		65	65	0.82	0.68	1LA7 063-2AA□□	4.1
0.37	0.43	71 M	2740	1.3		66	65	0.82	1	1LA7 070-2AA□□	5
0.55	0.63	71 M	2800	1.9		71	70	0.82	1.36	1LA7 073-2AA□□	6
0.75	0.86	80 M	2854	2.5		73	72	0.86	1.73	1LA7 080-2AA□□	9
1.1	1.3	80 M	2845	3.7	EFF2	77	77	0.87	2.4	1LA7 083-2AA□□	11
1.5	1.75	90 S	2860	5	EFF2	79	80	0.85	3.25	1LA7 090-2AA□□	12.9
2.2	2.55	90 L	2880	7.3	EFF2	82	82	0.85	4.55	1LA7 096-2AA□□	15.7
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1	1LA7 106-2AA□□	22
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8	1LA7 113-2AA□□	29
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4	1LA7 130-2AA□□	39
7.5	8.6	132 S	2930	24	EFF2	88	88	0.89	13.8	1LA7 131-2AA□□	48
11	12.6	160 M	2930	36	EFF2	89.5	89.5	0.88	20	1LA7 163-2AA□□	68
15	17.3	160 M	2940	49	EFF2	90	90.2	0.9	26.5	1LA7 164-2AA□□	77
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32	1LA7 166-2AA□□	86
22	24.5	180 M	2940	71	EFF2	91.7	91.7	0.88	39.5 ¹⁾	1LA5 183-2AA□□	113
30	33.5	200 L	2944	97	EFF2	92.3	92.3	0.89	53	1LA5 206-2AA□□	159
37	41.5	200 L	2944	120	EFF2	92.8	92.8	0.89	65 ¹⁾	1LA5 207-2AA□□	179
45	51	225 M	2959	145	EFF2	93.6	93.6	0.89	78 ¹⁾	1LA5 223-2AA□□	209

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz		60 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ^{2) 3)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 - □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 050-2AA□□	2	3.7	2.3	16	0.00015	41	52
1LA7 053-2AA□□	2.1	3.7	2.4	16	0.00015	41	52
1LA7 060-2AA□□	2	3.7	2.2	16	0.00018	49	60
1LA7 063-2AA□□	2	4	2.2	16	0.00022	49	60
1LA7 070-2AA□□	2.3	3.5	2.3	16	0.00029	52	63
1LA7 073-2AA□□	2.5	4.3	2.6	16	0.00041	52	63
1LA7 080-2AA□□	2.3	5.6	2.4	16	0.00079	56	67
1LA7 083-2AA□□	2.6	6.1	2.7	16	0.001	56	67
1LA7 090-2AA□□	2.4	5.5	2.7	16	0.0014	60	72
1LA7 096-2AA□□	2.8	6.3	3.1	16	0.0018	60	72
1LA7 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA7 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA7 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA7 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA7 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA7 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA7 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2AA□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2AA□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2AA□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2AA□□	2.8	7.7	3.4	16	0.2	71	84

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output				Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load							
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection													
0.06	0.07	56 M	1350	0.42		56	55	0.77	0.2		1LA7 050-4AB□□		3
0.09	0.11	56 M	1350	0.64		58	57	0.77	0.29		1LA7 053-4AB□□		3
0.12	0.14	63 M	1350	0.85		55	54	0.75	0.42		1LA7 060-4AB□□		3.5
0.18	0.21	63 M	1350	1.3		60	60	0.77	0.56		1LA7 063-4AB□□		4.1
0.25	0.29	71 M	1350	1.8		60	60	0.78	0.77		1LA7 070-4AB□□		4.8
0.37	0.43	71 M	1369	2.6		65	65	0.78	1.06		1LA7 073-4AB□□		6
0.55	0.63	80 M	1395	3.8		67	67	0.81	1.46		1LA7 080-4AA□□		9
0.75	0.86	80 M	1395	5.1		72	72	0.8	1.91		1LA7 083-4AA□□		10
1.1	1.3	90 S	1414	7.4		77	77	0.81	2.55		1LA7 090-4AA□□		13
1.5	1.75	90 L	1420	10	EFF2	79	79	0.81	3.4		1LA7 096-4AA□□		15.6
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7		1LA7 106-4AA□□		21
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4		1LA7 107-4AA□□		24
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2		1LA7 113-4AA□□		31
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4		1LA7 130-4AA□□		41
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2		1LA7 133-4AA□□		49
11	12.6	160 M	1459	72	EFF2	88.5	89	0.84	21.5		1LA7 163-4AA□□		73
15	17.3	160 L	1459	98	EFF2	90	90.2	0.84	28.5		1LA7 166-4AA□□		85
18.5	21.3	180 M	1459	121	EFF2	90.5	90.5	0.83	35.5 ¹⁾		1LA5 183-4AA□□		113
22	25.3	180 L	1459	144	EFF2	91.2	91.2	0.84	41.5 ¹⁾		1LA5 186-4AA□□		123
30	34.5	200 L	1465	196	EFF2	91.8	91.8	0.86	55		1LA5 207-4AA□□		157
37	42.5	225 NO	1470	240	EFF2	92.9	92.9	0.87	66 ¹⁾		1LA5 220-4AA□□		206
45	52	225 M	1470	292	EFF2	93.4	93.4	0.87	80 ¹⁾		1LA5 223-4AA□□		232

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz	Without flange	With flange	With standard flange	With special flange	With standard flange	With special flange	With standard flange	With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ^{2) 3)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 -... □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓	
1LA7 06 -... □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 07 -... □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 -... □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 -... □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 -... □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 -... □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 20 -... □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 22 -... □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 050-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 053-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 060-4AB□□	1.9	2.8	2	13	0.00029	42	53
1LA7 063-4AB□□	1.9	3	1.9	13	0.00037	42	53
1LA7 070-4AB□□	1.9	3	1.9	13	0.00052	44	55
1LA7 073-4AB□□	1.9	3.3	2.1	13	0.00077	44	55
1LA7 080-4AA□□	2.2	3.9	2.2	16	0.0014	47	58
1LA7 083-4AA□□	2.3	4.2	2.3	16	0.0017	47	58
1LA7 090-4AA□□	2.3	4.6	2.4	16	0.0024	48	60
1LA7 096-4AA□□	2.4	5.3	2.6	16	0.0033	48	60
1LA7 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA7 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA7 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA7 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA7 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA7 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA7 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4AA□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4AA□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4AA□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4AA□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4AA□□	2.8	7.7	3.3	16	0.36	65	78

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output			Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP					For Order No. supplements for voltage and type of construction see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection												
0.09	0.1	63 M	850	1		45	41.5	0.66	0.44	1LA7 063-6AB□□		4.1
0.18	0.21	71 M	835	2		53	54.5	0.73	0.67	1LA7 070-6AA□□		5
0.25	0.29	71 M	829	2.8		60	58.5	0.76	0.79	1LA7 073-6AA□□		6.3
0.37	0.43	80 M	919	3.8		62	60.5	0.72	1.2	1LA7 080-6AA□□		9
0.55	0.63	80 M	910	5.8		67	66.5	0.74	1.6	1LA7 083-6AA□□		10
0.75	0.86	90 S	915	7.8		69	69	0.76	2.05	1LA7 090-6AA□□		12.5
1.1	1.3	90 L	915	11		72	72	0.77	2.85	1LA7 096-6AA□□		15.7
1.5	1.75	100 L	925	15		74	74	0.75	3.9	1LA7 106-6AA□□		21
2.2	2.55	112 M	940	22		78	78.5	0.78	5.2	1LA7 113-6AA□□		26
3	3.45	132 S	949	30		79	79.5	0.76	7.2	1LA7 130-6AA□□		38
4	4.6	132 M	949	40		80.5	80.5	0.76	9.4	1LA7 133-6AA□□		44
5.5	6.3	132 M	949	55		83	83	0.76	12.6	1LA7 134-6AA□□		52
7.5	8.6	160 M	960	75		86	86	0.74	17	1LA7 163-6AA□□		74
11	12.6	160 L	960	109		87.5	87.5	0.74	24.5	1LA7 166-6AA□□		95
15	18	180 L	970	148		89.5	89.5	0.77	31.5	1LA5 186-6AA□□		126
18.5	22	200 L	975	181		90.2	90.2	0.77	38.5	1LA5 206-6AA□□		161
22	26.5	200 L	975	215		90.8	90.8	0.77	45.5	1LA5 207-6AA□□		183
30	36	225 M	978	293		91.8	91.8	0.77	61 ¹⁾	1LA5 223-6AA□□		214

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY (see "Introduction" for outputs at 60 Hz)	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓	
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
²⁾ 1LA5 183... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 063-6AB□□	1.8	2	1.9	13	0.00037	39	50
1LA7 070-6AA□□	2.1	2.3	1.9	16	0.00055	39	50
1LA7 073-6AA□□	2.2	2.7	2	16	0.0008	39	50
1LA7 080-6AA□□	1.9	3.1	2.1	16	0.0014	40	51
1LA7 083-6AA□□	2.1	3.4	2.2	16	0.0017	40	51
1LA7 090-6AA□□	2.2	3.7	2.2	16	0.0024	43	55
1LA7 096-6AA□□	2.3	3.8	2.3	16	0.0033	43	55
1LA7 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA7 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA7 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA7 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA7 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA7 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA7 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6AA□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6AA□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6AA□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6AA□□	2.8	5.7	2.9	16	0.36	66	78

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output			Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP					For Order No. supplements for voltage and type of construction see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection												
0.09	0.1	71 M	630	1.4		53	54.5	0.68	0.36	1LA7 070-8AB□□		6.3
0.12	0.14	71 M	645	1.8		53	49.5	0.64	0.51	1LA7 073-8AB□□		6.3
0.18	0.21	80 M	675	2.5		51	49.5	0.68	0.75	1LA7 080-8AB□□		9
0.25	0.29	80 M	685	3.5		55	50.5	0.64	1.02	1LA7 083-8AB□□		10
0.37	0.43	90 S	675	5.2		63	62	0.75	1.14	1LA7 090-8AB□□		10.5
0.55	0.63	90 L	675	7.8		66	65	0.76	1.58	1LA7 096-8AB□□		13.2
0.75	0.86	100 L	679	11		66	65	0.76	2.15	1LA7 106-8AB□□		19
1.1	1.3	100 L	679	15		72	72	0.76	2.9	1LA7 107-8AB□□		22
1.5	1.75	112 M	705	20		74	74	0.76	3.85	1LA7 113-8AB□□		24
2.2	2.55	132 S	700	30		75	75	0.74	5.7	1LA7 130-8AB□□		38
3	3.45	132 M	700	41		77	77.5	0.74	7.6	1LA7 133-8AB□□		44
4	4.6	160 M	715	53		80	80	0.72	10	1LA7 163-8AB□□		64
5.5	6.3	160 M	709	74		83.5	83.5	0.73	13	1LA7 164-8AB□□		74
7.5	8.6	160 L	715	100		85.5	85.5	0.72	17.6	1LA7 166-8AB□□		94
11	13.2	180 L	724	145		87	87	0.75	24.5	1LA5 186-8AB□□		128
15	18	200 L	724	198		87.5	87.5	0.78	31.5	1LA5 207-8AB□□		176
18.5	22	225 NO	724	244		89.2	89.2	0.79	38	1LA5 220-8AB□□		184
22	26.5	225 M	724	290		90.6	90.6	0.79	44.5	1LA5 223-8AB□□		214

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓	
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA5 20 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA5 22 □□	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 070-8AB□□	1.9	2.2	1.7	13	0.0008	36	47
1LA7 073-8AB□□	2.2	2.2	2	13	0.0008	36	47
1LA7 080-8AB□□	1.7	2.3	1.9	13	0.0014	41	52
1LA7 083-8AB□□	2	2.6	2.2	13	0.0017	41	52
1LA7 090-8AB□□	1.6	2.9	1.8	13	0.0023	41	53
1LA7 096-8AB□□	1.7	3	1.9	13	0.0031	41	53
1LA7 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA7 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA7 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA7 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA7 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA7 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA7 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA7 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LA5 186-8AB□□	2	5	2.2	13	0.21	60	73
1LA5 207-8AB□□	2.1	5	2.2	13	0.37	58	71
1LA5 220-8AB□□	2.1	4.5	2.2	13	0.37	58	71
1LA5 223-8AB□□	2.2	4.8	2.3	13	0.45	58	71

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Rated output at 50 Hz, 1500 rpm		3000 rpm	Frame size	Rated speed at 50 Hz, 1500 rpm		3000 rpm	Rated torque at 50 Hz, 1500 rpm		3000 rpm	Efficiency at 50 Hz 4/4-load 1500 rpm		3000 rpm	Efficiency at 50 Hz 4/4-load 1500 rpm		3000 rpm	Rated current at 400 V, 50 Hz 1500 rpm		3000 rpm	Order No.	Price	Weight motor
P_{rated} kW	kW	n_{rated} rpm		rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$	I_{rated} A	A										
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit											m kg										
0.1	0.15	63 M	1330	2650	0.72	0.54	45	52	0.79	0.82	0.41	0.51	1LA7 060-0AA□□				3.5				
0.15	0.2	63 M	1330	2750	1.1	0.7	45	57	0.71	0.73	0.68	0.7	1LA7 063-0AA□□				4.1				
0.21	0.28	71 M	1375	2770	1.5	0.97	59	48	0.73	0.76	0.7	1.1	1LA7 070-0AA□□				4.8				
0.3	0.43	71 M	1390	2780	2.1	1.5	64	58	0.76	0.82	0.89	1.3	1LA7 073-0AA□□				7				
0.48	0.6	80 M	1390	2810	3.3	2	66	64	0.82	0.84	1.25	1.6	1LA7 080-0AA□□				9				
0.7	0.85	80 M	1390	2810	4.8	2.9	69	70	0.84	0.83	1.75	2.1	1LA7 083-0AA□□				10				
1.1	1.4	90 S	1390	2810	7.6	4.8	69	66	0.85	0.85	2.7	3.6	1LA7 090-0AA□□				13				
1.5	1.9	90 L	1410	2860	10	6.4	74	72	0.86	0.85	3.4	4.5	1LA7 096-0AA□□				15.6				
2	2.4	100 L	1410	2870	14	8	81	75	0.84	0.84	4.25	5.5	1LA7 106-0AA□□				21				
2.6	3.1	100 L	1400	2850	18	10	79	74	0.86	0.8	5.5	7.6	1LA7 107-0AA□□				24				
3.7	4.4	112 M	1420	2885	25	15	79	76	0.85	0.8	8	10.5	1LA7 113-0AA□□				31				
4.7	5.9	132 S	1450	2920	31	19	83	80	0.84	0.85	9.7	12.5	1LA7 130-0AA□□				41				
6.5	8	132 M	1450	2930	43	26	82	82.5	0.84	0.84	13.6	16.7	1LA7 133-0AA□□				50				
9.3	11.5	160 M	1455	2930	61	37	86.5	80	0.85	0.89	18.3	23.4	1LA7 163-0AA□□				74				
13	17	160 L	1455	2930	85	55	87.5	87	0.84	0.88	25.6	32	1LA7 166-0AA□□				92				
15	18	180 M	1470	2950	97	58	90	86.5	0.83	0.8	29	37.5	1LA5 183-0AA□□				113				
18	21.5	180 L	1465	2950	117	70	90	87	0.84	0.85	34.5	42	1LA5 186-0AA□□				123				
26	31	200 L	1465	2940	169	101	90.9	86.5	0.86	0.85	48.5	61	1LA5 207-0AA□□				157				

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz, direct online starting				Without flange		With flange		With standard flange		With special flange	
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3	
1LA7 06 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 07 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 08 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 09 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 10 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 11 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 13 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 16 -... □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA5 18 -... □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–
1LA5 20 -... □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ 1LA5 183-... to 1LA5 207-... motors (motor series 1LA5, frame size 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The “Second shaft extension” option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting at 1500 rpm T_{LR}/T_{rated}	Locked-rotor current at 1500 rpm I_{LR}/I_{rated}	Breakdown torque at 1500 rpm T_B/T_{rated}	Locked-rotor torque at 3000 rpm T_{LR}/T_{rated}	Locked-rotor current at 3000 rpm I_{LR}/I_{rated}	Breakdown torque at 3000 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 060-0AA□□	1.8	1.8	2.7	2.9	1.8	1.8	10	0.00029
1LA7 063-0AA□□	2	2	3	3.3	2	2	10	0.0004
1LA7 070-0AA□□	1.6	1.6	3	3.1	1.8	1.8	10	0.00052
1LA7 073-0AA□□	1.8	1.8	3.7	3.8	2	2	10	0.00076
1LA7 080-0AA□□	1.7	1.7	3.9	4	2	2	10	0.0014
1LA7 083-0AA□□	1.8	1.8	4.3	4.3	2.1	2.1	10	0.0017
1LA7 090-0AA□□	1.6	1.8	4.2	4.3	1.9	2	13	0.0024
1LA7 096-0AA□□	1.9	1.9	4.9	5.3	2	2.1	13	0.0033
1LA7 106-0AA□□	1.8	1.8	5	5.5	2	2.1	13	0.0048
1LA7 107-0AA□□	2.3	2.4	5.6	5.6	2.4	2.4	13	0.0055
1LA7 113-0AA□□	2	2.2	5.6	5.8	2.2	2.3	13	0.011
1LA7 130-0AA□□	1.7	1.6	6.3	6.5	2.2	2.2	10	0.018
1LA7 133-0AA□□	2	2.1	6.9	7.5	2.5	2.6	10	0.023
1LA7 163-0AA□□	2	1.8	6.7	7.4	2.6	2.4	10	0.043
1LA7 166-0AA□□	2.5	2.8	7.6	8.5	3	3	10	0.06
1LA5 183-0AA□□	2.1	2.2	6.7	7.5	2.7	3.2	13	0.13
1LA5 186-0AA□□	2	2.2	6.4	7.3	2.6	3.1	13	0.15
1LA5 207-0AA□□	2.6	2.6	6.7	7.5	2.8	3.3	13	0.24

See the chapter “Fan motors” for pole-changing motors for quadratic load torque for driving fans.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Rated output at 50 Hz, 750 rpm		Frame size	Rated speed at 50 Hz, 750 rpm		Rated torque at 50 Hz, 750 rpm		Efficiency at 50 Hz 4/4-load 750 rpm		Efficiency at 50 Hz 4/4-load 1500 rpm		Rated current at 400 V, 50 Hz 750 rpm		Order No.	Price	Weight motor
1500 rpm			1500 rpm		1500 rpm		750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm			
P_{rated} kW		FS	n_{rated} rpm		T_{rated} Nm		η_{rated} %		$\cos\phi_{rated}$		I_{rated} A				m kg
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit															
0.35	0.5	90 S	675	1365	5.1	3.6	60	65	0.71	0.79	1.19	1.41	1LA7 090-0AB□□		11
0.5	0.7	90 L	675	1380	7.1	4.9	63	62	0.72	0.78	1.6	2.1	1LA7 096-0AB□□		13.2
0.7	1.1	100 L	690	1380	9.8	7.7	65	61	0.74	0.8	2.1	3.25	1LA7 106-0AB□□		20
0.9	1.5	100 L	690	1380	13	10	69	67	0.70	0.8	2.7	4.0	1LA7 107-0AB□□		22
1.4	1.9	112 M	690	1410	19	13	69	70	0.73	0.75	4	5.2	1LA7 113-0AB□□		25
1.8	3.6	132 S	720	1430	24	24	72	80	0.57	0.9	6.3	7.2	1LA7 130-0AB□□		41
2.5	5	132 M	720	1430	33	33	73	80	0.6	0.9	8.2	10	1LA7 133-0AB□□		49
3.5	7	160 M	725	1450	46	46	77	81.5	0.56	0.89	11.7	13.9	1LA7 163-0AB□□		73
5.6	11	160 L	725	1450	74	72	78	83	0.56	0.89	18.5	21.5	1LA7 166-0AB□□		91
11	18	180 L	725	1455	144	118	83.5	83.5	0.69	0.87	27.5	35	1LA5 186-0AB□□		123
17	27	200 L	730	1465	223	177	89	89.5	0.68	0.86	40.5	50.5	1LA5 207-0AB□□		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz, direct online starting				Without flange	With flange			With standard flange		With special flange
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3
1LA7 06 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	—	—	—
1LA5 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	—	—	—

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ 1LA5 183-... to 1LA5 207-... motors (motor series 1LA5, frame size 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ The “Second shaft extension” option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Aluminium series 1LA7/1LA5

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting at 750 rpm T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current at 750 rpm I_{LR}/I_{rated}	Breakdown torque at 750 rpm T_B/T_{rated}	Locked-rotor torque at 1500 rpm T_{LR}/T_{rated}	Locked-rotor current at 1500 rpm I_{LR}/I_{rated}	Breakdown torque at 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 090-0AB□□	1.3	1.3	2.5	3.2	1.6	1.6	10	0.0023
1LA7 096-0AB□□	1.4	1.5	3	3.5	1.7	1.8	10	0.0031
1LA7 106-0AB□□	1.7	1.6	3.3	3.5	2	1.9	10	0.0051
1LA7 107-0AB□□	1.8	1.6	3.5	3.6	2	1.9	10	0.0063
1LA7 113-0AB□□	1.4	1.5	3.6	4.4	1.7	1.8	10	0.013
1LA7 130-0AB□□	2	1.3	4.3	5.4	2.3	1.8	10	0.018
1LA7 133-0AB□□	2	1.3	4.3	5.4	2.3	1.8	10	0.023
1LA7 163-0AB□□	2	1.4	4	5.4	2.3	1.8	10	0.043
1LA7 166-0AB□□	2.2	1.7	4.2	5.9	2.4	2	10	0.06
1LA5 186-0AB□□	1.9	2	5.2	6.2	2.2	2.2	13	0.21
1LA5 207-0AB□□	2.4	2.3	5.4	6.6	2.5	2.5	13	0.37

See the chapter “Fan motors” for pole-changing motors for quadratic load torque for driving fans.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output				Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF I	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A		For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP												
0.09	56 M	2830	0.3		70	70	0.76	0.24		1LA9 050-2KA□□		3
0.12	56 M	2830	0.4		69	69	0.81	0.31		1LA9 053-2KA□□		3.8
0.18	63 M	2839	0.61		70	70	0.78	0.48		1LA9 060-2KA□□		4.1
0.25	63 M	2840	0.84		72	72	0.8	0.63		1LA9 063-2KA□□		5.1
0.37	71 M	2839	1.2		74	74	0.77	0.94		1LA9 070-2KA□□		6
0.55	71 M	2835	1.9		75	75	0.75	1.42		1LA9 073-2KA□□		7.2
0.75	80 M	2869	2.5		80	80	0.82	1.66		1LA9 080-2KA□□		9.8
1.1	80 M	2860	3.7	EFF1	84	84	0.89	2.1		1LA9 083-2KA□□		12.3
1.5	90 S	2890	5	EFF1	85	85	0.87	2.95		1LA9 090-2KA□□		15
2.2	90 L	2890	7.3	EFF1	86.5	86.5	0.87	4.2		1LA9 096-2KA□□		18.6
3	100 L	2890	9.9	EFF1	87	87	0.88	5.7		1LA9 106-2KA□□		24
4	112 M	2905	13	EFF1	88.5	88.5	0.89	7.3		1LA9 113-2KA□□		35
5.5	132 S	2929	18	EFF1	89.5	89.5	0.9	9.9		1LA9 130-2KA□□		43
7.5	132 S	2929	24	EFF1	90.5	90.5	0.92	13		1LA9 131-2KA□□		56
11	160 M	2944	36	EFF1	91	91	0.9	19.4		1LA9 163-2KA□□		73
15	160 M	2944	49	EFF1	91.5	91.5	0.9	26.5		1LA9 164-2KA□□		82
18.5	160 L	2940	60	EFF1	92.3	92.5	0.92	31.5		1LA9 166-2KA□□		102
22	180 M	2944	71	EFF1	93	93.2	0.89	38.5 ¹⁾		1LA9 183-2WA□□		131
30	200 L	2950	97	EFF1	93.5	93.5	0.89	52		1LA9 206-2WA□□		185
37	200 L	2950	120	EFF1	94	94.1	0.89	64 ¹⁾		1LA9 207-2WA□□		214

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ The "Second shaft extension" option, order code **K16** is not possible.
³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LA9 050-2KA□□	3.6	4.5	3	16	0.00015	41	52
1LA9 053-2KA□□	3.2	4.3	2.8	16	0.0002	41	52
1LA9 060-2KA□□	2.8	4.8	3.1	16	0.00022	49	60
1LA9 063-2KA□□	2.5	4.9	2.5	16	0.00026	49	60
1LA9 070-2KA□□	3.3	6.5	3.1	16	0.00041	52	63
1LA9 073-2KA□□	3.6	6.3	2.9	16	0.0005	52	63
1LA9 080-2KA□□	4.4	8.3	3.2	16	0.001	56	67
1LA9 083-2KA□□	3.8	7	3.2	16	0.0013	56	67
1LA9 090-2KA□□	4.1	7	3.5	16	0.0018	60	72
1LA9 096-2KA□□	4.1	7	3.5	16	0.0022	60	72
1LA9 106-2KA□□	3.4	7	3.2	16	0.0044	62	74
1LA9 113-2KA□□	2.8	7	3.2	16	0.0077	63	75
1LA9 130-2KA□□	2.7	7	3.2	16	0.019	68	80
1LA9 131-2KA□□	2.8	7	3.1	16	0.024	68	80
1LA9 163-2KA□□	2.5	7	3.1	16	0.044	70	82
1LA9 164-2KA□□	2.5	7	3.1	16	0.051	70	82
1LA9 166-2KA□□	2.4	7	3.1	16	0.065	70	82
1LA9 183-2WA□□	2.6	7.2	3.3	16	0.09	70	83
1LA9 206-2WA□□	2.5	7	3.2	16	0.16	71	84
1LA9 207-2WA□□	2.7	7	3.3	16	0.2	71	84

The motors can also be used for 60 Hz according to EPACT,
see pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF I	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
0.06	56 M	1380	0.42		61	61	0.66	0.22	1LA9 050-4KA□□		3
0.09	56 M	1390	0.62		62	62	0.68	0.31	1LA9 053-4KA□□		3.8
0.12	63 M	1395	0.82		66	66	0.65	0.41	1LA9 060-4KA□□		4.1
0.18	63 M	1395	1.3		65	65	0.68	0.59	1LA9 063-4KA□□		5.1
0.25	71 M	1410	1.7		70	70	0.64	0.81	1LA9 070-4KA□□		6
0.37	71 M	1384	2.6		71	71	0.73	1.04	1LA9 073-4KA□□		7.2
0.55	80 M	1410	3.7		77	77	0.78	1.32	1LA9 080-4KA□□		9.8
0.75	80 M	1399	5.1		81	81	0.75	1.78	1LA9 083-4KA□□		12.3
1.1	90 S	1440	7.3	EFF1	84	84	0.77	2.45	1LA9 090-4KA□□		15
1.5	90 L	1440	9.9	EFF1	85	85	0.77	3.3	1LA9 096-4KA□□		18
2.2	100 L	1435	15	EFF1	86.5	86.5	0.82	4.5	1LA9 106-4KA□□		25
3	100 L	1435	20	EFF1	87.5	87.7	0.81	6.1	1LA9 107-4KA□□		30
4	112 M	1440	27	EFF1	88.5	89	0.81	8.1	1LA9 113-4KA□□		37
5.5	132 S	1455	36	EFF1	89.5	89.5	0.84	10.6	1LA9 130-4KA□□		45
7.5	132 M	1455	49	EFF1	90.3	90.5	0.84	14.2	1LA9 133-4KA□□		60
11	160 M	1459	72	EFF1	91.5	92	0.85	20.5	1LA9 163-4KA□□		81
15	160 L	1459	98	EFF1	92	92.3	0.86	27.5	1LA9 166-4KA□□		107
18.5	180 M	1465	121	EFF1	92.5	93	0.84	34.5 ¹⁾	1LA9 183-4WA□□		126
22	180 L	1465	143	EFF1	93	93.4	0.84	40.5 ¹⁾	1LA9 186-4WA□□		146
30	200 L	1465	196	EFF1	93.5	94	0.87	53	1LA9 207-4WA□□		199

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LA9 050-4KA□□	2.7	3.1	2.8	16	0.00027	42	53
1LA9 053-4KA□□	2.8	3.2	2.8	16	0.00035	42	53
1LA9 060-4KA□□	2.7	3.5	2.6	16	0.00037	42	53
1LA9 063-4KA□□	3	3.6	2.5	16	0.00045	42	53
1LA9 070-4KA□□	3.6	4.3	3.1	16	0.00076	44	55
1LA9 073-4KA□□	3.3	4.2	3	16	0.00095	44	55
1LA9 080-4KA□□	3.4	5.6	2.9	16	0.0017	47	58
1LA9 083-4KA□□	4	5.8	3.5	16	0.0024	47	58
1LA9 090-4KA□□	3.1	6.4	3.2	16	0.0033	48	60
1LA9 096-4KA□□	3.6	6.7	3.4	16	0.004	48	60
1LA9 106-4KA□□	3.4	7	3.6	16	0.0062	53	65
1LA9 107-4KA□□	3.8	7	3.9	16	0.0077	53	65
1LA9 113-4KA□□	3.2	6.9	3.2	16	0.014	53	65
1LA9 130-4KA□□	3.2	7	3.6	16	0.023	62	74
1LA9 133-4KA□□	3.4	7	3.6	16	0.029	62	74
1LA9 163-4KA□□	2.6	6.9	3.2	16	0.055	66	78
1LA9 166-4KA□□	2.8	7	3.3	16	0.072	66	78
1LA9 183-4WA□□	2.8	7	3.2	16	0.15	63	76
1LA9 186-4WA□□	3.1	7.3	3.4	16	0.19	63	76
1LA9 207-4WA□□	3	7	3.2	16	0.32	65	78

The motors can also be used for 60 Hz according to EPACT,
see pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
0.75	90 S	925	7.7		75.5	75.5	0.72	2	1LA9 090-6KA□□		15.7
1.1	90 L	940	11		82	82	0.7	2.75	1LA9 096-6KA□□		19
1.5	100 L	949	15		85	85	0.7	3.65	1LA9 106-6KA□□		25
2.2	112 M	955	22		84	84	0.7	5.4	1LA9 113-6KA□□		37
4	132 M	949	40		84	84	0.81	8.5	1LA9 133-6KA□□		49
5.5	132 M	960	55		86	86	0.77	12	1LA9 134-6KA□□		64
7.5	160 M	964	74		88	88	0.72	17	1LA9 163-6KA□□		98
11	160 L	960	109		88.5	88.5	0.78	23	1LA9 166-6KA□□		105
15	180 L	970	148		91	91	0.75	31.5	1LA9 186-6WA□□		144
18.5	200 L	975	181		91	91	0.77	38	1LA9 206-6WA□□		186
22	200 L	975	215		91.5	91.5	0.77	45	1LA9 207-6WA□□		217

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6, IM V5 without protective cover	With flange IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover ¹⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	With special flange IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LA9 090-6KA□□	3	4.4	2.5	16	0.0033	43	55
1LA9 096-6KA□□	3.7	5.7	3.2	16	0.005	43	55
1LA9 106-6KA□□	3.5	6.2	3.4	16	0.0065	47	59
1LA9 113-6KA□□	2.9	6.2	3	16	0.014	52	64
1LA9 133-6KA□□	3	6.3	2.7	16	0.025	63	75
1LA9 134-6KA□□	3.7	7.3	3.6	16	0.03	63	75
1LA9 163-6KA□□	2.4	5.5	2.5	16	0.063	66	78
1LA9 166-6KA□□	3.1	6.9	3.2	16	0.0072	66	78
1LA9 186-6WA□□	2.2	6.5	2.5	16	0.19	66	78
1LA9 206-6WA□□	2.8	6.2	2.5	16	0.28	66	78
1LA9 207-6WA□□	2.8	6.2	2.5	16	0.36	66	78

The motors can also be used for 60 Hz according to EPACT, see pages 2/28 to 2/33.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output	Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT											
0.12	56 M	3440	0.25	No	70	0.74	0.23		1LA9 050-2KA□□		3
0.16	56 M	3440	0.33	No	71	0.76	0.28		1LA9 053-2KA□□		3.8
0.25	63 M	3440	0.53	No	71	0.79	0.4		1LA9 060-2KA□□		4.1
0.33	63 M	3460	0.69	No	72	0.76	0.56		1LA9 063-2KA□□		5.1
0.5	71 M	3445	1	No	72	0.75	0.86		1LA9 070-2KA□□		6
0.75	71 M	3445	1.6	No	73	0.73	1.3		1LA9 073-2KA□□		7.2
1	80 M	3485	2	Yes	75.5	0.82	1.52		1LA9 080-2KA□□		9.8
1.5	80 M	3480	3.1	Yes	82.5	0.88	1.9		1LA9 083-2KA□□		12.3
2	90 S	3510	4.1	Yes	84	0.86	2.6		1LA9 090-2KA□□		15
3	90 L	3510	6.1	Yes	85.5	0.85	3.8		1LA9 096-2KA□□		18.6
4	100 L	3510	8.1	No	86.5	0.87	5		1LA9 106-2KA□□		24
5	112 M	3540	10	Yes	87.5	0.88	6		1LA9 113-2KA□□		35
7.5	132 S	3540	15	Yes	88.5	0.9	8.7		1LA9 130-2KA□□		43
10	132 S	3540	20	Yes	89.5	0.92	11.4		1LA9 131-2KA□□		56
15	160 M	3555	30	Yes	90.2	0.9	17		1LA9 163-2KA□□		73
20	160 M	3555	40	Yes	90.2	0.9	23.2		1LA9 164-2KA□□		82
25	160 L	3550	50	Yes	91	0.92	27.7		1LA9 166-2KA□□		102
30	180 M	3545	60	Yes	91	0.86	36		1LA9 183-2WA□□		131
40	200 L	3555	80	Yes	91.7	0.88	46.5		1LA9 206-2WA□□		185
50	200 L	3555	100	Yes	92.4	0.88	57		1LA9 207-2WA□□		214

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ	Without flange	With flange	IM V1 with protective cover ¹⁾	IM B35	With standard flange	IM B34	With special flange
	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3			IM B14, IM V19, IM V18 without protective cover		IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.
²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 050-2KA□□	3.6	5.5	3.8	16	0.00015	45	56
1LA9 053-2KA□□	3.2	5.4	3.4	16	0.0002	45	56
1LA9 060-2KA□□	2.8	4.9	3.3	16	0.00022	53	64
1LA9 063-2KA□□	2.5	5	2.7	16	0.00026	53	64
1LA9 070-2KA□□	3.3	7.5	3.4	16	0.00041	56	67
1LA9 073-2KA□□	3.4	7.2	3.7	16	0.0005	56	67
1LA9 080-2KA□□	4.4	9.6	4.4	16	0.001	60	71
1LA9 083-2KA□□	3.8	8.6	3.2	16	0.0013	60	71
1LA9 090-2KA□□	4.1	8.6	4.1	16	0.0018	64	76
1LA9 096-2KA□□	4.1	8.5	5.1	16	0.0022	64	76
1LA9 106-2KA□□	3.4	8.6	3.7	16	0.0044	66	78
1LA9 113-2KA□□	2.8	9.2	4	16	0.0077	67	79
1LA9 130-2KA□□	2.7	8.5	3.8	16	0.019	72	84
1LA9 131-2KA□□	2.8	8.3	3.7	16	0.024	72	84
1LA9 163-2KA□□	2.5	8.5	3.7	16	0.044	74	86
1LA9 164-2KA□□	2.5	8.5	3.7	16	0.051	74	86
1LA9 166-2KA□□	2.4	8.5	3.5	16	0.065	74	86
1LA9 183-2WA□□	2.6	8.6	3.5	16	0.09	74	87
1LA9 206-2WA□□	2.5	8.4	3.6	16	0.16	75	88
1LA9 207-2WA□□	2.7	8.4	3.7	16	0.2	75	88

The motors can also be used for 50 Hz according to CEMEP, see pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output	Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT											
0.08	56 M	1715	0.33	No	63	0.65	0.18	0.18	1LA9 050-4KA□□		3
0.12	56 M	1725	0.5	No	64	0.6	0.29	0.29	1LA9 053-4KA□□		3.8
0.16	63 M	1710	0.66	No	68	0.6	0.37	0.37	1LA9 060-4KA□□		4.1
0.25	63 M	1705	1.1	No	66	0.63	0.54	0.54	1LA9 063-4KA□□		5.1
0.33	71 M	1730	1.4	No	69	0.6	0.76	0.76	1LA9 070-4KA□□		6
0.5	71 M	1725	2.1	No	70	0.68	0.98	0.98	1LA9 073-4KA□□		7.2
0.75	80 M	1725	3.1	No	75.5	0.74	1.24	1.24	1LA9 080-4KA□□		9.8
1	80 M	1720	4.1	Yes	82.5	0.75	1.59	1.59	1LA9 083-4KA□□		12.3
1.5	90 S	1755	6.1	Yes	84	0.76	2.15	2.15	1LA9 090-4KA□□		15
2	90 L	1775	14	Yes	84	0.76	2.95	2.95	1LA9 096-4KA□□		18
3	100 L	1750	12	No	87.5	0.79	4	4	1LA9 106-4KA□□		25
4	100 L	1750	16	No	87.5	0.79	5.5	5.5	1LA9 107-4KA□□		30
5	112 M	1755	20	Yes	87.5	0.79	6.7	6.7	1LA9 113-4KA□□		37
7.5	132 S	1760	30	Yes	89.5	0.81	9.5	9.5	1LA9 130-4KA□□		45
10	132 M	1760	40	Yes	89.5	0.82	12.8	12.8	1LA9 133-4KA□□		60
15	160 M	1765	61	Yes	91	0.85	17.9	17.9	1LA9 163-4KA□□		81
20	160 L	1765	81	Yes	91	0.85	24.5	24.5	1LA9 166-4KA□□		107
25	180 M	1770	101	Yes	92.4	0.83	30.5	30.5	1LA9 183-4WA□□		126
30	180 L	1770	121	Yes	92.4	0.83	36	36	1LA9 186-4WA□□		146
40	200 L	1770	161	Yes	93	0.86	47	47	1LA9 207-4WA□□		199

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ	Without flange	With flange	IM V1 with protective cover ¹⁾	IM B35	With standard flange	IM B34	With special flange
	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3			IM B14, IM V19, IM V18 without protective cover		IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 050-4KA□□	2.7	3.4	3	16	0.00027	46	57
1LA9 053-4KA□□	2.8	3.5	3	16	0.00035	46	57
1LA9 060-4KA□□	2.7	3.9	2.8	16	0.00037	46	57
1LA9 063-4KA□□	3	3.6	3.1	16	0.00045	46	57
1LA9 070-4KA□□	3.6	4.9	3.4	16	0.00076	48	59
1LA9 073-4KA□□	3.3	4.9	3.4	16	0.00095	48	59
1LA9 080-4KA□□	3.4	6.8	3.6	16	0.0017	51	62
1LA9 083-4KA□□	4	7.3	3.9	16	0.0024	51	62
1LA9 090-4KA□□	3.1	7.7	3.9	16	0.0033	52	64
1LA9 096-4KA□□	3.6	8.1	4.2	16	0.004	52	64
1LA9 106-4KA□□	3.4	8.4	4.3	16	0.0062	57	69
1LA9 107-4KA□□	3.8	8.7	4.6	16	0.0077	57	69
1LA9 113-4KA□□	3.2	8.6	3.9	16	0.014	57	69
1LA9 130-4KA□□	3.2	8.7	4.1	16	0.023	66	78
1LA9 133-4KA□□	3.4	8.7	4.1	16	0.029	66	78
1LA9 163-4KA□□	2.6	8.1	3.2	16	0.055	70	82
1LA9 166-4KA□□	2.8	8.5	3.5	16	0.072	70	82
1LA9 183-4WA□□	2.8	8.4	3.6	16	0.15	67	80
1LA9 186-4WA□□	3.1	8.8	3.9	16	0.19	67	80
1LA9 207-4WA□□	3	8.3	3.6	16	0.32	69	82

The motors can also be used for 50 Hz according to CEMEP, see pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

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Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output		EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
1	90 S	1140	6.2	Yes	80	0.66	1.78	1LA9 090-6KA□□		15.7
1.5	90 L	1150	9.3	Yes	85.5	0.64	2.55	1LA9 096-6KA□□		19
2	100 L	1160	12	No	86.5	0.68	3.2	1LA9 106-6KA□□		25
3	112 M	1160	18	Yes	87.5	0.66	4.8	1LA9 113-6KA□□		37
5	132 M	1160	31	Yes	87.5	0.77	6.9	1LA9 133-6KA□□		49
7.5	132 M	1160	46	Yes	89.5	0.73	10.6	1LA9 134-6KA□□		64
10	160 M	1165	61	Yes	89.5	0.7	15	1LA9 163-6KA□□		98
15	160 L	1165	92	Yes	90.2	0.77	19	1LA9 166-6KA□□		105
20	180 L	1175	121	Yes	90.2	0.75	28	1LA9 186-6WA□□		144
25	200 L	1175	152	Yes	91.7	0.75	34	1LA9 206-6WA□□		186
30	200 L	1175	182	Yes	91.7	0.75	40	1LA9 207-6WA□□		217

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY (see "Introduction" for outputs at 60 Hz)	460 VΔ	Without flange IM B3/6/7/8, IM V6, IM V5 without protective cover	With flange IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover ¹⁾	IM B35	With standard flange IM B14, IM V19, IM V18 without protective cover	IM B34	With special flange IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Aluminium series 1LA9

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 60 Hz L_{pA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 090-6KA□□	3	5.6	3	16	0.0033	47	59
1LA9 096-6KA□□	3.7	6.4	3.7	16	0.005	47	59
1LA9 106-6KA□□	3.5	7.2	3.8	16	0.0065	51	63
1LA9 113-6KA□□	2.9	7.5	3.7	16	0.014	56	68
1LA9 133-6KA□□	3	7.9	3.6	16	0.025	67	79
1LA9 134-6KA□□	3.7	8.4	4.3	16	0.03	67	79
1LA9 163-6KA□□	2.4	6.4	2.8	16	0.063	70	82
1LA9 166-6KA□□	3.1	8.3	3.8	16	0.0072	70	82
1LA9 186-6WA□□	2.8	7.1	2.8	16	0.19	70	82
1LA9 206-6WA□□	2.8	7.1	2.8	16	0.28	70	82
1LA9 207-6WA□□	2.8	7.2	2.8	16	0.36	70	82

The motors can also be used for 50 Hz according to CEMEP, see pages 2/22 to 2/27.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminium series 1LA9

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output, used as temperature class F											
0.2	0.23	56 M	2830	0.67	69	69	0.82	0.51	1LA9 053-2LA□□		3.8
0.33	0.38	63 M	2775	1.1	68	67.5	0.8	0.88	1LA9 060-2LA□□		4.1
0.45	0.52	63 M	2719	1.6	68	67.5	0.84	1.14	1LA9 063-2LA□□		5.1
0.65	0.75	71 M	2719	2.3	72	72	0.83	1.56	1LA9 070-2LA□□		6
0.94	1.08	71 M	2734	3.3	73	73	0.82	2.25	1LA9 073-2LA□□		7.2
1.45	1.67	80 M	2820	4.9	76	76	0.83	3.3	1LA9 080-2LA□□		9.8
1.75	2.01	80 M	2839	5.9	77	77.5	0.82	4	1LA9 083-2LA□□		12.3
2.9	3.34	90 S	2824	9.8	81	81	0.82	6.3	1LA9 090-2LA□□		15
3.8	4.37	90 L	2809	13	81	81	0.85	8	1LA9 096-2LA□□		18.6
4.4	5.06	100 L	2880	15	82	82	0.83	9.3	1LA9 106-2LA□□		24
6.5	7.48	112 M	2899	21	85	85	0.83	13.2	1LA9 113-2LA□□		35
9	10.35	132 S	2895	29	87	87	0.9	16.6	1LA9 130-2LA□□		43
12	13.8	132 S	2905	39	87	87	0.89	22.5	1LA9 131-2LA□□		56
18	20.7	160 M	2910	59	89	89	0.87	33.5	1LA9 163-2LA□□		73
21	24.15	160 M	2910	68	90	90	0.91	37	1LA9 164-2LA□□		82
26	29.9	160 L	2920	85	91	91	0.91	45.5	1LA9 166-2LA□□		102
33	37.95	180 M	2940	107	92	92	0.86	60	1LA9 183-2AA□□		131
44	50.6	200 L	2944	143	92	92	0.86	80	1LA9 206-2AA□□		182
53	60.95	200 L	2944	172	92.5	92.5	0.87	95	1LA9 207-2AA□□		211

Order No. supplements

Motor type	Penultimate position: Voltage code							Final position: Type of construction code						
	50 Hz				60 Hz			Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	(see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover 1)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3	
1LA9 05 □□	○	○	○	–	○	○	□	✓	–	–	✓	✓	✓	
1LA9 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA9 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	
1LA9 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminium series 1LA9

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output, used as temperature class F							
1LA9 053-2LA□□	2.1	4.5	2.3	16	0.0002	41	52
1LA9 060-2LA□□	2.3	4.4	2.2	16	0.00022	49	60
1LA9 063-2LA□□	2.2	4.2	2.3	16	0.00026	49	60
1LA9 070-2LA□□	2.4	4.5	2.5	16	0.00041	52	63
1LA9 073-2LA□□	2.5	4.8	2.4	16	0.0005	52	63
1LA9 080-2LA□□	3.1	6.7	3.1	16	0.001	56	67
1LA9 083-2LA□□	3.7	7.4	3.5	16	0.0013	56	67
1LA9 090-2LA□□	3.2	6.5	3	16	0.0018	60	72
1LA9 096-2LA□□	3.1	6.5	2.7	16	0.0022	60	72
1LA9 106-2LA□□	3	7.8	3.2	16	0.0044	62	74
1LA9 113-2LA□□	3	8.6	3.8	16	0.0077	63	75
1LA9 130-2LA□□	2	6.4	2.6	16	0.019	68	80
1LA9 131-2LA□□	3	7.4	3.2	16	0.024	68	80
1LA9 163-2LA□□	2.2	7	3.1	16	0.044	70	82
1LA9 164-2LA□□	2	6.9	2.7	16	0.051	70	82
1LA9 166-2LA□□	2.2	7.7	3.2	16	0.065	70	82
1LA9 183-2AA□□	2.5	7.4	3.3	16	0.09	70	83
1LA9 206-2AA□□	2.4	7.8	3.2	16	0.16	71	84
1LA9 207-2AA□□	2.6	8.2	3.3	16	0.2	71	84

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminium series 1LA9

2

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output, used as temperature class F											
0.14	0.16	56 M	1384	0.97	62	60.5	0.74	0.44	1LA9 053-4LA□□		3.8
0.21	0.24	63 M	1335	1.5	60	58.5	0.77	0.66	1LA9 060-4LA□□		4.1
0.29	0.33	63 M	1330	2.1	60	58.5	0.71	0.98	1LA9 063-4LA□□		5.1
0.45	0.52	71 M	1339	3.2	64	63	0.71	1.42	1LA9 070-4LA□□		6
0.6	0.69	71 M	1339	4.3	70	70	0.75	1.64	1LA9 073-4LA□□		7.2
0.9	1.04	80 M	1339	6.4	70	70	0.81	2.3	1LA9 080-4LA□□		9.8
1.25	1.44	80 M	1339	8.9	70	70	0.83	3.1	1LA9 083-4LA□□		12.3
1.8	2.07	90 S	1380	12	77	77.5	0.83	4.05	1LA9 090-4LA□□		15
2.5	2.88	90 L	1390	17	76	76	0.81	5.9	1LA9 096-4LA□□		18
4	4.6	100 L	1410	27	77	77.5	0.81	9.3	1LA9 107-4LA□□		25
5.5	6.33	112 M	1440	36	82	82	0.8	12.2	1LA9 113-4LA□□		37
8.6	9.89	132 S	1440	57	84	84	0.83	17.8	1LA9 130-4LA□□		45
11	12.65	132 M	1450	72	85	85	0.83	22.5	1LA9 133-4LA□□		60
17	19.55	160 M	1455	112	88	88	0.84	33	1LA9 163-4LA□□		81
22	25.3	160 L	1455	144	88	88	0.82	44	1LA9 166-4LA□□		107
26	30	180 M	1459	170	90.5	90.5	0.83	50	1LA9 183-4AA□□		126
32	38	180 L	1465	209	91.3	91.3	0.84	60	1LA9 186-4AA□□		146
43	49.6	200 L	1465	280	91.7	91.7	0.85	80	1LA9 207-4AA□□		196

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz						60 Hz						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	Without flange	With flange	With standard flange	With special flange			
					(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover IM V3	IM V1 with protective cover 1)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Aluminium series 1LA9

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output, used as temperature class F							
1LA9 053-4LA□□	2.3	3.5	2.2	16	0.00035	42	53
1LA9 060-4LA□□	2.1	2.9	2.1	16	0.00037	42	53
1LA9 063-4LA□□	2.3	2.9	2.3	16	0.00045	42	53
1LA9 070-4LA□□	2.3	3.4	2.3	16	0.00076	44	55
1LA9 073-4LA□□	2.3	3.6	2.3	16	0.00095	44	55
1LA9 080-4LA□□	2.3	4.1	2.4	16	0.0017	47	58
1LA9 083-4LA□□	2.7	4.5	2.4	16	0.0024	47	58
1LA9 090-4LA□□	2.4	5.1	2.4	16	0.0033	48	60
1LA9 096-4LA□□	2.5	5.1	2.3	16	0.004	48	60
1LA9 107-4LA□□	2.7	6	3	16	0.0062	53	65
1LA9 113-4LA□□	3	6.8	3	16	0.014	53	65
1LA9 130-4LA□□	2.3	6.8	2.7	16	0.023	62	74
1LA9 133-4LA□□	2.8	7.4	3.1	16	0.029	62	74
1LA9 163-4LA□□	2.9	7.5	2.8	16	0.055	66	78
1LA9 166-4LA□□	3.1	8.3	3.4	16	0.072	66	78
1LA9 183-4AA□□	2.4	7.5	3.2	16	0.15	63	76
1LA9 186-4AA□□	2.5	7.9	3.4	16	0.19	63	76
1LA9 207-4AA□□	2.7	7.8	3.5	16	0.32	65	78

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

2

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection												
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1	1LA6 106-2AA□□		34
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8	1LA6 113-2AA□□		43
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4	1LA6 130-2AA□□		53
7.5	8.6	132 S	2929	24	EFF2	88	88	0.89	13.8	1LA6 131-2AA□□		58
11	12.6	160 M	2940	36	EFF2	89.5	89.5	0.88	20	1LA6 163-2AA□□		96
15	17.3	160 M	2940	49	EFF2	90	90.2	0.9	26.5	1LA6 164-2AA□□		105
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32	1LA6 166-2AA□□		115
22	24.5	180 M	2945	71	EFF 2	91.6	91.6	0.86	40.5 ¹⁾	1LG4 183-2AA□□		145
30	33.5	200 L	2950	97	EFF 2	91.8	91.9	0.88	54 ¹⁾	1LG4 206-2AA□□		205
37	41.5	200 L	2955	120	EFF 2	92.9	93.2	0.89	65 ¹⁾	1LG4 207-2AA□□		225
45	51	225 M	2960	145	EFF 2	93.6	93.9	0.88	79 ¹⁾	1LG4 223-2AA□□		285
55	62	250 M	2970	177	EFF 2	93.6	93.8	0.88	96	1LG4 253-2AB□□		375
75	84	280 S	2975	241	EFF 2	94.5	94.3	0.88	130 ¹⁾	1LG4 280-2AB□□		500
90	101	280 M	2975	289	EFF 2	95.1	95.2	0.89	154 ¹⁾	1LG4 283-2AB□□		540
110	123	315 S	2982	352		94.6	93.8	0.88	190 ¹⁾	1LG4 310-2AB□□		720
132	148	315 M	2982	423		95.1	94.8	0.9	225 ¹⁾	1LG4 313-2AB□□		775
160	180	315 L	2982	512		95.5	95.3	0.91	265 ²⁾	1LG4 316-2AB□□		900
200	224	315 L	2982	641		95.9	95.8	0.92	325 ²⁾	1LG4 317-2AB□□		1015

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ⁴⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ^{4) 5)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–
1LG4 317 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

For footnotes, see page 2/39 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA6 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA6 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA6 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA6 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA6 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA6 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LG4 183-2AA□□	2.5	6.4	3.4	16	0.068	67	80
1LG4 206-2AA□□	2.3	6.5	3	16	0.13	73	86
1LG4 207-2AA□□	2.5	7.2	3.3	16	0.15	73	86
1LG4 223-2AA□□	2.4	6.7	3.1	16	0.22	73	86
1LG4 253-2AB□□	2.1	6.7	3.1	13	0.4	75	88
1LG4 280-2AB□□	2.5	7.5	3.1	13	0.72	74	87
1LG4 283-2AB□□	2.6	7.2	3.1	13	0.83	74	87
1LG4 310-2AB□□	2.4	7.2	3.1	13	1.2	81	95
1LG4 313-2AB□□	2.4	6.9	3	13	1.4	80	94
1LG4 316-2AB□□	2.4	7	3	13	1.6	79	92
1LG4 317-2AB□□	2.3	6.7	2.9	13	2.1	79	92

- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- For connection to 400 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- If motors 1LG4 183-... bis 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 1LG4 220-... bis 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

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Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection												
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7	1LA6 106-4AA□□		33
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4	1LA6 107-4AA□□		36
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2	1LA6 113-4AA□□		45
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4	1LA6 130-4AA□□		55
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2	1LA6 133-4AA□□		62
11	12.6	160 M	1459	72	EFF2	88.5	89	0.84	21.5	1LA6 163-4AA□□		100
15	17.3	160 L	1459	98	EFF2	90	90.2	0.84	28.5	1LA6 166-4AA□□		114
18.5	21.3	180 M	1465	121	EFF 2	90.4	90.8	0.84	35 ¹⁾	1LG4 183-4AA□□		140
22	25.3	180 L	1465	143	EFF 2	91	91.5	0.84	41.5 ¹⁾	1LG4 186-4AA□□		155
30	34.5	200 L	1465	196	EFF 2	91.6	92	0.85	56 ¹⁾	1LG4 207-4AA□□		205
37	42.5	225 S	1475	240	EFF 2	92.2	92.6	0.85	68 ¹⁾	1LG4 220-4AA□□		265
45	52	225 M	1475	291	EFF 2	93.1	93.6	0.86	81 ¹⁾	1LG4 223-4AA□□		300
55	63	250 M	1480	355	EFF 2	93.5	93.8	0.85	100	1LG4 253-4AA□□		390
75	86	280 S	1485	482	EFF 2	94.2	94.1	0.85	136 ¹⁾	1LG4 280-4AA□□		535
90	104	280 M	1485	579	EFF 2	94.6	94.6	0.86	160 ¹⁾	1LG4 283-4AA□□		580
110	127	315 S	1488	706		94.6	94.6	0.85	198 ¹⁾	1LG4 310-4AA□□		730
132	152	315 M	1488	847		95.2	95.2	0.85	235 ¹⁾	1LG4 313-4AA□□		810
160	184	315 L	1486	1028		95.7	95.8	0.86	280 ²⁾	1LG4 316-4AA□□		955
200	230	315 L	1486	1285		95.9	96.2	0.88	340 ²⁾	1LG4 317-4AA□□		1060

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange		IM B35	With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ⁴⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁴⁾⁵⁾		IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 - □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 - □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 - □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 - □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 - □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 - □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG4 317 - □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 2/41 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA6 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA6 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA6 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA6 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA6 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA6 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LG4 183-4AA□□	2.4	6.7	3.1	16	0.099	65	78
1LG4 186-4AA□□	2.5	6.9	3.2	16	0.12	65	78
1LG4 207-4AA□□	2.5	6.7	3.4	16	0.19	66	79
1LG4 220-4AA□□	2.5	6.7	3.1	16	0.37	66	79
1LG4 223-4AA□□	2.7	7.2	3.2	16	0.45	66	79
1LG4 253-4AA□□	2.4	6.1	2.8	16	0.69	65	78
1LG4 280-4AA□□	2.5	7.1	3	16	1.2	70	83
1LG4 283-4AA□□	2.5	7.4	3	16	1.4	68	82
1LG4 310-4AA□□	2.5	6.4	2.8	16	1.9	70	83
1LG4 313-4AA□□	2.7	6.8	2.9	16	2.3	70	83
1LG4 316-4AA□□	2.7	6.8	2.8	16	2.9	70	83
1LG4 317-4AA□□	2.6	6.5	2.8	16	3.5	71	86

- 1) For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- 2) For connection to 400 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- 3) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 4) 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 5) The "Second shaft extension" option, order code **K16** is not possible.
- 6) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 7) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

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Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output						Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Efficiency at 50 Hz 2/4-load					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection													
1.5	1.75	100 L	925	15		74	74	0.75	3.9		1LA6 106-6AA□□		33
2.2	2.55	112 M	940	22		78	78.5	0.78	5.2		1LA6 113-6AA□□		40
3	3.45	132 S	949	30		79	79.5	0.76	7.2		1LA6 130-6AA□□		50
4	4.6	132 M	949	40		80.5	80.5	0.76	9.4		1LA6 133-6AA□□		57
5.5	6.3	132 M	949	55		83	83	0.76	12.6		1LA6 134-6AA□□		66
7.5	8.6	160 M	960	75		86	86	0.74	17		1LA6 163-6AA□□		103
11	12.6	160 L	960	109		87.5	87.5	0.74	24.5		1LA6 166-6AA□□		122
15	18	180 L	965	148		88.9	90.3	0.83	29.5		1LG4 186-6AA□□		150
18.5	22	200 L	975	181		89.8	90.2	0.81	36.5		1LG4 206-6AA□□		195
22	26.5	200 L	975	215		90.3	91	0.81	43.5		1LG4 207-6AA□□		205
30	36	225 M	978	293		91.8	92.8	0.83	57 ¹⁾		1LG4 223-6AA□□		280
37	44.5	250 M	980	361		92.3	93	0.83	70		1LG4 253-6AA□□		370
45	54	280 S	985	436		92.4	93.1	0.85	83		1LG4 280-6AA□□		475
55	66	280 M	985	533		92.7	93.3	0.86	100		1LG4 283-6AA□□		510
75	90	315 S	988	725		93.5	93.7	0.84	138		1LG4 310-6AA□□		685
90	108	315 M	988	870		93.9	94.2	0.84	164 ¹⁾		1LG4 313-6AA□□		750
110	132	315 L	988	1063		94.3	94.6	0.86	196		1LG4 316-6AA□□		890
132	158	315 L	988	1276		94.8	95	0.86	235		1LG4 317-6AA□□		980
160	192	315 L	988	1547		95	95.1	0.86	285 ²⁾		1LG4 318-6AA□□		1180

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz			60 Hz			Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ⁴⁾	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁴⁾⁵⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 - . . . □□	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 - . . . □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG4 317 - . . . □□														
1LG4 318 - . . . □□														

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 2/43 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA6 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA6 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA6 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA6 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA6 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA6 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LG4 186-6AA□□	2.3	5.3	2.5	16	0.18	56	69
1LG4 206-6AA□□	2.5	5.6	2.5	16	0.24	56	70
1LG4 207-6AA□□	2.6	5.7	2.5	16	0.29	57	70
1LG4 223-6AA□□	2.7	5.6	2.5	16	0.49	60	73
1LG4 253-6AA□□	2.7	6	2.3	16	0.76	59	73
1LG4 280-6AA□□	2.4	6.1	2.4	16	1.1	61	74
1LG4 283-6AA□□	2.5	6.3	2.5	16	1.4	61	74
1LG4 310-6AA□□	2.5	6.5	2.8	16	2.1	65	78
1LG4 313-6AA□□	2.6	6.8	2.9	16	2.5	65	78
1LG4 316-6AA□□	2.5	6.8	2.9	16	3.2	62	77
1LG4 317-6AA□□	3.1	7.3	3	16	4	62	76
1LG4 318-6AA□□	3	7.5	3	16	4.7	65	78

- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- For connection to 400 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

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Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output				Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP								
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection													
0.75	0.86	100 L	679	11			66	65	0.76	2.15	1LA6 106-8AB□□		29
1.1	1.3	100 L	679	15			72	72	0.76	2.9	1LA6 107-8AB□□		32
1.5	1.75	112 M	705	20			74	74	0.76	3.85	1LA6 113-8AB□□		39
2.2	2.55	132 S	700	30			75	75	0.74	5.7	1LA6 130-8AB□□		50
3	3.45	132 M	700	41			77	77.5	0.74	7.6	1LA6 133-8AB□□		57
4	4.6	160 M	715	53			80	80	0.72	10	1LA6 163-8AB□□		91
5.5	6.3	160 M	709	74			83.5	83.5	0.73	13	1LA6 164-8AB□□		102
7.5	8.6	160 L	715	100			85.5	85.5	0.72	17.6	1LA6 166-8AB□□		122
11	13.2	180 L	725	145			87.5	88.3	0.73	25	1LG4 186-8AB□□		150
15	18	200 L	725	198			87.7	88.4	0.76	32.5	1LG4 207-8AB□□		205
18.5	22	225 S	730	242			89.4	90.4	0.78	38.5	1LG4 220-8AB□□		270
22	26.5	225 M	730	288			89.7	90.7	0.79	45	1LG4 223-8AB□□		290
30	36	250 M	730	392			91.4	92.2	0.81	58	1LG4 253-8AB□□		385
37	44.5	280 S	735	481			92	92.8	0.81	72	1LG4 280-8AB□□		475
45	54	280 M	735	585			92.4	93.3	0.81	87	1LG4 283-8AB□□		515
55	66	315 S	740	710			93	93.4	0.81	106	1LG4 310-8AB□□		680
75	90	315 M	738	971			93.3	94	0.83	140	1LG4 313-8AB□□		745
90	108	315 L	738	1165			93.4	94	0.83	168	1LG4 316-8AB□□		865
110	132	315 L	738	1423			94	94.4	0.83	205	1LG4 317-8AB□□		1020
132	158	315 L	738	1708			94.2	94.6	0.83	245	1LG4 318-8AB□□		1100

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz				60 Hz		Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM V1 with protective cover 2) 3)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁴⁾	–	✓	✓	–	–	–
1LG4 313 □□														
1LG4 316 □□	–	○	–	○	–	○	□ ⁵⁾	–	✓	✓	✓	–	–	–
1LG4 317 □□														
1LG4 318 □□														

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 2/45 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with increased efficiency – Cast-iron series 1LA6/1LG4

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA6 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA6 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA6 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA6 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA6 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA6 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA6 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LG4 186-8AB□□	1.7	4.2	2.1	13	0.17	65	78
1LG4 207-8AB□□	2.2	4.9	2.6	13	0.29	67	80
1LG4 220-8AB□□	2.3	5.5	2.7	13	0.48	57	70
1LG4 223-8AB□□	2.3	5.6	2.8	13	0.55	50	64
1LG4 253-8AB□□	2.3	5.5	2.6	13	0.84	55	68
1LG4 280-8AB□□	2.2	5	2.1	13	1.1	55	69
1LG4 283-8AB□□	2.2	5.1	2.1	13	1.4	58	71
1LG4 310-8AB□□	2.2	5.8	2.6	13	2.1	59	73
1LG4 313-8AB□□	2.2	5.7	2.6	13	2.5	57	71
1LG4 316-8AB□□	2.2	5.8	2.7	13	3.1	59	73
1LG4 317-8AB□□	2.4	6.1	2.8	13	3.9	59	73
1LG4 318-8AB□□	2.5	6.5	2.9	13	4.5	60	74

- 1) If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Cast-iron series 1LG4

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output											
30	33.5	180 L	2950	97	92.8	92.9	0.86	54 ¹⁾	1LG4 188-2AA□□		175
45	51	200 L	2955	145	93.6	93.7	0.89	78 ¹⁾	1LG4 208-2AA□□		255
55	62	225 M	2960	177	94.8	95	0.89	94 ¹⁾	1LG4 228-2AA□□		335
75	84	250 M	2970	241	94.5	94.5	0.88	130 ¹⁾	1LG4 258-2AA□□		420
110	123	280 M	2975	353	95.5	95.6	0.9	184 ¹⁾	1LG4 288-2AB□□		630
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output											
30	34.5	180 L	1465	196	91.7	91.9	0.8	59 ¹⁾	1LG4 188-4AA□□		180
37	42.5	200 L	1465	241	92.5	92.8	0.83	70 ¹⁾	1LG4 208-4AA□□		230
55	63	225 M	1475	356	93.4	93.9	0.86	99 ¹⁾	1LG4 228-4AA□□		330
75	86	250 M	1482	483	94.3	94.4	0.85	136 ¹⁾	1LG4 258-4AA□□		460
110	127	280 M	1488	706	95.2	94.9	0.84	198 ¹⁾	1LG4 288-4AA□□		680
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output											
18.5	22	180 L	970	182	89.6	90.3	0.8	37.5 ¹⁾	1LG4 188-6AA□□		175
30	36	200 L	975	294	90.9	91.3	0.8	60 ¹⁾	1LG4 208-6AA□□		245
37	44.5	225 M	978	361	92.2	93	0.83	70 ¹⁾	1LG4 228-6AA□□		325
45	54	250 M	982	438	93.3	93.8	0.83	84	1LG4 258-6AA□□		405
75	90	280 M	985	727	93.8	94.3	0.85	136 ¹⁾	1LG4 288-6AA□□		570
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output											
15	18	180 L	720	199	87.8	88.5	0.73	34 ¹⁾	1LG4 188-8AB□□		165
18.5	22	200 L	725	244	88.3	89.2	0.78	39	1LG4 208-8AB□□		230
30	36	225 M	730	392	90.4	91.2	0.79	61 ¹⁾	1LG4 228-8AB□□		340
37	44.5	250 M	730	484	91.9	92.8	0.82	71	1LG4 258-8AB□□		430
55	66	280 M	735	715	92.9	93.7	0.81	106	1LG4 288-8AB□□		565

Order No. supplements

Motor type	Penultimate position: Voltage code								Final position: Type of construction code						
	50 Hz				60 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6			0	1	4	6	2	7	3
1LG4 18 - . . . □□	○	○	○	○	○	○			□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 - . . . □□	○	○	○	○	○	○			□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 - . . . □□	○	○	○	○	○	○			□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 - . . . □□	○	○	○	○	○	○			□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 - . . . □□	○	○	○	○	○	○			□	✓ ⁵⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- ²⁾ If motors 1LG4 188-... to 1LG4 288-... (motor series 1LG4 frame sizes 180 L to 280 M) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG4 220-... to 1LG4 288-... motors (motor series 1LG4 frame sizes 225 M to 280 M) are supplied with two screw-in eyebolts in accordance with IM B 5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated motors with increased output –
Cast-iron series 1LG4

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output							
1LG4 188-2AA□□	2.4	7.1	3.4	16	0.09	71	84
1LG4 208-2AA□□	2.5	6.9	3.2	16	0.18	73	86
1LG4 228-2AA□□	2.6	7.3	3.2	16	0.27	70	84
1LG4 258-2AA□□	2.4	7.1	3.1	16	0.48	75	88
1LG4 288-2AB□□	2.5	7	3	13	1	74	87
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output							
1LG4 188-4AA□□	2.6	6.3	2.9	16	0.14	65	78
1LG4 208-4AA□□	2.6	6.5	3	16	0.23	66	79
1LG4 228-4AA□□	2.5	6.5	2.7	16	0.49	66	79
1LG4 258-4AA□□	2.5	7	3	16	0.86	67	80
1LG4 288-4AA□□	2.8	7.9	3.3	16	1.71	70	83
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output							
1LG4 188-6AA□□	2.3	4.9	2.4	16	0.2	56	69
1LG4 208-6AA□□	2.6	5.8	2.6	16	0.36	57	70
1LG4 228-6AA□□	2.5	5.9	2.8	16	0.62	56	69
1LG4 258-6AA□□	2.7	6.3	2.3	16	0.93	58	72
1LG4 288-6AA□□	3	6.8	2.8	16	1.65	61	74
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, with increased output							
1LG4 188-8AB□□	2	4.5	2.4	13	0.21	67	80
1LG4 208-8AB□□	2.4	5.2	2.6	13	0.37	57	70
1LG4 228-8AB□□	2.6	5.6	2.8	13	0.66	61	74
1LG4 258-8AB□□	2.4	5.6	2.6	13	1.06	55	68
1LG4 288-8AB□□	2.4	5.6	2.3	13	1.63	58	71

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency Class according to CEMEP (EFF I)	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos \phi_{rated}$	Rated current at 400 V, 50 Hz I_{rated} A	For order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
22	180 M	2955	71	EFF 1	94.1	94.5	0.88	38.5 ¹⁾	1LG6 183-2AA□□		180
30	200 L	2960	97	EFF 1	93.5	93.4	0.88	53 ¹⁾	1LG6 206-2AA□□		225
37	200 L	2960	119	EFF 1	94.1	94	0.89	64 ¹⁾	1LG6 207-2AA□□		255
45	225 M	2965	145	EFF 1	94.9	95.1	0.89	77 ¹⁾	1LG6 223-2AA□□		330
55	250 M	2975	177	EFF 1	95.3	95.3	0.9	93	1LG6 253-2AA□□		420
75	280 S	2975	241	EFF 1	95.2	95.2	0.89	128 ¹⁾	1LG6 280-2AB□□		530
90	280 M	2978	289	EFF 1	95.6	95.7	0.9	150 ¹⁾	1LG6 283-2AB□□		615
110	315 S	2982	352		95.8	95.7	0.91	182 ¹⁾	1LG6 310-2AB□□		790
132	315 M	2982	423		96	95.9	0.91	220 ¹⁾	1LG6 313-2AB□□		915
160	315 L	2982	512		96.4	96.4	0.92	260	1LG6 316-2AB□□		1055
200	315 L	2982	641		96.5	96.5	0.93	320	1LG6 317-2AB□□		1245
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
18.5	180 M	1470	120	EFF 1	92.6	93.2	0.83	34.5 ¹⁾	1LG6 183-4AA□□		155
22	180 L	1470	143	EFF 1	93.2	93.5	0.84	40.5 ¹⁾	1LG6 186-4AA□□		180
30	200 L	1470	195	EFF 1	93.3	93.4	0.85	55 ¹⁾	1LG6 207-4AA□□		225
37	225 S	1480	239	EFF 1	94	94.4	0.85	67 ¹⁾	1LG6 220-4AA□□		290
45	225 M	1480	290	EFF 1	94.5	94.7	0.85	81 ¹⁾	1LG6 223-4AA□□		330
55	250 M	1485	354	EFF 1	95.1	95.3	0.87	96	1LG6 253-4AA□□		460
75	280 S	1485	482	EFF 1	95.1	95.2	0.87	130 ¹⁾	1LG6 280-4AA□□		575
90	280 M	1486	578	EFF 1	95.4	95.5	0.86	158 ¹⁾	1LG6 283-4AA□□		675
110	315 S	1488	706		95.9	96	0.87	190 ¹⁾	1LG6 310-4AA□□		810
132	315 M	1488	847		96.1	96.2	0.88	225 ¹⁾	1LG6 313-4AA□□		965
160	315 L	1490	1026		96.3	96.4	0.88	275 ²⁾	1LG6 316-4AA□□		1105
200	315 L	1490	1282		96.4	96.5	0.88	340 ²⁾	1LG6 317-4AA□□		1305

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange				With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover ^{4) 5)}	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ^{4) 6)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	4	6	2	7	3
1LG6 18 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - ... □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - ... □□	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–
1LG6 317 - ... □□	–	–	–	–	–	–	–	–	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

For footnotes, see page 2/49 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LG6 183-2AA□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2AA□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2AA□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2AA□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2AA□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2AB□□	2.5	7	3	13	0.83	73	86
1LG6 283-2AB□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2AB□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2AB□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2AB□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2AB□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LG6 183-4AA□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4AA□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4AA□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4AA□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4AA□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4AA□□	2.6	7.5	3	16	0.86	61	75
1LG6 280-4AA□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4AA□□	2.7	7.5	3.1	16	1.7	67	80
1LG6 310-4AA□□	2.7	7.1	2.9	16	2.3	65	79
1LG6 313-4AA□□	2.7	7.3	2.9	16	2.9	64	78
1LG6 316-4AA□□	3	7.4	3	16	3.5	64	79
1LG6 317-4AA□□	3.2	7.6	3	16	4.2	64	79

The motors can also be used for 60 Hz according to EPACT, see pages 2/52 to 2/57.

- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- For connection to 400 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- If motors 1LG6 183-... to 1LG6 317-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 1LG6 220-... to 1LG6 317-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output		Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
15	180 L	975	147		90.9	91.7	0.81	29.5	1LG6 186-6AA□□		175
18.5	200 L	978	181		91.2	91.8	0.81	36	1LG6 206-6AA□□		210
22	200 L	978	215		91.9	92.5	0.82	42	1LG6 207-6AA□□		240
30	225 M	980	292		93.2	93.7	0.83	56 ¹⁾	1LG6 223-6AA□□		325
37	250 M	985	359		93.7	94.1	0.83	69	1LG6 253-6AA□□		405
45	280 S	988	435		94.4	94.6	0.85	81	1LG6 280-6AA□□		520
55	280 M	988	532		94.6	94.8	0.85	99	1LG6 283-6AA□□		570
75	315 S	990	723		95	95	0.83	138	1LG6 310-6AA□□		760
90	315 M	990	868		95.3	95.4	0.85	160 ¹⁾	1LG6 313-6AA□□		935
110	315 L	990	1061		95.6	95.7	0.85	196	1LG6 316-6AA□□		1010
132	315 L	990	1273		95.8	95.8	0.85	235	1LG6 317-6AA□□		1180
160	315 L	990	1543		95.8	95.9	0.86	280 ²⁾	1LG6 318-6AA□□		1245
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP											
11	180 L	725	145		88.7	89.6	0.76	23.5	1LG6 186-8AB□□		165
15	200 L	725	198		89.3	89.8	0.8	30.5	1LG6 207-8AB□□		235
18.5	225 S	730	242		91.1	91.8	0.81	36	1LG6 220-8AB□□		295
22	225 M	730	288		91.6	92.1	0.81	43	1LG6 223-8AB□□		335
30	250 M	735	390		92.8	93.3	0.82	57	1LG6 253-8AB□□		435
37	280 S	738	479		93.1	93.3	0.81	71	1LG6 280-8AB□□		510
45	280 M	738	582		93.7	94	0.81	86	1LG6 283-8AB□□		560
55	315 S	740	710		94.3	94.4	0.82	102	1LG6 310-8AB□□		750
75	315 M	740	968		94.5	94.7	0.83	138	1LG6 313-8AB□□		840
90	315 L	740	1161		94.7	95.1	0.84	164	1LG6 316-8AB□□		1005
110	315 L	740	1420		94.8	95.1	0.84	200	1LG6 317-8AB□□		1100
132	315 L	740	1704		94.9	95.2	0.84	240	1LG6 318-8AB□□		1270

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ³⁾	IM B5, IM V1 without protective cover IM V3 ^{4) 5)}	IM V1 without protective cover ⁴⁾	IM V1 with protective cover ^{4) 6)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	8	4	6	2	7	3
1LG6 18 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - . . . □□	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 317 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 318 - . . . □□	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 2/51 bottom.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LG6 186-6AA□□	2.4	5.5	2.5	16	0.2	52	65
1LG6 206-6AA□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6AA□□	2.4	5.6	2.4	16	0.36	56	70
1LG6 223-6AA□□	2.8	6.5	2.9	16	0.63	54	68
1LG6 253-6AA□□	2.9	6.8	2.5	16	0.93	57	70
1LG6 280-6AA□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6AA□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6AA□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6AA□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6AA□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6AA□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6AA□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, for implementation according to CEMEP							
1LG6 186-8AB□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8AB□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8AB□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8AB□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8AB□□	2.5	6	2.8	13	1.1	53	67
1LG6 280-8AB□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8AB□□	2.6	6.1	2.5	13	1.6	58	71
1LG6 310-8AB□□	2.5	6.3	2.9	13	2.5	58	72
1LG6 313-8AB□□	2.5	6.7	2.9	13	3.1	58	72
1LG6 316-8AB□□	2.4	6.3	2.8	13	3.9	57	71
1LG6 317-8AB□□	2.4	6.4	2.6	13	4.5	57	71
1LG6 318-8AB□□	2.5	6.7	2.9	13	5.3	58	72

The motors can also be used for 60 Hz according to EPACT, see pages 2/52 to 2/57.

- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- For connection to 400 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
- If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output			EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT											
30	180 M	3560	60	Yes	93	0.88	34		1LG6 183-2AA□□		180
40	200 L	3565	80	Yes	91.7	0.88	46		1LG6 206-2AA□□		225
50	200 L	3565	100	Yes	92.4	0.89	57		1LG6 207-2AA□□		255
60	225 M	3570	120	Yes	93.6	0.89	67		1LG6 223-2AA□□		330
75	225 M	3570	150	Yes	94.5	0.9	83		1LG6 228-2AA□□¹⁾		390
75	250 M	3578	149	No	93.6	0.89	84		1LG6 253-2AA□□		420
100	250 M	3580	199	Yes	94.1	0.89	112		1LG6 258-2AA□□¹⁾		470
100	280 S	3580	199	No	95	0.89	110		1LG6 280-2AB□□		530
125	280 M	3580	249	Yes	95	0.9	136		1LG6 283-2AB□□		615
150	280 M	3580	299	Yes	95	0.9	164		1LG6 288-2AA□□¹⁾		660
150	315 S	3585	298	Yes	94.5	0.91	164		1LG6 310-2AB□□		790
175	315 M	3586	348	Yes	95	0.91	190		1LG6 313-2AB□□		915
200	315 L	3588	397	Yes	95.4	0.91	215		1LG6 316-2AB□□		1055
250	315 L	3588	496	No	95.4	0.93	265		1LG6 317-2AB□□		1245
300	315 L	3591	595	No	95.4	0.92	320		1LG6 318-2AA□□¹⁾		1330

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code							
	60 Hz		Without flange	With flange			With standard flange		With special flange	
	460 VY (see "Introduction" for outputs at 60 Hz)	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover ^{3) 4)}	IM V1 without protective cover ³⁾	IM V1 with protective cover ^{3) 5)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - ... □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - ... □□	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–
1LG6 317 - ... □□										
1LG6 318 - ... □□										

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ Only 60 Hz data according to EPACT on the rating plate.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- ⁷⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 183-2AA□□	2.7	7.9	3.7	16	0.086	72	85
1LG6 206-2AA□□	2.7	7.8	3.7	16	0.15	75	88
1LG6 207-2AA□□	2.8	7.8	3.7	16	0.18	75	88
1LG6 223-2AA□□	2.8	8.3	3.6	16	0.27	74	87
1LG6 228-2AA□□	3.3	8.7	3.7	16	0.32	74	87
1LG6 253-2AA□□	2.7	7.5	3.2	16	0.47	75	88
1LG6 258-2AA□□	2.8	8.4	3.5	16	0.57	79	92
1LG6 280-2AB□□	2.8	7.9	3.4	13	0.83	77	90
1LG6 283-2AB□□	2.9	8.3	3.4	13	1	77	90
1LG6 288-2AA□□	3.1	8.5	3.6	16	1.16	77	90
1LG6 310-2AB□□	2.6	7.5	3.1	13	1.4	81	94
1LG6 313-2AB□□	3	8.3	3.3	13	1.6	81	94
1LG6 316-2AB□□	3	8.4	3.5	13	2.1	81	94
1LG6 317-2AB□□	3.2	8.6	3.4	13	2.5	81	94
1LG6 318-2AA□□	4.1	10	3.9	16	2.74	83	96

The motors can also be used for 50 Hz according to CEMEP, see pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output	Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT											
25	180 M	1775	100	Yes	92.4	0.82	31		1LG6 183-4AA□□		155
30	180 L	1775	120	Yes	92.4	0.83	36.5		1LG6 186-4AA□□		180
40	200 L	1775	160	Yes	93	0.84	48		1LG6 207-4AA□□		225
50	225 S	1785	199	No	93.6	0.84	60		1LG6 220-4AA□□		290
60	225 M	1785	239	Yes	94.1	0.85	70		1LG6 223-4AA□□		330
75	225 M	1785	299	Yes	94.1	0.85	88		1LG6 228-4AA□□ ¹⁾		355
75	250 M	1790	298	No	94.5	0.86	86		1LG6 253-4AA□□		460
100	250 M	1788	398	Yes	94.5	0.86	116		1LG6 258-4AA□□ ¹⁾		495
100	280 S	1788	398	No	94.5	0.86	114		1LG6 280-4AA□□		575
125	280 M	1790	497	Yes	95	0.86	144		1LG6 283-4AA□□		675
150	280 M	1788	598	Yes	95	0.86	172		1LG6 288-4AA□□ ¹⁾		710
150	315 S	1791	596	Yes	95	0.87	170		1LG6 310-4AA□□		810
175	315 M	1791	696	Yes	95.4	0.87	198		1LG6 313-4AA□□		965
200	315 L	1792	795	Yes	95.4	0.87	225		1LG6 316-4AA□□		1105
250	315 L	1792	994	No	95.8	0.87	280		1LG6 317-4AA□□		1305
300	315 L	1792	1193	No	95.8	0.87	335		1LG6 318-4AA□□ ¹⁾		1345

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code							
	60 Hz		Without flange	With flange			With standard flange		With special flange	
	460 VY (see “Introduction” for outputs at 60 Hz)	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover IM V3 ^{3) 4)}	IM V1 without protective cover ³⁾	IM V1 with protective cover ^{3) 5)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - . . . □□	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - . . . □□										
1LG6 316 - . . . □□	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 317 - . . . □□										
1LG6 318 - . . . □□										

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

- ¹⁾ Only 60 Hz data according to EPACT on the rating plate.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The “Second shaft extension” option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 183-4AA□□	2.9	7.1	3.3	16	0.12	65	78
1LG6 186-4AA□□	2.8	7.4	3.4	16	0.14	65	78
1LG6 207-4AA□□	3	7.7	3.7	16	0.23	66	79
1LG6 220-4AA□□	3.1	7.5	3.4	16	0.4	65	78
1LG6 223-4AA□□	3.3	7.9	3.5	16	0.49	65	78
1LG6 228-4AA□□	3	7.8	3.3	16	0.66	64	78
1LG6 253-4AA□□	2.9	8.2	3.4	16	0.86	68	81
1LG6 258-4AA□□	3	8.1	3.3	16	0.99	72	86
1LG6 280-4AA□□	2.9	7.6	3.2	16	1.4	71	84
1LG6 283-4AA□□	3	8.2	3.4	16	1.7	71	84
1LG6 288-4AA□□	3.1	8.4	3.5	16	1.88	71	85
1LG6 310-4AA□□	3.1	7.8	3.2	16	2.3	75	88
1LG6 313-4AA□□	3.2	8.4	3.3	16	2.9	75	88
1LG6 316-4AA□□	3.7	9	3.6	16	3.5	75	88
1LG6 317-4AA□□	4	9.1	3.7	16	4.2	75	88
1LG6 318-4AA□□	4	9.3	3.7	16	4.5	81	94

The motors can also be used for 50 Hz according to CEMEP, see pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output	Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm			η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT											
20	180 L	1178	121	Yes	91	0.8	25.5		1LG6 186-6AA□□		175
25	200 L	1180	151	Yes	91.7	0.79	32.5		1LG6 206-6AA□□		210
30	200 L	1180	181	Yes	91.7	0.8	38.5		1LG6 207-6AA□□		240
40	225 M	1184	241	Yes	93	0.82	49		1LG6 223-6AA□□		325
50	225 M	1184	301	Yes	93	0.83	61		1LG6 228-6AA□□¹⁾		355
50	250 M	1186	300	No	93	0.82	61		1LG6 253-6AA□□		405
60	250 M	1186	361	Yes	93.6	0.82	73		1LG6 258-6AA□□¹⁾		435
60	280 S	1190	359	No	94.1	0.83	72		1LG6 280-6AA□□		520
75	280 M	1190	449	No	94.5	0.83	89		1LG6 283-6AA□□		570
100	280 M	1190	599	Yes	94.5	0.84	118		1LG6 288-6AA□□¹⁾		615
100	315 S	1191	598	Yes	94.5	0.82	120		1LG6 310-6AA□□		760
125	315 M	1191	747	Yes	95	0.84	148		1LG6 313-6AA□□		935
150	315 L	1192	896	Yes	95	0.84	176		1LG6 316-6AA□□		1010
175	315 L	1192	1046	Yes	95	0.84	205		1LG6 317-6AA□□		1180
200	315 L	1192	1195	Yes	95.4	0.84	235		1LG6 318-6AA□□		1245

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code							With standard flange		With special flange
	60 Hz	460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange	With flange								
			IM B3/6/7/8, IM V6, IM V5 without protective cover ²⁾	IM B5, IM V1 without protective cover IM V3 ^{3) 4)}	IM V1 without protective cover ^{3) 5)}	IM V1 with protective cover ^{3) 5)}	IM B35			IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6		2	7	3	
1LG6 18 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 20 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 22 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 25 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 28 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 310 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 313 - ... □□	○	○	□	✓	–	✓	✓		–	–	–	–
1LG6 316 - ... □□	–	○	□ ⁶⁾	–	✓	✓	✓		–	–	–	–
1LG6 317 - ... □□												
1LG6 318 - ... □□												

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ Only 60 Hz data according to EPACT on the rating plate.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6

2

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 186-6AA□□	2.9	6.5	3	16	0.2	57	70
1LG6 206-6AA□□	2.9	6.5	2.7	16	0.29	65	78
1LG6 207-6AA□□	2.9	6.4	2.7	16	0.36	65	78
1LG6 223-6AA□□	3.4	7.2	3.4	16	0.63	62	75
1LG6 228-6AA□□	3.2	7.6	3.4	16	0.76	61	74
1LG6 253-6AA□□	3.4	7.4	2.9	16	0.93	63	76
1LG6 258-6AA□□	3.4	7.4	2.9	16	1.07	65	79
1LG6 280-6AA□□	3.6	7.7	3.1	16	1.4	62	75
1LG6 283-6AA□□	3.9	8.3	3.3	16	1.6	62	75
1LG6 288-6AA□□	4	8.4	3.3	16	1.94	64	78
1LG6 310-6AA□□	3.3	8.4	3.4	16	2.5	66	79
1LG6 313-6AA□□	3	7.9	3.1	16	3.2	66	79
1LG6 316-6AA□□	3.3	8.5	3.3	16	4	66	79
1LG6 317-6AA□□	3.6	8.9	3.6	16	4.7	66	79
1LG6 318-6AA□□	4	9.4	4	16	5.4	69	82

The motors can also be used for 50 Hz according to CEMEP, see pages 2/48 to 2/51.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminium series 1LP7/1LP5

2

Selection and ordering data

Rated output with		Frame size	Order No.	Price	Weight
			For order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS			m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, with reduced output					
0.12	0.14	63 M	1LP7 060-2AA□□		3.4
0.16	0.18	63 M	1LP7 063-2AA□□		3.9
0.19	0.22	71 M	1LP7 070-2AA□□		4.9
0.27	0.3	71 M	1LP7 073-2AA□□		6.4
0.38	0.45	80 M	1LP7 080-2AA□□		8.0
0.53	0.6	80 M	1LP7 083-2AA□□		9.6
0.82	0.95	90 S	1LP7 090-2AA□□		12.5
1.1	1.3	90 L	1LP7 096-2AA□□		15.2
1.3	1.5	100 L	1LP7 106-2AA□□		22.3
1.8	2.1	112 M	1LP7 113-2AA□□		29.0
2.5	2.9	132 S	1LP7 130-2AA□□		42.0
3.4	3.9	132 S	1LP7 131-2AA□□		51.0
5	5.7	160 M	1LP7 163-2AA□□		70.0
6	6.9	160 M	1LP7 164-2AA□□		82.0
7	8	160 L	1LP7 166-2AA□□		99.0
10	11.5	180 M	1LP5 183-2AA□□		112.0
13.5	15.5	200 L	1LP5 206-2AA□□		160.0
16.5	19	200 L	1LP5 207-2AA□□		182.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz		60 Hz				Without flange	With flange	With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminium series 1LP7/1LP5

2

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
			For order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS			m kg
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, with reduced output					
0.07	0.08	63 M	1LP7 060-4AB□□		3.4
0.12	0.14	63 M	1LP7 063-4AB□□		3.9
0.13	0.15	71 M	1LP7 070-4AB□□		4.7
0.19	0.22	71 M	1LP7 073-4AB□□		5.8
0.27	0.3	80 M	1LP7 080-4AA□□		7.8
0.38	0.45	80 M	1LP7 083-4AA□□		9.1
0.55	0.6	90 S	1LP7 090-4AA□□		11.9
0.66	0.75	90 L	1LP7 096-4AA□□		15.1
1	1.15	100 L	1LP7 106-4AA□□		23.0
1.2	1.4	100 L	1LP7 107-4AA□□		25.0
1.8	2.1	112 M	1LP7 113-4AA□□		30.0
2.5	2.9	132 S	1LP7 130-4AA□□		44.0
3.1	3.6	132 M	1LP7 133-4AA□□		54.0
4.8	5.5	160 M	1LP7 163-4AA□□		74.0
5.4	6.2	160 L	1LP7 166-4AA□□		90.0
7.5	8.5	180 M	1LP5 183-4AA□□		109.0
9	10.5	180 L	1LP5 186-4AA□□		122.0
12	14	200 L	1LP5 207-4AA□□		165.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz		60 Hz				Without flange	With flange	IM B35	With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminium series 1LP7/1LP5

2

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	For order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, with reduced output					
0.045	0.5	63 M	1LP7 063-6AA□□		4.0
0.09	0.105	71 M	1LP7 070-6AA□□		6.1
0.13	0.15	71 M	1LP7 073-6AA□□		6.1
0.18	0.2	80 M	1LP7 080-6AA□□		7.3
0.27	0.3	80 M	1LP7 083-6AA□□		9.1
0.37	0.4	90 S	1LP7 090-6AA□□		12.1
0.5	0.6	90 L	1LP7 096-6AA□□		15.2
0.7	0.8	100 L	1LP7 106-6AA□□		23.3
1.2	1.4	112 M	1LP7 113-6AA□□		26.0
1.7	1.9	132 S	1LP7 130-6AA□□		40.0
2	2.3	132 M	1LP7 133-6AA□□		45.0
2.3	2.65	132 M	1LP7 134-6AA□□		52.0
3.3	3.8	160 M	1LP7 163-6AA□□		74.0
4	4.6	160 L	1LP7 166-6AA□□		99.0
6.5	7.5	180 L	1LP5 186-6AA□□		122.0
8.5	10	200 L	1LP5 206-6AA□□		165.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz			60 Hz			Without flange	With flange	IM B35	With standard flange	IM B34	With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Aluminium series 1LP7/1LP5

2

Selection and ordering data (continued)

Rated output with		Frame size	Order No.	Price	Weight
			For order No. supplements for voltage and type of construction, see table below		For IM B3 type of construction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS			m kg
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, with reduced output					
0.045	0.05	71 M	1LP7 070-8AB□□		6.1
0.06	0.07	71 M	1LP7 073-8AB□□		6.1
0.09	0.105	80 M	1LP7 080-8AB□□		7.3
0.13	0.15	80 M	1LP7 083-8AB□□		9.1
0.25	0.3	90 S	1LP7 090-8AB□□		10.2
0.35	0.4	90 L	1LP7 096-8AB□□		12.8
0.45	0.5	100 L	1LP7 106-8AB□□		19.4
0.65	0.75	100 L	1LP7 107-8AB□□		21.3
0.8	0.9	112 M	1LP7 113-8AB□□		23.3
1.2	1.4	132 S	1LP7 130-8AB□□		40.0
1.45	1.7	132 M	1LP7 133-8AB□□		48.0
1.8	2.1	160 M	1LP7 163-8AB□□		59.0
2.4	2.8	160 L	1LP7 164-8AB□□		68.0
3	3.45	160 L	1LP7 166-8AB□□		88.0
5.5	6.5	180 L	1LP5 186-8AB□□		122.0
7.5	9	200 L	1LP5 207-8AB□□		180.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code					
	50 Hz				60 Hz		Without flange	With flange		With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V1 without protective cover ¹⁾ IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	6	2	7	3
1LP7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓
1LP7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓
1LP5 18 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–
1LP5 20 □□	○	○	○	○	○	○	□	✓ ²⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LP5 183-... to 1LP5 207-... motors (motor series 1LA5, frame sizes 180 M to 200 L) can be supplied with two additional eyebolts; specify supplement **-Z** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct torque	starting as multiple current	as multiple torque					
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	For order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, with reduced output														m kg
7.3	180 M	2945	24	91.0	0.89	13	2.4	6.5	3.4	16	0.068	1LP4 183-2FA□□		140
10	200 L	2950	32	90.9	0.89	17.8	2.3	6.4	2.9	16	0.129	1LP4 206-2FA□□		195
12.5	200 L	2955	40	91.9	0.90	22	2.5	7.1	3.2	16	0.153	1LP4 207-2FA□□		215
15	225 M	2960	48	93.2	0.90	26	2.3	6.7	3.0	16	0.217	1LP4 223-2FA□□		275
18.5	250 M	2970	59	92.6	0.89	32.5	2.0	6.6	3.0	13	0.403	1LP4 253-2FB□□		360
25	280 S	2975	80	93.8	0.90	42.5	2.5	7.6	3.0	13	0.715	1LP4 280-2FB□□		480
30	280 M	2975	96	94.4	0.90	51	2.6	7.2	2.9	13	0.832	1LP4 283-2FB□□		520
37	315 S	2984	118	94.5	0.90	63	2.3	7.3	3.0	13	1.19	1LP4 310-2FB□□		700
44	315 M	2982	141	94.0	0.91	74	2.3	6.8	2.8	13	1.39	1LP4 313-2FB□□		755
53	315 L	2982	170	94.6	0.91	89	2.3	6.9	2.9	13	1.62	1LP4 316-2FB□□		880
67	315 L	2984	214	95.1	0.92	110	2.1	6.5	2.8	13	2.09	1LP4 317-2FB□□		995

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz				60 Hz		Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ (see "Introduction" for outputs at 60 Hz)	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3	
1LP4 18 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 20 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 22 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 25 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 28 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 310 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 313 - . . . □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 316 - . . . □□	–	○	–	○	–	○	□ ³⁾	–	✓ ⁴⁾	✓	–	–	–	–
1LP4 317 - . . . □□	–	○	–	○	–	○	□ ³⁾	–	✓ ⁴⁾	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.
- ⁴⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

2

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\varphi_{rated}$	Rated current at 50 Hz 400 V I_{rated} A	with direct of rated torque T_{LR}/T_{rated}	starting as multiple current I_{LR}/I_{rated}	multiple torque T_B/T_{rated}	CL	J kg m ²	For order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, with reduced output														
6.2	180 M	1465	40	90.6	0.87	11.4	2.1	6.6	3.0	16	0.099	1LP4 183-4FA□□		135
7.3	180 L	1470	47	91.2	0.87	13.2	2.1	6.9	3.1	16	0.117	1LP4 186-4FA□□		150
10	200 L	1465	65	90.5	0.88	18.2	2.3	6.6	3.2	16	0.191	1LP4 207-4FA□□		195
12.5	225 S	1475	81	92.2	0.86	23	2.3	6.6	3.0	16	0.374	1LP4 220-4FA□□		255
15	225 M	1475	97	93.1	0.87	26.5	2.4	7.1	3.1	16	0.447	1LP4 223-4FA□□		290
18.5	250 M	1480	119	93.5	0.87	33	2.2	6.0	2.6	16	0.688	1LP4 253-4FA□□		375
25	280 S	1485	161	93.9	0.87	44	2.4	7.0	2.9	16	1.19	1LP4 280-4FA□□		515
30	280 M	1485	193	94.4	0.88	52	2.4	7.2	2.9	16	1.39	1LP4 283-4FA□□		560
37	315 S	1488	237	94.4	0.87	65	2.2	6.2	2.6	16	1.94	1LP4 310-4FA□□		710
44	315 M	1488	282	95.2	0.87	77	2.4	6.7	2.7	16	2.31	1LP4 313-4FA□□		790
53	315 L	1488	340	95.5	0.87	92	2.5	6.7	2.7	16	2.88	1LP4 316-4FA□□		935
67	315 L	1488	430	95.7	0.88	114	2.3	6.2	2.6	16	3.46	1LP4 317-4FA□□		1040

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz				60 Hz		Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM V3	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	1	6	0	1	8	6	2	7	3	
1LP4 18 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 20 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 22 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 25 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 28 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 310 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 313 - ... □□	○	○	○	○	○	○	□	✓	–	✓	–	–	–	–
1LP4 316 - ... □□	–	○	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	–
1LP4 317 - ... □□	–	○	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

2

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight			
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct of rated torque	starting current	as multiple torque								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²				For order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, with reduced output																	
5	180 L	970	49	89.4	0.83	10	2.1	5.3	2.4	16	0.175	1LP4 186-6FA□□		145			
6.2	200 L	975	61	90.4	0.83	12	2.2	5.7	2.4	16	0.238	1LP4 206-6FA□□		185			
7.3	200 L	975	71	90.8	0.82	14.2	2.3	5.8	2.4	16	0.287	1LP4 207-6FA□□		195			
10	225 M	980	97	92.1	0.84	18.6	2.3	5.5	2.4	16	0.492	1LP4 223-6FA□□		270			
12.5	250 M	982	122	92.5	0.84	23	2.3	5.8	2.2	16	0.762	1LP4 253-6FA□□		355			
15	280 S	986	145	92.5	0.86	27	2.1	6.0	2.3	16	1.12	1LP4 280-6FA□□		455			
18.5	280 M	986	179	92.9	0.86	33.5	2.1	6.0	2.4	16	1.37	1LP4 283-6FA□□		490			
25	315 S	990	241	93.9	0.87	44	2.2	6.6	2.7	16	2.10	1LP4 310-6FA□□		665			
30	315 M	988	290	94.2	0.86	53	2.3	6.8	2.8	16	2.50	1LP4 313-6FA□□		730			
37	315 L	988	358	94.5	0.87	65	2.2	6.6	2.7	16	3.20	1LP4 316-6FA□□		870			
44	315 L	990	424	94.9	0.87	77	2.7	7.2	2.9	16	4.02	1LP4 317-6FA□□		960			

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz						60 Hz		Without flange	With flange	With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾ IM V3	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34
	1	6	3	5	1	6	0	0	1	8	6	2	7	3
1LP4 18 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 20 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 22 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 25 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 28 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 310 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 313 - ... □□	○	○	○	○	○	○	○	□	✓	–	✓	–	–	–
1LP4 316 - ... □□	–	○	–	○	–	○	–	□ ³⁾	–	✓	✓	–	–	–
1LP4 317 - ... □□	–	○	–	○	–	○	–	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-cooled motors without external fan
Cast-iron series 1LP4

2

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No.	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²	For order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx. m kg
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, with reduced output														
3.7	180 L	725	49	88.4	0.76	10	1.5	4.4	2.0	13	0.169	1LP4 186-8FB□□		145
5	200 L	730	65	88.3	0.78	10.4	2.0	5.1	2.5	13	0.290	1LP4 207-8FB□□		195
6.2	225 S	735	81	89.8	0.80	12.4	2.1	5.6	2.6	13	0.482	1LP4 220-8FB□□		260
7.3	225 M	735	95	90.2	0.81	14.4	2.1	5.7	2.7	13	0.551	1LP4 223-8FB□□		280
10	250 M	735	130	91.6	0.82	19.2	2.0	5.4	2.5	13	0.837	1LP4 253-8FB□□		370
12.5	280 S	735	162	92.3	0.82	24	1.9	4.9	2.1	13	1.11	1LP4 280-8FB□□		455
15	280 M	735	195	92.6	0.81	29	1.9	5.0	2.0	13	1.35	1LP4 283-8FB□□		495
18.5	315 S	740	239	93.2	0.83	34.5	2.0	5.8	2.5	13	2.08	1LP4 310-8FB□□		660
25	315 M	738	323	93.5	0.84	46	2.0	5.7	2.5	13	2.48	1LP4 313-8FB□□		725
30	315 L	740	387	93.6	0.84	55	2.0	5.8	2.6	13	3.14	1LP4 316-8FB□□		845
37	315 L	740	477	94.1	0.84	68	2.2	6.0	2.7	13	3.95	1LP4 317-8FB□□		1000

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz						60 Hz		Without flange	With flange	With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	(see "Introduction" for outputs at 60 Hz)		IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾ IM V3	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34
	1	6	3	5	1	6	0	0	1	8	6	2	7	3
1LP4 18 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 20 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 22 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 25 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 28 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 310 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 313 - . . . □□	○	○	○	○	○	○	○	○	□	✓	–	✓	–	–
1LP4 316 - . . . □□	–	○	–	○	–	○	–	○	□ ³⁾	–	✓	✓	–	–
1LP4 317 - . . . □□	–	○	–	○	–	○	–	○	□ ³⁾	–	✓	✓	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ If motors 1LP4 183-... to 1LP4 317-... (motor series 1LP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- ²⁾ 1LP4 220-... to 1LP4 317-... motors (motor series 1LP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Overview

Category	Explanation
Voltages	For standard voltages, see the corresponding Order No. supplements in the selection and ordering data. For other voltages with voltage code 9 and the required order code, see "Special versions", "Selection and ordering data". For further information and details, see the "Introduction" section of the catalogue.
Types of construction	For standard construction types, see the corresponding Order No. supplements in the selection and ordering data. For other types of construction using type of construction code 9 and the required order code, see "Special versions", "Selection and ordering data". For further information and details, see the "Introduction" section of the catalogue.
Motor protection	For an overview of the relevant order codes, see "Special versions", "Selection and ordering data".
Motor connection and connection boxes	For further information and details, see the "Introduction" section of the catalogue.
Windings and insulation	
Colours and paint finish	
Modular technology - Basic versions	
Modular technology - Combinations of basic versions	
Modular technology - Additional versions	
Special technology	
Mechanical design and degrees of protection	
Ambient temperature and site altitude	
Designs in accordance with standards and specifications	
Bearings and lubrication	
Balance and vibration severity	
Shaft and rotor	
Heating and ventilation	
Rating plate and extra rating plates	
Packaging, safety notes, documentation and test certificates	
Design for Zones 2, 21 and 22 according to ATEX	See "Explosion-proof motors"
Ship version	See "Marine motors"

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identification code -Z with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																	
			1LA7 (aluminium)										1LA5 (aluminium)				
Voltage at 50 Hz																	
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A		○	○	○	○	○	○	○	○	○	○	○	○		
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U		○	○	○	○	○	○	○	○	○	○	○	○		
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○	○	○		
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○	○	○		
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Voltage changeover at 60 Hz																	
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	–	
230 VΔΔ/460 VΔ60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	–	
Non-standard voltages and/or frequencies																	
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

For legend and footnotes, see page 2/68.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code -Z with order code and plain text if required	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	

Self-ventilated energy-saving motors with increased efficiency in pole-changing version - Aluminium series 1LA7 and 1LA5

			1LA7 (aluminium)										1LA5 (aluminium)	
Voltage 60 Hz														
220 V; 50 Hz output	9	L4A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
220 V; 60 Hz output	9	L4B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
380 V; 50 Hz output	9	L4C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
380 V; 60 Hz output	9	L4D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
440 V; 50 Hz output	9	L4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
440 V; 60 Hz output	9	L4E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
460 V; 50 Hz output	9	L4J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
460 V; 60 Hz output	9	L4H	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
575 V; 50 Hz output	9	L4N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
575 V; 60 Hz output	9	L4M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard voltage and/or frequencies														
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for Y/Δ starting at low speed ²⁾	9	L3Y •	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ With order codes **L1A, L1C, L1D, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Voltage code 11th position of the Order No.	Additional identification code -Z with order code and plain text if required	Motor type frame size														
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																	
1LA9 (aluminium)																	
Voltage at 50 Hz																	
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A		○	○	○	○	○	○	○	○	○	○				
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U		○	○	○	○	○	○	○	○	○	○				
Voltage at 60 Hz																	
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○				
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○				
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Voltage changeover at 60 Hz																	
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G		–	–	–	–	–	✓	✓	✓	✓	✓				
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H		–	–	–	–	–	✓	✓	✓	✓	✓				
Non-standard voltage and/or frequencies																	
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/70.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with increased output - Aluminium series 1LA9																		
			1LA9 (aluminium)															
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A		○	○	○	○	○	○	○	○	○	○	○				
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U		○	○	○	○	○	○	○	○	○	○	○				
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○	○				
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○	○				
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Voltage changeover at 60 Hz																		
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Non-standard voltage and/or frequencies																		
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ With order codes **L1A**, **L1C**, **L1D**, **L1L**, **L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L	
Self-ventilated motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																			
			1LA6 (cast-iron)								1LG4 (cast-iron)								
Voltage at 50 Hz																			
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R									✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L									✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C									✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D									✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A									○	○	○	○	○	○	○	○	–
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U									○	○	○	○	○	○	○	○	○
Voltage at 60 Hz																			
220 VΔ/380 VY; 50 Hz output	9	L2A									✓	✓	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B									✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C									✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D									✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q									✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W									✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R									✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X									✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S									✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E									○	○	○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T									✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F									○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U									✓	✓	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L									✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V									✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M									○	○	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																			
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •									✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •									✓	✓	✓	✓	✓	✓	✓	✓	

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ With order codes **L1A, L1C, L1D, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code -Z with order code and plain text if required	Motor type frame size														315 S/M	315 L
			56	63	71	80	90	100	112	132	160	180	200	225	250	280		
Self-ventilated motors with increased output - Cast-iron series 1LG4																		
			1LG4 (cast-iron)															
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R												✓	✓	✓	✓	✓
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L												✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C												✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D												✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A												○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U												○	○	○	○	○
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A												✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B												✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C												✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D												✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q												✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W												✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R												✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X												✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S												✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E												○	○	○	○	○
460 VΔ; 50 Hz output	9	L2T												✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F												○	○	○	○	○
575 VY; 50 Hz output	9	L2U												✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L												✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V												✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M												○	○	○	○	○
Non-standard voltage and/or frequencies																		
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y												✓	✓	✓	✓	✓
Non-standard winding for voltages between 200 and 690 V (other voltages are available on request) ²⁾	9	L1Y												✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ With order codes **L1A**, **L1C**, **L1D**, **L1L**, **L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and plain text if necessary	Motor type frame size																315 S/M	315 L					
			56	63	71	80	90	100	112	132	160	180	200	225	250	280									
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																									
																			1LG6 (cast-iron)						
Voltage at 50 Hz																									
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R																	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L																	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C																	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D																	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A																	○	○	○	○	○	○	–
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U																	○	○	○	○	○	○	○
Voltage at 60 Hz																									
220 VΔ/380 VY; 50 Hz output	9	L2A																	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B																	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C																	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D																	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q																	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W																	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R																	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X																	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S																	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E																	○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T																	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F																	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U																	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L																	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V																	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M																	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																									
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y																	✓	✓	✓	✓	✓	✓	✓
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y																	✓	✓	✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ With order codes **L1A, L1C, L1D, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-cooled motors without external fan - Aluminium series 1LP7 and 1LP5																		
			1LP7 (aluminium)										1LP5 (alu- minium)					
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A		○	○	○	○	○	○	○	○	○	○	○	○	○		
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U		○	○	○	○	○	○	○	○	○	○	○	○	○		
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○	○	○	○		
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○	○	○	○		
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Voltage changeover at 60 Hz																		
230 VYY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
230 VΔΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G		○	○	○	○	✓	✓	✓	✓	✓	✓	✓	✓	✓		
230 VΔΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H		○	○	○	○	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard voltage and/or frequencies																		
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

For legend and footnotes, see page 2/75.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L	
Self-cooled motors without external fan - Cast-iron series 1LP4																			
			1LP4 (cast-iron)																
Voltage at 50 Hz																			
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R											✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L											✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C											✓	✓	✓	✓	✓	✓	✓
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D											✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A											○	○	○	○	○	○	○
400 VΔ (460 VΔ at 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U											○	○	○	○	○	○	○
Voltage at 60 Hz																			
220 VΔ/380 VY; 50 Hz output	9	L2A											✓	✓	✓	✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	L2B											✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	L2C											✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D											✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q											✓	✓	✓	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W											✓	✓	✓	✓	✓	✓	✓
440 VΔ; 50 Hz output	9	L2R											✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X											✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S											✓	✓	✓	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E											○	○	○	○	○	○	✓
460 VΔ; 50 Hz output	9	L2T											✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F											○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U											✓	✓	✓	✓	✓	✓	✓
575 VY; 60 Hz output	9	L2L											✓	✓	✓	✓	✓	✓	✓
575 VΔ; 50 Hz output	9	L2V											✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M											○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																			
Standard winding (winding according to voltage code 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •											✓	✓	✓	✓	✓	✓	✓
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •											✓	✓	✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ With order codes **L1A, L1C, L1D, L1L, L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Voltage code 12th position of the Order No.	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																			
			1LA7 (aluminium)									1LA5 (aluminium)							
Without flange																			
IM V5 with protective cover ¹⁾	9	M1F		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With flange																			
IM V3 ²⁾	9	M1G		–	–	–	–	–	–	–	–	–	✓	✓	✓				
With standard flange																			
IM V18 with protective cover ¹⁾	9	M2A		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
With special flange																			
IM V18 with protective cover ¹⁾	9	M2B		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
IM B34	9	M2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																			
Self-ventilated motors with increased output - Aluminium series 1LA9																			
			1LA9 (aluminium)																
Without flange																			
IM V5 with protective cover ¹⁾	9	M1F		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With flange																			
IM V3	9	M1G		–	–	–	–	–	–	–	–	–	✓	✓					
With standard flange																			
IM V18 with protective cover ¹⁾	9	M2A		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
With special flange																			
IM V18 with protective cover ¹⁾	9	M2B		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
IM B34	9	M2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–					

- ✓ With extra charge
- Not possible

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

²⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state identification code **-Z** and order code **K32**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

	Type of construction code 12th position of the Order No.	Additional identification code -Z with order code and plain text if required	Motor type frame size																315 S/M	315 L 2-pole	4-, 6-, 8-pole
			56	63	71	80	90	100	112	132	160	180	200	225	250	280					
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																					
			1LA6 (cast-iron)								1LG4 (cast-iron)										
Without flange																					
IM V5 without protective cover ¹⁾	9	M1D																✓ ²⁾	○		
IM V6 ¹⁾	9	M1E																✓ ²⁾	○		
IM V5 with protective cover ^{1) 3)}	9	M1F																✓ ²⁾	✓		
With flange																					
IM V3 ⁴⁾	9	M1G																			
With standard flange																					
IM V18 with protective cover ³⁾	9	M2A																			
With special flange																					
IM V18 with protective cover ³⁾	9	M2B																			
IM B34	9	M2C																			
Self-ventilated motors with increased output - Cast-iron series 1LG4																					
														1LG4 (cast-iron)							
Without flange																					
IM V5 with protective cover ^{1) 3)}	9	M1F																			
With flange																					
IM V3 ⁴⁾	9	M1G																			
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																					
														1LG6 (cast-iron)							
Without flange																					
IM V5 without protective cover ¹⁾	9	M1D																✓ ²⁾	○		
IM V6 ¹⁾	9	M1E																✓ ²⁾	○		
IM V5 with protective cover ^{1) 3)}	9	M1F																✓ ²⁾	✓		
With flange																					
IM V3 ⁴⁾	9	M1G																			
Self-cooled motors without external fan - Aluminium series 1LP7 and 1LP5																					
			1LP7 (aluminium)								1LP5 (aluminium)										
With flange																					
IM V3 ⁵⁾	9	M1G																			
Special flange																					
IM B34	9	M2C																			
Self-cooled motors without external fan - Cast-iron series 1LP4																					
														1LP4 (cast-iron)							
Without flange																					
IM V5 without protective cover ¹⁾	9	M1D																✓ ²⁾	○		
IM V6 ¹⁾	9	M1E																✓ ²⁾	○		
With flange																					
IM V3 ⁴⁾	9	M1G																			

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

²⁾ 60 Hz version is possible on request.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ 1LG4/1LG6/1LP4 motors of frame sizes 225 S to 315 L are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁵⁾ For frame sizes 180 M to 200 L, the 1LA5 motors can be supplied with two additional eyebolts; state identification code **-Z** and order code **K32**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																
		1LA7 (aluminium)									1LA5 (aluminium)					
Motor protection																
Motor protection with PTC ther- mistors with 3 embedded tem- perature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Motor protection with PTC ther- mistors with 6 embedded tem- perature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3 temperature detectors for tripping	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Installation of 3 PT 100 resistance thermometers	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Motor connection and connection boxes																
ECOFAST motor plug Han- Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–		
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–		
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Cable entry, standard configuration	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓		
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	✓	✓	✓		
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3 cables prgrtruding, 0.5 m long ⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
3 cables prgrtruding, 1.5 m long ⁴⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
6 cables prgrtruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
6 cables prgrtruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
6 cables protruding, 3 m long ⁴⁾	L49		–	–	–	–	–	–	–	–	–	O. R.	O. R.	O. R.		
Connection box on NDE	M64		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Terminal strip for main and auxiliary terminals	M69		–	✓	✓	✓	✓	✓	–	–	–	–	–	–		

For legend, see page 2/82, for footnotes, see page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																
			1LA7 (aluminium)									1LA5 (aluminium)				
Windings and insulation																
Temperature class F, used acc. to F, with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, with increased ambient temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class H at rated output and max. KT 60 °C ⁵⁾	C18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, other requirements	Y52 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Colours and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□	□		
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 6011 reseda green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

For legend, see page 2/82, for footnotes, see page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																
		1LA7 (aluminium)										1LA5 (aluminium)				
Colours and paint finish (continued)																
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○			
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Modular technology - Basic versions ⁶⁾																
Mounting of separately-driven fan	G17		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake ⁷⁾	G26		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Modular technology - Combinations of basic versions ⁶⁾																
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁷⁾	H62		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake and separately driven fan ⁷⁾	H63		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁷⁾	H64		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁷⁾	H98		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁷⁾	H99		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Modular technology - Additional versions																
Brake supply voltage 24 V DC	C00		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Brake supply voltage 400 V AC	C01		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Brake supply voltage 180 V DC, for operation on MICROMASTER 411-ECOFAST ⁸⁾	C02		–	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Mechanical manual brake release with lever (no locking)	K82		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

For legend, see page 2/82, for footnotes, see page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																
			1LA7 (aluminium)										1LA5 (aluminium)			
Special technology ⁶⁾																
Prepared for mounting MMI ⁹⁾	H15		O. R.	O. R.	✓	✓	✓	✓	✓	✓	–	–	–	–		
Mounting of LL 861 900 220 rotary pulse encoder	H70		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 9 rotary pulse encoder to be provided	H74		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 10 rotary pulse encoder to be provided	H75		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Prepared for mounting LL 861 900 220	H78		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Prepared for mounting HOG 9 D 1024 I	H79		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Prepared for mounting HOG 10 D 1024 I	H80		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors ¹⁰⁾	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	✓	✓	✓		
Low-noise version for 2-pole motors with clockwise direction of rotation ⁸⁾	K37		–	–	–	–	–	–	–	✓	✓	✓	✓	✓		
Low-noise version for 2-pole motors with anti-clockwise direction of rotation ⁸⁾	K38		–	–	–	–	–	–	–	✓	✓	✓	✓	✓		
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Condensation drainage holes ¹¹⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Mechanical protection for encoder ¹²⁾	M68		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Ambient temperature and site altitude																
Ambient temperature -40 to +40 °C	D03		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	✓	✓	✓		
Ambient temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹³⁾	D01		✓	✓	✓	✓	✓	–	–	–	–	–	–	–		
Electrical according to NEMA MG1-12	D30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Design according to UL with "Recognition Mark" ¹⁴⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Canadian regulations (CSA) ¹⁵⁾	D40		✓	✓	✓	✓	✓	○	○	○	○	○	○	○		
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹⁶⁾	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Regreasing device ¹⁶⁾	K40		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□	

For legend, see page 2/82, for footnotes, see page 2/83.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Aluminium series 1LA7 and 1LA5																
			1LA7 (aluminium)									1LA5 (aluminium)				
Balance and vibration severity																
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Vibration severity level R ¹⁷⁾ (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Vibration severity levels S ¹⁷⁾ (valid until 11/30/2006; then vibration severity level B)	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Shaft and rotor																
Concentricity of shaft exten- sion, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Concentricity of shaft exten- sion in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Standard shaft made of non- rusting steel	M65		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard cylindrical shaft extension ¹⁹⁾	Y55 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Heating and ventilation																
Fan cover for textile industry	H17		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Metal external fan ²⁰⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate with identifi- cation codes	Y82 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Additional information on rating plate and on package label	Y84 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Packaging, safety notes and test certificates																
Without safety and commission- ing note. Customer's declara- tion of renouncement required.	B00		○	○	○	○	○	○	○	○	○	○	○	○		
With one safety and startup guide per box pallet	B01		○	○	○	○	○	○	○	○	○	○	○	–	–	
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	–	–	
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. On request
- ✓ With extra charge
- Not possible

For footnotes, see page 2/83.

- 1) For appropriate tripping unit, see catalogue LV 1. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code **A11**, prices from **A12** or order code **A12**, prices on request).
- 2) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55**: **A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56**: **A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, H90, H91, H92, H93, H94, H95, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
The following order codes can only be used in combination with the ECOFAST plugs, order code **G56** only with order code **C01** (AC 400 V) or **C02** (DC 180 V): **G26, H62, H63, H64, H98, H99**.
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 5) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in the "Introduction" section of this catalogue refers to KT 40 °C. When the ambient temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00, C01** and **C02**.
- 8) Not possible in motors in a pole-changing version.
- 9) Converter mounting is possible, if the MICROMASTER DA 51.3 type is specified for 230 VΔ/400 VY.
- 10) Not possible for type of construction IM V3.
- 11) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 12) Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 13) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 14) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 15) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) Not possible when brake is mounted.
- 17) For pole-changing motors, please enquire.
- 18) Can be combined with deep-groove bearings of series 60..., 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 19) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- 20) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																	
		1LA9 (aluminium)															
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓					
Motor connection and connection boxes																	
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓				
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	✓	✓				
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
3 cables protruding, 0.5 m long ³⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
3 cables protruding, 1.5 m long ³⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 0.5 m long ³⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 1.5 m long ³⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 3 m long ³⁾	L49		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.				
Connection box on NDE	M64		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, with increased ambient temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, other requirements	Y52 • and identification code		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/87.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																
		1LA9 (aluminium)														
Colours and paint finish																
Special finish in RAL 7030 stone gray		□	□	□	□	□	□	□	□	□	□	□				
Special finish in RAL 1002 sand yellow	M16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 1013 pearl white	M17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 3000 flame red	M18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6011 reseda green	K27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6021 pale green	M19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7001 silver gray	M20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7031 blue gray	K28	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special paint finish in RAL 7032 pebble gray	L42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7035 light gray	M21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special paint finish in RAL 9001 cream	M22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9002 gray white	M23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9005 jet black	L43	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction.	K17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Low-noise version for 2-pole motors with clockwise direction of rotation	K37	–	–	–	–	–	–	–	–	–	–	✓	✓			
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38	–	–	–	–	–	–	–	–	–	–	✓	✓			
IP65 degree of protection	K50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
IP56 degree of protection (non-heavy-sea)	K52	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration-proof version	L03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Condensation drainage holes ⁴⁾	L12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-rusting screws (externally)	M27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																	
		1LA9 (aluminium)															
Ambient temperature and site altitude																	
Ambient temperature -40 to +40 °C	D03		–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	–	–				
Ambient temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Designs in accordance with standards and specifications																	
CCC China Compulsory Certification ⁵⁾	D01		✓	✓	✓	✓	✓	–	–	–	–	–	–				
Electrical according to NEMA MG1-12 ⁶⁾	D30		□	□	□	□	□	□	□	□	□	□	□				
Design according to UL with "Recognition Mark" ⁷⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Canadian regulations (CSA) ⁸⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Regreasing device	K40		–	–	–	–	–	✓	✓	✓ ⁹⁾	✓	✓	✓				
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	□	□	□				
Balance and vibration severity																	
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard cylindrical shaft extension ¹²⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Heating and ventilation																	
Fan cover for textile industry	H17		–	–	–	–	–	–	✓	✓	–	–	–				
Metal external fan ¹¹⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Rating plate and extra rating plates																	
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate with identification codes	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/87.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency - Aluminium series 1LA9																
		1LA9 (aluminium)														
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00		○	○	○	○	○	○	○	○	○	○	○			
With one safety and startup guide per box pallet	B01		○	○	○	○	○	○	○	○	○	○	○	○		
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	○		
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- . R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55**: **A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 4) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 5) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 6) Possible up to 600 V max. For EPACT version or UL standard version (no order code necessary).
- 7) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 9) Not possible for 1LA9 134-6..□□.
- 10) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 11) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- 12) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with increased output - Aluminium series 1LA9																	
		1LA9 (aluminium)															
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓					
Motor connection and connection boxes																	
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	–	–	–	–				
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓				
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	✓	✓				
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 cables protruding, 0.5 m long ³⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.			
3 cables protruding, 1.5 m long ³⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.			
6 cables protruding, 0.5 m long ³⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.			
6 cables protruding, 1.5 m long ³⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.			
6 cables protruding, 3 m long ³⁾	L49		–	–	–	–	–	–	–	–	–	–	O. R.	O. R.			
Connection box on NDE	M64		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Windings and insulation																	
Increased air humidity/temperature with 30 to 60 g water per m³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Colours and paint finish																	
Special finish in RAL 7030 stone gray			▣	▣	▣	▣	▣	▣	▣	▣	▣	▣					
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6011 reseda green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special paint finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special paint finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/90.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size												225	250	280	315
		56	63	71	80	90	100	112	132	160	180	200					
Self-ventilated motors with increased output - Aluminium series 1LA9																	
			1LA9 (aluminium)														
Colours and paint finish (continued)																	
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction.	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		–	–	–	–	–	–	–	–	–	✓	✓				
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		–	–	–	–	–	–	–	–	–	✓	✓				
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Condensation drainage holes	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Ambient temperature and site altitude																	
Ambient temperature -40 to +40 °C	D03		–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	–	–				
Ambient temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Designs in accordance with standards and specifications																	
CCC China Compulsory Certification ⁴⁾	D01		✓	✓	✓	✓	✓	–	–	–	–	–	–				
Electrical according to NEMA MG1-12 ⁵⁾	D30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Design according to UL with "Recognition Mark" ⁶⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Canadian regulations (CSA) ⁷⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Regreasing device	K40		–	–	–	–	–	✓	✓	✓ ⁸⁾	✓	✓	✓				
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	□	□	□				
Balance and vibration severity																	
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁹⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/90.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with increased output - Aluminium series 1LA9																
		1LA9 (aluminium)														
Heating and ventilation																
Fan cover for textile industry	H17		–	–	–	–	–	–	✓	✓	–	–	–			
Metal external fan ¹⁰⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Extra rating plate with identification codes	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00		○	○	○	○	○	○	○	○	○	○	○			
With one safety and startup guide per box pallet	B01		○	○	○	○	○	○	○	○	○	○	○	–		
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	–		
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For appropriate tripping unit, see Catalog LV 1.
- ²⁾ Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55**: **A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- ³⁾ In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- ⁴⁾ CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- ⁵⁾ Possible up to 600 V max. For EPACT version or UL standard version (no order code necessary).
- ⁶⁾ Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- ⁷⁾ Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.

- ⁸⁾ Not possible for 1LA9 134-6..□□.
- ⁹⁾ Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- ¹⁰⁾ For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- ¹¹⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25						–	–	–	–	✓	✓	✓	✓	✓	✓
3 temperature detectors for tripping ¹⁾	A31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61						–	–	–	–	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72						–	–	–	–	✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78						–	–	–	–	✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80						–	–	–	–	✓	✓ ²⁾	✓	✓	✓	✓
Motor connection and connection boxes																
Two-part plate on connection box	K06						–	–	–	–	–	✓	✓	✓	✓	✓
Connection box on RHS	K09						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11						–	–	–	–	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15						□	□	□	□	✓	✓	✓	□	□	□
Cable entry, standard configuration	K54						–	–	–	–	✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K55						–	–	–	–	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00						–	–	–	–	✓	✓	✓	✓	✓	✓
External earthing	L13						✓	✓	✓	✓	□	□	□	□	□	□
Undrilled entry plate	L01						–	–	–	–	○	○	○	○	○	○
6 cables protruding, 1.5 m long ³⁾	L48						–	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ³⁾	L49						–	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - right side ⁴⁾	L51						–	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - left side ⁴⁾	L52						–	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97						–	–	–	–	✓	✓	✓	✓	✓	✓
Stud terminal for cable connection, accessories pack (3 items)	M46						–	–	–	–	–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47						–	–	–	–	–	–	–	✓	✓	✓

For legend and footnotes, see page 2/96.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Windings and insulation																
Temperature class F, used acc. to F, with service factor (SF)	C11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, with increased output	C12						✓	✓	✓	✓	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾
Temperature class F, used acc. to F, with increased ambient temperature	C13						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class H at rated output and max. KT 60 °C ⁶⁾	C18						✓	✓	✓	✓	–	–	–	–	–	–
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19						✓	✓	✓	✓	–	–	–	–	–	–
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	C22						✓	✓	✓	✓	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	C23						✓	✓	✓	✓	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	C24						✓	✓	✓	✓	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	C25						✓	✓	✓	✓	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾	✓ ⁵⁾
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26						✓	✓	✓	✓	–	–	–	–	–	–
Temperature class F, used acc. to F, other requirements	Y52 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colours and paint finish																
Standard finish in RAL 7030 stone gray							–	–	–	–	□	□	□	□	□	□
Special finish in RAL 7030 stone gray	K26 ⁷⁾						□	□	□	□	✓	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 reseda green	K27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 2/96.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identifica- tion code - Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Colours and paint finish (continued)																
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL						–	–	–	–	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology - Basic versions ⁸⁾																
Mounting of separately driven fan ⁹⁾	G17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake ^{9) 10)}	G26						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology - Combinations of basic versions ⁸⁾																
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ¹⁰⁾	H62						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{9) 10)}	H63						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ¹⁰⁾	H64						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ¹⁰⁾	H98						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ¹⁰⁾	H99						–	–	–	–	✓	✓	✓	✓	✓	✓
Modular technology - Additional versions																
Brake supply voltage 24 V DC	C00						–	–	–	–	✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01						–	–	–	–	✓	✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82						–	–	–	–	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
		1LA6 (cast-iron)								1LG4 (cast-iron)						
Special technology ⁸⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72						O. R.	O. R.	O. R.	O. R.	✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of HOG 9 rotary pulse encoder to be provided	H74						O. R.	O. R.	O. R.	O. R.	✓	✓	✓	✓	✓	✓
Mounting of HOG 10 rotary pulse encoder to be provided	H75						–	–	–	–	✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79						O. R.	O. R.	O. R.	O. R.	✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80						–	–	–	–	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction ¹¹⁾	K17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37						–	–	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38						–	–	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03						✓	✓	✓	✓	–	–	–	–	–	–
Condensation drainage holes ¹²⁾	L12						✓	✓	✓	✓	▣	▣	▣	▣	▣	▣
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44						–	–	–	–	–	–	–	–	O. R.	O. R.
Mechanical protection for encoder ¹³⁾	M68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ambient temperature and site altitude																
Ambient temperature -50 to +40 °C	D02						–	–	–	–	✓	✓	✓	✓	✓	✓
Ambient temperature -40 to +40 °C	D03						O. R.	O. R.	O. R.	O. R.	✓	✓	✓	✓	✓	✓
Ambient temperature -30 to +40 °C	D04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Electrical according to NEMA MG1-12	D30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark" ¹⁴⁾	D31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁵⁾	D40						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 2/96.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁶⁾	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36						–	–	–	–	✓	✓	✓	✓	✓ ¹⁷⁾	✓ ¹⁷⁾
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Located bearing DE	K94						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04						✓	✓	✓	□	□	□	□	□	□	□
Insulated bearing cartridge	L27						–	–	–	–	–	–	✓	✓	✓	✓
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02						–	–	–	–	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁹⁾	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of non-rusting steel	M65						✓	✓	✓	✓	–	–	–	–	–	–
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17						✓	✓	✓	✓	–	–	–	–	–	–
Metal external fan ²¹⁾	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36						–	–	–	–	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Packaging, safety notes, documentation and test certificates																
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○	–	–	–	–	–	–
With one safety and startup guide per box pallet	B01						○	○	○	○	–	–	–	–	–	–
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99						○	○	○	○	–	–	–	–	–	–
Connected in star for dispatch	M32						✓	✓	✓	✓	–	–	–	–	–	–
Connected in delta for dispatch	M33						✓	✓	✓	✓	–	–	–	–	–	–

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 4) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 5) Only the 50 Hz data are indicated on the rating plate.
- 6) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in the "Introduction" section of this catalogue refers to KT 40 °C. When the ambient temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 7) For frame sizes 100 to 160, do not specify an order code. Order code is only necessary for frame sizes 180 to 315.
- 8) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 9) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 10) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 11) Not possible for motor series 1LG4 for 2-pole motors.
- 12) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 13) Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 14) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 15) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 17) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 18) Can be combined with deep-groove bearings of series 60..., 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 19) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 20) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- 21) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Options or order codes (supplement **-Z** is required)

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with increased output - Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	
3 temperature detectors for tripping ¹⁾	A31											✓	✓	✓	✓	✓	
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓ ²⁾	✓	✓	✓	
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓ ²⁾	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓ ²⁾	✓	✓	✓	
Motor connection and connection boxes																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	
Connection box on RHS	K09											✓	✓	✓	✓	✓	
Connection box on LHS	K10											✓	✓	✓	✓	✓	
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	
Connection box in cast-iron version	K15											✓	✓	✓	□	□	
Cable entry, standard configuration	K54											✓	✓	✓	✓	✓	
Cable entry, maximum configuration	K55											✓	✓	✓	✓	✓	
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	
Next larger connection box	L00											✓	✓	✓	✓	✓	
Undrilled entry plate	L01											○	○	○	○	○	
External earthing	L13											□	□	□	□	□	
6 cables protruding, 1.5 m long ³⁾	L48											O. R.	O. R.	O. R.	O. R.	O. R.	
6 cables protruding, 3 m long ³⁾	L49											O. R.	O. R.	O. R.	O. R.	O. R.	

For legend and footnotes, see page 2/101.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with increased output - Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Motor connection and connection boxes (continued)																	
Protruding cable ends - right side ⁴⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	
Protruding cable ends - left side ⁴⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.	
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓	
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11											✓	✓	✓	✓	✓	
Temperature class F, used acc. to F, with increased output ⁵⁾	C12											✓	✓	✓	✓	✓	
Temperature class F, used acc. to F, with increased ambient temperature	C13											✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4% ⁵⁾	C22											✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8% ⁵⁾	C23											✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13% ⁵⁾	C24											✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18% ⁵⁾	C25											✓	✓	✓	✓	✓	
Colours and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓	
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓	
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓	
Special finish in RAL 6011 reseda green	K27											✓	✓	✓	✓	✓	
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓	
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓	
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓	
Special paint finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓	
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	
Special paint finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL											✓	✓	✓	✓	✓	

For legend and footnotes, see page 2/101.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

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Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with increased output - Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Colours and paint finish (continued)																	
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL											✓	✓	✓	✓	✓	
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	
Unpainted, only primed	K24											✓	✓	✓	✓	✓	
Modular technology - Basic versions ⁶⁾																	
Mounting of separately driven fan ⁷⁾	G17											✓	✓	✓	✓	✓	
Mounting of brake ^{7) 8)}	G26											✓	✓	✓	✓	✓	
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57											✓	✓	✓	✓	✓	
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58											✓	✓	✓	✓	✓	
Modular technology - Combinations of basic versions ⁶⁾																	
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61											✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁸⁾	H62											✓	✓	✓	✓	✓	
Mounting of brake and separately driven fan ^{7) 8)}	H63											✓	✓	✓	✓	✓	
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁸⁾	H64											✓	✓	✓	✓	✓	
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97											✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁸⁾	H98											✓	✓	✓	✓	✓	
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁸⁾	H99											✓	✓	✓	✓	✓	
Modular technology - Additional versions																	
Brake supply voltage 24 V DC	C00											✓	✓	✓	✓	✓	
Brake supply voltage 400 V AC	C01											✓	✓	✓	✓	✓	
Mechanical manual brake release with lever (no locking)	K82											✓	✓	✓	✓	✓	
Special technology ⁶⁾																	
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓	
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71											✓	✓	✓	✓	✓	
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											✓	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											✓	✓	✓	✓	✓	
Mounting of HOG 9 rotary pulse encoder to be provided	H74											✓	✓	✓	✓	✓	
Mounting of HOG 10 rotary pulse encoder to be provided	H75											✓	✓	✓	✓	✓	
Prepared for mounting LL 861 900 220	H78											✓	✓	✓	✓	✓	
Prepared for mounting HOG 9 D 1024 I	H79											✓	✓	✓	✓	✓	
Prepared for mounting HOG 10 D 1024 I	H80											✓	✓	✓	✓	✓	

For legend and footnotes, see page 2/101.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																				
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315						
Self-ventilated motors with increased output - Cast-iron series 1LG4																						
		1LG4 (cast-iron)																				
Mechanical design and degrees of protection																						
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction ⁹⁾	K17																✓	✓	✓	✓	✓	
Low-noise version for 2-pole motors with clockwise direction of rotation	K37																✓	✓	✓	✓	✓	
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38																✓	✓	✓	✓	✓	
IP65 degree of protection	K50																✓	✓	✓	✓	✓	
IP56 degree of protection (non-heavy-sea)	K52																✓	✓	✓	✓	✓	
Condensation drainage holes ¹⁰⁾	L12																□	□	□	□	□	
Non-rusting screws (externally)	M27																✓	✓	✓	✓	✓	
Earth brushes for converter-fed operation	M44																–	–	–	–	O. R.	
Mechanical protection for encoder ¹¹⁾	M68																✓	✓	✓	✓	✓	
Ambient temperature and site altitude																						
Ambient temperature -50 to +40 °C	D02																✓	✓	✓	✓	✓	
Ambient temperature -40 to +40 °C	D03																✓	✓	✓	✓	✓	
Ambient temperature -30 to +40 °C	D04																✓	✓	✓	✓	✓	
Designs in accordance with standards and specifications																						
Electrical according to NEMA MG1-12	D30																✓	✓	✓	✓	✓	
Design according to UL with "Recognition Mark" ¹²⁾	D31																✓	✓	✓	✓	✓	
Canadian regulations (CSA) ¹³⁾	D40																✓	✓	✓	✓	✓	
Bearings and lubrication																						
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50																✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces ¹⁴⁾	K20																✓	✓	✓	✓	✓	
Special bearing for DE and NDE, bearing size	K36																✓	✓	✓	✓	✓ ¹⁵⁾	
Regreasing device	K40																✓	✓	✓	✓	□	
Located bearing DE	K94																✓	✓	✓	✓	✓	
Located bearing NDE	L04																□	□	□	□	□	
Insulated bearing cartridge	L27																–	–	✓	✓	✓	
Balance and vibration severity																						
Full key balancing	L68																✓	✓	✓	✓	✓	
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01																✓	✓	✓	✓	✓	
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02																✓	✓	✓	✓	✓	
Shaft and rotor																						
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁶⁾	K04																✓	✓	✓	✓	✓	
Second standard shaft extension ¹⁷⁾	K16																✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39																✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ¹⁸⁾	Y55 • and identifica- tion code																✓	✓	✓	✓	✓	

For legend and footnotes, see page 2/101.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
		Self-ventilated motors with increased output - Cast-iron series 1LG4																
				1LG4 (cast-iron)														
		Heating and ventilation																
Metal external fan ¹⁹⁾	K35										✓	✓	✓	✓	✓			
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓			
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓			
Sheet metal fan cover	L36										✓	✓	✓	✓	✓			
Rating plate and extra rating plates																		
Second rating plate, loose	K31										✓	✓	✓	✓	✓			
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code										✓	✓	✓	✓	✓			
Extra rating plate with identification codes	Y82 • and identification code										✓	✓	✓	✓	✓			
Additional information on rating plate and on package label	Y84 • and identification code										✓	✓	✓	✓	✓			
Packaging, safety notes, documentation and test certificates																		
Acceptance test certificate 3.1 according to EN 10204	B02										✓	✓	✓	✓	✓			

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For appropriate tripping unit, see Catalog LV 1.
- ²⁾ For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- ³⁾ In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- ⁴⁾ Possible in combination with order code **L44** to **L49** or length specification in plain text.
- ⁵⁾ Only the 50 Hz data are indicated on the rating plate.
- ⁶⁾ A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- ⁷⁾ For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- ⁸⁾ The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- ⁹⁾ Not possible for motor series 1LG4 for 2-pole motors.
- ¹⁰⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- ¹¹⁾ Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- ¹²⁾ Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- ¹³⁾ Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- ¹⁴⁾ Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- ¹⁵⁾ Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- ¹⁶⁾ Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- ¹⁷⁾ Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- ¹⁸⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- ¹⁹⁾ For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																
												1LG6 (cast-iron)				
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓	✓
3 temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60										✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72										✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78										✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓ ²⁾	✓	✓	✓	✓
Motor connection and connection boxes																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15										✓	✓	✓	□	□	□
Cable entry, standard configuration	K54										✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K55										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										✓	✓	✓	✓	✓	✓
Undrilled entry plate	L01										○	○	○	○	○	○
External earthing	L13										□	□	□	□	□	□

For legend, see page 2/106, for footnotes, see page 2/107.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																		
												1LG6 (cast-iron)						
Motor connection and connection boxes (continued)																		
6 cables protruding, 1.5 m long ³⁾	L48											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
6 cables protruding, 3 m long ³⁾	L49											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Protruding cable ends - right side ⁴⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Protruding cable ends - left side ⁴⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓	
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓	✓	
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	✓	
Windings and insulation																		
Temperature class F, used acc. to F, with service factor (SF)	C11											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to F, with increased output ⁵⁾	C12											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to F, with increased ambient temperature	C13											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4% ⁵⁾	C22											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8% ⁵⁾	C23											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13% ⁵⁾	C24											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18% ⁵⁾	C25											✓	✓	✓	✓	✓	✓	
Temperature class F, used acc. to F, other requirements	Y52 • and identification code											✓	✓	✓	✓	✓	✓	
Colours and paint finish																		
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□	
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓	
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓	✓	
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓	✓	
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓	✓	
Special finish in RAL 6011 reseda green	K27											✓	✓	✓	✓	✓	✓	
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓	✓	
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓	✓	

For legend, see page 2/106, for footnotes, see page 2/107.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																	
												1LG6 (cast-iron)					
Colours and paint finish (continued)																	
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓
Modular technology - Basic versions ⁶⁾																	
Mounting of separately driven fan ⁷⁾	G17											✓	✓	✓	✓	✓	✓
Mounting of brake ^{7) 8)}	G26											✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57											✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58											✓	✓	✓	✓	✓	✓
Modular technology - Combinations of basic versions ⁶⁾																	
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61											✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁸⁾	H62											✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{7) 8)}	H63											✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁸⁾	H64											✓	✓	✓	✓	✓	✓
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97											✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁸⁾	H98											✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁸⁾	H99											✓	✓	✓	✓	✓	✓
Modular technology - Additional versions																	
Brake supply voltage 24 V DC	C00											✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01											✓	✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82											✓	✓	✓	✓	✓	✓

For legend, see page 2/106, for footnotes, see page 2/107.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																		
												1LG6 (cast-iron)						
Special technology ⁶⁾																		
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓	✓	
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71											✓	✓	✓	✓	✓	✓	
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											✓	✓	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											✓	✓	✓	✓	✓	✓	
Mounting of HOG 9 rotary pulse encoder to be provided	H74											✓	✓	✓	✓	✓	✓	
Mounting of HOG 10 rotary pulse encoder to be provided	H75											✓	✓	✓	✓	✓	✓	
Prepared for mounting LL 861 900 220	H78											✓	✓	✓	✓	✓	✓	
Prepared for mounting HOG 9 D 1024 I	H79											✓	✓	✓	✓	✓	✓	
Prepared for mounting HOG 10 D 1024 I	H80											✓	✓	✓	✓	✓	✓	
Mechanical design and degrees of protection																		
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction and 2-pole motors ⁹⁾	K17											✓	✓	✓	✓	✓	✓	
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁰⁾	K37											-	-	-	-	-	-	
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁰⁾	K38											-	-	-	-	-	-	
IP65 degree of protection	K50											✓	✓	✓	✓	✓	✓	
IP56 degree of protection (non-heavy-sea)	K52											✓	✓	✓	✓	✓	✓	
Condensation drainage holes ¹¹⁾	L12											□	□	□	□	□	□	
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓	✓	
Earth brushes for converter-fed operation	M44											-	-	-	-	O. R.	O. R.	
Mechanical protection for encoder ¹²⁾	M68											✓	✓	✓	✓	✓	✓	
Ambient temperature and site altitude																		
Ambient temperature -50 to +40 °C	D02											✓	✓	✓	✓	✓	✓	
Ambient temperature -40 to +40 °C	D03											✓	✓	✓	✓	✓	✓	
Ambient temperature -30 to +40 °C	D04											✓	✓	✓	✓	✓	✓	
Designs in accordance with standards and specifications																		
Electrical according to NEMA MG1-12 ¹³⁾	D30											□	□	□	□	□	□	
Design according to UL with "Recognition Mark" ¹⁴⁾	D31											✓	✓	✓	✓	✓	✓	
Canadian regulations (CSA) ¹⁵⁾	D40											✓	✓	✓	✓	✓	✓	
Bearings and lubrication																		
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces ¹⁶⁾	K20											✓	✓	✓	✓	✓	✓	
Special bearing for drive-end and non-drive-end, bearing size 63	K36											✓	✓	✓	✓	✓ ¹⁷⁾	✓ ¹⁷⁾	
Regreasing device	K40											✓	✓	✓	✓	□	□	
Located bearing DE	K94											✓	✓	✓	✓	✓	✓	
Located bearing NDE	L04											□	□	□	□	□	□	
Insulated bearing cartridge	L27											-	-	✓	✓	✓	✓	

For legend, see page 2/106, for footnotes, see page 2/107.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with high efficiency - Cast-iron series 1LG6																	
		1LG6 (cast-iron)															
Balance and vibration severity																	
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01											✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁸⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁹⁾	K16											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Metal external fan ²¹⁾	K35											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36											✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																	
Second rating plate, loose	K31											✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification codes											✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code											✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

For footnotes, see page 2/107.

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 4) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 5) Only the 50 Hz data are indicated on the rating plate.
- 6) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions
 Exception: For frame size 225 and above, the options for mounting a brake (order code **G26**), separately driven fan (order code **G17**) or brake and separately driven fan (order code **H63**) can be combined with the options or rotary pulse encoders of the "Special technology" range.
- 7) For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- 8) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 9) Not possible for motor series 1LG6 for 2-pole motors.
- 10) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 11) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 12) Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cowl.
- 13) For the EPACT standard version (no order code required).
- 14) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 15) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 16) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 17) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 18) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake mounting or encoder mounting.
- 19) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 20) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- 21) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan - Aluminium series 1LP7 and 1LP5																	
			1LP7 (aluminium)								1LP5 (aluminium)						
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 temperature detectors for tripping	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Installation of 3 PT 100 resistance thermometers	A60		–	–	–	–	✓	✓	✓	✓	✓	✓					
Motor connection and connection boxes																	
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	–	–	–					
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	–	–	–					
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Cable entry, standard configuration	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85		✓	✓	✓	✓	○	○	○	○	✓	✓					
Next larger connection box	L00		–	–	–	–	–	–	–	–	✓	✓					
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 cables protruding, 0.5 m long ⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.					
3 cables protruding, 1.5 m long ⁴⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.					
6 cables protruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.					
6 cables protruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.					
6 cables protruding, 3 m long ⁴⁾	L49		–	–	–	–	–	–	–	–	–	–					
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Terminal strip for main and auxiliary terminals	M69		✓	✓	✓	✓	–	–	–	–	–	–					
Windings and insulation																	
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					

For legend and footnotes, see page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan - Aluminium series 1LP7 and 1LP5																
			1LP7 (aluminium)									1LP5 (aluminium)				
Colours and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□				
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6011 reseda green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL		–	–	–	–	–	–	–	–	–	–				
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors ⁵⁾	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	✓	✓			
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Condensation drainage holes ⁶⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/111.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan - Aluminium series 1LP7 and 1LP5																
			1LP7 (aluminium)									1LP5 (aluminium)				
Ambient temperature and site altitude																
Ambient temperature -40 to +40 °C	D03		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	✓	✓				
Ambient temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Designs in accordance with standards and specifications																
Design according to UL with "Recognition Mark" ⁷⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Canadian regulations (CSA) ⁸⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	✓	✓	✓	✓	✓	✓				
Bearing design for increased cantilever forces	K20		–	–	–	–	✓	✓	✓	✓	✓	✓				
Regreasing device	K40		–	–	–	–	✓	✓	✓	✓	✓	✓				
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	□	□	□				
Balance and vibration severity																
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁹⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Standard shaft made of non-rusting steel	M65		–	–	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard cylindrical shaft extension ¹⁰⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Heating and ventilation																
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate with identification codes	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 2/111.

Special versions

[illegible][illegible]

- 1) For appropriate tripping unit, see catalogue LV 1. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code **A11**, prices from **A12** or order code **A12**, prices on request).
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55: A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56: A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, H90, H91, H92, H93, H94, H95, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 5) Not possible for type of construction IM V3.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 9) Can be combined with deep-groove bearings of series 60..., 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 10) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extensionFor an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan - Cast-iron series 1LP4																	
		1LP4 (cast-iron)															
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	✓
3 temperature detectors for tripping ¹⁾	A31											✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓ ²⁾	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓ ²⁾	✓	✓	✓	✓
Motor connection and connection boxes																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	✓
Connection box on RHS	K09											✓	✓	✓	✓	✓	✓
Connection box on LHS	K10											✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	✓
Cable entry, standard configuration	K54											✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K55											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	✓
Next larger connection box	L00											✓	✓	✓	✓	✓	✓
External earthing	L13											□	□	□	□	□	□
6 cables protruding, 1.5 m long ³⁾	L48											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ³⁾	L49											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - right side ⁴⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - left side ⁴⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan - Cast-iron series 1LP4																	
												1LP4 (cast-iron)					
Motor connection and connection boxes (continued)																	
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	✓
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, with increased output ⁵⁾	C12											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, with increased ambient temperature	C13											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, other requirements	Y52 • and identification code											✓	✓	✓	✓	✓	✓
Colours and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 reseda green	K27											✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see “Special finish in special RAL colours” on Page 1/18	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-cooled motors without external fan - Cast-iron series 1LP4																
		1LP4 (cast-iron)														
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction ⁶⁾	K17											✓	✓	✓	✓	✓
IP65 degree of protection	K50											✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52											✓	✓	✓	✓	✓
Condensation drainage holes ⁷⁾	L12											□	□	□	□	□
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓
Ambient temperature and site altitude																
Ambient temperature -50 to +40 °C	D02											✓	✓	✓	✓	✓
Ambient temperature -40 to +40 °C	D03											✓	✓	✓	✓	✓
Ambient temperature -30 to +40 °C	D04											✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
Design according to UL with "Recognition Mark" ⁸⁾	D31											✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁹⁾	D40											✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁰⁾	K20											✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36											✓	✓	✓	✓ ¹¹⁾	✓ ¹¹⁾
Regreasing device	K40											✓	✓	✓	✓	□
Located bearing DE	K94											✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□
Insulated bearing cartridge	L27											–	–	✓	✓	✓
Balance and vibration severity																
Full key balancing	L68											✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01											✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02											✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹²⁾	K04											✓	✓	✓	✓	✓
Second standard shaft extension ¹³⁾	K16											✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁴⁾	Y55 • and identification code											✓	✓	✓	✓	✓
Heating and ventilation																
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓

For legend and footnotes, see page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-cooled motors without external fan - Cast-iron series 1LP4																	
												1LP4 (cast-iron)					
Rating plate and extra rating plates																	
Second rating plate, loose	K31											✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code											✓	✓	✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code											✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- 3) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 4) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 5) Only the 50 Hz data are indicated on the rating plate.
- 6) Not possible for motor series 1LP4 for 2-pole motors.
- 7) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 8) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 9) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 10) Not possible for 2-pole 1LP4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LP4 motors. Not possible for 1LP4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 11) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 12) Can be combined with deep-groove bearings of series 60..., 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 13) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 14) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Accessories and spare parts

Overview

Modular technology

The components of modular technology can be ordered as accessories. The brake, as a safety-related module, must not be retrofitted.

Cables for rotary pulse encoders can be ordered from Catalogue DA 65.10.

Mounting of rotary pulse encoder and separately driven fan for 1LA5, 1LA6, 1LA7 and 1LG motors

Version	Frame size	Number of poles	Order No.
Rotary pulse encoder ¹⁾	HTL version	71 ... 225	all
	TTL version	71 ... 225	all
Separately driven fan incl. mounting parts ²⁾	100	all	2CW2 180-8RF54-1AB0
	112	all	2CW2 210-8RF54-1AB1
	132	all	2CW2 250-8RF54-1AB2
	160	all	2CW2 300-8RF54-1AB3
	180	all	2CW2 300-8RF54-1AB4
	200	all	2CW2 300-8RF54-1AB5
	225 ³⁾	all	2CW2 300-8RF54-1AB6
	250	all	1PP9 063-2LA12-Z A11+K50 ⁴⁾
	280	all	1PP9 063-2LA12-Z A11+K50 ⁴⁾
	315	2	1PP9 070-2LA12-Z A11+K50 ⁴⁾
Separately driven fan and rotary pulse encoder 1XP8 001-1 incl. mounting parts ²⁾	315	4 to 8	1PP9 063-2LA12-Z A11+K50 ⁴⁾
	100	all	2CW2 180-8RF54-2AB0
	112	all	2CW2 210-8RF54-2AB1
	132	all	2CW2 250-8RF54-2AB2
	160	all	2CW2 300-8RF54-2AB3
	180	all	2CW2 300-8RF54-2AB4
	200	all	2CW2 300-8RF54-2AB5
	225 ³⁾	all	2CW2 300-8RF54-2AB6

Slide rails with fixing bolts and tensioning screws acc. to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 335 to 450, there are no standardised slide rails (please enquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

¹⁾ For motor series 1LG, the rotary pulse encoders are available on request. They are only available for motor series 1LA7 as accessories for spare parts.

²⁾ The separately driven fan 2CW2 ... comprises a complete fan unit with impeller, the separately driven fan 1PP9 ... only comprises the fan motor without mounting components and impeller.

³⁾ For 1LG motors with separately driven fan with Order No. 1PP9 063-2LA12-Z A11+K50 (weight 4.37 kg).

⁴⁾ Only for replacement purposes.

Overview (continued)

Taper pins acc. to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart
Tel. +49 (0)711-13 88-0
Fax +49 (0)711-13 88-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Available from:
A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

Mounting of encoder

In the case of supply or mounting by the customer.

Options H74, H79, H75, H80

Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0)30-690 03-0
Fax +49 (0)30-690 03-104

<http://www.huebner-berlin.de>
e-mail: info@huebner-berlin.de

Options H71, H78

Leine & Linde (Deutschland) GmbH
73430 Aalen
Bahnhofstraße 36
Tel. +49 (0)7361-78 093-0
Fax +49 (0)7361-78 093-11

<http://www.leinelinde.de>
e-mail: info@leinelinde.de

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cowl 1LA7,
frame size 160 M, 4-pole:

**Fan cowl No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

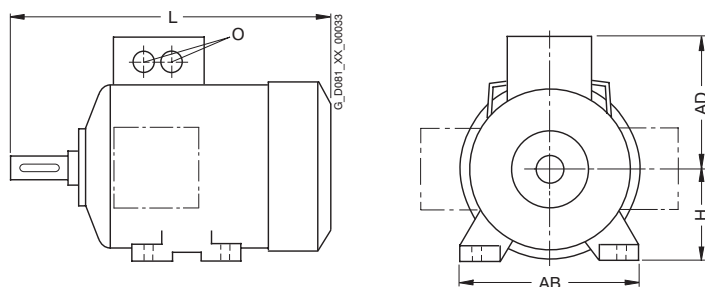
IEC Squirrel-Cage Motors

Standard motors frame size 315L and above

Dimensions

Overview

Overall dimensions



Sub-size	Type	Number of poles	Dimensions		H	AB	O
			L	AD			
56 M	1LA7		169	101	56	110	1 x M16 x 1.5
	1LA9		169	101	56	110	1 x M16 x 1.5
63 M	1LA7		202.5	101	63	120	1 x M16 x 1.5
	1LA9 063		202.5	101	63	120	1 x M16 x 1.5
	1LA9 061		228.5	101	63	120	1 x M16 x 1.5
71 M	1LA7		240	111	71	132	1 x M16 x 1.5
	1LA9		240	111	71	132	1 x M16 x 1.5
	1LP7		207	111	71	132	1 x M16 x 1.5
80 M	1LA7		273.5	120	80	150	1 x M16 x 1.5
	1LA9 080		273.5	120	80	150	1 x M16 x 1.5
	1LA9 083		308.5	120	80	150	1 x M16 x 1.5
	1LP7		237	120	80	150	1 x M16 x 1.5
90 S/ 90 L	1LA7		331	128	90	165	1 x M16 x 1.5
	1LA9		331	128	90	165	1 x M16 x 1.5
	1LA9 096-6K.		376	128	90	165	1 x M16 x 1.5
	1LA9 096-2..		358	128	90	165	1 x M16 x 1.5
	1LA9 096-4..		358	128	90	165	1 x M16 x 1.5
	1LP7		286	128	90	165	1 x M16 x 1.5
100 L	1LA6		372	164	100	196	2 x M32 x 1.5
	1LA7		372	135	100	196	2 x M32 x 1.5
	1LA9		407	135	100	196	2 x M32 x 1.5
	1LA9 107-4KA.		442	135	100	196	2 x M32 x 1.5
	1LP7		331	135	100	196	2 x M32 x 1.5
112 M	1LA6		393	178	112	226	2 x M32 x 1.5
	1LA7		393	148	112	226	2 x M32 x 1.5
	1LA9		431	148	112	226	2 x M32 x 1.5
	1LP7		349	148	112	226	2 x M32 x 1.5
132 S/ 132 M	1LA6		453	194	132	256	2 x M32 x 1.5
	1LA7		452.5	167	132	256	2 x M32 x 1.5
	1LA9		452.5	167	132	256	2 x M32 x 1.5
	1LA9 131	4	490.5	167	132	256	2 x M32 x 1.5
	1LA9 133		490.5	167	132	256	2 x M32 x 1.5
	1LA9 134		490.5	167	132	256	2 x M32 x 1.5
	1LP7		397	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA6		588	226	160	300	2 x M40 x 1.5
	1LA7		588	197	160	300	2 x M40 x 1.5
	1LA9		588	197	160	300	2 x M40 x 1.5
	1LA9 166		628	197	160	300	2 x M40 x 1.5
	1LP7		529	197	160	300	2 x M40 x 1.5
180 M/ 180 L	1LA5		712	258	180	339	2 x M40 x 1.5
	1LA9		712	258	180	339	2 x M40 x 1.5
	1LG4		669	262	180	339	2 x M40 x 1.5
	1LG4 188		720	262	180	339	2 x M40 x 1.5
	1LG6 183	2	720	262	180	339	2 x M40 x 1.5
	1LG6 183	4	669	262	180	339	2 x M40 x 1.5
	1LG6 186	4, 6, 8	720	262	180	339	2 x M40 x 1.5
	1LP4 183	2, 4	562	262	180	339	2 x M40 x 1.5
	1LP4 186	4, 6, 8	562	262	180	339	2 x M40 x 1.5
	1LP5		611	258	180	339	2 x M40 x 1.5

Sub-size	Type	Number of poles	Dimensions		H	AB	O
			L	AD			
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5
	1LA9		768.5	305	200	388	2 x M50 x 1.5
	1LG4		720	300	200	378	2 x M50 x 1.5
	1LG4 208	2, 6	777	300	200	378	2 x M50 x 1.5
	1LG6 206		720	300	200	378	2 x M50 x 1.5
	1LG6 207	2, 6	777	300	200	378	2 x M50 x 1.5
	1LG6 207	4, 8	720	300	200	378	2 x M50 x 1.5
	1LP4 206	2, 6	617	300	200	378	2 x M50 x 1.5
	1LP4 207	2, 4, 6, 8	617	300	200	378	2 x M50 x 1.5
	1LP5		675	305	200	388	2 x M50 x 1.5
225 S/ 225 M	1LA5		806	305	225	426	2 x M50 x 1.5
	1LA5	2	776	305	225	426	2 x M50 x 1.5
	1LG4		789	325	225	436	2 x M50 x 1.5
	1LG4 223	2	759	325	225	436	2 x M50 x 1.5
	1LG4 228	2	819	325	225	436	2 x M50 x 1.5
	1LG4 228	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 220	4, 8	789	325	225	436	2 x M50 x 1.5
	1LG6 223	2	819	325	225	436	2 x M50 x 1.5
	1LG6 223	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 228	2	869	325	225	436	2 x M50 x 1.5
	1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5
	1LP4 220	4, 8	670	325	225	436	2 x M50 x 1.5
	1LP4 223	2	640	325	225	436	2 x M50 x 1.5
	1LP4 223	4, 6, 8	670	325	225	436	2 x M50 x 1.5
250 M	1LG4		887	392	250	490	2 x M63 x 1.5
	1LG4 258	4	957	392	250	490	2 x M63 x 1.5
	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5
	1LP4 253	2	764	392	250	490	2 x M63 x 1.5
	1LP4 253	4, 6, 8	764	392	250	490	2 x M63 x 1.5

IEC Squirrel-Cage Motors

Standard motors frame size 315L and above

Dimensions

2

Overview (continued)

Sub-size	Type	Number of poles	Dimensions L	AD	H	AB	O
280 S/	1LG4		960	432	280	540	2 x M63 x 1.5
280 M	1LG4 288	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
	1LP4 280	2, 4, 6, 8	830	432	280	540	2 x M63 x 1.5
	1LP4 283	2, 4, 6, 8	830	432	280	540	2 x M63 x 1.5
315 S/	1LG4		1072	500	315	610	2 x M63 x 1.5
315 M/	1LG4 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
315 L	1LG4 313	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG4 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 317	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 317	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	6	1402	500	315	610	2 x M63 x 1.5

Sub-size	Type	Number of poles	Dimensions L	AD	H	AB	O
315 S/	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
315 M/	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
315 L	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5
	1LP4 310	2	925	500	315	610	2 x M63 x 1.5
	1LP4 310	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LP4 313	2	925	500	315	610	2 x M63 x 1.5
	1LP4 313	4, 6, 8	955	500	315	610	2 x M63 x 1.5
	1LP4 316	2	1085	500	315	610	2 x M63 x 1.5
	1LP4 316	4, 6, 8	1115	500	315	610	2 x M63 x 1.5
	1LP4 317	2	1085	500	315	610	2 x M63 x 1.5
	1LP4 317	4, 6, 8	1115	500	315	610	2 x M63 x 1.5

Notes on the dimensions

■ Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2
D, DA	to 30 over 31 to 50 over 50
N	to 250 over 250
F, FA	h6 h6 h9

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
A, B	to 250 over 250 to 500 over 500 to 750 over 750 to 1000 over 1000	± 0.75 ± 1.0 ± 1.5 ± 2.0 ± 2.5
M	to 200 over 200 to 500 over 500	± 0.25 ± 0.5 ± 1.0
H	to 250 over 250	- 0.5 - 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

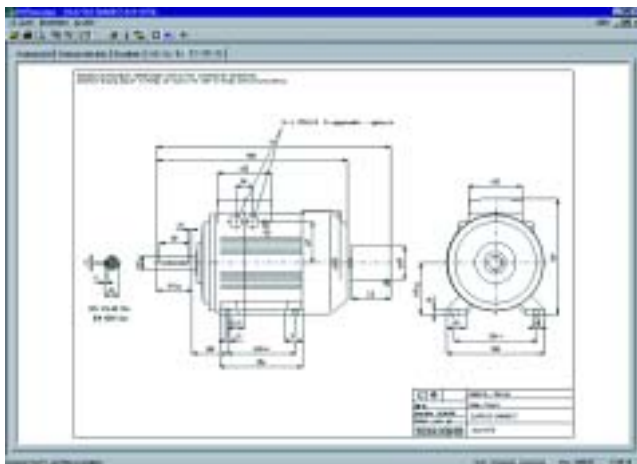
■ All dimensions are specified in mm.

Further information

Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic catalogue CA 01 as a selection aid (for further information, see "Technical information", "Project planning aids").

The interactive catalogue CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2006, english international:

CD-ROM: E86060-D4001-A110-C5-7600

DVD: E86060-D4001-A510-C5-7600

IEC Squirrel-Cage Motors

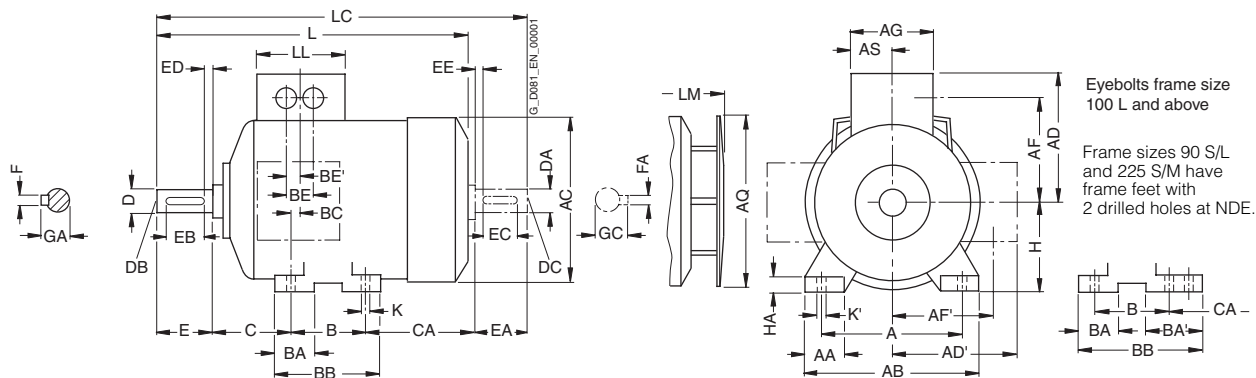
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

Aluminium series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B3

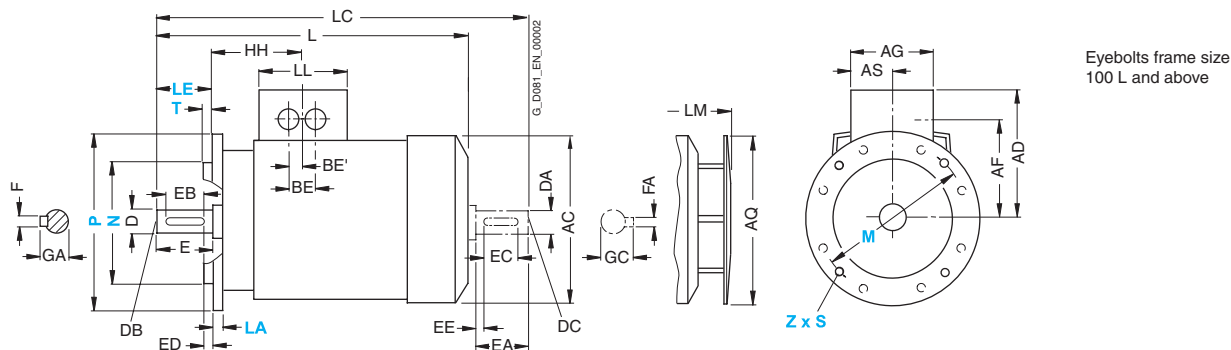


Eyebolts frame size 100 L and above

Frame sizes 90 S/L and 225 S/M have frame feet with 2 drilled holes at NDE.

Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



Eyebolts frame size 100 L and above

For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC ⁽¹⁾	AD ⁽²⁾	AD'	AF ⁽²⁾	AF'	AG ⁽²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ⁽²⁾	BE' ⁽²⁾	C	CA*	H	HA		
56 M ³⁾	1LA7 050 1LA7 053	2, 4	90	25	110	116	101	101	78	78	74	–	37	71	28	–	87	34	32	18	36	53	56	6		
63 M	1LA7 060 1LA7 063	2, 4, 6	100	27	120	124	101	101	78	78	74	124	37	80	28	–	96	30	32	18	40	66	63	7		
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	74	124	37	90	27	–	106	18	32	18	45	83	71	7		
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	–	118	14	32	18	50	94	80	8		
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	170	37.5	100 125	33	54	143	23	32	18	56 118	143 118	90	10		
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	–	176	39	42	21	63	125	100	12		
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	–	176	32	42	21	70	141	112	12		
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	–	180	39	42	21	89	162.5	132	15		
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	–	218	39	42	21	89	124.5	132	15		
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	–	256	52.5	54	27	108	183	160	18		
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	–	300	52.5	54	27	108	139	160	18		
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	–	287	38	54	27	121	259	180	18		
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	–	325	38	54	27	121	221	180	18		
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	–	355	45	85	42.5	133	239	200	24		
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24		
225 M	1LA5 223	2 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24		

■ For 1LA7 and 1LA5 standard motors in pole-changing version (6 or 9 terminals), the dimensions of the basic version apply.

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

²⁾ The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

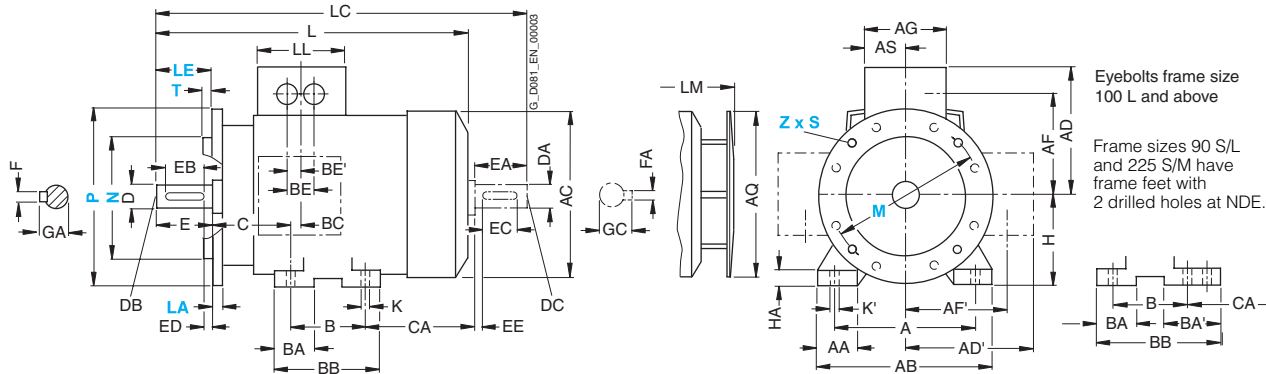
³⁾ The motors of frame size 56 M are not ventilated.

Dimensional drawings

Aluminium series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B35

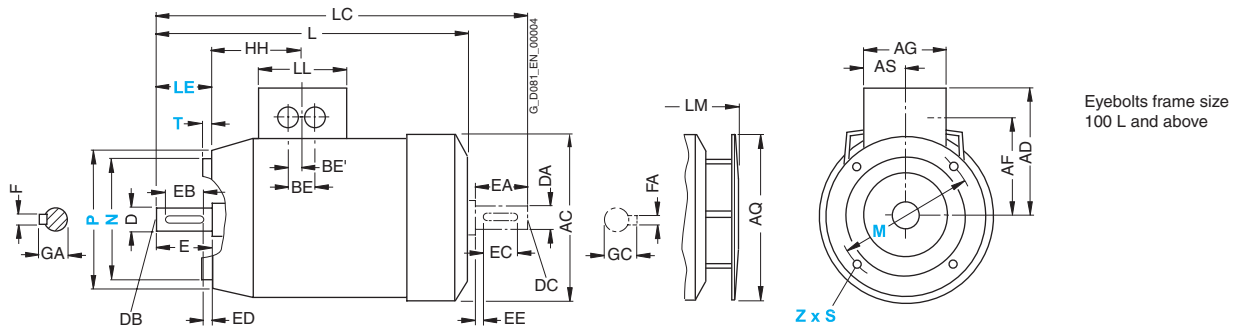
For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA5 motors, frame sizes 180 M to 225 M

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



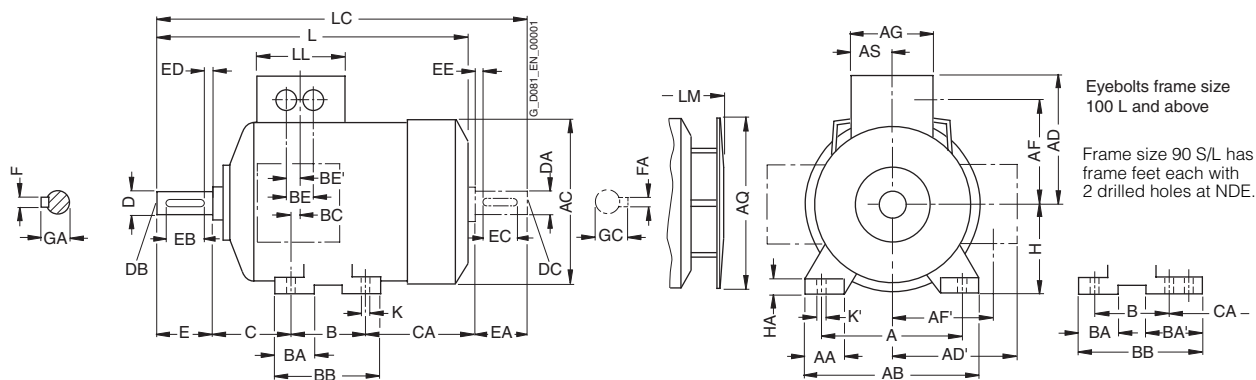
For motor			Dimension designation acc. to IEC							DE shaft extension				NDE shaft extension									
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA7 050 1LA7 053	2, 4	69.5	5.8	9	169	200	74	—	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
63 M	1LA7 060 1LA7 063	2, 4, 6	69.5	7	10	202.5	232	74	231.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	63.5	7	10	240	278	74	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	63.5	9.5	13.5	273.5	324 364	75	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	79	10	14	331	389	75	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA7 133 1LA7 134	4, 6, 8 6	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20 M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59

¹⁾ The motors of frame size 56 M are not ventilated.

²⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

2

Type of construction IM B3



Technical drawing of a motor frame showing dimensions and labels. The drawing includes a side view, a front view, and a detail of the eyebolt. Dimensions are labeled with letters and numbers. The side view shows dimensions L, LC, HH, LL, EE, DA, AC, EA, DC, EB, E, DB, ED, LA, GA, F, P, Z, T, BE, BE', and G_D081_EN_00005. The front view shows dimensions AG, AS, AD, AF, and M. The detail shows dimensions LM, FA, and GC. The text "Eyebolts frame size 100 L and above" is present.

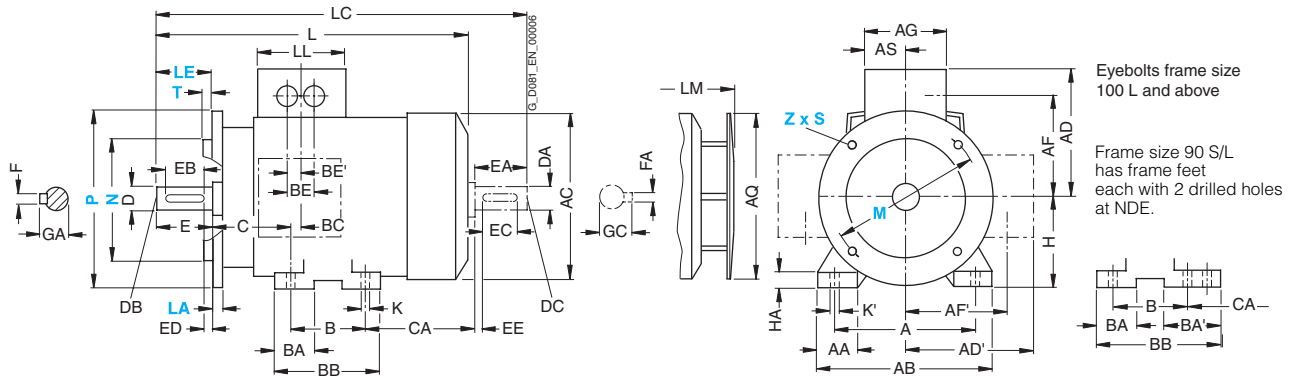
Siemens D 81.1 · 2006

Dimensional drawings

Aluminium series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B35

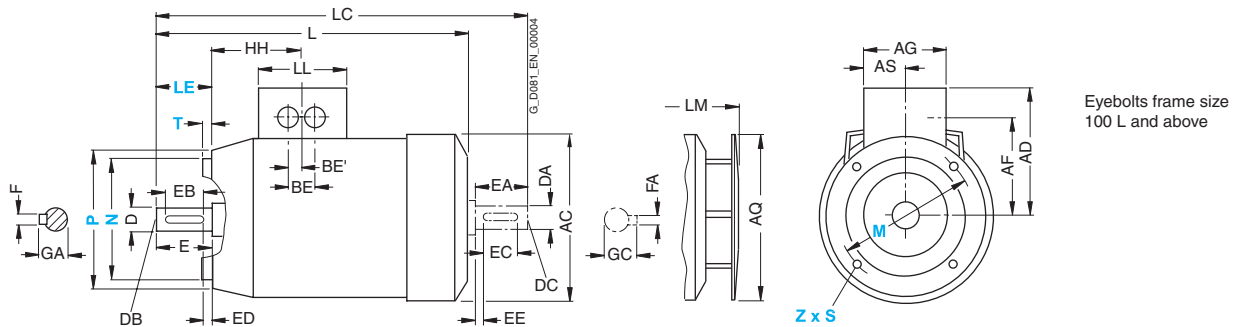
For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA9 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension							NDE shaft extension							
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
56 M ¹⁾	1LA9 050 1LA9 053	2, 4	69.5	5.8	9	169 195	200 226	74	—	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2	
63 M	1LA9 060 1LA9 063	2, 4	69.5	7	10	202.5 228.5	232 258	74	231.5 257.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5	
71 M	1LA9 070 1LA9 073	2, 4	63.5	7	10	240	278	74	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16	
80 M	1LA9 080 1LA9 083	2, 4	63.5	9.5	13.5	273.5 308.5	324 364	75	299.5 334.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5	
90 S 90 L	1LA9 090 1LA9 096	2, 4, 6	79	10	14	331 376 ²⁾ 358 ³⁾	389 434 ²⁾ 414 ³⁾	75	382.5 427.5 ²⁾ 409.5 ³⁾	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5	
100 L	1LA9 106 1LA9 107	2, 4, 6	102	12	16	407 442 ⁴⁾	473 508 ⁴⁾	120	458.5 493 ⁴⁾	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
112 M	1LA9 113	2, 4, 6	102	12	16	431	499	120	482.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
132 S	1LA9 130 1LA9 131	2, 4 2	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
132 M	1LA9 133 1LA9 133 1LA9 134	6 4 6	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
160 M	1LA9 163 1LA9 164	2, 4, 6 2	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
160 L	1LA9 166	2, 4, 6	160.5	15	19	628	761	165	680.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
180 M	1LA9 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
180 L	1LA9 186	4, 6	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1LA9 206 1LA9 207	2, 6 2, 4, 6	178	19	25	768.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	

¹⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

²⁾ For 1LA9 096-6KA.

³⁾ For 1LA9 096-2 and 1LA9 096-4.

⁴⁾ For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

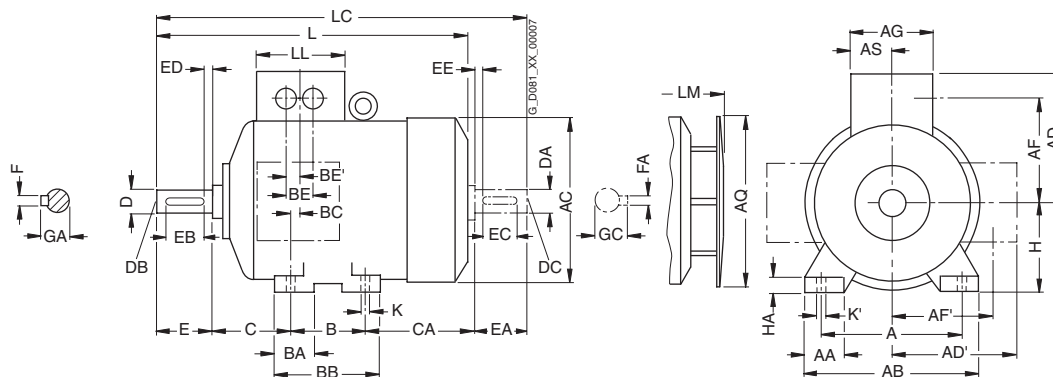
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

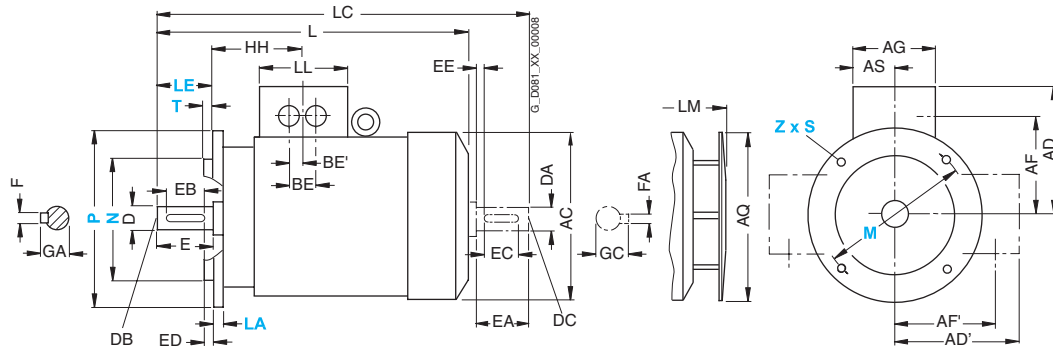
Cast-iron series 1LA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1LA6 106 1LA6 107	2, 4, 6, 8 4, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
112 M	1LA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1LA6 130 1LA6 131	2, 4, 6, 8 2	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
132 M	1LA6 133 1LA6 134	4, 6, 8 6	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
160 M	1LA6 163 1LA6 164	2, 4, 6, 8 2, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
160 L	1LA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

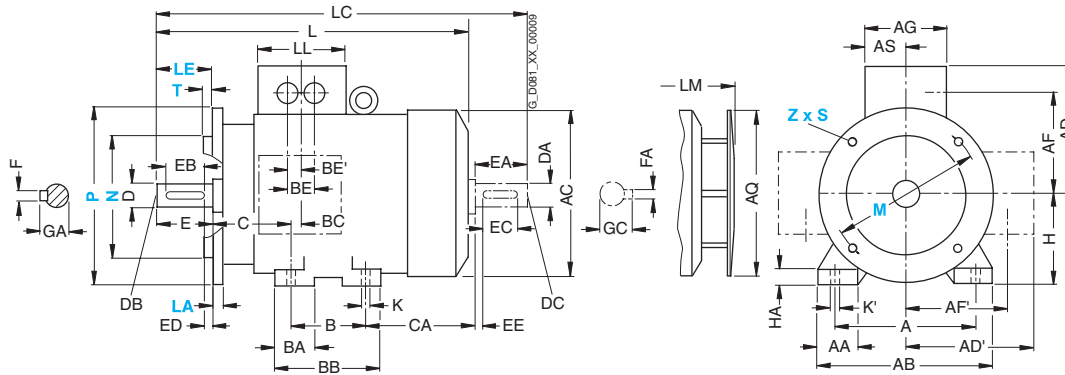
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LA6, frame sizes 100 L to 160 L

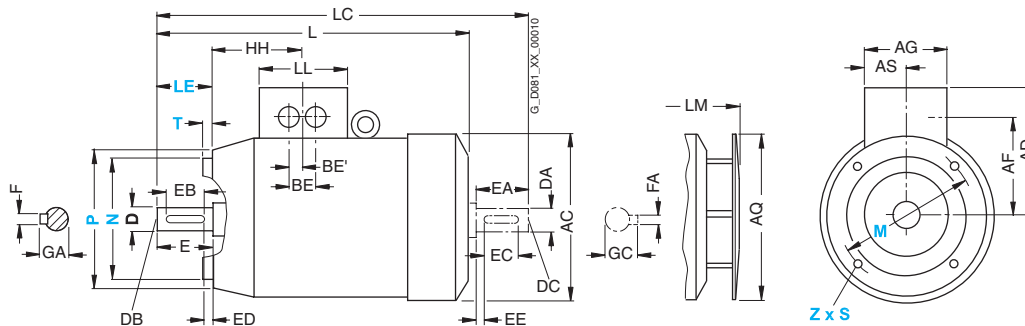
Type of construction IM B35

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



Types of construction IM B14

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC							DE shaft extension							NDE shaft extension						
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1LA6 106 1LA6 107	2, 4, 6, 8 4, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA6 130 1LA6 131	2, 4, 6, 8 2	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA6 133 1LA6 134	4, 6, 8 6	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA6 163 1LA6 164	2, 4, 6, 8 2, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

IEC Squirrel-Cage Motors

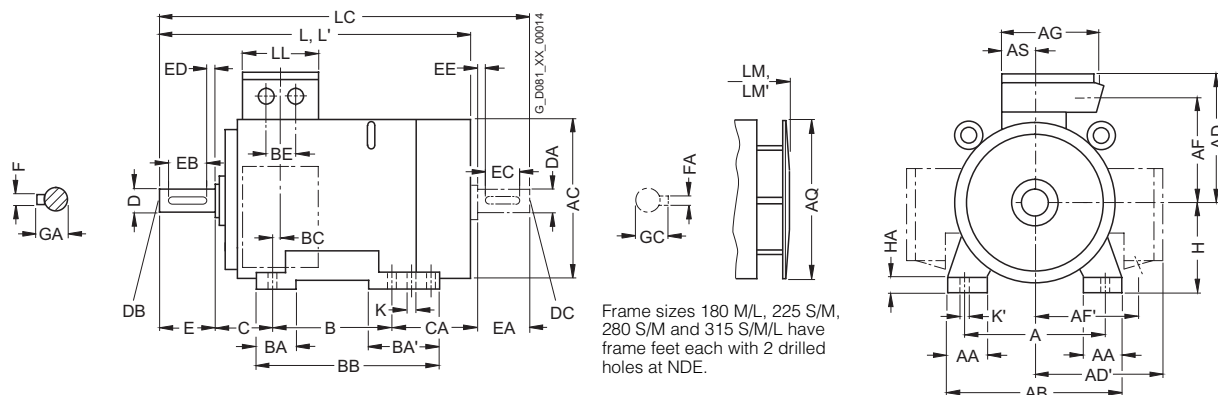
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

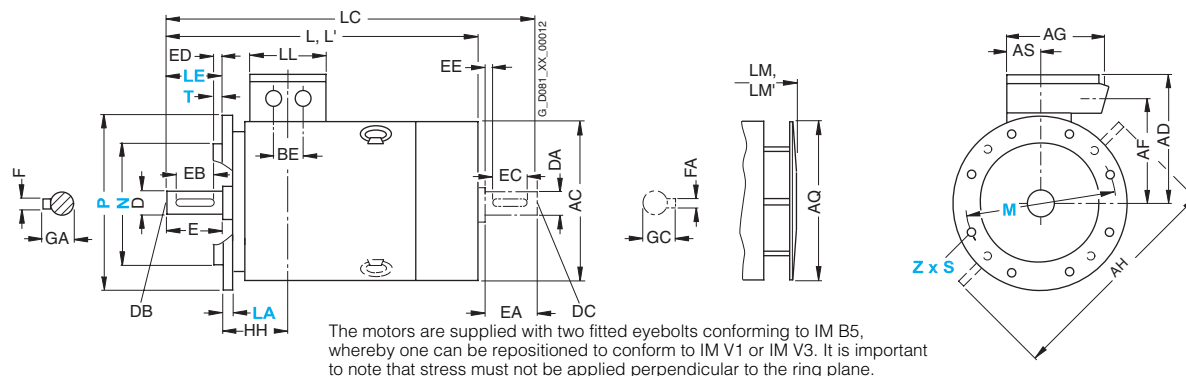
Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA		
180 M	1LG4 183	2, 4	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	202	180	20		
180 L	1LG4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	164	180	20		
	1LG4 188	2, 4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20		
200 L	1LG4 206	2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25		
	1LG4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25		
	1LG4 208	2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	234	200	25		
		4, 8																				177				
225 S	1LG4 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34		
225 M	1LG4 223	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	193	225	34		
		4, 6, 8																								
	1LG4 228	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34		
		4, 6, 8																								
250 M	1LG4 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40		
		4, 6, 8																								
	1LG4 258	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40		
		4																				305				
		6, 8																				235				
280 S	1LG4 280	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40		
		4, 6, 8																								
280 M	1LG4 283	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	280	40		
		4, 6, 8																								
	1LG4 288	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40		
		4																								
		6, 8																								
																						216				
315 S	1LG4 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50		
	1LG4 310	4, 6, 8																								
315 M ²⁾	1LG4 313	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50		
	1LG4 313	4, 6, 8																								
315 L ²⁾	1LG4 316/317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50		
	1LG4 316/317	4, 6, 8																								
	1LG4 318	8																								
	1LG4 318	6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50		

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

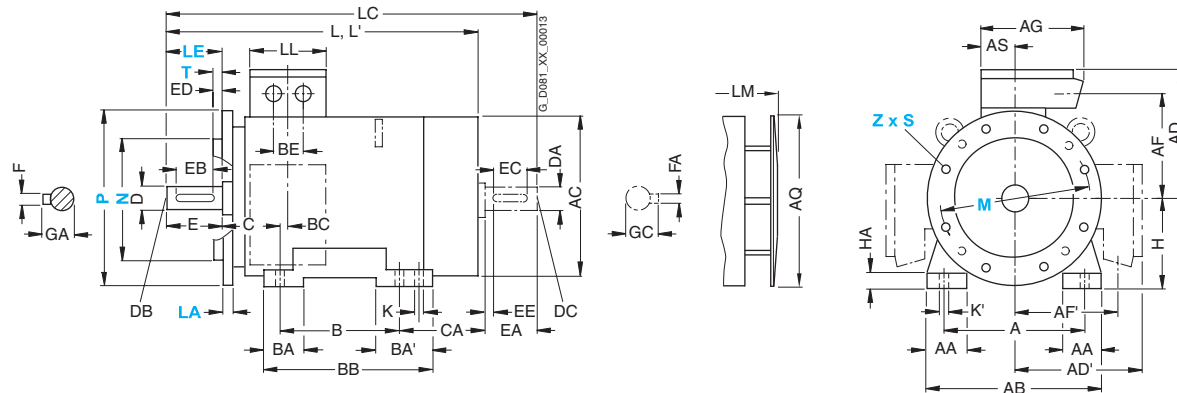
²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG4 183	2, 4	157	15	19	669	669	784	132	759	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LG4 186	4, 6, 8	157	15	19	669	—	784	132	759	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	1LG4 188	2, 4, 6, 8	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG4 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 207	2, 4, 6, 8	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LG4 208	2, 6 4, 8	196	19	25	777 720	811 —	892 835	192	867 810	901 —	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LG4 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG4 223	2 4, 6, 8	196	19	25	759 789	793 —	873 903	192	859 889	893 —	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
	1LG4 228	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8	—	849	—	849	—	963	—	949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LG4 253	2 4, 6, 8	237	24	30	887 —	924 —	1002 1032	236	987	1024 —	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
	1LG4 258	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4 6, 8	— —	957 887	— —	1102 1032	— —	1057 987	— —	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
280 S	1LG4 280	2 4, 6, 8	252	24	30	960 —	998 —	1105	236	1070	1108 —	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 M	1LG4 283	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8	—	—	—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
	1LG4 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4 6, 8	— —	— 960	— —	— 1105	— —	— 1070	— —	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
315 S	1LG4 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 M ³⁾	1LG4 310	4, 6, 8	—	—	—	1102	—	1247	—	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 313	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 L ³⁾	1LG4 313	4, 6, 8	—	—	—	1102	—	1247	—	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 316/317	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG4 316/317	4, 6, 8	—	—	—	1262	—	1407	—	1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	8	—	—	—	—	—	—	—	—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG4 318	6	285	28	35	1402	—	1547	307	1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ For version with low-noise fan for 2-pole motors.

²⁾ In the low-noise version, a second shaft extension and/or mounted encoder is not possible.

³⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

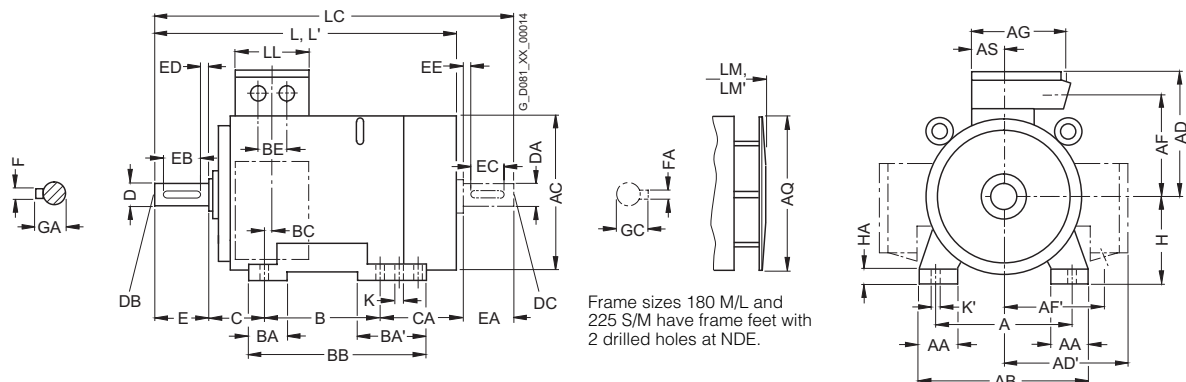
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

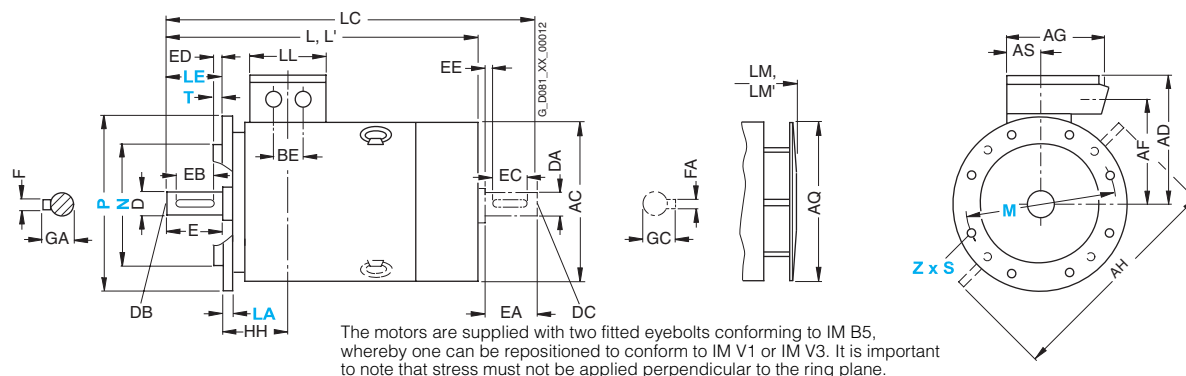
Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
180 L	1LG6 186	4																			202			
200 L	1LG6 206	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
		2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25
		2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	234	200	25
	1LG6 207	4, 8																			177			
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG6 223	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		4, 6, 8																						
		2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
	1LG6 228	4, 6																						
250 M	1LG6 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		4																			305			
		6, 8																			235			
	1LG6 258	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40
		4, 6																						

* This dimension is assigned in DIN EN 50347 to the frame size listed.

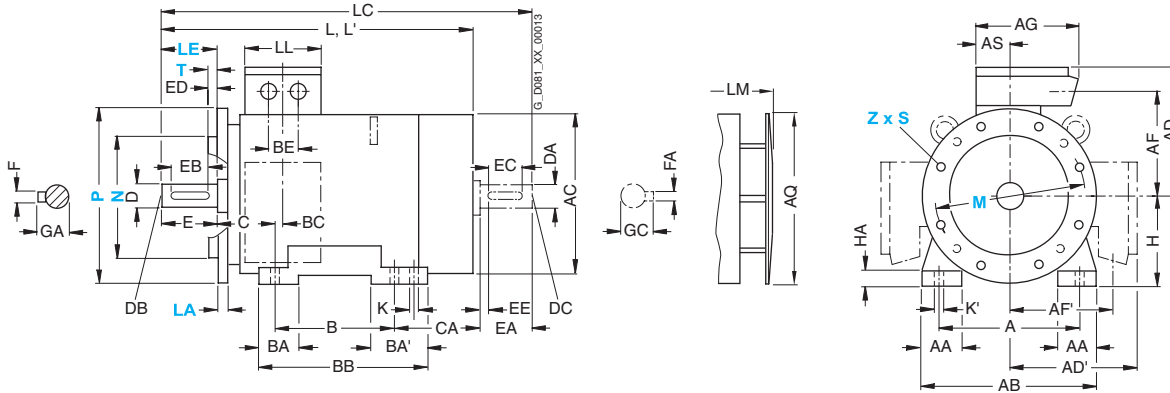
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B35

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension								NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
180 M	1LG6 183	2	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
		4				669	—	784		759	—																
180 L	1LG6 186	4, 6, 8	157	15	19	720	—	835	132	810	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
200 L	1LG6 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
	1LG6 207	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
		4, 8				720	—	835		810	—																
225 S	1LG6 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
225 M	1LG6 223	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
		4, 6, 8				849	—	963		949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
	1LG6 228	2	196	19	25	869	903	983	192	969	1003	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
		4, 6				899	—	1013		999	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
250 M	1LG6 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		4				957	—	1102		1057	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		6, 8				887	—	1032		987	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 258	2	237	24	30	957	994	1102	236	1057	1094	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		4, 6				—	—	—		—	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		

¹⁾ For version with low-noise fan for 2-pole motors.

IEC Squirrel-Cage Motors

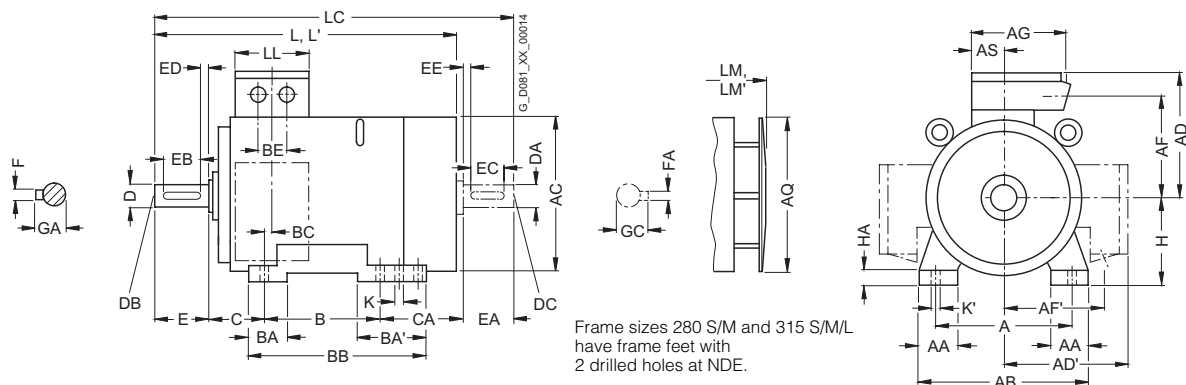
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

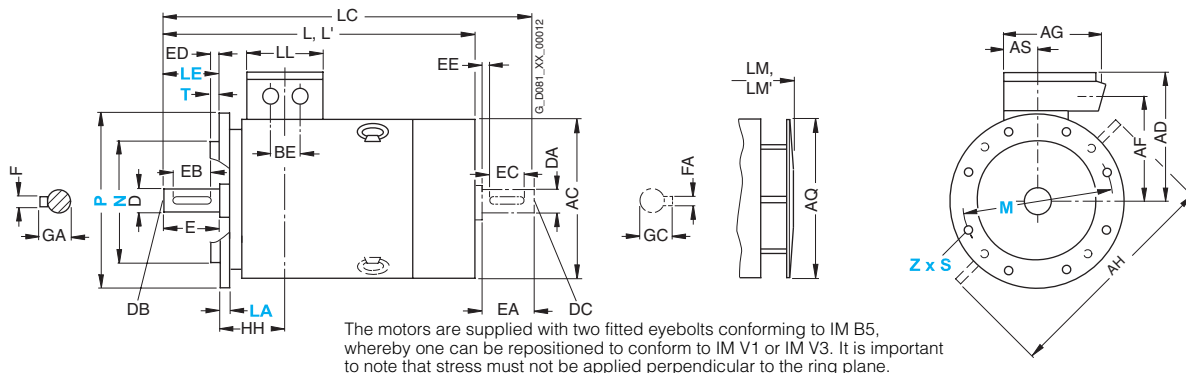
Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA		
280 S	1LG6 280	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40		
280 M	1LG6 283	4, 6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40		
		2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40		
	1LG6 288	4, 6	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40		
315 S	1LG6 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50		
315 M ²⁾	1LG6 310	4, 6, 8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50		
	1LG6 313	8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50		
	1LG6 313	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50		
315 L ²⁾	1LG6 313	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50		
	1LG6 316	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50		
	1LG6 316	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50		
	1LG6 316	8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50		
	1LG6 317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50		
	1LG6 317	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50		
	1LG6 317	8	508	120	610	610	500	500	400	400	380	780	590	154	508	155	206	648	69	110	216	513	315	50		
	1LG6 318	2	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50		
1LG6 318	4	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	216	513	315	50			
1LG6 318	6, 8					500	500	400	400	380									110							

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

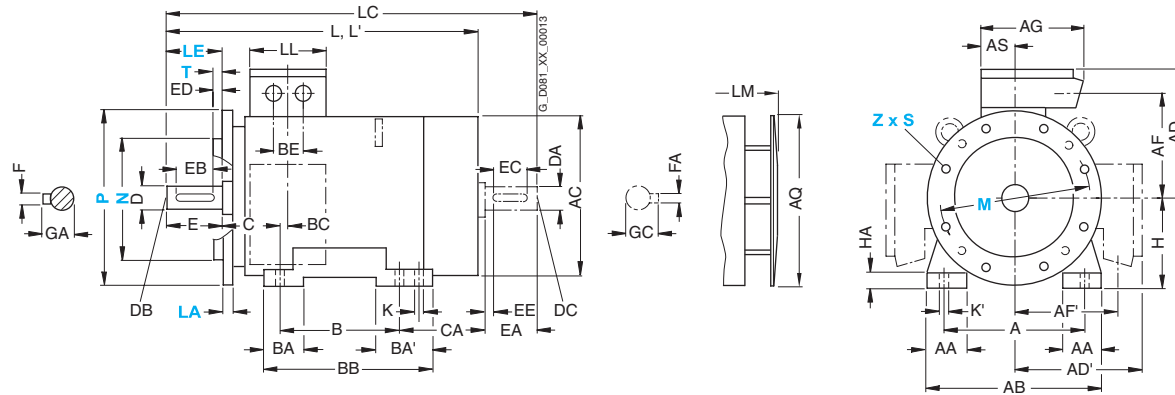
²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension							NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K' L	L ¹⁾	LC	LL	LM	LM ¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
280 S	1LG6 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
280 M	1LG6 283	4, 6, 8				—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
		2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	4				—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
	6, 8				960	—	1105	—	1070	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
	1LG6 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6				—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
315 S	1LG6 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
315 M ²⁾	1LG6 310	4, 6, 8				1102	—	1247	—	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 313	8	285	28	35	1102	—	1247	307	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 313	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
315 L ²⁾	1LG6 313	4, 6				1262	—	1407	—	1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 316	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG6 316	4, 6				1262	—	1407	—	1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 316	8				—	—	—	—	—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 317	2	285	28	35	1372	1442	1517	307	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG6 317	4, 6				1402	—	1547	—	1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 317	8				1262	—	1407	—	1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 318	2	285	28	35	1372	1442	1517	330	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG6 318	4				1402	—	1547	—	1512	—	80 ³⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG6 318	6, 8				—	—	—	307	—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	

¹⁾ For version with low-noise fan for 2-pole motors.

²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

³⁾ Diameters up to 90 mm are possible.

IEC Squirrel-Cage Motors

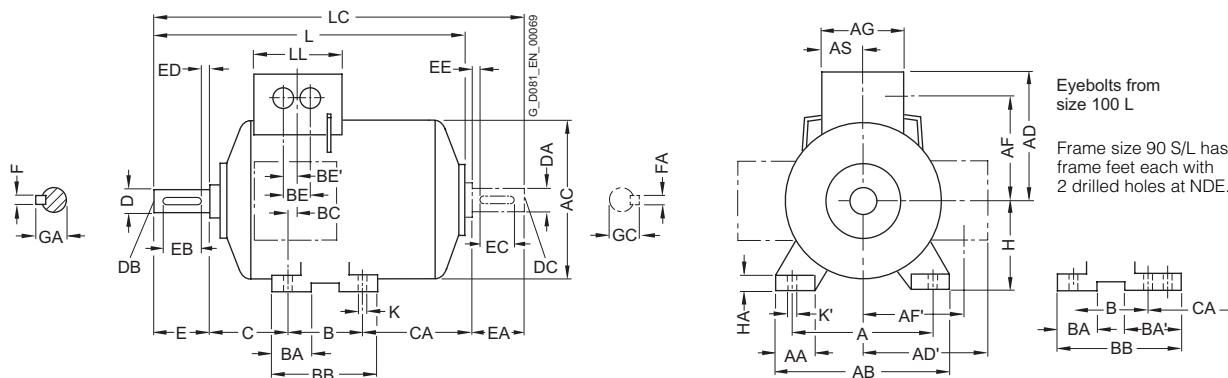
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

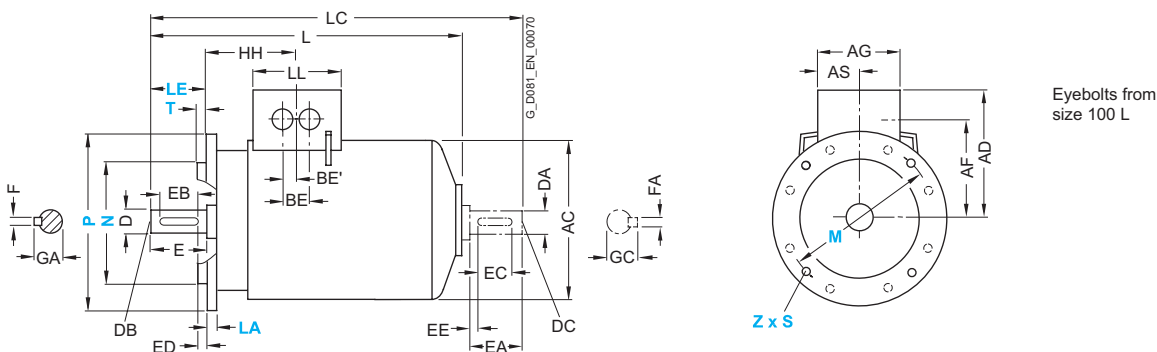
Aluminium series 1LP7 and 1LP5, frame sizes 63 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	
63 M	1LP7 060 1LP7 063	2, 4, 6	100	27	120	124	101	101	78	78	74	37	80	28	–	96	30	32	18	40	40	63	7	
71 M	1LP7 070 1LP7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	74	37	90	27	–	106	18	32	18	45	42	71	7	
80 M	1LP7 080 1LP7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	37.5	100	32	–	118	14	32	18	50	47	80	8	
90 S 90 L	1LP7 090 1LP7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	37.5	100 125	33	54	143	23	32	18	56 55	80	90	10	
100 L	1LP7 106 1LP7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	60	140	47	–	176	39	42	21	63	68	100	12	
112 M	1LP7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	60	140	47	–	176	32	42	21	70	79	112	12	
132 S	1LP7 130 1LP7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	70	140	49	–	180	39	42	21	89	96	132	15	
132 M	1LP7 133 1LP7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	70	178	49	–	218	39	42	21	89	58	132	15	
160 M	1LP7 163 1LP7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	82.5	210	57	–	256	52.5	54	27	108	107	160	18	
160 L	1LP7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	82.5	254	57	–	300	52.5	54	27	108	63	160	18	
180 M	1LP5 183	2, 4	279	69.5	339	363	258	258	216	216	152	71	241	50	–	287	38	54	27	121	145	180	18	
180 L	1LP5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	71	279	50	–	325	38	54	27	121	107	180	18	
200 L	1LP5 206 1LP5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	96	305	58.5	–	355	45	85	42.5	133	133	200	24	

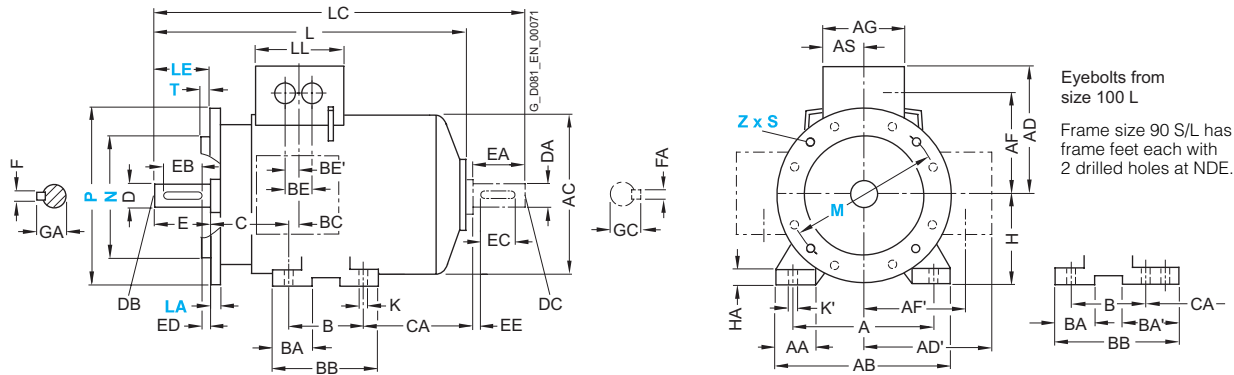
* This dimension is assigned in DIN EN 50347 to the frame size listed.

Dimensional drawings

Aluminium series 1LP7 and 1LP5, frame sizes 63 M to 200 L

Types of construction IM B35

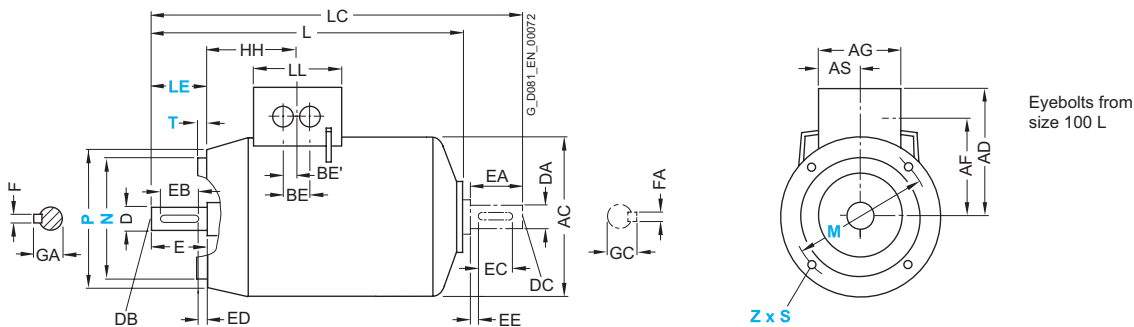
For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LP5 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC					DE shaft extension					NDE shaft extension									
				HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
	63 M	1LP7 060 1LP7 063	2, 4, 6	69.5	7	10	172	206	74	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
	71 M	1LP7 070 1LP7 073	2, 4, 6, 8	63.5	7	10	207	240	74	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
	80 M	1LP7 080 1LP7 083	2, 4, 6, 8	63.5	9.5	13.5	237	280	75	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
	90 S 90 L	1LP7 090 1LP7 096	2, 4, 6, 8	79	10	14	286 286	333 333	75	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
	100 L	1LP7 106 1LP7 107	2, 4, 6, 8 4, 8	102	12	16	331	385 ¹⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	112 M	1LP7 113	2, 4, 6, 8	102	12	16	349 ²⁾	403 ³⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	132 S	1LP7 130 1LP7 131	2, 4, 6, 8 2	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	132 M	1LP7 133 1LP7 134	4, 6, 8 6	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	160 M	1LP7 163 1LP7 164	2, 4, 6, 8 2, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	160 L	1LP7 166	2, 4, 6, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
	180 M	1LP5 183	2, 4	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	180 L	1LP5 186	4, 6, 8	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
	200 L	1LP5 206 1LP5 207	2, 6 2, 4, 6, 8	178	19	25	675	791	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

¹⁾ For IM B14, 381 mm.

²⁾ For IM B5, 345 mm.

³⁾ For IM B5, 399 mm.

IEC Squirrel-Cage Motors

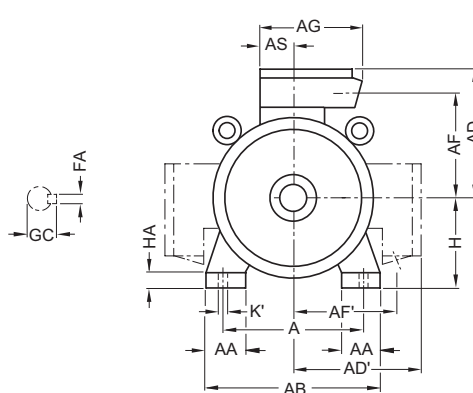
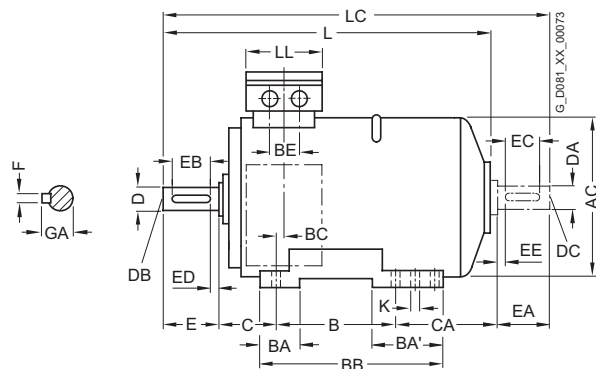
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

Cast-iron series 1LP4, frame sizes 180 M to 315 L

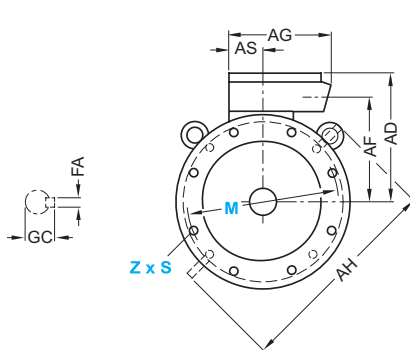
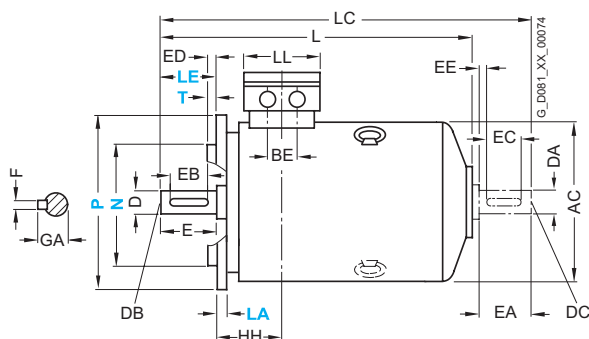
Type of construction IM B3



Frame sizes 180 M/L, 225 S/M, 280 S/M and 315 S/M/L have frame feet each with 2 drilled holes at NDE.

Types of construction IM B5 and IM V1 (IM B5 only up to frame size 315 M)

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



The motors are supplied with two fitted eyebolts conforming to IM B5, whereby one can be repositioned to conform to IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AH	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA			
180 M	1LP4 183	2, 4	279	65	339	363	262	262	220	220	152	452	71	241	70	111	328	36	54	121	94	180	20			
180 L	1LP4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	56	180	20			
200 L	1LP4 206	2, 6	318	70	378	402	300	300	247	247	260	486	96	305	80	80	355	63	85	133	76	200	25			
	1LP4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	486	96	305	80	80	355	63	85	133	76	200	25			
225 S	1LP4 220	4, 8	356	80	436	442	325	325	272	272	260	556	96	286	85	110	361	47	85	149	99	225	34			
225 M	1LP4 223	2	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	74	225	34			
		4, 6, 8																								
250 M	1LP4 253	2	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111	250	40			
		4, 6, 8																								
280 S	1LP4 280	2	457	100	540	555	432	432	348	348	300	672	118	368	100	151	479	62	110	190	137	280	40			
		4, 6, 8																								
280 M	1LP4 283	2	457	100	540	555	432	432	348	348	300	672	118	414	100	151	479	62	110	190	86	280	40			
		4, 6, 8																								
315 S	1LP4 310	2	508	120	610	610	500	500	400	400	380	780	154	406	125	176	527	69	110	216	168	315	50			
	1LP4 310	4, 6, 8																								
315 M ¹⁾	1LP4 313	2	508	120	610	610	500	500	400	400	380	780	154	457	125	176	527	69	110	216	117	315	50			
	1LP4 313	4, 6, 8																								
315 L ¹⁾	1LP4 316/317	2	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50			
	1LP4 316/317	4, 6, 8																								

* This dimension is assigned in DIN EN 50347 to the frame size listed.

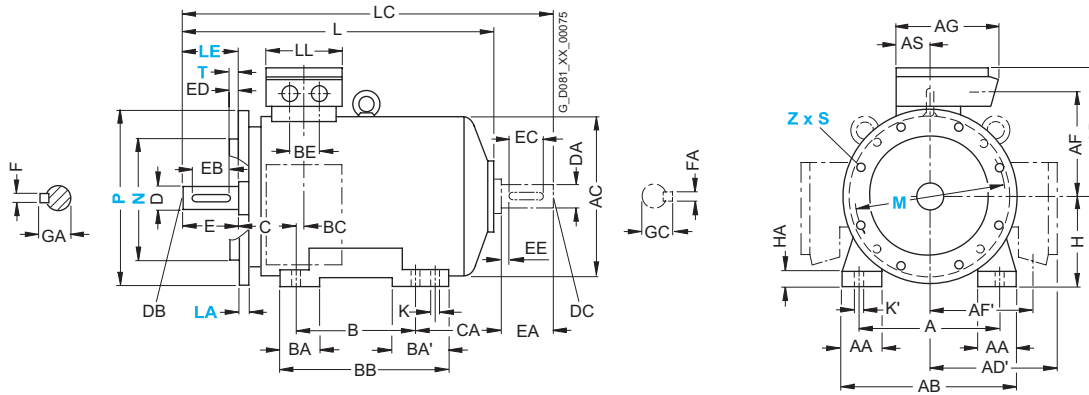
¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LP4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/136 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC						DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LP4 183	2, 4	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LP4 186	4, 6, 8	157	15	19	562	676	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LP4 206	2, 6	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
	1LP4 207	2, 4, 6, 8	196	19	25	617	734	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LP4 220	4, 8	196	19	25	670	784	192	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LP4 223	2	196	19	25	640	754	192	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				670	784		60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LP4 253	2	237	24	30	764	878	236	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8					908		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LP4 280	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8							75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LP4 283	2	252	24	30	830	975	236	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8							75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LP4 310	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 310	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 M ¹⁾	1LP4 313	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 313	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
315 L ¹⁾	1LP4 316/317	2	285	28	35	1085	1230	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LP4 316/317	4, 6, 8				1115	1260		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

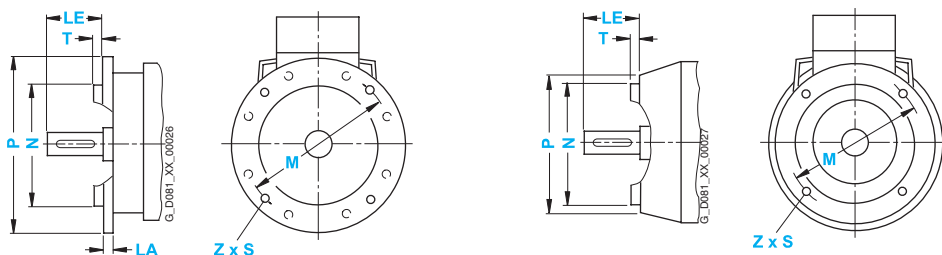
IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes.
The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes.
See the table below.
(Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) Tapped holes (FT/C)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
56 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 100	A 120	8	20	100	80	120	7	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 65	C 80	–	20	65	50	80	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 85	C 105	–	20	85	70	105	M6	2.5	4
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115	A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75	C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100	C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130	A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85	C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115	C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	A 450	16	110 140	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140 170	600	550	660	24	6	8

Non-standard motors frame size 315 and above

3



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IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Overview



N compact three-phase asynchronous motors: Series 1LA8, 1PQ8, 1LL8

The three-phase motor series N compact covers outputs up to 1250 kW (at 50 Hz) in the non-standard range. A number of technical features provide this motor series with its ruggedness and long service life and ensure the highest level of availability.

N compact motors are also characterised by their high output for small frame size. The consequence of this is an extremely compact design that can be used to save space in a number of industrial applications.

N compact motors are not only optimised in terms of their construction, but also in terms of their efficiency, so they also contribute towards lower energy consumption.

Apart from mains-fed operation, the motors of the series N compact are also specially designed for converter-fed operation. In combination with frequency converters from the SINAMICS and SIMOVERT MASTERDRIVES product series, they build up perfectly interacting drive systems for variable-speed drive applications.

Versions in the N compact series

Series 1LA8

The motors are asynchronous squirrel-cage motors with compact dimensions in fin-cooled design. They are designed for direct connection to the three-phase supply and for converter-fed operation.

- **1LA8 for mains-fed operation**
 - Designed for operation on the three-phase supply
 - Degree of protection: IP55
 - Cooling method: IC411, self-ventilated
 - Housing: Cast iron

- **1LA8 for converter-fed operation**
 - Converter-fed operation, optimised for the SINAMICS and SIMOVERT MASTERDRIVES drive systems
 - Degree of protection: IP55
 - Cooling method: IC411, self-ventilated
 - Housing: Cast iron
 - With standard insulation for voltages ≤ 500 V or with special insulation for 690 V

Series 1PQ8

The motors are asynchronous squirrel-cage motors with compact dimensions in fin-cooled design with a separately driven fan. As these motors are forced-ventilated, no derating or only relatively minor derating (depending on their speed range) is required for operation at constant load torque and with wide speed ranges. The motors are designed for converter-fed operation with the SINAMICS and SIMOVERT MASTERDRIVES drive system.

- Converter-fed operation
- Degree of protection: IP55
- Cooling method: IC416, forced-air cooling
- Housing: Cast iron
- With standard insulation for voltages ≤ 500 V or with special insulation for 690 V

Series 1LL8

The motors of series 1LL8 are asynchronous squirrel-cage motors with compact dimensions in an open fin-cooled design with self-cooling. They are similar in construction to 1LA8 motors. IP23 degree of protection is achieved by opening the internal cooling circuit and supplying it with external cooling air. This can increase the performance by up to 25% as compared to the 1LA8. They are designed for direct connection to the three-phase supply and for converter-fed operation.

Motors of the 1LL8 type series are intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

- **1LL8 for mains-fed operation**
 - Mains-fed operation
 - Degree of protection: IP23
 - Cooling method: IC01, self-ventilated
 - Housing: Cast iron
- **1LL8 for converter-fed operation**
 - Converter-fed operation
 - Degree of protection: IP23
 - Cooling method: IC01, self-ventilated
 - Housing: Cast iron

Versions with special insulation for >500 V and operation without an output filter on the frequency converter are only possible on request.

Benefits

Non-standard motors from Siemens offer the user numerous advantages:

- The optimised efficiency results in lower operating costs.
- The high output/size ratio ensures low space requirements combined with low weight.
- The cast-iron housing and bearing plates are extremely rigid and rugged and can therefore be subjected to considerable stress and have excellent vibration damping properties and are resistant to corrosion.
- The bearings are designed for maximum reliability, which results in good vibration characteristics, a long service life and low maintenance costs.
- The DURIGNIT IR 2000 insulation system with VPI or current-UV impregnation results in high reliability, a long service life and high resistance to stress, for example, during starting or under overload conditions.
- Due to the low noise emission level, the stringent requirements of worker protection are fulfilled without the need for additional measures.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Application

Thanks to the many options, the three-phase motor series N compact covers applications in a wide range of different sectors: Chemicals, paper, water/waste water, steel and shipbuilding are just a few examples. The available types of construction are IM B3, IM B35 and IM V1 according to DIN EN 60034-7. The degree of protection is IP55 as standard, but IP23 for motor series 1LL8.

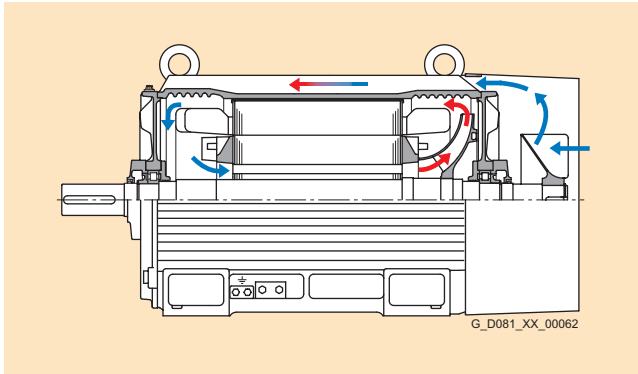
The 1PQ8 motors are specially designed for variable-speed applications with constant torque. The mounted separately driven fan provides a constantly high cooling air flow at any speed. These motors can therefore be continuously operated at low speed and high torque simultaneously.

The low-voltage motor series N compact is also available in a through-ventilated version to IP23 degree of protection. This 1LL8 motor series boasts an output 25 % higher than that of the closed 1LA8 motor series for the same frame size.

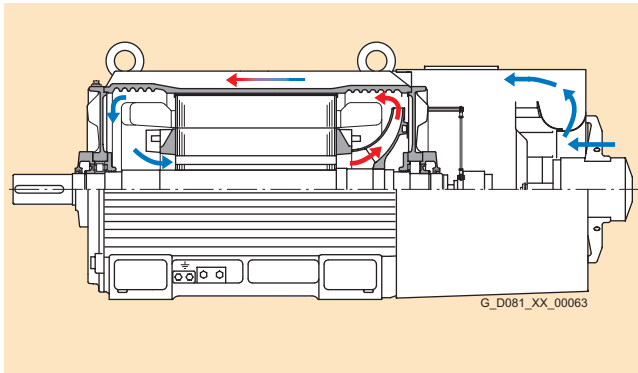
The 1LL8 motor is therefore useful for applications in which a closed 1LA8 motor is not essential and when the ambient conditions permit the use of a through-ventilated machine (IC 01 cooling method, IP23 degree of protection). Motors of the 1LL8 type series are only intended for installation indoors. They must not be subjected to humid, salty or corrosive atmospheres.

Design

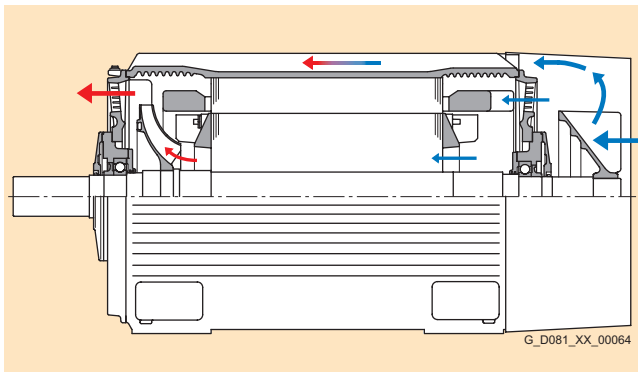
The basic structure of the non-standard motors is shown in the following sectional diagram.



Sectional diagram of 1LA8



Sectional diagram of 1PQ8



Sectional diagram of 1LL8

In conventional fin-cooled motors, the one-sided external ventilation naturally results in an uneven temperature distribution - this is however not the case with N compact motors with their additional internal air-flow channels. This cools, in particular, the stator winding heads, the rotor winding and the drive-end bearings. The resulting reduction in thermal loading increases the operating reliability and lengthens the service life. The internal air-flow channels increase the efficiency of the ventilation which means that the external air-flow can be reduced. The lower volumetric flow and air-flow optimisation of all guide channels results in a low level of fan noise.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications

The following table lists the most important technical specifications. For further information and details, see the "Introduction" section of the catalogue.

Technical specifications at a glance

Type of motor	Squirrel-cage induction motor
Connection types	Star/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8
Rated output	160 ... 1250 kW (at 50 Hz)
Rated speed (synchronous speed)	750 ... 3600 rpm
Rated torques	800 ... 10,300 Nm
Insulation of the stator winding to EN 60034-1 (IEC 60034-1)	Temperature class F (155) Used in mains-fed operation (at rated output) as: temperature class B Used in converter-fed operation (at rated output): temperature class F For ambient temperatures of up to 40 °C as standard DURIGNIT IR 2000 insulation system with impregnation by VPI or current-UV technique
Degree of protection according to EN 60034-5 (IEC 60034-5)	Motor series 1LA8 and 1PQ8: IP55 Motor series 1LL8: IP23
Cooling according to EN 60034-6 (IEC 60034-6)	Self-ventilated (motor series 1LA8) Motor frame sizes 315 to 450 (IC 411) Forced-air cooled (motor series 1PQ8) Motor frame sizes 315 to 450 (IC 416) Self-ventilated (motor series 1LL8) Motor frame sizes 315 to 450 (IC 01)
Permissible coolant temperature	See "Ambient temperature and site altitude" in the section "Introduction"
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 400 V, 500 V, 690 V The voltage used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7):	<u>Without flange:</u> IM B3 <u>With flange:</u> IM V1 without protective cover, IM V1 with protective cover, IM B35
Frame design	Cast-iron with cast frame feet for IM B3 and IM B35 types of construction
Paint finish Suitability of paint finish for climate group in accordance with IEC 60721, Part 2-1	<u>Standard:</u> Standard paint finish (moderate = expanded) RAL 7030 stone gray
Vibration severity level according to EN 60034-14 (IEC 60034-14)	Level N (normal) optional: Level R (reduced) / S (special)
Shaft extension according to DIN 748 (IEC 60072)	With featherkey, half-key balancing
Shaft and flange accuracy according to DIN 42955 (IEC 60072-1)	Tolerance N (normal) <u>Optional:</u> Tolerance R (reduced)
Sound pressure level to DIN EN ISO 1680 (tolerance +3 dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Mechanical limit speeds	The limit speed is listed in the selection and ordering data for the required motor.
Packing weights and dimensions	See "Packing weights and packing dimensions" in the "Introduction" section of the catalogue.
Rating plates	Fixed to the motor (optionally: 1 additional set of rating plates, loose), labeled as standard in English/German, can be supplied in French/Spanish, Italian or Portuguese at no extra charge See "Rating plate" in the "Introduction" section of the catalogue
Connection and connection boxes	See "Connection, circuit and connection boxes" in the "Introduction" section.
Bearing design	See "Bearings" in the "Introduction" section of the catalogue.
Cantilever forces	See "Maximum cantilever forces" in the "Introduction" section of the catalogue.
Pulse encoder	See "Special technology" in the "Introduction" section of the catalogue.
Options	See the selection and ordering data for "Special versions"

Technical specifications (continued)

Rating plate

According to DIN EN 60034-1, the approximate overall weight is specified on the rating plate for all motors of frame size 90 and above (from approx. 30 kg).

For all motors, an additional rating plate can be supplied loose, order code **K31**. An extra rating plate for identification codes is also possible, order code **Y82**. In the standard version, the rating plate is available in English and German.

SIEMENS										
3~MOT. 1LA8 317-4AB60-Z NoN- R41124661010001/2003 IMB3 Th.Cl.F										
V	Hz		A	kW	cosφ	1/min	I _A /I _N	T _E s	Certif.No	IP
400 Δ	50		540	315	0.87	1488				55
690 Y			315							
Rotor SQU.CAGE KL 13 EN/IEC 60034-1								Gew/Wt	1.5 t	
380..420VΔ, 560..530A 660..725V Y, 325..305A 50Hz										
N _{MAX} =3000 1/MIN										
S.F. 1.10										
MADE IN GERMANY D-90441 Nürnberg										
CE										

1 Motor type: 3-phase LV motor

2 Type of construction

3 Degree of protection

4 Rated voltage [V] and circuit

5 Rated current [A]

6 Rated output [kW]

7 Standards and regulations
e.g. explosion-proof motors

8 Serial number

9 Motor weight [kg]

10 Temperature class

11 Rated speed [rpm]

12 Rated frequency [Hz]

13 Power factor [cos φ]

14 Maximum speed [rpm]

15 Motor type

16 Rotor class

17 Additional details (optional)

18 Service factor

Example of rating plate for 1LA8

Converter-fed operation

The motors are equipped with standard rotors and are suitable for mains-fed or converter-fed operation.

All motors can therefore be operated with a converter, in principle. Special measures are necessary in the case of some motors, especially when separately driven fans are used. All data are applicable for a 50 Hz sinusoidal supply.

Rated voltage

The tolerance for the rated voltage is in accordance with DIN EN 60034-1 in all cases, a rated voltage range is not specified.

Motor protection

A motor protection function can be implemented using the R_t detection present in the converter software.

If required, more precise motor protection can be afforded by direct temperature measurement using KTY84 sensors, PT 100 resistance thermometers or PTC thermistors in the motor winding. Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping. If PT 100 resistance thermometers are ordered for cooling temperature monitoring (order code **A61**) or KTY84 temperature sensors (order code **A23**), the standard thermistors are omitted.

Insulation

The standard insulation of the motors is designed such that converter-fed operation is possible without limitation at voltages ≤500 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_r > 0.1 \mu s$ at the motor terminals.

All motors with voltage codes 4, 5 and 8 must be operated under these preconditions on a converter.

This does not apply to motors with voltages >500 up to 690 V, that must have special insulation for operation on a pulse-controlled AC converter (SINAMICS, SIMOVERT MASTERDRIVES) without a converter circuit (du/dt filter or sinusoidal filter), i.e. when 10th position of the Order No. = "M".

For converter-fed operation with the outputs specified in the catalogue, the motors are used according to temperature class F, i.e. in this case neither a service factor >1 nor an increased ambient temperature is possible (order codes C11, C12 and C13 cannot be ordered).

Motor connection

When connecting the motors, it is important to consider the restrictions for mains-fed machines as well as the maximum conductor cross-sections permitted for the converter.

Ventilation/noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors (this is not the case for forced-air cooled motors 1PQ8). To increase motor utilisation at low speeds it is recommended that forced-air cooled motors are used, e.g. those of series 1PQ8.

In general, for converter-fed operation, the noise level is higher than that specified in the catalogue (exception: 1PQ8). The increase depends on the converter type and can lie between 5 and 10 dB(A) depending on the frame size and number of poles for the motor.

Mechanical stress and grease lifetime

When motors are operated at speeds above the rated speed, the running smoothness and the bearings are subjected to greater mechanical stress. This reduces the grease lifetime and the bearing lifetime. More detailed information on request.

Storage

To prevent damage being caused as a result of bearing currents, insulated bearings are used at the non-drive-end of 1LA8, 1LL8 and 1PQ8 motors for converter-fed operation in the standard version (this can be recognised when 9th position of Order No. = "P").

When operating multiphase induction machines on a converter, an electrical bearing stress results from a capacitive induced voltage via the bearing lubricating film, depending on the principle being used. The physical cause of this is the common-mode voltage at the converter output that is inherent in the control method for a converter: the sum of the three-phase voltages is – in contrast to straightforward mains-fed operation – not equal to zero at every point in time. The high-frequency, pulse-shaped common-mode voltage brings about a residual current, which closes back to the converter's DC link via the machine's internal capacitances, the machine housing and the earthing circuit. The machine's internal capacitances include the main insulation winding capacitance, the geometric capacitance between the rotor and stator, the lubricating film capacitance and the capacitance of any bearing insulation that may be present. The level of the currents due to the internal capacitances is proportional to the gradients, i.e. the voltage variation of the DC voltage ($i_{(t)} = C \cdot du/dt$).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Technical specifications (continued)

In order to apply currents to the motor which are sinusoidal as far as possible (smooth running, oscillation torques, stray losses), a high clock frequency is required for the converter's output voltage. The related (very steep) switching edges of the converter output voltage (and also, therefore, of the common-mode voltage) cause correspondingly high capacitive currents and voltages on the machine's internal capacitances.

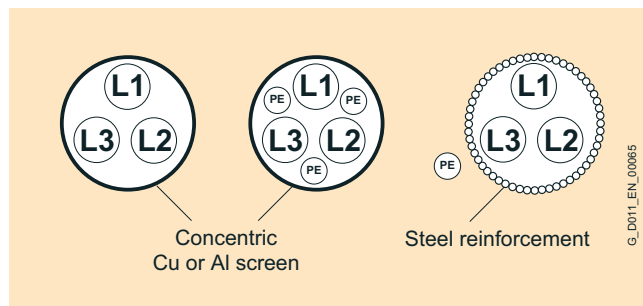
The voltage that is injected capacitively across the bearing can result, in the worst case, in stochastic arcing through the lubrication film of the bearing and prematurely age or damage the bearing. (The current pulses caused by arcing in the lubrication film are known as EDM currents (Electrostatic Discharge Machining) in the technical literature.)

This physical effect, which occurs in isolated cases, has mostly been observed in connection with larger motors.

EMC-compliant installation of the drive system is a basic prerequisite for preventing premature bearing damage as a result of bearing currents.

The most important measures for reducing bearing currents:

- Insulated motor bearings at the non-drive-end NDE (BS) (standard for 1LA8, 1LL8 and 1PQ8 for converter-fed operation)
- Use of cables with a symmetrical cable cross-section:



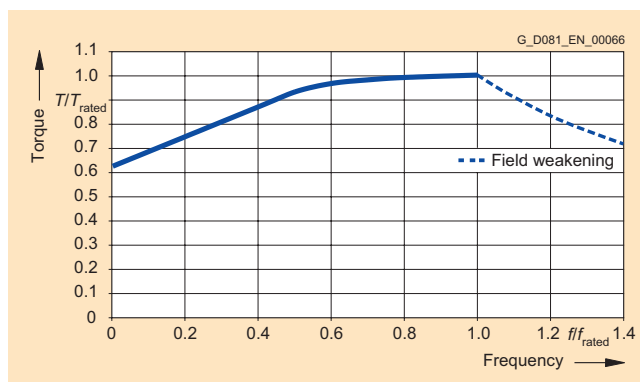
- Preference given to a supply with insulated neutral point (IT system)
- Use of earthing cables with low impedance in a large frequency range (DC up to approximately 70 MHz): for example, plaited copper ribbon cables, HF litz wires
- Separate HF equipotential-bonding cable between motor frame and driven machine
- Separate HF equipotential-bonding cable between motor housing and converter PE busbar
- 360° HF contacting of the cable shield on the motor frame and the converter PE busbar. This can be achieved using EMC screwed glands on the motor end and EMC shield clips on the converter end, for example.
- Using motor reactors at the converter
- Common-mode filters at the converter output

Thermal torque limits

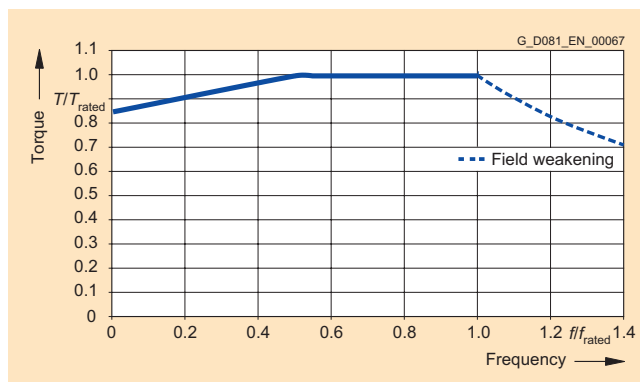
Guide values for the maximum load torques at various speeds can be obtained from the diagrams below.

In the case of self-ventilated motors, such as series 1LA8 and 1LL8, the thermally permissible load torques are reduced for continuous operation for speeds below the rated speed. This must be taken into account in those applications in particular that are not subjected to a load torque that is dependent on the square of the speed. Also in the case of forced-air cooled motors of series 1PQ8, the maximum load torques are reduced slightly for high speed ranges.

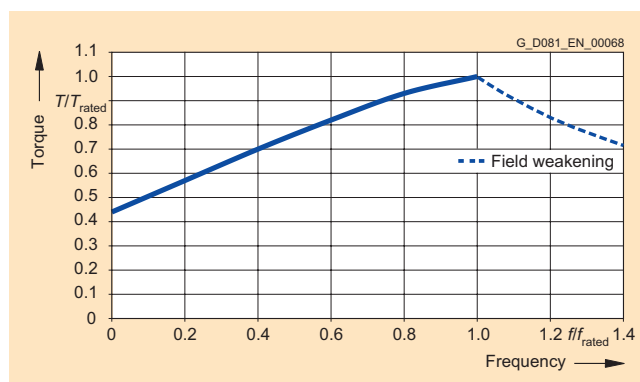
When motors are operated at speeds above their rated speed (operation in the field-weakening range), the maximum load torque is also reduced.



Thermal torque limit characteristic 1LA8



Thermal torque limit characteristic 1PQ8



Thermal torque limit characteristic 1LL8

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors for mains-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LA8						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/10 ... 3/11
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/10 ... 3/11
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/12 ... 3/13
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/12 ... 3/13

Self-ventilated motors for converter-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LA8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/14 ... 3/15
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/14 ... 3/15
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/16 ... 3/17
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/16 ... 3/17

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LA8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/18 ... 3/19
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/18 ... 3/19
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/20 ... 3/21
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/20 ... 3/21

Forced-air cooled motors with mounted separately driven fan for converter-fed operation (IP55 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1PQ8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/22 ... 3/23
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/22 ... 3/23
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/24 ... 3/25
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/24 ... 3/25

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1PQ8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/26 ... 3/27
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/26 ... 3/27
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/28 ... 3/29
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/28 ... 3/29

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Orientation

Selection and ordering data (continued)

Self-ventilated motors with through-ventilation for mains-fed operation (IP23 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LL8						
3000, 2-pole	315 ... 450	315 ... 1250	2974 ... 2986	1010 ... 4000	510 ... 1300	3/30 ... 3/31
1500, 4-pole	315 ... 450	315 ... 1250	1483 ... 1490	2030 ... 8010	540 ... 1360	3/30 ... 3/31
1000, 6-pole	315 ... 450	250 ... 1000	988 ... 993	2420 ... 9620	430 ... 1380	3/32 ... 3/33
750, 8-pole	315 ... 450	200 ... 800	738 ... 743	2590 ... 10300	370 ... 1440	3/32 ... 3/33

Self-ventilated motors with through-ventilation for converter-fed operation (IP23 degree of protection)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LL8 with standard insulation ≤500 V						
3000, 2-pole	315 ... 450	315 ... 1250	2974 ... 2986	1010 ... 4000	510 ... 1300	3/34 ... 3/35
1500, 4-pole	315 ... 450	315 ... 1250	1483 ... 1490	2030 ... 8010	540 ... 1360	3/34 ... 3/35
1000, 6-pole	315 ... 450	250 ... 1000	988 ... 993	2420 ... 9620	430 ... 1380	3/36 ... 3/37
750, 8-pole	315 ... 450	200 ... 800	738 ... 743	2590 ... 10300	370 ... 1440	3/36 ... 3/37

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1LL8 with special insulation >500 to 690 V						
3000, 2-pole	315 ... 450	300 ... 1210	O. R.	O. R.	O. R.	3/38
1500, 4-pole	315 ... 450	295 ... 1225	O. R.	O. R.	O. R.	3/38
1000, 6-pole	315 ... 450	235 ... 975	O. R.	O. R.	O. R.	3/39
750, 8-pole	315 ... 450	180 ... 760	O. R.	O. R.	O. R.	3/39

O. R. Values available on request.

More information

Standardline

4-pole 1LA8 motors are available with a reduced range of options up to an output of 500 kW in the *Standardline*.

Benefits to the customer:

- Much shorter delivery time
- Attractive price
- Products in the *Standardline* can be configured with a variety of options so as to ensure a high degree of flexibility.

Application:

Standardline low-voltage motors are optimised for applications in pump, fan and compressor drives.

For the low-voltage motors, this is particularly true for complete, coordinated drive systems comprising the motor and a SINAMICS G150 frequency converter.

Standardline motors can be ordered with the order code **B20**.

Scope of the *Standardline*:

- 4-pole version
- Power range 250 to 500 kW
- Types 1LA8 315, 1LA8 317, 1LA8 353, 1LA8 355 and 1LA8 357
- Type of construction code **0** (IM B3)
- Voltage code **6** (400 VΔ/690 VY) or **5** (500 VΔ)
- Can be ordered for converter-fed operation, but not in the 690 V version
- Possible order codes: **A23, A61, A72, G50, H70, H73, K10, K45, K46, K57, K83, K84, K85, L00, L97, L98, M58** (only frame size 315), **M88** and **Y53**

For more information, see Catalogue D 86.1 *Standardline*.

For more information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation

Cast-iron series 1LA8

Selection and ordering data

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output							Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction, approx. m kg
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1LA8 315-2AC□□		1300
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1LA8 317-2AC□□		1500
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1LA8 353-2AC□□		1900
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1LA8 355-2AC□□		2000
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1LA8 357-2AC□□		2200
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1LA8 403-2AC□□		2800
630	693	400	2985	2020	97.1	97.1	0.91	1020	600	1LA8 405-2AC□□		3000
710	781	400	2985	2270	97.3	97.3	0.91	–	670 ¹⁾	1LA8 407-2AC□□		3200
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1LA8 453-2AE□□		4000
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1LA8 455-2AE□□		4200
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1LA8 457-2AE□□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection												
250	288	315	1488	1600	96.0	96.0	0.87	430	250 ²⁾	1LA8 315-4AB□□		1300
315	362	315	1488	2020	96.2	96.2	0.87	540	315 ²⁾	1LA8 317-4AB□□		1500
355	408	355	1488	2280	96.3	96.3	0.87	610	355 ²⁾	1LA8 353-4AB□□		1900
400	460	355	1488	2570	96.4	96.4	0.87	690	400 ²⁾	1LA8 355-4AB□□		2000
500	575	355	1488	3210	96.7	96.7	0.88	850	490 ²⁾	1LA8 357-4AB□□		2200
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1LA8 403-4AB□□		2800
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1LA8 405-4AB□□		3000
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1LA8 407-4AB□□		3200
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1LA8 453-4AC□□		4000
900	1040	450	1492	5760	97.1	97.1	0.88	–	880 ¹⁾	1LA8 455-4AC□□		4200
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1LA8 457-4AC□□		4400

Up to frame size 355, a service factor of 1.1 is stamped, above this 1.05.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (for rated output at 60 Hz, see above)	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
1LA8 315-... □□ to 1LA8 405-... □□	□	○	– ⁵⁾	○	□	✓ ⁶⁾	✓ ⁶⁾	✓
1LA8 407-... □□ to 1LA8 457-... □□	–	○	□	O. R.	□	✓ ⁶⁾	✓ ⁶⁾	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

- ¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
- ²⁾ *Standardline* for 1LA8 motors is a standardised range in specific versions which can be ordered with the order code **B20**. The delivery time is 4 weeks. Scope of the *Standardline*: 4-pole, types **1LA8 315**, **1LA8 317**, **1LA8 353**, **1LA8 355**, type of construction code **0** (IM B3), voltage code **6** (400 VΔ/690 VY) or **5** (500 VΔ); can be ordered for converter-fed operation, but not in 690 V version; possible order codes: **A23**, **A61**, **A72**, **H70**, **H73**, **K10**, **K45**, **L97**, **M58** (for frame size 315 only), **M88**, **Y53**.

- ³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
- ⁶⁾ For 2-pole motors 60 Hz version, not possible for 1LA8 353 to 1LA8 457.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Locked- rotor torque	Locked- rotor current	Breakdown torque	Torque class	Moment of inertia	Noise	Mechanical limit speed ¹⁾		Parallel feeders required		
	At 50 Hz and for multiple of rated torque	for direct online starting current	torque			Measuring- surface sound pres- sure level at 50 Hz	Sound power level at 50 Hz				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection											
1LA8 315-2AC□□	1.8	7.0	2.8	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600	Yes		
1LA8 317-2AC□□	1.8	7.0	2.8	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600	Yes		
1LA8 353-2AC□□	1.7	6.5	2.5	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 355-2AC□□	1.7	6.5	2.5	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 357-2AC□□	1.8	6.5	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	Yes		
1LA8 403-2AC□□	1.6	7.0	2.8	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	Yes		
1LA8 405-2AC□□	1.6	7.0	2.8	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	Yes	Yes	
1LA8 407-2AC□□	1.7	7.0	2.8	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾		Yes	
1LA8 453-2AE□□	0.9	7.0	3.0	5	19	81 ³⁾	96 ³⁾	3000		Yes	
1LA8 455-2AE□□	0.9	7.0	2.8	5	21	81 ³⁾	96 ³⁾	3000		Yes	Yes
1LA8 457-2AE□□	0.9	7.0	2.7	5	23	81 ³⁾	96 ³⁾	3000		Yes	Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection											
1LA8 315-4AB□□	1.9	6.5	2.8	13	3.6	73	87	3000 (2650)	Yes		
1LA8 317-4AB□□	2.0	6.8	2.8	13	4.4	73	87	3000 (2650)	Yes		
1LA8 353-4AB□□	2.1	6.5	2.6	13	6.1	75	90	2500 (2350)	Yes	Yes	
1LA8 355-4AB□□	2.1	6.5	2.6	13	6.8	75	90	2500 (2350)	Yes	Yes	
1LA8 357-4AB□□	2.1	6.5	2.4	13	8.5	75	90	2500 (2350)	Yes		
1LA8 403-4AB□□	1.9	6.5	2.7	13	13	78	93	2200 (2100)/2100 ⁴⁾	Yes		
1LA8 405-4AB□□	1.9	6.8	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	Yes	Yes	
1LA8 407-4AB□□	1.9	6.8	2.7	13	16	78	93	2200 (2100)/2100 ⁴⁾	Yes		
1LA8 453-4AC□□	1.6	7.0	2.6	10	23	81	96	2100 (1900)/1800 ⁴⁾		Yes	
1LA8 455-4AC□□	1.6	7.0	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾		Yes	Yes
1LA8 457-4AC□□	1.7	7.0	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾		Yes	Yes

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.
²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, anticlockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For anticlockwise rotation, order code **K38** is necessary.
⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output		Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V	Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction, approx. m kg
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection												
200	230	315	988	1930	95.7	95.8	0.86	345	200	1LA8 315-6AB□□		1300
250	288	315	988	2410	95.9	96.0	0.86	430	250	1LA8 317-6AB□□		1500
315	362	355	993	3040	96.2	96.2	0.86	540	315	1LA8 355-6AB□□		2000
400	460	355	993	3850	96.5	96.5	0.86	690	400	1LA8 357-6AB□□		2200
450	518	400	991	4330	96.5	96.5	0.86	780	455	1LA8 403-6AB□□		2800
500	575	400	991	4810	96.5	96.5	0.86	860	500	1LA8 405-6AB□□		3000
560	644	400	991	5390	96.7	96.7	0.86	960	560	1LA8 407-6AB□□		3200
630	725	450	993	6060	96.8	96.8	0.86	1100	630	1LA8 453-6AB□□		4000
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾	1LA8 455-6AB□□		4200
800	920	450	993	7690	97.0	97.1	0.86	–	790 ¹⁾	1LA8 457-6AB□□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection												
160	184	315	739	2070	94.9	94.9	0.82	295	172	1LA8 315-8AB□□		1300
200	230	315	739	2580	95.2	95.2	0.82	370	215	1LA8 317-8AB□□		1500
250	288	355	741	3220	95.7	95.7	0.82	460	265	1LA8 355-8AB□□		2000
315	362	355	741	4060	96.0	96.0	0.82	580	335	1LA8 357-8AB□□		2200
355	408	400	742	4570	96.1	96.1	0.82	650	375	1LA8 403-8AB□□		2800
400	460	400	742	5150	96.2	96.2	0.82	730	425	1LA8 405-8AB□□		3000
450	518	400	742	5790	96.3	96.3	0.82	820	475	1LA8 407-8AB□□		3200
500	575	450	744	6420	96.4	96.4	0.81	920	540	1LA8 453-8AB□□		4000
560	644	450	744	7190	96.5	96.5	0.81	1040	600	1LA8 455-8AB□□		4200
630	725	450	744	8090	96.6	96.6	0.81	1160	670	1LA8 457-8AB□□		4500

Up to frame size 355, a service factor of 1.1 is stamped, above this 1.05.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (for rated output at 60 Hz, see above)	Without flange IM B3	With flange IM V1 without protective cover ²⁾	IM V1 with protective cover ³⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
6-pole								
1LA8 315-...□□ to 1LA8 453-...□□	□	○	– ⁴⁾	○	□	✓	✓	✓
1LA8 455-...□□ to 1LA8 457-...□□	–	○	□	O. R.	□	✓	✓	✓
8-pole								
1LA8 315-...□□ to 1LA8 457-...□□	□	○	– ⁴⁾	○	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
²⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for mains-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Locked- rotor torque	Locked- rotor current	Breakdown torque	Torque class	Moment of inertia	Noise		Mechanical limit speed	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated					Measuring- surface sound pres- sure level at 50 Hz	Sound power level at 50 Hz				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection											
1LA8 315-6AB□□	2.0	6.3	2.5	13	6.0	68	82	2950 (2350)			
1LA8 317-6AB□□	2.0	6.3	2.5	13	7.3	68	82	2950 (2350)	Yes		
1LA8 355-6AB□□	2.2	6.5	2.8	13	13	71	86	2500 (2100)	Yes		
1LA8 357-6AB□□	2.2	6.5	2.8	13	16	71	86	2500 (2100)	Yes	Yes	Yes
1LA8 403-6AB□□	2.2	6.5	2.8	13	21	73	88	2200 (1900)/2100 ¹⁾			
1LA8 405-6AB□□	2.3	6.5	2.8	13	24	73	88	2200 (1900)/2100 ¹⁾	Yes		
1LA8 407-6AB□□	2.3	6.5	2.8	13	27	73	88	2200 (1900)/2100 ¹⁾	Yes		
1LA8 453-6AB□□	2.0	6.5	2.6	13	35	75	90	2100 (1700)/1800 ¹⁾	Yes	Yes	
1LA8 455-6AB□□	2.0	6.5	2.5	13	39	75	90	2100 (1700)/1800 ¹⁾	Yes	Yes	
1LA8 457-6AB□□	2.0	6.5	2.5	13	44	75	90	2100 (1700)/1800 ¹⁾	Yes	Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP55 degree of protection											
1LA8 315-8AB□□	2.1	6.0	2.3	13	6.0	65	79	2950 (2350)			
1LA8 317-8AB□□	2.1	6.0	2.3	13	7.3	65	79	2950 (2350)			
1LA8 355-8AB□□	2.1	6.1	2.4	13	13	67	82	2500 (2100)			
1LA8 357-8AB□□	2.1	6.1	2.4	13	16	67	82	2500 (2100)	Yes		
1LA8 403-8AB□□	2.0	6.5	2.6	13	21	69	84	2200 (1900)/2100 ¹⁾			
1LA8 405-8AB□□	2.1	6.5	2.6	13	24	69	84	2200 (1900)/2100 ¹⁾			
1LA8 407-8AB□□	2.1	6.5	2.6	13	27	69	84	2200 (1900)/2100 ¹⁾	Yes		
1LA8 453-8AB□□	2.0	6.6	2.4	13	35	71	86	2100 (1700)/1800 ¹⁾	Yes		
1LA8 455-8AB□□	2.0	6.6	2.4	13	39	71	86	2100 (1700)/1800 ¹⁾	Yes	Yes	
1LA8 457-8AB□□	2.0	6.6	2.4	13	44	71	86	2100 (1700)/1800 ¹⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight of IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Rated current at 50 Hz 400 V I_{rated} A	Rated current at 50 Hz 690 V I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1LA8 315-2PC□□		1300
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1LA8 317-2PC□□		1500
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1LA8 353-2PC□□		1900
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1LA8 355-2PC□□		2000
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1LA8 357-2PC□□		2200
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1LA8 403-2PC□□		2800
630	693	400	2985	2020	97.1	97.1	0.91	1020	600 ¹⁾	1LA8 405-2PC□□		3000
710	781	400	2985	2270	97.3	97.3	0.91	–	670	1LA8 407-2PC□□		3200
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1LA8 453-2PE□□		4000
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1LA8 455-2PE□□		4200
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1LA8 457-2PE□□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	288	315	1488	1600	96.0	96.0	0.87	430	250 ²⁾	1LA8 315-4PB□□		1300
315	362	315	1488	2020	96.2	96.2	0.87	540	315 ²⁾	1LA8 317-4PB□□		1500
355	408	355	1488	2280	96.3	96.3	0.87	610	355 ²⁾	1LA8 353-4PB□□		1900
400	460	355	1488	2570	96.4	96.4	0.87	690	400 ²⁾	1LA8 355-4PB□□		2000
500	575	355	1488	3210	96.7	96.7	0.88	850	490 ²⁾	1LA8 357-4PB□□		2200
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1LA8 403-4PB□□		2800
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1LA8 405-4PB□□		3000
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1LA8 407-4PB□□		3200
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1LA8 453-4PC□□		4000
900	1040	450	1492	5760	97.1	97.1	0.88	–	880 ¹⁾	1LA8 455-4PC□□		4200
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1LA8 457-4PC□□		4400

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ³⁾	500 VΔ	690 VΔ ³⁾	Without flange IM B3	With flange IM V1 without protective cover ⁴⁾	IM V1 with protective cover ⁵⁾	IM B35
	4	8	5	7	0	8	4	6
1LA8 315- ... □□ to 1LA8 405- ... □□	○	□	○	–	□	✓ ⁶⁾	✓ ⁶⁾	✓
1LA8 407- ... □□ to 1LA8 457- ... □□	–	–	○	□	□	✓ ⁶⁾	✓ ⁶⁾	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

²⁾ *Standardline* for 1LA8 motors is a standardised range in specific versions which can be ordered with the order code **B20**. The delivery time is 4 weeks. Scope of the *Standardline*: 4-pole, types **1LA8 315**, **1LA8 317**, **1LA8 353**, **1LA8 355**, type of construction code **0** (IM B3), voltage code **6** (400 VΔ/690 VY) or **5** (500 VΔ); can be ordered for converter-fed operation, but not in 690 V version. Possible order codes: **A23**, **A61**, **A72**, **H70**, **H73**, **K09**, **K10**, **K45**, **L97**, **M58** (for frame size 315 only), **M88**, **Y53**.

³⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

⁴⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁶⁾ In 2-pole motors 60 Hz version, not possible for 1LA8 353 to 1LA8 457.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	At 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz For rated output, 50 Hz, tolerance +3 dB(A)	Sound power level at 50 Hz	Mech. Limit speed ¹⁾		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-2PC□□	2.8	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 317-2PC□□	2.8	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 353-2PC□□	2.5	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 355-2PC□□	2.5	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 357-2PC□□	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 403-2PC□□	2.8	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 405-2PC□□	2.8	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 407-2PC□□	2.8	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 453-2PE□□	3.0	5	19	81 ³⁾	96 ³⁾	3000	50		Yes	
1LA8 455-2PE□□	2.8	5	21	81 ³⁾	96 ³⁾	3000	50		Yes	Yes
1LA8 457-2PE□□	2.7	5	23	81 ³⁾	96 ³⁾	3000	50		Yes	Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-4PB□□	2.8	13	3.6	73	87	3000 (2650)	100 (88)	Yes		
1LA8 317-4PB□□	2.8	13	4.4	73	87	3000 (2650)	100 (88)	Yes		
1LA8 353-4PB□□	2.6	13	6.1	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 355-4PB□□	2.6	13	6.8	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 357-4PB□□	2.4	13	8.5	75	90	2500 (2350)	83 (78)	Yes		
1LA8 403-4PB□□	2.7	13	13	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 405-4PB□□	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes	Yes	
1LA8 407-4PB□□	2.7	13	16	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾		Yes	
1LA8 453-4PC□□	2.6	10	23	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾		Yes	
1LA8 455-4PC□□	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾		Yes	Yes
1LA8 457-4PC□□	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾		Yes	Yes

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, anticlockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For anticlockwise rotation, order code **K38** is necessary.

⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output	Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V	Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A				m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V													
200	230	315	988	1930	95.7	95.8	0.86	345	200		1LA8 315-6PB□□		1300
250	288	315	988	2410	95.9	96.0	0.86	430	250		1LA8 317-6PB□□		1500
315	362	355	993	3040	96.2	96.2	0.86	540	315		1LA8 355-6PB□□		2000
400	460	355	993	3850	96.5	96.5	0.86	690	400		1LA8 357-6PB□□		2200
450	518	400	991	4330	96.5	96.5	0.86	780	455		1LA8 403-6PB□□		2800
500	575	400	991	4810	96.5	96.5	0.86	860	500		1LA8 405-6PB□□		3000
560	644	400	991	5390	96.7	96.7	0.86	960	560		1LA8 407-6PB□□		3200
630	725	450	993	6060	96.8	96.8	0.86	1100	630		1LA8 453-6PB□□		4000
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾		1LA8 455-6PB□□		4200
800	920	450	993	7690	97.0	97.1	0.86	–	790 ¹⁾		1LA8 457-6PB□□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V													
160	184	315	739	2070	94.9	94.9	0.82	295	172		1LA8 315-8PB□□		1300
200	230	315	739	2580	95.2	95.2	0.82	370	215		1LA8 317-8PB□□		1500
250	288	355	741	3220	95.7	95.7	0.82	460	265		1LA8 355-8PB□□		2000
315	362	355	741	4060	96.0	96.0	0.82	580	335		1LA8 357-8PB□□		2200
355	408	400	742	4570	96.1	96.1	0.82	650	375		1LA8 403-8PB□□		2800
400	460	400	742	5150	96.2	96.2	0.82	730	425		1LA8 405-8PB□□		3000
450	518	400	742	5790	96.3	96.3	0.82	820	475		1LA8 407-8PB□□		3200
500	575	450	744	6420	96.4	96.4	0.81	920	540		1LA8 453-8PB□□		4000
560	644	450	744	7190	96.5	96.5	0.81	1040	600		1LA8 455-8PB□□		4200
630	725	450	744	8090	96.6	96.6	0.81	1160	670		1LA8 457-8PB□□		4500

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1LA8 315- ... □□ to 1LA8 453- ... □□	○	□	○	–	□	✓	✓	✓
1LA8 455- ... □□ to 1LA8 457- ... □□	–	–	○	□	□	✓	✓	✓
8-pole								
1LA8 315- ... □□ to 1LA8 457- ... □□	○	□	○	– ⁵⁾	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁵⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	At 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Noise	Sound power level at 50 Hz	Mech. Limiting speed		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz For rated output, 50 Hz, tolerance +3 dB(A) $L_{p(A)}$ dB(A)	Sound power level at 50 Hz L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-6PB□□	2.5	13	6.0	68	82	2950 (2350)	147 (117)			
1LA8 317-6PB□□	2.5	13	7.3	68	82	2950 (2350)	147 (117)	Yes		
1LA8 355-6PB□□	2.8	13	13	71	86	2500 (2100)	125 (105)	Yes		
1LA8 357-6PB□□	2.8	13	16	71	86	2500 (2100)	125 (105)	Yes	Yes	
1LA8 403-6PB□□	2.8	13	21	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾			
1LA8 405-6PB□□	2.8	13	24	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes		
1LA8 407-6PB□□	2.8	13	27	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes		
1LA8 453-6PB□□	2.6	13	35	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾	Yes	Yes	
1LA8 455-6PB□□	2.5	13	39	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes	
1LA8 457-6PB□□	2.5	13	44	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LA8 315-8PB□□	2.3	13	6.0	65	79	2950 (2350)	196 (156)			
1LA8 317-8PB□□	2.3	13	7.3	65	79	2950 (2350)	196 (156)			
1LA8 355-8PB□□	2.4	13	13	67	82	2500 (2100)	166 (140)			
1LA8 357-8PB□□	2.4	13	16	67	82	2500 (2100)	166 (140)	Yes		
1LA8 403-8PB□□	2.6	13	21	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾			
1LA8 405-8PB□□	2.6	13	24	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾			
1LA8 407-8PB□□	2.6	13	27	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾	Yes		
1LA8 453-8PB□□	2.4	13	35	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes		
1LA8 455-8PB□□	2.4	13	39	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes	
1LA8 457-8PB□□	2.4	13	44	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at 50 Hz 60 Hz		Frame size	Operating values at rated output						Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx. <i>m</i> kg
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V			
<i>P</i> _{rated} kW	<i>P</i> _{rated} kW	FS	<i>n</i> _{rated} rpm	<i>T</i> _{rated} Nm	<i>η</i> _{rated} %	<i>η</i> _{rated} %	<i>cos φ</i> _{rated}	<i>I</i> _{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
240	270	315	2978	770	96.0	96.0	0.90	230	1LA8 315-2PM8□		1300
300	335	315	2978	962	96.4	96.4	0.91	285	1LA8 317-2PM8□		1500
345	385	355	2981	1105	96.4	96.4	0.90	335	1LA8 353-2PM8□		1900
390	435	355	2981	1249	96.6	96.6	0.91	370	1LA8 355-2PM8□		2000
485	545	355	2982	1553	97.0	97.0	0.91	460	1LA8 357-2PM8□		2200
545	600	400	2986	1743	97.1	97.1	0.91	520	1LA8 403-2PM8□		2800
610	670	400	2986	1951	97.1	97.1	0.91	580	1LA8 405-2PM7□		3000
680	750	400	2986	2175	97.2	97.2	0.92	640	1LA8 407-2PM7□		3200
775	-	450	2987	2478	97.2	97.2	0.92	730	1LA8 453-2PM7□		4000
875	-	450	2987	2798	97.3	97.3	0.92	820	1LA8 455-2PM7□		4200
970	-	450	2987	3101	97.4	97.4	0.93	900	1LA8 457-2PM7□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
235	270	315	1485	1511	95.8	95.8	0.87	235	1LA8 315-4PM8□		1300
290	335	315	1485	1865	95.9	95.9	0.87	285	1LA8 317-4PM8□		1500
340	390	355	1488	2182	96.0	96.0	0.87	340	1LA8 353-4PM8□		1900
385	445	355	1488	2471	96.2	96.2	0.87	385	1LA8 355-4PM8□		2000
480	550	355	1488	3081	96.4	96.4	0.87	480	1LA8 357-4PM8□		2200
545	625	400	1491	3491	96.5	96.5	0.88	540	1LA8 403-4PM8□		2800
615	710	400	1491	3939	96.7	96.7	0.88	600	1LA8 405-4PM8□		3000
690	795	400	1491	4420	96.9	96.9	0.89	670	1LA8 407-4PM7□		3200
785	905	450	1492	5025	96.8	96.8	0.88	770	1LA8 453-4PM7□		4000
880	1010	450	1492	5633	97.0	97.0	0.87	870	1LA8 455-4PM7□		4200
980	1125	450	1492	6273	97.1	97.1	0.89	950	1LA8 457-4PM7□		4400

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LA8 315-... □□ to 1LA8 457-... □□	0	8	4	6
	□	✓	✓	✓

- Standard version
✓ With extra charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Noise	Sound power level at 50 Hz	Mech. Limit speed ¹⁾		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz For rated output, 50 Hz, tolerance +3 dB(A)	Sound power level at 50 Hz L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-2PM8□	3.0	10	2.7	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 317-2PM8□	3.0	10	3.3	82 (75) ²⁾	97 (90) ²⁾	3600	60	Yes		
1LA8 353-2PM8□	2.6	10	4.8	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 355-2PM8□	2.6	10	5.3	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 357-2PM8□	2.6	10	6.4	77 ³⁾	92 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 403-2PM7□	3.0	10	8.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 405-2PM7□	3.1	10	9.6	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes	Yes	
1LA8 407-2PM7□	3.0	10	11	79 ³⁾	94 ³⁾	3600/3100 ⁴⁾	60/52 ⁴⁾	Yes		
1LA8 453-2PM7□	2.8	5	19	81 ³⁾	96 ³⁾	3000	50	Yes		
1LA8 455-2PM7□	2.8	5	21	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
1LA8 457-2PM7□	2.8	5	23	81 ³⁾	96 ³⁾	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-4PM8□	2.8	13	3.6	73	87	3000 (2650)	100 (88)	Yes		
1LA8 317-4PM8□	2.8	13	4.4	73	87	3000 (2650)	100 (88)	Yes		
1LA8 353-4PM8□	2.6	13	6.1	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 355-4PM8□	2.6	13	6.8	75	90	2500 (2350)	83 (78)	Yes	Yes	
1LA8 357-4PM8□	2.5	13	8.5	75	90	2500 (2350)	83 (78)	Yes		
1LA8 403-4PM8□	2.6	13	13	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 405-4PM8□	2.7	13	14	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes	Yes	
1LA8 407-4PM7□	2.6	13	16	78	93	2200 (2100)/2100 ⁴⁾	73 (70)/70 ⁴⁾	Yes		
1LA8 453-4PM7□	2.5	10	23	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes		
1LA8 455-4PM7□	2.6	10	26	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	
1LA8 457-4PM7□	2.6	10	28	81	96	2100 (1900)/1800 ⁴⁾	70 (63)/60 ⁴⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ Low-noise version, 2-pole, in brackets. To reduce noise, 2-pole motors can be equipped with an axial fan that is only suitable for one direction of rotation. Clockwise rotation order code **K37**, anticlockwise rotation **K38**.

³⁾ In the standard version, the motors already have an axial fan for clockwise rotation. Order code **K37** is not necessary. For anticlockwise rotation, order code **K38** is necessary.

⁴⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output					Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V	Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A				m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V												
190	220	315	990	1833	95.5	95.6	0.85	196		1LA8 315-6PM8□		1300
235	270	315	990	2267	95.7	95.8	0.86	240		1LA8 317-6PM8□		1500
300	345	355	992	2888	96.2	96.2	0.86	305		1LA8 355-6PM8□		2000
380	435	355	992	3658	96.4	96.4	0.86	385		1LA8 357-6PM8□		2200
435	500	400	993	4184	96.4	96.4	0.85	445		1LA8 403-6PM8□		2800
485	560	400	993	4664	96.5	96.5	0.86	490		1LA8 405-6PM8□		3000
545	625	400	993	5241	96.6	96.6	0.86	550		1LA8 407-6PM8□		3200
615	705	450	993	5915	96.8	96.8	0.84	630		1LA8 453-6PM8□		4000
690	795	450	993	6636	96.8	96.8	0.85	700		1LA8 455-6PM7□		4200
780	895	450	993	7502	96.9	97.0	0.85	790		1LA8 457-6PM7□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V												
145	165	315	740	1871	94.6	94.6	0.79	162		1LA8 315-8PM8□		1300
180	205	315	740	2323	94.9	94.9	0.80	198		1LA8 317-8PM8□		1500
230	265	355	743	2956	95.5	95.5	0.80	250		1LA8 355-8PM8□		2000
290	335	355	743	3727	95.7	95.7	0.81	315		1LA8 357-8PM8□		2200
335	385	400	743	4306	96.0	96.0	0.80	365		1LA8 403-8PM8□		2800
375	430	400	743	4820	96.1	96.1	0.80	410		1LA8 405-8PM8□		3000
425	490	400	743	5463	96.2	96.2	0.79	470		1LA8 407-8PM8□		3200
485	560	450	745	6217	96.5	96.5	0.78	540		1LA8 453-8PM8□		4000
545	625	450	745	6986	96.6	96.6	0.78	610		1LA8 455-8PM8□		4200
600	690	450	745	7691	96.7	96.7	0.79	660		1LA8 457-8PM8□		4500

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LA8 315-... □□ to 1LA8 457-... □□	0 □	8 ✓	4 ✓	6 ✓

- Standard version
- ✓ With extra charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors for converter-fed operation
Cast-iron series 1LA8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz For rated output, 50 Hz, tolerance +3 dB(A)	Sound power level at 50 Hz	Mech. Limiting speed		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-6PM8□	2.7	13	6.0	68	82	2950 (2350)	147 (117)			
1LA8 317-6PM8□	2.7	13	7.3	68	82	2950 (2350)	147 (117)	Yes		
1LA8 355-6PM8□	2.8	13	13	71	86	2500 (2100)	125 (105)	Yes		
1LA8 357-6PM8□	2.9	13	16	71	86	2500 (2100)	125 (105)	Yes	Yes	
1LA8 403-6PM8□	2.8	13	21	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾			
1LA8 405-6PM8□	2.8	13	24	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes		
1LA8 407-6PM8□	2.7	13	27	73	88	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes		
1LA8 453-6PM8□	2.7	13	35	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾	Yes	Yes	
1LA8 455-6PM7□	2.5	13	39	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes	
1LA8 457-6PM7□	2.6	13	44	75	90	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V										
1LA8 315-8PM8□	2.5	13	6.0	65	79	2950 (2350)	196 (156)			
1LA8 317-8PM8□	2.5	13	7.3	65	79	2950 (2350)	196 (156)			
1LA8 355-8PM8□	2.4	13	13	67	82	2500 (2100)	166 (140)			
1LA8 357-8PM8□	2.4	13	16	67	82	2500 (2100)	166 (140)	Yes		
1LA8 403-8PM8□	2.6	13	21	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾			
1LA8 405-8PM8□	2.7	13	24	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾			
1LA8 407-8PM8□	2.7	13	27	69	84	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾	Yes		
1LA8 453-8PM8□	2.5	13	35	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes		
1LA8 455-8PM8□	2.5	13	39	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes	
1LA8 457-8PM8□	2.5	13	44	71	86	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data

Rated output at 50 Hz 60 Hz		Frame size	Operating values at rated output							Order No. For order No. supplе- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of construction approx.
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A	m kg		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	280	315	2979	801	96.2	96.2	0.90	415	240	1PQ8 315-2PC□□	1400	
315	353	315	2979	1010	96.5	96.5	0.91	520	300	1PQ8 317-2PC□□	1600	
355	398	355	2980	1140	96.5	96.5	0.90	590	340	1PQ8 353-2PC□□	2000	
400	448	355	2980	1280	96.7	96.7	0.91	660	380	1PQ8 355-2PC□□	2100	
500	560	355	2982	1600	97.1	97.1	0.91	820	475	1PQ8 357-2PC□□	2300	
560	616	400	2985	1790	97.1	97.1	0.91	910	530	1PQ8 403-2PC□□	2900	
630	693	400	2985	2020	97.1	97.1	0.91	1020	600	1PQ8 405-2PC□□	3100	
710	781	400	2985	2270	97.3	97.3	0.91	–	670 ¹⁾	1PQ8 407-2PC□□	3300	
800	–	450	2986	2560	97.2	97.2	0.91	–	760	1PQ8 453-2PE□□	4100	
900	–	450	2986	2880	97.3	97.3	0.92	–	840	1PQ8 455-2PE□□	4300	
1000	–	450	2986	3200	97.4	97.4	0.93	–	920	1PQ8 457-2PE□□	4500	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	288	315	1488	1600	96.0	96.0	0.87	430	250	1PQ8 315-4PB□□	1400	
315	362	315	1488	2020	96.2	96.2	0.87	540	315	1PQ8 317-4PB□□	1600	
355	408	355	1488	2280	96.3	96.3	0.87	610	355	1PQ8 353-4PB□□	2000	
400	460	355	1488	2570	96.4	96.4	0.87	690	400	1PQ8 355-4PB□□	2100	
500	575	355	1488	3210	96.7	96.7	0.88	850	490	1PQ8 357-4PB□□	2300	
560	644	400	1492	3580	96.7	96.7	0.88	950	550	1PQ8 403-4PB□□	2900	
630	725	400	1492	4030	96.9	96.9	0.88	1060	620	1PQ8 405-4PB□□	3100	
710	817	400	1492	4540	97.0	97.0	0.89	–	690 ¹⁾	1PQ8 407-4PB□□	3300	
800	920	450	1492	5120	97.0	97.0	0.88	–	780 ¹⁾	1PQ8 453-4PC□□	4100	
900	1040	450	1492	5760	97.1	97.1	0.88	–	880 ¹⁾	1PQ8 455-4PC□□	4300	
1000	1150	450	1492	6400	97.1	97.1	0.89	–	970	1PQ8 457-4PC□□	4500	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 V	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
1PQ8 315- ... □□ to 1PQ8 405- ... □□	○	□	○	–	□	✓	✓	✓
1PQ8 407- ... □□ to 1PQ8 457- ... □□	–	–	○	□	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.
⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. Limit speed ¹⁾	Parallel feeders required			
				Power consumption with		Rated current at								
				50 Hz	60 Hz	400 V 50 Hz	460 V 60 Hz							For rated output, 50 Hz, tolerance +3 dB(A)
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-2PC□□	2.8	10	2.7	0.75	1.23	3.4	3.3	79	94	3600	60	Yes		
1PQ8 317-2PC□□	2.8	10	3.3	0.75	1.23	3.4	3.3	79	94	3600	60	Yes		
1PQ8 353-2PC□□	2.5	10	4.8	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 355-2PC□□	2.5	10	5.3	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 357-2PC□□	2.6	10	6.4	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 403-2PC□□	2.8	10	8.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 405-2PC□□	2.8	10	9.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1PQ8 407-2PC□□	2.8	10	11	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes		
1PQ8 453-2PE□□	3.0	5	19	3.0	4.2	8.2	7.7	86	101	3000	50	Yes		
1PQ8 455-2PE□□	2.8	5	21	3.0	4.2	8.2	7.7	86	101	3000	50	Yes	Yes	
1PQ8 457-2PE□□	2.7	5	23	3.0	4.2	8.2	7.7	86	101	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V														
1PQ8 315-4PB□□	2.8	13	3.6	0.75	1.23	3.4	3.3	79	83	3000 (2650)	100 (88)	Yes		
1PQ8 317-4PB□□	2.8	13	4.4	0.75	1.23	3.4	3.3	79	83	3000 (2650)	100 (88)	Yes		
1PQ8 353-4PB□□	2.6	13	6.1	1.3	2.2	6.4	6.2	81	86	2500 (2350)	83 (78)	Yes	Yes	
1PQ8 355-4PB□□	2.6	13	6.8	1.3	2.2	6.4	6.2	81	86	2500 (2350)	83 (78)	Yes	Yes	
1PQ8 357-4PB□□	2.4	13	8.5	1.3	2.2	6.4	6.2	81	86	2500 (2350)	83 (78)	Yes		
1PQ8 403-4PB□□	2.7	13	13	1.6	2.8	6.4	6.2	83	88	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 405-4PB□□	2.7	13	14	1.6	2.8	6.4	6.2	83	88	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes	Yes	
1PQ8 407-4PB□□	2.7	13	16	1.6	2.8	6.4	6.2	83	88	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes		
1PQ8 453-4PC□□	2.6	10	23	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes		
1PQ8 455-4PC□□	2.6	10	26	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes	Yes	
1PQ8 457-4PC□□	2.6	10	28	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (63)/60 ²⁾	Yes	Yes	

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at 50 Hz 60 Hz		Frame size	Operating values at rated output							Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx.
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A		m kg	
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
200	230	315	988	1930	95.7	95.8	0.86	345	200	1PQ8 315-6PB□□	1400	
250	288	315	988	2410	95.9	96.0	0.86	430	250	1PQ8 317-6PB□□	1600	
315	362	355	993	3040	96.2	96.2	0.86	540	315	1PQ8 355-6PB□□	2100	
400	460	355	993	3850	96.5	96.5	0.86	690	400	1PQ8 357-6PB□□	2300	
450	518	400	991	4330	96.5	96.5	0.86	780	455	1PQ8 403-6PB□□	2900	
500	575	400	991	4810	96.5	96.5	0.86	860	500	1PQ8 405-6PB□□	3100	
560	644	400	991	5390	96.7	96.7	0.86	960	460	1PQ8 407-6PB□□	3300	
630	725	450	993	6060	96.8	96.8	0.86	1100	630	1PQ8 453-6PB□□	4100	
710	817	450	993	6830	96.8	96.8	0.86	–	710 ¹⁾	1PQ8 455-6PB□□	4300	
800	920	450	993	7690	97.0	97.1	0.86	–	790 ¹⁾	1PQ8 457-6PB□□	4600	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
160	184	315	739	2070	94.9	94.9	0.82	295	172	1PQ8 315-8PB□□	1400	
200	230	315	739	2580	95.2	95.2	0.82	370	215	1PQ8 317-8PB□□	1600	
250	288	355	741	3220	95.7	95.7	0.82	460	265	1PQ8 355-8PB□□	2100	
315	362	355	741	4060	96.0	96.0	0.82	580	335	1PQ8 357-8PB□□	2300	
355	408	400	742	4570	96.1	96.1	0.82	650	375	1PQ8 403-8PB□□	2900	
400	460	400	742	5150	96.2	96.2	0.82	730	425	1PQ8 405-8PB□□	3100	
450	518	400	742	5790	96.3	96.3	0.82	820	475	1PQ8 407-8PB□□	3300	
500	575	450	744	6420	96.4	96.4	0.81	920	540	1PQ8 453-8PB□□	4100	
560	644	450	744	7190	96.5	96.5	0.81	1040	600	1PQ8 455-8PB□□	4300	
630	725	450	744	8090	96.6	96.6	0.81	1160	670	1PQ8 457-8PB□□	4600	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 V	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover ³⁾	IM V1 with protective cover ⁴⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1PQ8 315-...□□ to 1PQ8 453-...□□	○	□	○	–	□	✓	✓	✓
1PQ8 455-...□□ to 1PQ8 457-...□□	–	–	○	□	□	✓	✓	✓
8-pole								
1PQ8 315-...□□ to 1PQ8 457-...□□	○	□	○	– ⁵⁾	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ For explosion-proof motors, the type of construction IM V1 without protective cover is not possible.

⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁵⁾ As special version with voltage code **9** and order code **1LY** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. Limiting speed			Parallel feeders required				
				Power consumption with		Rated current at				For rated output, 50 Hz, tolerance +3 dB(A)	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
				50 Hz	60 Hz	400 V	460 V										
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A										
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V																	
1PQ8 315-6PB□□	2.5	13	6.0	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)						
1PQ8 317-6PB□□	2.5	13	7.3	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)	Yes					
1PQ8 355-6PB□□	2.8	13	13	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes					
1PQ8 357-6PB□□	2.8	13	16	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes	Yes				
1PQ8 403-6PB□□	2.8	13	21	1.3	2.2	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾						
1PQ8 405-6PB□□	2.8	13	24	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes					
1PQ8 407-6PB□□	2.8	13	27	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes					
1PQ8 453-6PB□□	2.6	13	35	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾	Yes	Yes				
1PQ8 455-6PB□□	2.5	13	39	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes				
1PQ8 457-6PB□□	2.5	13	44	3.0	4.2	8.2	7.7	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes				
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V																	
1PQ8 315-8PB□□	2.3	13	6.0	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)						
1PQ8 317-8PB□□	2.3	13	7.3	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)						
1PQ8 355-8PB□□	2.4	13	13	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)						
1PQ8 357-8PB□□	2.4	13	16	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)	Yes					
1PQ8 403-8PB□□	2.6	13	21	1.3	2.2	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾						
1PQ8 405-8PB□□	2.6	13	24	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾						
1PQ8 407-8PB□□	2.6	13	27	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾	Yes					
1PQ8 453-8PB□□	2.4	13	35	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes					
1PQ8 455-8PB□□	2.4	13	39	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ¹⁾	141 (113)/120 ¹⁾	Yes	Yes				
1PQ8 457-8PB□□	2.4	13	44	3.0	4.2	8.2	7.7	86	101	2100 (1700)/1800 ¹⁾	142 (113)/120 ¹⁾	Yes	Yes				

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output				Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 690 V	Order No.	Price	Weight of IM B3 type of con- struction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. suppl- ements for voltage and type of construction, see table below		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
240	270	315	2978	770	96.0	96.0	0.90	230	1PQ8 315-2PM8□		1400
300	335	315	2978	962	96.4	96.4	0.91	285	1PQ8 317-2PM8□		1600
345	385	355	2981	1105	96.4	96.4	0.90	335	1PQ8 353-2PM8□		2000
390	435	355	2981	1249	96.6	96.6	0.91	370	1PQ8 355-2PM8□		2100
485	545	355	2982	1553	97.0	97.0	0.91	460	1PQ8 357-2PM8□		2300
545	600	400	2986	1743	97.1	97.1	0.91	520	1PQ8 403-2PM7□		2900
610	670	400	2986	1951	97.1	97.1	0.91	580	1PQ8 405-2PM7□		3100
680	750	400	2986	2175	97.2	97.2	0.92	640	1PQ8 407-2PM7□		3300
775	-	450	2987	2478	97.2	97.2	0.92	730	1PQ8 453-2PM7□		4100
875	-	450	2987	2798	97.3	97.3	0.92	820	1PQ8 455-2PM7□		4300
970	-	450	2987	3101	97.4	97.4	0.93	900	1PQ8 457-2PM7□		4500
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V											
235	270	315	1485	1511	95.8	95.8	0.87	235	1PQ8 315-4PM8□		1400
290	335	315	1485	1865	95.9	95.9	0.87	285	1PQ8 317-4PM8□		1600
340	390	355	1488	2182	96.0	96.0	0.87	340	1PQ8 353-4PM8□		2000
385	445	355	1488	2471	96.2	96.2	0.87	385	1PQ8 355-4PM8□		2100
480	550	355	1488	3081	96.4	96.4	0.87	480	1PQ8 357-4PM8□		2300
545	625	400	1491	3491	96.5	96.5	0.88	540	1PQ8 403-4PM8□		2900
615	710	400	1491	3939	96.7	96.7	0.88	600	1PQ8 405-4PM8□		3100
690	795	400	1491	4420	96.9	96.9	0.89	670	1PQ8 407-4PM7□		3300
785	905	450	1492	5025	96.8	96.8	0.88	770	1PQ8 453-4PM7□		4100
880	1010	450	1492	5633	97.0	97.0	0.87	870	1PQ8 455-4PM7□		4300
980	1125	450	1492	6273	97.1	97.1	0.89	950	1PQ8 457-4PM7□		4500

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1PQ8 315- ... □□	0	8	4	6
to		✓	✓	✓
1PQ8 457- ... □□	□			

- Standard version
✓ With extra charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. Limit speed ¹⁾			Parallel feeders required		
				Power consumption with		Rated current at				L _{pf} A	L _{WA} dB(A)	n _{max} rpm			f _{max} Hz
				50 Hz	60 Hz	400 V	460 V								
	T _B /T _{rated}	CL	J kgm ²	P kW	P kW	I A	I A	L _{pf} A dB(A)	L _{WA} dB(A)	n _{max} rpm	f _{max} Hz	400 V	500 V	690 V	
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V															
1PQ8 315-2PM8□	3.0	10	2.7	0.75	1.23	3.4	3.3	79	94	3600	60	Yes	Yes		
1PQ8 317-2PM8□	3.0	10	3.3	0.75	1.23	3.4	3.3	79		3600	60	Yes	Yes		
1PQ8 353-2PM8□	2.6	10	4.8	1.3	2.2	6.4	6.2	81	96	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes		
1PQ8 355-2PM8□	2.6	10	5.3	1.3	2.2	6.4	6.2	81		3600/3100 ²⁾	60/52 ²⁾	Yes	Yes		
1PQ8 357-2PM8□	2.6	10	6.4	1.3	2.2	6.4	6.2	81		3600/3100 ²⁾	60/52 ²⁾	Yes			
1PQ8 403-2PM7□	3.0	10	8.6	1.6	2.8	6.4	6.2	83	98	3600/3100 ²⁾	60/52 ²⁾	Yes			
1PQ8 405-2PM7□	3.1	10	9.6	1.6	2.8	6.4	6.2	83		3600/3100 ²⁾	60/52 ²⁾	Yes	Yes		
1PQ8 407-2PM7□	3.0	10	11	1.6	2.8	6.4	6.2	83		3600/3100 ²⁾	60/52 ²⁾	Yes			
1PQ8 453-2PM7□	2.8	5	19	3.0	4.2	8.2	7.7	86	101	3000	50	Yes			
1PQ8 455-2PM7□	2.8	5	21	3.0	4.2	8.2	7.7	86		3000	50	Yes	Yes		
1PQ8 457-2PM7□	2.8	5	23	3.0	4.2	8.2	7.7	86		3000	50	Yes	Yes		
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V															
1PQ8 315-4PM8□	2.8	13	3.6	0.75	1.23	3.4	3.3	79	83	3000 (2650)	100 (88)	Yes			
1PQ8 317-4PM8□	2.8	13	4.4	0.75	1.23	3.4	3.3	79		3000 (2650)	100 (88)	Yes			
1PQ8 353-4PM8□	2.6	13	6.1	1.3	2.2	6.4	6.2	81	86	2500 (2350)	83 (78)	Yes	Yes		
1PQ8 355-4PM8□	2.6	13	6.8	1.3	2.2	6.4	6.2	81		2500 (2350)	83 (78)	Yes	Yes		
1PQ8 357-4PM8□	2.5	13	8.5	1.3	2.2	6.4	6.2	81		2500 (2350)	83 (78)	Yes			
1PQ8 403-4PM8□	2.6	13	13	1.6	2.8	6.4	6.2	83	88	2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes			
1PQ8 405-4PM8□	2.7	13	14	1.6	2.8	6.4	6.2	83		2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes	Yes		
1PQ8 407-4PM7□	2.6	13	16	1.6	2.8	6.4	6.2	83		2200 (2100)/2100 ²⁾	73 (70)/70 ²⁾	Yes			
1PQ8 453-4PM7□	2.5	10	23	3.0	4.2	8.2	7.7	86	101	2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes			
1PQ8 455-4PM7□	2.6	10	26	3.0	4.2	8.2	7.7	86		2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes	Yes		
1PQ8 457-4PM7□	2.6	10	28	3.0	4.2	8.2	7.7	86		2100 (1900)/1800 ²⁾	70 (61)/60 ²⁾	Yes	Yes		

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ Limit speeds for reinforced bearings (order code **K20**) for 4-pole motors on request.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Rated output at 50 Hz 60 Hz		Frame size	Operating values at rated output						Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight of IM B3 type of construction approx.	
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A				m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V												
190	220	315	990	1833	95.5	95.6	0.85	196	1PQ8 315-6PM8□		1400	
235	270	315	990	2267	95.7	95.8	0.86	240	1PQ8 317-6PM8□		1600	
300	345	355	992	2888	96.2	96.2	0.86	305	1PQ8 355-6PM8□		2100	
380	435	355	992	3658	96.4	96.4	0.86	385	1PQ8 357-6PM8□		2300	
435	500	400	993	4184	96.4	96.4	0.85	445	1PQ8 403-6PM8□		2900	
485	560	400	993	4664	96.5	96.5	0.86	490	1PQ8 405-6PM8□		3100	
545	625	400	993	5241	96.6	96.6	0.86	550	1PQ8 407-6PM8□		3300	
615	705	450	993	5915	96.8	96.8	0.84	630	1PQ8 453-6PM8□		4100	
690	795	450	993	6636	96.8	96.8	0.85	700	1PQ8 455-6PM7□		4300	
780	895	450	993	7502	96.9	97.0	0.85	790	1PQ8 457-6PM7□		4600	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V												
145	165	315	740	1871	94.6	94.6	0.79	162	1PQ8 315-8PM8□		1400	
180	205	315	740	2323	94.9	94.9	0.80	198	1PQ8 317-8PM8□		1600	
230	265	355	743	2956	95.5	95.5	0.80	250	1PQ8 355-8PM8□		2100	
290	335	355	743	3727	95.7	95.7	0.81	315	1PQ8 357-8PM8□		2300	
335	385	400	743	4306	96.0	96.0	0.80	365	1PQ8 403-8PM8□		2900	
375	430	400	743	4820	96.1	96.1	0.80	410	1PQ8 405-8PM8□		3100	
425	490	400	743	5463	96.2	96.2	0.79	470	1PQ8 407-8PM8□		3300	
485	560	450	745	6217	96.5	96.5	0.78	540	1PQ8 453-8PM8□		4100	
545	625	450	745	6986	96.6	96.6	0.78	610	1PQ8 455-8PM8□		4300	
600	690	450	745	7691	96.7	96.7	0.79	660	1PQ8 457-8PM8□		4600	

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1PQ8 315-...□□ to 1PQ8 457-...□□	0	8	4	6
□ Standard version	□	✓	✓	✓
✓ With extra charge				

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Forced-air cooled motors with externally-mounted fan
for converter-fed operation - Cast-iron series 1PQ8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Technical data of the separately driven fan				Measuring surface sound pressure level at 50 Hz	Sound power level at 50 Hz	Mech. Limiting speed			Parallel feeders required				
				Power consumption with		Rated current at				For rated output, 50 Hz, tolerance +3 dB(A)	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
				50 Hz	60 Hz	400 V	460 V										
	T_B/T_{rated}	CL	J kgm ²	P kW	P kW	I A	I A										
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V																	
1PQ8 315-6PM8	2.7	13	6	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)						
1PQ8 317-6PM8	2.7	13	7.3	0.75	1.23	3.4	3.3	80	94	2950 (2350)	147 (117)	Yes					
1PQ8 355-6PM8	2.8	13	13	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes					
1PQ8 357-6PM8	2.9	13	16	1.3	2.2	6.4	6.2	82	97	2500 (2100)	125 (105)	Yes	Yes				
1PQ8 403-6PM8	2.8	13	21	1.3	2.2	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾						
1PQ8 405-6PM8	2.8	13	24	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes					
1PQ8 407-6PM8	2.7	13	27	1.6	2.8	6.4	6.2	84	99	2200 (1900)/2100 ¹⁾	110 (95)/105 ¹⁾	Yes					
1PQ8 453-6PM8	2.7	13	35	1.6	2.8	6.4	6.2	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾	Yes	Yes				
1PQ8 455-6PM7	2.5	13	39	3	4.2	8.2	7.7	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes				
1PQ8 457-6PM7	2.6	13	44	3	4.2	8.2	7.7	87	102	2100 (1700)/1800 ¹⁾	105 (85)/90 ¹⁾		Yes				
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP55 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V																	
1PQ8 315-8PM8	2.5	13	6	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)						
1PQ8 317-8PM8	2.5	13	7.3	0.75	1.23	3.4	3.3	79	93	2950 (2350)	196 (156)						
1PQ8 355-8PM8	2.4	13	13	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)						
1PQ8 357-8PM8	2.4	13	16	1.3	2.2	6.4	6.2	81	96	2500 (2100)	166 (140)	Yes					
1PQ8 403-8PM8	2.6	13	21	1.3	2.2	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾						
1PQ8 405-8PM8	2.7	13	24	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾						
1PQ8 407-8PM8	2.7	13	27	1.6	2.8	6.4	6.2	83	98	2200 (1900)/2100 ¹⁾	146 (126)/140 ¹⁾	Yes					
1PQ8 453-8PM8	2.5	13	35	1.6	2.8	6.4	6.2	86	101	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes					
1PQ8 455-8PM8	2.5	13	39	3	4.2	8.2	7.7	86	101	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes				
1PQ8 457-8PM8	2.5	13	44	3	4.2	8.2	7.7	86	101	2100 (1700)/1800 ¹⁾	140 (113)/120 ¹⁾	Yes	Yes				

Values in brackets apply to the use of motors in hazardous areas.

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation - Cast-iron series 1LL8

Selection and ordering data

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight of IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Rated current at 50 Hz 400 V I_{rated} A	Rated current at 50 Hz 690 V I_{rated} A	For order No. supplements for voltage and type of construction, see table below		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
315	345	315	2974	1010	96.1	0.92	510	300	1LL8 315-2AC□□		1300
400	440	315	2974	1280	96.4	0.92	650	375	1LL8 317-2AC□□		1500
450	–	355	2978	1440	96.4	0.91	740	430	1LL8 353-2AD□□		1900
500	–	355	2979	1600	96.6	0.92	810	470	1LL8 355-2AD□□		2000
630	–	355	2980	2020	96.9	0.93	1000	580	1LL8 357-2AD□□		2200
710	–	400	2984	2270	97.0	0.91	1160	670	1LL8 403-2AD□□		2800
800	–	400	2984	2560	97.1	0.92	1300	750	1LL8 405-2AD□□		3000
900	–	400	2985	2880	97.3	0.92	–	840 ¹⁾	1LL8 407-2AD□□		3200
1000	–	450	2987	3200	97.3	0.93	–	920	1LL8 453-2AE□□		4000
1120	–	450	2986	3580	97.3	0.94	–	1020	1LL8 455-2AE□□		4200
1250	–	450	2986	4000	97.4	0.94	–	1140	1LL8 457-2AE□□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
315	360	315	1483	2030	96.0	0.87	540	315	1LL8 315-4AC□□		1300
400	460	315	1484	2570	96.2	0.88	680	395	1LL8 317-4AC□□		1500
450	515	355	1487	2890	96.5	0.87	770	450	1LL8 353-4AC□□		1900
500	575	355	1487	3210	96.6	0.88	850	490	1LL8 355-4AC□□		2000
630	725	355	1488	4040	96.9	0.88	1060	620	1LL8 357-4AC□□		2200
710	815	400	1489	4550	96.9	0.88	1200	700	1LL8 403-4AC□□		2800
800	920	400	1490	5130	97.0	0.88	1360	780	1LL8 405-4AC□□		3000
900	1035	400	1491	5760	97.2	0.87	–	890 ¹⁾	1LL8 407-4AC□□		3200
1000	1150	450	1492	6400	97.2	0.86	–	1000 ¹⁾	1LL8 453-4AD□□		4000
1120	1280	450	1491	7170	97.2	0.89	–	1080 ¹⁾	1LL8 455-4AD□□		4200
1250	1430	450	1490	8010	97.2	0.89	–	1200	1LL8 457-4AD□□		4400

A service factor (SF) of 1.05 is stamped onto all 1LL8 motors for mains-fed operation.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
1LL8 315-...□□ to 1LL8 317-...□□	□	○	– ³⁾	○	□	✓	✓	✓
1LL8 353-...□□ to 1LL8 405-...□□	□	○	– ³⁾	○	□ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
1LL8 407-...□□ to 1LL8 457-...□□	–	○	□	O. R.	□ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾

- Standard version
- With no extra charge
- ✓ With extra charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

⁴⁾ Not possible for 2-pole motors in 60 Hz version.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Locked- rotor torque	Locked- rotor current	Break- down torque	Torque class	Moment of inertia	Noise		Mech. Limiting speed	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque	At 50 Hz and for direct online starting as multiple of rated current	torque			Measuring- surface sound pressure level at 50 Hz	Sound power level at 50 Hz				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
1LL8 315-2AC□□	1.6	7.0	2.8	10	2.7	84 ¹⁾	99	3600	Yes		
1LL8 317-2AC□□	1.7	7.0	2.8	10	3.3	84 ¹⁾	99	3600	Yes		
1LL8 353-2AD□□	1.4	7.0	2.6	7	4.8	86 ¹⁾	101	3600/3100 ²⁾	Yes	Yes	
1LL8 355-2AD□□	1.4	7.0	2.6	7	5.3	86 ¹⁾	101	3600/3100 ²⁾	Yes	Yes	
1LL8 357-2AD□□	1.6	7.0	2.6	7	6.4	86 ¹⁾	101	3600/3100 ²⁾	Yes		
1LL8 403-2AD□□	1.4	6.8	2.6	7	8.6	88 ¹⁾	103	3600/3100 ²⁾	Yes		
1LL8 405-2AD□□	1.5	7.0	2.6	7	9.6	88 ¹⁾	103	3600/3100 ²⁾	Yes	Yes	
1LL8 407-2AD□□	1.5	7.0	2.7	7	11	88 ¹⁾	103	3600/3100 ²⁾		Yes	
1LL8 453-2AE□□	0.9	7.0	2.9	5	19	90 ¹⁾	105	3000		Yes	
1LL8 455-2AE□□	0.9	7.0	2.7	5	21	90 ¹⁾	105	3000		Yes	Yes
1LL8 457-2AE□□	0.9	7.0	2.6	5	23	90 ¹⁾	105	3000		Yes	Yes
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
1LL8 315-4AC□□	1.6	7.0	2.7	10	3.6	75	90	3000/2600 ²⁾	Yes		
1LL8 317-4AC□□	1.7	7.0	2.7	10	4.4	75	90	3000/2600 ²⁾	Yes		
1LL8 353-4AC□□	1.5	7.0	2.6	10	6.1	77	92	2500/2200 ²⁾	Yes	Yes	
1LL8 355-4AC□□	1.6	7.0	2.6	10	6.8	77	92	2500/2200 ²⁾	Yes	Yes	
1LL8 357-4AC□□	1.6	7.0	2.7	10	8.5	77	92	2500/2200 ²⁾	Yes		
1LL8 403-4AC□□	1.6	7.0	2.4	10	13	81	96	2200/1900 ²⁾	Yes		
1LL8 405-4AC□□	1.7	7.0	2.5	10	14	81	96	2200/1900 ²⁾	Yes	Yes	
1LL8 407-4AC□□	1.7	7.0	2.6	10	16	81	96	2200/1900 ²⁾		Yes	
1LL8 453-4AD□□	1.5	7.0	2.8	7	23	84	99	2100/1800 ²⁾		Yes	
1LL8 455-4AD□□	1.5	7.0	2.6	7	26	84	99	2100/1800 ²⁾	Yes	Yes	
1LL8 457-4AD□□	1.5	7.0	2.5	7	28	84	99	2100/1800 ²⁾	Yes	Yes	

¹⁾ The noise values for **1LL8**, 2-pole are for guidance only.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output				Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V	Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	M_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A			m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
250	285	315	988	2420	95.4	0.88	430	250	1LL8 315-6AC□□		1300
315	360	315	988	3040	95.7	0.89	530	310	1LL8 317-6AC□□		1500
400	460	355	991	3850	96.1	0.88	680	395	1LL8 355-6AC□□		2000
500	575	355	991	4820	96.4	0.88	850	495	1LL8 357-6AC□□		2200
560	645	400	993	5390	96.6	0.87	960	560	1LL8 403-6AC□□		2800
630	725	400	993	6060	96.7	0.88	1060	620	1LL8 405-6AC□□		3000
710	815	400	993	6830	96.7	0.88	1200	700	1LL8 407-6AC□□		3200
800	920	450	993	7700	96.8	0.87	1380	790	1LL8 453-6AD□□		4000
900	1035	450	992	8660	96.8	0.88	–	880 ¹⁾	1LL8 455-6AD□□		4200
1000	1150	450	993	9620	96.9	0.88	–	980 ¹⁾	1LL8 457-6AD□□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
200	230	315	738	2590	94.7	0.82	370	215	1LL8 315-8AC□□		1300
250	285	315	738	3240	95.0	0.82	465	270	1LL8 317-8AC□□		1500
315	360	355	740	4070	95.5	0.83	570	335	1LL8 355-8AC□□		2000
400	460	355	740	5160	95.6	0.84	720	415	1LL8 357-8AC□□		2200
450	515	400	741	5800	95.9	0.84	810	465	1LL8 403-8AD□□		2800
500	575	400	741	6440	96.1	0.84	890	520	1LL8 405-8AD□□		3000
560	645	400	742	7210	96.2	0.83	1020	590	1LL8 407-8AD□□		3200
630	745	450	743	8100	96.3	0.82	1160	670	1LL8 453-8AD□□		4000
710	815	450	743	9130	96.4	0.83	1280	740	1LL8 455-8AD□□		4200
800	920	450	743	10300	96.5	0.83	1440	840	1LL8 457-8AD□□		4500

A service factor (SF) of 1.05 is stamped onto all 1LL8 motors for mains-fed operation.

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ/690 VY	500 VΔ	690 VΔ	60 Hz 460 VΔ (see "Introduction" for outputs at 60 Hz)	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover ²⁾	IM B35
	6	5	0	9 L2F	0	8	4	6
6-pole								
1LL8 315-...□□ to 1LL8 453-...□□	□	○	– ³⁾	○	□	✓	✓	✓
1LL8 455-...□□ to 1LL8 457-...□□	–	○	□	O. R.	□	✓	✓	✓
8-pole								
1LL8 315-...□□ to 1LL8 457-...□□	□	○	– ³⁾	○	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- O. R. Possible on request
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through ventilation
for mains-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Locked- rotor torque	Locked- rotor current	Break- down torque	Torque class	Moment of inertia	Noise		Mech. Limiting speed	Parallel feeders required		
	At 50 Hz and for direct online starting as multiple of rated torque	as multiple of rated current	torque			Measuring- surface sound pressure level at 50 Hz	Sound power level at 50 Hz				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	n_{max} rpm	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
1LL8 315-6AC□□	1.6	7	2.6	10	6	70	84	2950/2600 ¹⁾			
1LL8 317-6AC□□	1.7	7	2.6	10	7.3	70	84	2950/2600 ¹⁾	Yes		
1LL8 355-6AC□□	1.7	7	2.5	10	13	73	88	2500/2200 ¹⁾	Yes		
1LL8 357-6AC□□	1.8	7	2.6	10	16	73	88	2500/2200 ¹⁾	Yes	Yes	
1LL8 403-6AC□□	1.8	7	2.6	10	21	76	91	2200/1900 ¹⁾			
1LL8 405-6AC□□	1.8	7	2.6	10	24	76	91	2200/1900 ¹⁾	Yes		
1LL8 407-6AC□□	1.8	7	2.5	10	27	76	91	2200/1900 ¹⁾	Yes		
1LL8 453-6AD□□	1.5	7	2.5	7	35	78	93	2100/1800 ¹⁾	Yes	Yes	
1LL8 455-6AD□□	1.5	7	2.4	7	39	78	93	2100/1800 ¹⁾		Yes	
1LL8 457-6AD□□	1.5	7	2.5	7	44	78	93	2100/1800 ¹⁾		Yes	
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used acc. to temperature class B, IP23 degree of protection											
1LL8 315-8AC□□	1.6	5.8	2.4	10	6	67	81	2950/2600 ¹⁾			
1LL8 317-8AC□□	1.6	5.8	2.4	10	7.3	67	81	2950/2600 ¹⁾			
1LL8 355-8AC□□	1.6	6	2.4	10	13	69	84	2500/2200 ¹⁾			
1LL8 357-8AC□□	1.6	6	2.3	10	16	69	84	2500/2200 ¹⁾	Yes		
1LL8 403-8AD□□	1.3	5.8	2.3	7	21	72	87	2200/1900 ¹⁾			
1LL8 405-8AD□□	1.4	5.8	2.4	7	24	72	87	2200/1900 ¹⁾			
1LL8 407-8AD□□	1.4	6	2.4	7	27	72	87	2200/1900 ¹⁾	Yes		
1LL8 453-8AD□□	1.3	5.8	2.3	7	35	74	89	2100/1800 ¹⁾	Yes		
1LL8 455-8AD□□	1.3	5.8	2.3	7	39	74	89	2100/1800 ¹⁾	Yes	Yes	
1LL8 457-8AD□□	1.3	5.8	2.3	7	44	74	89	2100/1800 ¹⁾	Yes	Yes	

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data

Rated output at 50 Hz 60 Hz		Frame size	Operating values at rated output						Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	M_{rated} Nm	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A	I_{rated} A			kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
315	345	315	2974	1010	96.1	0.92	510	300	1LL8 315-2PC□□		1300
400	440	315	2974	1280	96.4	0.92	650	375	1LL8 317-2PC□□		1500
450	–	355	2978	1440	96.4	0.91	740	430	1LL8 353-2PD□□		1900
500	–	355	2979	1600	96.6	0.92	810	470	1LL8 355-2PD□□		2000
630	–	355	2980	2020	96.9	0.93	1000	580	1LL8 357-2PD□□		2200
710	–	400	2984	2270	97.0	0.91	1160	670	1LL8 403-2PD□□		2800
800	–	400	2984	2560	97.1	0.92	1300	750	1LL8 405-2PD□□		3000
900	–	400	2985	2880	97.3	0.92	–	840 ¹⁾	1LL8 407-2PD□□		3200
1000	–	450	2987	3200	97.3	0.93	–	920	1LL8 453-2PE□□		4000
1120	–	450	2986	3580	97.3	0.94	–	1020	1LL8 455-2PE□□		4200
1250	–	450	2986	4000	97.4	0.94	–	1140	1LL8 457-2PE□□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V											
315	360	315	1483	2030	96.0	0.87	540	315	1LL8 315-4PC□□		1300
400	460	315	1484	2570	96.2	0.88	680	395	1LL8 317-4PC□□		1500
450	515	355	1487	2890	96.5	0.87	770	450	1LL8 353-4PC□□		1900
500	575	355	1487	3210	96.6	0.88	850	490	1LL8 355-4PC□□		2000
630	725	355	1488	4040	96.9	0.88	1060	620	1LL8 357-4PC□□		2200
710	815	400	1489	4550	96.9	0.88	1200	700	1LL8 403-4PC□□		2800
800	920	400	1490	5130	97.0	0.88	1360	780	1LL8 405-4PC□□		3000
900	1035	400	1491	5760	97.2	0.87	–	890 ¹⁾	1LL8 407-4PC□□		3200
1000	1150	450	1492	6400	97.2	0.86	–	1000 ¹⁾	1LL8 453-4PD□□		4000
1120	1280	450	1491	7170	97.2	0.89	–	1080 ¹⁾	1LL8 455-4PD□□		4200
1250	1430	450	1490	8010	97.2	0.89	–	1200	1LL8 457-4PD□□		4400

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LL8 315-...□□ to 1LL8 405-...□□	4	8	5	7	0	8	4	6
1LL8 407-...□□ to 1LL8 457-...□□	–	–	0	□	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Measuring- surface sound pres- sure level at 50 Hz	Sound power level at 50 Hz	Mech. Limiting speed		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	$L_{p(A)}$ dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-2PC□□	2.8	10	2.7	84 ¹⁾	99	3600	60	Yes		
1LL8 317-2PC□□	2.8	10	3.3	84 ¹⁾	99	3600	60	Yes		
1LL8 353-2PD□□	2.6	7	4.8	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1LL8 355-2PD□□	2.6	7	5.3	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1LL8 357-2PD□□	2.6	7	6.4	86 ¹⁾	101	3600/3100 ²⁾	60/52 ²⁾	Yes		
1LL8 403-2PD□□	2.6	7	8.6	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾	Yes		
1LL8 405-2PD□□	2.6	7	9.6	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾	Yes	Yes	
1LL8 407-2PD□□	2.7	7	11	88 ¹⁾	103	3600/3100 ²⁾	60/52 ²⁾	Yes		
1LL8 453-2PE□□	2.9	5	19	90 ¹⁾	105	3000	50	Yes		
1LL8 455-2PE□□	2.7	5	21	90 ¹⁾	105	3000	50	Yes	Yes	
1LL8 457-2PE□□	2.6	5	23	90 ¹⁾	105	3000	50	Yes	Yes	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-4PC□□	2.7	10	3.6	75	90	3000/2600 ²⁾	100/87 ²⁾	Yes		
1LL8 317-4PC□□	2.7	10	4.4	75	90	3000/2600 ²⁾	100/87 ²⁾	Yes		
1LL8 353-4PC□□	2.6	10	6.1	77	92	2500/2200 ²⁾	83/73 ²⁾	Yes	Yes	
1LL8 355-4PC□□	2.6	10	6.8	77	92	2500/2200 ²⁾	83/73 ²⁾	Yes	Yes	
1LL8 357-4PC□□	2.7	10	8.5	77	92	2500/2200 ²⁾	83/73 ²⁾	Yes		
1LL8 403-4PC□□	2.4	10	13	81	96	2200/1900 ²⁾	73/63 ²⁾	Yes		
1LL8 405-4PC□□	2.5	10	14	81	96	2200/1900 ²⁾	73/63 ²⁾	Yes	Yes	
1LL8 407-4PC□□	2.6	10	16	81	96	2200/1900 ²⁾	73/63 ²⁾	Yes		
1LL8 453-4PD□□	2.8	7	23	84	99	2100/1800 ²⁾	70/60 ²⁾	Yes		
1LL8 455-4PD□□	2.6	7	26	84	99	2100/1800 ²⁾	70/60 ²⁾	Yes	Yes	
1LL8 457-4PD□□	2.5	7	28	84	99	2100/1800 ²⁾	70/60 ²⁾	Yes	Yes	

¹⁾ The noise values for **1LL8**, 2-pole are for guidance only.

²⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output				Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	Rated current at 50 Hz 690 V	Order No. For order No. supple- ments for voltage and type of construction, see table below	Price	Weight of IM B3 type of con- struction approx. kg
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	M_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	I_{rated} A				
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
250	285	315	988	2420	95.4	0.88	430	250		1LL8 315-6PC□□		1300
315	360	315	988	3040	95.7	0.89	530	310		1LL8 317-6PC□□		1500
400	460	355	991	3850	96.1	0.88	680	395		1LL8 355-6PC□□		2000
500	575	355	991	4820	96.4	0.88	850	495		1LL8 357-6PC□□		2200
560	645	400	993	5390	96.6	0.87	960	560		1LL8 403-6PC□□		2800
630	725	400	993	6060	96.7	0.88	1060	620		1LL8 405-6PC□□		3000
710	815	400	993	6830	96.7	0.88	1200	700		1LL8 407-6PC□□		3200
800	920	450	993	7700	96.8	0.87	1380	790		1LL8 453-6PD□□		4000
900	1035	450	992	8660	96.8	0.88	–	880 ¹⁾		1LL8 455-6PD□□		4200
1000	1150	450	993	9620	96.9	0.88	–	980 ¹⁾		1LL8 457-6PD□□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V												
200	230	315	738	2590	94.7	0.82	370	215		1LL8 315-8PC□□		1300
250	285	315	738	3240	95.0	0.82	465	270		1LL8 317-8PC□□		1500
315	360	355	740	4070	95.5	0.83	570	335		1LL8 355-8PC□□		2000
400	460	355	740	5160	95.6	0.84	720	415		1LL8 357-8PC□□		2200
450	515	400	741	5800	95.9	0.84	810	465		1LL8 403-8PD□□		2800
500	575	400	741	6440	96.1	0.84	890	520		1LL8 405-8PD□□		3000
560	645	400	742	7210	96.2	0.83	1020	590		1LL8 407-8PD□□		3200
630	745	450	743	8100	96.3	0.82	1160	670		1LL8 453-8PD□□		4000
710	815	450	743	9130	96.4	0.83	1280	740		1LL8 455-8PD□□		4200
800	920	450	743	10300	96.5	0.83	1440	840		1LL8 457-8PD□□		4500

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code			
	400 VΔ	400 VΔ/690 VY ²⁾	500 VΔ	690 VΔ ²⁾	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover ³⁾	IM B35
	4	8	5	7	0	8	4	6
6-pole								
1LL8 315-...□□ to 1LL8 453-...□□	○	□	○	–	□	✓	✓	✓
1LL8 455-...□□ to 1LL8 457-...□□	–	–	○	□	□	✓	✓	✓
8-pole								
1LL8 315-...□□ to 1LL8 457-...□□	○	□	○	– ⁴⁾	□	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

¹⁾ Can also be supplied for 400 VΔ with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).
²⁾ Motors with standard insulation can only be operated with converter circuit (du/dt or sinusoidal filter).

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ As special version with voltage code **9** and order code **L1Y** (specify output, voltage and frequency).

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Order No.	Breakdown torque at 50 Hz and for direct online starting as multiple of rated torque	Torque class	Moment of inertia	Measuring- surface sound pres- sure level at 50 Hz	Sound power level at 50 Hz	Mech. Limiting speed		Parallel feeders required		
	T_B/T_{rated}	CL	J kgm ²	$L_{p(A)}$ dB(A)	L_{WA} dB(A)	n_{max} rpm	f_{max} Hz	400 V	500 V	690 V
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-6PC□□	2.6	10	6.0	70	84	2950/2600 ¹⁾	147/130 ¹⁾			
1LL8 317-6PC□□	2.6	10	7.3	70	84	2950/2600 ¹⁾	147/130 ¹⁾	Yes		
1LL8 355-6PC□□	2.5	10	13	73	88	2500/2200 ¹⁾	125/110 ¹⁾	Yes		
1LL8 357-6PC□□	2.6	10	16	73	88	2500/2200 ¹⁾	125/110 ¹⁾	Yes	Yes	
1LL8 403-6PC□□	2.6	10	21	76	91	2200/1900 ¹⁾	110/95 ¹⁾			
1LL8 405-6PC□□	2.6	10	24	76	91	2200/1900 ¹⁾	110/95 ¹⁾	Yes		
1LL8 407-6PC□□	2.5	10	27	76	91	2200/1900 ¹⁾	110/95 ¹⁾	Yes		
1LL8 453-6PD□□	2.5	7	35	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes	Yes	
1LL8 455-6PD□□	2.4	7	39	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes		
1LL8 457-6PD□□	2.5	7	44	78	93	2100/1800 ¹⁾	105/90 ¹⁾	Yes		
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with standard insulation for voltages ≤500 V										
1LL8 315-8PC□□	2.4	10	6.0	67	81	2950/2600 ¹⁾	196/173 ¹⁾			
1LL8 317-8PC□□	2.4	10	7.3	67	81	2950/2600 ¹⁾	196/173 ¹⁾			
1LL8 355-8PC□□	2.4	10	13	69	84	2500/2200 ¹⁾	166/146 ¹⁾			
1LL8 357-8PC□□	2.3	10	16	69	84	2500/2200 ¹⁾	166/146 ¹⁾	Yes		
1LL8 403-8PD□□	2.3	7	21	72	87	2200/1900 ¹⁾	146/126 ¹⁾			
1LL8 405-8PD□□	2.4	7	24	72	87	2200/1900 ¹⁾	146/126 ¹⁾			
1LL8 407-8PD□□	2.4	7	27	72	87	2200/1900 ¹⁾	146/126 ¹⁾	Yes		
1LL8 453-8PD□□	2.3	7	35	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes		
1LL8 455-8PD□□	2.3	7	39	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes	Yes	
1LL8 457-8PD□□	2.3	7	44	74	89	2100/1800 ¹⁾	140/120 ¹⁾	Yes	Yes	

¹⁾ For vertical type of construction IM V1.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at 50 Hz P_{rated} kW	Frame size FS	Order No.	Price	Weight of IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V				
300	315	1LL8 315-2PM8□		1300
380	315	1LL8 317-2PM8□		1500
435	355	1LL8 353-2PM8□		1900
485	355	1LL8 355-2PM8□		2000
610	355	1LL8 357-2PM8□		2200
690	400	1LL8 403-2PM8□		2800
770	400	1LL8 405-2PM8□		3000
860	400	1LL8 407-2PM7□		3200
965	450	1LL8 453-2PM7□		4000
1085	450	1LL8 455-2PM7□		4200
1210	450	1LL8 457-2PM7□		4400
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V				
295	315	1LL8 315-4PM8□		1300
365	315	1LL8 317-4PM8□		1500
430	355	1LL8 353-4PM8□		1900
480	355	1LL8 355-4PM8□		2000
600	355	1LL8 357-4PM8□		2200
690	400	1LL8 403-4PM8□		2800
780	400	1LL8 405-4PM8□		3000
870	400	1LL8 407-4PM7□		3200
980	450	1LL8 453-4PM7□		4000
1095	450	1LL8 455-4PM7□		4200
1225	450	1LL8 457-4PM7□		4400

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LL8 315-... □□ to 1LL8 457-... □□	0	8	4	6
□ Standard version	□	✓	✓	✓
✓ With extra charge				

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

Further data on request.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Self-ventilated motors with through-ventilation
for converter-fed operation - Cast-iron series 1LL8

Selection and ordering data (continued)

Rated output at 50 Hz P_{rated} kW	Frame size FS	Order No.	Price	Weight of IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V				
235	315	1LL8 315-6PM8□		1300
295	315	1LL8 317-6PM8□		1500
380	355	1LL8 355-6PM8□		2000
475	355	1LL8 357-6PM8□		2200
540	400	1LL8 403-6PM8□		2800
610	400	1LL8 405-6PM8□		3000
690	400	1LL8 407-6PM8□		3200
780	450	1LL8 453-6PM8□		4000
870	450	1LL8 455-6PM7□		4200
975	450	1LL8 457-6PM7□		4500
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, used according to temperature class F, IP23 degree of protection, specially for operation on SINAMICS or SIMOVERT MASTERDRIVES with special insulation for voltages >500 to 690 V				
180	315	1LL8 315-8PM8□		1300
225	315	1LL8 317-8PM8□		1500
285	355	1LL8 355-8PM8□		2000
365	355	1LL8 357-8PM8□		2200
420	400	1LL8 403-8PM8□		2800
465	400	1LL8 405-8PM8□		3000
525	400	1LL8 407-8PM8□		3200
610	450	1LL8 453-8PM8□		4000
690	450	1LL8 455-8PM8□		4200
760	450	1LL8 457-8PM8□		4500

Order No. supplements

Motor type	Final position: Type of construction code			
	Without flange IM B3	With flange IM V1 without protective cover	IM V1 with protective cover	IM B35
1LL8 315-... □□ to 1LL8 457-... □□	0	8	4	6
	□	✓	✓	✓

- Standard version
- ✓ With extra charge

The voltage code is already in the Order No. as the penultimate position.

Assignment:

7 = 690 VΔ

8 = 400 VΔ/690 VY

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Voltages or frequencies that are not covered by the predefined options can be ordered with order code **L1Y**. In this case, the output, voltage and frequency must be specified.

Further data on request.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Overview

Motor protection

KTY 84 temperature sensor:

Order code **A23**:

1 x KTY 84-130 (+ 1 x KTY 84-130 as spare)

The sensor is a semi-conductor sensor that changes its resistance depending on temperature in accordance with a defined, approximately linear characteristic. The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor.

PT100 resistance thermometers

Order code **A61**: 6 PT100 resistance thermometers

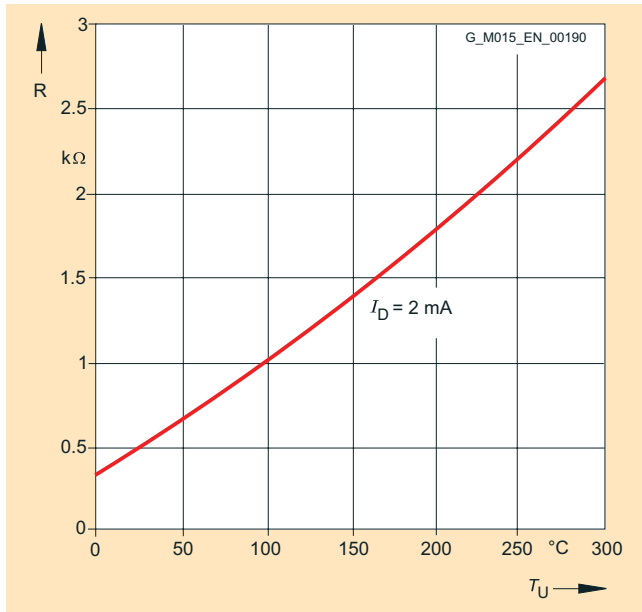
The thermometer changes its resistance depending on the temperature in accordance with a defined, almost linear characteristic. The temperature sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor.

Evaluation of the KTY or PT100 sensor is performed, for example, in the converter.

For motors for mains-fed operation, the 3RS10 temperature monitoring device that forms part of the protective equipment must be ordered separately, for further details, see Catalogue LV 1.

For all non-standard motors of series 1LA8, 1PQ8 and 1LL8, if order code **A23** or **A61** is used, the standard PTC thermistors will be omitted.

If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text.



IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if necessary	Motor type frame size			
			315	355	400	450
Self-ventilated motors for mains-fed operation - Cast-iron series 1LA8						
Self-ventilated motors for converter-fed operation - Cast-iron series 1LA8						
			1LA8			
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D	✓	✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R	✓	✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X	✓	✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T	✓	✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F	○	○	○	○
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	○	○	○	○
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 0, 4, 5, 6, 7 or 8; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •	○	○	○	○
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if necessary	Motor type frame size			
			315	355	400	450
Forced-air cooled motors with externally-mounted fan for converter-fed operation - Cast-iron series 1PQ8						
			1PQ8			
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C		✓	✓	✓
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D		✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R		✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X		✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T		✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F		○	○	○
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓
575 VΔ; 60 Hz output	9	L2M		○	○	○
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 4, 5, 7 or 8; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		○	○	○
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if necessary	Motor type frame size			
			315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation - Cast-iron series 1LL8						
			1LL8			
Voltage at 60 Hz						
380 VΔ/660 VY; 50 Hz output ¹⁾	9	L2C		✓ ³⁾	✓ ³⁾	✓ ³⁾
380 VΔ/660 VY; 60 Hz output ¹⁾	9	L2D		✓	✓	✓
440 VΔ; 50 Hz output ¹⁾	9	L2R		✓	✓	✓
440 VΔ; 60 Hz output ¹⁾	9	L2X		✓	✓	✓
460 VΔ; 50 Hz output ¹⁾	9	L2T		✓	✓	✓
460 VΔ; 60 Hz output ¹⁾	9	L2F		○	○	○
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓
575 VΔ; 60 Hz output	9	L2M		○	○	○
Non-standard voltage and/or frequencies						
Standard winding (winding according to voltage code 0, 5 or 6; rating plate will be stamped in accordance with order) ²⁾	9	L8Y •		○	○	○
Non-standard winding for voltages between 380 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Only possible with rated outputs of up to 630 kW.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

³⁾ Not possible for 2-pole motors in 60 Hz version of frame size 355 and above.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation 1LA8										
			1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Standardline										
Standardline version ¹⁾	B20		↓	↓	–	–	↓	↓	–	–
Motor protection										
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ²⁾	A12		□	□	□	□	□	□	□	□
Motor temperature detection with embedded temperature sensor KTY 84-130 ³⁾	A23		○	○	○	○	○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ³⁾	A61		✓	✓	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72		✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection boxes										
Two-part plate on connection box	K06		✓ ⁴⁾	✓	✓	✓	O. R.	O. R.	O. R.	O. R.
Undrilled entry plate	L01		○ ⁴⁾	○	○	○	○ ⁴⁾	○	○	○
Connection box on RHS	K09		□	□	□	□	□	□	□	□
Connection box on LHS	K10		○	○	○	○	○	○	○	○
Connection box above (1XB1 634 connection box) ¹⁷⁾	K11		✓	✓	✓	✓	✓	✓	✓	✓
Cable entry DIN 89280, maximum configuration	K57		✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		○	○	○	○	○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84		○	○	○	○	○	○	○	○
Rotation of connection box through 180°	K85		○	○	○	○	○	○	○	○
Larger connection box (1XB1 621 connection box)	M58		✓	□ ⁵⁾	–	–	✓	□	–	–
Larger connection box (1XB1 631 connection box)	L00		✓	✓ ⁶⁾	□	□	✓	✓ ⁶⁾	□	□
6 cables protruding, 1.5 m long	L48		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50		✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB3 020 ⁷⁾	L97		✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminium)	M88		✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 3/47.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation 1LA8										
			1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Windings and insulation										
Temperature class F, used acc. to F, with service factor (SF 1,1) ⁸⁾	C11		○	○	○	○	–	–	–	–
Temperature class F, used acc. to F, with increased output (10%) ⁸⁾	C12		○	○	○	○	–	–	–	–
Temperature class F, used according to F, with increased ambient temperature (55 °C, 50 °C above 400 m altitude) ⁸⁾	C13		○	○	○	○	–	–	–	–
Colours and paint finish										
Standard finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□
Standard paint finish in other colors	Y53 • and standard finish RAL		✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26		✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other colors	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○
Special technology										
Mounting of brake (incl. brake of Stromag)	H47		–	–	–	–	O. R.	O. R.	O. R.	O. R.
Mounting of LL 861 900 220 rotary pulse encoder	H70		–	–	–	–	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73		–	–	–	–	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78		–	–	–	–	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80		–	–	–	–	✓	✓	✓	✓
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation		–	–	–	–	O. R.	O. R.	O. R.	O. R.
Mechanical design and degrees of protection										
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		✓	□	□	□	✓	□	□	□
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		✓	–	–	–	✓	–	–	–
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓
Ambient temperature and site altitude										
Ambient temperature -50 to +40 °C	D02		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Ambient temperature -40 to +40 °C	D03		✓	✓	✓	✓	✓	✓	✓	✓
Ambient temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓
Ambient temperature 45 °C, derating 4% ⁹⁾	D11		○	○	○	○	○	○	○	○
Ambient temperature 50 °C, derating 8% ⁹⁾	D12		○	○	○	○	○	○	○	○
Ambient temperature 55 °C, derating 13% ⁹⁾	D13		○	○	○	○	○	○	○	○
Ambient temperature 60 °C, derating 18% ⁹⁾	D14		○	○	○	○	○	○	○	○

For legend and footnotes, see page 3/47.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation 1LA8										
			1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Designs in accordance with standards and specifications										
Electrical according to NEMA MG1-12	D30		✓	✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31		✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA)	D40		✓	✓	✓	✓	✓	✓	✓	✓
Design for Zones 2 and 22 according to ATEX ¹⁰⁾										
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{11) 12)}	M72		✓	✓	✓	✓	–	–	–	–
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{11) 12) 13)}	M73		–	–	–	–	✓	✓	✓	✓
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35		✓	✓	✓	✓	–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation ¹²⁾	M39		–	–	–	–	✓	✓	✓	✓
VIK version ¹⁴⁾	K30		✓	✓	–	–	O. R.	O. R.	–	–
Stamping of EEx nA II on VIK rating plate	C27		✓	✓	–	–	O. R.	O. R.	–	–
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁵⁾	K20		✓	✓	–	–	✓	✓	–	–
Balance and vibration severity										
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Shaft and rotor										
Second standard shaft extension ¹⁶⁾	K16		✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation										
Metal external fan	K35		✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates										
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates										
Acceptance test certificate 3.1 according to EN 10204	B02		□	□	□	□	□	□	□	□
Operating instructions on CD	B21		□	□	□	□	□	□	□	□
Document - EU manufacturer's declaration	B30		□	□	□	□	□	□	□	□
Document - Electrical data sheet	B31		✓	✓	✓	✓	✓	✓	✓	✓
Document - Order dimension drawing	B32		✓	✓	✓	✓	✓	✓	✓	✓
Document - Routine test certificate	B33		□	□	□	□	□	□	□	□
Document - Load characteristics	B37		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see page 3/47.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation 1LA8										
			1LA8 Mains-fed operation				1LA8 Converter-fed operation			
Packaging, safety notes, documentation and test certificates (continued)										
Standard test (routine test) with acceptance	F01		✓	✓	✓	✓	✓	✓	✓	✓
Visual acceptance and report handover with acceptance	F03		✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, without acceptance	F04		✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, with acceptance	F05		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, no noise analysis, no acceptance	F28		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, no noise analysis, with acceptance	F29		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, with noise analysis, with acceptance	F63		✓	✓	✓	✓	✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34		✓	✓	✓	✓	–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35		✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52		✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53		✓	✓	✓	✓	–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93		✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. Possible on request
- ✓ With extra charge
- Not possible
- ↓ Price reduction

- 1) For 4-pole version only, type of construction IM B3, 400 VΔ/690 VY or 500 VΔ voltage (no special insulation). Only the following short codes can be ordered in combination with the *Standardline*: **A23, A61, A72, G50, H70, H73, K10, K45, K46, K57, K83, K84, K85, L00, L97, M58** (only frame size 315), **Y53**.
- 2) For appropriate tripping unit, see Catalogue LV 1.
- 3) The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text.
- 4) Only possible in combination with the larger connection boxes 1XB1 621 or 1XB1 631 (order codes **M58** or **L00**).
- 5) With 1LA8 357-2 and 1LA8 357-4, connection box 1XB1 631 is supplied in the standard version.
- 6) Standard version for 1LA8 357-2 and 1LA8 357-4.
- 7) VIK version is not possible.
- 8) Not possible for converter operation.
- 9) Site altitude up to 1000 m above sea level.
- 10) Explosion-protected encoders are available on request.
- 11) Only permitted for use in accordance with temperature class B. PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2 and 22. Derating data are available on request.

- 12) These motors do not have a rated voltage range stamped on the rating plate.
- 13) In the order, the "Speed range and torque characteristic" must be specified in plain text. A system test is necessary for $M = \text{constant}$.
- 14) The VIK version comprises Zone 2 for mains-fed operation – without EEx nA II marking on rating plate. For 2-pole motors of frame size 315, the low-noise version is also required. Order code **K37** or **K38**. Note the specified output and dimensions. For 1LA8 353 to 1LA8 357 motors, the connection box cannot be rotated by $4 \times 90^\circ$.
- 15) Not possible for 2-pole motors and motors of vertical type of construction.
- 16) Please enquire in the case of 2-pole motors and motors in vertical type of construction.
- 17) A combination with the order codes **M72, M73, M35, M39, K30, C27, M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through $4 \times 90^\circ$. Cable entry is from NDE or the delivery position. Dimension drawings available on request.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size				
		315	355	400	450	
Forced-air cooled motors with externally-mounted fan for converter-fed operation 1PQ8						
		1PQ8 Converter-fed operation				
Standardline						
Standardline version	B20		–	–	–	–
Motor protection						
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		□	□	□	□
Motor temperature detection with embedded temperature sensor KTY 84-130 ²⁾	A23		○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ²⁾	A61		✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72		✓	✓	✓	✓
Motor connection and connection boxes						
Two-part plate on connection box	K06		✓	✓	✓	✓
Undrilled entry plate	L01		○ ³⁾	○	○	○
Connection box on RHS	K09		□	□	□	□
Connection box on LHS	K10		○	○	○	○
Connection box above (1XB1 634 connection box) ¹⁵⁾	K11		✓	✓	✓	✓
Cable entry, maximum configuration	K57		✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84		○	○	○	○
Rotation of connection box through 180°	K85		○	○	○	○
Larger connection box (1XB1 621 connection box)	M58		✓	□ ⁴⁾	–	✓
Larger connection box (1XB1 631 connection box)	L00		✓	✓ ⁵⁾	□	□
6 cables protruding, 1.5 m long	L48		O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49		O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50		✓	✓	✓	✓
Auxiliary connection box 1XB3 020	L97		✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminium)	M88		✓	✓	✓	✓
Connection box on NDE	M64		✓	✓	✓	✓

For legend and footnotes, see page 3/51.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size				
		315	355	400	450	
Forced-air cooled motors with externally-mounted fan for converter-fed operation 1PQ8						
		1PQ8 Converter-fed operation				
Windings and insulation						
Temperature class F, used acc. to F, with service factor (SF 1,1) ⁶⁾	C11		–	–	–	–
Temperature class F, used acc. to F, with increased output (10%) ⁶⁾	C12		–	–	–	–
Temperature class F, used according to F, with increased ambient temperature (55 °C, 50 °C above 400 m altitude) ⁶⁾	C13		–	–	–	–
Colours and paint finish						
Standard finish in RAL 7030 stone gray			□	□	□	□
Standard paint finish in other colors	Y53 • and standard finish RAL		✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26		✓	✓	✓	✓
Special finish in other colors	Y54 • and special finish RAL		✓	✓	✓	✓
Unpainted (only cast-iron parts primed)	K23		✓	✓	✓	✓
Special technology						
Mounting of brake (incl. brake of Stromag)	H47		O. R.	O. R.	O. R.	O. R.
Mounting of LL 861 900 220 rotary pulse encoder	H70		✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73		✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78		✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80		✓	✓	✓	✓
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation		O. R.	O. R.	O. R.	O. R.
Mechanical design and degrees of protection						
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		–	–	–	–
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		–	–	–	–
IP56 degree of protection (non-heavy-sea)	K52		O. R.	O. R.	O. R.	O. R.
Non-rusting screws (externally) ⁷⁾	M27		✓	✓	✓	✓
Ambient temperature and site altitude						
Ambient temperature -50 to +40 °C	D02		O. R.	O. R.	O. R.	O. R.
Ambient temperature -40 to +40 °C	D03		O. R.	O. R.	O. R.	O. R.
Ambient temperature -30 to +40 °C	D04		O. R.	O. R.	O. R.	O. R.
Ambient temperature 45 °C, derating 4% ⁸⁾	D11		O	O	O	O
Ambient temperature 50 °C, derating 8% ⁸⁾	D12		O	O	O	O
Ambient temperature 55 °C, derating 13% ⁸⁾	D13		O	O	O	O
Ambient temperature 60 °C, derating 18% ⁸⁾	D14		O. R.	O. R.	O. R.	O. R.
Designs in accordance with standards and specifications						
Electrical according to NEMA MG1-12 ¹⁶⁾	D30		✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31		✓	✓	✓	✓
Canadian regulations (CSA)	D40		✓	✓	✓	✓

For legend and footnotes, see page 3/51.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size				
		315	355	400	450	
Forced-air cooled motors with externally-mounted fan for converter-fed operation 1PQ8						
			1PQ8 Converter-fed operation			
Design for Zones 2 and 22 according to ATEX ⁹⁾						
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{10) 11)}	M72		–	–	–	–
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{10) 11) 12)}	M73		O. R.	O. R.	O. R.	O. R.
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation ¹¹⁾	M35		–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation ¹¹⁾	M39		–	–	–	–
VIK version	K30		–	–	–	–
Stamping of EEx nA II on VIK rating plate	C27		–	–	–	–
Bearings and lubrication						
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		✓	✓	✓	✓
Bearing design for increased cantilever forces ¹³⁾	K20		✓	✓	–	–
Balance and vibration severity						
Full key balancing	L68		✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		O. R.	O. R.	O. R.	O. R.
Shaft and rotor						
Metal external fan	K35		□	□	□	□
Second standard shaft extension	K16		–	–	–	–
Shaft extension with standard dimensions, without featherkey way	K42		✓	✓	✓	✓
Non-standard cylindrical shaft extension	Y55 • and identification code		✓	✓	✓	✓
Heating and ventilation						
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓
Separately-driven fan with non-standard voltage and/or frequency ¹⁶⁾	Y81 • and identification code		✓	✓	✓	✓
Rating plate and extra rating plates						
Second rating plate, loose	K31		✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates						
Acceptance test certificate 3.1 according to EN 10204	B02		□	□	□	□
Operating instructions on CD	B21		□	□	□	□
Document - EU manufacturer's declaration	B30		□	□	□	□
Document - Electrical data sheet	B31		✓	✓	✓	✓
Document - Order dimension drawing	B32		✓	✓	✓	✓
Document - Routine test certificate	B33		□	□	□	□
Document - Load characteristics	B37		O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see page 3/51.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size				
		315	355	400	450	
Forced-air cooled motors with externally-mounted fan for converter-fed operation 1PQ8						
		1PQ8 Converter-fed operation				
Packaging, safety notes, documentation and test certificates (continued)						
Normal inspection (routine inspection) with acceptance	F01		✓	✓	✓	✓
Visual acceptance and report handover with acceptance	F03		✓	✓	✓	✓
Temperature-rise test, without acceptance	F04		✓	✓	✓	✓
Temperature-rise test, with acceptance	F05		✓	✓	✓	✓
Noise measurement during idling, no noise analysis, no acceptance	F28		✓	✓	✓	✓
Noise measurement during idling, no noise analysis, with acceptance	F29		✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62		✓	✓	✓	✓
Noise measurement during idling, with noise analysis, with acceptance	F63		✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34		–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35		–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52		–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53		–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82		✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83		✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92		✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93		✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalogue LV 1.
- 2) The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text.
- 3) Only possible in combination with the larger connection boxes 1XB1 621 or 1XB1 631 (order codes **M58** or **L00**).
- 4) With 1PQ8 357-2 and 1PQ8 357-4, connection box 1XB1 631 is supplied in the standard version.
- 5) Standard version for 1PQ8 357-2 and 1PQ8 357-4.
- 6) Not possible for converter operation.
- 7) Only possible for main motor – Not possible for separately driven fan.
- 8) Site altitude up to 1000 m above sea level.
- 9) Explosion-protected encoders are available on request.
- 10) Only permitted for use in accordance with temperature class B. PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2 and 22. Derating data are available on request.

- 11) These motors do not have a rated voltage range stamped on the rating plate.
- 12) In the order, the "Speed range and torque characteristic" must be specified in plain text. A system test is necessary for $M = \text{constant}$.
- 13) Not possible for 2-pole motors and motors of vertical type of construction.
- 14) When ordering, specify in plain text: Voltage, frequency and circuit.
- 15) A combination with the order codes **M72**, **M73**, **M35**, **M39**, **K30**, **C27**, **M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through $4 \times 90^\circ$. Cable entry is from NDE or the delivery position. Dimension drawings available on request.
- 16) Only possible for main motor – Not possible for separately driven fan motor.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation										
			1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Standardline										
Standardline version	B20		–	–	–	–	–	–	–	–
Motor protection										
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		□	□	□	□	□	□	□	□
Motor temperature detection with embedded temperature sensor KTY 84-130 ²⁾	A23		○	○	○	○	○	○	○	○
Installation of 6 PT 100 resistance thermometers in stator winding ²⁾	A61		✓	✓	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	A72		✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection boxes										
Two-part plate on connection box	K06		✓	✓	✓	✓	O. R.	O. R.	O. R.	O. R.
Undrilled entry plate	L01		✓	✓	✓	✓	✓	✓	✓	✓
Connection box on RHS	K09		□	□	□	□	□	□	□	□
Connection box on LHS	K10		○	○	○	○	○	○	○	○
Connection box above (1XB1 634 connection box) ⁶⁾	K11		✓	✓	✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K57		✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		○	○	○	○	○	○	○	○
Rotation of the connection box through 90°, entry from NDE	K84		○	○	○	○	○	○	○	○
Rotation of connection box through 180°	K85		○	○	○	○	○	○	○	○
Larger connection box (1XB1 621 connection box)	M58		✓	–	–	–	✓	–	–	–
Larger connection box (1XB1 631 connection box)	L00		✓	□	□	□	✓	□	□	□
6 cables protruding, 1.5 m long	L48		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long	L49		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB9 016 (cast-iron)	M50		✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB3 020	L97		✓	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB9 014 (aluminium)	M88		✓	✓	✓	✓	✓	✓	✓	✓
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 3/55.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation										
			1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Windings and insulation										
Temperature class F, used acc. to F, with service factor (SF 1,1) ³⁾	C11		✓	✓	✓	✓	–	–	–	–
Temperature class F, used acc. to F, with increased output (10%) ³⁾	C12		✓	✓	✓	✓	–	–	–	–
Temperature class F, used according to F, with increased ambient temperature (55 °C, 50 °C above 400 m altitude) ³⁾	C13		✓	✓	✓	✓	–	–	–	–
Colours and paint finish										
Standard finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□
Standard paint finish in other colors	Y53 • and standard finish RAL		✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26		✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other colors	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23		✓	✓	✓	✓	✓	✓	✓	✓
Special technology										
Mounting of brake (incl. brake of Stromag)	H47		–	–	–	–	–	–	–	–
Mounting of LL 861 900 220 rotary pulse encoder	H70		–	–	–	–	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73		–	–	–	–	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78		–	–	–	–	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80		–	–	–	–	✓	✓	✓	✓
Mounting a special type of rotary pulse encoder	Y70 • and encoder designation		–	–	–	–	O. R.	O. R.	O. R.	O. R.
Mechanical design and degrees of protection										
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		✓	–	–	–	✓	–	–	–
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		✓	–	–	–	✓	–	–	–
IP56 degree of protection (non-heavy-sea)	K52		–	–	–	–	–	–	–	–
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓
Ambient temperature and site altitude										
Ambient temperature -50 to +40 °C	D02		–	–	–	–	–	–	–	–
Ambient temperature -40 to +40 °C	D03		–	–	–	–	–	–	–	–
Ambient temperature -30 to +40 °C	D04		–	–	–	–	–	–	–	–
Ambient temperature 45 °C, derating 4% ⁴⁾	D11		○	○	○	○	○	○	○	○
Ambient temperature 50 °C, derating 8% ⁴⁾	D12		○	○	○	○	○	○	○	○
Ambient temperature 55 °C, derating 13% ⁴⁾	D13		○	○	○	○	○	○	○	○
Ambient temperature 60 °C, derating 18% ⁴⁾	D14		○	○	○	○	○	○	○	○

For legend and footnotes, see page 3/55.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation									
			1LL8 Mains-fed operation				1LL8 Converter-fed operation		
Designs in accordance with standards and specifications									
Electrical according to NEMA MG1-12	D30		✓	✓	✓	✓	✓	✓	✓
Design according to UL with "Recognition Mark"	D31		✓	✓	✓	✓	✓	✓	✓
VIK version	K30		–	–	–	–	–	–	–
Canadian regulations (CSA)	D40		✓	✓	✓	✓	✓	✓	✓
Designs for Zones 2 and 22 according to ATEX									
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15	M72		–	–	–	–	–	–	–
Design for Zone 2 for converter-fed operation, derating Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15	M73		–	–	–	–	–	–	–
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35		–	–	–	–	–	–	–
Designs for Zone 22 for non-conducting dust (IP55) for converter-fed operation	M39		–	–	–	–	–	–	–
Stamping of EEx nA II on VIK rating plate	C27		–	–	–	–	–	–	–
Bearings and lubrication									
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces	K20		–	–	–	–	–	–	–
Balance and vibration severity									
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Shaft and rotor									
Second standard shaft extension ⁵⁾	K16		✓	✓	✓	✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension	Y55 • and identification data		✓	✓	✓	✓	✓	✓	✓
Heating and ventilation									
Metal external fan	K35		✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36		□	□	□	□	□	□	□
Rating plate and extra rating plates									
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 3/55.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		315	355	400	450	315	355	400	450	
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation										
			1LL8 Mains-fed operation				1LL8 Converter-fed operation			
Packaging, safety notes, documentation and test certificates										
Acceptance test certificate 3.1 according to EN 10204	B02		□	□	□	□	□	□	□	□
Operating instructions on CD	B21		□	□	□	□	□	□	□	□
Document - EU manufacturer's declaration	B30		□	□	□	□	□	□	□	□
Document - Electrical data sheet	B31		✓	✓	✓	✓	✓	✓	✓	✓
Document - Order dimension drawing	B32		✓	✓	✓	✓	✓	✓	✓	✓
Document - Routine test certificate	B33		□	□	□	□	□	□	□	□
Document - Load characteristics	B37		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Standard test (routine test) with acceptance	F01		✓	✓	✓	✓	✓	✓	✓	✓
Visual acceptance and report handover with acceptance	F03		✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, without acceptance	F04		✓	✓	✓	✓	✓	✓	✓	✓
Temperature-rise test, with acceptance	F05		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, no noise analysis, no acceptance	F28		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, no noise analysis, with acceptance	F29		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement in no-load operation, with noise analysis, without acceptance	F62		✓	✓	✓	✓	✓	✓	✓	✓
Noise measurement during idling, with noise analysis, with acceptance	F63		✓	✓	✓	✓	✓	✓	✓	✓
Recording of current and torque curves with torque metering shaft during starting, without acceptance	F34		✓	✓	✓	✓	–	–	–	–
Recording of current and torque curves with torque metering shaft during starting, with acceptance	F35		✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, without acceptance	F52		✓	✓	✓	✓	–	–	–	–
Measurement of locked-rotor torque and current, with acceptance	F53		✓	✓	✓	✓	–	–	–	–
Type test with heat run for horizontal motors, without acceptance	F82		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, without acceptance	F92		✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93		✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. Possible on request
- ✓ With extra charge
- Not possible

1) For appropriate tripping unit, see Catalogue LV 1.

2) The standard thermistors are omitted. If PTC thermistors are required as well as KTYs or PT100s, this must be specified in the order in plain text.

3) Not possible for converter operation.

4) Site altitude 1000 m above sea level

5) Please enquire in the case of 2-pole motors and motors in vertical type of construction.

6) A combination with the order codes **M72, M73, M35, M39, K30, C27, M88** and **M50** is not possible. Connection box 1XP1 634 can be rotated through 4 x 90°. Cable entry is from NDE or the delivery position. Dimension drawings available on request.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Accessories and spare parts

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 335 to 450, there are no standardised slide rails (please enquire).

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:

Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart
Tel. +49 (0)711-13 88-0
Fax +49 (0)711-13 88-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex-S couplings are recommended. These coupling types are suitable for use in areas subject to explosion hazards and are offered with declaration of conformity and type test certificate according to directive 94/9/EU.

Available from:

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for an order for a fan cowl 1LA8,
frame size 315, 4-pole:

**Fan cowl No. 12.01,
1LA8 315-4AB60, factory No. J1172515010001**

- For bearing types, see the "Introduction".
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

You will find telephone numbers for other countries on our Internet site:

<http://www.siemens.com/automation/service&support>

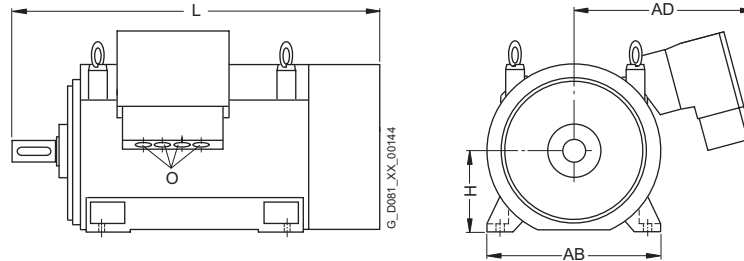
IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Dimensions

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions L	AD	H	AB
315	1LA8	2	1380	570	315	680
	1LA8	4, 6, 8	1410	570	315	680
	1LA8	4, 6, 8 ¹⁾	1430	570	315	680
	1PQ8	2	1742	570	315	680
	1PQ8	4, 6, 8	1772	570	315	680
	1PQ8	4 ¹⁾	1792	570	315	680
	1LL8	2	1380	655	315	680
	1LL8	4, 6, 8	1410	655	315	680
355	1LA8	2	1605	710	355	780
	1LA8	4, 6, 8	1635	710	355	780
	1LA8	4, 6, 8 ¹⁾	1700	710	355	780
	1PQ8	2	1971	690	355	780
	1PQ8	4, 6, 8	2001	690	355	780
	1PQ8	4, 6, 8 ¹⁾	2065	690	355	780
	1LL8	2	1605	840	355	780
	1LL8	4, 6, 8	1635	840	355	780

Frame size	Type	Number of poles	Dimensions L	AD	H	AB
400	1LA8	2	1795	865	400	860
	1LA8	4, 6, 8	1835	865	400	860
	1PQ8	2	2148	865	400	860
	1PQ8	4, 6, 8	2188	865	400	860
	1LL8	2	1793	865	400	860
	1LL8	4, 6, 8	1833	865	400	860
450	1LA8	2	1955	900	450	980
	1LA8	4, 6, 8	1995	900	450	980
	1PQ8	2	2308	900	450	980
	1PQ8	4, 6, 8	2348	900	450	980
	1LL8	2	1953	900	450	980
	1LL8	4, 6, 8	1993	900	450	980

For dimension "O", see "Introduction" under "Connection boxes".

Notes on the dimensions

■ Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2
D, DA	over 50 m6
N	over 250 h6
F, FA	h9

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
A, B	over 500 to 750	± 1.5
	over 750 to 1000	± 2.0
	over 1000	± 2.5
M	over 500	± 1.0
H	over 250	– 1.0
E, EA		– 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

¹⁾ With bearings for increased cantilever forces: Dimensions available on request.

IEC Squirrel-Cage Motors

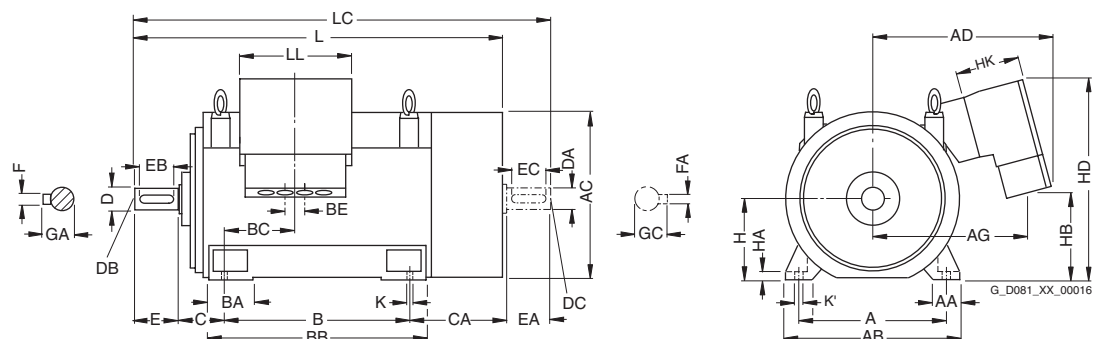
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

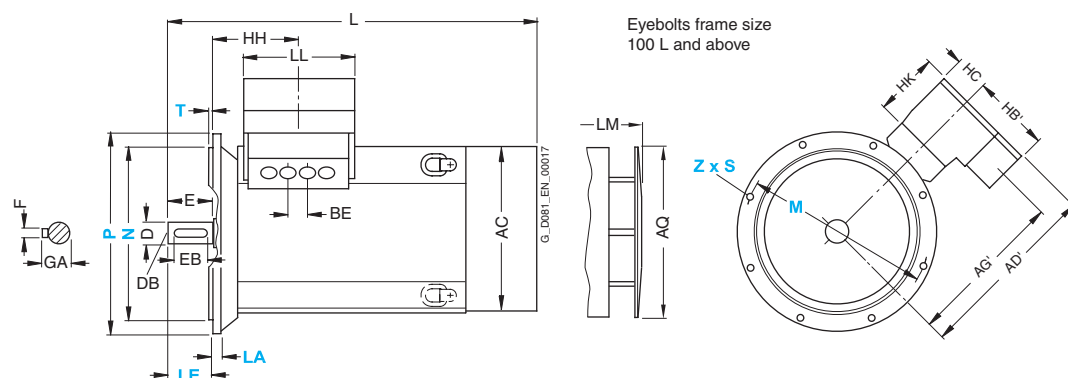
Cast-iron series 1LA8, frame sizes 315 to 450

Type of construction IM B3



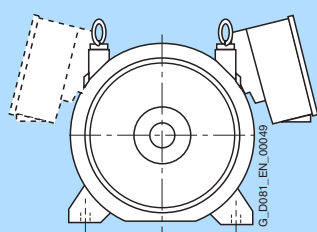
Type of construction IM V1

For flange dimensions, see Page 3/64 (Z = the number of retaining holes)



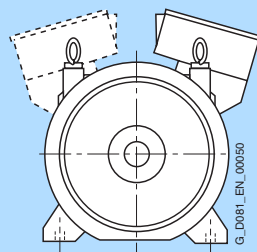
Connection box position

Basic version

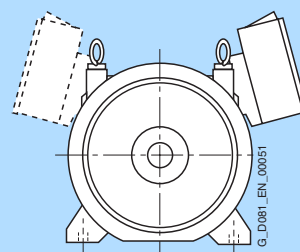


Cable entry: bottom
Console: 0 degrees
Order code: -

Special versions



Cable entry: top
Console: 180 degrees
Order code: K85



Cable entry: top
Console: 0 degrees
Order code: plain text

With cable entry from above, protection against rain and other adverse weather conditions must be provided.

For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C	CA	H	HA	HB	HB'	HC
315	1LA8 31	2 4, 6, 8 4, 6, 8 ²⁾	560	120	680	710	570	582	474	481	670	630	180	780	195	140	180 180 200	435	315	28	404	217	162
355	1LA8 35	2 4, 6, 8	630	150	780	790	690	697	597	593	750	800	220	980	185	135	200 200	470	355	35	431	290	165
	1LA8 357	2, 4					829	875	739	745						100	200				359	395	175
	1LA8 35	4, 6, 8 ²⁾					690	697	597	593						135	224				431	290	165
400	1LA8 40	2 4, 6, 8	710	150	860	880	865	925	775	795	850	900	220	1080	186	100	224	506	400	35	440	395	175
450	1LA8 45	2 ³⁾ 4, 6, 8	800	180	980	970	900	975	810	845	950	1000	260	1220	170	100	250	540	450	42	525	395	175

¹⁾ Measured across the bolt heads (not in the flattened area of the fan cowl).

²⁾ With bearings for increased cantilever forces. – No second shaft extension possible.

³⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

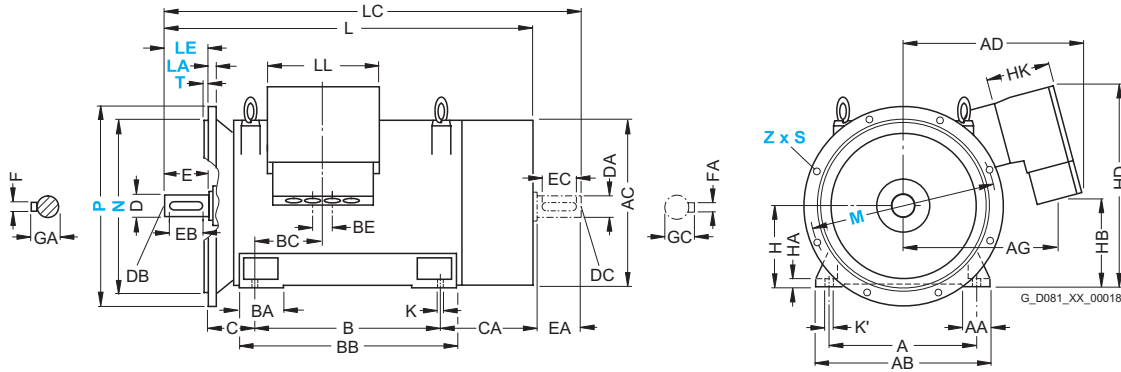
Dimensions

Dimensional drawings

Cast-iron series 1LA8, frame sizes 315 to 450

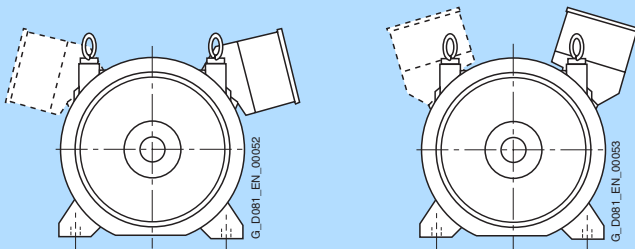
Type of construction IM B35

For flange dimensions, see Page 3/64 (Z = the number of retaining holes)



Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84

Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor Frame size	Type	Number of poles	Dimension designation acc. to IEC										DE shaft extension					NDE shaft extension				
			HD	HK	K	K'	L	LC	LL	LM	D	DB	E	EB	F	GA	DA	DC	EA	EC	FA	GC
315	1LA8 31	2	783	170	26	33	1380	1495	307	1510	65	M20	140	125	18	69	50	M16	110	100	14	53.5
		4, 6, 8					1410	1555		1540	85	M20	170	140	22	90	70	M20	140	125	20	74.5
		4, 6, 8 ¹⁾					1430	1575			95	M24	170	140	25	100	70	M20	140	125	20	74.5
355	1LA8 35	2	895	229	33	40	1605	1750	330	1745	75	M20	140	125	20	79.5	60	M20	140	125	18	64
		4, 6, 8					1635	1810		1775	95	M24	170	140	25	100	80		170	140	22	85
		2, 4																				
400	1LA8 357	2, 4	945	320																		
		4, 6, 8 ¹⁾					1700	1874			100	M24	210	180	28	106	80	M20	170	140	22	85
450	1LA8 40	2	1025	320	33	40	1795	1940	550	1945	80	M20	170	140	22	85	70	M20	140	125	20	74.5
		4, 6, 8					1835	2010		1985	110	M24	210	180	28	116	90	M24	170	140	25	95
		2 ²⁾					1955	2100	550	2105	90	M24	170	140	25	95	75	M20	140	125	20	79.5
450	1LA8 45	4, 6, 8	1110	320	39	47	1995	2210		2145	120		210	180	32	127	100	M24	210	180	28	106

¹⁾ With bearings for increased cantilever forces. – No second shaft extension possible.

²⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

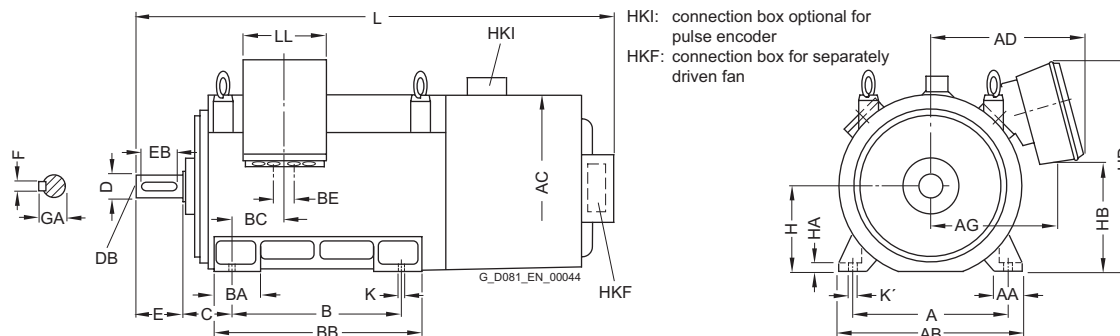
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

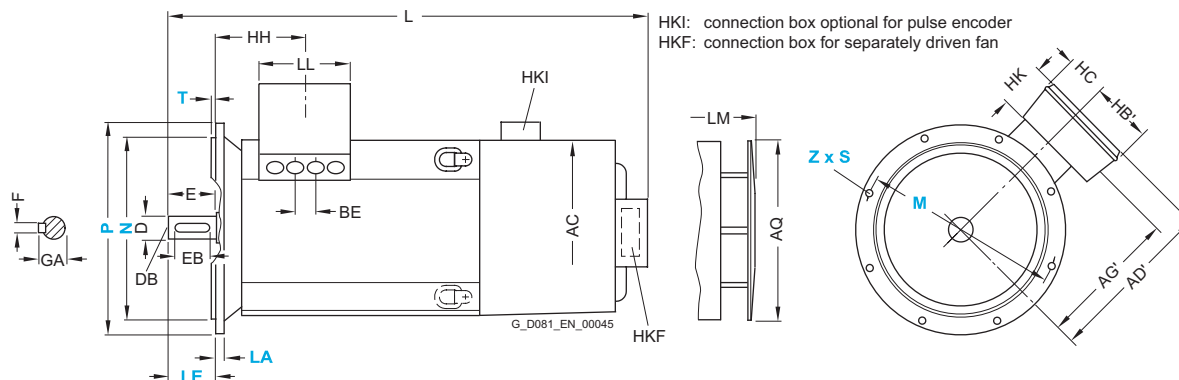
Cast-iron series 1PQ8, frame sizes 315 to 450

Type of construction IM B3



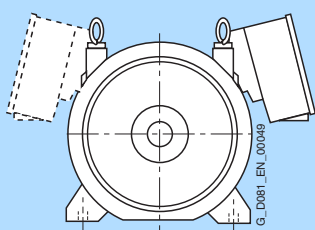
Type of construction IM V1

For flange dimensions, see Page 3/64 (Z = the number of retaining holes)



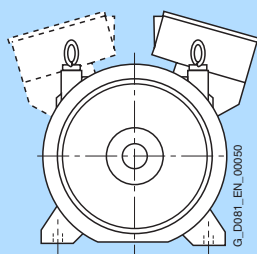
Connection box position

Basic version

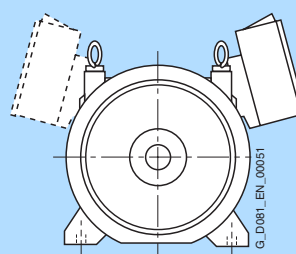


Cable entry: bottom
Console: 0 degrees
Order code: —

Special versions



Cable entry: top
Console: 180 degrees
Order code: K85



Cable entry: top
Console: 0 degrees
Order code: plain text

With cable entry from above, protection against rain and other adverse weather conditions must be provided.

For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C						
315	1PQ8 31.	2 4, 6, 8 4, 6, 8 ²⁾	560	120	680	710	570	582	474	481	670	630	180	780	195	140	180 180 200						
355	1PQ8 35.	2 4, 6, 8	630	150	780	790	690	697	597	593	750	800	220	980	185	135	200 200						
	1PQ8 357	2, 4																829	875	739	745	100	200
	1PQ8 35.	4, 6, 8 ²⁾																670	697	597	593	135	224
400	1PQ8 40.	2 4, 6, 8	710	150	860	880	865	925	775	795	850	900	220	1080	186	100	224						
450	1PQ8 45.	2 ³⁾ 4, 6, 8	800	180	980	970	900	980	810	845	950	1000	260	1220	170	100	250						

¹⁾ Measured across the bolt heads (not in the flattened area of the fan cowl).

²⁾ With bearings for increased cantilever forces.

³⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

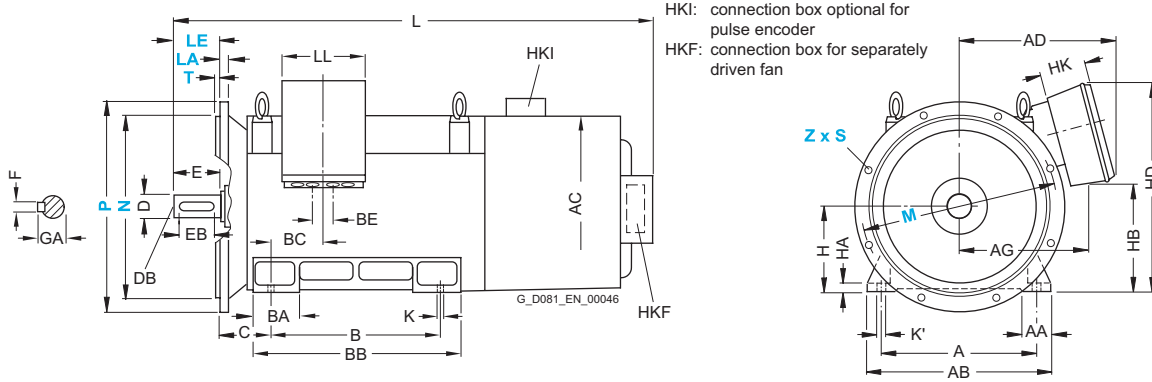
Dimensions

Dimensional drawings

Cast-iron series 1PQ8, frame sizes 315 to 450

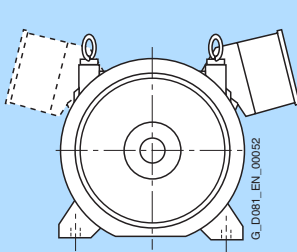
Type of construction IM B35

For flange dimensions, see Page 3/64 (Z = the number of retaining holes)

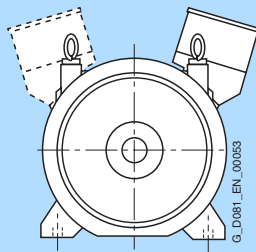


Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84



Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor		Dimension designation acc. to IEC													DE shaft extension						
Frame size	Type	Number of poles	H	HA	HB	HB'	HC	HD	HK	K	K'	L	LL	LM	D	DB	E	EB	F	GA	
315	1PQ8 31.	2 4, 6, 8 4 ¹⁾	315	28	404	217	162	783	170	26	33	1742 1772 1792	307	1510 1540	65 85 95	M20 M20 M24	140 170 170	125 140 140	18 22 25	69 90 100	
355	1PQ8 35.	2 4, 6, 8	355	35	431	290	165	896	229	33	40	1971 2001	330	1745 1775	75 95	M20 M24	140 170	125 140	20 25	79.5 100	
	1PQ8 357	2, 4			359	395	175	945	320												
	1PQ8 35.	4, 6, 8 ¹⁾										2065			100	M24	210	180	28	106	
400	1PQ8 40.	2 4, 6, 8	400	35	440	400	175	1025	320	33	40	2148 2188	550	1945 1985	80 110	M20 M24	170 210	140 180	22 28	85 116	
		2 ²⁾ 4, 6, 8	450	42	525	400	175	1110	320	39	47	2308 2348	550	2105 2145	90 120	M24	170 210	140 180	25 32	95 127	

¹⁾ With bearings for increased cantilever forces.

²⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

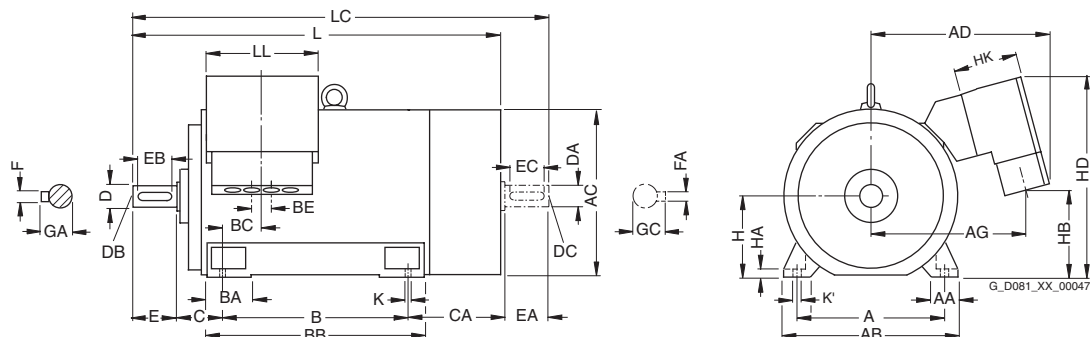
Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

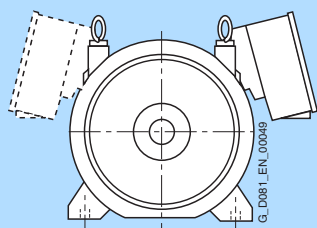
Cast-iron series 1LL8, frame sizes 315 to 450

Type of construction IM B3



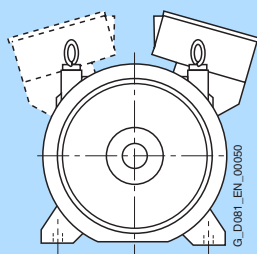
Connection box position

Basic version

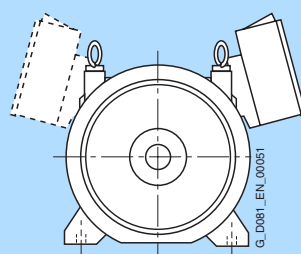


Cable entry: bottom
Console: 0 degrees
Order code: –

Special versions



Cable entry: top
Console: 180 degrees
Order code: K85



Cable entry: top
Console: 0 degrees
Order code: plain text

For motor			Dimension designation acc. to IEC																
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AG	AG'	AQ	B	BA	BB	BC	BE	C	CA	
315	1LL8 31.	2 4, 6, 8	560	120	680	710	655	– 660	565	– 560	670	630	180	780	195	110	180	435	
355	1LL8 35.	2 4, 6, 8	630	150	780	790	840	– 880	740	– 745	750	800	220	980	185	135	200	470	
400	1LL8 40.	2 4, 6, 8	710	150	860	880	865	– 930	775	– 795	850	900	220	1080	186	100	224	506	
450	1LL8 45.	2 ²⁾ 4, 6, 8	800	180	980	970	900	– 980	810	– 845	950	1000	260	1220	170	100	250	540	

¹⁾ Measured across the bolt heads.

²⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

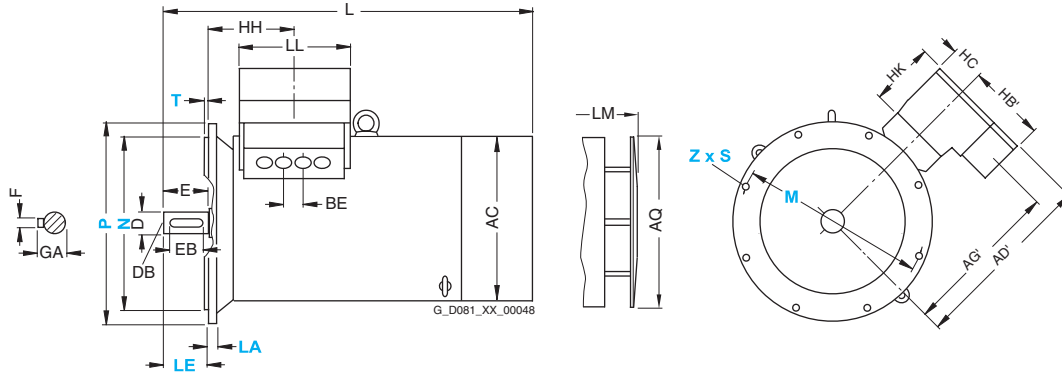
Dimensions

Dimensional drawings

Cast-iron series 1LL8, frame sizes 315 to 450

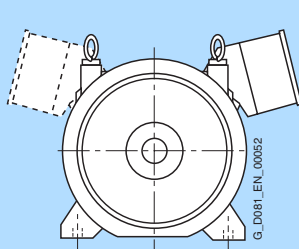
Type of construction IM V1

For flange dimensions, see Page 3/64 (Z = the number of retaining holes)

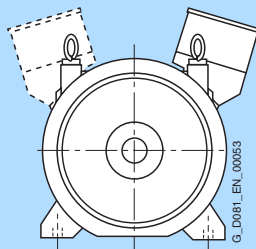


Connection box position

Special versions



Cable entry: DE / NDE
Console: 0 degrees
Order code: K83/K84



Cable entry: DE / NDE
Console: 180 degrees
Order code: plain text

For motor			Dimension designation acc. to IEC												DE shaft extension						
Frame size	Type	Number of poles	H	HA	HB	HB'	HD	HK	K	K'	L	LC	LL	LM	D	DB	E	EB	F	GA	
315	1LL8 31.	2 4, 6, 8	315	28	360	– 290	825	250	26	33	1380 1410	1495 1555	330	1530	70 90	M20 M24	140 170	125 140	20 25	74.5 95	
355	1LL8 35.	2 4, 6, 8	355	35	360	– 400	945	320	33	40	1605 1635	1750 1820	550	1765	80 110	M20 M24	170 210	140 180	22 28	85 116	
400	1LL8 40.	2 4, 6, 8	400	35	440	– 400	1020	320	33	40	1793 1833	1940 2010	550	1975	85 120	M20 M24	170 210	140 180	22 32	90 127	
450	1LL8 45.	2 ¹⁾ 4, 6, 8	450	42	525	– 400	1110	320	39	47	1953 1993	2100 2250	550	2145	90 130	M24 M24	170 250	140 220	25 32	95 137	

¹⁾ Only at 50 Hz.

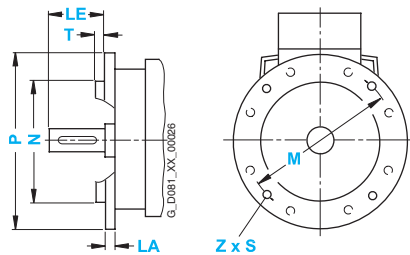
IEC Squirrel-Cage Motors

Non-standard motors frame size 315 and above

Dimensions

Dimensional drawings

Flange dimensions



Frame size	Type of construction	Flange type	Flange with through holes (FF/A)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
315 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	—	—	25	140 170	740	680	800	22	6	8
355 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	—	—	25	140 170	840	780	900	22	6	8
400 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	—	—	28	170 210	940	880	1000	22	6	8
450 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	—	—	30	170 210	1080	1000	1150	26	6	8

Explosion-proof motors



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- 4/3 Technical specifications
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- 4/12 Selection and ordering data

4/16 Self-ventilated motors in Zone 1 with type of protection "e" Cast-iron series 1MA6

- 4/16 Selection and ordering data

4/28 Self-ventilated motors in Zone 1 with type of protection "d" Cast-iron series 1MJ6 and 1MJ7

- 4/28 Selection and ordering data

4/36 Self-ventilated motors in Zone 1 with type of protection "d" Cast-iron/steel series 1MJ8 and 1MJ1

- 4/36 Selection and ordering data

4/40 Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions Aluminium series 1LA7 and 1LA5

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4/48 Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions Aluminium series 1LA9

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4/60 Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions Cast-iron series 1LA6 and 1LG4

- 4/60 Selection and ordering data

4/68 Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions Cast-iron series 1LG6

- 4/68 Selection and ordering data

4/78 Self-ventilated motors in Zone 2, 22 with type of protection "n" or protection against dust explosions Cast-iron series 1LA8

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4/78 Forced-air cooled motors in Zone 2, 22 with type of protection "n" or protection against dust explosions Cast-iron series 1PQ8

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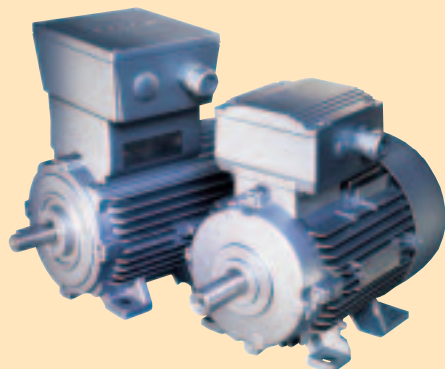


IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

Overview



Explosion-protected equipment are designed such that an explosion can be prevented when they are used properly.

The explosion-protected equipment can be designed in accordance with various types of protection.

The **local** conditions must be subdivided into specified zones by the user with the assistance of the responsible authorities in accordance with the frequency of occurrence of an explosion hazard. Device (equipment) categories are assigned to these zones. The zones are then subdivided into possible types of protection and therefore into possible equipment (product) types.

Our product range contains motors in the following types of protection:

- "Increased safety" EEx e II
- "Explosion-proof enclosure" EEx de IIC/EEx d IIC
- "Non-sparking" Ex nA II/EEx nA II
- "Areas protected against dust explosions in Zones 21 and 22"

The table below "Overview of explosion-proof motors" contains a complete overview of our products, their types of protection and the assignment of motor types to categories. It is important to note that depending on whether the motor is used for converter-fed operation or mains-fed operation, different order codes are required for unique selection of the required product.

In many industrial sectors as well as in domestic life, explosion protection or explosion hazards are ever-present, e.g. in the chemicals industry, in refineries, on drilling platforms, at petrol stations, in feed manufacturing and in sewage treatment plants.

The risk of explosion is always present when gases, fumes, mist or dust are mixed with oxygen in the air in an explosive ratio close to sources of ignition that are able to release the so-called minimum ignition energy.

Overview of explosion-proof motors

Section	Category	Zone	Frequency of occurrence of the Ex atmosphere	Degree of protection	Temperature class	Degree of protection	Operation	Standard	Motor type (Pos. 1-4 of Order No.)	Order code	Utilisation according to temperature class
Gas and steam (G)	1G	0	Continuously or long-term	Not common practice with low-voltage motors							
	2G	1	Infrequently	EEx de IIC ¹⁾ (explosion-proof enclosure)	T1 – T4	IP55	<u>Mains</u> <u>Converter</u>	IEC/EN 60 079-0 IEC/EN 60 079-1	1MJ6/7 1MJ8/1	– A15 A16	B F
				EEx e II (increased safety)	T1 – T3	IP55	Mains	IEC/EN 60 079-0 IEC/EN 60 079-7	1MA6 1MA7	–	B/F
	3G	2	Rarely or briefly	EEx nA II Ex nA II (non sparking)	T1 – T3	IP55	<u>Mains</u> <u>Converter</u>	IEC/EN 60079-15	1LA6 1LA7 1LA8, 1PQ8 ²⁾ 1LA9 1LG4/6	<u>M72</u> M73	B
Dust (D)	1D	20	Continuously or long-term	Not common practice with low-voltage motors							
	2D	21	Infrequently	Conductive dust	Max. enclosure temperature T 125 °C	IP65	<u>Mains</u> <u>Converter</u>	EN 50281	1LA5 1LA6	<u>M34</u> M38	B
	3D	22	Rarely or briefly	Non-conductive dust		IP55	<u>Mains</u> <u>Converter</u>		1LA7 1LA8 ³⁾ , 1PQ8 ²⁾ 1LA9 1LG4/6	<u>M35</u> M39	

¹⁾ Highest explosion group IIC includes IIB and IIA.

²⁾ 1PQ8 is not possible for Zone 21 and 22; Zone 2 for 1PQ8 available on request. Utilisation according to temperature class F.

³⁾ 1LA8 only available for Zone 22 (order codes M35, M39). Utilisation according to temperature class F.

Benefits

The explosion-proof motors from Siemens offer the user numerous advantages:

- The motors are designed in accordance with Directive 94/9/EU (ATEX 95 previously ATEX 100a). As product supplier, Siemens accepts responsibility for compliance with the applicable product standards for the selected equipment.
- By using this product, the plant operating company satisfies Directive 1999/92/EU in accordance with Appendix II B (ATEX 137 previously ATEX 118a). The plant manufacturer or plant operating company is responsible for correct selection and proper usage of the equipment.

- Comprehensive series of explosion-proof motors for protection against gas and dust.
- Individual versions of motors are possible thanks to the numerous catalogue options.
- Further special versions are possible on request.
- Certificates are available for a defined spectrum of Siemens motors/converters.

Application

The explosion-proof motors are used in the following sectors to prevent explosion hazards that result in serious injury to persons and severe damage to property.

- Chemical and petrochemical industry
- Production of mineral oil and gas
- Gas works
- Gas supply companies

- Petrol stations
- Coking plants
- Mills (e.g. corn, solids)
- Sewage treatment plants
- Wood processing (e.g. sawdust, tree resin)
- Other industries subject to explosion hazards

Technical specifications

Zone 1 with type of protection EEx e II Increased Safety "e"

All 1MA motors are certified in type of protection EEx e II for temperature classes T1 to T3 at an ambient temperature from -20 to +40 °C and have an EU type test certificate according to Directive 94/9/EG (ATEX 95). Higher temperature classes are available on request.

Explosion protection is achieved when the certified motor versions interact with a similarly certified motor protection switch. The motor protection switch is selected in accordance with the values certified for the motor for the starting current ratio I_A/I_N and the t_E times, so that in the case of a locked rotor fault, the motor is isolated from the supply within the t_E time. The t_E times assigned to the separate temperature classes and the starting current ratio are marked on the rating plate.

Explosion protection can be achieved exclusively by the PTC thermistors embedded in the winding provided that the motor has been specially approved and certified for this. This type of protection is not technically possible for every motor, so it is essential to enquire before ordering.

With the exception of 2-pole motors of frame size 225 M and above, all motors are of an identical version, i.e. the motors can be operated at T1/T2 or T3 at the appropriate rated output. For special versions (different frequency, output, ambient temperature, site altitude, etc.) a new certificate is necessary (please enquire). The temperature class must be specified in the order, otherwise the universal version T1/T2 and T3 will be certified (doubling the certification costs).

Identification on the rating plate:

 II 2G EEx e II T1 – T3

Zone 1 with type of protection EEx de IIC explosion-proof enclosure "d"

All 1MJ motors are certified for the highest explosion group IIC, temperature classes T1 to T4 at ambient temperatures from -20 to +60 °C and have an EC type test certificate according to Directive 94/9/EG (ATEX 95).

These motors are designed such that an explosion within the casing cannot result in an explosion in the environment. The energy that is generated internally by an explosion is dissipated in the so-called "flameproof chamber" so far that the energy is no longer sufficient for ignition outside the casing. The casing temperature is below the ignition temperature of the gases to which temperature class T4 applies.

The 1MJ6 motors (frame size 71 to 200) generally have a located bearing on the non-drive-end (NDE) of the motor.

The following variations are possible on request:

- Coolant temperature >40 °C or site altitude >1000 m (for 1MJ6, the reduction factors listed in the "Introduction" section of the catalogue under "General technical data", "Coolant temperature and site altitude" are applicable).
- Frequency and rated duty
- Pole-changing motors
- Insulated bearing at the non-drive-end (NDE)
- Use according to temperature class F in mains-fed operation

On the frequency converter, motors in type of protection "explosion-proof enclosure" can be used thermally acc. to temperature class F. Converter-fed operation can be ordered with order code **A15** (PTC thermistors for tripping) or **A16** (PTC thermistors for tripping and alarm), whereby an additional PTC thermistor is fitted to 1MJ6/1MJ7 motors in the connection box.

Identification on the rating plate:

 II 2G EEx de IIC T1 – T4
or
 II 2G EEx d IIC T1 – T4

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Orientation

Technical specifications (continued)

Zone 2 with type of protection EEx nA/Ex nA (non-sparking)

- Zone 2 acc. to IEC/EN 60079-15
- The duty types are:
 - Design for Zone 2 for mains-fed operation (order code **M72**)
 - Design for Zone 2 for mains-fed operation, with derating (order code **M73**)

1LA/1LG motors are modified for this purpose in the "Non-sparking" design and are suitable for use in hazardous areas of Zone 2 for temperature classes T1 to T3. The maximum surface temperature that can occur during operation must lie below the limit temperature of the respective temperature class. The ventilation system must be in accordance with DIN EN 50014. An external earthing terminal is fitted to the motors. The connection box is similar to the EExe design.

Please enquire in the case of

- Use in accordance with temperature class F
- For pole-changing versions

For motors in the "Non-sparking" version, a conformity declaration is available from a recognised testing authority.

Ambient temperature -20 to +60 °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

The rating plate or the extra rating plate contains the text:

 Ex nA II T3 II 3G EEx nA II T3

IEC/EN 60079-15 and number of the "Conformity declaration"

The motors do not have a rated voltage range stamped on the rating plate.

Protection against dust explosions in Zones 21 and 22

The distinction between Zones 21 and 22 is as follows:

- Zone 21 according to IEC 61241, EN 50281 ¹⁾
 - Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation (order code **M34**)
 - Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating (order code **M38**)

- Zone 22 according to IEC 61241, EN 50281
 - Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation (order code **M35**)
 - Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating (order code **M39**)

The 1LA/1LG motors are modified for this purpose for use in zones subject to dust explosion hazards. The surface temperature is ≤125 °C at rated duty.

An external earthing terminal and an external metal fan are fitted to the motors. In the design for Zone 21, the connection box is similar to the EExe design.

Pole-changing versions are not possible for Zone 21 – they are possible for Zone 22 on request.

Certification:

- Zone 21: EC type-test certificate (ATEX), issued by the DMT testing authority (Deutsche Montan-Technologie) and EC declaration of conformity.
- Zone 22: EC declaration of conformity

Identification on the rating plate:

Zone 21:  II 2D T125 °C

Zone 22:  II 3D T125 °C

Ambient temperature -20 °C to +60 °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

Generally, the following is valid:

All Ex motors in vertical type of construction with shaft extension pointing down must have a protective cover.

Ex motors cannot be designed in accordance with UL and CSA.

The certificates for the motors for hazardous areas are stored with the documentation in the SD configurator tool for low-voltage motors.

For converter-fed operation, Ex motors must always be monitored using PTC thermistors. Certified tripping units are required for this purpose, see Catalog LV1.

Comprehensive operating instructions and the declaration of conformity are supplied with Ex motors. In the case of non-standard 1LA8 and 1PQ8 motors, the bearing temperature must be monitored (order code **A72**).

Overview of the technical specifications

Explosion-proof motors - The technology at a glance				
Motors	Type of protection "e"	Type of protection "d"	Type of protection "n"	Dust explosion protection
Frame size	63 M ... 315 L	71 M ... 450	63 M ... 450	56 M ... 450 L
Output range	0.12 to 160 kW	0.25 to 950 kW	0.09 to 1000 kW	0.06 to 1000 kW
Number of poles	2/4/6	2/4/6/8	2/4/6/8	2/4/6/8
Temperature class	T1 - T3	T1 - T4	T3	–
Degree of protection	II 2 G EEx e II acc. to IEC/EN 60079-0 IEC/EN 60079-7	II 2 G EEx de II acc. to IEC/EN 60079-0 IEC/EN 60079-1	Ex nA II 3 G EEx nA acc. to IEC/EN 60079-15	Zone 21: II 2D IP 65 T 125 °C ²⁾ Zone 22: II 3D IP 55 T 125 °C acc. to EN 50281/IEC 61241
Directive	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95
Protection class	IP55	IP55	IP55	Zone 21: IP65 Zone 22: IP55
Voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages
Frequency	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz
Type of construction	All common types of construction	All common types of construction	All common types of construction	All common types of construction
Casing	FS 63 M ... 160 L aluminium FS 100 L ... 315 L cast-iron	FS 71 M ... 315 L cast-iron FS 355 ... 450 steel	FS 63 M ... 160 L aluminium FS 100 L ... 450 cast-iron	FS 56 M ... 225 M aluminium FS 100 L ... 450 ¹⁾ cast-iron
Cooling method	Surface-cooled	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	F used acc. to B	F used acc. to B	F used acc. to B	F used acc. to B ³⁾
Insulation system	DURIGNIT IR 2000	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request

¹⁾ Zone 21 only up to frame size 315 L

²⁾ Zone 21 for "Non-standard motors frame size 315 and above" only up to frame size 315 possible.

³⁾ For "Non-standard motors frame size 315 and above" temperature class F utilized according to F.

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors in Zone 1 with type of protection "e" (EEx e II Increased safety)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1MA7 50 Hz						
3000, 2-pole	63 M ... 160 L	0.18 ... 16	2810 ... 2910	0.61 ... 53	0.55 ... 30.0	4/12 ... 4/13
1500, 4-pole	63 M ... 160 L	0.12 ... 13.5	1375 ... 1465	0.83 ... 88	0.52 ... 27	4/14 ... 4/15
1000, 6-pole	71 M ... 160 L	0.25 ... 9.7	850 ... 965	2.8 ... 96	0.81 ... 21	4/14 ... 4/15
Cast-iron series 1MA6 50 Hz						
3000, 2-pole	100 L ... 315 L	2.5 ... 165	2865 ... 2986	8.3 ... 528	5.3 ... 280	4/16 ... 4/19
1500, 4-pole	100 L ... 315 L	2 ... 165	1420 ... 1492	14 ... 1061	4.5 ... 305	4/20 ... 4/23
1000, 6-pole	100 L ... 315 L	1.3 ... 135	935 ... 991	13 ... 1300	3.35 ... 240	4/24 ... 4/27

Self-ventilated motors in Zone 1 with type of protection "d" (EEx de IIC explosion-proof enclosure)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1MJ6 50 Hz						
3000, 2-pole	71 M ... 200 L	0.37 ... 37	2750 ... 2945	1 ... 120	0.98 ... 64	4/28 ... 4/29
1500, 4-pole	71 M ... 200 L	0.25 ... 30	1325 ... 1465	1 ... 196	0.78 ... 55	4/30 ... 4/31
1000, 6-pole	71 M ... 200 L	0.25 ... 22	870 ... 75	2 ... 215	0.82 ... 42.5	4/32 ... 4/33
750, 8-pole	90 L ... 200 L	0.37 ... 15	655 ... 725	5 ... 198	1.16 ... 32	4/34 ... 4/35
Cast-iron series 1MJ7 50 Hz						
3000, 2-pole	225 M ... 315 M	45 ... 132	2955 ... 2980	145 ... 423	77 ... 225	4/28 ... 4/29
1500, 4-pole	225 S ... 315 M	37 ... 132	1475 ... 1486	240 ... 848	67 ... 232	4/30 ... 4/31
1000, 6-pole	225 M ... 315 M	30 ... 90	978 ... 988	293 ... 870	56 ... 162	4/32 ... 4/33
750, 8-pole	225 S ... 315 M	18.5 ... 75	725 ... 738	244 ... 970	37.5 ... 140	4/34 ... 4/35
Steel series 1MJ8 50 Hz						
3000, 2-pole	355	315 ... 400	2982 ... 2985	1009 ... 1279	530 ... 655	4/36 ... 4/37
1500, 4-pole	355	280 ... 400	1485 ... 1491	1795 ... 2561	495 ... 690	4/36 ... 4/37
1000, 6-pole	355	250 ... 315	993 ... 994	2403 ... 3027	440 ... 560	4/38 ... 4/39
750, 8-pole	355	200 ... 250	744	2566 ... 3206	370 ... 466	4/38 ... 4/39
Steel/cast-iron series 1MJ1 50 Hz						
3000, 2-pole	315 M ... 450	160 ... 900	2977 ... 2985	515 ... 2879	280 ... 915	4/36 ... 4/37
1500, 4-pole	315 M ... 450	160 ... 950	1485 ... 1493	1030 ... 6076	285 ... 1355	4/36 ... 4/37
1000, 6-pole	315 M ... 450	110 ... 800	990 ... 995	1060 ... 7676	195 ... 1240	4/38 ... 4/39
750, 8-pole	315 M ... 450	90 ... 670	740 ... 746	1160 ... 8579	175 ... 1210	4/38 ... 4/39

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Selection and ordering data (continued)

Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current	Detailed selection and ordering data
rpm		kW at 50 Hz HP at 60 Hz	rpm	Nm	at 400 V, 50 Hz at 460 V, 60 Hz A	Page
Aluminium series 1LA7 and 1LA5 ¹⁾ 50 Hz						
3000, 2-pole	56 M ²⁾ ... 225 M	0.09 ... 45	2830 ... 2959	0.3 ... 145	0.26 ... 78	4/40 ... 4/41
1500, 4-pole	56 M ²⁾ ... 225 M	0.06 ... 45	1350 ... 1470	0.42 ... 292	0.2 ... 80	4/42 ... 4/43
1000, 6-pole	63 M ... 225 M	0.09 ... 30	850 ... 978	1 ... 293	0.44 ... 61	4/44 ... 4/45
750, 8-pole	71 M ... 225 M	0.09 ... 22	630 ... 724	1.4 ... 290	0.36 ... 44.5	4/46 ... 4/47
Aluminium series 1LA9						
"High Efficiency" 50 Hz						
3000, 2-pole	56 M ... 200 L	0.09 ... 37	2830 ... 2950	0.3 ... 120	0.24 ... 64	4/48 ... 4/49
1500, 4-pole	56 M ... 200 L	0.06 ... 30	1380 ... 1465	0.42 ... 196	0.22 ... 53	4/50 ... 4/51
1000, 6-pole	90 S ... 200 L	0.75 ... 22	925 ... 975	7.7 ... 215	2 ... 45	4/52 ... 4/53
For implementation in the North American market according to EPACT 60 Hz						
3600, 2-pole	56 M ... 200 L	0.12 ... 50	3440 ... 3555	0.25 ... 100	0.23 ... 57	4/54 ... 4/55
1800, 4-pole	56 M ... 200 L	0.08 ... 40	1715 ... 1770	0.33 ... 161	0.18 ... 47	4/56 ... 4/57
1200, 6-pole	90 S ... 200 L	1 ... 30	1140 ... 1175	6.2 ... 182	1.78 ... 40	4/58 ... 4/59
Cast-iron series 1LA6 and 1LG4 50 Hz						
3000, 2-pole	100 L ... 315 L	3 ... 200	2890 ... 2982	9.9 ... 641	6.1 ... 325	4/60 ... 4/61
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1420 ... 1486	15 ... 1285	4.7 ... 340	4/62 ... 4/63
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 988	15 ... 1547	3.9 ... 285	4/64 ... 4/65
750, 8-pole	100 L ... 315 L	0.75 ... 132	679 ... 738	11 ... 1708	2.15 ... 245	4/66 ... 4/67
Cast-iron series 1LG6						
"High Efficiency" 50 Hz						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	38.5 ... 320	4/68 ... 4/69
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	34.5 ... 340	4/68 ... 4/69
1000, 6-pole	180 M ... 315 L	15 ... 160	975 ... 990	147 ... 1543	29.5 ... 280	4/70 ... 4/71
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 740	145 ... 1704	23.5 ... 240	4/70 ... 4/71
For implementation in the North American market according to EPACT 60 Hz						
3600, 2-pole	180 M ... 315 L	30 ... 300	3560 ... 3591	60 ... 595	34 ... 320	4/72 ... 4/73
1800, 4-pole	180 M ... 315 L	25 ... 300	1775 ... 1792	100 ... 1193	31 ... 335	4/74 ... 4/75
1200, 6-pole	180 M ... 315 L	20 ... 200	1178 ... 1192	121 ... 1195	25.5 ... 235	4/76 ... 4/77
Cast-iron series 1LA8 50 Hz for mains-fed operation ³⁾						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/10 ... 3/11
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/10 ... 3/11
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/12 ... 3/13
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/12 ... 3/13
Cast-iron series 1PQ8 50 Hz with standard insulation ≤500 V ³⁾						
3000, 2-pole	315 ... 450	250 ... 1000	2979 ... 2986	801 ... 3200	415 ... 1020	3/22 ... 3/23
1500, 4-pole	315 ... 450	250 ... 1000	1488 ... 1492	1600 ... 6400	430 ... 1060	3/22 ... 3/23
1000, 6-pole	315 ... 450	200 ... 800	988 ... 993	1930 ... 7690	345 ... 1100	3/24 ... 3/25
750, 8-pole	315 ... 450	160 ... 630	739 ... 744	2070 ... 8090	295 ... 1160	3/24 ... 3/25

Motors for converter-fed operation 1LA8 ³⁾ with normal and special insulation or 1PQ8 ³⁾, for special insulation, see overview on page 3/7.

¹⁾ Motor series 1LA5 is not possible for Zone 2.

²⁾ Motor series 1LA7 is only possible for Zone 2 in frame size 63 M and above.

³⁾ Motor series 1LA8 and 1PQ8 are not possible for Zone 21, 1PQ8 for Zone 2 & 22 on request.

More information

Fundamental physical principles and definitions

Explosion

An explosion is the sudden chemical reaction of a combustible substance with oxygen, involving the release of high energy. Combustible substances can be gases, vapours, steam or dust. An explosion can only take place if the following three factors coincide:

1. Combustible substance (in the relevant distribution and concentration)
2. Oxygen (in the air)
3. Source of ignition (e.g. electrical spark)

Primary and secondary explosion protection

Integrated explosion protection

1. Prevention of dangerous potentially explosive atmospheres
2. Prevention of the ignition of dangerous potentially explosive atmospheres
3. Limiting the explosion to a negligible degree

The principle of integrated explosion protection requires all explosion protection measures to be carried out in a defined order. A distinction is made here between primary and secondary protective measures.

Primary explosion protection covers all measures that prevent the formation of a potentially explosive atmosphere.

What are the protective measures that can be taken to minimise the risk of an explosion?

- Avoidance of combustible substances
- Inerting (addition of nitrogen, carbon dioxide, etc.)
- Limiting of the concentration
- Improved ventilation

Secondary explosion protection is required if the explosion hazard cannot be removed or can only be partially removed using primary explosion protection measures.

When considering safety-related factors, it is necessary to know certain characteristic quantities of combustible materials.

Flash point

The flash point for flammable liquids specifies the lowest temperature at which a vapor-air mixture forms over the surface of the liquid that can be ignited by a separate source.

If the flash point of such a flammable liquid is significantly above the maximum occurring temperatures, a potentially explosive atmosphere cannot form there. However, the flash point of a mixture of different liquids can also be lower than the flash point of the individual components.

In technical regulations, flammable liquids are divided into four hazard classes:

Hazard class	Flash point
AI	<21 °C
AII	21 ... 55 °C
AIII	>55 ... 100 °C
B	<21 °C, at 15 °C soluble in water

Explosion limits

Combustible substances form a potentially explosive atmosphere when they are present within a certain range of concentration (see "Area subject to explosion hazard").

If the concentration is too low (lean mixture) and if the concentration is too high (rich mixture) an explosion does not take place. Instead slow burning takes place, or no burning at all. Only in the area between the upper and the lower explosion limit does the mixture react explosively if ignited. The explosion limits depend on the surrounding pressure and the proportion of oxygen in the air (see the table below).

We refer to a deflagration, explosion, or detonation, depending on the speed of combustion. A potentially explosive atmosphere is present if ignition represents a hazard for personnel or materials. A potentially explosive atmosphere, even one of low volume, can result in hazardous explosions in an enclosed space.

Area subject to explosion hazard

100 % vol	Air concentration	0 % vol
Mixture too weak	Area subject to explosion hazard	Mixture too rich
No combustion		Partial combustion, no explosion
← Lower explosion limit upper →		
0 % vol		100 % vol
Concentration of combustible substance		

Dusts

In industrial environments, e.g. in chemical plants or in flour mills, solid matter is often present in small particles and also in the form of dust.

The term "dust" is defined in DIN EN 50281-1-2 as small solid particles in the atmosphere that are deposited due to their own weight but which remain in the atmosphere for some time in the form of a dust/air mixture". Dust deposits are comparable to a porous body and have an air component of up to 90%. If the temperature of dust deposits is increased, this can result in self-ignition of the combustible substance in the form of dust.

When deposits of dust with a small particle size are disturbed, there is a risk of explosion. This risk increases as the particle size decreases, because the surface area of the hollow space increases. Dust explosions are often the result of disturbed glowing dust deposits that carry the initial spark within them.

Explosions of gas/air or vapour/air mixtures can also disturb dust, in which case the gas explosion can become a dust explosion.

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Explosion-proof motors

Orientation

More information (continued)

In coal mines, methane gas explosions often caused coal dust explosions which surpassed the gas explosions in their effects.

The risk of an explosion is prevented by using explosion-proof equipment in accordance with its protection capability. The identification of the equipment categories mirrors the effectiveness of the explosion protection and therefore its use in the corresponding areas subject to explosion hazard.

The potential risk of explosive dust atmospheres and the selection of appropriate protective measures are assessed on the basis of safety characteristics for the materials involved. Dusts are subdivided here in accordance with two of their material-specific characteristics:

- **Conductivity**
Dusts that have a specific electrical resistance of up to $10^3 \Omega\text{m}$ are classed as conductive.
- **Combustibility**
Combustible dusts, however, are characterised by the fact that they can burn or glow in air and that they can form explosive mixtures at atmospheric pressure and at temperature from -20 to $+60^\circ\text{C}$ in combination with air.

Examples of safety characteristics in the case of disturbed dust include the minimum ignition energy and the ignition temperature, whereas in the case of dust deposits, the glowing temperature is a characteristic feature.

Minimum ignition energy

The application of a certain amount of energy is required to ignite a potentially explosive atmosphere.

The minimum energy is taken to be the lowest possible converted energy, for example, the discharge of a capacitor, that will ignite the relevant flammable mixture.

The minimum energy lies between approximately 10^{-5} J for hydrogen, and several Joules for certain dusts.

What can cause ignition?

- Hot surfaces
- Adiabatic compression
- Ultrasound
- Ionized radiation
- Open flames
- Chemical reaction
- Optical radiation
- Electromagnetic radiation
- Electrostatic discharge
- Sparks caused mechanically by friction or impact
- Electrical sparks and arcing
- Ionized radiation

Legislative basis and standards

Legislative basis of explosion protection

Globally, explosion protection is regulated by the legislatures of the individual countries. At the international level, the IEC is attempting to get closer to the aim of "a single global test and certificate" by introducing the IECEx Scheme.

EU directives

In the European Union, explosion protection is regulated by directives and laws.

Electrical equipment for use in potentially explosive atmospheres must therefore possess test certification or approval. The relevant systems and equipment are graded as systems requiring monitoring and must only use devices approved for this purpose. In addition, commissioning, modification, and regular safety inspections must only be accepted or carried out by approved institutions or societies. The EU directives are binding for all Member States and form the legal framework.

Selection of important EU directives

Short designation	Full text	Directive no.	Valid as of:	End of transition period
EX Directive (ATEX 95)	Directive of the European Parliament and Council of March 23, 1994 on the harmonization of laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres	94/9/EG	01.03.96	30.06.03
ATEX 137	Minimum regulations for improving the health protection and safety of employees that could be endangered by potentially explosive atmospheres	1999/92/EG	16.12.99	30.06.03

More information (continued)

National laws and regulations

In general, the EU directives are European laws that must be incorporated by the individual member states unmodified by ratification. Directive 94/9/EU was adopted completely into the German explosion protection regulation ExVO. The underlying legislation for technical equipment is the Equipment Safety Law (GSG) to which ExVO is appended as a separate regulation (11th. GSGV).

In contrast, ATEX 137 (Directive - 1999/92/EC) contains only "Minimum regulations for improving the health protection and safety of employees that could be endangered by potentially explosive atmospheres", so that each EU member state can pass its own regulations beyond the minimum requirements. In the German Federal Republic, the contents of the directive have been implemented in factory safety legislation. In order to simplify the legislation, the contents of several earlier regulations have been simultaneously integrated into the factory safety legislation ('BetrSichVO'). From the area of explosion protection, these are:

- The regulation concerning electrical installations in potentially explosive atmospheres (ExEV)
- The acetylene regulation
- The regulation concerning flammable liquids

These regulations became defunct when the factory safety legislation came into force on 01.01.2003.

Explosion protection guidelines (EX-RL) of the professional associations

In the "Guidelines for the prevention of hazards from potentially explosive atmospheres with listed examples" of the *German Chemicals Professional Association*, specific information is given on the hazards of potentially explosive atmospheres, and measures for their prevention or limitation are listed. Of special use are the examples of individual potentially explosive process plants in the most diverse industrial sectors in which these measures are listed in detail. Valuable suggestions and risk evaluations are available for planners and operators of such plants or similar process plants. While the EX Directives have no legal status, they are nevertheless to be regarded as important recommendations that can also be called upon for support in deciding legal questions in the event of damage.

Standards

There are a host of technical standards worldwide for the area of explosion protection. The standards environment is subject to constant modification. This is the result both of adaptation to technical progress and of increased safety demands in society. International efforts towards harmonisation also contribute, with the aim of achieving the most uniform global standards possible and the resulting removal of barriers to trade.

EU standards

The standards for explosion protection valid in the European Union are created on the basis of the EU Directives under the leadership of CENELEC (European Committee for Electrotechnical Standardisation). CENELEC comprises the national committees of the member states. Since, in the meantime, standardisation at international level gained greatly in importance through the dynamism of the IEC (International Electrotechnical Commission), CENELEC has decided only to pass standards in parallel with the IEC. In practice, this means European standards in the area of electrical/electronic systems will now be created or redefined almost exclusively on the basis of IEC standards as harmonized EN standards. For the area of explosion protection, these are mainly the standards of the EN 60079 series. The numbers of harmonised European standards are built up according to the following system:

IEC/EN	60079-0	:	1997	Meaning
				Year of issue
				Number of standard
				Harmonized European Standard

IEC

At the international level, the IEC (International Electrotechnical Commission) issues standards for explosion protection. The Technical Committee TC31 is responsible. Standards for explosion protection are found in the IEC 60079-x series (previously IEC 79-x). The x represents the numbers of the individual technical standards, e.g. IEC 60079-7 for intrinsic safety.

Classification of explosion-protected equipment

Identification

The identification of electrical equipment for areas protected against explosion hazards should include:

- The manufacturer who supplied the equipment
- A designation that identifies it
- The implementation range
 - In underground mines I
 - Other areas II
 - Gases and vapours - G -, dusts - D - or mines - M -
- The categories that specify whether the device can be used for specific zones
- The type(s) of protection to which the equipment complies
- The testing authority that issued the test certificate, the standard or version of the standard to which the equipment complies – including the registration number of the certificate from the testing authority, and if necessary, the special conditions to be observed.
- The data that is normally required for an identical item of equipment in industrial design should also be provided.

Example for identification according to 94/9/EU

CE	0158	Ex II 2D	IP65	T125 °C	Meaning
					Temperature range
					Enclosure protection class
					Ex protection zone
					Nominated authority for certification of the QA system in accordance with 94/9/EU
					Conformity mark

Equipment identification code	Meaning
SAMPLE_COMPANY	Manufacturer and type designation
Type 07-5103-.../...	
Ex II 2D IP65 T 125 °C	Acc. to EN 50281-1-1. Protection afforded by housing, IP65 protection class Max. surface temperature +125 °C
PTB	Serial No. of test authority
00	ATEX generation
ATEX	Certified 2000
1081	Symbol of test authority

IEC Squirrel-Cage Motors

Explosion-proof motors

Orientation

More information (continued)

Device groups/categories

Devices are classified into device groups:

- Device group I
 - in underground operations
 - in mines
 - as well as open-cast operations
- Device group II
 - Devices for use in the other areas

Each device group contains equipment that is in turn assigned to different categories (Directive 94/9/EC).

The category specifies the zone in which the equipment may be used.

Comparison of device groups and categories

Device group I (mining)			
Category	M1: Extremely high level of safety	M2: High level of safety	
Sufficient safety	Through 2 protective measures/in the event of 2 faults	Must be switched off in the presence of an Ex atmosphere.	

Device group II (other areas subject to explosion hazard)						
Category	1: Extremely high level of safety	2: High level of safety	3: Normal level of safety			
Sufficient safety	Through 2 protective measures/in the event of 2 faults	In the event of frequent device faults/in the event of one fault	In the case of fault-free operation			
Use	Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22
Atmosphere	G (gas)	D (dust)	G	D	G	D

Zones

Potentially explosive atmospheres are divided into zones. Division into zones depends on the chronological and geographical probability of the presence of a hazardous, potentially explosive atmosphere.

Information and specifications for zone subdivision can be found in EN/IEC 60079-10.

Equipment in areas where a constant explosion hazard exists (Zone 0/20) are subject to stricter requirements, and by contrast, equipment in less hazardous areas (Zone 1/21, Zone 2/22) is subject to less stringent requirements. In general, 95% of systems are installed in Zone 1 and only 5% of equipment is in Zone 0.

Subdivision of combustible dusts into different zones

Flammable gases, vapors, and mist		
Zone	Equipment category	Description
0	1G	Hazardous, potentially explosive atmosphere present continuously and over extended periods .
1	2G 1G	It is to be expected that a hazardous, potentially explosive atmosphere will only occur occasionally .
2	3G 2G 1G	It is to be expected that a hazardous, potentially explosive atmosphere will occur only rarely and then only for a short period .

Flammable dusts		
Zone	Equipment category	Description
20	1D	Areas where a potentially explosive atmosphere comprising dust-air mixtures is present continuously, over extended periods or frequently .
21	2D 1D	Areas where it is expected that a hazardous, potentially explosive atmosphere comprising dust-air mixtures will occur occasionally and for short periods .
22	3D 2D 1D	Areas in which it is not to be expected that a potentially explosive atmosphere will be caused by stirred-up dust. If this does occur, then in all probability only rarely and for a short period .

Types of protection

The protection types are design measures and electrical measures carried out on the equipment to achieve explosion protection in the areas subject to explosion hazard.

Protection types are secondary explosion protection measures. The scope of the secondary explosion protection measures depends on the probability of the occurrence of a hazardous, potentially explosive atmosphere.

Electrical equipment for areas subject to explosion hazard must comply with the general requirements of IEC/EN 60079-0 and the specific requirements for the relevant type of protection in which the equipment is listed.

The types of protection listed on the pages below are significant in accordance with IEC/EN 60079-0. All types of protection are based on different principles.

Types of protection for gases							Use in Zone		
Degree of protection	Coding	Schematic diagram	Basic principle	Standard	Examples		0	1	2
General requirements			General requirements for the type and testing of electrical equipment intended for the Ex area	EN 50014					
Increased safety	e		Applies only to equipment, or its component parts, that normally does not create sparks or arcs, does not attain hazardous temperatures, and whose mains voltage does not exceed 1 kV	IEC/EN 60079-7	Squirrel-cage motors, terminals, connection boxes			•	•
Flameproof enclosure	d		If an explosion occurs inside the enclosure, the housing will withstand the pressure and the explosion will not be propagated outside the enclosure	IEC/EN 60079-1	Squirrel-cage motors, switchgear, transformers			•	•
Types of protection	n	Zone 2 Several protection types are included under this type	Slightly simplified application of the other Zone 2 protection types - "n" stands for "non-igniting"	EN 50021 ¹⁾ IEC/EN 60079-15	Squirrel-cage motors, programmable controllers				•

¹⁾ From 2007 IEC/EN 60079-15

More information (continued)

Types of protection for dusts		Basic principle	Standard	Examples	Use in Zone		
Type of protection	Coding				20	21	22
Pressurized enclosure	pD	Penetration of a surrounding atmosphere into the housing of electrical equipment is prevented by retaining an ignition protection gas (air, inert gas or other suitable gas) internally at a higher pressure than the surrounding atmosphere.	EN 50281 IEC 61241	Equipment in which sparks, arcs or hot components occur during operation	•	•	•
Encapsulation	mD	Components that can ignite a potentially explosive atmosphere through sparks or heating are embedded in a potting compound such that the explosive atmosphere cannot ignite. This is achieved by completely covering the components with a potting compound that is resistant to physical (particularly electrical, thermal and mechanical) as well as chemical influences.	EN 50281 IEC 61241	Switchgear and control cabinets	•	•	•
Protection by housing	tD	The housing is so thick that ingress of combustible dust is not possible. The external surface temperature of the housing is limited.	EN 50281 IEC 61241	Measuring and monitoring equipment	•	•	•
Intrinsic safety	iaD, ibD	Current and voltage are limited so that intrinsic safety is guaranteed. Sparks or thermal effects cannot ignite a dust/air mixture.	EN 50281 IEC 61241	Sensors and actuators	•	•	•

Temperature classes

The ignition temperature of flammable gases or a flammable liquid is the lowest temperature of a heated surface at which the gas/air or vapor/air mixture just ignites.

Thus the highest surface temperature of any equipment must always be less than the ignition temperature of the surrounding atmosphere.

Temperature classes T1 to T6 have been introduced for electrical equipment of Explosion group II. Equipment is assigned to each temperature class according to its maximum surface temperature.

Equipment that corresponds to a higher temperature class can also be used for applications with a lower temperature class.

Flammable gases and vapors are assigned to the relevant temperature class according to ignition temperature.

Definition of the temperature classes

Temperature class	Maximum surface temperature of the equipment	Ignition temperatures of combustible substances
T1	450 °C	>450 °C
T2	300 °C	>300 °C
T3	200 °C	>200 °C
T4	135 °C	>135 °C
T5	100 °C	>100 °C
T6	85 °C	>85 °C

Classification of gases and vapors into explosion groups and temperature classes

Explosion group	Temperature classes					
	T1	T2	T3	T4	T5	T6
I	Methane					
II A	Acetone Ethane Ethyl acetate Ammonia Benzene (pure) Acetic acid Carbon monoxide Carbon dioxide Methane Methanol Propane Toluene	Ethyl alcohol i-amyl acetate n-butane n-butyl alcohol	Petrol Diesel fuel Aviation gasoline Fuel oil n-hexane	Acetyl aldehyde Ethyl ether		
II B	Town gas (Illuminating gas)	Ethylene				
II C	Hydrogen	Acetylene				Carbon disulfide

For further information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminium series 1MA7

Selection and ordering data

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
0.18	0.18	T1,T2,T3	63 M	2810	0.61	66	0.74	0.55	1MA7 060-2BA□□		3.9
0.25	0.25	T1,T2,T3	63 M	2800	0.85	68	0.81	0.7	1MA7 063-2BA□□		4.5
0.37	0.37	T1,T2,T3	71 M	2825	1.3	73	0.8	0.93	1MA7 070-2BA□□		5.4
0.55	0.55	T1,T2,T3	71 M	2785	1.9	72	0.80	1.4	1MA7 073-2BA□□		7
0.75	0.75	T1,T2,T3	80 M	2845	2.5	73	0.85	1.81	1MA7 080-2BA□□		8.6
1.1	1.1	T1,T2,T3	80 M	2855	3.7	79	0.85	2.5	1MA7 083-2BA□□		10.3
1.3	1.3	T1,T2,T3	90 S	2850	4.4	78	0.88	2.9	1MA7 090-2BA□□		13.3
1.85	1.85	T1,T2,T3	90 L	2860	6.2	81	0.88	3.95	1MA7 096-2BA□□		16.1
2.5	2.5	T1,T2,T3	100 L	2865	8.3	82	0.87	5.3	1MA7 106-2BA□□		21
3.3	3.3	T1,T2,T3	112 M	2875	11	84	0.89	6.7	1MA7 113-2BB□□		27
4.6	4.6	T1,T2,T3	132 S	2920	15	83	0.9	9.2	1MA7 130-2BB□□		53
5.5	5.5	T3	132 S	2925	18	86	0.92	10.6	1MA7 131-2BB□□ ¹⁾		44
7.5	7.5	T3	160 M	2945	24	87.5	0.9	14.3	1MA7 163-2BB□□ ¹⁾		67
10	10	T3	160 M	2940	33	88.5	0.92	18.6	1MA7 164-2BB□□ ¹⁾		72
12.5	12.5	T3	160 L	2940	41	89	0.93	23	1MA7 166-2BB□□ ¹⁾		82

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
6.5	6.5	T1,T2	132 S	2900	21	85	0.93	12.5	1MA7 131-2BB□□ ¹⁾		44
9.5	9.5	T1,T2	160 M	2920	31	87	0.91	18.1	1MA7 163-2BB□□ ¹⁾		67
13	13	T1,T2	160 M	2910	43	87.5	0.92	24.5	1MA7 164-2BB□□ ^{1) 2)}		72
16	16	T1,T2	160 L	2910	53	87	0.93	30	1MA7 166-2BB□□ ^{1) 2)}		82

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY 400 VΔ/690 VY 500 VY 500 VΔ				IM B3/6/7/8, IM V6 ³⁾		IM B5 ³⁾ , IM V3 ³⁾		IM V1 with protective cover ^{3) 4)}		IM B35
	For delta connection, overload protection with phase-failure protection must be provided.								IM B14 ³⁾ , IM V19 ³⁾		IM B34
	1	6	3	5	0	1	4	6	2	7	3
1MA7 06 □□	○	–	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/13.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminium series 1MA7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	t_E time for temperature class T1/T2	t_E time for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA7 060-2BA□□	2.3	4.4	2.3	16	0.00018	49	60	30	27
1MA7 063-2BA□□	2.2	4.4	2.3	16	0.00023	49	60	19	16
1MA7 070-2BA□□	2.3	5.6	2.1	16	0.00035	52	63	28	25
1MA7 073-2BA□□	3	5.2	2.6	16	0.00045	52	63	18	13
1MA7 080-2BA□□	2.5	6.2	2.7	16	0.00085	56	67	13	11
1MA7 083-2BA□□	2.8	6.4	3	16	0.0011	56	67	12	10
1MA7 090-2BA□□	2.6	6.2	2.8	16	0.0015	60	72	12	11
1MA7 096-2BA□□	2.8	7.2	2.8	16	0.002	60	72	9	8
1MA7 106-2BA□□	2.6	7.4	2.8	16	0.0038	62	74	9	8
1MA7 113-2BB□□	2.1	6.6	2.3	13	0.0055	63	75	10	9
1MA7 130-2BB□□	1.9	6.8	2.5	13	0.016	68	80	15	13
1MA7 131-2BB□□	2.2	7.7	2.7	13	0.021	68	80	15	13
1MA7 163-2BB□□	2.2	7.6	3.1	13	0.034	70	82	29	18
1MA7 164-2BB□□	2.1	7.6	2.9	13	0.04	70	82	23	12
1MA7 166-2BB□□	2.3	7.6	3	13	0.052	70	82	21	9

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	t_E time for temperature class T1/T2	t_E time for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)									
1MA7 131-2BB□□	1.9	6.5	2.3	13	0.021	68	80	12	7
1MA7 163-2BB□□	1.7	6	2.4	13	0.034	70	82	24	–
1MA7 164-2BB□□	1.6	5.8	2.2	13	0.04	70	82	16	–
1MA7 166-2BB□□	1.8	5.8	2.3	13	0.052	70	82	15	–

- With voltage code "9", separate versions for T1, T2 and T3. For order code **A11**, only one output possible in each case.
- Utilization according to temperature class F.
- The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminium series 1MA7

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
0.12	0.12	T1,T2,T3	63 M	1375	0.83	55	0.66	0.52	1MA7 060-4BB□□		3.9
0.18	0.18	T1,T2,T3	63 M	1330	1.3	57	0.75	0.62	1MA7 063-4BB□□		4.5
0.25	0.25	T1,T2,T3	71 M	1310	1.8	60	0.77	0.8	1MA7 070-4BB□□		6
0.37	0.37	T3	71 M	1355	2.6	67	0.74	1.1	1MA7 073-4BB□□		6.4
0.55	0.55	T1,T2,T3	80 M	1390	3.8	73	0.73	1.59	1MA7 080-4BA□□		8.4
0.75	0.75	T1,T2,T3	80 M	1395	5.1	73	0.75	2.05	1MA7 083-4BA□□		11
1	1	T1,T2,T3	90 S	1420	6.7	77	0.78	2.5	1MA7 090-4BA□□		12.7
1.35	1.35	T1,T2,T3	90 L	1415	9.1	78	0.82	3.1	1MA7 096-4BA□□		16
2	2	T1,T2,T3	100 L	1420	14	80	0.82	4.5	1MA7 106-4BA□□		20
2.5	2.5	T1,T2,T3	100 L	1415	17	81	0.83	5.5	1MA7 107-4BA□□		23
3.6	3.6	T1,T2,T3	112 M	1435	24	85	0.83	7.5	1MA7 113-4BA□□		29
5	5	T1,T2,T3	132 S	1445	33	86	0.82	10.4	1MA7 130-4BA□□		42
6.8	6.8	T1,T2,T3	132 M	1465	44	87	0.82	14	1MA7 133-4BA□□		61
10	10	T1,T2,T3	160 M	1455	66	88	0.87	19.7	1MA7 163-4BB□□		67
13.5	13.5	T1,T2,T3	160 L	1465	88	89	0.84	27	1MA7 166-4BB□□		107
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
0.25	0.25	T1,T2,T3	71 M	850	2.8	63	0.72	0.81	1MA7 073-6BA□□		6.7
0.37	0.37	T1,T2,T3	80 M	920	3.6	68	0.7	1.14	1MA7 080-6BA□□		8.3
0.55	0.55	T1,T2,T3	80 M	930	5.6	69	0.67	1.75	1MA7 083-6BA□□		12.5
0.65	0.65	T1,T2,T3	90 S	915	6.8	70	0.75	1.8	1MA7 090-6BA□□		14
0.95	0.95	T1,T2,T3	90 L	915	9.9	72	0.75	2.6	1MA7 096-6BA□□		15.7
1.3	1.3	T1,T2,T3	100 L	935	13	77	0.73	3.35	1MA7 106-6BA□□		20
1.9	1.9	T1,T2,T3	112 M	940	19	79	0.76	4.7	1MA7 113-6BB□□		24
2.6	2.6	T1,T2,T3	132 S	945	26	79	0.75	6.5	1MA7 130-6BB□□		36
3.5	3.5	T1,T2,T3	132 M	955	35	81	0.72	9	1MA7 133-6BB□□		41
4.8	4.8	T1,T2,T3	132 M	950	48	83	0.76	11.4	1MA7 134-6BB□□		50
6.6	6.6	T1,T2,T3	160 M	960	65	85	0.75	14.9	1MA7 163-6BB□□		70
9.7	9.7	T1,T2,T3	160 L	965	96	88	0.76	21	1MA7 166-6BB□□		105

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14 IM V19 ¹⁾
	For delta connection, overload protection with phase-failure protection must be provided.										
	1	6	3	5	0	1	4	6	2	7	3
1MA7 06 □□	○	–	○ ³⁾	–	□	✓	✓	✓	✓	✓	✓
1MA7 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/15.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Aluminium series 1MA7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise		t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA7 060-4BB□□	1.9	2.6	1.9	13	0.0003	42	53	35	30
1MA7 063-4BB□□	1.9	2.7	1.9	13	0.0004	42	53	30	25
1MA7 070-4BB□□	1.9	3.1	1.9	13	0.0006	44	55	50	40
1MA7 073-4BB□□	1.9	3.7	2.1	13	0.00083	44	55	35	29
1MA7 080-4BA□□	2.4	4.6	2.5	16	0.0015	47	58	24	21
1MA7 083-4BA□□	2.6	4.8	2.6	16	0.0018	47	58	19	16
1MA7 090-4BA□□	2.2	5.4	2.5	16	0.0028	48	60	16	14
1MA7 096-4BA□□	2.3	5.9	2.5	16	0.0035	48	60	15	13
1MA7 106-4BA□□	2.5	6.4	2.7	16	0.0048	53	65	13	11
1MA7 107-4BA□□	2.6	6.4	2.7	16	0.0058	53	65	12	10
1MA7 113-4BA□□	2.6	7.2	2.9	16	0.011	53	65	10	9
1MA7 130-4BA□□	2.7	6.6	3.2	16	0.021	62	74	10	9
1MA7 133-4BA□□	3	7.7	3.6	16	0.027	62	74	11	9
1MA7 163-4BB□□	2.3	6.5	2.7	13	0.052	66	78	17	10
1MA7 166-4BB□□	2.4	6.9	3	13	0.057	66	78	18	9
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA7 073-6BA□□	2.2	3	2.1	16	0.0009	39	50	130	70
1MA7 080-6BA□□	2.3	3.6	2.4	16	0.0015	40	51	60	55
1MA7 083-6BA□□	2.4	4	2.4	16	0.0025	40	51	30	27
1MA7 090-6BA□□	2.3	3.9	2.4	16	0.0028	43	55	35	30
1MA7 096-6BA□□	2.3	4.1	2.4	16	0.0038	43	55	22	19
1MA7 106-6BA□□	2.4	4.8	2.5	16	0.0063	47	59	26	26
1MA7 113-6BB□□	2.3	5	2.5	13	0.011	52	64	19	16
1MA7 130-6BB□□	1.8	4.4	2.4	13	0.015	63	75	21	18
1MA7 133-6BB□□	2.3	5.1	2.8	13	0.019	63	75	16	13
1MA7 134-6BB□□	2.4	5.6	2.8	13	0.025	63	75	13	11
1MA7 163-6BB□□	2.7	6.4	3.1	13	0.041	66	78	18	9
1MA7 166-6BB□□	2.8	7.7	2.2	13	0.055	66	78	15	8

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ³⁾ For motors 1MA7 06.-4. (motor series 1MA7 frame size 63, 4-pole) not possible.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
2.5	2.5	T1,T2,T3	100 L	2865	8.3	82	0.87	5.3	1MA6 106-2BA□□		34
3.3	3.3	T1,T2,T3	112 M	2875	11	84	0.89	6.7	1MA6 113-2BB□□		43
4.6	4.6	T1,T2,T3	132 S	2920	15	83	0.9	9.3	1MA6 130-2BB□□		53
5.5	5.5	T3	132 S	2925	18	86	0.92	10.7	1MA6 131-2BB□□¹⁾		58
7.5	7.5	T3	160 M	2945	24	87.5	0.9	15.3	1MA6 163-2BB□□¹⁾		96
10	10	T3	160 M	2940	33	88.5	0.92	19.1	1MA6 164-2BB□□¹⁾		105
12.5	12.5	T3	160 L	2940	41	89	0.93	23	1MA6 166-2BB□□¹⁾		115
15	15	T3	180 M	2955	49	92	0.87	29	1MA6 183-2BC□□		170
20	20	T3	200 L	2950	64	91.2	0.87	49	1MA6 206-2BC□□		245
24	24	T3	200 L	2965	77	92	0.87	46	1MA6 207-2BC□□		246
28	28	T3	225 M	2970	90	93.6	0.9	51	1MA6 223-2BC□□		310
38	38	T1,T2	225 M	2970	122	93.9	0.89	69 ²⁾	1MA6 223-2AC□□		310
36	36	T3	250 M	2975	116	93.5	0.91	64	1MA6 253-2BC□□		415
47	47	T1,T2	250 M	2975	151	93.9	0.9	85	1MA6 253-2AC□□		415
47	47	T3	280 S	2983	150	94.5	0.9	84	1MA6 280-2BD□□		570
64	64	T1,T2	280 S	2980	205	94.3	0.89	115	1MA6 280-2AD□□		570
58	58	T3	280 M	2982	186	94.7	0.91	104	1MA6 283-2BD□□		610
76	76	T1,T2	280 M	2978	244	94.8	0.9	134	1MA6 283-2AD□□		610
68	68	T3	315 S	2985	218	94	0.91	120	1MA6 310-2BD□□		790
95	95	T1,T2	315 S	2985	304	94.6	0.9	169	1MA6 310-2AD□□		790
80	80	T3	315 M	2985	256	94.8	0.91	142	1MA6 313-2BD□□		850
112	112	T1,T2	315 M	2985	358	94.8	0.91	198 ²⁾	1MA6 313-2AD□□		850
100	100	T3	315 L	2984	320	94.9	0.92	174	1MA6 316-2BD□□		990
135	135	T1,T2	315 L	2984	432	95.2	0.91	234	1MA6 316-2AD□□		990
125	125	T3	315 L	2985	400	95.5	0.91	214	1MA6 317-2BD□□³⁾		1100
165	165	T1,T2	315 L	2986	528	95.7	0.91	280	1MA6 317-2AD□□³⁾		1100

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{4) 5)}	IM B5, IM V3 ^{4) 6)}	IM V1 with protective cover ^{4) 6) 7)}	IM B35	IM B14, ⁴⁾ IM V19 ⁴⁾	IM B34	IM B14 IM V19 ⁴⁾
	1	6	3	5	0	1	4	6	2	7	3
1MA6 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 22 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 25 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 28 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 310 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 313 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 316 □□	–	○	○	○	□ ⁹⁾	–	✓ ¹⁰⁾	✓	–	–	–
1MA6 317 □□	–	○	○	○	□ ⁹⁾	–	✓ ¹⁰⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/17.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise		t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-2BA□□	2.6	7.4	2.8	16	0.0038	62	74	9	8
1MA6 113-2BB□□	2.1	6.6	2.3	13	0.0055	63	75	10	9
1MA6 130-2BB□□	1.9	6.8	2.5	13	0.016	68	80	15	13
1MA6 131-2BB□□	2.2	7.7	2.7	13	0.021	68	80	15	13
1MA6 163-2BB□□	2.2	7.6	3.1	13	0.034	70	82	29	18
1MA6 164-2BB□□	2.1	7.6	2.9	13	0.04	70	82	23	12
1MA6 166-2BB□□	2.3	7.6	3	13	0.052	70	82	23	9
1MA6 183-2BC□□	2	6.9	3.3	10	0.077	70	83	30	14
1MA6 206-2BC□□	1.9	6	2.9	10	0.14	71	84	35	14
1MA6 207-2BC□□	2	6.4	3	10	0.16	71	84	35	10
1MA6 223-2BC□□	1.8	6.4	2.7	10	0.24	71	84	30	13
1MA6 223-2AC□□	1.8	7	2.7	10	0.24	71	84	16	–
1MA6 253-2BC□□	1.5	6.6	2.7	10	0.45	75	89	30	11
1MA6 253-2AC□□	1.5	6.5	2.7	10	0.45	75	89	18	–
1MA6 280-2BD□□	1.5	7.1	2.9	7	0.79	77	91	30	23
1MA6 280-2AD□□	1.5	7.8	2.9	7	0.79	77	91	19	–
1MA6 283-2BD□□	1.5	7.2	2.8	7	0.92	77	91	27	11
1MA6 283-2AD□□	1.5	7.5	2.8	7	0.92	77	91	15	–
1MA6 310-2BD□□	1.4	7.1	2.8	7	1.3	79	93	50	21
1MA6 310-2AD□□	1.5	7.3	2.9	7	1.3	79	93	30	–
1MA6 313-2BD□□	1.6	7	2.8	7	1.5	79	93	40	19
1MA6 313-2AD□□	1.4	7.5	2.7	7	1.5	79	93	21	–
1MA6 316-2BD□□	1.4	6.8	2.7	7	1.8	79	93	40	11
1MA6 316-2AD□□	1.6	7.4	2.9	7	1.8	79	93	17	–
1MA6 317-2BD□□	1.5	7.3	2.5	7	2.3	79	93	30	7
1MA6 317-2AD□□	1.8	9.3	2.9	7	2.3	79	93	7	–

- With voltage code "9", separate versions for T1, T2 and T3. For order code **A11**, only one output possible in each case.
- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- Technical data and dimensions are available for VIK version (order code **K30**) on request (extra charge).
- The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Tempera- ture class	Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
6.5	6.5	T1,T2	132 S	2900	21	85	0.91	12.6	1MA6 131-2BB□□²⁾		58
9.5	9.5	T1,T2	160 M	2920	31	87	0.88	18.6	1MA6 163-2BB□□²⁾		96
13	13	T1,T2	160 M	2910	43	87.5	0.92	24.5	1MA6 164-2BB□□^{1) 2)}		105
16	16	T1,T2	160 L	2910	53	87	0.93	30	1MA6 166-2BB□□^{1) 2)}		115
19	19	T1,T2	180 M	2935	62	91.1	0.88	36.5	1MA6 183-2BC□□¹⁾		170
25	25	T1,T2	200 L	2960	81	90.6	0.86	39	1MA6 206-2BC□□¹⁾		245
31	31	T1,T2	200 L	2950	100	91.4	0.88	60	1MA6 207-2BC□□¹⁾		246

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{3) 4)}	IM B5, IM V3 ^{3) 5)}	IM V1 with protective cover ^{3) 5) 6)}	IM B35	IM B14, IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾
	1	6	3	5	0	1	4	6	2	7	3
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ Utilization according to temperature class F.

²⁾ With voltage code **9**, separate versions for T1, T2 and T3. For order code **A11**, only one output possible in each case.

³⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

⁴⁾ If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁵⁾ 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁶⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁷⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 131-2BB□□	1.9	6.5	2.3	13	0.021	12	7
1MA6 163-2BB□□	1.7	6	2.4	13	0.034	24	–
1MA6 164-2BB□□	1.6	5.8	2.2	13	0.04	16	–
1MA6 166-2BB□□	1.8	5.8	2.3	13	0.052	5	–
1MA6 183-2BC□□	1.6	5.5	2.6	10	0.077	24	–
1MA6 206-2BC□□	1.5	4.8	2.3	10	0.14	28	–
1MA6 207-2BC□□	1.5	4.9	2.3	10	0.16	26	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
2	2	T1,T2,T3	100 L	1420	14	80	0.82	4.5	1MA6 106-4BA□□		33
2.5	2.5	T1,T2,T3	100 L	1415	17	81	0.83	5.5	1MA6 107-4BA□□		36
3.6	3.6	T1,T2,T3	112 M	1435	24	85	0.83	7.5	1MA6 113-4BA□□		45
5	5	T1,T2,T3	132 S	1445	33	86	0.82	10.4	1MA6 130-4BA□□		55
6.8	6.8	T1,T2,T3	132 M	1460	44	87	0.82	14	1MA6 133-4BA□□		62
10	10	T1,T2,T3	160 M	1455	66	88	0.87	19.7	1MA6 163-4BB□□		100
13.5	13.5	T1,T2,T3	160 L	1465	88	89	0.84	27	1MA6 166-4BB□□		114
15	15	T3	180 M	1470	97	90.7	0.8	31	1MA6 183-4BC□□		165
17.5	17.5	T3	180 L	1470	114	91.6	0.8	36	1MA6 186-4BC□□		177
24	24	T3	200 L	1475	155	92.5	0.82	47.5	1MA6 207-4BC□□		280
30	30	T3	225 S	1481	193	93.3	0.83	59	1MA6 220-4BC□□		300
36	36	T3	225 M	1484	232	93.8	0.84	70 ¹⁾	1MA6 223-4BC□□		330
44	44	T3	250 M	1485	283	94	0.85	83	1MA6 253-4BC□□		435
58	58	T3	280 S	1488	372	94.6	0.84	111	1MA6 280-4BC□□ ²⁾		610
70	70	T3	280 M	1488	449	94.8	0.85	130	1MA6 283-4BC□□ ²⁾		660
84	84	T3	315 S	1492	538	95.4	0.84	158	1MA6 310-4BD□□		830
100	100	T3	315 M	1492	640	95.8	0.85	185	1MA6 313-4BD□□ ²⁾		910
115	115	T3	315 L	1490	740	95.6	0.86	214	1MA6 316-4BD□□ ²⁾		1060
135	135	T3	315 L	1492	868	95.8	0.86	245	1MA6 317-4BD□□		1200

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{3) 4)}	IM B5, IM V3 ^{3) 5)}	IM V1 with protec- tive cover ^{3) 5) 6)}	IM B35	IM B14, IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾	
	For delta connection, overload protection with phase-failure protection must be provided.											
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1MA6 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 22 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 25 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 28 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 310 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 313 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	–
1MA6 316 □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	–
1MA6 317 □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/21.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	t_E time for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-4BA□□	2.5	6.4	2.7	16	0.0048	53	65	13	11
1MA6 107-4BA□□	2.6	6.4	2.7	16	0.0058	53	65	12	10
1MA6 113-4BA□□	2.6	7.2	2.9	16	0.011	53	65	10	9
1MA6 130-4BA□□	2.7	6.6	3.2	16	0.021	62	74	10	9
1MA6 133-4BA□□	3	7.7	3.6	16	0.027	62	74	10	9
1MA6 163-4BB□□	2.3	6.5	2.7	13	0.052	66	78	17	10
1MA6 166-4BB□□	2.4	6.9	3	13	0.057	66	78	18	9
1MA6 183-4BC□□	1.8	6.1	2.9	10	0.13	63	76	18	11
1MA6 186-4BC□□	1.8	6.4	3	10	0.15	63	76	16	11
1MA6 207-4BC□□	2.1	7.9	3	10	0.24	65	78	20	11
1MA6 220-4BC□□	1.6	6.7	2.7	10	0.44	65	78	13	13
1MA6 223-4BC□□	1.7	6.9	2.8	10	0.52	65	78	12	12
1MA6 253-4BC□□	1.7	7.3	2.5	10	0.79	65	79	18	11
1MA6 280-4BC□□	1.7	6.3	2.5	10	1.4	67	81	30	7
1MA6 283-4BC□□	1.7	7	2.5	10	1.6	67	81	26	6
1MA6 310-4BD□□	1.7	7.7	2.8	7	2.2	69	83	28	8
1MA6 313-4BD□□	1.6	7.2	2.5	7	2.7	69	83	29	7
1MA6 316-4BD□□	1.7	7.5	2.5	7	3.2	69	83	28	5
1MA6 317-4BD□□	1.7	7.8	2.8	7	4.2	69	83	26	7

4

- For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- Technical data and dimensions are available for VIK version (order code **K30**) on request (extra charge).
- The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- The "Second shaft extension" option, order code **K16** is not possible.
- Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
17	17	T1,T2	180 M	1460	111	90	0.82	35.5	1MA6 183-4BC□□¹⁾		165
20	20	T1,T2	180 L	1465	130	90.6	0.82	41 ²⁾	1MA6 186-4BC□□¹⁾		177
27	27	T1,T2	200 L	1475	175	92.4	0.84	53	1MA6 207-4BC□□		280
33	33	T1,T2	225 S	1480	213	93.1	0.84	64 ²⁾	1MA6 220-4BC□□		300
40	40	T1,T2	225 M	1480	258	93.6	0.85	77 ²⁾	1MA6 223-4BC□□		330
50	50	T1,T2	250 M	1485	322	93.8	0.86	94	1MA6 253-4BC□□		435
68	68	T1,T2	280 S	1485	437	94.5	0.85	131	1MA6 280-4BC□□³⁾		610
80	80	T1,T2	280 M	1485	514	94.8	0.87	150 ²⁾	1MA6 283-4BC□□³⁾		660
100	100	T1,T2	315 S	1490	641	95.3	0.85	188	1MA6 310-4BD□□		830
120	120	T1,T2	315 M	1488	770	95.7	0.86	222 ²⁾	1MA6 313-4BD□□³⁾		910
135	135	T1,T2	315 L	1488	868	95.5	0.86	248	1MA6 316-4BD□□³⁾		1060
165	165	T1,T2	315 L	1485	1061	95.8	0.87	305	1MA6 317-4BD□□		1200

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY 400 VΔ/690 VY 500 VY 500 VΔ				IM B3/6/7/8, IM V6 ^{4) 5)}	IM B5, IM V3 ^{4) 6)}	IM V1 with protective cover ^{4) 6) 7)}	IM B35	IM B14, IM V19 ⁴⁾	IM B34	IM B14 IM V19 ⁴⁾
	For delta connection, overload protection with phase-failure protection must be provided.										
	1	6	3	5	0	1	4	6	2	7	3
1MA6 18 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 22 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 25 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 28 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 310 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 313 □□	○	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MA6 316 □□	–	○	○	○	□ ⁹⁾	–	✓	✓	–	–	–
1MA6 317 □□	–	○	○	○	□ ⁹⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ Utilization according to temperature class F.
- ²⁾ For connection to 230 V, parallel supply cables are necessary (see the "Introduction" section, "Connection, circuit and connection box").
- ³⁾ Technical data and dimensions are available for VIK version (order code **K30**) on request (extra charge).
- ⁴⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ⁵⁾ If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- ⁶⁾ 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁷⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁸⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁹⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 183-4BC□□	1.6	5.3	2.4	10	0.13	13	–
1MA6 186-4BC□□	1.6	5.6	2.6	10	0.15	13	–
1MA6 207-4BC□□	1.9	7.1	2.7	10	0.24	19	–
1MA6 220-4BC□□	1.4	6.2	2.5	10	0.44	11	–
1MA6 223-4BC□□	1.5	6.2	2.5	10	0.52	10	–
1MA6 253-4BC□□	1.5	6.4	2.1	10	0.79	15	–
1MA6 280-4BC□□	1.5	5.3	2.1	10	1.4	23	–
1MA6 283-4BC□□	1.5	6	2.2	10	1.6	20	–
1MA6 310-4BD□□	1.4	6.5	2.4	7	2.2	24	–
1MA6 313-4BD□□	1.3	6	2.1	7	2.7	24	–
1MA6 316-4BD□□	1.4	6.4	2.1	7	3.2	21	–
1MA6 317-4BD□□	1.5	6.3	2.3	7	4.2	17	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz			
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3											
1.3	1.3	T1,T2,T3	100 L	935	13	77	0.73	3.35	1MA6 106-6BA□□		33
1.9	1.9	T1,T2,T3	112 M	940	19	79	0.76	4.7	1MA6 113-6BB□□		40
2.6	2.6	T1,T2,T3	132 S	945	26	79	0.75	6.5	1MA6 130-6BB□□		50
3.5	3.5	T1,T2,T3	132 M	955	35	81	0.72	9	1MA6 133-6BB□□		57
4.8	4.8	T1,T2,T3	132 M	950	48	83	0.76	11.4	1MA6 134-6BB□□		66
6.6	6.6	T1,T2,T3	160 M	960	65	85	0.75	14.9	1MA6 163-6BB□□		103
9.7	9.7	T1,T2,T3	160 L	965	96	88	0.76	21	1MA6 166-6BB□□		122
13.2	13.2	T1,T2,T3	180 L	976	129	89.6	0.78	28.5	1MA6 186-6BC□□		177
16.5	16.5	T1,T2,T3	200 L	980	161	90.5	0.81	34.5	1MA6 206-6BC□□		220
20	20	T1,T2,T3	200 L	980	195	90.8	0.82	41	1MA6 207-6BC□□		235
27	27	T1,T2,T3	225 M	980	263	92.5	0.82	54	1MA6 223-6BC□□		305
33	33	T1,T2,T3	250 M	985	320	93	0.83	66	1MA6 253-6BC□□		410
40	40	T1,T2,T3	280 S	990	386	93.3	0.85	77	1MA6 280-6BC□□		540
46	46	T3	280 M	988	445	93.5	0.86	86	1MA6 283-6BC□□		580
64	64	T3	315 S	991	617	94.3	0.84	124	1MA6 310-6BC□□		770
76	76	T3	315 M	991	732	94.6	0.84	146	1MA6 313-6BC□□		830
92	92	T3	315 L	991	887	95	0.85	172	1MA6 316-6BC□□		970
110	110	T3	315 L	991	1060	95.2	0.84	210	1MA6 317-6BC□□ ¹⁾		1060
125	125	T3	315 L	991	1210	95.2	0.86	220	1MA6 318-6BC□□ ¹⁾²⁾		1100

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ³⁾⁴⁾	IM B5, IM V3 ³⁾⁵⁾	IM V1 with protective cover ³⁾⁵⁾⁶⁾	IM B35	IM B14, IM V19 ³⁾	IM B34	IM B14 IM V19 ³⁾
	For delta connection, overload protection with phase-failure protection must be provided.										
	1	6	3	5	0	1	4	6	2	7	3
1MA6 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1MA6 16 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	✓	✓	✓
1MA6 18 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 20 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 22 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 25 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 28 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 310 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 313 □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–
1MA6 316 □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–
1MA6 317 □□											
1MA6 318 □□											

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/25.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz	t_E time for temperature class T1/T2	for temperature class T3
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pFA} dB(A)	L_{WA} dB(A)	t_E s	t_E s
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T3									
1MA6 106-6BA□□	2.4	4.8	2.5	16	0.0063	47	59	26	26
1MA6 113-6BB□□	2.3	5	2.5	13	0.011	52	64	19	16
1MA6 130-6BB□□	1.8	4.4	2.4	13	0.015	63	75	21	18
1MA6 133-6BB□□	2.3	5.1	2.8	13	0.019	63	75	16	13
1MA6 134-6BB□□	2.4	5.6	2.8	13	0.025	63	75	13	11
1MA6 163-6BB□□	2.7	6.4	3.1	13	0.041	66	78	18	9
1MA6 166-6BB□□	2.8	7.7	2.2	13	0.055	66	78	15	8
1MA6 186-6BC□□	1.6	5.4	2.5	10	0.2	66	78	22	18
1MA6 206-6BC□□	1.7	5.4	2.6	10	0.29	66	78	23	19
1MA6 207-6BC□□	1.7	5.6	2.6	10	0.33	66	78	22	17
1MA6 223-6BC□□	1.6	5.6	2.5	10	0.57	66	78	15	15
1MA6 253-6BC□□	1.6	5.3	2.4	10	0.89	60	74	16	16
1MA6 280-6BC□□	1.5	6.2	2.6	10	1.3	60	74	13	13
1MA6 283-6BC□□	1.6	6.5	2.5	10	1.5	60	74	0	12
1MA6 310-6BC□□	1.7	6.2	2.5	10	2.4	63	77	0	14
1MA6 313-6BC□□	1.7	6.4	2.5	10	2.9	63	77	0	8
1MA6 316-6BC□□	1.7	6.5	2.5	10	3.5	63	77	0	9
1MA6 317-6BC□□	1.7	6.8	2.5	10	4.3	63	77	0	6
1MA6 318-6BC□□	1.6	7	2.5	10	4.9	63	77	0	6

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1) Technical data and dimensions are available for VIK version (order code **K30**) on request (extra charge).

2) Only certified for rated voltage of 400 V.

3) The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

4) If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

5) 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

6) The "Second shaft extension" option, order code **K16** is not possible.

7) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

8) Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Rated output at		Temperature class	Frame size	Operating values at rated output					Order No.	Price	Weight
50 Hz	60 Hz			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 380 ... 420 V, 50 Hz	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW		FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)											
50	50	T1,T2	280 M	987	484	93.3	0.86	96	1MA6 283-6BC□□		580
68	68	T1,T2	315 S	990	656	94.2	0.85	131	1MA6 310-6BC□□		770
82	82	T1,T2	315 M	990	791	94.5	0.84	158	1MA6 313-6BC□□		830
98	98	T1,T2	315 L	990	945	94.8	0.85	185	1MA6 316-6BC□□		970
120	120	T1,T2	315 L	990	1160	95	0.85	230	1MA6 317-6BC□□¹⁾		1060
135	135	T1,T2	315 L	990	1300	95	0.86	240 ²⁾	1MA6 318-6BC□□¹⁾		1100

Order No. supplements

Motor type	Penultimate position: Voltage code					Final position: Type of construction code						
	50 Hz	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6 ^{3) 4)}	With flange IM B5, IM V3 ^{3) 5)}	IM V1 with protec- tive cover ^{3) 5) 6)}	IM B35	With standard flange IM B14, IM V19 ³⁾	IM B34	With special flange IM B14 IM V19 ³⁾
		For delta connection, overload protection with phase-failure protection must be provided.										
	1	6	3	5	0	1	4	6	2	7	3	
1MA6 28 - ... □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 310 - ... □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 313 - ... □□	○	○	○	○	□	✓ ⁷⁾	✓	✓	–	–	–	
1MA6 316 - ... □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	
1MA6 317 - ... □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	
1MA6 318 - ... □□	–	○	○	○	□ ⁸⁾	–	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ Technical data and dimensions are available for VIK version (order code **K30**) on request (extra charge).

²⁾ Only certified for rated voltage of 400 V.

³⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

⁴⁾ If motors 1MA6 183-... to 1MA6 318-... (motor series 1MA6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁵⁾ 1MA6 220-... to 1MA6 318-... motors (motor series 1MA6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁶⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁷⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁸⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zone 1 with type of protection "e"
Cast-iron series 1MA6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	t_E time	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	for temperature class T1/T2 t_E s	for temperature class T3 t_E s
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 and T2, with double rating plate (T1/T2 and T3)							
1MA6 283-6BC□□	1.5	5.8	2.3	10	1.5	14	–
1MA6 310-6BC□□	1.6	5.9	2.3	10	2.4	22	–
1MA6 313-6BC□□	1.6	5.9	2.3	10	2.9	18	–
1MA6 316-6BC□□	1.6	6.1	2.3	10	3.5	20	–
1MA6 317-6BC□□	1.6	6.2	2.3	10	4.3	16	–
1MA6 318-6BC□□	1.5	6.5	2.3	10	4.9	17	–

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data

Rated output at		Frame size	Operating values at rated output			Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4										
0.37	0.43	71 M	2750	1	67	0.81	0.98	1MJ6 070-2CA□□		19
0.55	0.63	71 M	2790	1	71	0.81	1.38	1MJ6 073-2CA□□		20
0.75	0.86	80 M	2840	2	72	0.86	1.75	1MJ6 080-2CA□□		24
1.1	1.3	80 M	2835	3	74	0.87	2.45	1MJ6 083-2CA□□		26
1.5	1.75	90 L	2850	5	78	0.84	3.3	1MJ6 096-2CA□□		32
2.2	2.55	90 L	2860	7	80	0.86	4.6	1MJ6 097-2CA□□		35
3	3.45	100 L	2885	9	82	0.85	6.2	1MJ6 106-2CA□□		44
4	4.6	112 M	2895	13	84	0.88	7.8	1MJ6 113-2CA□□		57
5.5	6.3	132 S	2925	18	85	0.89	10.5	1MJ6 130-2CA□□		75
7.5	8.6	132 S	2930	24	87	0.89	14.5	1MJ6 131-2CA□□		82
11	12.6	160 M	2940	36	88	0.88	20.5	1MJ6 163-2CA□□		123
15	17.3	160 M	2940	49	89	0.91	26.5	1MJ6 164-2CA□□		134
18.5	21.3	160 L	2940	60	91	0.91	32.5	1MJ6 166-2CA□□		161
22	24.5	180 M	2940	71	92	0.88	39	1MJ6 183-2CA□□		175
30	33.5	200 L	2940	97	92.3	0.89	53	1MJ6 206-2CA□□		250
37	41.5	200 L	2945	120	92.8	0.9	64	1MJ6 207-2CA□□		266
45	51	225 M	2955	145	93.9	0.9	77 ¹⁾	1MJ7 223-2CB□□		335
55	62	250 M	2965	177	94	0.9	93	1MJ7 253-2CB□□		445
75	84	280 S	2975	241	94.7	0.9	128 ¹⁾	1MJ7 280-2CC□□		600
90	101	280 M	2975	289	95.1	0.91	150 ¹⁾	1MJ7 283-2CC□□		640
110	123	315 S	2980	353	94.8	0.9	186 ¹⁾	1MJ7 310-2CC□□		840
132	148	315 M	2980	423	95.1	0.9	225 ¹⁾	1MJ7 313-2CC□□		900

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange		With flange		With standard flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{2) 3)}	IM B5, ^{2) 4)} IM V3 ^{2) 4)}	IM V1 with protective cover ^{2) 4) 5)}	IM B35	IM B14, ²⁾ IM V19 ²⁾	IM B34	IM B14 IM V19 ²⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/29.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ6 070-2CA□□	2.3	4.3	2.3	16	0.00035	52	63
1MJ6 073-2CA□□	2.3	5.3	2.3	16	0.00045	52	63
1MJ6 080-2CA□□	2.4	6.3	2.3	16	0.00085	56	67
1MJ6 083-2CA□□	2.6	6.3	2.3	16	0.0011	56	67
1MJ6 096-2CA□□	2.5	6.7	2.5	16	0.0015	60	72
1MJ6 097-2CA□□	2.8	7.1	2.8	16	0.002	60	72
1MJ6 106-2CA□□	2.8	7.7	3	16	0.0038	62	74
1MJ6 113-2CA□□	2.4	7.6	2.8	16	0.0055	63	75
1MJ6 130-2CA□□	2	5.9	2.6	16	0.01	68	80
1MJ6 131-2CA□□	2.3	6.9	2.6	16	0.01	68	80
1MJ6 163-2CA□□	2.1	6.5	2.6	16	0.03	70	82
1MJ6 164-2CA□□	2.2	6.6	3.1	16	0.04	70	82
1MJ6 166-2CA□□	2.4	7	3.3	16	0.05	70	82
1MJ6 183-2CA□□	2.5	6.9	3.2	16	0.07	70	83
1MJ6 206-2CA□□	2.4	6.5	2.8	16	0.14	71	84
1MJ6 207-2CA□□	2.4	7.7	2.8	16	0.16	71	84
1MJ7 223-2CB□□	2.3	6.9	2.7	13	0.24	71	84
1MJ7 253-2CB□□	2.1	6.9	2.8	13	0.45	75	89
1MJ7 280-2CC□□	1.9	7	2.7	10	0.79	77	91
1MJ7 283-2CC□□	2	7	2.7	10	0.92	77	91
1MJ7 310-2CC□□	1.8	7	2.8	10	1.3	79	93
1MJ7 313-2CC□□	1.9	7	2.8	10	1.5	79	93

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

³⁾ If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁴⁾ 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁶⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output			Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4										
0.25	0.29	71 M	1325	1	60	0.77	0.78	1MJ6 070-4CB□□		20
0.37	0.43	71 M	1375	2	64	0.74	1.13	1MJ6 073-4CB□□		21
0.55	0.63	80 M	1395	3	71	0.79	1.42	1MJ6 080-4CA□□		24
0.75	0.86	80 M	1395	5	73	0.79	1.88	1MJ6 083-4CA□□		26
1.1	1.3	90 L	1410	7	73	0.80	2.7	1MJ6 096-4CA□□		32
1.5	1.75	90 L	1420	10	77	0.8	3.5	1MJ6 097-4CA□□		35
2.2	2.55	100 L	1420	15	78	0.8	5.1	1MJ6 106-4CA□□		44
3	3.45	100 L	1415	20	80	0.82	6.6	1MJ6 107-4CA□□		47
4	4.6	112 M	1435	27	83	0.82	8	1MJ6 113-4CA□□		58
5.5	6.3	132 S	1450	36	86	0.83	11.1	1MJ6 130-4CA□□		76
7.5	8.6	132 M	1450	49	86	0.84	15	1MJ6 133-4CA□□		85
11	12.6	160 M	1455	72	87	0.85	21.5	1MJ6 163-4CA□□		128
15	17.3	160 L	1455	98	89	0.85	28.5	1MJ6 166-4CA□□		158
18.5	21.3	180 M	1460	121	90.5	0.84	35	1MJ6 183-4CA□□		175
22	25.3	180 L	1460	144	91.2	0.85	41	1MJ6 186-4CA□□		189
30	34.5	200 L	1465	196	91.8	0.86	55	1MJ6 207-4CA□□		247
37	42.5	225 S	1475	240	93	0.86	67 ¹⁾	1MJ7 220-4CA□□		325
45	52	225 M	1475	292	93.4	0.87	80 ¹⁾	1MJ7 223-4CA□□		355
55	63	250 M	1480	355	94	0.87	97 ¹⁾	1MJ7 253-4CA□□		465
75	86	280 S	1485	482	94.7	0.86	132 ¹⁾	1MJ7 280-4CA□□		630
90	104	280 M	1485	579	95	0.86	160 ¹⁾	1MJ7 283-4CA□□		680
110	127	315 S	1486	707	94.8	0.86	194 ¹⁾	1MJ7 310-4CA□□		870
132	152	315 M	1486	848	95.5	0.86	232 ¹⁾	1MJ7 313-4CA□□		950

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{2) 3)}	IM B5, IM V3 ^{2) 4)}	IM V1 with protective cover ^{2) 4) 5)}	IM B35	IM B14, IM V19 ²⁾	IM B34	IM B14 IM V19 ²⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/31.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ6 070-4CB□□	1.8	3.2	1.8	13	0.0006	44	55
1MJ6 073-4CB□□	2	3.6	2	13	0.0008	44	55
1MJ6 080-4CA□□	2.3	4.7	2.4	16	0.0015	47	58
1MJ6 083-4CA□□	2.5	5	2.6	16	0.0018	47	58
1MJ6 096-4CA□□	2.1	4.9	2.5	16	0.0028	48	60
1MJ6 097-4CA□□	2.2	5.8	2.6	16	0.0035	48	60
1MJ6 106-4CA□□	2.2	6	2.6	16	0.0048	53	65
1MJ6 107-4CA□□	2.7	6.4	3	16	0.0058	53	65
1MJ6 113-4CA□□	2.8	7.2	3	16	0.01	53	65
1MJ6 130-4CA□□	2.4	6.9	3.3	16	0.01	62	74
1MJ6 133-4CA□□	2.7	7.7	3.3	16	0.02	62	74
1MJ6 163-4CA□□	2.4	6.6	2.9	16	0.04	66	78
1MJ6 166-4CA□□	2.8	7.4	3.2	16	0.05	66	78
1MJ6 183-4CA□□	2.3	7.1	3	16	0.13	63	76
1MJ6 186-4CA□□	2.3	7.1	3	16	0.15	63	76
1MJ6 207-4CA□□	2.6	7.4	3.2	16	0.24	65	78
1MJ7 220-4CA□□	2.5	7	3.1	16	0.44	65	78
1MJ7 223-4CA□□	2.6	7	3.2	16	0.52	65	78
1MJ7 253-4CA□□	2.6	6.7	2.5	16	0.79	65	79
1MJ7 280-4CA□□	2.5	6.7	2.7	16	1.4	67	81
1MJ7 283-4CA□□	2.5	6.8	2.8	16	1.6	67	81
1MJ7 310-4CA□□	2.5	6.7	2.7	16	2.2	69	83
1MJ7 313-4CA□□	2.7	7.2	3	16	2.7	69	83

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

³⁾ If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁴⁾ 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁶⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output			Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz ¹⁾					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection temperature classes T1 to T4										
0.25	0.29	71 M	870	2	63	0.7	0.82	1MJ6 073-6CA□□		16
0.37	0.43	80 M	910	3	64	0.71	1.18	1MJ6 080-6CA□□		35
0.55	0.63	80 M	900	5	64	0.74	1.67	1MJ6 083-6CA□□		22.5
0.75	0.86	90 L	910	8	69	0.76	2.1	1MJ6 096-6CA□□		32
1.1	1.3	90 L	905	12	72	0.75	2.95	1MJ6 097-6CA□□		32
1.5	1.75	100 L	930	15	75	0.73	4	1MJ6 106-6CA□□		39
2.2	2.55	112 M	945	22	76	0.76	5.5	1MJ6 113-6CA□□		52
3	3.45	132 S	945	30	78	0.75	7.4	1MJ6 130-6CA□□		78
4	4.6	132 M	945	40	79	0.76	9.6	1MJ6 133-6CA□□		85
5.5	6.3	132 M	950	55	83	0.76	12.6	1MJ6 134-6CA□□		92
7.5	8.6	160 M	960	75	86	0.72	17.5	1MJ6 163-6CA□□		134
11	12.6	160 L	960	109	87	0.74	24.5	1MJ6 166-6CA□□		167
15	18	180 L	970	148	89	0.83	29.5	1MJ6 186-6CA□□		190
18.5	22	200 L	975	181	90.2	0.82	36	1MJ6 206-6CA□□		240
22	26.5	200 L	975	215	90.8	0.83	42.5	1MJ6 207-6CA□□		255
30	36	225 M	978	293	92	0.84	56	1MJ7 223-6CA□□		330
37	44.5	250 M	980	361	92.4	0.84	69	1MJ7 253-6CA□□		440
45	54	280 S	982	438	93	0.86	81	1MJ7 280-6CA□□		560
55	66	280 M	984	534	93.6	0.86	99 ¹⁾	1MJ7 283-6CA□□		600
75	90	315 S	988	725	93.8	0.85	136	1MJ7 310-6CA□□		810
90	108	315 M	988	870	94.2	0.85	162 ¹⁾	1MJ7 313-6CA□□		870

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{2) 3)}	IM B5, IM V3 ^{2) 4)}	IM V1 with protective cover ^{2) 4) 5)}	IM B35	IM B14, IM V19 ²⁾	IM B34	IM B14 IM V19 ²⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 18 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ6 20 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 22 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 25 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 28 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–
1MJ7 31 □□	○	○	○	○	□	✓ ⁶⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/33.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pTA} dB(A)	L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection temperature classes T1 to T4							
1MJ6 073-6CA□□	2.2	3.1	2.2	16	0.0009	39	50
1MJ6 080-6CA□□	1.9	3.3	2	16	0.0015	40	51
1MJ6 083-6CA□□	2	3.5	2.1	16	0.0018	40	51
1MJ6 096-6CA□□	2.2	3.9	2.3	16	0.0028	43	55
1MJ6 097-6CA□□	2.4	4.3	2.4	16	0.0035	43	55
1MJ6 106-6CA□□	2.3	4.5	2.5	16	0.0063	47	59
1MJ6 113-6CA□□	2.2	4.8	2.5	16	0.01	52	64
1MJ6 130-6CA□□	2	4.8	2.2	16	0.01	63	75
1MJ6 133-6CA□□	2	5	2.4	16	0.01	63	75
1MJ6 134-6CA□□	2.2	5.4	2.5	16	0.02	63	75
1MJ6 163-6CA□□	2.1	5.1	2.5	16	0.04	66	78
1MJ6 166-6CA□□	2.3	5.5	2.5	16	0.04	66	78
1MJ6 186-6CA□□	2.6	6.3	2.4	16	0.2	66	78
1MJ6 206-6CA□□	2.6	6.3	2.3	16	0.29	66	78
1MJ6 207-6CA□□	2.5	5.7	2.3	16	0.33	66	78
1MJ7 223-6CA□□	2.6	5.7	2.2	16	0.57	66	78
1MJ7 253-6CA□□	2.6	6	2.1	16	0.89	60	74
1MJ7 280-6CA□□	2.4	6	2.3	16	1.3	60	74
1MJ7 283-6CA□□	2.5	6.2	2.4	16	1.5	60	74
1MJ7 310-6CA□□	2.4	6.2	2.5	16	2.4	63	77
1MJ7 313-6CA□□	2.4	6.2	2.5	16	2.9	63	77

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

³⁾ If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

⁴⁾ 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁶⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output					Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A			
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4										
0.37	0.43	90 L	655	5	61	0.76	1.16	1MJ6 096-8CB□□		27.5
0.55	0.63	90 L	655	7	65	0.76	1.62	1MJ6 097-8CB□□		29.5
0.75	0.86	100 L	685	10	65	0.72	2.3	1MJ6 106-8CB□□		40
1.1	1.3	100 L	685	16	74	0.74	2.9	1MJ6 107-8CB□□		48
1.5	1.75	112 M	700	21	74	0.73	4	1MJ6 113-8CB□□		52
2.2	2.55	132 S	695	30	74	0.72	6	1MJ6 130-8CB□□		78
3	3.45	132 M	700	40	76	0.72	7.9	1MJ6 133-8CB□□		85
4	4.6	160 M	715	54	81	0.72	9.9	1MJ6 163-8CB□□		119
5.5	6.3	160 M	710	74	83	0.72	13.3	1MJ6 164-8CB□□		134
7.5	8.6	160 L	715	100	84	0.72	17.9	1MJ6 166-8CB□□		159
11	13.2	180 L	725	145	87	0.7	26	1MJ6 186-8CB□□		191
15	18	200 L	725	198	87.5	0.78	32	1MJ6 207-8CB□□		263
18.5	22	225 S	725	244	88.6	0.8	37.5	1MJ7 220-8CB□□		325
22	26.5	225 M	725	290	90.1	0.81	43.5	1MJ7 223-8CB□□		350
30	36	250 M	730	392	91.6	0.81	58	1MJ7 253-8CB□□		465
37	44.5	280 S	732	483	92.7	0.82	70	1MJ7 280-8CB□□		570
45	54	280 M	734	585	92.8	0.83	84	1MJ7 283-8CB□□		620
55	66	315 S	738	712	93.1	0.82	104	1MJ7 310-8CB□□		780
75	90	315 M	738	970	93.6	0.82	140	1MJ7 313-8CB□□		890

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange		With flange		With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{1) 2)}	IM B5, IM V3 ^{1) 3)}	IM V1 with protective cover ^{1) 3) 4)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14 IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ6 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1MJ6 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	–
1MJ6 10 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 11 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 13 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 16 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1MJ6 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1MJ6 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1MJ7 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1MJ7 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1MJ7 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1MJ7 31 □□	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/35.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Cast-iron series 1MJ6 and 1MJ7

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ6 096-8CB□□	1.4	2.8	1.7	13	0.0025	41	53
1MJ6 097-8CB□□	1.5	2.9	1.7	13	0.0035	41	53
1MJ6 106-8CB□□	1.6	3.5	1.8	13	0.0053	45	57
1MJ6 107-8CB□□	1.8	3.9	2	13	0.007	45	57
1MJ6 113-8CB□□	1.8	4.4	2	13	0.01	49	61
1MJ6 130-8CB□□	1.7	4.2	2.1	13	0.01	53	65
1MJ6 133-8CB□□	1.9	4.4	2.2	13	0.01	53	65
1MJ6 163-8CB□□	2.1	4.8	2.3	13	0.03	63	75
1MJ6 164-8CB□□	2.3	5.1	2.5	13	0.04	63	75
1MJ6 166-8CB□□	2.6	5.8	2.8	13	0.06	63	75
1MJ6 186-8CB□□	2	5	2.2	13	0.21	60	73
1MJ6 207-8CB□□	2.1	5	2.2	13	0.37	58	71
1MJ7 220-8CB□□	2.1	5	2.2	13	0.58	58	71
1MJ7 223-8CB□□	2.1	5	2.2	13	0.66	58	71
1MJ7 253-8CB□□	2.1	5	2.1	13	1.1	57	71
1MJ7 280-8CB□□	2.2	5.5	2.2	13	1.4	58	72
1MJ7 283-8CB□□	2.2	5.5	2.2	13	1.6	58	72
1MJ7 310-8CB□□	2.2	6	2.4	13	2.3	62	76
1MJ7 313-8CB□□	2.3	6.2	2.5	13	3	62	76

- 1) The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- 2) If motors 1MJ6 183-... to 1MJ7 313-... (motor series 1MJ6 frame size 180 M and above to 1MJ7 frame size 315 M) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- 3) 1MJ7 220-... to 1MJ7 313-... motors (motor series 1MJ7 frame sizes 225 S to 315 M) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Steel/cast-iron series 1MJ8 and 1MJ1

Selection and ordering data

Rated output at		Frame size	Operating values at rated output					Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A				
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4											
160	185	315 M	2977	515	95.6	0.87	280		1MJ1 313-2AC□□		1185
200	220	315 L	2980	640	96	0.88	345		1MJ1 316-2AC□□		1400
250	275	315 L	2980	800	96	0.88	425 ¹⁾		1MJ1 318-2AC□□		1540
315	355	355	2982	1009	96.6	0.89	530 ¹⁾		1MJ8 356-2AC□□		2000
355	400	355	2983	1136	96.7	0.92	575		1MJ8 357-2AD□□		2300
400	450	355	2985	1279	96.9	0.91	655		1MJ8 358-2AD□□		2400
450	500	355	2978	1443	96.6	0.91	740		1MJ1 358-2AE□□		2600
500	560	400	2982	1601	96.8	0.91	820		1MJ1 405-2AE□□		3000
560	630	400	2983	1792	97	0.91	915		1MJ1 407-2AE□□		3000
630	710	400	2984	2016	97	0.91	595 ²⁾		1MJ1 408-2AE□□		3300
710	710	450	2986	2270	97	0.91	670 ²⁾		1MJ1 455-2AE□□		4000
800	800	450	2986	2557	97.1	0.91	760 ²⁾		1MJ1 457-2AE□□		4200
900	900	450	2985	2879	97.2	0.91	850 ²⁾		1MJ1 458-2AE□□		4200
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4											
160	180	315 M	1486	1030	95.8	0.84	285		1MJ1 313-4AC□□		1190
200	220	315 L	1486	1285	96	0.83	360		1MJ1 316-4AC□□		1400
250	275	315 L	1486	1605	96	0.82	455 ¹⁾		1MJ1 318-4AB□□		1520
280	315	355	1485	1795	96.2	0.85	495 ¹⁾		1MJ8 356-4AC□□		2100
315	355	355	1490	2017	96.6	0.86	540 ¹⁾		1MJ8 357-4AD□□		2100
355	400	355	1491	2273	96.8	0.86	615		1MJ8 358-4AD□□		2400
400	450	355	1491	2561	96.9	0.86	690		1MJ8 350-4AD□□		2500
450	500	355	1491	2880	96.8	0.86	785		1MJ1 357-4AD□□		2700
500	560	355	1492	3200	96.9	0.85	875		1MJ1 358-4AD□□		2800
560	630	400	1492	3583	96.9	0.88	950 ³⁾		1MJ1 405-4AD□□		3300
630	710	400	1492	4031	97	0.88	1070 ^{1) 3) 4)}		1MJ1 407-4AD□□		3300
710	800	400	1492	4544	97.1	0.88	1200 ^{1) 3) 4)}		1MJ1 408-4AD□□		3100
800	900	450	1493	5114	97.1	0.88	1355 ^{1) 3) 4)}		1MJ1 455-4AD□□		4300
900	1000	450	1493	5755	97.2	0.88	880 ²⁾		1MJ1 457-4AD□□		4800
950	on req.	450	1493	6076	97.2	0.88	930 ²⁾		1MJ1 458-4AD□□		4800

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange			
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ^{5) 6)}	IM B5, IM V3 ⁵⁾	IM V1 With protective cover ^{5) 7)}	IM B35	IM B14, IM V19 ⁵⁾	IM B34	IM B14, IM V19 ⁵⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ1 31 □□	–	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MJ8 35 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 35 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 40 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 45 □□	–	○	○	○	□	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/37.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Steel/cast-iron series 1MJ8 and 1MJ1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pTA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ1 313-2AC□□	2.3	6.7	2.6	10	2.2	77	92
1MJ1 316-2AC□□	2.6	7	2.7	10	2.8	77	92
1MJ1 318-2AC□□	2.7	7	2.6	10	3.5	77	92
1MJ8 356-2AC□□	2.1	6.7	2.6	10	3.6	82	97
1MJ8 357-2AD□□	1.2	6.8	2.8	7	3.6	78	93.5
1MJ8 358-2AD□□	1.4	7.9	3.2	7	4	78	93.5
1MJ1 358-2AE□□	0.95	6.2	2.55	5	5	80	96
1MJ1 405-2AE□□	0.8	5.9	2.55	5	7	80	96
1MJ1 407-2AE□□	0.85	6.2	2.7	5	7	80	96
1MJ1 408-2AE□□	0.85	6.2	2.6	5	8.5	82	98.5
1MJ1 455-2AE□□	0.8	6.3	2.8	5	11	82	98.5
1MJ1 457-2AE□□	0.8	6.3	2.8	5	13	82	98.5
1MJ1 458-2AE□□	0.85	6.4	2.7	5	13	82	98.5
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ1 313-4AC□□	2.1	6.5	2.5	10	3.3	69	84
1MJ1 316-4AC□□	2.3	6.6	2.5	10	3.9	71	85
1MJ1 318-4AB□□	2.6	6.9	2.7	13	4.7	71	85
1MJ8 356-4AC□□	2.1	6.6	2.3	10	6.5	73	88
1MJ8 357-4AD□□	1.2	6.5	2.4	7	7	73	88
1MJ8 358-4AD□□	1.25	6.7	2.4	7	7.7	76	91.5
1MJ8 350-4AD□□	1.25	6.7	2.4	7	8.5	76	91.5
1MJ1 357-4AD□□	1.1	6.2	2.4	7	9	76	91.5
1MJ1 358-4AD□□	1	6.2	2.4	7	9.5	78	94
1MJ1 405-4AD□□	1.1	6.2	2.55	7	15	78	94
1MJ1 407-4AD□□	1.1	6.3	2.6	7	15	78	94
1MJ1 408-4AD□□	1.05	6.3	2.5	7	17	80	96.5
1MJ1 455-4AD□□	1	6.6	2.6	7	24.5	80	96.5
1MJ1 457-4AD□□	1.05	6.6	2.5	7	29	80	96.5
1MJ1 458-4AD□□	1.05	6.6	2.5	7	29	80	96.5

1) The motors have 2 connection boxes.

2) Rated current at 690 V.

3) For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

4) For connection to 500 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

5) The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

6) Not possible for types of construction IM B6, IM B7, IM B8 or IM V6.

7) The "Second shaft extension" option, order code **K16** is not possible.

8) Not possible for type of construction IM V3.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Steel/cast-iron series 1MJ8 and 1MJ1

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output			Power factor at 50 Hz	Rated current at 400 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A			
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4										
110	132	315 M	990	1060	95.2	0.87	195	1MJ1 313-6AB□□		1180
132	150	315 M	990	1275	95.3	0.87	229	1MJ1 314-6AB□□		1180
160	170	315 L	990	1545	95.5	0.87	278	1MJ1 316-6AB□□		1390
200	220	315 L	990	1930	96	0.84	355	1MJ1 318-6AB□□		1510
250	280	355	994	2403	96.3	0.85	440	1MJ8 356-6AD□□		2200
280	315	355	993	2691	96.3	0.85	495	1MJ8 357-6AD□□		2450
315	355	355	994	3027	96.4	0.84	560	1MJ8 358-6AD□□		2550
355	400	355	993	3415	96.5	0.85	630	1MJ1 357-6AD□□		2700
400	450	355	992	3849	96.5	0.84	715	1MJ1 358-6AD□□		2700
450	500	400	994	4323	96.6	0.84	800 ³⁾	1MJ1 405-6AD□□		3500
500	560	400	994	4805	96.7	0.84	890 ³⁾	1MJ1 407-6AD□□		3500
560	630	450	995	5374	96.9	0.85	980 ^{1) 3)}	1MJ1 453-6AD□□		4600
630	710	450	995	6046	97	0.85	1105 ^{1) 3) 4)}	1MJ1 455-6AD□□		4600
710	800	450	995	6813	97.1	0.85	1240 ^{1) 3) 4)}	1MJ1 457-6AD□□		4900
800	900	450	995	7676	97.2	0.85	815 ²⁾	1MJ1 458-6AD□□		4900
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4										
90	100	315 M	740	1160	94.4	0.79	175	1MJ1 313-8AC□□		1180
110	120	315 M	740	1420	94.4	0.79	216	1MJ1 314-8AC□□		1180
132	145	315 L	740	1705	94.5	0.79	255	1MJ1 316-8AC□□		1390
160	175	315 L	742	2060	94.5	0.76	330	1MJ1 318-8AC□□		1490
200	225	355	744	2566	95.4	0.82	370	1MJ8 356-8AD□□		2250
250	280	355	744	3206	95.5	0.81	466	1MJ8 358-8AD□□		2550
280	315	355	743	3597	96	0.81	520	1MJ1 357-8AD□□		2700
315	355	355	743	4049	96	0.81	580	1MJ1 358-8AD□□		2850
355	400	400	743	4559	96.2	0.81	655	1MJ1 404-8AD□□		3200
400	450	400	744	5136	96.3	0.82	735	1MJ1 407-8AD□□		3500
450	500	400	743	5779	96.3	0.81	830	1MJ1 408-8AD□□		3650
500	560	450	745	6411	96.7	0.83	900 ³⁾	1MJ1 455-8AE□□		4600
560	630	450	745	7178	96.7	0.84	1000 ^{1) 3) 4)}	1MJ1 457-8AE□□		4900
630	710	450	745	8075	96.8	0.83	1130 ^{1) 3) 4)}	1MJ1 458-8AE□□		4900
670	750	450	746	8579	96.9	0.83	1210 ^{1) 3) 4)}	1MJ1 450-8AE□□		5100

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY 400 VΔ/690 VY 500 VY 500 VΔ				IM B3/6/7/8, IM V6 ^{5) 6)}	IM B5, IM V3 ⁵⁾	IM V1 With protective cover ^{5) 7)}	IM B35	IM B14, IM V19 ⁵⁾	IM B34	IM B14, IM V19 ⁵⁾
	1	6	3	5	0	1	4	6	2	7	3
1MJ1 31 □□	–	○	○	○	□	✓ ⁸⁾	✓	✓	–	–	–
1MJ8 35 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 35 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 40 □□	–	○	○	○	□	–	✓	✓	–	–	–
1MJ1 45 □□	–	○	○	○	□	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

For footnotes, see page 4/39.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated in Zone 1 with type of protection "d"
Steel/cast-iron series 1MJ8 and 1MJ1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pTA} dB(A)	L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ1 313-6AB□□	2.3	7	2.3	13	4.9	70	85
1MJ1 314-6AB□□	2.4	6.9	2.2	13	4.9	70	85
1MJ1 316-6AB□□	2.4	7	2.3	13	6	72	87
1MJ1 318-6AB□□	2.4	7	2.5	13	6.8	72	87
1MJ8 356-6AD□□	1.35	6.5	2.5	7	9	75	90
1MJ8 357-6AD□□	1.2	6.4	2.35	7	10.5	74	89.5
1MJ8 358-6AD□□	1.35	6.6	2.5	7	11.5	74	89.5
1MJ1 357-6AD□□	1	5.6	2.3	7	12.5	74	89.5
1MJ1 358-6AD□□	1	5.6	2.25	7	12.5	75	91
1MJ1 405-6AD□□	1	5.5	2.25	7	21.5	75	91
1MJ1 407-6AD□□	1.05	5.7	2.3	7	21.5	75	91
1MJ1 453-6AD□□	0.95	5.8	2.3	7	34	77	93.5
1MJ1 455-6AD□□	0.95	5.7	2.3	7	34	77	93.5
1MJ1 457-6AD□□	0.95	5.7	2.25	7	40	77	93.5
1MJ1 458-6AD□□	1	5.9	2.35	7	40	77	93.5
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection, temperature classes T1 to T4							
1MJ1 313-8AC□□	1.7	5.8	2	10	4.8	69	84
1MJ1 314-8AC□□	1.7	5.8	2	10	4.8	69	84
1MJ1 316-8AC□□	1.6	5.7	2	10	6	71	86
1MJ1 318-8AC□□	1.9	5.7	2.2	10	6.8	71	86
1MJ8 356-8AD□□	1.15	5.8	2.35	7	14.7	73	88
1MJ8 358-8AD□□	1.2	5.8	2.45	7	17	75	90.5
1MJ1 357-8AD□□	1.15	5.2	2.3	7	12.5	75	90.5
1MJ1 358-8AD□□	1.05	5.1	2.2	7	13.5	77	93
1MJ1 404-8AD□□	1	5.1	2.3	7	17.5	77	93
1MJ1 407-8AD□□	0.95	5.2	2.25	7	21	77	93
1MJ1 408-8AD□□	0.95	5	2.25	7	23	79	96
1MJ1 455-8AE□□	0.85	5.2	2.2	5	35.5	79	96
1MJ1 457-8AE□□	0.85	5.4	2.25	5	42	79	96
1MJ1 458-8AE□□	0.9	5.3	2.25	5	42	79	96
1MJ1 450-8AE□□	0.85	5.2	2.3	5	46	79	96

1) The motors have 2 connection boxes.

2) Rated current at 690 V.

3) For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

4) For connection to 500 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

5) The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

6) Not possible for types of construction IM B6, IM B7, IM B8 or IM V6.

7) The "Second shaft extension" option, order code **K16** is not possible.

8) Not possible for type of construction IM V3.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx.
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.09	0.11	56 M	2830	0.3	63	62	0.81	0.26	1LA7 050-2AA□□		3
0.12	0.14	56 M	2800	0.41	65	64	0.83	0.32	1LA7 053-2AA□□		3
0.18	0.21	63 M	2820	0.61	63	62	0.82	0.5	1LA7 060-2AA□□		3.5
0.25	0.29	63 M	2830	0.84	65	65	0.82	0.68	1LA7 063-2AA□□		4.1
0.37	0.43	71 M	2740	1.3	66	65	0.82	1	1LA7 070-2AA□□		5
0.55	0.63	71 M	2800	1.9	71	70	0.82	1.36	1LA7 073-2AA□□		6
0.75	0.86	80 M	2854	2.5	73	72	0.86	1.73	1LA7 080-2AA□□		9
1.1	1.3	80 M	2845	3.7	77	77	0.87	2.4	1LA7 083-2AA□□		11
1.5	1.75	90 S	2860	5	79	80	0.85	3.25	1LA7 090-2AA□□		12.9
2.2	2.55	90 L	2880	7.3	82	82	0.85	4.55	1LA7 096-2AA□□		15.7
3	3.45	100 L	2890	9.9	84	84	0.85	6.1	1LA7 106-2AA□□		22
4	4.6	112 M	2905	13	86	86	0.86	7.8	1LA7 113-2AA□□		29
5.5	6.3	132 S	2925	18	86.5	86.5	0.89	10.4	1LA7 130-2AA□□		39
7.5	8.6	132 S	2929	24	88	88	0.89	13.8	1LA7 131-2AA□□		48
11	12.6	160 M	2940	36	89.5	89.5	0.88	20	1LA7 163-2AA□□		68
15	17.3	160 M	2940	49	90	90.2	0.9	26.5	1LA7 164-2AA□□		77
18.5	21.3	160 L	2940	60	91	91.2	0.91	32	1LA7 166-2AA□□		86
22	24.5	180 M	2940	71	91.7	91.7	0.88	39.5 ¹⁾	1LA5 183-2AA□□		113
30	33.5	200 L	2944	97	92.3	92.3	0.89	53	1LA5 206-2AA□□		159
37	41.5	200 L	2944	120	92.8	92.8	0.89	65 ¹⁾	1LA5 207-2AA□□		179
45	51	225 M	2959	145	93.6	93.6	0.89	78 ¹⁾	1LA5 223-2AA□□		209

Special versions according to ATEX

Motor type	Zone 2			VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
	Frame size	Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA7	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
1LA5	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓
	225	–	–	–	–	✓	✓	✓	✓

- ✓ With extra charge
- Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 050-2AA□□	2	3.7	2.3	16	0.00015	41	52
1LA7 053-2AA□□	2.1	3.7	2.4	16	0.00015	41	52
1LA7 060-2AA□□	2	3.7	2.2	16	0.00018	49	60
1LA7 063-2AA□□	2	4	2.2	16	0.00022	49	60
1LA7 070-2AA□□	2.3	3.5	2.3	16	0.00029	52	63
1LA7 073-2AA□□	2.5	4.3	2.6	16	0.00041	52	63
1LA7 080-2AA□□	2.3	5.6	2.4	16	0.00079	56	67
1LA7 083-2AA□□	2.6	6.1	2.7	16	0.001	56	67
1LA7 090-2AA□□	2.4	5.5	2.7	16	0.0014	60	72
1LA7 096-2AA□□	2.8	6.3	3.1	16	0.0018	60	72
1LA7 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA7 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA7 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA7 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA7 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA7 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA7 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2AA□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2AA□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2AA□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2AA□□	2.8	7.7	3.4	16	0.2	71	84

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz	60 Hz	Without flange	With flange	With standard flange	With special flange	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ							
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 - □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 - □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 - □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 - □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at 50 Hz	60 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
			Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.06	0.07	56 M	1350	0.42	56	55	0.77	0.2	1LA7 050-4AB□□		3
0.09	0.11	56 M	1350	0.64	58	57	0.77	0.29	1LA7 053-4AB□□		3
0.12	0.14	63 M	1350	0.85	55	54	0.75	0.42	1LA7 060-4AB□□		3.5
0.18	0.21	63 M	1350	1.3	60	60	0.77	0.56	1LA7 063-4AB□□		4.1
0.25	0.29	71 M	1350	1.8	60	60	0.78	0.77	1LA7 070-4AB□□		4.8
0.37	0.43	71 M	1369	2.6	65	65	0.78	1.06	1LA7 073-4AB□□		6
0.55	0.63	80 M	1395	3.8	67	67	0.81	1.46	1LA7 080-4AA□□		9
0.75	0.86	80 M	1395	5.1	72	72	0.8	1.91	1LA7 083-4AA□□		10
1.1	1.3	90 S	1414	7.4	77	77	0.81	2.55	1LA7 090-4AA□□		13
1.5	1.75	90 L	1420	10	79	79	0.81	3.4	1LA7 096-4AA□□		15.6
2.2	2.55	100 L	1420	15	82	82.5	0.82	4.7	1LA7 106-4AA□□		21
3	3.45	100 L	1420	20	83	83.5	0.82	6.4	1LA7 107-4AA□□		24
4	4.6	112 M	1440	27	85	85.5	0.83	8.2	1LA7 113-4AA□□		31
5.5	6.3	132 S	1455	36	86	86	0.81	11.4	1LA7 130-4AA□□		41
7.5	8.6	132 M	1455	49	87	87.5	0.82	15.2	1LA7 133-4AA□□		49
11	12.6	160 M	1459	72	88.5	89	0.84	21.5	1LA7 163-4AA□□		73
15	17.3	160 L	1459	98	90	90.2	0.84	28.5	1LA7 166-4AA□□		85
18.5	21.3	180 M	1459	121	90.5	90.5	0.83	35.5 ¹⁾	1LA5 183-4AA□□		113
22	25.3	180 L	1459	144	91.2	91.2	0.84	41.5 ¹⁾	1LA5 186-4AA□□		123
30	34.5	200 L	1465	196	91.8	91.8	0.86	55	1LA5 207-4AA□□		157
37	42.5	225 S	1470	240	92.9	92.9	0.87	66 ¹⁾	1LA5 220-4AA□□		206
45	52	225 M	1470	292	93.4	93.4	0.87	80 ¹⁾	1LA5 223-4AA□□		232

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA7	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
1LA5	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓
	225	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 050-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 053-4AB□□	1.9	2.6	1.9	13	0.00027	42	53
1LA7 060-4AB□□	1.9	2.8	2	13	0.00029	42	53
1LA7 063-4AB□□	1.9	3	1.9	13	0.00037	42	53
1LA7 070-4AB□□	1.9	3	1.9	13	0.00052	44	55
1LA7 073-4AB□□	1.9	3.3	2.1	13	0.00077	44	55
1LA7 080-4AA□□	2.2	3.9	2.2	16	0.0014	47	58
1LA7 083-4AA□□	2.3	4.2	2.3	16	0.0017	47	58
1LA7 090-4AA□□	2.3	4.6	2.4	16	0.0024	48	60
1LA7 096-4AA□□	2.4	5.3	2.6	16	0.0033	48	60
1LA7 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA7 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA7 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA7 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA7 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA7 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA7 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4AA□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4AA□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4AA□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4AA□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4AA□□	2.8	7.7	3.3	16	0.36	65	78

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 05 □□	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.09	0.1	63 M	850	1	45	41.5	0.66	0.44	1LA7 063-6AA□□		4.1
0.18	0.21	71 M	835	2	53	54.5	0.73	0.67	1LA7 070-6AA□□		5
0.25	0.29	71 M	829	2.8	60	58.5	0.76	0.79	1LA7 073-6AA□□		6.3
0.37	0.43	80 M	919	3.8	62	60.5	0.72	1.2	1LA7 080-6AA□□		9
0.55	0.63	80 M	910	5.8	67	66.5	0.74	1.6	1LA7 083-6AA□□		10
0.75	0.86	90 S	915	7.8	69	69	0.76	2.05	1LA7 090-6AA□□		12.5
1.1	1.3	90 L	915	11	72	72	0.77	2.85	1LA7 096-6AA□□		15.7
1.5	1.75	100 L	925	15	74	74	0.75	3.9	1LA7 106-6AA□□		21
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	1LA7 113-6AA□□		26
3	3.45	132 S	949	30	79	79.5	0.76	7.2	1LA7 130-6AA□□		38
4	4.6	132 M	949	40	80.5	80.5	0.76	9.4	1LA7 133-6AA□□		44
5.5	6.3	132 M	949	55	83	83	0.76	12.6	1LA7 134-6AA□□		52
7.5	8.6	160 M	960	75	86	86	0.74	17	1LA7 163-6AA□□		74
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	1LA7 166-6AA□□		95
15	18	180 L	970	148	89.5	89.5	0.77	31.5	1LA5 186-6AA□□		126
18.5	22	200 L	975	181	90.2	90.2	0.77	38.5	1LA5 206-6AA□□		161
22	26.5	200 L	975	215	90.8	90.8	0.77	45.5	1LA5 207-6AA□□		183
30	36	225 M	978	293	91.8	91.8	0.77	61 ¹⁾	1LA5 223-6AA□□		214

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA7	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
1LA5	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓
	225	–	–	–	–	✓	✓	✓	✓

- ✓ With extra charge
- Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 063-6AB□□	1.8	2	1.9	13	0.00037	39	50
1LA7 070-6AA□□	2.1	2.3	1.9	16	0.00055	39	50
1LA7 073-6AA□□	2.2	2.7	2	16	0.0008	39	50
1LA7 080-6AA□□	1.9	3.1	2.1	16	0.0014	40	51
1LA7 083-6AA□□	2.1	3.4	2.2	16	0.0017	40	51
1LA7 090-6AA□□	2.2	3.7	2.2	16	0.0024	43	55
1LA7 096-6AA□□	2.3	3.8	2.3	16	0.0033	43	55
1LA7 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA7 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA7 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA7 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA7 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA7 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA7 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6AA□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6AA□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6AA□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6AA□□	2.8	5.7	2.9	16	0.36	66	78

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz				60 Hz		Without flange	With flange			With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	(see "Introduction" for outputs at 60 Hz)												
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 06 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.09	0.1	71 M	630	1.4	53	54.5	0.68	0.36	1LA7 070-8AB□□		6.3
0.12	0.14	71 M	645	1.8	53	49.5	0.64	0.51	1LA7 073-8AB□□		6.3
0.18	0.21	80 M	675	2.5	51	49.5	0.68	0.75	1LA7 080-8AB□□		9
0.25	0.29	80 M	685	3.5	55	50.5	0.64	1.02	1LA7 083-8AB□□		10
0.37	0.43	90 S	675	5.2	63	62	0.75	1.14	1LA7 090-8AB□□		10.5
0.55	0.63	90 L	675	7.8	66	65	0.76	1.58	1LA7 096-8AB□□		13.2
0.75	0.86	100 L	679	11	66	65	0.76	2.15	1LA7 106-8AB□□		19
1.1	1.3	100 L	679	15	72	72	0.76	2.9	1LA7 107-8AB□□		22
1.5	1.75	112 M	705	20	74	74	0.76	3.85	1LA7 113-8AB□□		24
2.2	2.55	132 S	700	30	75	75	0.74	5.7	1LA7 130-8AB□□		38
3	3.45	132 M	700	41	77	77.5	0.74	7.6	1LA7 133-8AB□□		44
4	4.6	160 M	715	53	80	80	0.72	10	1LA7 163-8AB□□		64
5.5	6.3	160 M	709	74	83.5	83.5	0.73	13	1LA7 164-8AB□□		74
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	1LA7 166-8AB□□		94
11	13.2	180 L	724	145	87	87	0.75	24.5	1LA5 186-8AB□□		128
15	18	200 L	724	198	87.5	87.5	0.78	31.5	1LA5 207-8AB□□		176
18.5	22	225 S	724	244	89.2	89.2	0.79	38	1LA5 220-8AB□□		184
22	26.5	225 M	724	290	90.6	90.6	0.79	44.5	1LA5 223-8AB□□		214

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA7	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
1LA5	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓
	225	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA7 070-8AB□□	1.9	2.2	1.7	13	0.0008	36	47
1LA7 073-8AB□□	2.2	2.2	2	13	0.0008	36	47
1LA7 080-8AB□□	1.7	2.3	1.9	13	0.0014	41	52
1LA7 083-8AB□□	2	2.6	2.2	13	0.0017	41	52
1LA7 090-8AB□□	1.6	2.9	1.8	13	0.0023	41	53
1LA7 096-8AB□□	1.7	3	1.9	13	0.0031	41	53
1LA7 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA7 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA7 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA7 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA7 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA7 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA7 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA7 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LA5 186-8AB□□	2	5	2.2	13	0.21	60	73
1LA5 207-8AB□□	2.1	5	2.2	13	0.37	58	71
1LA5 220-8AB□□	2.1	4.5	2.2	13	0.37	58	71
1LA5 223-8AB□□	2.2	4.8	2.3	13	0.45	58	71

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2) 3)}	IM B35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
					(see "Introduction" for outputs at 60 Hz)								
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA7 07 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **Z** and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Rated current at 400 V, 50 Hz I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
0.09	56 M	2830	0.3	70	68	0.76	0.24	1LA9 050-2KA□□		3
0.12	56 M	2830	0.4	69	69	0.81	0.31	1LA9 053-2KA□□		3.8
0.18	63 M	2839	0.61	70	70	0.78	0.48	1LA9 060-2KA□□		4.1
0.25	63 M	2840	0.84	72	70	0.8	0.63	1LA9 063-2KA□□		5.1
0.37	71 M	2839	1.2	74	74	0.77	0.94	1LA9 070-2KA□□		6
0.55	71 M	2835	1.9	75	75	0.75	1.42	1LA9 073-2KA□□		7.2
0.75	80 M	2869	2.5	80	80	0.82	1.66	1LA9 080-2KA□□		9.8
1.1	80 M	2860	3.7	84	84	0.89	2.1	1LA9 083-2KA□□		12.3
1.5	90 S	2890	5	85	85	0.87	2.95	1LA9 090-2KA□□		15
2.2	90 L	2890	7.3	86.5	86.5	0.87	4.2	1LA9 096-2KA□□		18.6
3	100 L	2890	9.9	87	87	0.88	5.7	1LA9 106-2KA□□		24
4	112 M	2905	13	88.5	88.5	0.89	7.3	1LA9 113-2KA□□		35
5.5	132 S	2929	18	89.5	89.5	0.9	9.9	1LA9 130-2KA□□		43
7.5	132 S	2929	24	90.5	90.5	0.92	13	1LA9 131-2KA□□		56
11	160 M	2944	36	91	91	0.9	19.4	1LA9 163-2KA□□		73
15	160 M	2944	49	91.5	91.5	0.9	26.5	1LA9 164-2KA□□		82
18.5	160 L	2940	60	92.3	92.5	0.92	31.5	1LA9 166-2KA□□		102
22	180 M	2944	71	93	93.2	0.89	38.5 ¹⁾	1LA9 183-2WA□□		131
30	200 L	2950	97	93.5	93.5	0.89	52	1LA9 206-2WA□□		185
37	200 L	2950	120	94	94.1	0.89	64 ¹⁾	1LA9 207-2WA□□		214

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA9	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

The motors can also be used for 60 Hz according to EPACT, see pages 4/54 to 4/59.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LA9 050-2KA□□	3.6	4.5	3	16	0.00015	41	52
1LA9 053-2KA□□	3.2	4.3	2.8	16	0.0002	41	52
1LA9 060-2KA□□	2.8	4.8	3.1	16	0.00022	49	60
1LA9 063-2KA□□	2.5	4.9	2.5	16	0.00026	49	60
1LA9 070-2KA□□	3.3	6.5	3.1	16	0.00041	52	63
1LA9 073-2KA□□	3.6	6.3	2.9	16	0.0005	52	63
1LA9 080-2KA□□	4.4	8.3	3.2	16	0.001	56	67
1LA9 083-2KA□□	3.8	7	3.2	16	0.0013	56	67
1LA9 090-2KA□□	4.1	7	3.5	16	0.0018	60	72
1LA9 096-2KA□□	4.1	7	3.5	16	0.0022	60	72
1LA9 106-2KA□□	3.4	7	3.2	16	0.0044	62	74
1LA9 113-2KA□□	2.8	7	3.2	16	0.0077	63	75
1LA9 130-2KA□□	2.7	7	3.2	16	0.019	68	80
1LA9 131-2KA□□	2.8	7	3.1	16	0.024	68	80
1LA9 163-2KA□□	2.5	7	3.1	16	0.044	70	82
1LA9 164-2KA□□	2.5	7	3.1	16	0.051	70	82
1LA9 166-2KA□□	2.4	7	3.1	16	0.065	70	82
1LA9 183-2WA□□	2.6	7.2	3.3	16	0.09	70	83
1LA9 206-2WA□□	2.5	7	3.2	16	0.16	71	84
1LA9 207-2WA□□	2.7	7	3.3	16	0.2	71	84

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, ¹⁾ IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, ¹⁾ IM V19 ¹⁾	IM B34	IM B14, ¹⁾ IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Rated current at 400 V, 50 Hz I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
0.06	56 M	1380	0.42	61	61	0.66	0.22	1LA9 050-4KA□□		3
0.09	56 M	1390	0.62	62	62	0.68	0.31	1LA9 053-4KA□□		3.8
0.12	63 M	1395	0.82	66	66	0.65	0.41	1LA9 060-4KA□□		4.1
0.18	63 M	1395	1.3	65	65	0.68	0.59	1LA9 063-4KA□□		5.1
0.25	71 M	1410	1.7	70	70	0.64	0.81	1LA9 070-4KA□□		6
0.37	71 M	1384	2.6	71	71	0.73	1.04	1LA9 073-4KA□□		7.2
0.55	80 M	1410	3.7	77	77	0.78	1.32	1LA9 080-4KA□□		9.8
0.75	80 M	1399	5.1	81	81	0.75	1.78	1LA9 083-4KA□□		12.3
1.1	90 S	1440	7.3	84	84	0.77	2.45	1LA9 090-4KA□□		15
1.5	90 L	1440	9.9	85	85	0.77	3.3	1LA9 096-4KA□□		18
2.2	100 L	1435	15	86.5	86.5	0.82	4.5	1LA9 106-4KA□□		25
3	100 L	1435	20	87.5	87.7	0.81	6.1	1LA9 107-4KA□□		30
4	112 M	1440	27	88.5	89	0.81	8.1	1LA9 113-4KA□□		37
5.5	132 S	1455	36	89.5	89.5	0.84	10.6	1LA9 130-4KA□□		45
7.5	132 M	1455	49	90.3	90.5	0.84	14.2	1LA9 133-4KA□□		60
11	160 M	1459	72	91.5	92	0.85	20.5	1LA9 163-4KA□□		81
15	160 L	1459	98	92	92.3	0.86	27.5	1LA9 166-4KA□□		107
18.5	180 M	1465	121	92.5	93	0.84	34.5 ¹⁾	1LA9 183-4WA□□		126
22	180 L	1465	143	93	93.4	0.84	40.5 ¹⁾	1LA9 186-4WA□□		146
30	200 L	1465	196	93.5	94	0.87	53	1LA9 207-4WA□□		199

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	—	—	—	—	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	—	—	—	—	✓	✓	✓	✓
	200	—	—	—	—	✓	✓	✓	✓

✓ With extra charge
— Not possible

The motors can also be used for 60 Hz according to EPACT, see pages 4/54 to 4/59.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LA9 050-4KA□□	2.7	3.1	2.8	16	0.00027	42	53
1LA9 053-4KA□□	2.8	3.2	2.8	16	0.00035	42	53
1LA9 060-4KA□□	2.7	3.5	2.6	16	0.00037	42	53
1LA9 063-4KA□□	3	3.6	2.5	16	0.00045	42	53
1LA9 070-4KA□□	3.6	4.3	3.1	16	0.00076	44	55
1LA9 073-4KA□□	3.3	4.2	3	16	0.00095	44	55
1LA9 080-4KA□□	3.4	5.6	2.9	16	0.0017	47	58
1LA9 083-4KA□□	4	5.8	3.5	16	0.0024	47	58
1LA9 090-4KA□□	3.1	6.4	3.2	16	0.0033	48	60
1LA9 096-4KA□□	3.6	6.7	3.4	16	0.004	48	60
1LA9 106-4KA□□	3.4	7	3.6	16	0.0062	53	65
1LA9 107-4KA□□	3.8	7	3.9	16	0.0077	53	65
1LA9 113-4KA□□	3.2	6.9	3.2	16	0.014	53	65
1LA9 130-4KA□□	3.2	7	3.6	16	0.023	62	74
1LA9 133-4KA□□	3.4	7	3.6	16	0.029	62	74
1LA9 163-4KA□□	2.6	6.9	3.2	16	0.055	66	78
1LA9 166-4KA□□	2.8	7	3.3	16	0.072	66	78
1LA9 183-4WA□□	2.8	7	3.2	16	0.15	63	76
1LA9 186-4WA□□	3.1	7.3	3.4	16	0.19	63	76
1LA9 207-4WA□□	3	7	3.2	16	0.32	65	78

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6 ¹⁾	IM B5, ¹⁾ IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, ¹⁾ IM V19 ¹⁾	IM B34	IM B14, ¹⁾ IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LA9 05 □□	○	○	○	–	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output				Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
0.75	90 S	925	7.7	75.5	75.5	0.72	2	1LA9 090-6KA□□		15.7
1.1	90 L	940	11	82	82	0.7	2.75	1LA9 096-6KA□□		19
1.5	100 L	949	15	85	85	0.7	3.65	1LA9 106-6KA□□		25
2.2	112 M	955	22	84	84	0.7	5.4	1LA9 113-6KA□□		37
4	132 M	949	40	84	84	0.81	8.5	1LA9 133-6KA□□		49
5.5	132 M	960	55	86	86	0.77	12	1LA9 134-6KA□□		64
7.5	160 M	964	74	88	88	0.72	17	1LA9 163-6KA□□		98
11	160 L	960	109	88.5	88.5	0.78	23	1LA9 166-6KA□□		105
15	180 L	970	148	91	91	0.75	31.5	1LA9 186-6WA□□		144
18.5	200 L	975	181	91	91	0.77	38	1LA9 206-6WA□□		186
22	200 L	975	215	91.5	91.5	0.77	45	1LA9 207-6WA□□		217

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA9	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

The motors can also be used for 60 Hz according to EPACT, see pages 4/54 to 4/59.

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LA9 090-6KA□□	3.	4.4	2.5	16	0.0033	43	55
1LA9 096-6KA□□	3.7	5.7	3.2	16	0.005	43	55
1LA9 106-6KA□□	3.5	6.2	3.4	16	0.0065	47	59
1LA9 113-6KA□□	2.9	6.2	3	16	0.014	52	64
1LA9 133-6KA□□	3	6.3	2.7	16	0.025	63	75
1LA9 134-6KA□□	3.7	7.3	3.6	16	0.03	63	75
1LA9 163-6KA□□	2.4	5.5	2.5	16	0.063	66	78
1LA9 166-6KA□□	3.1	6.9	3.2	16	0.0072	66	78
1LA9 186-6WA□□	2.2	6.5	2.5	16	0.19	66	78
1LA9 206-6WA□□	2.8	6.2	2.5	16	0..28	66	78
1LA9 207-6WA□□	2.8	6.2	2.5	16	0.36	66	78

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz					Final position: Type of construction code					
						Without flange	With flange		With standard flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ		IM B3/6/7/8, IM V6 ¹⁾	IM B5, ¹⁾ IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, ¹⁾ IM V19 ¹⁾	IM B34 IM B14, ¹⁾ IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LA9 09 □□	○	○	○	–	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data

Rated output at 60 Hz	Frame size	Operating values at rated output			Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated}	FS	Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	η_{rated}	$\cos\phi_{rated}$	I_{rated}	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx.
HP		n_{rated} rpm	T_{rated} Nm		%		A			m kg
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
0.12	56 M	3440	0.25	No	70	0.74	0.23	1LA9 050-2KA□□		3
0.16	56 M	3440	0.33	No	71	0.76	0.28	1LA9 053-2KA□□		3.8
0.25	63 M	3440	0.53	No	71	0.79	0.4	1LA9 060-2KA□□		4.1
0.33	63 M	3460	0.69	No	72	0.76	0.56	1LA9 063-2KA□□		5.1
0.5	71 M	3445	1	No	72	0.75	0.86	1LA9 070-2KA□□		6
0.75	71 M	3445	1.6	No	73	0.73	1.3	1LA9 073-2KA□□		7.2
1	80 M	3485	2	Yes	75.5	0.82	1.52	1LA9 080-2KA□□		9.8
1.5	80 M	3480	3.1	Yes	82.5	0.88	1.9	1LA9 083-2KA□□		12.3
2	90 S	3510	4.1	Yes	84	0.86	2.6	1LA9 090-2KA□□		15
3	90 L	3510	6.1	Yes	85.5	0.85	3.8	1LA9 096-2KA□□		18.6
4	100 L	3510	8.1	No	86.5	0.87	5	1LA9 106-2KA□□		24
5	112 M	3540	10	Yes	87.5	0.88	6	1LA9 113-2KA□□		35
7.5	132 S	3540	15	Yes	88.5	0.9	8.7	1LA9 130-2KA□□		43
10	132 S	3540	20	Yes	89.5	0.92	11.4	1LA9 131-2KA□□		56
15	160 M	3555	30	Yes	90.2	0.9	17	1LA9 163-2KA□□		73
20	160 M	3555	40	Yes	90.2	0.9	23.2	1LA9 164-2KA□□		82
25	160 L	3550	50	Yes	91	0.92	27.7	1LA9 166-2KA□□		102
30	180 M	3545	60	Yes	91	0.86	36	1LA9 183-2WA□□		131
40	200 L	3555	80	Yes	91.7	0.88	46.5	1LA9 206-2WA□□		185
50	200 L	3555	100	Yes	92.4	0.88	57	1LA9 207-2WA□□		214

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

The motors can also be used for 50 Hz "High Efficiency", see pages 4/48 to 4/53.

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 60 Hz L_{pTA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 050-2KA□□	3.6	5.5	3.8	16	0.00015	45	56
1LA9 053-2KA□□	3.2	5.4	3.4	16	0.0002	45	56
1LA9 060-2KA□□	2.8	4.9	3.3	16	0.00022	53	64
1LA9 063-2KA□□	2.5	5	2.7	16	0.00026	53	64
1LA9 070-2KA□□	3.3	7.5	3.4	16	0.00041	56	67
1LA9 073-2KA□□	3.6	7.2	3.7	16	0.0005	56	67
1LA9 080-2KA□□	4.4	9.6	4.4	16	0.001	60	71
1LA9 083-2KA□□	3.8	8.6	3.2	16	0.0013	60	71
1LA9 090-2KA□□	4.1	8.6	4.1	16	0.0018	64	76
1LA9 096-2KA□□	4.1	8.5	5.1	16	0.0022	64	76
1LA9 106-2KA□□	3.4	8.6	3.7	16	0.0044	66	78
1LA9 113-2KA□□	2.8	9.2	4	16	0.0077	67	79
1LA9 130-2KA□□	2.7	8.5	3.8	16	0.019	72	84
1LA9 131-2KA□□	2.8	8.3	3.7	16	0.024	72	84
1LA9 163-2KA□□	2.5	8.5	3.7	16	0.044	74	86
1LA9 164-2KA□□	2.5	8.5	3.7	16	0.051	74	86
1LA9 166-2KA□□	2.4	8.5	3.5	16	0.065	74	86
1LA9 183-2WA□□	2.6	8.6	3.5	16	0.09	74	87
1LA9 206-2WA□□	2.5	8.4	3.6	16	0.16	75	88
1LA9 207-2WA□□	2.7	8.4	3.7	16	0.2	75	88

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output		EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
0.08	56 M	1715	0.33	No	63	0.65	0.18	1LA9 050-4KA□□		3
0.12	56 M	1725	0.5	No	64	0.6	0.29	1LA9 053-4KA□□		3.8
0.16	63 M	1710	0.66	No	68	0.6	0.37	1LA9 060-4KA□□		4.1
0.25	63 M	1705	1.1	No	66	0.63	0.54	1LA9 063-4KA□□		5.1
0.33	71 M	1730	1.4	No	69	0.6	0.76	1LA9 070-4KA□□		6
0.5	71 M	1725	2.1	No	70	0.68	0.98	1LA9 073-4KA□□		7.2
0.75	80 M	1725	3.1	No	75.5	0.74	1.24	1LA9 080-4KA□□		9.8
1	80 M	1720	4.1	Yes	82.5	0.75	1.59	1LA9 083-4KA□□		12.3
1.5	90 S	1755	6.1	Yes	84	0.76	2.15	1LA9 090-4KA□□		15
2	90 L	1775	14	Yes	84	0.76	2.95	1LA9 096-4KA□□		18
3	100 L	1750	12	No	87.5	0.79	4	1LA9 106-4KA□□		25
4	100 L	1750	16	No	87.5	0.79	5.5	1LA9 107-4KA□□		30
5	112 M	1755	20	Yes	87.5	0.79	6.7	1LA9 113-4KA□□		37
7.5	132 S	1760	30	Yes	89.5	0.81	9.5	1LA9 130-4KA□□		45
10	132 M	1760	40	Yes	89.5	0.82	12.8	1LA9 133-4KA□□		60
15	160 M	1765	61	Yes	91	0.85	17.9	1LA9 163-4KA□□		81
20	160 L	1765	81	Yes	91	0.85	24.5	1LA9 166-4KA□□		107
25	180 M	1770	101	Yes	92.4	0.83	30.5	1LA9 183-4WA□□		126
30	180 L	1770	121	Yes	92.4	0.83	36	1LA9 186-4WA□□		146
40	200 L	1770	161	Yes	93	0.86	47	1LA9 207-4WA□□		199

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA9	56	–	–	–	–	✓	✓	✓	✓
	63	✓	✓	✓	✓	✓	✓	✓	✓
	71	✓	✓	✓	✓	✓	✓	✓	✓
	80	✓	✓	✓	✓	✓	✓	✓	✓
	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

The motors can also be used for 50 Hz "High Efficiency", see pages 4/48 to 4/53.

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 60 Hz L_{pA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 050-4KA□□	2.7	3.4	3	16	0.00027	46	57
1LA9 053-4KA□□	2.8	3.5	3	16	0.00035	46	57
1LA9 060-4KA□□	2.7	3.9	2.8	16	0.00037	46	57
1LA9 063-4KA□□	3	3.6	3.1	16	0.00045	46	57
1LA9 070-4KA□□	3.6	4.9	3.4	16	0.00076	48	59
1LA9 073-4KA□□	3.3	4.9	3.4	16	0.00095	48	59
1LA9 080-4KA□□	3.4	6.8	3.6	16	0.0017	51	62
1LA9 083-4KA□□	4	7.3	3.9	16	0.0024	51	62
1LA9 090-4KA□□	3.1	7.7	3.9	16	0.0033	52	64
1LA9 096-4KA□□	3.6	8.1	4.2	16	0.004	52	64
1LA9 106-4KA□□	3.4	8.4	4.3	16	0.0062	57	69
1LA9 107-4KA□□	3.8	8.7	4.6	16	0.0077	57	69
1LA9 113-4KA□□	3.2	8.6	3.9	16	0.014	57	69
1LA9 130-4KA□□	3.2	8.7	4.1	16	0.023	66	78
1LA9 133-4KA□□	3.4	8.7	4.1	16	0.029	66	78
1LA9 163-4KA□□	2.6	8.1	3.2	16	0.055	70	82
1LA9 166-4KA□□	2.8	8.5	3.5	16	0.072	70	82
1LA9 183-4WA□□	2.8	8.4	3.6	16	0.15	67	80
1LA9 186-4WA□□	3.1	8.8	3.9	16	0.19	67	80
1LA9 207-4WA□□	3	8.3	3.6	16	0.32	69	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LA9 05 □□	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 □□	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output		EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
1	90 S	1140	6.2	Yes	80	0.66	1.78	1LA9 090-6KA□□		15.7
1.5	90 L	1150	9.3	Yes	85.5	0.64	2.55	1LA9 096-6KA□□		19
2	100 L	1160	12	No	86.5	0.68	3.2	1LA9 106-6KA□□		25
3	112 M	1160	18	Yes	87.5	0.66	4.8	1LA9 113-6KA□□		37
5	132 M	1160	31	Yes	87.5	0.77	6.9	1LA9 133-6KA□□		49
7.5	132 M	1160	46	Yes	89.5	0.73	10.6	1LA9 134-6KA□□		64
10	160 M	1165	61	Yes	89.5	0.7	15	1LA9 163-6KA□□		98
15	160 L	1165	92	Yes	90.2	0.77	19	1LA9 166-6KA□□		105
20	180 L	1175	121	Yes	90.2	0.75	28	1LA9 186-6WA□□		144
25	200 L	1175	152	Yes	91.7	0.75	34	1LA9 206-6WA□□		186
30	200 L	1175	182	Yes	91.7	0.75	40	1LA9 207-6WA□□		217

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA9	90	✓	✓	✓	✓	✓	✓	✓	✓
	100	✓	✓	✓	✓	✓	✓	✓	✓
	112	✓	✓	✓	✓	✓	✓	✓	✓
	132	✓	✓	✓	✓	✓	✓	✓	✓
	160	✓	✓	✓	✓	✓	✓	✓	✓
	180	–	–	–	–	✓	✓	✓	✓
	200	–	–	–	–	✓	✓	✓	✓

✓ With extra charge
– Not possible

The motors can also be used for 50 Hz "High Efficiency", see pages 4/48 to 4/53.

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code C27. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Aluminium series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise Measuring-surface sound pressure level at 60 Hz	Sound pressure level at 60 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LA9 090-6KA□□	3	5.6	3	16	0.0033	47	59
1LA9 096-6KA□□	3.7	6.4	3.7	16	0.005	47	59
1LA9 106-6KA□□	3.5	7.2	3.8	16	0.0065	51	63
1LA9 113-6KA□□	2.9	7.5	3.7	16	0.014	56	68
1LA9 133-6KA□□	3	7.9	3.6	16	0.025	67	79
1LA9 134-6KA□□	3.7	8.4	4.3	16	0.03	67	79
1LA9 163-6KA□□	2.4	6.4	2.8	16	0.063	70	82
1LA9 166-6KA□□	3.1	8.3	3.8	16	0.0072	70	82
1LA9 186-6WA□□	2.8	7.1	2.8	16	0.19	70	82
1LA9 206-6WA□□	2.8	7.1	2.8	16	0.28	70	82
1LA9 207-6WA□□	2.8	7.2	2.8	16	0.36	70	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ	Without flange IM B3/6/7/8, IM V6 ¹⁾	With flange IM B5, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LA9 09 - □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 - □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 - □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 - □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 - □□	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 - □□	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA9 20 - □□	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection											
3	3.45	100 L	2890	9.9	84	84	0.85	6.1	1LA6 106-2AA□□		34
4	4.6	112 M	2905	13	86	86	0.86	7.8	1LA6 113-2AA□□		43
5.5	6.3	132 S	2925	18	86.5	86.5	0.89	10.4	1LA6 130-2AA□□		53
7.5	8.6	132 S	2929	24	88	88	0.89	13.8	1LA6 131-2AA□□		58
11	12.6	160 M	2940	36	89.5	89.5	0.88	20	1LA6 163-2AA□□		96
15	17.3	160 M	2940	49	90	90.2	0.9	26.5	1LA6 164-2AA□□		105
18.5	21.3	160 L	2940	60	91	91.2	0.91	32	1LA6 166-2AA□□		115
22	24.5	180 M	2945	71	91.6	91.6	0.86	40.5 ¹⁾	1LG4 183-2AA□□		145
30	33.5	200 L	2950	97	91.8	91.9	0.88	54 ¹⁾	1LG4 206-2AA□□		205
37	41.5	200 L	2955	120	92.9	93.2	0.89	65 ¹⁾	1LG4 207-2AA□□		225
45	51	225 M	2960	145	93.6	93.9	0.88	79 ¹⁾	1LG4 223-2AA□□		285
55	62	250 M	2970	177	93.6	93.8	0.88	96	1LG4 253-2AB□□		375
75	84	280 S	2975	241	94.5	94.3	0.88	130 ¹⁾	1LG4 280-2AB□□		500
90	101	280 M	2975	289	95.1	95.2	0.89	154 ¹⁾	1LG4 283-2AB□□		540
110	123	315 S	2982	352	94.6	93.8	0.88	190 ¹⁾	1LG4 310-2AB□□		720
132	148	315 M	2982	423	95.1	94.8	0.9	225 ¹⁾	1LG4 313-2AB□□		775
160	180	315 L	2982	512	95.5	95.3	0.91	265 ²⁾	1LG4 316-2AB□□		900
200	224	315 L	2982	641	95.9	95.8	0.92	325 ²⁾	1LG4 317-2AB□□		1015

Special versions according to ATEX

Motor type		Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
	Frame size	Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge
– Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

³⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-2AA□□	2.8	6.8	3	16	0.0035	62	74
1LA6 113-2AA□□	2.6	7.2	2.9	16	0.0059	63	75
1LA6 130-2AA□□	2	5.9	2.8	16	0.015	68	80
1LA6 131-2AA□□	2.3	6.9	3	16	0.019	68	80
1LA6 163-2AA□□	2.1	6.5	2.9	16	0.034	70	82
1LA6 164-2AA□□	2.2	6.6	3	16	0.043	70	82
1LA6 166-2AA□□	2.4	7	3.1	16	0.051	70	82
1LG4 183-2AA□□	2.5	6.4	3.4	16	0.068	67	80
1LG4 206-2AA□□	2.3	6.5	3	16	0.13	73	86
1LG4 207-2AA□□	2.5	7.2	3.3	16	0.15	73	86
1LG4 223-2AA□□	2.4	6.7	3.1	16	0.22	73	86
1LG4 253-2AB□□	2.1	6.7	3.1	13	0.4	75	88
1LG4 280-2AB□□	2.5	7.5	3.1	13	0.72	74	87
1LG4 283-2AB□□	2.6	7.2	3.1	13	0.83	74	87
1LG4 310-2AB□□	2.4	7.2	3.1	13	1.2	81	95
1LG4 313-2AB□□	2.4	6.9	3	13	1.4	80	94
1LG4 316-2AB□□	2.4	7	3	13	1.6	79	92
1LG4 317-2AB□□	2.3	6.7	2.9	13	2.1	79	92

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ^{1) 2)}	IM B5, IM V3 ^{1) 3)}	IM V1 With protective cover ^{1) 3) 4)}	IM B 35	IM B14, IM V19 ¹⁾	IM B34	IM B14, ¹⁾ IM V19
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓	–	–	–
1LG4 317 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- ⁷⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection											
2.2	2.55	100 L	1420	15	82	82.5	0.82	4.7	1LA6 106-4AA□□		33
3	3.45	100 L	1420	20	83	83.5	0.82	6.4	1LA6 107-4AA□□		36
4	4.6	112 M	1440	27	85	85.5	0.83	8.2	1LA6 113-4AA□□		45
5.5	6.3	132 S	1455	36	86	86	0.81	11.4	1LA6 130-4AA□□		55
7.5	8.6	132 M	1455	49	87	87.5	0.82	15.2	1LA6 133-4AA□□		62
11	12.6	160 M	1459	72	88.5	89	0.84	21.5	1LA6 163-4AA□□		100
15	17.3	160 L	1459	98	90	90.2	0.84	28.5	1LA6 166-4AA□□		114
18.5	21.3	180 M	1465	121	90.4	90.8	0.84	35 ¹⁾	1LG4 183-4AA□□		140
22	25.3	180 L	1465	143	91	91.5	0.84	41.5 ¹⁾	1LG4 186-4AA□□		155
30	34.5	200 L	1465	196	91.6	92	0.85	56 ¹⁾	1LG4 207-4AA□□		205
37	42.5	225 S	1475	240	92.2	92.6	0.85	68 ¹⁾	1LG4 220-4AA□□		265
45	52	225 M	1475	291	93.1	93.6	0.86	81 ¹⁾	1LG4 223-4AA□□		300
55	63	250 M	1480	355	93.5	93.8	0.85	100	1LG4 253-4AA□□		390
75	86	280 S	1485	482	94.2	94.1	0.85	136 ¹⁾	1LG4 280-4AA□□		535
90	104	280 M	1485	579	94.6	94.6	0.86	160 ¹⁾	1LG4 283-4AA□□		580
110	127	315 S	1488	706	94.6	94.6	0.85	198 ¹⁾	1LG4 310-4AA□□		730
132	152	315 M	1488	847	95.2	95.2	0.85	235 ¹⁾	1LG4 313-4AA□□		810
160	184	315 L	1486	1028	95.7	95.8	0.86	280 ²⁾	1LG4 316-4AA□□		955
200	230	315 L	1486	1285	95.9	96.2	0.88	340 ²⁾	1LG4 317-4AA□□		1060

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge
– Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

³⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-4AA□□	2.5	5.6	2.8	16	0.0047	53	65
1LA6 107-4AA□□	2.7	5.6	3	16	0.0055	53	65
1LA6 113-4AA□□	2.7	6	3	16	0.012	53	65
1LA6 130-4AA□□	2.5	6.3	3.1	16	0.018	62	74
1LA6 133-4AA□□	2.7	6.7	3.2	16	0.023	62	74
1LA6 163-4AA□□	2.2	6.2	2.7	16	0.043	66	78
1LA6 166-4AA□□	2.6	6.5	3	16	0.055	66	78
1LG4 183-4AA□□	2.4	6.7	3.1	16	0.099	65	78
1LG4 186-4AA□□	2.5	6.9	3.2	16	0.12	65	78
1LG4 207-4AA□□	2.5	6.7	3.4	16	0.19	66	79
1LG4 220-4AA□□	2.5	6.7	3.1	16	0.37	66	79
1LG4 223-4AA□□	2.7	7.2	3.2	16	0.45	66	79
1LG4 253-4AA□□	2.4	6.1	2.8	16	0.69	65	78
1LG4 280-4AA□□	2.5	7.1	3	16	1.2	70	83
1LG4 283-4AA□□	2.5	7.4	3	16	1.4	68	82
1LG4 310-4AA□□	2.5	6.4	2.8	16	1.9	70	83
1LG4 313-4AA□□	2.7	6.8	2.9	16	2.3	70	83
1LG4 316-4AA□□	2.7	6.8	2.8	16	2.9	70	83
1LG4 317-4AA□□	2.6	6.5	2.8	16	3.5	71	86

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz				60 Hz		Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ^{1) 2)}	IM B5, IM V3 ^{1) 3)}	IM V1 With protective cover ^{1) 3) 4)}	IM B 35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection											
1.5	1.75	100 L	925	15	74	74	0.75	3.9	1LA6 106-6AA□□		33
2.2	2.55	112 M	940	22	78	78.5	0.78	5.2	1LA6 113-6AA□□		40
3	3.45	132 S	949	30	79	79.5	0.76	7.2	1LA6 130-6AA□□		50
4	4.6	132 M	949	40	80.5	80.5	0.76	9.4	1LA6 133-6AA□□		57
5.5	6.3	132 M	949	55	83	83	0.76	12.6	1LA6 134-6AA□□		66
7.5	8.6	160 M	960	75	86	86	0.74	17	1LA6 163-6AA□□		103
11	12.6	160 L	960	109	87.5	87.5	0.74	24.5	1LA6 166-6AA□□		122
15	18	180 L	965	148	88.9	90.3	0.83	29.5	1LG4 186-6AA□□		150
18.5	22	200 L	975	181	89.8	90.2	0.81	36.5	1LG4 206-6AA□□		195
22	26.5	200 L	975	215	90.3	91	0.81	43.5	1LG4 207-6AA□□		205
30	36	225 M	978	293	91.8	92.8	0.83	57 ¹⁾	1LG4 223-6AA□□		280
37	44.5	250 M	980	361	92.3	93	0.83	70	1LG4 253-6AA□□		370
45	54	280 S	985	436	92.4	93.1	0.85	83	1LG4 280-6AA□□		475
55	66	280 M	985	533	92.7	93.3	0.86	100	1LG4 283-6AA□□		510
75	90	315 S	988	725	93.5	93.7	0.84	138	1LG4 310-6AA□□		685
90	108	315 M	988	870	93.9	94.2	0.84	164 ¹⁾	1LG4 313-6AA□□		750
110	132	315 L	988	1063	94.3	94.6	0.86	196	1LG4 316-6AA□□		890
132	158	315 L	988	1276	94.8	95	0.86	235	1LG4 317-6AA□□		980
160	192	315 L	988	1547	95	95.1	0.86	285 ²⁾	1LG4 318-6AA□□		1180

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation	Mains-fed operation	Converter-fed operation
		Order code M72	Order code M73	Order code K30	On request	Order code M34	Order code M38	Order code M35	Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge
– Not possible

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

³⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-6AA□□	2.3	4	2.3	16	0.0047	47	59
1LA6 113-6AA□□	2.2	4.6	2.5	16	0.0091	52	64
1LA6 130-6AA□□	1.9	4.2	2.2	16	0.015	63	75
1LA6 133-6AA□□	2.1	4.5	2.4	16	0.019	63	75
1LA6 134-6AA□□	2.3	5	2.6	16	0.025	63	75
1LA6 163-6AA□□	2.1	4.6	2.5	16	0.044	66	78
1LA6 166-6AA□□	2.3	4.8	2.6	16	0.063	66	78
1LG4 186-6AA□□	2.3	5.3	2.5	16	0.18	56	69
1LG4 206-6AA□□	2.5	5.6	2.5	16	0.24	56	70
1LG4 207-6AA□□	2.6	5.7	2.5	16	0.29	57	70
1LG4 223-6AA□□	2.7	5.6	2.5	16	0.49	60	73
1LG4 253-6AA□□	2.7	6	2.3	16	0.76	59	73
1LG4 280-6AA□□	2.4	6.1	2.4	16	1.1	61	74
1LG4 283-6AA□□	2.5	6.3	2.5	16	1.4	61	74
1LG4 310-6AA□□	2.5	6.5	2.8	16	2.1	65	78
1LG4 313-6AA□□	2.6	6.8	2.9	16	2.5	65	78
1LG4 316-6AA□□	2.5	6.8	2.9	16	3.2	62	77
1LG4 317-6AA□□	3.1	7.3	3	16	4	62	76
1LG4 318-6AA□□	3	7.5	3	16	4.7	65	78

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange			With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ^{1) 2)}	IM B5, IM V3 ^{1) 3)}	IM V1 With protective cover ^{1) 3) 4)}	IM B 35	IM B14, IM V19 ¹⁾	IM B34	IM B14, IM V19 ¹⁾
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317 □□													
1LG4 318 □□													

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output						Order No.	Price	Weight IM B3 type of construction approx. m kg
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection											
0.75	0.86	100 L	679	11	66	65	0.76	2.15	1LA6 106-8AB□□		29
1.1	1.3	100 L	679	15	72	72	0.76	2.9	1LA6 107-8AB□□		32
1.5	1.75	112 M	705	20	74	74	0.76	3.85	1LA6 113-8AB□□		39
2.2	2.55	132 S	700	30	75	75	0.74	5.7	1LA6 130-8AB□□		50
3	3.45	132 M	700	41	77	77.5	0.74	7.6	1LA6 133-8AB□□		57
4	4.6	160 M	715	53	80	80	0.72	10	1LA6 163-8AB□□		91
5.5	6.3	160 M	709	74	83.5	83.5	0.73	13	1LA6 164-8AB□□		102
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	1LA6 166-8AB□□		122
11	13.2	180 L	725	145	87.5	88.3	0.73	25	1LG4 186-8AB□□		150
15	18	200 L	725	198	87.7	88.4	0.76	32.5	1LG4 207-8AB□□		205
18.5	22	225 S	730	242	89.4	90.4	0.78	38.5	1LG4 220-8AB□□		270
22	26.5	225 M	730	288	89.7	90.7	0.79	45	1LG4 223-8AB□□		290
30	36	250 M	730	392	91.4	92.2	0.81	58	1LG4 253-8AB□□		385
37	44.5	280 S	735	481	92	92.8	0.81	72	1LG4 280-8AB□□		475
45	54	280 M	735	585	92.4	93.3	0.81	87	1LG4 283-8AB□□		515
55	66	315 S	740	710	93	93.4	0.81	106	1LG4 310-8AB□□		680
75	90	315 M	738	971	93.3	94	0.83	140	1LG4 313-8AB□□		745
90	108	315 L	738	1165	93.4	94	0.83	168	1LG4 316-8AB□□		865
110	132	315 L	738	1423	94	94.4	0.83	205	1LG4 317-8AB□□		1020
132	158	315 L	738	1708	94.2	94.6	0.83	245	1LG4 318-8AB□□		1100

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ¹⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA6	100	✓	✓	✓	✓	–	–	✓	✓
	112	✓	✓	✓	✓	–	–	✓	✓
	132	✓	✓	✓	✓	–	–	✓	✓
	160	✓	✓	✓	✓	–	–	✓	✓
1LG4	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ With extra charge
– Not possible

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pTA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class F, IP55 degree of protection							
1LA6 106-8AB□□	1.6	3	1.9	13	0.0051	45	57
1LA6 107-8AB□□	1.8	3.3	2.1	13	0.0063	45	57
1LA6 113-8AB□□	1.8	3.7	2.1	13	0.013	49	61
1LA6 130-8AB□□	1.9	3.9	2.3	13	0.014	53	65
1LA6 133-8AB□□	2.1	4.1	2.4	13	0.019	53	65
1LA6 163-8AB□□	2.2	4.5	2.6	13	0.036	63	75
1LA6 164-8AB□□	2.3	4.7	2.7	13	0.046	63	75
1LA6 166-8AB□□	2.7	5.3	3	13	0.064	63	75
1LG4 186-8AB□□	1.7	4.2	2.1	13	0.17	65	78
1LG4 207-8AB□□	2.2	4.9	2.6	13	0.29	67	80
1LG4 220-8AB□□	2.3	5.5	2.7	13	0.48	57	70
1LG4 223-8AB□□	2.3	5.6	2.8	13	0.55	50	64
1LG4 253-8AB□□	2.3	5.5	2.6	13	0.84	55	68
1LG4 280-8AB□□	2.2	5	2.1	13	1.1	55	69
1LG4 283-8AB□□	2.2	5.1	2.1	13	1.4	58	71
1LG4 310-8AB□□	2.2	5.8	2.6	13	2.1	59	73
1LG4 313-8AB□□	2.2	5.7	2.6	13	2.5	57	71
1LG4 316-8AB□□	2.2	5.8	2.7	13	3.1	59	73
1LG4 317-8AB□□	2.4	6.1	2.8	13	3.9	59	73
1LG4 318-8AB□□	2.5	6.5	2.9	13	4.5	60	74

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code						
	50 Hz			60 Hz			Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	460 VY	460 VΔ	IM B3/6/7/8, IM V6 ^{1) 2)}	IM B5, IM V3 ^{1) 3)}	IM V1 With protective cover ^{1) 3) 4)}	IM B 35 IM V19 ¹⁾	IM B14, IM B34	IM B14, IM V19 ¹⁾	
	1	6	3	5	1	6	0	1	4	6	2	7	3
1LA6 10 . - . . . □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 11 . - . . . □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 13 . - . . . □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA6 16 . - . . . □□	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LG4 18 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 20 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 22 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 25 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 28 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 310 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 313 . - . . . □□	○	○	○	○	○	○	□	✓ ⁵⁾	✓	✓	–	–	–
1LG4 316 . - . . . □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 317 . - . . . □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG4 318 . - . . . □□	–	○	–	○	–	○	□ ⁶⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁵⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Rated current at 400 V, 50 Hz I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
22	180 M	2955	71	94.1	94.5	0.88	38.5 ¹⁾	1LG6 183-2AA□□		180
30	200 L	2960	97	93.5	93.4	0.88	53 ¹⁾	1LG6 206-2AA□□		225
37	200 L	2960	119	94.1	94	0.89	64 ¹⁾	1LG6 207-2AA□□		255
45	225 M	2965	145	94.9	95.1	0.89	77 ¹⁾	1LG6 223-2AA□□		330
55	250 M	2975	177	95.3	95.3	0.9	93	1LG6 253-2AA□□		420
75	280 S	2975	241	95.2	95.2	0.89	128 ¹⁾	1LG6 280-2AB□□		530
90	280 M	2978	289	95.6	95.7	0.9	150 ¹⁾	1LG6 283-2AB□□		615
110	315 S	2982	352	95.8	95.7	0.91	182 ¹⁾	1LG6 310-2AB□□		790
132	315 M	2982	423	96	95.9	0.91	220 ¹⁾	1LG6 313-2AB□□		915
160	315 L	2982	512	96.4	96.4	0.92	260 ²⁾	1LG6 316-2AB□□		1055
200	315 L	2982	641	96.5	96.5	0.93	320 ²⁾	1LG6 317-2AB□□		1245
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
18.5	180 M	1470	120	92.6	93.2	0.83	34.5 ¹⁾	1LG6 183-4AA□□		155
22	180 L	1470	143	93.2	93.5	0.84	40.5 ¹⁾	1LG6 186-4AA□□		180
30	200 L	1470	195	93.3	93.4	0.85	55 ¹⁾	1LG6 207-4AA□□		225
37	225 S	1480	239	94	94.4	0.85	67 ¹⁾	1LG6 220-4AA□□		290
45	225 M	1480	290	94.5	94.7	0.85	81 ¹⁾	1LG6 223-4AA□□		330
55	250 M	1485	354	95.1	95.3	0.87	96	1LG6 253-4AA□□		460
75	280 S	1485	482	95.1	95.2	0.87	130 ¹⁾	1LG6 280-4AA□□		575
90	280 M	1486	578	95.4	95.5	0.86	158 ¹⁾	1LG6 283-4AA□□		675
110	315 S	1488	706	95.9	96	0.87	190 ¹⁾	1LG6 310-4AA□□		810
132	315 M	1488	847	96.1	96.2	0.88	225 ¹⁾	1LG6 313-4AA□□		965
160	315 L	1490	1026	96.3	96.4	0.88	275 ²⁾	1LG6 316-4AA□□		1105
200	315 L	1490	1282	96.4	96.5	0.88	340 ²⁾	1LG6 317-4AA□□		1305

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge

The motors can also be used for 60 Hz according to EPACT, see pages 4/72 to 4/77.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

³⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LG6 183-2AA□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2AA□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2AA□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2AA□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2AA□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2AB□□	2.5	7	3	13	0.83	73	86
1LG6 283-2AB□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2AB□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2AB□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2AB□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2AB□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LG6 183-4AA□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4AA□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4AA□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4AA□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4AA□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4AA□□	2.6	7.5	3	16	0.86	61	75
1LG6 280-4AA□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4AA□□	2.7	7.5	3.1	16	1.7	67	80
1LG6 310-4AA□□	2.7	7.1	2.9	16	2.3	65	79
1LG6 313-4AA□□	2.7	7.3	2.9	16	2.9	64	78
1LG6 316-4AA□□	3	7.4	3	16	3.5	64	79
1LG6 317-4AA□□	3.2	7.6	3	16	4.2	64	79

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6 ^{1) 2)}	With flange IM B5 ^{1) 3)} IM V3 ⁴⁾	IM V1 with protective cover ^{1) 3) 5)}	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LG6 18 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 20 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 22 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 25 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 28 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 310 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 313 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 316 - ... □□	-	○	-	○	□ ⁶⁾	-	✓ ⁷⁾	✓	-	-	-
1LG6 317 - ... □□	-	○	-	○	□ ⁶⁾	-	✓ ⁷⁾	✓	-	-	-

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- ⁷⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos \phi_{\text{rated}}$	Rated current at 400 V, 50 Hz I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
15	180 L	975	147	90.9	91.7	0.81	29.5	1LG6 186-6AA□□		175
18.5	200 L	978	181	91.2	91.8	0.81	36	1LG6 206-6AA□□		210
22	200 L	978	215	91.9	92.5	0.82	42	1LG6 207-6AA□□		240
30	225 M	980	292	93.2	93.7	0.83	56 ¹⁾	1LG6 223-6AA□□		325
37	250 M	985	359	93.7	94.1	0.83	69	1LG6 253-6AA□□		405
45	280 S	988	435	94.4	94.6	0.85	81	1LG6 280-6AA□□		520
55	280 M	988	532	94.6	94.8	0.85	99	1LG6 283-6AA□□		570
75	315 S	990	723	95	95	0.83	138	1LG6 310-6AA□□		760
90	315 M	990	868	95.3	95.4	0.85	160 ¹⁾	1LG6 313-6AA□□		935
110	315 L	990	1061	95.6	95.7	0.85	196	1LG6 316-6AA□□		1010
132	315 L	990	1273	95.8	95.8	0.85	235	1LG6 317-6AA□□		1180
160	315 L	990	1543	95.8	95.9	0.86	280 ²⁾	1LG6 318-6AA□□		1245
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"										
11	180 L	725	145	88.7	89.6	0.76	23.5	1LG6 186-8AB□□		165
15	200 L	725	198	89.3	89.8	0.8	30.5	1LG6 207-8AB□□		235
18.5	225 S	730	242	91.1	91.8	0.81	36	1LG6 220-8AB□□		295
22	225 M	730	288	91.6	92.1	0.81	43	1LG6 223-8AB□□		335
30	250 M	735	390	92.8	93.3	0.82	57	1LG6 253-8AB□□		435
37	280 S	738	479	93.1	93.3	0.81	71	1LG6 280-8AB□□		510
45	280 M	738	582	93.7	94	0.81	86	1LG6 283-8AB□□		560
55	315 S	740	710	94.3	94.4	0.82	102	1LG6 310-8AB□□		750
75	315 M	740	968	94.5	94.7	0.83	138	1LG6 313-8AB□□		840
90	315 L	740	1161	94.7	95.1	0.84	164	1LG6 316-8AB□□		1005
110	315 L	740	1420	94.8	95.1	0.84	200	1LG6 317-8AB□□		1100
132	315 L	740	1704	94.9	95.2	0.84	240	1LG6 318-8AB□□		1270

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ³⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge

The motors can also be used for 60 Hz according to EPACT, see pages 4/72 to 4/77.

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").
²⁾ For connection to 400 V, parallel feeders are necessary (see the "Introduction" section, "Connection, circuit and connection boxes").

³⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LG6 186-6AA□□	2.4	5.5	2.5	16	0.2	52	65
1LG6 206-6AA□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6AA□□	2.4	5.6	2.4	16	0.36	56	70
1LG6 223-6AA□□	2.8	6.5	2.9	16	0.63	54	68
1LG6 253-6AA□□	2.9	6.8	2.5	16	0.93	57	70
1LG6 280-6AA□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6AA□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6AA□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6AA□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6AA□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6AA□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6AA□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, "High Efficiency"							
1LG6 186-8AB□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8AB□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8AB□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8AB□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8AB□□	2.5	6	2.8	13	1.1	53	67
1LG6 280-8AB□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8AB□□	2.6	6.1	2.5	13	1.6	58	71
1LG6 310-8AB□□	2.5	6.3	2.9	13	2.5	58	72
1LG6 313-8AB□□	2.5	6.7	2.9	13	3.1	58	72
1LG6 316-8AB□□	2.4	6.3	2.8	13	3.9	57	71
1LG6 317-8AB□□	2.4	6.4	2.6	13	4.5	57	71
1LG6 318-8AB□□	2.5	6.7	2.9	13	5.3	58	72

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6 ¹⁾²⁾	With flange IM B5 ¹⁾³⁾ IM V3 ⁴⁾	IM V1 with protective cover ¹⁾³⁾⁵⁾	IM B35	With standard flange IM B14, IM V19 ¹⁾	With special flange IM B14, IM V19 ¹⁾
	1	6	3	5	0	1	4	6	2	7	3
1LG6 18 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 20 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 22 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 25 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 28 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 310 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 313 - ... □□	○	○	○	○	□	✓	✓	✓	-	-	-
1LG6 316 - ... □□	-	○	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 317 - ... □□	-	○	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 318 - ... □□	-	○	-	○	□ ⁶⁾	-	✓	✓	-	-	-

- Standard version
○ With no extra charge

- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data

Rated output at 60 Hz	Frame size	Operating values at rated output						Order No. For order No. supplе- ments for voltage, type of construction and explosion protection zones according to ATEX, see tables below	Price	Weight IM B3 type of construc- tion approx. <i>m</i> kg
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz			
<i>P</i> _{rated} HP	FS	<i>n</i> _{rated} rpm	<i>T</i> _{rated} Nm		<i>η</i> _{rated} %	cos <i>φ</i> _{rated}	<i>I</i> _{rated} A			
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
30	180 M	3560	60	Yes	93	0.88	34	1LG6 183-2AA□□		180
40	200 L	3565	80	Yes	91.7	0.88	46	1LG6 206-2AA□□		225
50	200 L	3565	100	Yes	92.4	0.89	57	1LG6 207-2AA□□		255
60	225 M	3570	120	Yes	93.6	0.89	67	1LG6 223-2AA□□		330
75	225 M	3570	150	Yes	94.5	0.9	83	1LG6 228-2AA□□ ¹⁾		390
75	250 M	3578	149	No	93.6	0.89	84	1LG6 253-2AA□□		420
100	250 M	3580	199	Yes	94.1	0.89	112	1LG6 258-2AA□□ ¹⁾		470
100	280 S	3580	199	No	95	0.89	110	1LG6 280-2AB□□		530
125	280 M	3580	249	Yes	95	0.9	136	1LG6 283-2AB□□		615
150	280 M	3580	299	Yes	95	0.9	164	1LG6 288-2AA□□ ¹⁾		660
150	315 S	3585	298	Yes	94.5	0.91	164	1LG6 310-2AB□□		790
175	315 M	3586	348	Yes	95	0.91	190	1LG6 313-2AB□□		915
200	315 L	3588	397	Yes	95.4	0.91	215	1LG6 316-2AB□□		1055
250	315 L	3588	496	No	95.4	0.93	265	1LG6 317-2AB□□		1245
300	315 L	3591	595	No	95.4	0.92	320	1LG6 318-2AA□□ ¹⁾		1330

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge

The motors can also be used for 50 Hz "High Efficiency", see pages 4/68 to 4/71.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 60 Hz L_{pA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 183-2AA□□	2.7	7.9	3.7	16	0.086	72	85
1LG6 206-2AA□□	2.7	7.8	3.7	16	0.15	75	88
1LG6 207-2AA□□	2.8	7.8	3.7	16	0.18	75	88
1LG6 223-2AA□□	2.8	8.3	3.6	16	0.27	74	87
1LG6 228-2AA□□	3.3	8.7	3.7	16	0.32	74	87
1LG6 253-2AA□□	2.7	7.5	3.2	16	0.47	75	88
1LG6 258-2AA□□	2.8	8.4	3.5	16	0.57	79	92
1LG6 280-2AB□□	2.8	7.9	3.4	13	0.83	77	90
1LG6 283-2AB□□	2.9	8.3	3.4	13	1	77	90
1LG6 288-2AA□□	3.1	8.5	3.6	16	1.16	77	90
1LG6 310-2AB□□	2.6	7.5	3.1	13	1.4	81	94
1LG6 313-2AB□□	3	8.3	3.3	13	1.6	81	94
1LG6 316-2AB□□	3	8.4	3.5	13	2.1	81	94
1LG6 317-2AB□□	3.2	8.6	3.4	13	2.5	81	94
1LG6 318-2AA□□	4.1	10	3.9	16	2.74	83	96

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY (see "Introduction" for outputs at 60 Hz)	460 VΔ	Without flange IM B3/6/7/8, IM V6 ^{1) 2)}	With flange IM B5, IM V3 ^{1) 3) 4)}	IM V1 with protective cover ^{1) 3) 5)}	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 20 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 22 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 25 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 28 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 310 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 313 - □□	○	○	□	✓	✓	✓	–	–	–
1LG6 316 - □□	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓	–	–	–
1LG6 317 - □□	–	○	□	–	✓	✓	–	–	–
1LG6 318 - □□	–	○	□	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.
- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.
- ⁷⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output		EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
25	180 M	1775	100	Yes	92.4	0.82	31	1LG6 183-4AA□□		155
30	180 L	1775	120	Yes	92.4	0.83	36.5	1LG6 186-4AA□□		180
40	200 L	1775	160	Yes	93	0.84	48	1LG6 207-4AA□□		225
50	225 S	1785	199	No	93.6	0.84	60	1LG6 220-4AA□□		290
60	225 M	1785	239	Yes	94.1	0.85	70	1LG6 223-4AA□□		330
75	225 M	1785	299	Yes	94.1	0.85	88	1LG6 228-4AA□□ ¹⁾		355
75	250 M	1790	298	No	94.5	0.86	86	1LG6 253-4AA□□		460
100	250 M	1788	398	Yes	94.5	0.86	116	1LG6 258-4AA□□ ¹⁾		495
100	280 S	1788	398	No	94.5	0.86	114	1LG6 280-4AA□□		575
125	280 M	1790	497	Yes	95	0.86	144	1LG6 283-4AA□□		675
150	280 M	1788	598	Yes	95	0.86	172	1LG6 288-4AA□□ ¹⁾		710
150	315 S	1791	596	Yes	95	0.87	170	1LG6 310-4AA□□		810
175	315 M	1791	696	Yes	95.4	0.87	198	1LG6 313-4AA□□		965
200	315 L	1792	795	Yes	95.4	0.87	225	1LG6 316-4AA□□		1105
250	315 L	1792	994	No	95.8	0.87	280	1LG6 317-4AA□□		1305
300	315 L	1792	1193	No	95.8	0.87	335	1LG6 318-4AA□□ ¹⁾		1345

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge

The motors can also be used for 50 Hz "High Efficiency", see pages 4/68 to 4/71.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code C27. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 60 Hz L_{pTA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 183-4AA□□	2.9	7.1	3.3	16	0.12	65	78
1LG6 186-4AA□□	2.8	7.4	3.4	16	0.14	65	78
1LG6 207-4AA□□	3	7.7	3.7	16	0.23	66	79
1LG6 220-4AA□□	3.1	7.5	3.4	16	0.4	65	78
1LG6 223-4AA□□	3.3	7.9	3.5	16	0.49	65	78
1LG6 228-4AA□□	3	7.8	3.3	16	0.66	64	78
1LG6 253-4AA□□	2.9	8.2	3.4	16	0.86	68	81
1LG6 258-4AA□□	3	8.1	3.3	16	0.99	72	86
1LG6 280-4AA□□	2.9	7.6	3.2	16	1.4	71	84
1LG6 283-4AA□□	3	8.2	3.4	16	1.7	71	84
1LG6 288-4AA□□	3.1	8.4	3.5	16	1.88	71	85
1LG6 310-4AA□□	3.1	7.8	3.2	16	2.3	75	88
1LG6 313-4AA□□	3.2	8.4	3.3	16	2.9	75	88
1LG6 316-4AA□□	3.7	9	3.6	16	3.5	75	88
1LG6 317-4AA□□	4	9.1	3.7	16	4.2	75	88
1LG6 318-4AA□□	4	9.3	3.7	16	4.5	81	94

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY 460 VΔ (see "Introduction" for outputs at 60 Hz)		Without flange IM B3/6/7/8, IM V6 ^{1) 2)}	With flange IM B5, IM V3 ^{1) 3) 4)}	IM V1 with protective cover ^{1) 3) 5)}	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 20-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 22-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 25-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 28-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 310-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 313-...□□	○	○	□	✓	✓	✓	–	–	–
1LG6 316-...□□	–	○	□ ⁶⁾	–	✓	✓	–	–	–
1LG6 317-...□□	–	○	□	–	✓	✓	–	–	–
1LG6 318-...□□	–	○	□	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output		EPACT with CC No. CC 032A	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	Order No.	Price	Weight
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For order No. supplements for voltage, type of construction and explosion protection zones according to ATEX, see tables below		IM B3 type of construction approx. m kg
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT										
20	180 L	1178	121	Yes	91	0.8	25.5	1LG6 186-6AA□□		175
25	200 L	1180	151	Yes	91.7	0.79	32.5	1LG6 206-6AA□□		210
30	200 L	1180	181	Yes	91.7	0.8	38.5	1LG6 207-6AA□□		240
40	225 M	1184	241	Yes	93	0.82	49	1LG6 223-6AA□□		325
50	225 M	1184	301	Yes	93	0.83	61	1LG6 228-6AA□□ ¹⁾		355
50	250 M	1186	300	No	93	0.82	61	1LG6 253-6AA□□		405
60	250 M	1186	361	Yes	93.6	0.82	73	1LG6 258-6AA□□ ¹⁾		435
60	280 S	1190	359	No	94.1	0.83	72	1LG6 280-6AA□□		520
75	280 M	1190	449	No	94.5	0.83	89	1LG6 283-6AA□□		570
100	280 M	1190	599	Yes	94.5	0.84	118	1LG6 288-6AA□□ ¹⁾		615
100	315 S	1191	598	Yes	94.5	0.82	120	1LG6 310-6AA□□		760
125	315 M	1191	747	Yes	95	0.84	148	1LG6 313-6AA□□		935
150	315 L	1192	896	Yes	95	0.84	176	1LG6 316-6AA□□		1010
175	315 L	1192	1046	Yes	95	0.84	205	1LG6 317-6AA□□		1180
200	315 L	1192	1195	Yes	95.4	0.84	235	1LG6 318-6AA□□		1245

Special versions according to ATEX

Motor type	Frame size	Zone 2		VIK (includes Zone 2) ²⁾		Zone 21		Zone 22	
		Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LG6	180	✓	✓	✓	✓	✓	✓	✓	✓
	200	✓	✓	✓	✓	✓	✓	✓	✓
	225	✓	✓	✓	✓	✓	✓	✓	✓
	250	✓	✓	✓	✓	✓	✓	✓	✓
	280	✓	✓	✓	✓	✓	✓	✓	✓
	315	✓	✓	✓	✓	✓	✓	✓	✓

✓ With extra charge

The motors can also be used for 50 Hz "High Efficiency", see pages 4/68 to 4/71.

¹⁾ Only 60 Hz data according to EPACT on the rating plate.

²⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code C27. The VIK version is not possible in combination with Zone 21 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2, 21, 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring-surface sound pressure level at 60 Hz L_{pA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class F, IP55 degree of protection, for implementation in the North American market according to EPACT							
1LG6 186-6AA□□	2.9	6.5	3	16	0.2	57	70
1LG6 206-6AA□□	2.9	6.5	2.7	16	0.29	65	78
1LG6 207-6AA□□	2.9	6.4	2.7	16	0.36	65	78
1LG6 223-6AA□□	3.4	7.2	3.4	16	0.63	62	75
1LG6 228-6AA□□	3.2	7.6	3.4	16	0.76	61	74
1LG6 253-6AA□□	3.4	7.4	2.9	16	0.93	63	76
1LG6 258-6AA□□	3.4	7.4	2.9	16	1.07	65	79
1LG6 280-6AA□□	3.6	7.7	3.1	16	1.4	62	75
1LG6 283-6AA□□	3.9	8.3	3.3	16	1.6	62	75
1LG6 288-6AA□□	4	8.4	3.3	16	1.94	64	78
1LG6 310-6AA□□	3.3	8.4	3.4	16	2.5	66	79
1LG6 313-6AA□□	3	7.9	3.1	16	3.2	66	79
1LG6 316-6AA□□	3.3	8.5	3.3	16	4	66	79
1LG6 317-6AA□□	3.6	8.9	3.6	16	4.7	66	79
1LG6 318-6AA□□	4	9.4	4	16	5.4	69	82

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz 460 VY (see "Introduction" for outputs at 60 Hz)	460 VΔ	Without flange IM B3/6/7/8, IM V6 ^{1) 2)}	With flange IM B5, IM V3 ^{1) 3) 4)}	IM V1 with protective cover ^{1) 3) 5)}	IM B35	With standard flange IM B14, ¹⁾ IM V19 ¹⁾	IM B34	With special flange IM B14, IM V19 ¹⁾
	1	6	0	1	4	6	2	7	3
1LG6 18-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 20-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 22-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 25-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 28-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 310-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 313-...□□	○	○	□	✓	✓	✓	-	-	-
1LG6 316-...□□	-	○	□ ⁶⁾	-	✓	✓	-	-	-
1LG6 317-...□□	-	-	-	-	-	-	-	-	-
1LG6 318-...□□	-	-	-	-	-	-	-	-	-

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7 or IM V6 are fixed to the wall, it is recommended that the motor feet are supported.

- ³⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- ⁵⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁶⁾ Type of construction IM V6 is only possible using type of construction code **9** and order code **M1E**.

IEC Squirrel-Cage Motors

Explosion-proof motors

Self-ventilated, in Zones 2 and 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1LA8

Selection and ordering data

The data for series 1LA8 with type of protection "n" or protection against dust explosions can be found in the selection and ordering data in the "Non-standard motors of frame size 315 and above" section of the catalogue. The technical specifications are identical to the specifications of the non-explosion-proof ver-

sions. They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in Section 3 of the catalogue.

Special versions according to ATEX

Motor type	Zone 2			VIK ¹⁾ (includes Zone 2, utilization F according to B)		Zone 21		Zone 22	
	Frame size	Mains-fed operation Order code M72	Converter-fed operation Order code M73	Mains-fed operation Order code K30	Converter-fed operation On request	Mains-fed operation Order code M34	Converter-fed operation Order code M38	Mains-fed operation Order code M35	Converter-fed operation Order code M39
1LA8	315	✓	O. R.	✓	✓	–	–	✓	✓
	355	✓	O. R.	✓	✓	–	–	✓	✓
	400	✓	O. R.	–	–	–	–	✓	✓
	450	✓	O. R.	–	–	–	–	✓	✓

O. R. Possible on request
 ✓ With extra charge
 – Not possible

Forced-air cooled, in Zones 2 and 22 with type of prot. "n" or prot. against dust explosions - Cast-iron series 1PQ8

Selection and ordering data

The data for series 1PQ8 with type of protection "n" or protection against dust explosions can be found in the selection and ordering data in the "Non-standard motors of frame size 315 and above" section of the catalogue. The technical specifications are identical to the specifications of the non-explosion-proof ver-

sions. They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in Section 3 of the catalogue. Motor series 1PQ8 for converter-fed operation in Zone 2 available on request.

¹⁾ If the marking EEx nA II is required in addition to VIK on the rating plate, this must be ordered using order code **C27**. The VIK version is not possible in combination with Zone 21 and 22.

Overview

General information

Ex motors in vertical type of construction with shaft extension pointing down must have a protective cover.

Extensive operating instructions are supplied as standard with explosion-proof motors.

For all explosion-proof motors, designs according to UL (order code **D31**) and CSA (order code **D40**) are not possible.

Motor connection

For motors in Ex version (except for Zone 22, VIK, motor series 1MJ8 and 1MJ1), certified metric cable glands/sealing plugs are included in the scope of supply.

Motor series 1MJ8 and 1MJ1 have an auxiliary connection box when they are ordered with PTC thermistors, anti-condensation heater or 3 PT 100s for monitoring the windings.

Mains-fed operation

Motors to type of protection

- EEx e are only certified for mains operation.
- EEx de/EEx d are designed in the basic version for mains-fed operation
- Motors 1LA/1LG can be modified for use in Zones 2, 21 or 22 if they are ordered using order codes:
 - Design for Zone 2 for mains-fed operation - (order code **M72**)
 - Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation - (order code **M34**)
 - Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation - (order code **M35**)

Certified motor protection switches/tripping units must be used for motor protection, see Catalogue LV 1.

Converter-fed operation

The motors are suitable for use with converters for voltage rise times $t_g > 0.1 \mu s$ for $U \leq 500 V$.

For converter-fed operation, Ex motors must always be monitored using PTC thermistors. Certified tripping units are required for this purpose, see Catalogue LV 1.

For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" - Order code **L27** is used.

Type of protection "Explosion-proof enclosure" EEx de IIC T4/ EEx d IIC T4

The motors must be ordered with:

- Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping - Order code **A15**

or

- Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping - Order code **A16**

For motor series 1MJ6 and 1MJ7, when PTC thermistors are mounted, one is installed in the connection box in each case.

Thermal utilisation is according to temperature class F.

The EU type test certificate and factory certificate 2.2 also cover converter-fed operation.

General converters for Zone 2/21/22

1LA and 1LG motors for Zones 2, 21 and 22 for converter-fed operation have 3 PTC thermistors for tripping as standard. 1LG4/1LG6 motors also have an additional PTC thermistor in the connection box.

Optionally available: PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 - Order code **A10**

For all motors, "MICROMASTER DUTY S9" is stamped on the rating plate complete with the relevant rating data. (Exception: Motor series 1LA8 and 1PQ8).

These rated operating points apply for both constant torque drives and pump/fan/compressor drives. For a constant torque drive, the resulting thermal motor torques in the positioning range must be taken into account.

On the rating plate, four rated operating points are possible in the following variants:

Possible variants:	Rated operating points in Hz				Additional order information
50 Hz field weakening range	5	25	50	f_{max}	50 Hz voltage: e.g. "9" and L1A
60 Hz field weakening range	6	30	60	f_{max}	60 Hz voltage: e.g. "9" and L2E
87 Hz characteristic	5	25	87	f_{max}	87 Hz at 400 VΔ: "9" and L3A

Alternatively, rated operating points for SIMOVERT MASTER-DRIVES, SINAMICS G110 or ET 200S FC on the rating plate can be ordered as follows:

Y68 with plain text (C text): Y68:SIMOVERT MASTERDRIVES

Y68 with plain text (C text): Y68:SINAMICS G110

Y68 with plain text (C text): Y68:ET 200S FC

- The converter type and the associated rating data are on the rating plate

The reasons for this are the different control levels for the converter with a converter output frequency of 45 Hz and above and the associated derating of the motor.

For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. Derating information is available on request.

The certificates for the motors and converters for hazardous areas are stored under "Documentation" in the SD configurator tool for low-voltage motors.

Only "one" voltage must be assigned to voltage codes/order codes:

Voltage code	Order code	Supply voltage
3	-	500 VY 50 Hz
5	-	500 VΔ 50 Hz
9	L1A	400 VY 50 Hz
9	L1B	400 VΔ 50 Hz
9	L1C	415 VY 50 Hz
9	L1D	415 VΔ 50 Hz
9	L2E	460 VY 60 Hz
9	L2F	460 VΔ 60 Hz
9	L2W	440 VY 60 Hz
9	L2X	440 VΔ 60 Hz
9	L1Y (non-standard winding)	Plain text (max. 500 VY 50 or 60 Hz)
9	L3A ¹⁾	For 87 Hz 400 VΔ (4 to 8-pole)

¹⁾ Not technically possible for 1LG, FS 315 L.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Overview (continued)

1LA8, 1PQ8 motors for converter-fed operation

When 1LA8 and 1PQ8 motors are ordered, the speed setting range and the load torque must be specified as well as whether the application is for a "Constant torque drive" or a "Fan/pump/compressor drive".

In some cases, a system test must be performed to ensure that the maximum limit temperature is not exceeded.

- A system test is not generally required for motors for applications with quadratic load torque ($M \sim n^2$).
- A system test is usually required for motors for applications with constant load torque. In individual cases in which the motor type has already been measured once using the same speed setting range, a new system test is not necessary.

Please enquire in such cases.

For all motors, an additional rating plate complete with the rating data for the converter is fitted.

Converters specially for Zone 2, type of protection "n" or (E)Ex nA II T3

The motors must be ordered with

- **Design for Zone 2 for converter-fed operation, reduced output**
Ex nA II T3/EEEx nA II T3 acc. to IEC/EN 60079-15 - Order code **M73**.

In the version for order code **M73**, PTC thermistors are included in accordance with temperature class B.

The IEC/EN 60079-15 standard requires that the converter drive for motors is subjected to the "non-sparking" test. The test is available for Siemens motors (E)Ex nA II on Siemens converters in accordance with Factory Certificate 2.1.

Please enquire in the case of a non-Siemens converter (extra charge).

The test will cost more in the case of non-Siemens converters (especially on commissioning). Commissioning personnel must be provided by the customer for setting up and operating the non-Siemens converter during the test, if required.

Converters specially for Zone 21/22

The motors must be ordered with:

- Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating - Order code **M38**
- Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating - Order code **M39**

In order codes **M38/M39**, PTC thermistors are included in accordance with temperature class B.

Please enquire in the case of a non-Siemens converter (extra charge).

VIK version

VIK standard version:

- VIK version - Order code **K30**

VIK version "Non-sparking":

- "EEEx nA II T3" marking on VIK rating plate according to Directive 94/9/EU (ATEX) - Order code **C27**

The motors in VIK design (**K30**) contain technology for Zone 2 in EEx nA II T3 type of protection. In accordance with VIK recommendations, "EEEx nA II T3" will only be stamped on the rating plate on the express wish of the customer when ordering with order code **C27**.

Note: When ordering, **C27** must be specified in addition to **K30**.

Motors up to frame size 355 can be supplied in accordance with the technical requirements of the VIK (Verband der Industriellen Energie- und Kraftwirtschaft e.V.). Not possible for 1LA5 motors, 1LG4 motors will be supplied.

1LG4, 1LG6, 1MJ6 and 1MJ7 motors in frame size 315 are supplied with special connection boxes with a removable cable entry plate.

Note the output and dimensions in the case of 1LA8 motors. With 1LA8 motors the connection boxes cannot be rotated by $4 \times 90^\circ$. Motors in a vertical type of construction with the shaft extension pointing down must have a protective cover (e.g. type of construction code **4**). Use according to temperature class B is mandatory. Frame sizes 400 and 450 are not included in VIK.

Please enquire about converter-fed operation in all cases.

Motors in VIK design with mounted technology (brake, rotary pulse encoder, separately driven fan and anti-condensation heater) are not compatible with Zone 2. Designs for Zone 21/22 are not possible.

Chinese explosion-proof certification

For projects in China in particular, explosion-proof motors are required that have been approved by a named Chinese testing authority.

Ex certification for China - Order code **D32**

The following motor series have Chinese Ex certification:

- Zone 1 type of protection "d" or EEx de IIC T4/EEEx d IIC T4: 1LA6, 1LA7, 1LA9, 1MJ6, 1MJ7
- Zone 2 type of protection "n" or Ex nA II T3: 1LG when ordered in:
 - **Design for Zone 2 for mains-fed operation**
Ex nA II T3/EEEx nA II T3 acc. to IEC/EN 60079-15 - Order code **M72**.
 - **Design for Zone 2 for converter-fed operation, derating**
Ex nA II T3/EEEx nA II T3 acc. to IEC/EN 60079-15 - Order code **M73**.

In addition, the VIK design for motor series 1MJ6, 1MJ7, 1LA, 1LG can also be ordered with Ex certification for China.

When these motors are ordered in the version

- "Ex certification for China" - Order code **D32**

the "NEPSI¹⁾ certificate number" and the "NEPSI" logo are stamped on the rating plate.

For motor series 1LA8, the "CQST²⁾ certificate number" and the logo: "CQST" are then stamped on the rating plate.

¹⁾ NEPSI = National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation.

²⁾ CQST = China National Quality Supervision and Test Centre for Explosion Protected Electrical Products.

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in Zone 1 with type of protection "e" - Aluminium series 1MA7																		
			1MA7 (aluminium)															
Voltage at 50 Hz																		
220 VΔ/380 VY (209 ... 231 VΔ/361 ... 399 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓							
380 VΔ/660 VY (361 ... 399 VΔ/627 ... 693 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓							
415 VY (394 ... 436 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓							
415 VΔ (394 ... 436 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓							
Voltage at 60 Hz ²⁾																		
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓							
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓							
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓							
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓							
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓							
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓							
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓							
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓							
Non-standard voltage and/or frequencies																		
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓							
Self-ventilated motors in Zone 1 with type of protection "e" - Cast-iron series 1MA6																		
			1MA6 (cast-iron)															
Voltage at 50 Hz																		
220 VΔ/380 VY (209 ... 231 VΔ/361 ... 399 VY); 50 Hz output ¹⁾	9	L1R							✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY (361 ... 399 VΔ/627 ... 693 VY); 50 Hz output ¹⁾	9	L1L							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (394 ... 436 VY); 50 Hz output ¹⁾	9	L1C							✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (394 ... 436 VΔ); 50 Hz output ¹⁾	9	L1D							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Voltage at 60 Hz ²⁾																		
220 VΔ/380 VY; 50 Hz output	9	L2A							✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q							✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S							✓	✓	✓	✓	✓	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T							✓	✓	✓	✓	✓	○	○	○	○	○
575 VY; 50 Hz output	9	L2U							✓	✓	✓	✓	✓	○	○	○	○	–
575 VΔ; 50 Hz output	9	L2V							✓	✓	✓	✓	✓	○	○	○	○	○
Non-standard voltage and/or frequencies																		
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For order codes **L1C**, **L1D**, **L1L**, **L1R**, **L1U** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ Special certification is required for 60 Hz.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size																315 S/M	315 L
			56	63	71	80	90	100	112	132	160	180	200	225	250	280				
Self-ventilated motors in Zone 1w ith type of protection "d" - Cast-iron series 1MJ6 and 1MJ7																				
			1MJ6 (cast-iron)										1MJ7 (cast-iron)							
Voltage at 50 Hz																				
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R																–		
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L																✓		
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C																–		
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D																✓		
Voltage at 60 Hz																				
220 VΔ/380 VY; 50 Hz output	9	L2A																–		
220 VΔ/380 VY; 60 Hz output	9	L2B																–		
380 VΔ/660 VY; 50 Hz output	9	L2C																–		
380 VΔ/660 VY; 60 Hz output	9	L2D																–		
440 VY; 50 Hz output	9	L2Q																–		
440 VY; 60 Hz output	9	L2W																–		
440 VΔ; 50 Hz output	9	L2R																–		
440 VΔ; 60 Hz output	9	L2X																–		
460 VY; 50 Hz output	9	L2S																–		
460 VY; 60 Hz output	9	L2E														○	○	–		
460 VΔ; 50 Hz output	9	L2T																–		
460 VΔ; 60 Hz output	9	L2F														○	○	–		
575 VY; 50 Hz output	9	L2U																–		
575 VY; 60 Hz output	9	L2L																–		
575 VΔ; 50 Hz output	9	L2V																–		
575 VΔ; 60 Hz output	9	L2M														○	○	–		
Non-standard voltage and/or frequencies																				
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •																		

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For order codes **L1C**, **L1D**, **L1L**, **L1R**, **L1U** and **L1A**, a rated voltage range is also included on the rating plate, with the exception of versions in Zone 2 type of protection "n" or (E) Ex n II T3.

²⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size			
			315	355	400	450
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron/steel series 1MJ8 and 1MJ1						
			1MJ8			
Voltage at 60 Hz						
220 VΔ/380 VY; 60 Hz output	9	L2B		✓		
380 VΔ/660 VY; 60 Hz output	9	L2D		✓		
440 VY; 60 Hz output	9	L2W		✓		
440 VΔ; 60 Hz output	9	L2X		✓		
460 VY; 60 Hz output	9	L2E		○		
460 VΔ; 60 Hz output	9	L2F		○		
575 VY; 60 Hz output	9	L2L		✓		
575 VΔ; 60 Hz output	9	L2M		○		
Non-standard voltage and/or frequencies						
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •		✓		
			1MJ1			
Voltage at 60 Hz						
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓
460 VY; 60 Hz output	9	L2E	○	○	○	○
460 VΔ; 60 Hz output	9	L2F	○	○	○	○
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M	○	○	○	○
Non-standard voltage and/or frequencies						
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5																		
			1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ¹⁾					
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A		○	○	○	○	○	○	○	○	○	○	○				
400 VΔ (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1B		○	○	○	○	○	○	○	○	○	○	○				
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U		○	○	○	○	○	○	○	○	○	○	○				
400 VΔ 87 Hz output (4-pole to 8-pole only) ³⁾	9	L3A		○	○	○	○	○	○	○	○	○	○	○				
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○	○				
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○	○				
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard voltage and/or frequencies																		
Non-standard winding for voltages between 200 V and 690 V (voltages outside this range are available on request) ⁴⁾	9	L1Y •		✓	✓		✓	✓	✓	✓	✓		✓	✓				

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Zone 2 is not possible for motor series 1LA5 and motor series 1LA7 for frame size 56.

²⁾ For Zone 21 and 22, for order codes **L1C, L1D, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

³⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

⁴⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

Special versions	Voltage code 11th position of the Order No.	Additional identifica- tion code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9																		
			1LA9 (aluminium)															
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A		○	○	○	○	○	○	○	○	○	○					
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B		○	○	○	○	○	○	○	○	○	○					
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U		○	○	○	○	○	○	○	○	○	○					
400 VΔ 87 Hz output (4-pole to 8-pole only) ²⁾	9	L3A		○	○	○	○	○	○	○	○	○	○					
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
220 VΔ/380 VY; 60 Hz output	9	L2B		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
380 VΔ/660 VY; 50 Hz output	9	L2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
380 VΔ/660 VY; 60 Hz output	9	L2D		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
440 VY; 50 Hz output	9	L2Q		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
440 VY; 60 Hz output	9	L2W		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
440 VΔ; 50 Hz output	9	L2R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
440 VΔ; 60 Hz output	9	L2X		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
460 VY; 50 Hz output	9	L2S		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
460 VY; 60 Hz output	9	L2E		○	○	○	○	○	○	○	○	○	○					
460 VΔ; 50 Hz output	9	L2T		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
460 VΔ; 60 Hz output	9	L2F		○	○	○	○	○	○	○	○	○	○					
575 VY; 50 Hz output	9	L2U		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
575 VY; 60 Hz output	9	L2L		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
575 VΔ; 50 Hz output	9	L2V		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
575 VΔ; 60 Hz output	9	L2M		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Non-standard voltage and/or frequencies																		
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					

- With no extra charge
- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For Zones 21 and 22, for order codes **L1C, L1D, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size																
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L	
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																			
										1LA6 (cast-iron)				1LG4 (cast-iron)					
Voltage at 50 Hz																			
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A								○	○	○	○	○	○	○	○	○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B								○	○	○	○	○	○	○	○	○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U								○	○	○	○	○	○	○	○	○	○
400 VΔ 87 Hz output (2-pole to 4-pole only) ²⁾	9	L3A								○	○	○	○	○	○	○	○	○	–
Voltage at 60 Hz																			
220 VΔ/380 VY; 50 Hz output	9	L2A								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E								○	○	○	○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F								○	○	○	○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L								✓	✓	✓	✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M								○	○	○	○	○	○	○	○	○	○
Non-standard voltage and/or frequencies																			
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For Zone 21 and 22, for order codes **L1C, L1D, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L

Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6

			1LG6 (cast-iron)										
Voltage at 50 Hz													
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R					✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ¹⁾	9	L1L					✓	✓	✓	✓	✓	✓	✓
415 VY (395 ... 435 VY); 50 Hz output ¹⁾	9	L1C					✓	✓	✓	✓	✓	✓	–
415 VΔ (395 ... 435 VΔ); 50 Hz output ¹⁾	9	L1D					✓	✓	✓	✓	✓	✓	✓
400 VY (380 ... 420 VY); 50 Hz output ¹⁾	9	L1A					○	○	○	○	○	○	–
400 VΔ (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1B					○	○	○	○	○	○	○
400 VΔ (460 VΔ bei 60 Hz) (380 ... 420 VΔ); 50 Hz output ¹⁾	9	L1U					○	○	○	○	○	○	○
400 VΔ 87 Hz output (4-pole to 8-pole only) ²⁾	9	L3A					○	○	○	○	○	○	–
Voltage at 60 Hz													
220 VΔ/380 VY; 50 Hz output	9	L2A					✓	✓	✓	✓	✓	✓	–
220 VΔ/380 VY; 60 Hz output	9	L2B					✓	✓	✓	✓	✓	✓	–
380 VΔ/660 VY; 50 Hz output	9	L2C					✓	✓	✓	✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	L2D					✓	✓	✓	✓	✓	✓	✓
440 VY; 50 Hz output	9	L2Q					✓	✓	✓	✓	✓	✓	–
440 VY; 60 Hz output	9	L2W					✓	✓	✓	✓	✓	✓	–
440 VΔ; 50 Hz output	9	L2R					✓	✓	✓	✓	✓	✓	✓
440 VΔ; 60 Hz output	9	L2X					✓	✓	✓	✓	✓	✓	✓
460 VY; 50 Hz output	9	L2S					✓	✓	✓	✓	✓	✓	–
460 VY; 60 Hz output	9	L2E					○	○	○	○	○	○	–
460 VΔ; 50 Hz output	9	L2T					✓	✓	✓	✓	✓	✓	✓
460 VΔ; 60 Hz output	9	L2F					○	○	○	○	○	○	○
575 VY; 50 Hz output	9	L2U					✓	✓	✓	✓	✓	✓	–
575 VY; 60 Hz output	9	L2L					✓	✓	✓	✓	✓	✓	–
575 VΔ; 50 Hz output	9	L2V					✓	✓	✓	✓	✓	✓	✓
575 VΔ; 60 Hz output	9	L2M					○	○	○	○	○	○	○
Non-standard voltage and/or frequencies													
Non-standard winding for volt- ages between 200 and 690 V (voltages outside this range are available on request) ³⁾	9	L1Y •					✓	✓	✓	✓	✓	✓	✓

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For Zone 21 and 22, for order codes **L1C, L1D, L1L, L1R, L1U, L1B** and **L1A** a rated voltage range is also marked on the rating plate.

²⁾ The rating data for converter-fed operation is also provided in a table on the rating plate.

³⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size																315 S/M	315 L	2-pole	4-, 6-, 8-pole
			56	63	71	80	90	100	112	132	160	180	200	225	250	280						

Self-ventilated motors in Zone 1 with type of protection "e" - Aluminium series 1MA7

			1MA7 (aluminium)																		
Without flange																					
IM V5 with protective cover ^{1) 2)}	9	M1F			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With standard flange																					
IM V18 with protective cover ^{1) 2)}	9	M2A			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With special flange																					
IM V18 with protective cover ^{1) 2)}	9	M2B			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
IM B34	9	M2C			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

Self-ventilated motors in Zone 1 with type of protection "e" - Cast-iron series 1MA6

			1MA6 (cast-iron)																		
Without flange																					
IM V6 ^{1) 3)}	9	M1E																	✓ ⁴⁾	○	
IM V5 with protective cover ^{1) 2) 3)}	9	M1F							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ⁴⁾	✓	
With flange																					
IM V3 ^{1) 5)}	9	M1G										✓	✓	✓	✓	✓	✓	✓			
With special flange																					
IM V18 with protective cover ^{1) 2)}	9	M2B							✓	✓	✓	✓									
IM B34	9	M2C							✓	✓	✓	✓									

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

⁴⁾ 60 Hz version is possible on request.

⁵⁾ 1MA6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 1w ith type of protection "d" - Cast-iron series 1MJ6 and 1MJ7																		
			1MJ6 (cast-iron)											1MJ7 (cast-iron)				
Without flange																		
IM V5 with protective cover ^{1) 2) 3)}	9	M1F			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With flange																		
IM V3 ^{1) 4)}	9	M1G			–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
With standard flange																		
IM V18 with protective cover ^{1) 2)}	9	M2A			✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–
With special flange																		
IM V18 with protective cover ^{1) 2)}	9	M2B			✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
IM B34	9	M2C			✓	✓	–	–	–	–	–	–	–	–	–	–	–	–

- ✓ With extra charge
– Not possible

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size			
			315	355	400	450
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron/steel series 1MJ8 and 1MJ1						
			1MJ8 (cast-iron)			
Without flange						
IM V5 with protective cover ^{1) 2) 5)}	9	M1F		✓		
			1MJ1 (cast-iron)			
Without flange						
IM V5 with protective cover ^{1) 2) 5)}	9	M1F	✓	✓	✓	✓

- ✓ With extra charge

- ¹⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ²⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ³⁾ If motors of frame sizes 180 M to 315 M are mounted on the wall, it is recommended that the motor feet are supported.

- ⁴⁾ 1MJ7 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
- ⁵⁾ When motors are mounted on the wall, it is recommended that the motor feet are supported.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and plain text if required	Motor type frame size																315 S/M	315 L	2-pole	4-, 6-, 8-pole
			56	63	71	80	90	100	112	132	160	180	200	225	250	280						

Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5

			1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ¹⁾			
Without flange																
IM V5 with protective cover ^{2) 3)}	9	M1F		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
With flange																
IM V3 ^{2) 4)}	9	M1G		–	–	–	–	–	–	–	–	–	–	✓	✓	✓
With standard flange																
IM V18 with protective cover ^{2) 3)}	9	M2A		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
With special flange																
IM V18 with protective cover ^{2) 3)}	9	M2B		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
IM B34	9	M2C		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–

Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9

			1LA9 (aluminium)													
Without flange																
IM V5 with protective cover ^{2) 3)}	9	M1F	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With flange																
IM V3	9	M1G	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
With standard flange																
IM V18 with protective cover ^{2) 3)}	9	M2A	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
With special flange																
IM V18 with protective cover ^{2) 3)}	9	M2B	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
IM B34	9	M2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-

Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4

				1LA6 (cast-iron)	1LG4 (cast-iron)											
Without flange																
IM V6 ^{2) 6)}	9	M1E		-	-	-	-	-	-	-	-	-	-	-	✓ ⁵⁾	○
IM V5 with protective cover ^{2) 3) 6)}	9	M1F		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ⁵⁾	✓
With flange																
IM V3 ^{2) 7)}	9	M1G		-	-	-	-	✓	✓	✓	✓	✓	✓	✓	-	-
With standard flange																
IM V18 with protective cover ^{2) 3)}	9	M2A		✓	✓	✓	✓	-	-	-	-	-	-	-	-	-
With special flange																
IM V18 with protective cover ^{2) 3)}	9	M2B		✓	✓	✓	✓	-	-	-	-	-	-	-	-	-
IM B34	9	M2C		✓	✓	✓	✓	-	-	-	-	-	-	-	-	-

Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6

			1LG6 (cast-iron)													
Without flange																
IM V6 ⁶⁾	9	M1E	-	-	-	-	-	-	-	-	-	-	-	-	✓ ⁵⁾	○
IM V5 with protective cover ^{2) 3) 6)}	9	M1F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ⁵⁾	✓
With flange																
IM V3 ^{2) 7)}	9	M1G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-

- With no extra charge
- ✓ With extra charge
- Not possible

- ¹⁾ Zone 2 is not possible for motor series 1LA5 and motor series 1LA7 for frame size 56.
- ²⁾ The following applies for explosion-proof motors: In the case of the types of construction with shaft end down, the version "with protective cover" is required. For types of construction with shaft extension pointing upwards, a suitable cover must be implemented to prevent small parts from falling into the fan cover (see the standard IEC/EN 60079-0). The cover must not block the cooling air-flow.
- ³⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁴⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state identification code **"-Z"** and order code **K32**.

- ⁵⁾ 60 Hz version is possible on request.
- ⁶⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.
- ⁷⁾ 1LG4/1LG6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" - Aluminium series 1MA7																
		1MA7 (aluminium)														
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓						
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓						
Motor connection and connection boxes																
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓						
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓						
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓						
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓						
Rotation of connection box through 180°	K85		✓	✓	✓	✓	○	○	○	○						
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓						
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓						
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓						
Colours and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□						
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 6011 mignonetta green	K27		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓						
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓						

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 1 with type of protection "e" - Aluminium series 1MA7																	
		1MA7 (aluminium)															
Colours and paint finish (continued)																	
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓							
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓							
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓							
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓							
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓							
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓							
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○							
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓							
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction	K17		✓	✓	✓	✓	✓	✓	✓	✓							
Low-noise version for 2-pole motors with clockwise direction of rotation ²⁾	K37		–	–	–	–	–	–	✓	✓							
Low-noise version for 2-pole motors with clockwise direction of rotation ²⁾	K38		–	–	–	–	–	–	✓	✓							
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓							
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓							
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓							
Condensation drainage holes ³⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓							
Non-rusting screws (externally)	M27		–	–	✓	✓	✓	✓	✓	✓							
Designs in accordance with standards and specifications																	
CCC China Compulsory Certification ⁴⁾	D01		✓	✓	✓	✓	–	–	–	–							
VIK version	K30		✓	✓	✓	✓	✓	✓	✓	✓							
Bearings and lubrication																	
Bearing design for increased cantilever forces	K20		–	–	–	–	✓	✓	✓	✓							
Regreasing device	K40		–	–	–	–	✓	✓	✓	✓							
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓							
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓							
Balance and vibration severity																	
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓							
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓							
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁵⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓							
Second standard shaft extension ⁶⁾	K16		✓	✓	✓	✓	✓	✓	✓	✓							
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓							
Non-standard cylindrical shaft extension ⁷⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓							

For legend and footnotes, see page 4/93.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" - Aluminium series 1MA7																
		1MA7 (aluminium)														
Heating and ventilation																
Metal external fan	K35		–	–	–	–	✓	✓	✓	✓						
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓						
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓						
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓						
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓						
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓						
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○						

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For associated 3RN1 tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required. Motor protection by means of PTC thermistor as sole protection available on request.
- 2) 1MA7 motors are up to 80 mm longer than normal. A second shaft extension is not possible.
- 3) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 4) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 5) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 6) Not possible for low-noise version (2-pole) for frame sizes 132 S to 160 L. Version with protective cover not possible.
- 7) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
 - For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 - For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 1 with type of protection "e" - Cast-iron series 1MA6																	
		1MA6 (cast-iron)															
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection boxes																	
Connection box on RHS	K09						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15						□	□	□	□	✓	✓	□	□	□	□	□
Rotation of the connection box through 90°, entry from DE	K83						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00						–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Auxiliary connection box 1XB3 020	L97						–	–	–	–	–	–	✓	✓	✓	✓	✓
Windings and insulation																	
Increased air humidity/temperature with 30 to 60 g water per m³ of air	C19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26						✓	✓	✓	✓	✓	✓	–	–	–	–	–
Colours and paint finish																	
Standard finish in RAL 7030 stone gray							–	–	–	–	–	–	–	□	□	□	□
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL						–	–	–	–	–	–	–	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26 ²⁾						□	□	□	□	□	□	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 mignonetta green	K27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 4/96.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e" - Cast-iron series 1MA6																
		1MA6 (cast-iron)														
Colours and paint finish (continued)																
Special finish in RAL 7001 silver gray	M20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	–	–	–	–
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for type of construction IM V3; with frame size 180 M and above, only possible for 4-pole to 6-pole motors	K17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ³⁾	K37						–	–	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ³⁾	K38						–	–	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03						✓	✓	✓	–	–	–	–	–	–	–
Condensation drainage holes ⁴⁾	L12						✓	✓	✓	✓	✓	✓	–	–	–	–
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																
VIK version	K30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						–	–	–	–	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁵⁾	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Located bearing DE	K94						✓	✓	✓	✓	✓	✓	–	–	–	–
Located bearing NDE	L04						✓	✓	✓	□	–	–	–	–	–	–
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level R)	K02						–	–	–	–	✓	✓	✓ ⁶⁾	✓ ⁶⁾	✓ ⁶⁾	✓ ⁶⁾

For legend and footnotes, see page 4/96.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 1 with type of protection "e" - Cast-iron series 1MA6																	
		1MA6 (cast-iron)															
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁶⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Second standard shaft extension ⁷⁾	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ⁸⁾	Y55 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Heating and ventilation																	
Cast-iron fan cowl	K34						–	–	–	–	–	–	✓	✓	✓	✓	
Metal external fan	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Anti-condensation heaters for 230 V	K45						–	–	–	–	–	–	✓	✓	✓	✓	
Anti-condensation heaters for 115 V	K46						–	–	–	–	–	–	✓	✓	✓	✓	
Rating plate and extra rating plates																	
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Additional information on rating plate and on package label	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Wire-lattice pallet	L99						○	○	○	○	○	○	–	–	–	–	

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For associated 3RN1 tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required. Motor protection with PTC thermistors is available as sole protection up to frame size 160 L on request. With frame size 180 M and above, it is not permitted as sole protection; motor protection switch is required.
- ²⁾ For frame sizes 100 to 200, do not specify an order code. Order code is only necessary for frame sizes 225 to 315.
- ³⁾ 1MA6 motors are up to 80 mm longer than normal. A second shaft extension is not possible.
- ⁴⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- ⁵⁾ Not possible for 2-pole 1MA6 motors, frame size 315 L in vertical frame sizes; bearings for increased cantilever forces for vibration severity level R are available on request for 1MA6 motors of frame size 225 M and above. Not possible for 1MA6 motors of frame size 225 M and above in combination with concentricity of shaft extension, coaxiality and linear movement according to DIN 42955 tolerance R for flange-mounting types.
- ⁶⁾ Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).

- ⁷⁾ For motors of frame size 180 M and above in vertical type of construction in version with second shaft extension on request. Not possible for low-noise version (2-pole) for frame sizes 132 S to 160 L. Version with protective cover not possible.
- ⁸⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
– Dimensions D and DA ≤ Inner diameter of roller bearing (see tables under "Dimensions")
– Dimensions E and EA ≤ 2 x Length E (normal) of the shaft extension
For explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron series 1MJ6 and 1MJ7																
		1MJ6 (cast-iron)										1MJ7 (cast-iron)				
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ^{1) 2)}	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ^{1) 2) 3)}	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors for converter-fed operation with 4 embedded temperature sensors for tripping ^{1) 2)}	A15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors for converter-fed operation with 8 embedded temperature sensors for tripping and alarm ^{1) 2) 3)}	A16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor connection and connection boxes																
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15		✓	✓	✓	✓	✓	✓	✓	✓ ⁴⁾	✓	✓	✓	□	□	□
Explosion-proof connection box, EEx d IIC type of protection ¹⁴⁾	K53		✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Auxiliary connection box 1XB3020	L97		–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓
Windings and insulation																
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colours and paint finish																
Standard finish in RAL 7030 stone gray			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 1/17	Y53 • and standard finish RAL		–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26 ⁵⁾		□	□	□	□	□	□	□	□	□	□	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 reseda green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 4/99.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron series 1MJ6 and 1MJ7																
			1MJ6 (cast-iron)										1MJ7 (cast-iron)			
Colours and paint finish (continued)																
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for type of construction IM V3; with frame size 180 M and above, only possible for 4-pole to 8-pole motors	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁶⁾	K37		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with anticlockwise direction of rotation ⁶⁾	K38		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁷⁾	D01		✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–
VIK version	K30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ex certification for China	D32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁸⁾	K20		–	–	–	–	–	–	–	✓	✓	✓	✓	–	–	–
Regreasing device	K40		–	–	–	–	–	–	–	✓	✓	✓	✓	□	□	□
Insulated bearing cartridge	L27		–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
Balance and vibration severity																
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		–	–	–	–	–	–	–	–	–	–	✓	✓	–	–

For legend and footnotes, see page 4/99.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron series 1MJ6 and 1MJ7																
		1MJ6 (cast-iron)										1MJ7 (cast-iron)				
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁹⁾	K04			–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁰⁾	K16			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39			–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code			–	–	–	–	–	–	–	–	–	O. R.	O. R.	O. R.	O. R.
Heating and ventilation																
Metal external fan	K35			–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V ¹²⁾ ¹³⁾	K45			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V ¹²⁾ ¹³⁾	K46			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second rating plate, loose	K31			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99			○	○	○	○	○	○	○	○	○	–	–	–	–

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For associated 3RN1 tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.
- ²⁾ For 1MJ6 motors, for a version with PTC thermistors, an anti-condensation heater (order code **K45**, **K46**) up to frame size 160 L is not possible.
- ³⁾ For 1MJ7 motors, for a version with 6 PTC thermistors, an anti-condensation heater (order code **K45**, **K46**) is not possible. Exception: 1MJ7 frame size 315.
- ⁴⁾ For 1MJ6 motors frame size 160 L standard version.
- ⁵⁾ For frame sizes 71 to 200, do not specify an order code. Order code is only necessary for frame sizes 225 to 315.
- ⁶⁾ The motors are up to 80 mm longer than normal. A second shaft extension is not possible.
- ⁷⁾ CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- ⁸⁾ Bearings for increased cantilever forces at vibration severity level R on request.
- ⁹⁾ Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- ¹⁰⁾ For 1MJ6/1MJ7 motors of frame size 180 M and above in vertical type of construction in version with second shaft extension on request. Not possible for low-noise version (2-pole). Version with protective cover not possible.

- ¹¹⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- ¹²⁾ For 1MJ6 motors, version with 3 PTC thermistors (order codes **A11**, **A15**) is not possible up to frame size 160 L.
- ¹³⁾ Not possible for version with 6 PTC thermistors (order codes **A12**, **A16**). Exception: 1MJ7 frame size 315.
- ¹⁴⁾ Drilled holes for the cable glands are sealed with EExd plugs for 1MJ motors as standard.
On request, the EExd cable entries can be supplied for 1MJ7 motors. When ordering, the number of cables and outer diameters must be specified so that the appropriate cable glands can be supplied.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron/steel series 1MJ8 and 1MJ1									
			1MJ8 (cast-iron)		1MJ1 (cast-iron)				
Motor protection and degrees of protection									
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ^{1) 2)}	A11		✓		✓	✓	✓	✓	
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ^{1) 2) 3)}	A12		✓		✓	✓	✓	✓	
Motor protection with PTC thermistors for converter-fed operation with 3 embedded temperature sensors for tripping ^{1) 2)}	A15		✓		✓	✓	✓	✓	
Motor protection with PTC thermistors for converter-fed operation with 6 embedded temperature sensors for tripping and alarm ^{1) 2) 3)}	A16		✓		✓	✓	✓	✓	
Installation of 3 PT 100 resistance thermometers ²⁾	A60		✓		✓	✓	✓	✓	
Motor connection and connection boxes									
Connection box on RHS	K09		O. R.		O. R.	O. R.	O. R.	O. R.	
Connection box on LHS	K10		O. R.		O. R.	O. R.	O. R.	O. R.	
Explosion-proof connection box, EEx d IIC type of protection	K53		✓		✓	✓	✓	O. R.	
Rotation of the connection box through 90°, entry from DE	K83		O		O	O	O	O	
Rotation of the connection box through 90°, entry from NDE	K84		O		O	O	O	O	
Rotation of connection box through 180°	K85		O		O	O	O	O	
Auxiliary connection boxes ⁴⁾	L97		✓		✓	✓	✓	✓	
Colours and paint finish									
Standard finish in RAL 7030 stone gray			□		□	□	□	□	
Standard finish in other standard RAL colours: RAL 1004, 1018, 2000, 2004, 5009, 5012, 6003, 6011, 7000, 7011, 7038, 9002 Page 1/17 (other colours available on request)	Y53 • and standard finish RAL		✓		✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26		✓		✓	✓	✓	✓	
Special finish in other standard RAL colours: RAL 1004, 1018, 2000, 2004, 5009, 5012, 6003, 6011, 7000, 7011, 7038, 9002 Page 1/17 (other colours available on request)	Y54 • and special finish RAL		✓		✓	✓	✓	✓	
Unpainted (only cast iron parts primed)	K23		O		O	O	O	O	
Unpainted, only primed	K24		–		–	–	–	–	

For legend and footnotes, see page 4/101.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size							
		315	355	400	450	315	355	400	450
Self-ventilated motors in Zone 1 with type of protection "d" - Cast-iron/steel series 1MJ8 and 1MJ1									
			1MJ8 (cast-iron)			1MJ1 (cast-iron)			
Mechanical design									
Drive-end seal for flange-mounting motors Not possible for type of construction IM V3; only possible for 4-pole to 8-pole motors	K17		✓			✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ⁵⁾	K37		✓			✓	✓	✓	O. R.
Low-noise version for 2-pole motors with clockwise direction of rotation ⁵⁾	K38		✓			✓	✓	✓	O. R.
Designs in accordance with standards and specifications									
VIK version	K30		✓			✓	✓	–	–
Bearings and lubrication									
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		✓			✓	✓	✓	✓
Regreasing device	K40		□			□	□	□	□
Insulated bearing cartridge	L27		✓			✓	✓	✓	✓
Balance and vibration severity									
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓			✓	✓	✓	✓
Shaft and rotor									
Second standard shaft extension ⁶⁾	K16		✓			✓	✓	✓	✓
Heating and ventilation									
Anti-condensation heaters for 230 V ^{2) 7)}	K45		✓			✓	✓	✓	✓
Anti-condensation heaters for 115 V ^{2) 7)}	K46		✓			✓	✓	✓	✓
Rating plate and extra rating plates									
Second rating plate, loose	K31		✓			✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code		✓			✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code		✓			✓	✓	✓	✓

□ Standard version

○ With no extra charge

• This order code only determines the price of the version - Additional plain text is required.

O. R. Possible on request

✓ With extra charge

– Not possible

¹⁾ For associated 3RN1 tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.

²⁾ For 1MJ8/1MJ1 motors, this version has an auxiliary connection box (order code **L97**).

³⁾ For 1MJ8/1MJ1 motors, for a version with 6 PTC thermistors, an anti-condensation heater (order code **K45**, **K46**) is not possible.

⁴⁾ The auxiliary connection box is the standard version with order codes **A11**, **A12**, **A15**, **A16**, **A60**, **K45** and **K46**.

⁵⁾ The motors are up to 80 mm longer than normal. A second shaft extension is not possible.

⁶⁾ Not possible for low-noise version (2-pole). Version with protective cover not possible.

⁷⁾ Not possible for version with 6 PTC thermistors (order codes **A12**, **A16**).

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5																
			1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ²⁾			
Designs for Zones 2, 21 and 22 according to ATEX ³⁾																
Design for Zone 2 for mains-fed operation Ex nA II T ₃ , EEx nA II T ₃ to IEC/EN 60079-15 ⁴⁾	M72		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T ₃ , EEx nA II T ₃ to IEC/EN 60079-15 ^{4) 5) 6)}	M73		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	M34		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{4) 6)}	M38		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Design for Zone 22 for conducting dust (IP55) for converter-fed operation, derating ^{4) 6)}	M39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
VIK design (comprises Zone 2 for mains-fed operation, without EEx nA II marking on rating plate)	K30		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
EEx nA II on VIK rating plate	C27		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110 or ET 200S FC)	Y68 • and converter type		○	○	○	○	○	○	○	○	○	○	○	○		
Motor protection																
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁷⁾	A10		✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁷⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ⁷⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁷⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Installation of 3 PT 100 resistance thermometers ⁷⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Motor connection and connection boxes																
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Cable entry, standard configuration	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓		
Next larger connection box	L00		–	–	–	–	–	–	–	–	–	✓	✓	✓		
External earthing	L13		□	□	□	□	□	□	□	□	□	□	□	□		

For legend and footnotes, see page 4/105.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5																
			1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ²⁾			
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Colours and paint finish																
Special finish in RAL 7030 stone gray			◻	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻		
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 6011 reseda green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○		
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5																	
			1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ²⁾				
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	✓	✓	✓			
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		–	–	–	–	–	–	–	✓	✓	✓	✓	✓			
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		–	–	–	–	–	–	–	✓	✓	✓	✓	✓			
IP65 degree of protection ⁸⁾	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
IP56 degree of protection (non-heavy-sea) ⁹⁾	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Condensation drainage holes ¹⁰⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Designs in accordance with standards and specifications																	
CCC China Compulsory Certification ¹¹⁾	D01		✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–			
Electrical according to NEMA MG1-12	D30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Ex-certification for China (only valid for Zone 2)	D32		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓			
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓			
Regreasing device	K40		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓			
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□		
Balance and vibration severity																	
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹²⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Standard shaft made of non-rusting steel	M65		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Heating and ventilation																	
Fan cover for textile industry	H17		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Metal external fan ¹⁴⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 230 V ¹⁵⁾	K45		–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
Anti-condensation heaters for 115 V ¹⁵⁾	K46		–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			

For legend and footnotes, see page 4/105.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA7 and 1LA5																
		1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ²⁾				
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	○	○	
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ Zone 2 for motor series 1LA7 only frame size 63 and above.
- ²⁾ Zone 2 is not possible for motor series 1LA5. For Zone 2, instead of 1LA5 motors, 1LG4 motors are used.
- ³⁾ Modular and special technology not possible; anti-condensation heater up to frame size 71 M is not possible. For pole-changing motors, please enquire.
- ⁴⁾ These motors do not have a rated voltage range stamped on the rating plate.
- ⁵⁾ According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please enquire in the case of a non-Siemens converter (extra charge).
- ⁶⁾ With this option, PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request.
- ⁷⁾ For associated tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.
- ⁸⁾ Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- ⁹⁾ Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not permissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- ¹⁰⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

- ¹¹⁾ CCC certification is required for
 - 2-pole motors: ≤2.2 kW
 - 4-pole motors: ≤1.1 kW
 - 6-pole motors: ≤0.75 kW
 - 8-pole motors: ≤0.55 kW
- ¹²⁾ Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- ¹³⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
 - For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- ¹⁴⁾ For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is standard for these motors in the version for Zone 21/22. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- ¹⁵⁾ For 1LA5 and 1LA7 motors in Zone 21, a mounted anti-condensation heater is not possible up to frame size 200 L. Available on request for Zones 2 and 22.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9																	
		1LA9 (aluminium)															
Designs for Zones 2, 21 and 22 according to ATEX ¹⁾																	
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ²⁾	M72	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	M34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{2) 4)}	M38	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
VIK design (comprises Zone 2 for mains-fed operation, without EEx nA II marking on rating plate)	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
EEx nA II on VIK rating plate	C27	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110 or ET 200S FC)	Y68 • and converter type	○	○	○	○	○	○	○	○	○	○	○					
Motor protection																	
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁵⁾	A10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁵⁾	A11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ⁵⁾	A12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁵⁾	A23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Installation of 3 PT 100 resistance thermometers ⁵⁾	A60	–	–	–	–	–	✓	✓	✓	✓	✓	✓					
Motor connection and connection boxes																	
Connection box on RHS	K09	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85	✓	✓	✓	✓	✓	○	○	○	○	✓	✓					
Next larger connection box	L00	–	–	–	–	–	–	–	–	–	✓	✓					
External earthing	L13	□	□	□	□	□	□	□	□	□	□	□					

For legend and footnotes, see page 4/109.

Special versions	Additional identification code - Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9																
		1LA9 (aluminium)														
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Colours and paint finish																
Special finish in RAL 7030 stone gray		◻	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻				
Special finish in RAL 1002 sand yellow	M16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 1013 pearl white	M17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 3000 flame red	M18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6011 reseda green	K27	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6021 pale green	M19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7001 silver gray	M20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7031 blue gray	K28	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7032 pebble gray	L42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7035 light gray	M21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9001 cream	M22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9002 gray white	M23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9005 jet black	L43	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Unpainted (only cast iron parts primed)	K23	○	○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9																
		1LA9 (aluminium)														
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction.	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Low-noise version for 2-pole motors with clockwise direction of rotation	K37		–	–	–	–	–	–	–	–	–	✓	✓			
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38		–	–	–	–	–	–	–	–	–	✓	✓			
IP65 degree of protection ⁶⁾	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
IP56 degree of protection (non-heavy-sea) ⁷⁾	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Condensation drainage holes ⁸⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁹⁾	D01		✓	✓	✓	✓	✓	–	–	–	–	–	–			
Electrical according to NEMA MG1-12	D30		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Ex-certification for China (only valid for Zone 2)	D32		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–			
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Regreasing device	K40		–	–	–	–	–	✓	✓	✓	✓	✓	✓			
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	□	□	□			
Balance and vibration severity																
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Heating and ventilation																
Fan cover for textile industry	H17		–	–	–	–	–	–	✓	✓	–	–	–			
Metal external fan ¹¹⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 230 V ¹²⁾	K45		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
Anti-condensation heaters for 115 V ¹²⁾	K46		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			

For legend and footnotes, see page 4/109.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Aluminium series 1LA9																
			1LA9 (aluminium)													
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Packaging, safety notes, documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○				
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) Modular and special technology not possible; anti-condensation heater up to frame size 71 M not possible.
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please enquire in the case of a non-Siemens converter (extra charge).
- 4) With this option, PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request.
- 5) For associated tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.
- 6) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 7) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not permissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 8) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 9) CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW
- 10) Can be combined with deep-groove bearings of series 60... 62... and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 11) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is standard for these motors in the version for Zone 21/22. The external metal fan is a motor of series 1LA7/1LA5 in the standard version for Zone 21/22. The external metal fan is not possible in combination with a low-noise version - Order code **K37** or **K38**.
- 12) For 1LA9 motors in Zone 21, a mounted anti-condensation heater is not possible up to frame size 200 L. Available on request for Zones 2 and 22.
- 13) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																	
							1LA6 (cast-iron)				1LG4 (cast-iron)						
Designs for Zones 2, 21 and 22 according to ATEX ¹⁾																	
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ²⁾	M72						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	M34						–	–	–	–	✓	✓	✓	✓	✓	✓	
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ^{2) 4)}	M38						–	–	–	–	✓	✓	✓	✓	✓	✓	
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
VIK design (comprises Zone 2 for mains-fed operation, without EEx nA II marking on rating plate) ⁵⁾	K30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
EEx nA II on VIK rating plate	C27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110 or ET 200S FC)	Y68 • and converter type						○	○	○	○	○	○	○	○	○	○	
Motor protection																	
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁶⁾	A10						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁶⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ⁶⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁶⁾	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁶⁾	A25						–	–	–	–	✓	✓	✓	✓	✓	✓	
Installation of 3 PT 100 resistance thermometers ⁶⁾	A60						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Installation of 6 PT 100 resistance thermometers in stator winding ⁶⁾	A61						–	–	–	–	✓	✓	✓	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ^{6) 7)}	A72						–	–	–	–	✓	✓	✓ ⁸⁾	✓	✓	✓	
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ^{6) 7)}	A78						–	–	–	–	✓	✓	✓ ⁸⁾	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ^{6) 7)}	A80						–	–	–	–	✓	✓	✓ ⁸⁾	✓	✓	✓	

For legend and footnotes, see page 4/114.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																
			1LA6 (cast-iron)					1LG4 (cast-iron)								
Motor connection and connection boxes																
Two-part plate on connection box	K06		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Connection box on RHS	K09		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on LHS	K10		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15		–	–	–	–	–	–	–	✓	✓	✓	□	□	□	□
Cable entry, standard configuration ⁹⁾	K54		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration ⁹⁾	K55		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Next larger connection box	L00		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
External earthing	L13		□	□	□	□	□	□	□	□	□	□	□	□	□	□
Auxiliary connection box 1XB3 020	L97		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47		–	–	–	–	–	–	–	–	–	–	✓ ¹⁰⁾	✓ ¹⁰⁾	✓ ¹⁰⁾	✓ ¹⁰⁾
Windings and insulation																
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Temperature class F, used acc. to B, coolant tempera- ture 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant tempera- ture 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant tempera- ture 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant tempera- ture 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26		✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–
Colours and paint finish																
Standard finish in RAL 7030 stone gray			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 1/17	Y53 • and standard finish RAL		–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Colours and paint finish (continued)																
Special finish in RAL 7030 stone gray	K26 ¹¹⁾						□	□	□	□	✓	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 reseda green	K27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special fin- ish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special fin- ish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange- mounting motors Not possible for IM V3 type of construction ¹²⁾	K17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	K37						–	–	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38						–	–	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection ¹³⁾	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹⁴⁾	K52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03						✓	✓	✓	✓	–	–	–	–	–	–
Condensation drainage holes ¹⁵⁾	L12						✓	✓	✓	✓	□	□	□	□	□	□
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 4/114.

Special versions	Additional identifica- tion code -Z with order code and, if required, with plain text data	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Designs in accordance with standards and specifications																
Electrical according to NEMA MG1-12	D30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ex certification for China (only valid for Zone 2)	D32						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁶⁾	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36						–	–	–	–	✓	✓	✓	✓	✓ ¹⁷⁾	✓ ¹⁷⁾
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Located bearing DE	K94						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04						✓	✓	✓	□	□	□	□	□	□	□
Insulated bearing cartridge	L27						–	–	–	–	–	–	✓	✓	✓	✓
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibra- tion severity level A as standard version without order code)	K01						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration severity levels S ¹⁸⁾ (valid until 11/30/2006; then vibra- tion severity level B)	K02						–	–	–	–	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁹⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension ²⁰⁾	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standard shaft made of non-rust- ing steel	M65						✓	✓	✓	✓	–	–	–	–	–	–
Non-standard cylindrical shaft extension ²¹⁾	Y55 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17						✓	✓	✓	✓	–	–	–	–	–	–
Metal external fan ²²⁾	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V ^{23) 24)}	K45						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heaters for 115 V ^{23) 24)}	K46						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Rating plate and extra rating plates																
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identifica- tion code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zone 2, 21, 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LA6 and 1LG4																	
								1LA6 (cast-iron)				1LG4 (cast-iron)					
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99							○	○	○	○	–	–	–	–	–	–
Connected in star for dispatch	M32							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge

- This order code only determines the price of the version - Additional plain text is required.

O. R. Possible on request

- ✓ With extra charge
- Not possible

- 1) Modular and special technology is not possible. Only permitted for use in accordance with temperature class B.
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please enquire in the case of a non-Siemens converter (extra charge).
- 4) With this option, PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. The operating data for the MICROMASTER converter series from Siemens are specified on the rating plate as standard. Derating information is available on request.
- 5) Anti-condensation heater is not possible.
- 6) For associated tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.
- 7) Options A72, A78 and A80 are only possible in the case of 1LG motors of frame size 180 to 315 for Zone 22.
- 8) For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- 9) For 1LG4 motors extra charge only applies to Zone 22. Designs for Zone 2 and 21 already have a cable entry in the standard version.
- 10) Standard with designs for Zone 2, Zone 21 and VIK.
- 11) For frame sizes 100 to 160, do not specify an order code. Order code is only necessary for frame sizes 180 to 315.
- 12) Not possible for motor series 1LG4 for 2-pole motors.
- 13) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 14) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not permissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 15) For 1LA6 motors: Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 16) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 17) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 18) Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 19) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 20) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 21) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
– Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
– Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
For an explanation of the order codes, see "Introduction".
- 22) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is standard for these motors in the version for Zone 21/22. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- 23) For 1LA6 motors in Zone 21, a mounted anti-condensation heater is not possible up to frame size 200 L. Available on request for Zones 2 and 22.
- 24) For 1LG4 motors in Zone 2, the mounted anti-condensation heater is not possible.

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6																		
												1LG6 (cast-iron)						
Designs for Zones 2, 21 and 22 according to ATEX ¹⁾																		
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ²⁾	M72											✓	✓	✓	✓	✓	✓	✓
Design for Zone 2 for converter-fed operation, reduced output Ex nA II T3, EEx nA II T3 to IEC/EN 60079-15 ^{2) 3) 4)}	M73											✓	✓	✓	✓	✓	✓	✓
Design for Zone 21, as well as Zone 22 for con- ducting dust (IP65) for mains-fed operation	M34											✓	✓	✓	✓	✓	✓	✓
Design for Zone 21, as well as Zone 22 for con- ducting dust (IP65) for converter-fed operation, derating ^{2) 4)}	M38											✓	✓	✓	✓	✓	✓	✓
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35											✓	✓	✓	✓	✓	✓	✓
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ^{2) 4)}	M39											✓	✓	✓	✓	✓	✓	✓
VIK design (comprises Zone 2 for mains-fed operation, without EEx nA II marking on rating plate)	K30											✓	✓	✓	✓	✓	✓	✓
EEx nA II on VIK rating plate	C27											✓	✓	✓	✓	✓	✓	✓
Alternative converter (SIMOVERT MASTERDRIVES)	Y68 • and converter type											○	○	○	○	○	○	○
Motor protection																		
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21, 22 ⁵⁾	A10											✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ⁵⁾	A11											✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ⁵⁾	A12											✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ⁵⁾	A23											✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ⁵⁾	A25											✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ⁵⁾	A60											✓	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ⁵⁾	A61											✓	✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ^{5) 6)}	A72											✓	✓ ⁷⁾	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ^{5) 6)}	A78											✓	✓ ⁷⁾	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (three-wire circuit) for rolling- contact bearings ^{5) 6)}	A80											✓	✓ ⁷⁾	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6																	
														1LG6 (cast-iron)			
Motor connection and connection boxes																	
Two-part plate on connection box	K06	—												✓	✓	✓	✓
Connection box on RHS	K09	✓												✓	✓	✓	✓
Connection box on LHS	K10	✓												✓	✓	✓	✓
Connection box on top, feet screwed on	K11	✓												✓	✓	✓	✓
Connection box in cast-iron version	K15	✓												✓	✓	□	□
Cable entry, standard configuration ⁸⁾	K54	✓												✓	✓	✓	✓
Cable entry, maximum configuration ⁸⁾	K55	✓												✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83	✓												✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84	✓												✓	✓	✓	✓
Rotation of connection box through 180°	K85	✓												✓	✓	✓	✓
Next larger connection box	L00	✓												✓	✓	✓	✓
Auxiliary connection box	L97	✓												✓	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47	—												—	—	✓ ⁹⁾	✓ ⁹⁾
Windings and insulation																	
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22	✓												✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23	✓												✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24	✓												✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25	✓												✓	✓	✓	✓
Colours and paint finish																	
Standard finish in RAL 7030 stone gray		□												□	□	□	□
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 1/17	Y53 • and standard finish RAL	✓												✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26	✓												✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16	✓												✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17	✓												✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18	✓												✓	✓	✓	✓
Special finish in RAL 6011 reseda green	K27	✓												✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19	✓												✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20	✓												✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28	✓												✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42	✓												✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21	✓												✓	✓	✓	✓
Special finish in RAL 9001 cream	M22	✓												✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23	✓												✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43	✓												✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL	✓												✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL	✓												✓	✓	✓	✓
Unpainted (only cast-iron parts primed)	K23	○												○	○	○	○
Unpainted, only primed	K24	✓												✓	✓	✓	✓

For legend and footnotes, see page 4/118.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6																	
												1LG6 (cast-iron)					
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction and 2-pole motors	K17											✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁰⁾	K37											–	–	–	–	–	–
Low-noise version for 2-pole motors with anticlockwise direction of rotation ¹⁰⁾	K38											–	–	–	–	–	–
IP65 degree of protection ¹¹⁾	K50											✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹²⁾	K52											✓	✓	✓	✓	✓	✓
Condensation water holes ²⁰⁾	L12											□	□	□	□	□	□
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																	
Electrical according to NEMA MG1-12 (standard version with EPACT)	D30											□	□	□	□	□	□
Ex certification for China (only valid for Zone 2)	D32											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹³⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36											✓	✓	✓	✓	✓ ¹⁴⁾	✓ ¹⁴⁾
Regreasing device	K40											✓	✓	✓	✓	□	□
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge	L27											–	–	✓	✓	✓	✓
Balance and vibration severity																	
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01											✓	✓	✓	✓	✓	✓
Vibration severity levels S ¹⁵⁾ (valid until 11/30/2006; then vibration severity level B)	K02											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁶⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹⁷⁾	K16											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹⁸⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Metal external fan ¹⁹⁾	K35											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Anti-condensation heaters for 115 V	K46											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see page 4/118.

IEC Squirrel-Cage Motors

Explosion-proof motors

Special versions

Special versions	Additional identification code -Z with order code and, if required, with plain text data	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions - Cast-iron series 1LG6																	
												1LG6 (cast-iron)					
Rating plate and extra rating plates																	
Second rating plate, loose	K31											✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code											✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82 • and identification code											✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) Modular design and further mountings not possible. Only permitted for use in accordance with temperature class B.
- 2) These motors do not have a rated voltage range stamped on the rating plate.
- 3) According to the standard, the motor and converter must be tested as a unit. A "Manufacturer test certificate" is available for a defined spectrum of Siemens motors (frame sizes 63 M to 315 L)/converter. Please enquire in the case of a non-Siemens converter (extra charge).
- 4) With this option, PTC thermistors for temperature class B are included. For compliance with temperature class B, derating is necessary in the case of converter-fed operation in Zones 2, 21 and 22. Derating information is available on request.
- 5) For associated tripping unit, see Catalogue LV 1. When used in hazardous areas, a certified tripping unit is required.
- 6) Options A72, A78 and A80 are only possible in the case of 1LG motors of frame size 180 to 315 for Zone 22.
- 7) For frame size 200, bearing temperature monitoring is only possible at the drive end DE.
- 8) For 1LG6 motors, extra charge only applies to Zone 22. Designs for Zones 2 and 21 already have a cable entry in the standard version.
- 9) Standard with designs for Zone 2, Zone 21 and VIK.
- 10) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 11) Order code **K50** (IP65 degree of protection) can only be ordered for Zone 2. For Zone 21, IP65 degree of protection is standard. Not possible for Zone 22, because only IP55 degree of protection is required.
- 12) Order code **K52** IP56 degree of protection (non-heavy-sea) is only possible for Zone 2. Not permissible for Zone 21 (IP65 degree of protection) and Zone 22 (IP55 degree of protection).
- 13) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 14) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 15) Can be combined with deep-groove bearings of series 60.., 62.. and 63... Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 16) Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 17) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 18) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
– Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
– Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
For an explanation of the order codes, see "Introduction".
- 19) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is standard for these motors in the version for Zone 21/22. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- 20) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardised slide rails (please enquire).

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:

Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Source, for example:

Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)7 11-1388-0
Fax +49 (0)7 11-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings for use in hazardous areas

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex-S couplings are recommended. These coupling types are suitable for use in areas subject to explosion hazards and are offered with declaration of conformity and type test certificate according to directive 94/9/EU.

Available from:

A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt, Germany
Tel. +49 (0)2871-92 2185
Fax +49 (0)2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

IEC Squirrel-Cage Motors

Explosion-proof motors

Accessories and spare parts

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cowl 1LA7,
frame size 160 M, 4-pole:

**Fan cowl No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

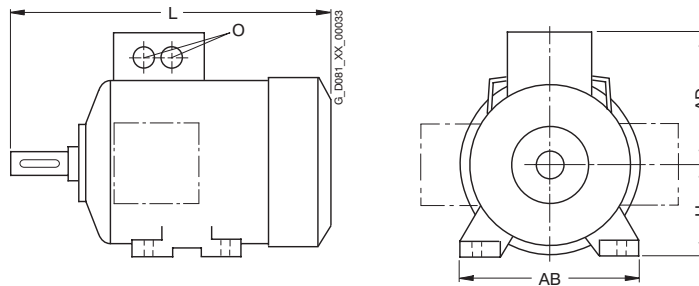
- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80/5 05 04 48

You will find telephone numbers for other countries on our Internet site

<http://www.siemens.com/automation/service&support>

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions	L	AD	H	AB	O
56 M	1LA7		169	101	56	110	1 x M16 x 1.5	
	1LA9		169	101	56	110	1 x M16 x 1.5	
63 M	1LA7		202.5	101	63	120	1 x M16 x 1.5	
	1LA9 063		202.5	101	63	120	1 x M16 x 1.5	
	1LA9 061		228.5	101	63	120	1 x M16 x 1.5	
	1MA7		202.5	135	63	120	1 x M16 x 1.5	
71 M	1LA7		240	111	71	132	1 x M16 x 1.5	
	1LA9		240	111	71	132	1 x M16 x 1.5	
	1MA7		240	145	71	132	1 x M16 x 1.5	
	1MJ6		299	201	71	140	1 x M16 x 1.5	
80 M	1LA7		273.5	120	80	150	1 x M16 x 1.5	
	1LA9 080		273.5	120	80	150	1 x M16 x 1.5	
	1LA9 083		308.5	120	80	150	1 x M16 x 1.5	
	1MA7		273.5	154	80	150	1 x M16 x 1.5	
	1MA7 083-6.		308.5	154	80	150	1 x M16 x 1.5	
	1MJ6		336	209	80	160	1 x M16 x 1.5	
90 S/ 90 L	1LA7		331	128	90	165	1 x M16 x 1.5	
	1LA9		331	128	90	165	1 x M16 x 1.5	
	1LA9 096-6K.		376	128	90	165	1 x M16 x 1.5	
	1LA9 096-2..		358	128	90	165	1 x M16 x 1.5	
	1LA9 096-4..		358	128	90	165	1 x M16 x 1.5	
	1MA7		331	162	90	165	1 x M16 x 1.5	
	1MJ6		383	218	90	168	1 x M16 x 1.5	
100 L	1LA6		372	164	100	196	2 x M32 x 1.5	
	1LA7		372	135	100	196	2 x M32 x 1.5	
	1LA9		407	135	100	196	2 x M32 x 1.5	
	1LA9 107-4KA.		442	135	100	196	2 x M32 x 1.5	
	1MA6		372	164	100	196	2 x M32 x 1.5	
	1MA7		372	135	100	196	2 x M32 x 1.5	
	1MJ6		426	223	100	196	2 x M32 x 1.5	
112 M	1LA6		393	178	112	226	2 x M32 x 1.5	
	1LA7		393	148	112	226	2 x M32 x 1.5	
	1LA9		431	148	112	226	2 x M32 x 1.5	
	1MA6		393	178	112	226	2 x M32 x 1.5	
	1MA7		393	148	112	226	2 x M32 x 1.5	
	1MJ6		428	238	112	226	2 x M32 x 1.5	
132 S/ 132 M	1LA6		453	194	132	256	2 x M32 x 1.5	
	1LA7		452.5	167	132	256	2 x M32 x 1.5	
	1LA9		452.5	167	132	256	2 x M32 x 1.5	
	1LA9 131		490.5	167	132	256	2 x M32 x 1.5	
	1LA9 133		490.5	167	132	256	2 x M32 x 1.5	
	1LA9 134		490.5	167	132	256	2 x M32 x 1.5	
	1MA6		453	194	132	256	2 x M32 x 1.5	
	1MA7		452.5	167	132	256	2 x M32 x 1.5	
	1MA7 133-4		490	167	132	256	2 x M32 x 1.5	
	1MJ6		515	258	132	256	2 x M32 x 1.5	

Frame size	Type	Number of poles	Dimensions	L	AD	H	AB	O
160 M/ 160 L	1LA6		588	226	160	300	2 x M40 x 1.5	
	1LA7		588	197	160	300	2 x M40 x 1.5	
	1LA9		588	197	160	300	2 x M40 x 1.5	
	1LA9 166		628	197	160	300	2 x M40 x 1.5	
	1MA6		588	226	160	300	2 x M40 x 1.5	
	1MA7		588	197	160	300	2 x M40 x 1.5	
	1MA7 166-4		628	197	160	300	2 x M40 x 1.5	
	1MA7 166-6		628	197	160	300	2 x M40 x 1.5	
	1MJ6		641	280	160	300	2 x M40 x 1.5	
180 M/ 180 L	1LA5		712	258	180	339	2 x M40 x 1.5	
	1LA9		712	258	180	339	2 x M40 x 1.5	
	1LG4		669	262	180	339	2 x M40 x 1.5	
	1LG4 188		720	262	180	339	2 x M40 x 1.5	
	1LG6 183	2	720	262	180	339	2 x M40 x 1.5	
	1LG6 183	4	669	262	180	339	2 x M40 x 1.5	
	1LG6 186	4, 6, 8	720	262	180	339	2 x M40 x 1.5	
	1MJ6		715	306	180	339	2 x M40 x 1.5	
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5	
	1LA9		768.5	305	200	388	2 x M50 x 1.5	
	1LG4		720	300	200	378	2 x M50 x 1.5	
	1LG4 208	2, 6	777	300	200	378	2 x M50 x 1.5	
	1LG6 206		720	300	200	378	2 x M50 x 1.5	
	1LG6 207	2, 6	777	300	200	378	2 x M50 x 1.5	
	1LG6 207	4, 8	720	300	200	378	2 x M50 x 1.5	
	1MJ6		771.5	349	200	398	2 x M50 x 1.5	
225 S/ 225 M	1LA5		806	305	225	426	2 x M50 x 1.5	
	1LA5	2	776	305	225	426	2 x M50 x 1.5	
	1LG4		789	325	225	436	2 x M50 x 1.5	
	1LG4 223	2	759	325	225	436	2 x M50 x 1.5	
	1LG4 228	2	819	325	225	436	2 x M50 x 1.5	
	1LG4 228	4, 6, 8	849	325	225	436	2 x M50 x 1.5	
	1LG6 220	4, 8	789	325	225	436	2 x M50 x 1.5	
	1LG6 223	2	819	325	225	436	2 x M50 x 1.5	
	1LG6 223	4, 6, 8	849	325	225	436	2 x M50 x 1.5	
	1LG6 228	2	869	325	225	436	2 x M50 x 1.5	
	1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5	
	1MJ7		839	377	225	436	2 x M50 x 1.5	
	1MJ7 223	2	809	377	225	436	2 x M50 x 1.5	

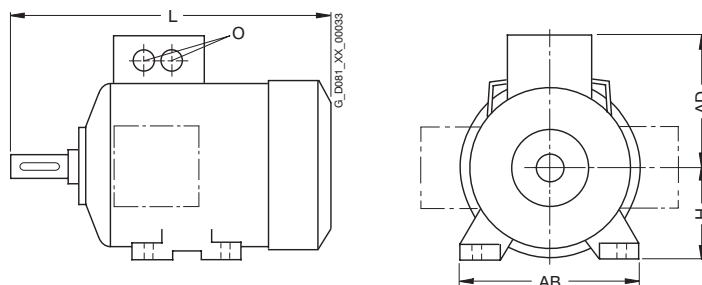
IEC Squirrel-Cage Motors

Explosion-proof motors

Dimensions

Overview (continued)

Overall dimensions



Frame size	Type	Number of poles	Dimensions L	AD	H	AB	O ¹⁾
250 M	1LG4		887	392	250	490	2 x M63 x 1.5
	1LG4 258	4	957	392	250	490	2 x M63 x 1.5
	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5
	1MJ7		930	466	250	506	2 x M63 x 1.5
280 S/ 280 M	1LG4		960	432	280	540	2 x M63 x 1.5
	1LG4 288	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
	1MJ7		1010	491	280	557	2 x M63 x 1.5
	1MJ7		1010	491	280	557	2 x M63 x 1.5
315 S/ 315 M/ 315 L	1LG4		1072	500	315	610	2 x M63 x 1.5
	1LG4 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG4 313	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG4 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 317	2	1232	500	315	610	2 x M63 x 1.5
	1LG4 317	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	8	1262	500	315	610	2 x M63 x 1.5
	1LG4 318	6	1402	500	315	610	2 x M63 x 1.5
	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5
	1MJ1 313	2	1304	587	315	630	2 x M63 x 1.5
	1MJ1 313	4, 6, 8	1334	587	315	630	2 x M63 x 1.5
	1MJ1 314	6, 8	1334	587	315	630	2 x M63 x 1.5
	1MJ1 316	2	1491	676	315	630	2 x M63 x 1.5
	1MJ1 316	4, 6, 8	1521	676	315	630	2 x M63 x 1.5
	1MJ1 318	2	1491	676	316	630	2 x M63 x 1.5
	1MJ1 318	4, 6, 8	1521	676	315	630	2 x M63 x 1.5
	1MJ6	2	1114	558	315	628	2 x M63 x 1.5
	1MJ6	4, 6, 8	1140	558	315	628	2 x M63 x 1.5

Frame size	Type	Number of poles	Dimensions L	AD	H	AB	O ¹⁾
355	1MJ1 357	4, 6, 8	1900	675 (930) ²⁾³⁾	355	780	35 – 75
	1MJ1 358	2	2016	675 (930) ²⁾³⁾	355	780	35 – 75
	1MJ1 358	4, 6, 8	1900	675 (930) ²⁾³⁾	355	780	35 – 75
	1MJ8 350	4	1855	707	355	700	35 – 75
	1MJ8 356	2	1870	707	355	700	35 – 75
	1MJ8 356	4, 6, 8	1755	707	355	700	35 – 75
	1MJ8 357	2	1950	707	355	700	35 – 75
	1MJ8 357	4	1855	707	355	700	35 – 75
	1MJ8 357	6	1855	707	355	700	35 – 75
	1MJ8 358	2	1950	707	355	700	35 – 75
	1MJ8 358	4, 6, 8	1855	707	355	700	35 – 75
	1MJ8 358	4, 6, 8	1855	707	355	700	35 – 75
400	1LA8	4, 6, 8	1825	865	400	860	Ø 80
	1PQ8	2	2150	865	400	860	Ø 80
	1PQ8	4, 6, 8	2190	865	400	860	Ø 80
	1LL8	2	1793	865	400	860	Ø 80
	1LL8	4, 6, 8	1833	865	400	860	Ø 80
	1MJ1 404	8	2025	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 405	2	2131	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 405	4, 6	2025	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 407	2	2131	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 407	4, 6, 8	2025	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 408	2	2131	645 (980) ²⁾³⁾	400	860	35 – 75
	1MJ1 408	4, 8	2025	645 (980) ²⁾³⁾	400	860	35 – 75
450	1MJ1 450	8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 453	6	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 455	2	2251	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 455	4, 6, 8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 457	2	2251	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 457	4, 6, 8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	2	2251	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	4	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	6	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75
	1MJ1 458	8	2180	745 (1010) ²⁾³⁾	450	900	35 – 75

¹⁾ For 1MJ8 frame size 355 in type of construction IM B3, cable entry from drive-end DE, in types of construction IM B35, IM B5 and IM V1 cable entry from right side.

²⁾ Dimensions for standard connection boxes. Dimensions for explosion-proof connection boxes type of protection Eex d IIC order code K53 are available on request.

³⁾ The connection box is on the side. The value without brackets is the dimension upwards. The value in brackets () is the sideways dimension (top of connection box).

■ Only overall dimensions are specified for 1MJ1 and 1MJ8 motors, complete dimension drawings are not provided in this catalogue. The relevant dimension drawings can be ordered separately.

Overview (continued)

Notes on the dimensions

- Dimension designations according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2	
D, DA	to 30	j6
	over 30 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
A, B	to 250	± 0.75
	over 250 to 500	± 1.0
	over 500 to 750	± 1.5
	over 750 to 1000	± 2.0
	over 1000	± 2.5
M	to 200	± 0.25
	over 200 to 500	± 0.5
	over 500	± 1.0
H	to 250	-0.5
	over 250	-1.0
E, EA		-0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

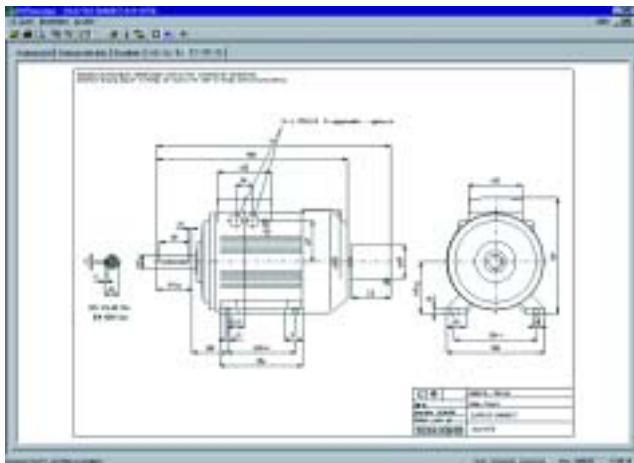
- All dimensions are specified in mm.

More information

Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic catalogue CA 01 as a selection aid (for more information, see "Technical information", "Project planning aids").

The interactive catalogue CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2006, english international:

CD-ROM: E86060-D4001-A110-C5-7600

DVD: E86060-D4001-A510-C5-7600

IEC Squirrel-Cage Motors

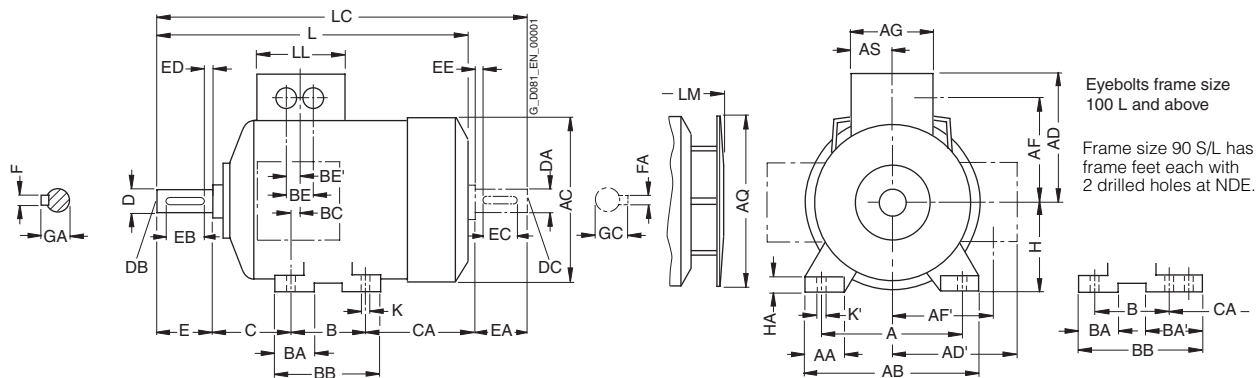
Explosion-proof motors

Dimensions

Dimensional drawings

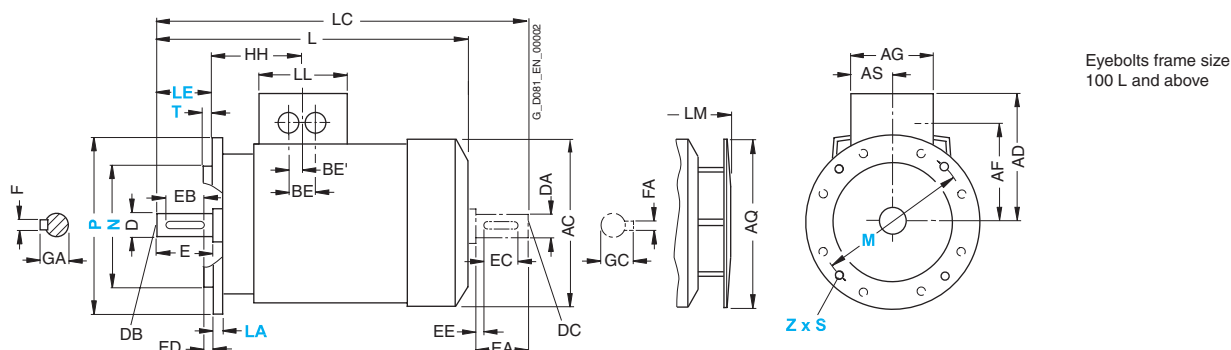
Aluminium series 1MA7, frame sizes 63 M to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor	Frame size	Type	Number of poles	Dimension designation acc. to IEC																								
				A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA			
	63 M	1MA7 060 1MA7 063	2, 4, 6	100	27	120	124	135	101	95	78	120	124	60	80	28	—	96	52.5	32	16	40	66	63	7			
	71 M	1MA7 070 1MA7 073	2, 4, 6, 8	112	27	132	145	145	111	105	88	120	124	60	90	27	—	106	41.5	32	16	45	83	71	7			
	80 M	1MA7 080 1MA7 083	2, 4, 6, 8	125	30.5	150	163	154	154	114	114	120	124	60	100	32	—	118	36	32	16	50	94 134 ²⁾	80	8			
	90 S 90 L	1MA7 090 1MA7 096	2, 4, 6, 8	140	30.5	165	180	162	162	122	122	120	170	60	100 125	33	54	143	46	32	16	56	143 118	90	10			
	100 L	1MA7 106 1MA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	—	176	39	42	21	63	125	100	12			
	112 M	1MA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	—	176	32	42	21	70	141	112	12			
	132 S	1MA7 130 1MA7 131 2	2, 4, 6, 8	216	53	256	267	167	194	107	154	140	250	70	140	49	—	180	39	42	21	89	162.5	132	15			
	132 M	1MA7 133 1MA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	—	218	39	42	21	89	124.5 162.5 ³⁾	132	15			
	160 M	1MA7 163 1MA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	—	256	52.5	54	27	108	183	160	18			
	160 L	1MA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	—	300	52.5	54	27	108	139 179 ⁴⁾	160	18			

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) For 1MA7 083-6.

3) For 1MA7 133-4.

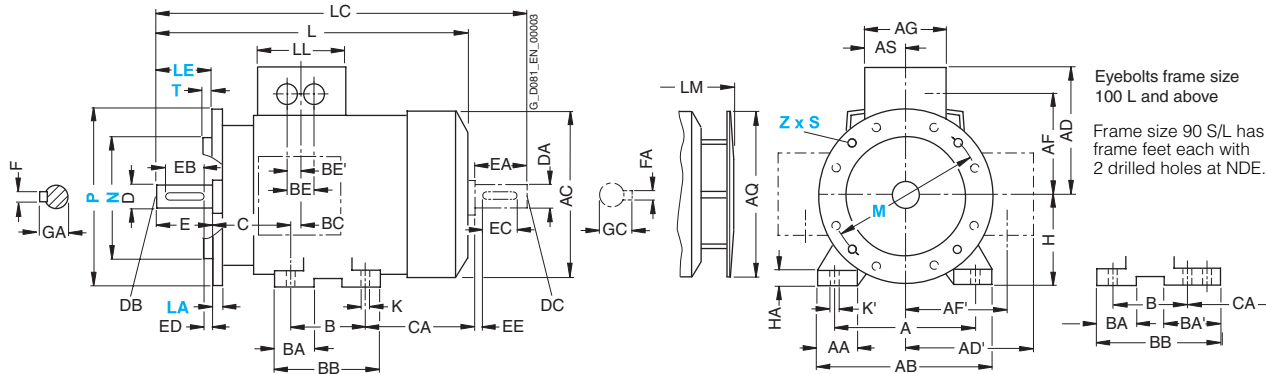
4) For 1MA7 166-4 and 1MA7 166-6.

Dimensional drawings

Aluminium series 1MA7, frame sizes 63 M to 160 L

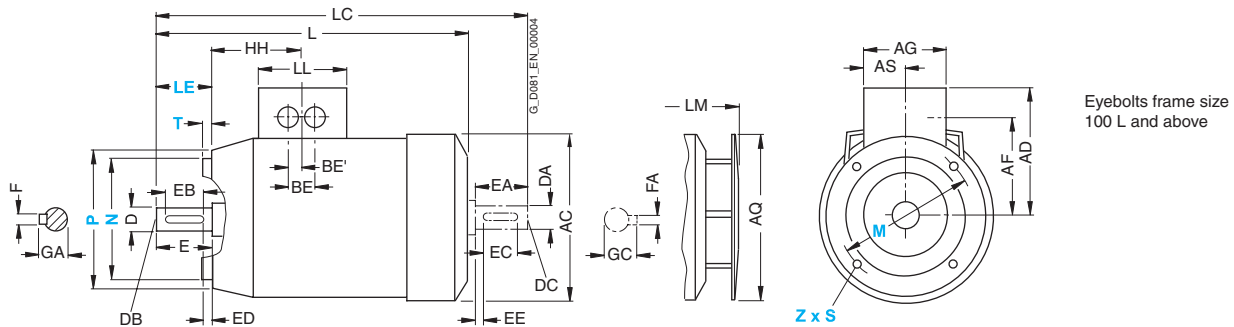
Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC								DE shaft extension							NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
63 M	1MA7 060 1MA7 063	2, 4, 6	92.5	7	10	202.5	232	120	231.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5		
71 M	1MA7 070 1MA7 073	2, 4, 6, 8	86.5	7	10	240	278	120	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16		
80 M	1MA7 080 1MA7 083	2, 4, 6, 8	86	9.5	13.5	273.5 308.5 ²⁾	324 364	120	299.5 334.5 ²⁾	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5		
90 S 90 L	1MA7 090 1MA7 096	2, 4, 6, 8	101.5	10	14	331	389	120	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5		
100 L	1MA7 106 1MA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
112 M	1MA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
132 S	1MA7 130 1MA7 131	2, 4, 6, 8 2	128	12	16	452.5 ¹⁾	551.5	140	505 ¹⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
132 M	1MA7 133 1MA7 134	4, 6, 8 6	128	12	16	452.5 ¹⁾ 490.5 ³⁾	551.5 589.5 ³⁾	140	505 ¹⁾ 543 ³⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
160 M	1MA7 163 1MA7 164	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		
160 L	1MA7 166	2, 4, 6, 8	160.5	15	19	588 628 ⁴⁾	721 761 ⁴⁾	165	640.5 680.5 ⁴⁾	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		

¹⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

²⁾ For 1MA7 083-6.

³⁾ For 1MA7 133-4.

⁴⁾ For 1MA7 166-4 and 1MA7 166-6.

IEC Squirrel-Cage Motors

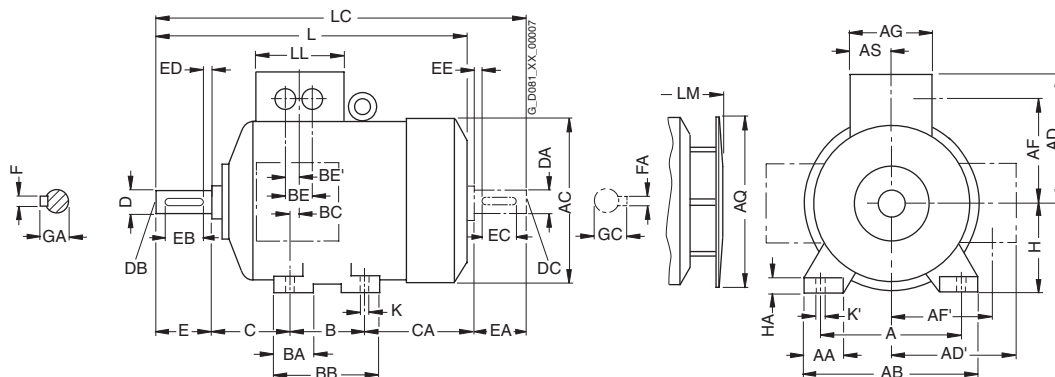
Explosion-proof motors

Dimensions

Dimensional drawings

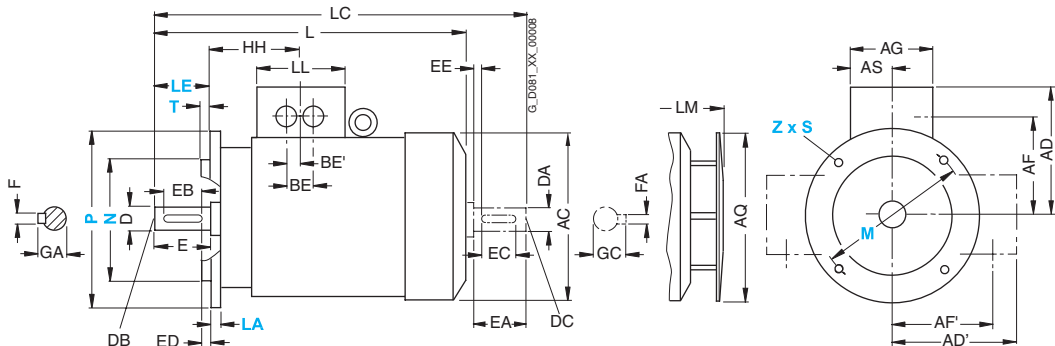
Cast-iron series 1MA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1MA6 106 1MA6 107	2, 4, 6, 8 4, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
112 M	1MA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1MA6 130 1MA6 131	2, 4, 6, 8 2	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
132 M	1MA6 133 1MA6 134	4, 6, 8 6	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
160 M	1MA6 163 1MA6 164	2, 4, 6, 8 2, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
160 L	1MA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

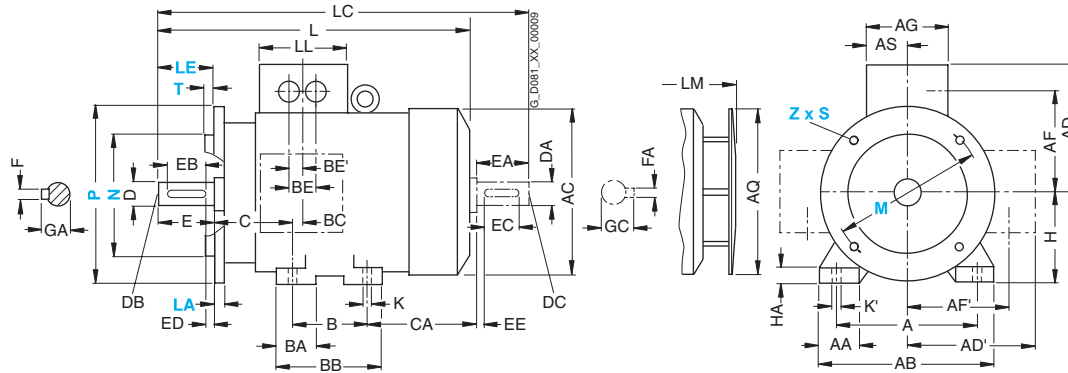
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1MA6, frame sizes 100 L to 160 L

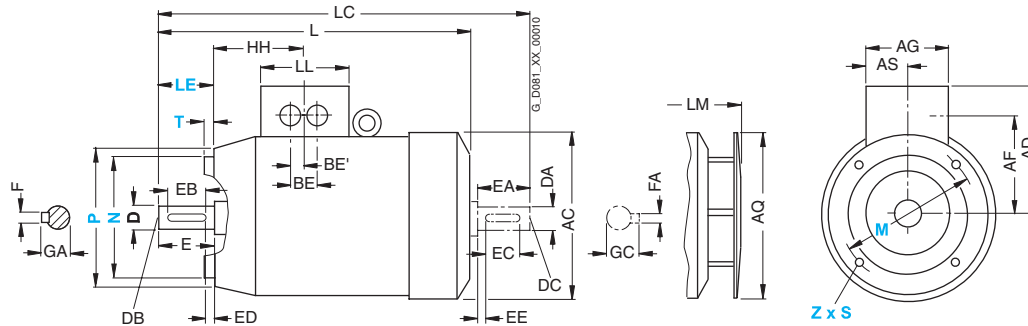
Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC								DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
100 L	1MA6 106 1MA6 107	2, 4, 6, 8 4, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
112 M	1MA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
132 S	1MA6 130 1MA6 131	2, 4, 6, 8 2	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
132 M	1MA6 133 1MA6 134	4, 6, 8 6	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
160 M	1MA6 163 1MA6 164	2, 4, 6, 8 2, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
160 L	1MA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	

IEC Squirrel-Cage Motors

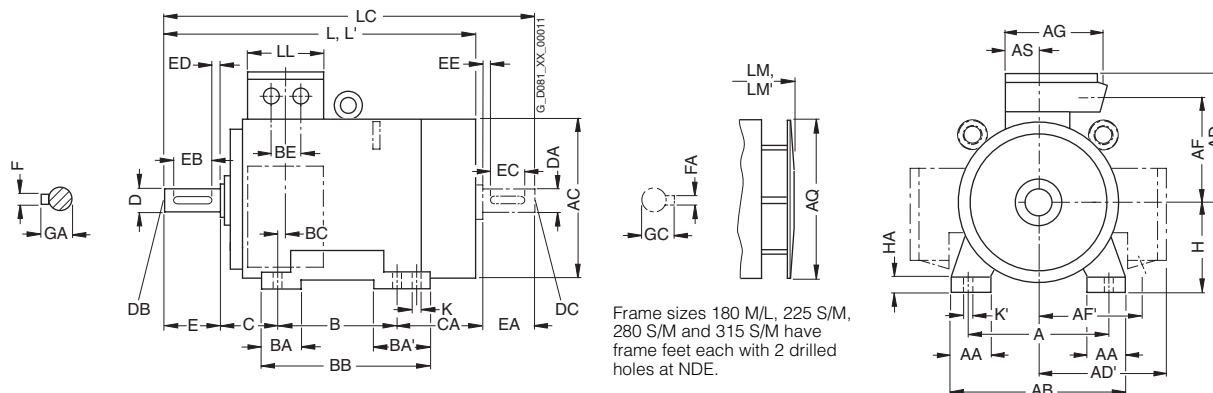
Explosion-proof motors

Dimensions

Dimensional drawings

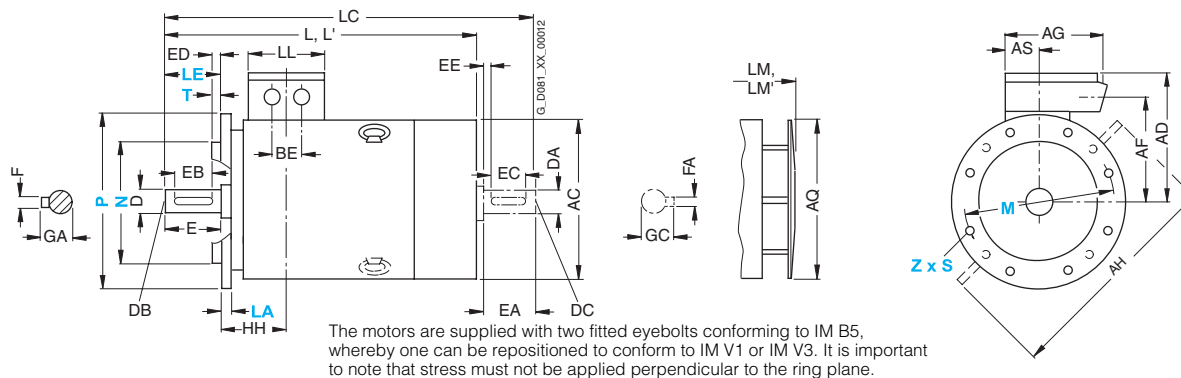
Cast-iron series 1MA6, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA		
180 M	1MA6 183	2	279	65	344	375	274	274	227	227	220	470	340	82	241	70	108	319	35	75	121	259	180	26		
180 L	1MA6 186	4, 6, 8	279	65	344	375	274	274	227	227	220	470	340	82	279	70	108	319	35	75	121	221	180	26		
200 L	1MA6 206	2	318	80	398	402	308	308	248	248	262	530	340	99	305	85	85	355	42	85	133	239	200	34		
	1MA6 207	6	318	80	398	402	308	308	248	248	262	530	340	99	305	85	85	355	42	85	133	239	200	34		
225 S	1MA6 220	2	356	80	436	442	339	339	269	269	264	580	425	100	286	85	110	361	25	85	149	269	225	34		
	1MA6 223	4, 6, 8	356	80	436	442	339	339	269	269	264	580	425	100	311	85	110	361	25	85	149	244	225	34		
250 M	1MA6 253	2	406	100	506	505	427	427	333	333	338	645	470	120	349	100	100	409	39	95	168	283	250	42		
280 S	1MA6 280	2	457	100	557	555	452	452	358	358	338	700	525	120	368	100	151	471	30	95	190	317	280	42		
	1MA6 283	4, 6, 8	457	100	557	555	452	452	358	358	338	700	525	120	419	100	151	471	30	95	190	366	280	42		
315 S		2	508	120	628	620	515	515	395	395	405	805	590	134	406	125	171	527	32	90	216	358	315	52		
315 M	1MA6 313	4, 6, 8	508	120	628	620	515	515	395	395	405	805	590	134	457	125	171	527	32	90	216	307	315	52		
	315 L	2	508	120	628	620	515	515	395	395	405	805	590	134	508	120	120	578	32	90	216	396	315	52		
1MA6 317		4, 6, 8																								
1MA6 318		6, 8																								

■ Dimensions for 9-terminal connection box can be supplied on request.

* This dimension is assigned in DIN EN 50347 to the frame size listed.

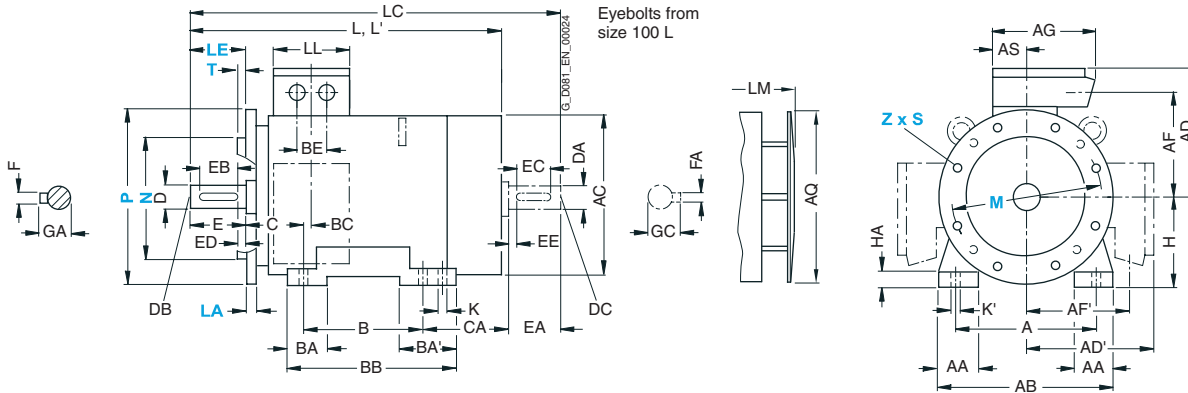
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1MA6, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1MA6 183	2	156	15	20	715	770	841	164	796.5	855	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
		4					—				—														
180 L	1MA6 186	4, 6, 8	156	15	20	715	—	841	164	796.5	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1MA6 206	2	175	19	25		819.5	897	197	853	901	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		6				771.5	—				—								55	M20				16	59
	1MA6 207	2	175	19	25	771.5	819.5	897	197	853	901	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8					—				—								55	M20				16	59
225 S	1MA6 220	4, 8	174	19	25	839	—	954	200	935	—	60	M20	140	125	10	18	64	55	M20	110	100	10	16	59
225 M	1MA6 223	2	174	19	25	809	855	924	200	909	955	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
		4, 6, 8				839	—	954		935	—	60		140	125	10	18	64	55	M20		100	10	16	59
250 M	1MA6 253	2	207	24	30	935	1010	1050	234	1035	1110	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		4, 6, 8					—	1080			—	65						69	60		140	125		18	64
280 S	1MA6 280	2	220	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8									75						20	79.5	65					69	
280 M	1MA6 283	2	220	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8					—				75						20	79.5	65					69	
315 S	1MA6 310	2	248	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8				1144	—	1290		1254	—	80		170	140			85	70					20	74.5
315 M	1MA6 313	2	248	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6, 8				1144	—	1290		1254	—	80		170	140			85	70					20	74.5
315 L	1MA6 316	2	248	28	35	1254	1325	1400	266	1364	1435	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1MA6 317	4, 6, 8				1284	—	1430		1394	—	80		170	140			85	70					20	74.5
	1MA6 318	6, 8				1284	—	1430		1394	—	80		170	140			85	70					20	74.5

¹⁾ For version with low-noise fan.

²⁾ In the low-noise version, a second shaft extension is not possible.

IEC Squirrel-Cage Motors

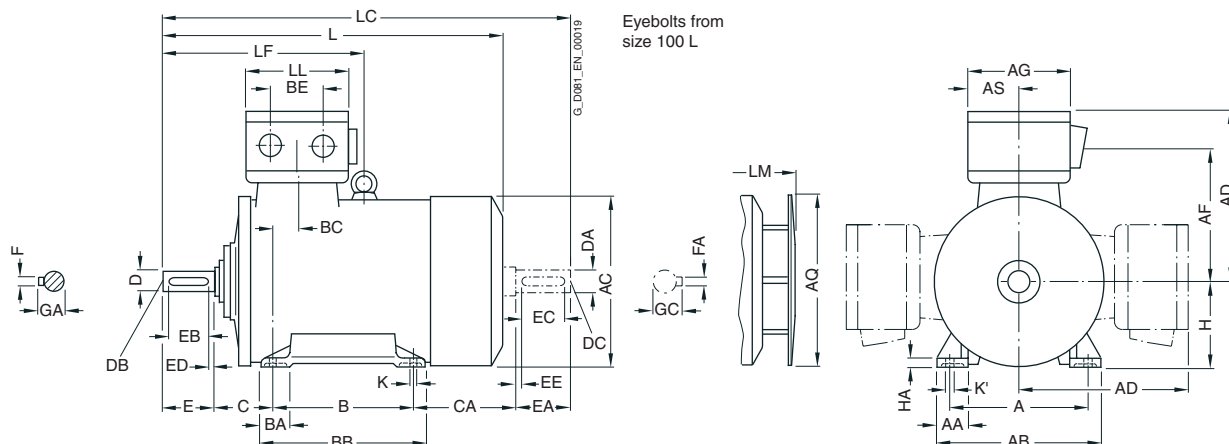
Explosion-proof motors

Dimensions

Dimensional drawings

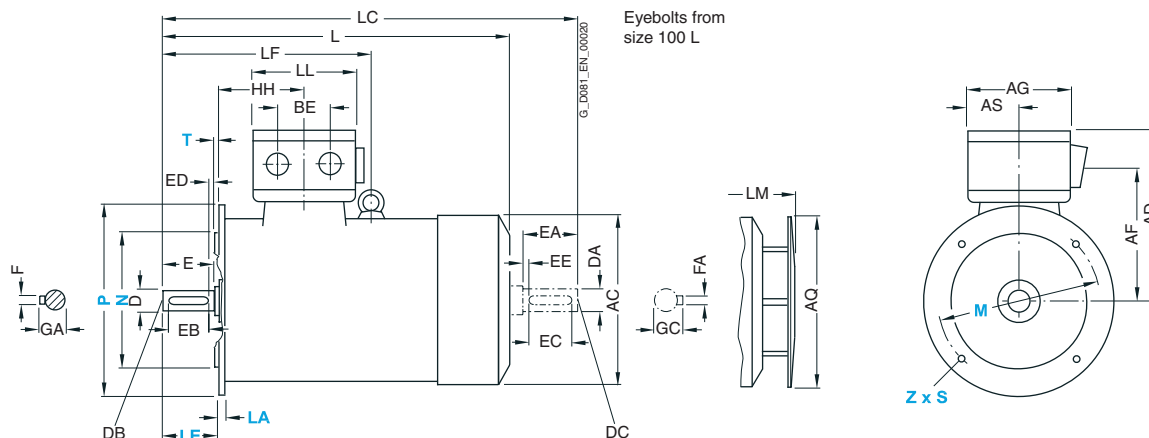
Cast-iron series 1MJ6, frame sizes 71 M to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC																									
Frame size	Type		A	AA	AB	AC ¹⁾	AD	AF	AG	AQ	AS	B	BA	BB	BC	BE	C	CA	H	HA	HH	K	K'	L				
71 M	1MJ6 070	2, 4	112	34	140	148.5	201 ²⁾	162	152	124	71	90	30	110	58	54	45	144	71	8	103	7	10	299				
	1MJ6 073	2, 4, 6																										
80 M	1MJ6 080	2, 4, 6	125	36	160	165.5	209 ²⁾	170	152	125	71	100	35	125	44	54	50	156	80	10	93.5	9.5	13.5	336				
	1MJ6 083	2, 4, 6																										
90 L	1MJ6 096	2, 4, 6, 8	140	37	168	183	218	177	162	170	81	125	35	156	54	54	56	177	90	13	109.5	10	14	383				
	1MJ6 097	2, 4, 6, 8																										
100 L	1MJ6 106	2, 4, 6, 8	160	45	196	202.5	223	182	162	170	81	140	45	176	50	54	63	185	100	14	112.5	12	16	426				
	1MJ6 107	4, 8																										
112 M	1MJ6 113	2, 4, 6, 8	190	50	226	228.5	238	197	162	170	81	140	45	176	52	54	70	180	112	15	121.5	12	16	428				
132 S	1MJ6 130	2, 4, 6, 8	216	53	256	267.5	258	217	162	250	81	140	49	180	55	54	89	228	132	17	144	12	16	515				
	1MJ6 131	2																										
132 M	1MJ6 133	4, 6, 8	216	53	256	267.5	258	217	162	250	81	178	49	218	55	54	89	190	132	17	144	12	16	515				
	1MJ6 134	6																										
160 M	1MJ6 163	2, 4, 6, 8	254	60	300	323	280	239	162	250	81	210	57	256	40	54	108	238	160	20	148	15	19	641				
	1MJ6 164	2, 8																										
160 L	1MJ6 166	2, 4, 6, 8	254	60	300	323	314	246	216	250	95	254	57	300	40	96	108	194	160	20	148	15	19	641				

¹⁾ Measured across the bolt heads.

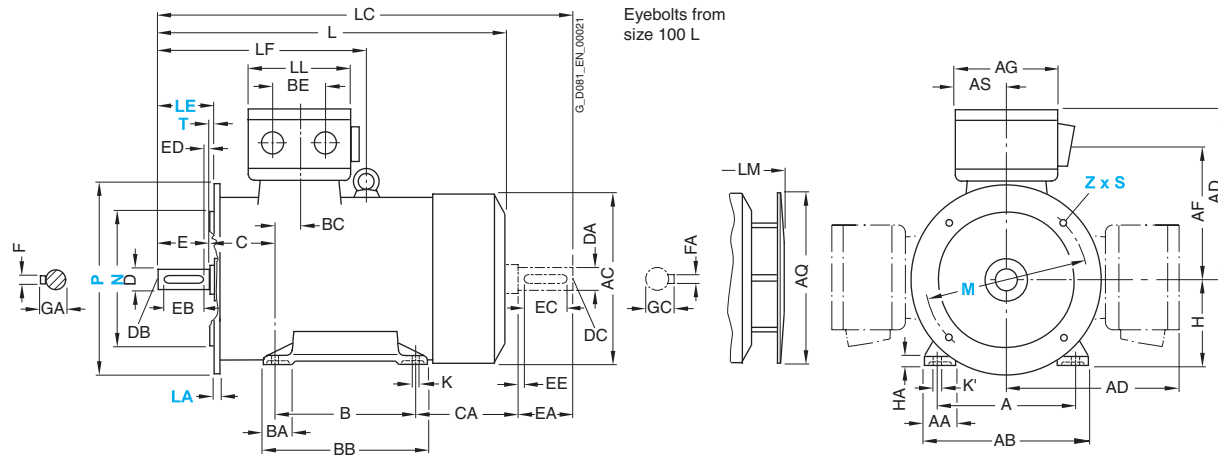
²⁾ K09 and K10 frame size 90 and above.

Dimensional drawings

Cast-iron series 1MJ6, frame sizes 71 M to 160 L

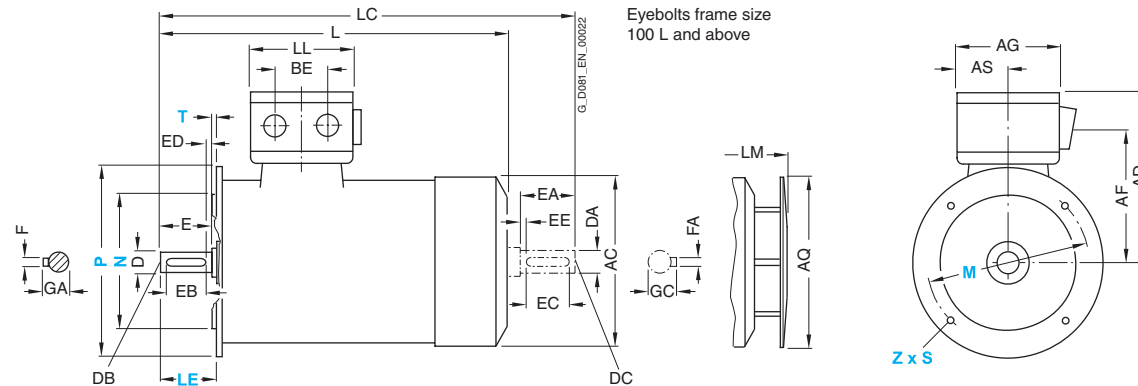
Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Type of construction IM B14 – only for frame sizes 71 M to 90 L

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC										NDE shaft extension									
Frame size	Type	Number of poles	LC	LF	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
71 M	1MJ6 070	2, 4	339	–	132	327	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16		
	1MJ6 073	2, 4, 6																				
80 M	1MJ6 080	2, 4, 6	386	–	132	362	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5		
	1MJ6 083	2, 4, 6																				
90 L	1MJ6 096	2, 4, 6, 8	458	–	162	434.5	24	M8	50	40	5	8	27	24	M8	50	40	5	8	27		
	1MJ6 097	2, 4, 6, 8																				
100 L	1MJ6 106	2, 4, 6, 8	508	–	162	477.5	28	M10	60	50	5	8	31	28	M10	60	50	5	8	31		
	1MJ6 107	4, 8																				
112 M	1MJ6 113	2, 4, 6, 8	510	–	162	479.5	28	M10	60	50	5	8	31	28	M10	60	50	5	8	31		
132 S	1MJ6 130	2, 4, 6, 8	617	–	162	567.5	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
	1MJ6 131	2																				
132 M	1MJ6 133	4, 6, 8	617	–	162	567.5	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
	1MJ6 134	6																				
160 M	1MJ6 163	2, 4, 6, 8	776	383	162	693.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		
	1MJ6 164	2, 8																				
160 L	1MJ6 166	2, 4, 6, 8	776	383	190	693.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		

Dimensions

Cast-iron series 1MJ6 and 1MJ7, frame sizes 180 M to 315 M

Technical drawings of the 280 S/M motor frame, showing front, side, and top views with dimension labels.

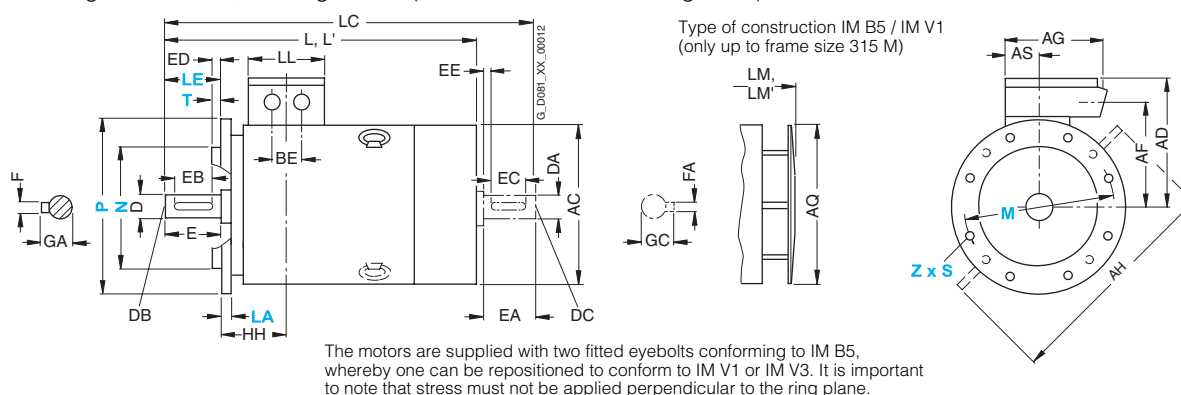
Front View (Left): Shows the motor frame with dimensions: LC, L, L', ED, EE, EB, BE, BC, EC, DA, AC, DC, EA, BA, BB, BA', CA, K, DB, D, GA, F, and G_D081_XX_00011.

Side View (Middle): Shows the motor frame with dimensions: LM, LM', AQ, and FA.

Top View (Right): Shows the motor frame with dimensions: AG, AS, AF, HA, AA, A, AF', AA', AD', AB, and H.

Frame sizes 180 M/L, 225 S/M, 280 S/M and 315 S/M have frame feet each with 2 drilled holes at NDE.

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



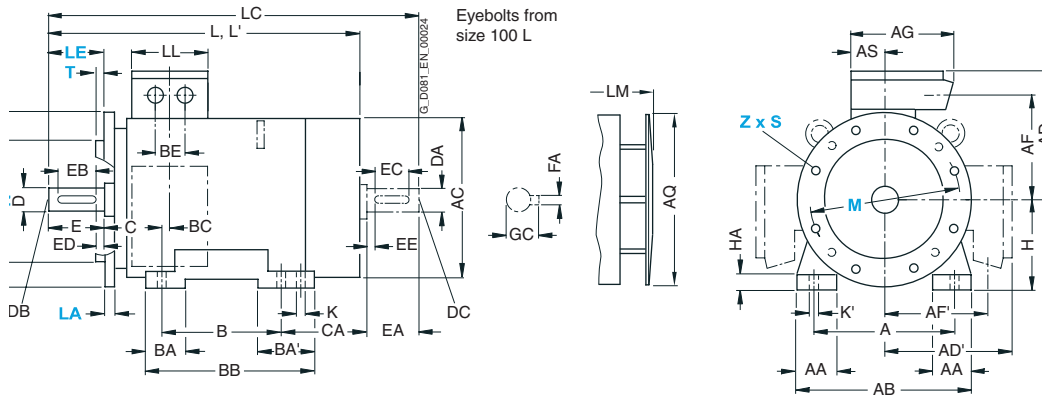
1) Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1MJ6 and 1MJ7, frame sizes 180 M to 315 M

Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Number of poles	Dimension designation acc. to IEC								DE shaft extension								NDE shaft extension							
Frame size	Type	K		K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC			
180 M	1MJ6 183	2, 4	15	20	715	770	841	164	796.5	885	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5			
180 L	1MJ6 186	4, 6, 8	15	20	715	—	841	164	796.5	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5			
200 L	1MJ6 206	2	19	25	771.5	825	897	197	853	910	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5			
	1MJ6 207	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	55	M20	—	—	—	—	—			
		2	19	25	771.5	825	897	197	853	910	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5			
		4, 6, 8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	55	M20	—	—	—	—	—			
225 S	1MJ7 220	4, 8	19	25	839	—	954	197	939	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59			
225 M	1MJ7 223	2	19	25	809	855	924	197	909	955	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5			
		4, 6, 8	—	—	839	—	954	—	939	—	60	—	140	125	10	18	64	55	M20	—	—	—	—	—			
250 M	1MJ7 253	2	24	30	930	1010	1050	234	1035	1110	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59			
		4, 6, 8	—	—	—	—	1080	—	—	—	65	—	—	—	—	—	69	60	—	140	125	10	18	64			
280 S	1MJ7 280	2	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64			
		4, 6, 8	—	—	—	—	—	—	—	—	75	—	—	—	—	20	79.5	65	—	—	—	—	—	69			
280 M	1MJ7 283	2	24	30	1010	1080	1155	234	1120	1230	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64			
		4, 6, 8	—	—	—	—	—	—	—	—	75	—	—	—	—	20	79.5	65	—	—	—	—	—	69			
315 S	1MJ7 310	2	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64			
		4, 6, 8	—	—	1140	—	1290	—	1250	—	80	—	170	140	—	22	85	70	—	—	—	—	—	20			
315 M	1MJ7 313	2	28	35	1114	1185	1260	266	1224	1295	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64			
		4, 6, 8	—	—	1140	—	1290	—	1250	—	80	—	170	140	—	22	85	70	—	—	—	—	—	20			

¹⁾ For version with low-noise fan.

²⁾ In the low-noise version, a second shaft extension is not possible.

IEC Squirrel-Cage Motors

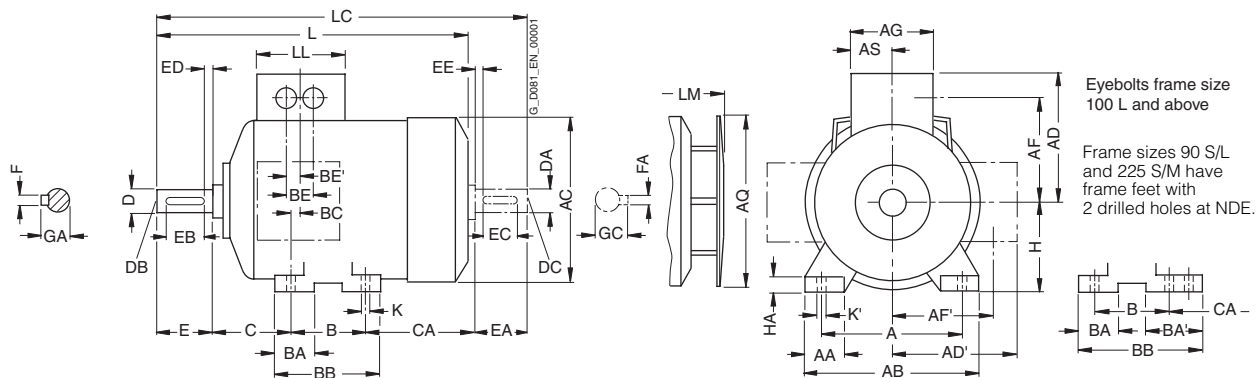
Explosion-proof motors

Dimensions

Dimensional drawings

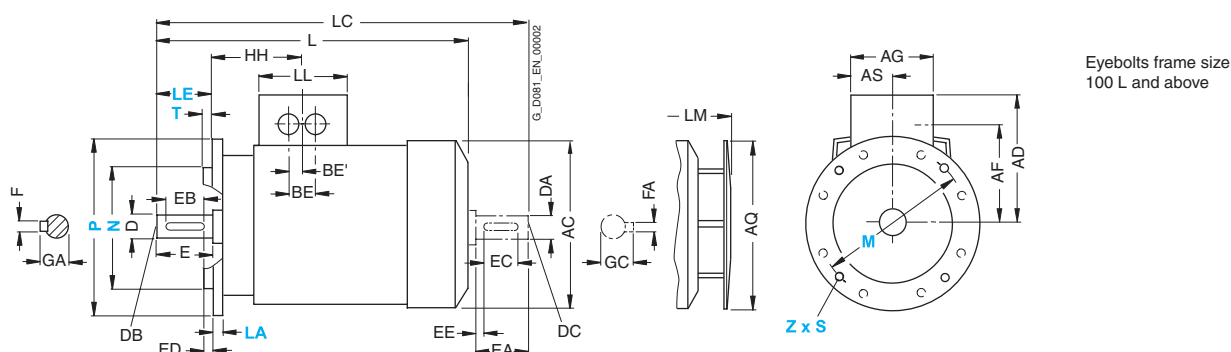
Aluminium series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																								
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD ²⁾	AD'	AF ²⁾	AF'	AG ²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ²⁾	BE' ²⁾	C	CA*	H	HA			
56 M ³⁾	1LA7 050 1LA7 053	2, 4	90	25	110	116	101	101	78	78	74	–	37	71	28	–	87	34	32	18	36	53	56	6			
63 M	1LA7 060 1LA7 063	2, 4, 6	100	27	120	124	101	101	78	78	74	124	37	80	28	–	96	30	32	18	40	66	63	7			
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	74	124	37	90	27	–	106	18	32	18	45	83	71	7			
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	–	118	14	32	18	50	94	80	8			
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	170	37.5	100 125	33	54	143	23	32	18	56	143 118	90	10			
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	–	176	39	42	21	63	125	100	12			
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	–	176	32	42	21	70	141	112	12			
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	–	180	39	42	21	89	162.5	132	15			
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	–	218	39	42	21	89	124.5	132	15			
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	–	256	52.5	54	27	108	183	160	18			
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	–	300	52.5	54	27	108	139	160	18			
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	–	287	38	54	27	121	259	180	18			
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	–	325	38	54	27	121	221	180	18			
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	–	355	45	85	42.5	133	239	200	24			
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24			
225 M	1LA5 223	2, 6 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24			

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) The values are increased when the connection box is rotated. Further information is provided by the dimension sheet generator in SD configurator.

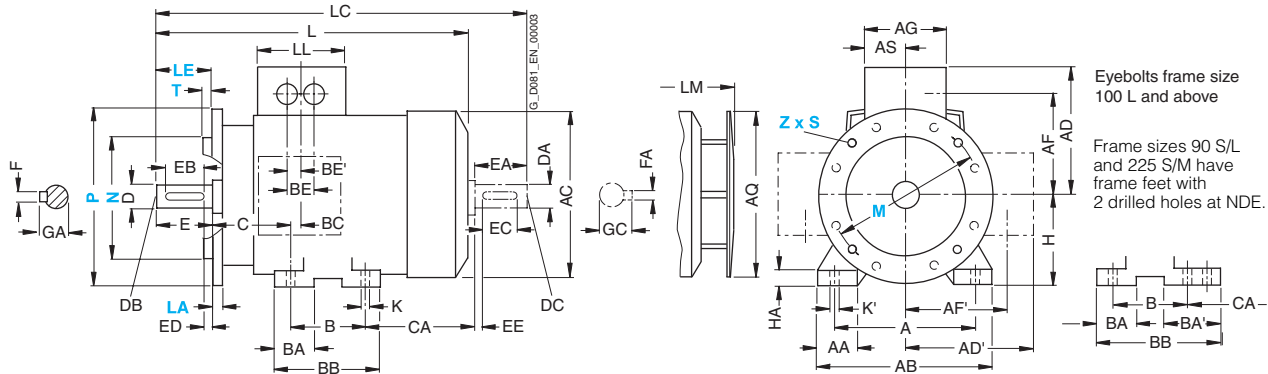
3) The motors of frame size 56 M are not ventilated.

Dimensional drawings

Aluminium series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B35

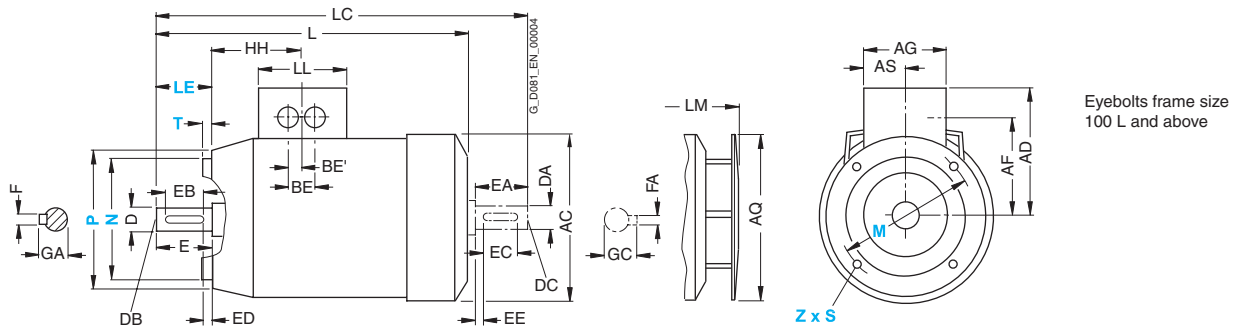
For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA5 motors, frame sizes 180 M to 225 M

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC							DE shaft extension							NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
56 M ¹⁾	1LA7 050 1LA7 053	2, 4	69.5	5.8	9	169	200	74	–	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2	
63 M	1LA7 060 1LA7 063	2, 4, 6	69.5	7	10	202.5	232	74	231.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5	
71 M	1LA7 070 1LA7 073	2, 4, 6, 8	63.5	7	10	240	278	74	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16	
80 M	1LA7 080 1LA7 083	2, 4, 6, 8	63.5	9.5	13.5	273.5	324 364	75	299.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5	
90 S 90 L	1LA7 090 1LA7 096	2, 4, 6, 8	79	10	14	331	389	75	382.5	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5	
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
132 M	1LA7 133 1LA7 134	4, 6, 8 6	128	12	16	452.5 ²⁾	551.5	140	505 ²⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41	
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59	
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20 M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59	

¹⁾ The motors of frame size 56 M are not ventilated.

²⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

IEC Squirrel-Cage Motors

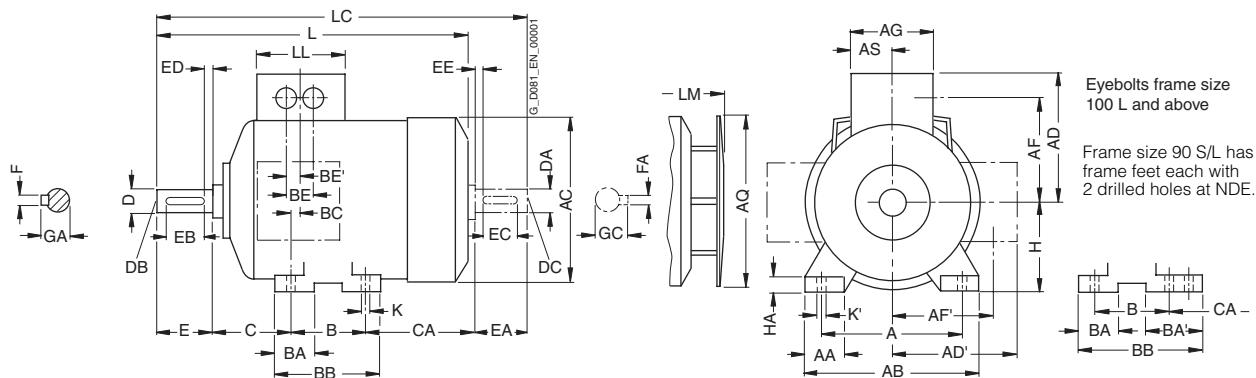
Explosion-proof motors

Dimensions

Dimensional drawings

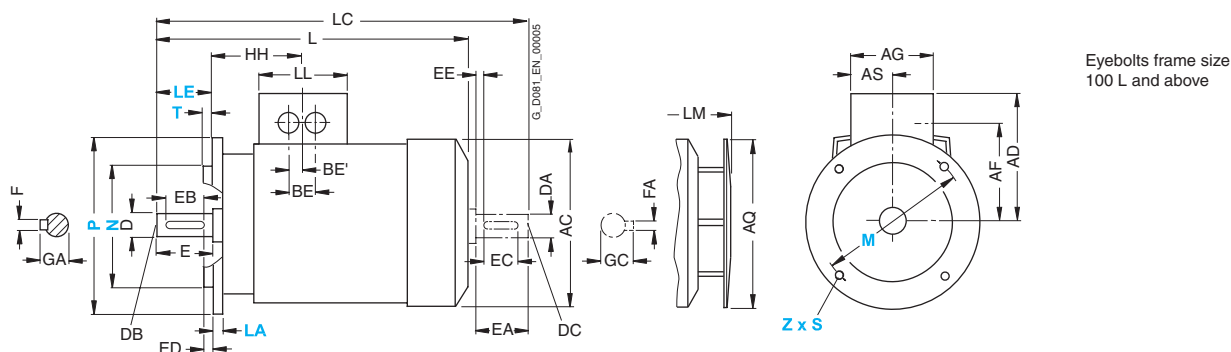
Aluminium series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																								
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA		
56 M ²⁾	1LA9 050 1LA9 053	2, 4	90	25	110	116	101	101	78	78	74 37	—	37	71	28	—	87	34	32	18	36	53	56	6		
63 M	1LA9 060 1LA9 063	2, 4	100	27	120	124	101	101	78	78	74 37	124	37	80	28	—	96	30	32	18	40	66 92	63	7		
71 M	1LA9 070 1LA9 073	2, 4	112	30.5	132	145	111	111	88	88	74 37	124	37	90	27	—	106	18	32	18	45	83	71	7		
80 M	1LA9 080 1LA9 083	2, 4	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	—	118	14	32	18	50	94 134	80	8		
90 S 90 L	1LA9 090 1LA9 096	2, 4, 6	140	30.5	165	180	128	128	105	105	75	170	37.5	100 125	33	54	143	23	32	18	56	143 118	90	10		
100 L	1LA9 106 1LA9 107	2, 4, 6	160	42	196	203	135	163	78	123	120	170	60	140	47	—	176	39	42	21	63	160 195 ⁴⁾	100	12		
112 M	1LA9 113	2, 4, 6	190	46	226	227	148	176	91	136	120	170	60	140	47	—	176	32	42	21	70	179	112	12		
132 S	1LA9 130 1LA9 131	2, 4 2	216	53	256	267	167	194	107	154	140	250	70	140	49	—	180	39	42	21	89	162.5 200.5	132	15		
132 M	1LA9 133 1LA9 133 1LA9 134	6 4 6	216	53	256	267	167	194	107	154	140	250	70	178	49	—	218	39	42	21	89	124.5 162.5	132	15		
160 M	1LA9 163 1LA9 164	2, 4, 6 2	254	60	300	320	197	226	127	183	165	250	82.5	210	57	—	256	52.5	54	27	108	183	160	18		
160 L	1LA9 166	2, 4, 6	254	60	300	320	197	226	127	183	165	250	82.5	254	57	—	300	52.5	54	27	108	179	160	18		
180 M	1LA9 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	—	287	38	54	27	121	259	180	18		
180 L	1LA9 186	4, 6	279	69.5	339	363	258	258	216	216	152	340	71	279	50	—	325	38	54	27	121	221	180	18		
200 L	1LA9 206 1LA9 207	2, 6 2, 4, 6	318	83	388	402	305	305	252	252	260	340	96	305	58.5	—	355	45	85	42.5	133	239	200	24		

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

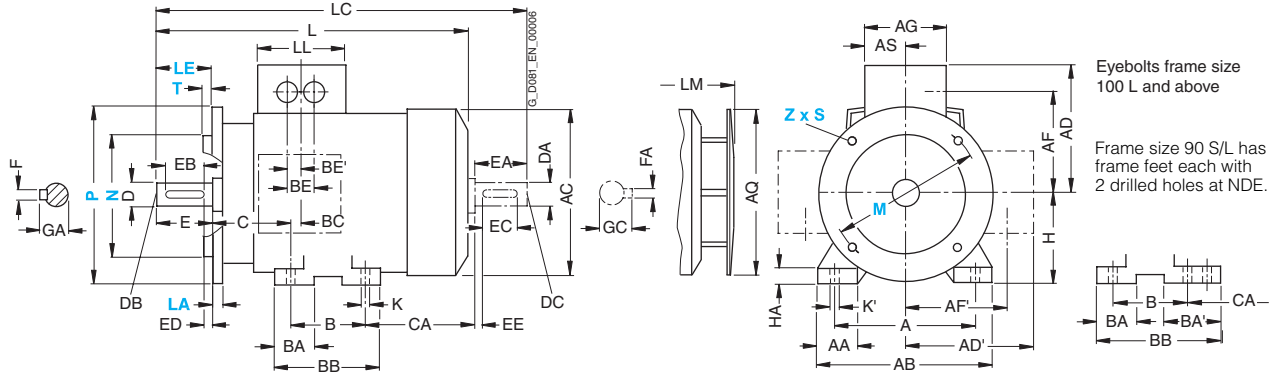
²⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

Dimensional drawings

Aluminium series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B35

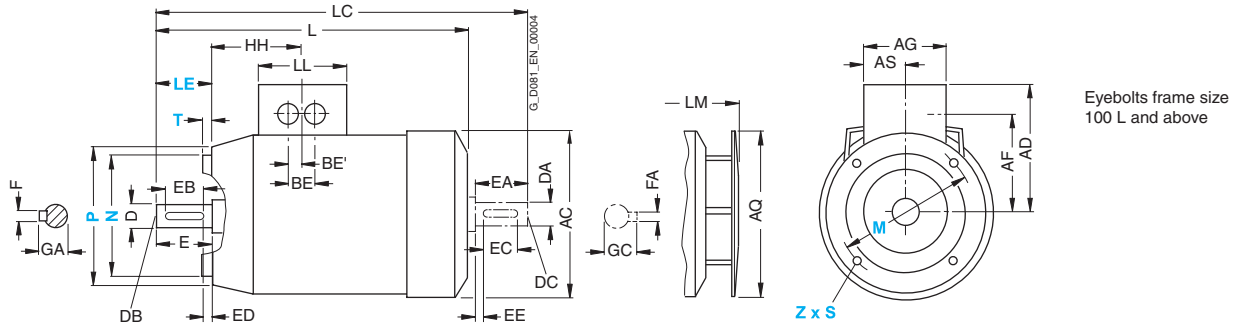
For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Type of construction IM B14

Type of construction IM B14 not possible for 1LA9 motors, frame sizes 180 M to 200 L

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor		Number of poles	Dimension designation acc. to IEC							DE shaft extension						NDE shaft extension							
Frame size	Type		HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
56 M ¹⁾	1LA9 050 1LA9 053	2, 4	69.5	5.8	9	169 195	200 226	74	–	9	M3	20	14	3	3	10.2	9	M3	20	14	3	3	10.2
63 M	1LA9 060 1LA9 063	2, 4	69.5	7	10	202.5 228.5	232 258	74	231.5 257.5	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1LA9 070 1LA9 073	2, 4	63.5	7	10	240	278	74	268	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1LA9 080 1LA9 083	2, 4	63.5	9.5	13.5	273.5 308.5	324 364	75	299.5 334.5	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1LA9 090 1LA9 096	2, 4, 6	79	10	14	331 376 ²⁾ 358 ³⁾	389 434 ²⁾ 414 ³⁾	75	382.5 427.5 ²⁾ 409.5 ³⁾	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1LA9 106 1LA9 107	2, 4, 6	102	12	16	407 442 ⁴⁾	473 508 ⁴⁾	120	458.5 493 ⁴⁾	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA9 113	2, 4, 6	102	12	16	431	499	120	482.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA9 130 1LA9 131	2, 4 2	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA9 133 1LA9 133 1LA9 134	6 4 6	128	12	16	452.5 490.5	551.5 589.5	140	505 543	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA9 163 1LA9 164	2, 4, 6 2	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA9 166	2, 4, 6	160.5	15	19	628	761	165	680.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1LA9 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LA9 186	4, 6	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LA9 206 1LA9 207	2, 6 2, 4, 6	178	19	25	768.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

¹⁾ The motors of frame size 56 M are not ventilated. Frame size 56 M is not available in IM B35.

²⁾ For 1LA9 096-6KA.

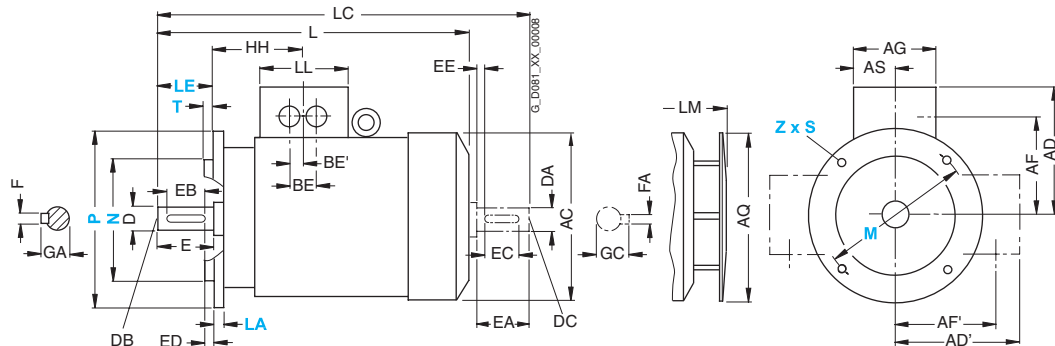
³⁾ For 1LA9 096-2 and 1LA9 096-4.

⁴⁾ For 1LA9 107-4KA.

Dimensions

Cast-iron series 1LA6, frame sizes 100 L to 160 L

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AQ	AS	B	BA	BB	BC	BE	BE'	C	CA	H	HA
100 L	1LA6 106 1LA6 107	2, 4, 6, 8 4, 8	160	40	196	201	164	164	124	124	121	170	60.5	140	46	180	42	44	22	63	125	100	12
112 M	1LA6 113	2, 4, 6, 8	190	42.5	226	225.5	178	178	138	138	121	170	60.5	140	46	180	34	44	22	70	141	112	15
132 S	1LA6 130 1LA6 131	2, 4, 6, 8 2	216	50	256	265	194	194	154	154	141	250	70.5	140	47	180	42	44	22	89	162.5	132	17
132 M	1LA6 133 1LA6 134	4, 6, 8 6	216	50	256	265	194	194	154	154	141	250	70.5	178	49	218	42	44	22	89	124.5	132	17
160 M	1LA6 163 1LA6 164	2, 4, 6, 8 2, 8	254	60	300	320	226	226	183	183	166	250	83	210	63	256	52	54	27	108	183	160	18
160 L	1LA6 166	2, 4, 6, 8	254	60	300	320	226	226	183	183	166	250	83	254	63	300	52	54	27	108	139	160	18

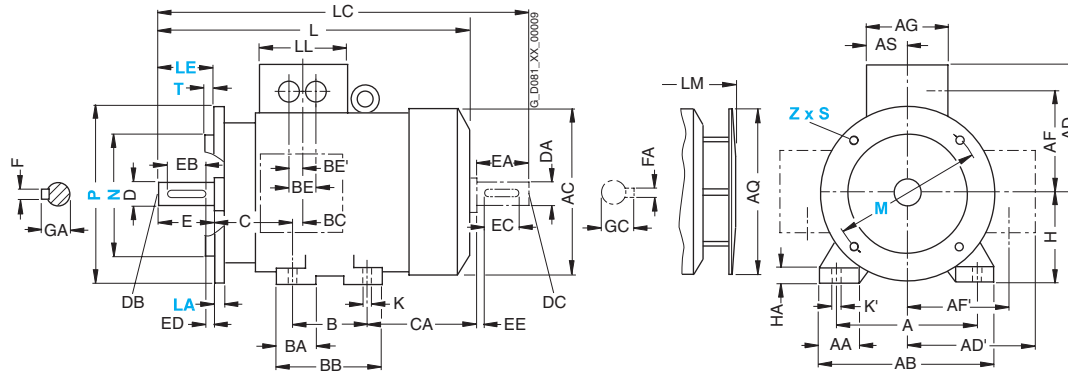
1) Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LA6, frame sizes 100 L to 160 L

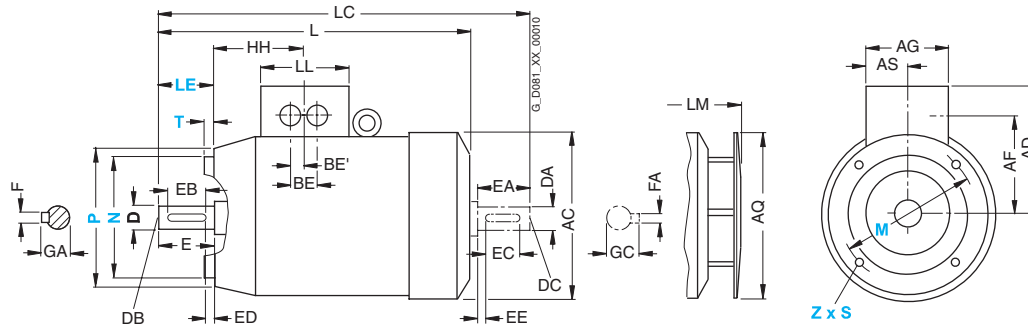
Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



Types of construction IM B14

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



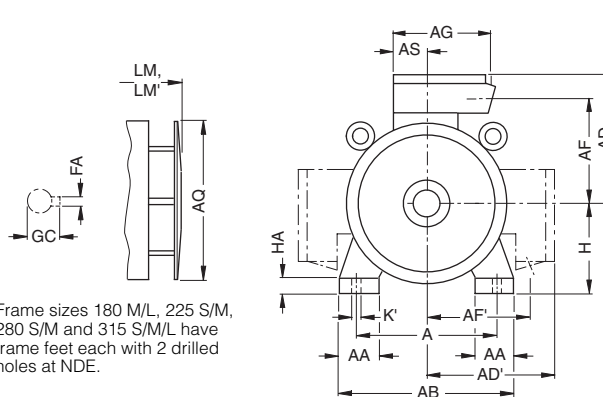
For motor			Dimension designation acc. to IEC							DE shaft extension							NDE shaft extension						
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	1LA6 106 1LA6 107	2, 4, 6, 8 4, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1LA6 113	2, 4, 6, 8	104.5	12	16	393	461	121	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1LA6 130 1LA6 131	2, 4, 6, 8 2	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1LA6 133 1LA6 134	4, 6, 8 6	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1LA6 163 1LA6 164	2, 4, 6, 8 2, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1LA6 166	2, 4, 6, 8	160	14.5	18	588	721	166	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

Dimensions

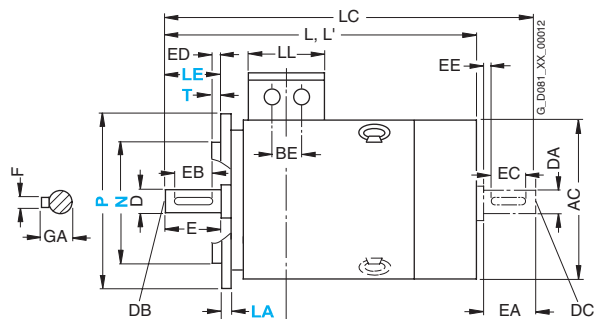
Cast-iron series 1LG4, frame sizes 180 M to 315 L

Technical drawing of a 1000 mm x 1000 mm x 100 mm plate. The drawing shows a top view and a side view. The top view is a square with dimensions 1000 mm x 1000 mm. The side view shows the thickness of 100 mm. Various dimensions and labels are provided:

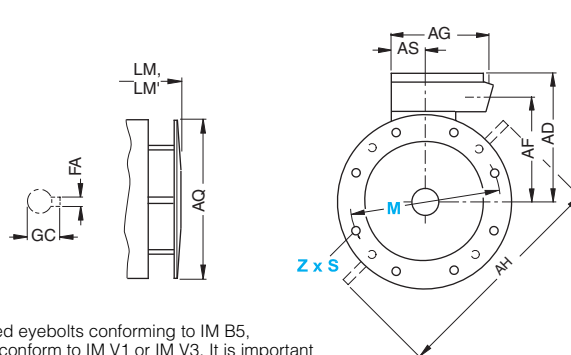
- Dimensions:**
 - 1000 (Overall width)
 - 1000 (Overall height)
 - 100 (Thickness)
 - 100 (Distance from top edge to first hole center)
 - 100 (Distance from bottom edge to first hole center)
 - 100 (Distance from left edge to first hole center)
 - 100 (Distance from right edge to first hole center)
 - 100 (Distance from top edge to second hole center)
 - 100 (Distance from bottom edge to second hole center)
 - 100 (Distance from left edge to second hole center)
 - 100 (Distance from right edge to second hole center)
 - 100 (Distance from top edge to third hole center)
 - 100 (Distance from bottom edge to third hole center)
 - 100 (Distance from left edge to third hole center)
 - 100 (Distance from right edge to third hole center)
- Labels:**
 - GA (Top edge)
 - GB (Bottom edge)
 - GC (Left edge)
 - GD (Right edge)
 - GE (Top edge)
 - GF (Bottom edge)
 - GG (Left edge)
 - GH (Right edge)
 - GI (Top edge)
 - GJ (Bottom edge)
 - GK (Left edge)
 - GL (Right edge)
 - GM (Top edge)
 - GN (Bottom edge)
 - GO (Left edge)
 - GP (Right edge)
 - GQ (Top edge)
 - GR (Bottom edge)
 - GS (Left edge)
 - GT (Right edge)
 - GU (Top edge)
 - GV (Bottom edge)
 - GW (Left edge)
 - GX (Right edge)
 - GY (Top edge)
 - GZ (Bottom edge)
 - GA' (Top edge)
 - GB' (Bottom edge)
 - GC' (Left edge)
 - GD' (Right edge)
 - GE' (Top edge)
 - GF' (Bottom edge)
 - GG' (Left edge)
 - GH' (Right edge)
 - GI' (Top edge)
 - GJ' (Bottom edge)
 - GK' (Left edge)
 - GL' (Right edge)
 - GM' (Top edge)
 - GN' (Bottom edge)
 - GO' (Left edge)
 - GP' (Right edge)
 - GQ' (Top edge)
 - GR' (Bottom edge)
 - GS' (Left edge)
 - GT' (Right edge)
 - GU' (Top edge)
 - GV' (Bottom edge)
 - GW' (Left edge)
 - GX' (Right edge)
 - GY' (Top edge)
 - GZ' (Bottom edge)



For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



The motors are supplied with two fitted eyebolts conforming to IM B5, whereby one can be repositioned to conform to IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.



*) This dimension is assigned in DIN EN 50347 to the frame size listed.
1) Measured across the bolt heads.

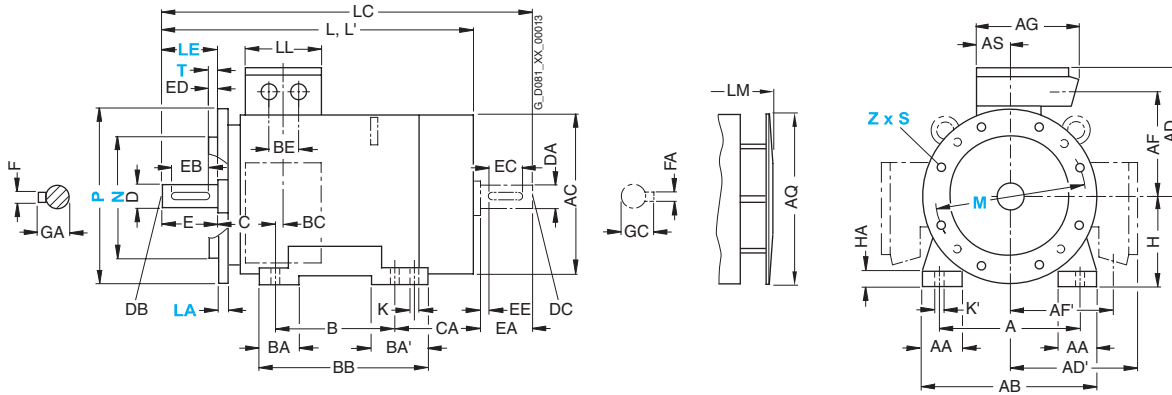
2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC										DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
180 M	1LG4 183	2, 4	157	15	19	669	669	784	132	759	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
180 L	1LG4 186	4, 6, 8	157	15	19	669	—	784	132	759	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
	1LG4 188	2, 4, 6, 8	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1LG4 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
	1LG4 207	2, 4, 6, 8	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
	1LG4 208	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
		4, 8				720	—	835		810	—															
225 S	1LG4 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
225 M	1LG4 223	2	196	19	25	759	793	873	192	859	893	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8				789	—	903		889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
	1LG4 228	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8				849	—	963		949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
250 M	1LG4 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		4, 6, 8				—	—	1032		—	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG4 258	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		4				957	—	1102		1057	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		6, 8				887	—	1032		987	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
280 S	1LG4 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8				—	—	—		—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
280 M	1LG4 283	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4, 6, 8				—	—	—		—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
	1LG4 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		4				—	—	—		—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
		6, 8				960	—	1105		1070	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
315 S	1LG4 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG4 310	4, 6, 8				1102	—	1247		1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
315 M ³⁾	1LG4 313	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG4 313	4, 6, 8				1102	—	1247		1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
315 L ³⁾	1LG4 316/317	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG4 316/317	4, 6, 8				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG4 318	8				—	—	—		—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	
	1LG4 318	6	285	28	35	1402	—	1547	307	1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5	

¹⁾ For version with low-noise fan for 2-pole motors.

²⁾ In the low-noise version, a second shaft extension is not possible.

³⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

IEC Squirrel-Cage Motors

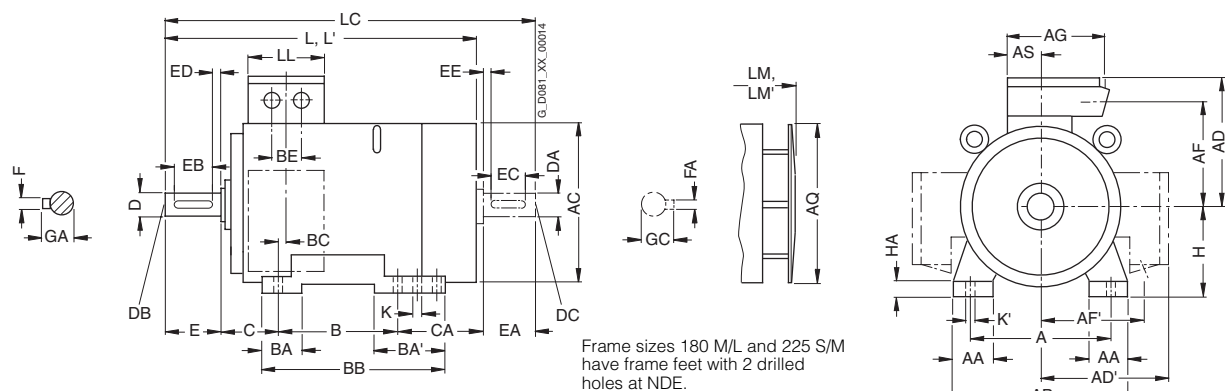
Explosion-proof motors

Dimensions

Dimensional drawings

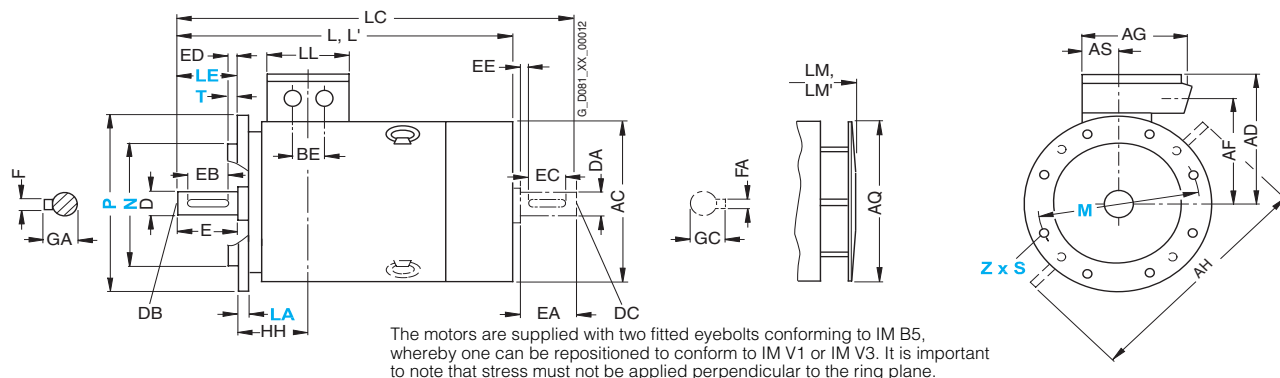
Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
180 L	1LG6 186	4																			202			
200 L	1LG6 206 1LG6 207	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
		2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25
		2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	234	200	25
	1LG6 207	4, 8																			177			
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG6 223 1LG6 228	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		4, 6, 8																						
		2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
	1LG6 228	4, 6																						
250 M	1LG6 253 1LG6 258	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		4																			305			
		6, 8																			235			
	1LG6 258	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40
		4, 6																						

* This dimension is assigned in DIN EN 50347 to the frame size listed.

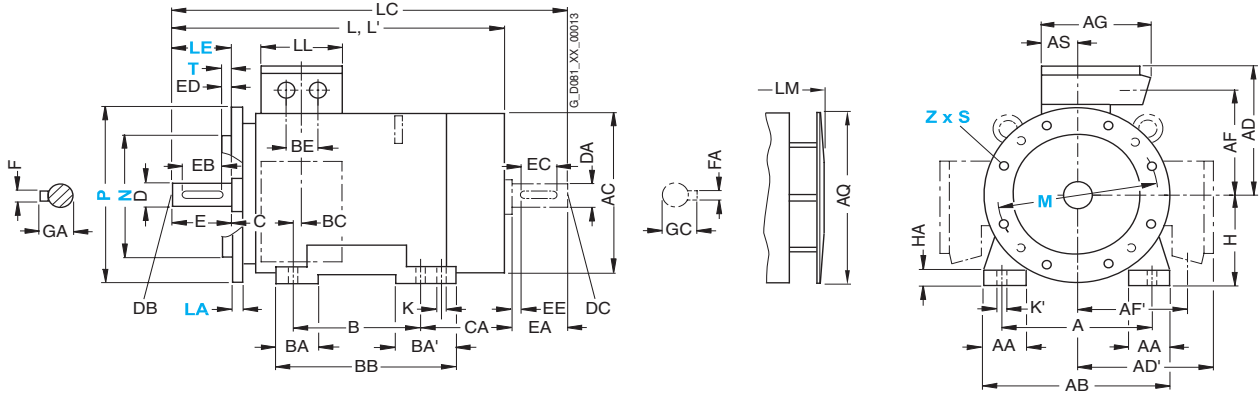
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension							NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K' L	L	L ⁽¹⁾	LC	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
180 M	1LG6 183	2	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
		4				669	—	784		759	—															
180 L	1LG6 186	4, 6, 8	157	15	19	720	—	835	132	810	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5	
200 L	1LG6 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
	1LG6 207	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59	
		4, 8				720	—	835		810	—															
225 S	1LG6 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
225 M	1LG6 223	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6, 8				849	—	963		949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
	1LG6 228	2	196	19	25	869	903	983	192	969	1003	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5	
		4, 6				899	—	1013		999	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
250 M	1LG6 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
		4				957	—	1102		1057	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
		6, 8				887	—	1032		987	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	
	1LG6 258	2	237	24	30	957	994	1102	236	1057	1094	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59	
4, 6						—					—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64	

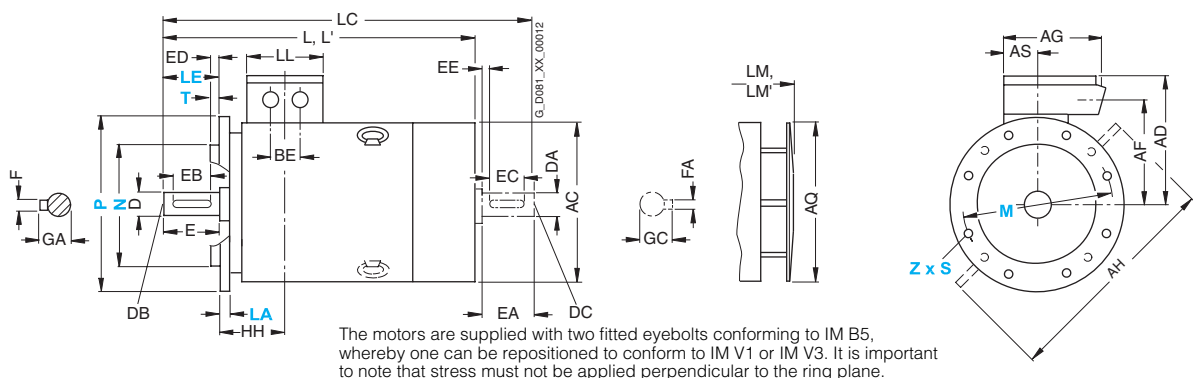
¹⁾ For version with low-noise fan for 2-pole motors.

Dimensions

Cast-iron series 1LG6, frame sizes 280 S to 315 L

[illegible]

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



*) This dimension is assigned in DIN EN 50347 to the frame size listed.
1) Measured across the bolt heads.

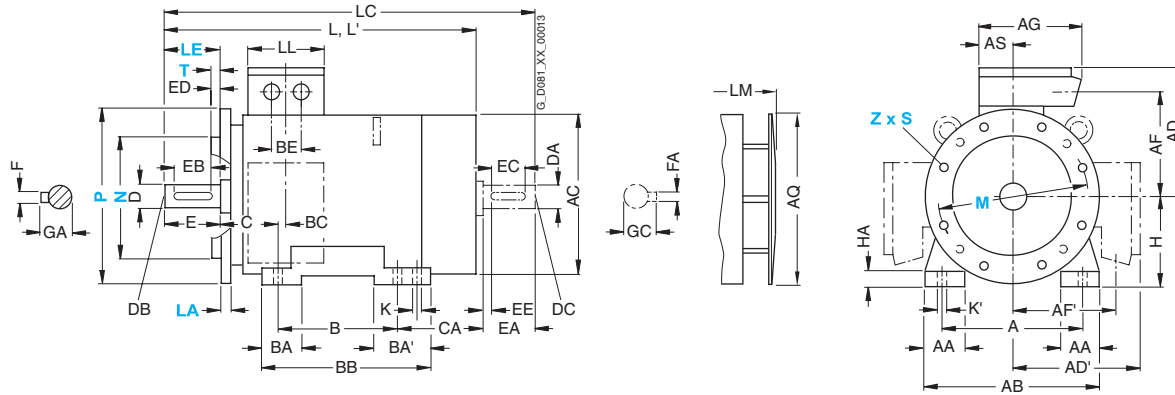
2) With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B35

For flange dimensions, see Page 4/146 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension								NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
280 S	1LG6 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		4, 6, 8				—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
280 M	1LG6 283	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		4				—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
		6, 8				960	—	1105	—	1070	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
	1LG6 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		4, 6				—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69		
315 S	1LG6 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 310	4, 6, 8				1102	—	1247		1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
315 M ²⁾	1LG6 313	8	285	28	35	1102	—	1247	307	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 313	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 313	4, 6				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
315 L ²⁾	1LG6 316	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 316	4, 6				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 316	8				—	—	—		—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 317	2	285	28	35	1372	1442	1517	307	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 317	4, 6				1402	—	1547		1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 317	8				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 318	2	285	28	35	1372	1442	1517	330	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 318	4				1402	—	1547		1512	—	80 ³⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		
	1LG6 318	6, 8				—	—	—	307	—	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5		

¹⁾ For version with low-noise fan for 2-pole motors.

²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

³⁾ Diameters up to 90 mm are possible.

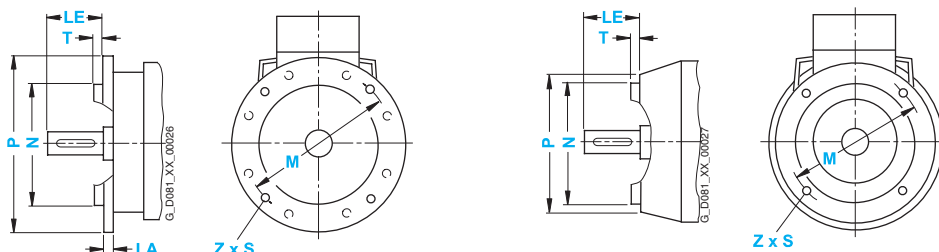
IEC Squirrel-Cage Motors

Explosion-proof motors

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) Tapped holes (FT/C)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
56 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 100	A 120	8	20	100	80	120	7	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 65	C 80	–	20	65	50	80	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 85	C 105	–	20	85	70	105	M6	2.5	4
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115	A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75	C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100	C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130	A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85	C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115	C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	A 450	16	110	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140	600	550	660	24	6	8
315 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	25	140	740	680	800	22	6	8
355 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	25	140	840	780	900	22	6	8
400 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	28	170	940	880	1000	22	6	8
450 2-pole 4-pole to 8-pole	IM B35, IM V1	Flange	–	–	30	170	1080	1000	1150	26	6	8

Motors operating with frequency converters

5



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5/10 Surface-cooled motors with standard insulation for voltages ≤ 500 V, aluminium or cast-iron housing

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5/12 Selection and ordering data

5/14 Self-ventilated motors with special insulation for voltages up to 690 V, cast-iron series 1LG6

5/14 Selection and ordering data

5/17 Self-ventilated motors up to FS 315 with special insulation for voltages up to 690 V, cast-iron series 1LA8

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IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Overview



Converter-fed operation up to 500 V +10% mains voltage

The standard insulation of the 1LA and 1LG motors is designed such that operation without limitation is only possible on the converter at supply voltages up to 500 V +10%. This also applies for operation with a pulse-controlled AC converter with voltage rise times of $t_s > 0.1 \mu s$ at the motor terminals (IGBT transistors). At higher voltages, the motors require greater insulation resistance. Please enquire in the case of converter-fed operation with motors with protruding connection cables (order codes **L44**, **L45**, **L47**, **L48**, **L49**, **L51** and **L52**).

The 1LA8 non-standard motors of the types specially identified for converter-fed operation (the 9th and 10th position of the Order No. is filled with “**PB**”, “**PC**” or “**PE**”) have an insulated motor bearing as standard at the non-drive end NDE (BS). The motors are equipped with standard insulation and standard rotors and are suitable for mains-fed and converter-fed operation.

Converter-fed operation up to 690 V +5% mains voltage

1LA5, 1LA7 and 1LG6 standard motors as well as 1LA8 and 1PQ8 non-standard motors are also available with a higher insulation resistance for operation on the converter with voltages up to 690 V +5%, and do not usually require a filter. These motors are identified by an “**M**” in the 10th digit of the Order No. (e.g. 1LA8315-2PM). With the reinforced insulating system, there is less space in the grooves in motor series 1LA8 and 1PQ8 for the same number of windings compared to the normal version, which slightly reduces the rated output of these motors.

Converter-fed operation for motors in type of protection “d” up to 500 V + 10% mains voltage

Siemens 1MJ asynchronous motors can be operated on the mains as well as on a converter as explosion-proof motors in type of protection EEx de IIC “Explosion-proof enclosure”. In accordance with the test specifications, 1MJ motors must be equipped with PTC thermistors.

When 1MJ motors are connected to converters, like the 1LA motors of the same output, depending on their load characteristics their maximum torque must be reduced.

1MJ motors have a connection box in type of protection EEx e II “Increased safety” as standard.

Note:

Special measures are necessary in the case of high-speed motors, especially when separately driven fans are used. Please contact your local Siemens office for advice.

Benefits

Motors operating with frequency converters from Siemens offer the user numerous advantages:

- The motors feature the future-oriented insulation system DURIGNIT IR 2000 (IR = Inverter Resistant). The DURIGNIT IR 2000 insulating system is made up of high-quality enamel wires and insulating materials in conjunction with a resin impregnation which does not contain any solvents.
- The motors can withstand operation with all converters that have IGBT transistors.

The specially developed motors on the frequency converter with special insulation up to 690 V for converter-fed operation offer the user the following advantages:

- No costs incurred for sinusoidal or du/dt filter and control cabinet.
- Mounting space is saved due to omission of filters.

Application

The motors can be used in numerous drive applications with variable-speed drives when they are combined with converters from the MICROMASTER and SINAMICS spectrum.

The wide field of implementation includes the following applications:

- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

Their large range of line voltages enables them to be used all over the world.

Integration

MICROMASTER 411/COMBIMASTER 411 distributed drive solutions

MICROMASTER 411/COMBIMASTER 411 is included in the DA 51.3 Catalog that includes the entire product range with ordering data, technical specifications and explanations.

Application

MICROMASTER 411 and COMBIMASTER 411 are the ideal solution for distributed drive applications that require a high degree of protection for the converter. The devices are designed for a wide drive range – for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems. The ECOFAST versions of the MICROMASTER 411/COMBIMASTER 411 frequency converter series contain plug-in cables for the power supply, communications interface and motor connections. They support fast and problem-free replacement in time-critical applications and are completely compatible with the ECOFAST technology systems. They are based on the universal MICROMASTER 420 converter series and are characterised by customer-oriented performance and ease of use.

Structure

The modular structure allows MICROMASTER 411/COMBIMASTER 411 products and their accessories to be individually selected, e.g. electromechanical brake control module or PROFIBUS module.

Main features:

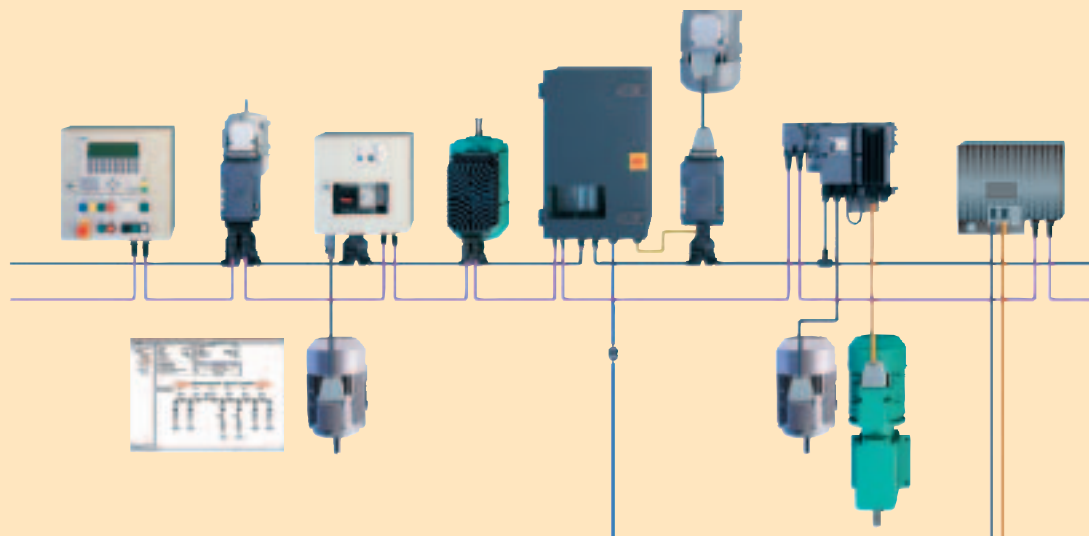
- Output range: 0.37 to 3.0 kW, 400 V, 3AC
- IP66 degree of protection (MICROMASTER 411), self-cooling
- Electrical isolation between the electronics and the connection terminals
- Parameter sets for fast startup and cost savings
- Modular structure with numerous accessories
- Operation without operator panel possible (using jumpers and/or control potentiometer)
- Integrated control potentiometer accessible from outside.

Accessories (overview):

- Basic Operator Panel (BOP) for parameterising the converter
- Plain text Advanced Operator Panel (AOP) for MICROMASTER 411 and COMBIMASTER 411 with multiple-language display
- PROFIBUS module
- AS-Interface module
- DeviceNet module
- REM module (dynamic brake and control module for electro-mechanical brake)
- EM module (electromechanical brake control module)
- PC connection kit
- Mounting kits for installing the operator panels
- PC startup programs.

Orientation

ECOFAST system



Technical specifications

General note:

All the data listed in the catalogue is applicable for a 50 Hz line supply. With converter-fed operation, the torque reduction factors for constant torque and drives for fans, pumps and compressors must be observed. Higher noise levels must be expected at frequencies other than 50 Hz for motors operating with converters due to the harmonic content of the supply.

Implementation of 1LA/1LG motors in areas subject to explosion hazards

Type of protection "n" (Zone 2)

Ex nA II T3
II 3G EEx nA II T3
acc. to IEC/EN 60079-15

IEC/EN 60079-15 specifies that the motor and converter must be tested as a unit (individual test). Individual testing has been performed for motors of type of protection "n" operating with the MICROMASTER, SIMOVERT MASTERDRIVES, SINAMICS G110 and SIMATIC ET 200S FC converters (partially for "Non-standard motors frame size 315" and above). For details, see factory certificate 2.1. Individual testing can be performed for non-Siemens converters on request; the customer may be required to supply the non-Siemens converter.

Design for Zone 2 for converter-fed operation, derating Ex nA II T3, EEx nA II T3 acc. to IEC/EN 60079-15 ⇒ Order with order code M73

Motors protected against dust explosions (Zone 21/22)

Zone 21: II 2D IP65 T 125 °C
Zone 22: II 3D IP55 T 125 °C
acc. to EN 50281/IEC 61241

The drive system comprising motors protected against dust explosions operating on MICROMASTER, SIMOVERT MASTERDRIVE, SINAMICS G110 and SIMATIC ET 200S FC converters has been tested. For details, see factory certificate 2.1. Please enquire about operation with non-Siemens converters.

Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating ⇒ Order with order code M38

Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating ⇒ Order with order code M39

Order codes M73, M38 and M39:

The rated operating points at 5, 25, 50 Hz and $f_{\max}$ are stamped on the rating plate; (alternative rated operating points at 6, 30, 60 Hz and $f_{\max}$ when ordered with 60 Hz voltage) for operation on MICROMASTER.

Alternatively, these rated operating points can be ordered for SIMOVERT MASTERDRIVES, SINAMICS G110 or SIMATIC ET 200S FC with order code **Y68** and "Plain text". The type of converter is specified on the rating plate.

The motors already have PTC thermistors for tripping in accordance with temperature class B. The thermistors must be operated by a tripping unit certified by the relevant testing authority.

With some motors it is necessary to reduce the limit speed or to use metal fans.

When 1LA8 motors are ordered, it must be specified in plain text whether "constant torque drive" or "fan/pump/compressor drive" is required.

Rated voltage

The tolerance of the motors specially developed for converter-fed operation with special insulation up to 690 V (the 9th and 10th position of the Order No. is marked with "PM") is generally in accordance with DIN EN 60034-1 – A rated voltage range is not specified on the rating plate.

Mechanical limit speeds

When the motor is operated at its rated frequency, it is important to note that the maximum speeds are limited by the limits for the roller bearings, critical rotor speed and rigidity of the rotating parts.

Motor protection

A motor protection function can be implemented using the R_t detection present in the converter software.

If required, more precise motor protection can be afforded by direct temperature measurement using KTY84 sensors or PTC thermistors in the motor winding. Some converters from Siemens determine the motor temperature using the resistance of the temperature sensor. They can be set to a required temperature for alarm and tripping.

Insulation

The standard insulation of 1LA and 1LG motors is designed such that converter-fed operation is possible without limitation at voltages ≤ 500 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_r > 0.1 \mu s$ at the motor terminals.

All motors with voltage codes 1, 3, 5, and 6 (400 V motors Δ connection) operating with a converter must be operated under these conditions. This does not apply to motors with voltages > 500 up to 690 V, that must have special insulation for operation on a pulse-controlled AC converter (SIMOVERT MASTERDRIVES and MICROMASTER 440 for voltages between 500 and 600 V) without a converter circuit (du/dt filter or sinusoidal filter), (10th position of the Order No. = "M"). For converter-fed operation with the outputs specified in the catalogue, the motors are used according to temperature class F, i.e. in this case neither a service factor > 1 nor an increased coolant temperature is possible (order codes **C11**, **C12** and **C13** cannot be ordered).

Motor connection

When connecting the motors, it is important to consider the restrictions for mains-fed machines as well as the maximum conductor cross-sections permitted for the converter.

Ventilation and noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors. To increase motor utilisation at low speeds it is recommended that forced-air cooled motors are used.

Mechanical stress and grease lifetime

Due to the increased speeds above the rated speed and the thereby increased vibrations, the mechanical smooth running is changed and the bearings are used stronger mechanically. Hereby, the grease lifetime and the bearing lifetime are reduced. Further information on request.

Utilization (non-standard motors)

When F is used according to temperature class B, derating of 15% is necessary.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

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Technical specifications (continued)

Mechanical limit speeds $n_{\max}$ at maximum supply frequency $f_{\max}$

Default values

The values in the following table are valid for all areas of application with the exception of explosion-proof motors (see overleaf).

The values for motor series 1 LA8, 1PQ8 and 1LL8 are listed in the selection and ordering data in the section "Non-standard motors frame size 315 and above".

Motor frame size	Motor type		2-pole $n_{\max}$ rpm	$f_{\max}$ Hz	4-pole $n_{\max}$ rpm	$f_{\max}$ Hz	6-pole $n_{\max}$ rpm	$f_{\max}$ Hz	8-pole $n_{\max}$ rpm	$f_{\max}$ Hz
1LA5, 1LA6, 1LA7, 1LA9, 1LP5, 1LP7, 1PP5, 1PP7										
56 M	1LA7/1LA9	05.	6000	100	4200	140	3600	180	3000	200
63 M	1LA7/1LA9 1LP7/1PP7	06.	6000	100	4200	140	3600	180	3000	200
71 M	1LA7/1LA9 1LP7/1PP7	07.	6000	100	4200	140	3600	180	3000	200
80 M	1LA7/1LA9 1LP7/1PP7	08.	6000	100	4200	140	3600	180	3000	200
90 L	1LA7/1LA9 1LP7/1PP7	09.	6000	100	4200	140	3600	180	3000	200
100 L	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	10.	6000	100	4200	140	3600	180	3000	200
112 M	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	11.	6000	100	4200	140	3600	180	3000	200
132 S/M	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	13.	5600	90	4200	140	3600	180	3000	200
160 M/L	1LA6/1LA7/1LA9 1LP7/1PP7/1PP6	16.	4800	80	4200	140	3600	180	3000	200
180 M/L	1LA5/1LA9 1LP5/1PP5	18.	5100	85	4200	140	3600	180	3000	200
200 L	1LA5/1LA9 1LP5/1PP5	20.	5100	85	4200	140	3600	180	3000	200
225 S/M	1LA5	22.	4500	75	4200	140	3600	180	3000	200
1LG4, 1LG6, 1LP4, 1PP4, 1PP6										
180 M/L	1LG4/1LG6 1LP4/1PP4/1PP6	18.	4600	76	4200	140	3600	180	3000	200
200 L	1LG4/1LG6 1LP4/1PP4/1PP6	20.	4500	75	4200	140	3600	180	3000	200
225 S/M	1LG4/1LG6 1LP4/1PP4/1PP6	22.	4500	75	4500	150	4400	220	4400	293
250 M	1LG4/1LG6 1LP4/1PP4/1PP6	25.	3900	65	3700	123	3700	185	3700	247
280 S/M	1LG4/1LG6 1LP4/1PP4/1PP6	28.	3600	60	3000	100	3000	150	3000	200
315 S	1LG4/1LG6 1LP4/1PP4/1PP6	310	3600	60	2600	87	2600	130	2600	176
315 M	1LG4/1LG6 1LP4/1PP4/1PP6	313	3600	60	2600	87	2600	130	2600	173
315 L	1LG4/1LG6 1LP4/1PP4/1PP6	316 317 318	3600 ¹⁾	60 ¹⁾	2600	87	2600	130	2600	173

¹⁾ For vertical mounting $n_{\max} = 3000$ rpm, $f_{\max} = 50$ Hz.

Technical specifications (continued)

Explosion-proof motors in Zone 1 with type of protection "d" (motor series 1MJ)

Motor frame size	Motor type	2-pole $n_{\max}$ rpm	$f_{\max}$ Hz	4-pole $n_{\max}$ rpm	$f_{\max}$ Hz	6-pole $n_{\max}$ rpm	$f_{\max}$ Hz	8-pole $n_{\max}$ rpm	$f_{\max}$ Hz
1MJ6									
71 M	1MJ6 07 .	6000	100	3000	100	2000	100	1500	100
80 M	1MJ6 08 .	6000	100	3000	100	2000	100	1500	100
90 L	1MJ6 09 .	6000	100	3000	100	2000	100	1500	100
100 L	1MJ6 10 .	5400	90	3000	100	2000	100	1500	100
112 M	1MJ6 11 .	5400	90	3000	100	2000	100	1500	100
132 S/M	1MJ6 13 .	4800	80	3000	100	2000	100	1500	100
160 M/L	1MJ6 16 .	4500	75	3000	100	2000	100	1500	100
180 M/L	1MJ6 18 .	5100	85	3000	100	2000	100	1500	100
200 L	1MJ6 20 .	5100	85	3000	100	2000	100	1500	100
1MJ7									
225 S/M	1MJ7 22 .	4500	75	3000	100	2000	100	1500	100
250 M	1MJ7 25 .	3900	65	3700	100	2000	100	1500	100
280 S	1MJ7 28 .	3600	60	3000	100	2000	100	1500	100
315 S/M	1MJ7 31 .	3600 ¹⁾	60 ¹⁾	2600	87	2000	100	1500	100
1MJ1, 1MJ8									
315 M/L	1MJ1 31 .	4000	66	3700	123	3700	185	3000	200
355	1MJ8 35 .	3600	60	2700	90	2600	130	2550	170
355	1MJ1 35 .	3600	60	2700	90	2600	130	2550	170
400	1MJ1 40 .	3000	50	2250	75	2200	110	2100	140
450	1MJ1 45 .	3000	50	2100	70	2100	105	2100	140

Explosion-proof motors in Zone 1 with type of protection "e" (motor series 1MA)

1MA motors cannot be operated with a converter.

Explosion-proof motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions (motor series 1LA, 1LG and 1PQ8)

The values for motor series 1LA8 and 1PQ8 in Zones 2 and 22 are listed in the selection and ordering data in the section "Non-standard motors frame size 315 and above".

Motor frame size	Motor type		2-pole $n_{\max}$ rpm	$f_{\max}$ Hz	4-pole $n_{\max}$ rpm	$f_{\max}$ Hz	6-pole $n_{\max}$ rpm	$f_{\max}$ Hz	8-pole $n_{\max}$ rpm	$f_{\max}$ Hz
1LA5, 1LA6, 1LA7, 1LA9										
56 M	1LA7/1LA9	05.	6000	100	3000	100	2000	100	1500	100
63 M	1LA7/1LA9	06.	6000	100	3000	100	2000	100	1500	100
71 M	1LA7/1LA9	07.	6000	100	3000	100	2000	100	1500	100
80 M	1LA7/1LA9	08.	6000	100	3000	100	2000	100	1500	100
90 L	1LA7/1LA9	09.	6000	100	3000	100	2000	100	1500	100
100 L	1LA6/1LA7/1LA9	10.	5400	90	3000	100	2000	100	1500	100
112 M	1LA6/1LA7/1LA9	11.	5400	90	3000	100	2000	100	1500	100
132 S/M	1LA6/1LA7/1LA9	13.	4800	80	3000	100	2000	100	1500	100
160 M/L	1LA6/1LA7/1LA9	16.	4500	75	3000	100	2000	100	1500	100
180 M/L	1LA5/1LA9	18.	5100 ²⁾	85 ²⁾	3000	100	2000	100	1500	100
200 L	1LA5/1LA9	20.	5100 ²⁾	85 ²⁾	3000	100	2000	100	1500	100
225 S/M	1LA5	22.	5100	85	3000	100	2000	100	1500	100
1LG4, 1LG6										
180 M/L	1LG4/1LG6	18.	4500	75	3000	100	2000	100	1500	100
200 L	1LG4/1LG6	20.	4500	75	3000	100	2000	100	1500	100
225 S/M	1LG4/1LG6	22.	4500	75	3000	100	2000	100	1500	100
250 M	1LG4/1LG6	25.	3900	65	3000	100	2000	100	1500	100
280 S/M	1LG4/1LG6	28.	3600	60	3000	100	2000	100	1500	100
315 S/M/L	1LG4/1LG6	31.	3600 ¹⁾	60 ¹⁾	2600	87	2000	100	1500	100

¹⁾ For vertical mounting $n_{\max} = 3000$ rpm, $f_{\max} = 50$ Hz.

²⁾ For 1LA9 motors frame sizes 180 M/L and 200 L, $n_{\max} = 4500$ rpm and $f_{\max} = 75$ Hz.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Orientation

Technical specifications (continued)

Bearings and bearing currents

When operating multiphase induction machines on a converter, an electrical bearing stress results from a capacitive induced voltage via the bearing lubricating film, depending on the principle being used. The physical cause of this is the common-mode voltage at the converter output. The sum of the three phase-to-neutral voltages is not zero at all times, unlike with direct on-line operation. The high-frequency, pulse-shaped common-mode voltage brings about a residual current, which closes back to the converter's DC link via the machine's internal capacitances, the machine housing and the earthing circuit. The machine's internal capacitances include the main insulation winding capacitance, the geometric capacitance between the rotor and stator, the lubricating film capacitance and the capacitance of any bearing insulation that may be present. The current level via the internal capacitances is proportional to the common-mode voltage regulation ($i_{(t)} = C \cdot du/dt$).

In order to apply currents to the motor which are sinusoidal as far as possible (smooth running, oscillation torques, stray losses), a high clock frequency is required for the converter's output voltage. The related (very steep) switching edges of the converter output voltage (and also, therefore, of the common-mode voltage) cause correspondingly high capacitive currents and voltages on the machine's internal capacitances.

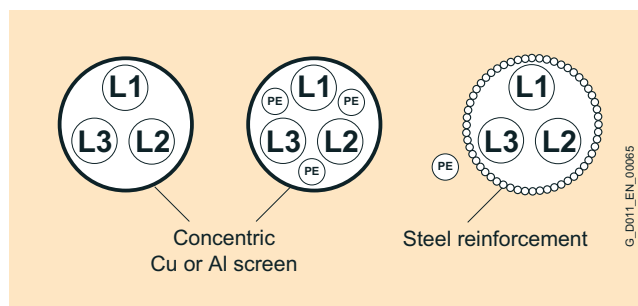
In the worst-case scenario, the capacitive voltage induced via the bearing can lead to random punctures of the bearing lubricating film, thus damaging the bearing/causing premature wear. The current pulses caused by the puncture in the lubricating film are referred to as EDM (Electrostatic Discharge Machining) currents, although this is not primarily a question of an electrostatic effect, but more of (partial) punctures of insulating material, i.e., of partial discharges.

This physical effect, which occurs in isolated cases, has mostly been observed in connection with larger motors.

EMC-compliant installation of the drive system is a basic prerequisite for preventing premature bearing damage via bearing currents.

The most important measures for reducing bearing currents:

- Insulated motor bearings at the non-drive end NDE (BS)
The insulated bearing is standard for all non-standard 1LA8 motors designated for converter operation. Furthermore it is recommended that an insulated bearing is ordered for NDE for motor series 1LG, 1PP4 and 1LP4 frame size 225 and above (order code **L27**), for 1MJ7 motors, order code **L27** is possible from frame size 250 to 315.
- Earthing brush for converter-fed operation for 1LG motors (order code **M44**)
- Use of cables with a symmetrical cable cross-section:



- Use of motor reactors
- Use of earthing cables with low impedance in a large frequency range (0 Hz up to approximately 70 MHz): for example, plaited copper ribbon cables, HF litz wires
- Separate HF equipotential-bonding cable between motor housing and driven machine
- Separate HF equipotential-bonding cable between motor housing and converter PE busbar
- 360° HF contacting of the cable shield on the motor housing and the converter PE busbar. This can be achieved using EMC screwed glands on the motor end and EMC shield clips on the converter end, for example.
- Common-mode filters at the converter output.

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Surface-cooled motors with standard insulation for voltages ≤500 V - Aluminium or cast-iron housing

See section "Surface-cooled motors with standard insulation for voltages ≤500 V - Aluminium or cast-iron housing" Pages 5/10 and 5/11.

Self-ventilated motors with special insulation for voltages up to 690 V

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1LA7 and 1LA5						
3000, 2-pole	100 L ... 225 M	3 ... 45	2890 ... 2960	9.9 ... 145	3.5 ... 45.0	5/12 ... 5/13
1500, 4-pole	100 L ... 225 S	2.2 ... 37	1420 ... 1470	15 ... 240	2.75 ... 38.5	5/12 ... 5/13
1000, 6-pole	100 L ... 225 M	1.5 ... 30	925 ... 978	15 ... 293	2.25 ... 35.5	5/12 ... 5/13
Cast-iron series 1LG6						
3000, 2-pole	180 M ... 315 L	22 ... 200	2955 ... 2982	71 ... 641	22.5 ... 188	5/14 ... 5/16
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1470 ... 1490	120 ... 1282	20 ... 198	5/14 ... 5/16
1000, 6-pole	180 L ... 315 L	15 ... 160	975 ... 990	147 ... 1543	17.2 ... 164	5/14 ... 5/16
750, 8-pole	180 L ... 315 L	11 ... 132	725 ... 740	145 ... 1704	13.8 ... 140	5/14 ... 5/16
Cast-iron series 1LA8						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/18 ... 3/19
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/18 ... 3/19
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/20 ... 3/21
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/20 ... 3/21

Forced-air cooled motors with externally mounted fan with special insulation for voltages up to 690 V

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 690 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1PQ8						
3000, 2-pole	315 ... 450	240 ... 970	2978 ... 2987	770 ... 3101	730 ... 900	3/26 ... 3/27
1500, 4-pole	315 ... 450	235 ... 980	1485 ... 1492	1511 ... 6273	235 ... 950	3/26 ... 3/27
1000, 6-pole	315 ... 450	190 ... 780	990 ... 993	1833 ... 7502	196 ... 790	3/28 ... 3/29
750, 8-pole	315 ... 450	145 ... 600	740 ... 745	1871 ... 7691	162 ... 660	3/28 ... 3/29

More information

Planning notes for drives with constant and square-law torque can be found in the following catalogs:

- Frequency converters - MICROMASTER 410/420/430/440: Catalog DA 51.2
- Frequency converters for distributed drive solutions - MICROMASTER 411/COMBIMASTER 411: Catalog DA 51.3
- SIMOVERT MASTERDRIVES Motion Control/Vector Control: Catalog series DA 65
- SINAMICS G110, G130 and G150 frequency converters: Catalog series D 11
- SINAMICS S120 and S150 drive systems: Catalog series D 21

These catalogs contain tables that specify the assignment of squirrel-cage motors to converters from Siemens in accordance with the load characteristic of the driven machine.

For further information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Surface-cooled motors with standard insulation
up to 500 V - Aluminium or cast-iron housing

Overview

Standard motors up to frame size 315 L

The standard motors from Siemens are suitable for converter-fed operation at rated voltages up to 500 V. The following table shows the available motor series:

Standard motors up to frame size 315 L for converter-fed operation up to 500 V rated voltage

Motor type	Standard type of protection	Frame design	Motor series	Motor frame sizes	Output range kW
Self-ventilated motors with improved efficiency (energy-saving motors according to efficiency class EFF2 Improved Efficiency for 2-pole and 4-pole motors with outputs from 1.1 to 90 kW)	IP55	Aluminium	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4	180 M ... 315 L	11 ... 200
Self-ventilated motors with high efficiency (energy-saving motors according to efficiency class EFF1 High Efficiency for 2-pole and 4-pole motors with outputs from 1.1 to 90 kW)	IP55	Aluminium	1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors with increased output	IP55	Aluminium	1LA9	56 M ... 200 L	0.14 ... 53
		Cast-iron	1LG4	180 M ... 280 M	15 ... 110
Self-cooled motors without external fan	IP55	Aluminium	1LP7	63 M ... 160 L	0.045 ... 7
			1LP5	180 M ... 200 L	5.5 ... 16.5
		Cast-iron	1LP4	180 L ... 315 L	3.7 ... 67
Pole-changing motors	IP55	Aluminium	1LA7	63 M ... 160 L	0.1 ... 17
			1LA5	180 M ... 200 L	11 ... 31

For technical data, selection and ordering data and special versions, see the relevant sections of "Standard motors up to frame size 315 L".

Non-standard motors frame size 315 and above

The non-standard motors from Siemens are suitable for converter-fed operation at rated voltages up to 500 V. The following table shows the available motor series:

Non-standard motors up to frame size 315 for converter-fed operation up to 500 V rated voltage

Motor type	Standard type of protection	Frame design	Motor series	Motor frame sizes	Output range kW
Self-ventilated motors for converter-fed operation - Cast-iron series 1LA8	IP55	Cast-iron	1LA8	315 ... 450	145 ... 1000
Forced-air cooled motors with externally-mounted fan for converter-fed operation - Cast-iron series 1PQ8	IP55	Cast-iron	1PQ8	315 ... 450	145 ... 1000
Self-ventilated motors with through ventilation for converter-fed operation - Cast-iron series 1LL8	IP23	Cast-iron	1LL8	315 ... 450	200 ... 1250

For technical data, selection and ordering data and special versions, see the relevant sections of "Non-standard motors up to frame size 315".

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Surface-cooled motors with standard insulation
up to 500 V - Aluminium or cast-iron housing

Overview (continued)

Explosion-proof motors

The explosion-proof motors from Siemens listed below up to frame size 315 L can be operated with a converter at rated voltages up to 500 V:

Explosion-proof motors up to frame size 315 L for converter-fed operation up to 500 V rated voltage

Motor type	Standard type of protection	Frame design	Motor series ¹⁾	Motor frame sizes	Output range
					kW
Self-ventilated motors in Zone 1 with type of protection "d" (Zone 1 EExde IIC T4)	IP55	Cast-iron	1MJ6	71 M ... 200 L	0.25 ... 37
			1MJ7	225 M ... 315 L	30 ... 132
			1MJ8	355	200 ... 400
		Cast-iron/steel	1MJ1	315 M ... 450	90 ... 950
Self-ventilated motors in Zone 2 with type of protection "n" or protection against dust explosions	IP55	Aluminium	1LA7	63 M ... 160 L	0.09 ... 18.5
			1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 21 with type of protection "n" or protection against dust explosions	IP55	Aluminium	1LA7	56 M ... 160 L	0.09 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
		Cast-iron	1LA9	56 M ... 200 L	0.06 ... 37
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 22 with type of protection "n" or protection against dust explosions	IP55	Aluminium	1LA7	56 M ... 160 L	0.09 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
		Cast-iron	1LA9	56 M ... 200 L	0.06 ... 37
			1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zones 2 and 22 with type of protection "n" or protection against dust explosions	IP55	Cast-iron	1LA8	315 ... 450	145 ... 1000
Forced-air cooled motors with mounted separately driven fan for converter-fed operation in Zones 2 and 22 with type of protection "n" or protection against dust explosions	IP55	Cast-iron	1PQ8	315 ... 450	145 ... 1000

For technical data, selection and ordering data and special versions, see the relevant sections of "Explosion-proof motors".

Fan motors

The fan motors from Siemens listed below are suitable for converter-fed operation at rated voltages up to 500 V:

Fan motors for converter-fed operation at 500 V rated voltage

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range
					kW
Self-ventilated motors in pole-changing version	IP55	Aluminium	1LA7	80 M ... 160 L	0.15 ... 17
			1LA5	180 M ... 200 L	18 ... 31
		Cast-iron	1LG4	180 M ... 315 L	11 ... 200
Forced-air cooled motors without external fan, without fan cover	IP55	Aluminium	1PP7	63 M ... 160 L	0.09 ... 18.5
			1PP5	180 M ... 200 L	15 ... 37
		Cast-iron	1PP4	180 M ... 315 L	11 ... 200

For technical data, selection and ordering data and special versions, see the relevant sections of "Fan motors".

¹⁾ For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" - Order code **L27** - is used. For motor series 1LA8 and 1PQ8, the insulated bearing cartridge is standard.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V - Aluminium series 1LA7 and 1LA5

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output			Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Power factor at 50 Hz 3/4-load	Rated current at 690 V, 50 Hz	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	$\cos\phi_{rated}$	I_{rated} A			
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
3	100 L	2890	9.9	84	84	0.85	0.81	3.5	1LA7 106-2PM□□		21
4	112 M	2905	13	86	86	0.86	0.83	4.55	1LA7 113-2PM□□		27
5.5	132 S	2925	18	86.5	86.5	0.89	0.86	6	1LA7 130-2PM□□		37
7.5	132 S	2929	24	88	88	0.89	0.86	8	1LA7 131-2PM□□		42
11	160 M	2940	36	89.5	89.5	0.88	0.85	11.6	1LA7 163-2PM□□		63
15	160 M	2940	49	90	90.2	0.9	0.88	15.4	1LA7 164-2PM□□		72
18.5	160 L	2940	60	91	91.2	0.91	0.89	18.6	1LA7 166-2PM□□		82
22	180 M	2940	71	91.7	91.7	0.88	0.85	23	1LA5 183-2PM□□		113
30	200 L	2944	97	92.3	92.3	0.89	0.86	30.5	1LA5 206-2PM□□		159
37	200 L	2944	120	92.8	92.8	0.89	0.86	37.5	1LA5 207-2PM□□		179
45	225 M	2959	145	93.6	93.6	0.89	0.86	45	1LA5 223-2PM□□		209
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
2.2	100 L	1420	15	82	82.5	0.82	0.77	2.75	1LA7 106-4PM□□		20
3	100 L	1420	20	82.6	82.6	0.82	0.77	3.7	1LA7 107-4PM□□		23
4	112 M	1440	27	85	85.5	0.83	0.79	4.75	1LA7 113-4PM□□		29
5.5	132 S	1455	36	86	86	0.81	0.76	6.6	1LA7 130-4PM□□		39
7.5	132 M	1455	49	87	87.5	0.82	0.77	8.8	1LA7 133-4PM□□		46
11	160 M	1459	72	88.5	89	0.84	0.8	12.4	1LA7 163-4PM□□		67
15	160 L	1459	98	90	90.2	0.84	0.8	16.6	1LA7 166-4PM□□		81
18.5	180 M	1459	121	90.5	90.5	0.83	0.79	20.5	1LA5 183-4PM□□		113
22	180 L	1459	144	91.2	91.2	0.84	0.8	24	1LA5 186-4PM□□		123
30	200 L	1465	196	91.8	91.8	0.86	0.83	32	1LA5 207-4PM□□		157
37	225 S	1470	240	92.9	92.9	0.87	0.84	38.5	1LA5 220-4PM□□		206
45	225 M	1470	292	93.4	93.4	0.87	0.84	46.5	1LA5 223-4PM□□		232
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
1.5	100 L	925	15	74	74	0.75	0.69	2.25	1LA7 106-6PM□□		20
2.2	112 M	940	22	78	78.5	0.78	0.72	3.05	1LA7 113-6PM□□		24
3	132 S	949	30	79	79.5	0.76	0.7	4.2	1LA7 130-6PM□□		34
4	132 M	949	40	80.5	80.5	0.76	0.7	5.5	1LA7 133-6PM□□		41
5.5	132 M	949	55	83	83	0.76	0.7	7.3	1LA7 134-6PM□□		50
7.5	160 M	960	75	86	86	0.74	0.68	9.9	1LA7 163-6PM□□		70
11	160 L	960	109	87.5	87.5	0.74	0.68	14.2	1LA7 166-6PM□□		89
15	180 L	970	148	89.5	89.5	0.77	0.71	18.2	1LA5 186-6PM□□		126
18.5	200 L	975	181	90.2	90.2	0.77	0.71	22.5	1LA5 206-6PM□□		161
22	200 L	975	215	90.8	90.8	0.77	0.71	26.5	1LA5 207-6PM□□		183
30	225 M	978	293	91.8	91.8	0.77	0.71	35.5	1LA5 223-6PM□□		214

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	50 Hz	No rated voltage range	Without flange IM B3/6/7/8, IM V6, IM V5 without protective cover	With flange IM B5, IM V1 without protective cover ¹⁾ , IM V3	IM V1 with protective cover ^{1) 2)}	IM B35	With standard flange IM B14, IM V18 with- out protec- tive cover, IM V19	IM B34	With special flange IM B14, IM V18 without protective cover, IM V19
	8		0	1	4	6	2	7	3
1LA7 10 □□	○		□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○		□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○		□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○		□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○		□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○		□	✓ ³⁾	✓	✓	–	–	–
1LA5 22 □□	○		□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

For additional text and footnotes, see page 5/13.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V - Aluminium series 1LA7 and 1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring- surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-2PM□□	2.8	6.8	3	16	0.0035	62	74
1LA7 113-2PM□□	2.6	7.2	2.9	16	0.0059	63	75
1LA7 130-2PM□□	2	5.9	2.8	16	0.015	68	80
1LA7 131-2PM□□	2.3	6.9	3	16	0.019	68	80
1LA7 163-2PM□□	2.1	6.5	2.9	16	0.034	70	82
1LA7 164-2PM□□	2.2	6.6	3	16	0.043	70	82
1LA7 166-2PM□□	2.4	7	3.1	16	0.051	70	82
1LA5 183-2PM□□	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2PM□□	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2PM□□	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2PM□□	2.8	7.7	3.4	16	0.2	71	84
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-4PM□□	2.5	5.6	2.8	16	0.0047	53	65
1LA7 107-4PM□□	2.7	5.6	3	16	0.0055	53	65
1LA7 113-4PM□□	2.7	6	3	16	0.012	53	65
1LA7 130-4PM□□	2.5	6.3	3.1	16	0.018	62	74
1LA7 133-4PM□□	2.7	6.7	3.2	16	0.023	62	74
1LA7 163-4PM□□	2.2	6.2	2.7	16	0.043	66	78
1LA7 166-4PM□□	2.6	6.5	3	16	0.055	66	78
1LA5 183-4PM□□	2.3	7.5	3	16	0.13	63	76
1LA5 186-4PM□□	2.3	7.5	3	16	0.15	63	76
1LA5 207-4PM□□	2.6	7	3.2	16	0.24	65	78
1LA5 220-4PM□□	2.8	7	3.2	16	0.32	65	78
1LA5 223-4PM□□	2.8	7.7	3.3	16	0.36	65	78
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LA7 106-6PM□□	2.3	4	2.3	16	0.0047	47	59
1LA7 113-6PM□□	2.2	4.6	2.5	16	0.0091	52	64
1LA7 130-6PM□□	1.9	4.2	2.2	16	0.015	63	75
1LA7 133-6PM□□	2.1	4.5	2.4	16	0.019	63	75
1LA7 134-6PM□□	2.3	5	2.6	16	0.025	63	75
1LA7 163-6PM□□	2.1	4.6	2.5	16	0.044	66	78
1LA7 166-6PM□□	2.3	4.8	2.6	16	0.063	66	78
1LA5 186-6PM□□	2	5.2	2.4	16	0.15	66	78
1LA5 206-6PM□□	2.7	5.5	2.8	16	0.24	66	78
1LA5 207-6PM□□	2.8	5.5	2.9	16	0.28	66	78
1LA5 223-6PM□□	2.8	5.7	2.9	16	0.36	66	78

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts. Specify order supplement **"Z"** and order code **K32**.
- 2) The "Second shaft extension" option, order code **K16** is not possible.
- 3) Type of construction IM V3 can only be ordered using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V - Cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output							Order No.	Price	Weight
P_{rated} kW	FS	Rated speed at 50 Hz n_{rated} rpm	Rated torque at 50 Hz T_{rated} Nm	Efficiency at 50 Hz 4/4-load η_{rated} %	Efficiency at 50 Hz 3/4-load η_{rated} %	Power factor at 50 Hz 4/4-load $\cos\phi_{rated}$	Power factor at 50 Hz 3/4-load $\cos\phi_{rated}$	Rated current at 690 V, 50 Hz I_{rated} A	For Order No. supplements for voltage and type of construction, see table below		Type of construction IM B3 approx. m kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
22	180 M	2955	71	93.7	94.1	0.88	0.85	22.5	1LG6 183-2PM□□		180
30	200 L	2960	97	93.1	93	0.89	0.85	30.5	1LG6 206-2PM□□		225
37	200 L	2960	119	93.6	93.5	0.89	0.86	37	1LG6 207-2PM□□		255
45	225 M	2965	145	94.4	94.6	0.89	0.87	45	1LG6 223-2PM□□ ¹⁾		330
55	250 M	2975	177	95	95	0.9	0.88	54	1LG6 253-2PM□□ ¹⁾		420
75	280 S	2975	241	95	95	0.89	0.87	74	1LG6 280-2PM□□ ¹⁾		530
90	280 M	2978	289	95.3	95.4	0.9	0.88	88	1LG6 283-2PM□□ ¹⁾		615
110	315 S	2982	352	95.5	95.4	0.91	0.89	106	1LG6 310-2PM□□ ¹⁾		790
132	315 M	2982	423	95.8	95.7	0.91	0.91	126	1LG6 313-2PM□□ ¹⁾		915
160	315 L	2982	512	96.2	96.2	0.92	0.91	152	1LG6 316-2PM□□ ¹⁾		1055
200	315 L	2982	641	96.2	96.2	0.93	0.92	188	1LG6 317-2PM□□ ¹⁾		1245
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
18.5	180 M	1470	120	92.1	92.7	0.83	0.78	20	1LG6 183-4PM□□		155
22	180 L	1470	143	92.7	93	0.84	0.79	23.5	1LG6 186-4PM□□		180
30	200 L	1470	195	92.7	92.8	0.85	0.8	32	1LG6 207-4PM□□		225
37	225 S	1480	239	93.6	94	0.85	0.81	39	1LG6 220-4PM□□ ¹⁾		290
45	225 M	1480	290	94.1	94.3	0.85	0.82	47	1LG6 223-4PM□□ ¹⁾		330
55	250 M	1485	354	94.8	95	0.87	0.83	56	1LG6 253-4PM□□ ¹⁾		460
75	280 S	1485	482	94.7	94.8	0.87	0.84	76	1LG6 280-4PM□□ ¹⁾		575
90	280 M	1486	578	95.1	95.2	0.86	0.83	92	1LG6 283-4PM□□ ¹⁾		675
110	315 S	1488	706	95.6	95.7	0.87	0.84	110	1LG6 310-4PM□□ ¹⁾		810
132	315 M	1488	847	95.9	96	0.88	0.85	130	1LG6 313-4PM□□ ¹⁾		965
160	315 L	1490	1026	96.1	96.2	0.88	0.85	158	1LG6 316-4PM□□ ¹⁾		1105
200	315 L	1490	1282	96.1	96.2	0.88	0.86	198	1LG6 317-4PM□□ ¹⁾		1305
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
15	180 L	975	147	90	90.8	0.81	0.77	17.2	1LG6 186-6PM□□		175
18.5	200 L	978	181	90.5	91.1	0.81	0.76	21	1LG6 206-6PM□□		210
22	200 L	978	215	91.4	92	0.82	0.78	24.5	1LG6 207-6PM□□		240
30	225 M	980	292	92.6	93.1	0.83	0.8	32.5	1LG6 223-6PM□□ ¹⁾		325
37	250 M	985	359	93.1	93.5	0.83	0.79	40	1LG6 253-6PM□□ ¹⁾		405
45	280 S	988	435	93.9	94.1	0.85	0.81	47	1LG6 280-6PM□□ ¹⁾		520
55	280 M	988	532	93.9	94.1	0.85	0.81	58	1LG6 283-6PM□□ ¹⁾		570
75	315 S	990	723	94.6	94.6	0.83	0.79	80	1LG6 310-6PM□□ ¹⁾		760
90	315 M	990	868	94.9	95	0.85	0.81	93	1LG6 313-6PM□□ ¹⁾		935
110	315 L	990	1061	95.2	95.3	0.85	0.82	114	1LG6 316-6PM□□ ¹⁾		1010
132	315 L	990	1273	95.4	95.4	0.85	0.82	136	1LG6 317-6PM□□ ¹⁾		1180
160	315 L	990	1543	95.3	95.4	0.86	0.82	164	1LG6 318-6PM□□ ¹⁾		1245
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES											
11	180 L	725	145	88.1	89	0.76	0.69	13.8	1LG6 186-8PM□□		165
15	200 L	725	198	88.2	88.7	0.8	0.73	17.8	1LG6 207-8PM□□		235
18.5	225 S	730	242	89.9	90.6	0.81	0.75	21.5	1LG6 220-8PM□□ ¹⁾		295
22	225 M	730	288	90.6	91.1	0.81	0.75	25	1LG6 223-8PM□□ ¹⁾		335
30	250 M	735	390	91.9	92.4	0.82	0.77	33.5	1LG6 253-8PM□□ ¹⁾		435
37	280 S	738	479	92.6	92.8	0.81	0.76	41.5	1LG6 280-8PM□□ ¹⁾		510
45	280 M	738	582	93.3	93.6	0.81	0.77	50	1LG6 283-8PM□□ ¹⁾		560
55	315 S	740	710	93.8	93.9	0.82	0.77	60	1LG6 310-8PM□□ ¹⁾		750
75	315 M	740	968	93.9	94.1	0.83	0.78	81	1LG6 313-8PM□□ ¹⁾		840
90	315 L	740	1161	94.2	94.6	0.84	0.8	95	1LG6 316-8PM□□ ¹⁾		1005
110	315 L	740	1420	94.3	94.6	0.84	0.79	116	1LG6 317-8PM□□ ¹⁾		1100
132	315 L	740	1704	94.4	94.7	0.84	0.8	140	1LG6 318-8PM□□ ¹⁾		1270

For Order No. supplement, see page 5/16.

¹⁾ Insulated bearing cartridge at non-drive-end NDE is recommended (order code L27).

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise Measuring- surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} DB(A)
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 183-2PM□□	2.5	7.2	3.4	16	0.086	67	80
1LG6 206-2PM□□	2.4	7	3.3	16	0.15	71	84
1LG6 207-2PM□□	2.5	7.2	3.3	16	0.18	71	84
1LG6 223-2PM□□	2.5	7.3	3.2	16	0.27	71	84
1LG6 253-2PM□□	2.4	6.8	3	16	0.47	71	84
1LG6 280-2PM□□	2.5	7	3	13	0.83	73	86
1LG6 283-2PM□□	2.6	7.6	3.1	13	1	73	86
1LG6 310-2PM□□	2.4	6.9	2.8	13	1.4	76	89
1LG6 313-2PM□□	2.6	7.1	2.9	13	1.6	76	89
1LG6 316-2PM□□	2.5	7.1	2.9	13	2.1	76	89
1LG6 317-2PM□□	2.5	6.9	2.8	13	2.5	76	89
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 183-4PM□□	2.5	6.4	3	16	0.12	60	73
1LG6 186-4PM□□	2.5	6.7	3.1	16	0.14	60	73
1LG6 207-4PM□□	2.6	6.7	3.3	16	0.23	62	75
1LG6 220-4PM□□	2.7	6.8	3	16	0.4	60	73
1LG6 223-4PM□□	2.8	6.9	3	16	0.49	60	73
1LG6 253-4PM□□	2.6	7.5	3	16	0.86	61	75
1LG6 280-4PM□□	2.5	6.8	2.9	16	1.4	67	80
1LG6 283-4PM□□	2.7	7.5	3.1	16	1.7	67	80
1LG6 310-4PM□□	2.7	7.1	2.9	16	2.3	65	79
1LG6 313-4PM□□	2.7	7.3	2.9	16	2.9	64	78
1LG6 316-4PM□□	3	7.4	3	16	3.5	64	79
1LG6 317-4PM□□	3.2	7.6	3	16	4.2	64	79
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 186-6PM□□	2.4	5.5	2.5	16	0.2	52	65
1LG6 206-6PM□□	2.4	5.6	2.4	16	0.29	59	72
1LG6 207-6PM□□	2.4	5.6	2.4	16	0.36	56	70
1LG6 223-6PM□□	2.8	6.5	2.9	16	0.63	54	68
1LG6 253-6PM□□	2.9	6.8	2.5	16	0.93	57	70
1LG6 280-6PM□□	3	6.8	2.7	16	1.4	58	71
1LG6 283-6PM□□	3.3	7.3	2.9	16	1.6	58	71
1LG6 310-6PM□□	2.8	7.3	3	16	2.5	61	74
1LG6 313-6PM□□	2.7	7.3	2.9	16	3.2	61	74
1LG6 316-6PM□□	2.9	7.4	2.9	16	4	61	74
1LG6 317-6PM□□	3.1	7.8	3.1	16	4.7	61	74
1LG6 318-6PM□□	3.2	7.8	3.1	16	5.4	64	77
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection, specially for operation on SIMOVERT MASTERDRIVES							
1LG6 186-8PM□□	1.7	4.6	2.2	13	0.21	62	75
1LG6 207-8PM□□	2.3	5.3	2.6	13	0.37	62	75
1LG6 220-8PM□□	2.3	5.6	2.6	13	0.55	54	67
1LG6 223-8PM□□	2.4	5.8	2.8	13	0.66	58	71
1LG6 253-8PM□□	2.5	6	2.8	13	1.1	53	67
1LG6 280-8PM□□	2.3	5.7	2.3	13	1.4	58	71
1LG6 283-8PM□□	2.6	6.1	2.4	13	1.6	58	71
1LG6 310-8PM□□	2.5	6.3	2.9	13	2.5	58	72
1LG6 313-8PM□□	2.5	6.7	2.9	13	3.1	58	72
1LG6 316-8PM□□	2.4	6.3	2.8	13	3.9	57	71
1LG6 317-8PM□□	2.4	6.4	2.6	13	4.5	57	71
1LG6 318-8PM□□	2.5	6.7	2.9	13	5.3	58	72

For Order No. supplement, see page 5/16.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors with special insulation
up to 690 V - Cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code	Final position: Type of construction code		IM B35	IM B14, IM V18 without protective cover, IM V19	IM B34	IM B14, IM V18 without protective cover, IM V19		
	50 Hz 690 VY No rated voltage range	Without flange IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	With flange IM B5, IM V1 without protective cover ²⁾						
	8	0	1	8	4	6	2	7	3
1LG6 18 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 20 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 22 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 25 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 28 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 310 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 313 . . . PM□□	○	□	✓	–	✓	✓	–	–	–
1LG6 316 . . . PM□□	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–
1LG6 317 . . . PM□□	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–
1LG6 318 . . . PM□□	○	□ ⁴⁾	–	✓ ⁵⁾	✓ ⁵⁾	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Voltages”).

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see “Special versions” in the “Selection and ordering data” under “Types of construction”).

¹⁾ If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ The “Second shaft extension” option, order code **K16** is not possible.

⁴⁾ Type of construction IM V6/IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** and **M1D**.

⁵⁾ 2-pole motors in 60 Hz version available on request.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Self-ventilated motors FS 315 a. above, w. special insulation up to 690 V - Cast-iron series 1LA8

Overview

Recommended types:

- 1LA8 in output range from 145 to 980 kW (at 50 Hz).

Selection and ordering data

The data for motor series 1LA8 with special insulation for voltages up to 690 V for converter-fed operation can be found in the "Technical specifications" and "Selection and ordering data" in the catalogue section "Non-standard motors frame size 315 and above". They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog section "Non-standard motors frame size 315 and above".

Forced-air cooled motors FS 315 a. above, w. fan, with special insulation up to 690 V - Cast-iron series 1PQ8

Overview

Recommended types:

- 1PQ8 in output range from 145 to 980 kW (at 50 Hz)

Selection and ordering data

The data for motor series 1PQ8 with special insulation for voltages up to 690 V for converter-fed operation can be found in the "Technical specifications" and "Selection and ordering data" in the catalogue section "Non-standard motors frame size 315 and above". They are ordered using additional order options (special versions). These special versions for voltages, construction types or options are listed in catalog section "Non-standard motors frame size 315 and above". Please enquire about 1PQ8 motors.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Overview

Motor protection

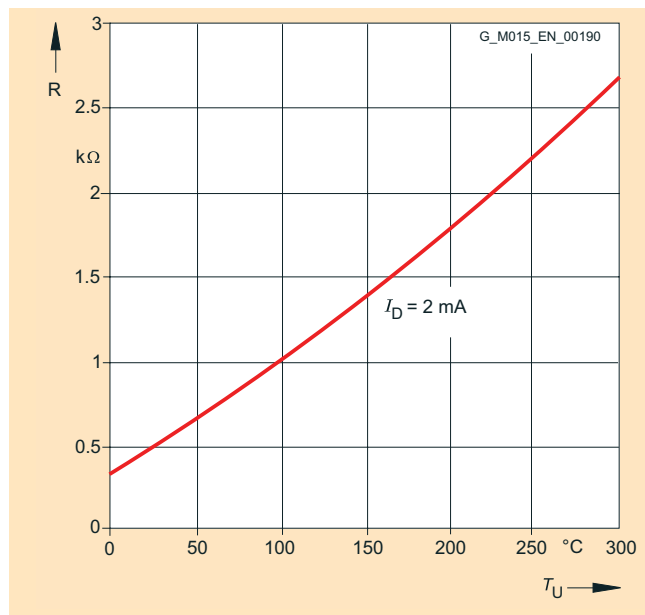
KTY 84 temperature sensor

Order code

A23: 1 x KTY 84-130

A25: 2 x KTY 84-130

This sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84 temperature sensor

For 1LA8 motors, the PTC thermistors supplied as standard are omitted when ordering with order code **A23**.

For line-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV1.

Motor protection for explosion-proof motors

The explosion-proof motors for Zones 2, 21 and 22 for converter-fed operation (ordered with order codes **M73**, **M38** or **M39**) already have PTC thermistors for tripping as standard. For converter-fed operation, thermistors can be additionally ordered for alarm (order code **A10**).

For the explosion-proof motor series of Zone 1 with type of protection "d", order codes **A15** and **A16** are available specially for converter-fed operation:

Order code **A15**: Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping.

Order code **A16**: Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping.

Rating plate data for motors operating with frequency converters for Zones 2, 21 and 22

"MICROMASTER DUTY S9" is stamped on the rating plate as standard, i.e. the rating data for the MICROMASTER converter series from Siemens are indicated. For other converter types (SIMOVERT MASTERDRIVES, SINAMICS G110 or SIMATIC ET 200S FC), the converter type required must be specified in the order in plain text following the order code **Y68**. This is due to the different degree of utilisation of the converter and the resulting derating of the motor.

Storage

For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" - Order code **L27** is used.

Ventilation/noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors.

To increase motor utilisation at low speeds, it is recommended that forced-air cooled motors are used, in particular motor series 1LA5, 1LA7, 1LG4 and 1LG6 with order code **G17** or motor series 1PQ8.

Insulation

For converter-fed operation with the outputs specified in the catalogue, the motors are used according to temperature class F, i.e. in this case neither a service factor >1 nor an increased coolant temperature is possible, that is order codes **C11**, **C12** and **C13** cannot be ordered. Explosion-proof motors for Zones 2, 21 and 22 are utilised in accordance with temperature class B.

Supply frequencies larger than 60 Hz

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: Max. speed).

Overview (continued)

ECOFAST motor connectors

In combination with the ECOFAST versions of the MICROMASTER 411 distributed drive solutions, the following motor connectors can be ordered separately:

- ECOFAST motor connector, standard (unshielded connection): Order code **G55**.
- ECOFAST motor connector, EMC (shielded connection): Order code **G56**.
Shielded motor connection cables must be used for frequency converters and soft starters.

Maximum permissible line voltage on motor connector: ≤500 V

Ordering example:

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with high efficiency (EFF1), IP55 degree of protection, aluminium housing	1LA9 □□□□-□□□□□□
No. of poles/speed	4-pole/1500 rpm	1LA9 090-4KA90 L1U
Rated output	1.1 kW	
Special voltage and frequency	Star/delta starting for a supply voltage 400 VΔ, 50 Hz ¹⁾	
Type of construction	IM B3	
ECOFAST connector	Shielded connection	1LA9 090-4KA90 – Z L1U + G56

Converter mounting

Motor series 1LA7 with standard insulation up to 500 V in chapters “Standard motors up to frame size 315 L” and “Fan motors” can be prepared for mounting an MMI (MICROMASTER Integrated). Order code **H15** is required for this purpose.

Earth brushes for converter-fed operation

Earth brushes are available for converter-fed operation for 1LG4 and 1LG6 motors with order code **M44**. Please contact your local Siemens office for advice.

Motor series with special insulation up to 690 V

For motor series 1LA7/5 and 1LG6 with special insulation up to 690 V, the following special versions are generally not possible:

Description	Order code
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21 and 22	A10
Temperature class F, used acc. to F, with service factor (SF)	C11
Temperature class F, used acc. to F, with increased output	C12
Temperature class F, used acc. to F, with increased coolant temperature	C13
Design according to UL with “Recognition Mark”	D31
Canadian regulations (CSA)	D40
Prepared for mounting the MICROMASTER Integrated frequency converter	H15
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	M34
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	M35
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	M38
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	M39
Design for Zone 2 for mains-fed operation Ex nA II T3, EEx nA II T3 acc. to IEC/EN 60079-15	M72
Design for Zone 2 for converter-fed operation, derating Ex nA II T3, EEx nA II T3 acc. to IEC/EN 60079-15	M73
Temperature class F, used acc. to F, other requirements	Y52
ECOFAST motor connector Han-Drive 10e for 230 VΔ/400 VY	G55
ECOFAST motor connector EMC Han-Drive 10e for 230 VΔ/400 VY	G56

¹⁾ Note: Voltage code **9** with order code **L1U** must be selected due to the 400 V voltage. With voltage code 6 (= 400 VΔ/690 VY, 50 Hz), temporary voltage peaks of 690 V can arise which can cause faults on the ECOFAST connectors.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of the Order No.	Additional identification code with order code and, if required, with plain text	Motor type frame size													
			56	63	71	80	90	100	112	132	160	180	200	225	250	280
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																
						1LA7 (aluminium)				1LA5 (aluminium)						
Non-standard voltage and/or frequencies																
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •					✓	✓	✓	✓	✓	✓	✓			
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Non-standard voltage and/or frequencies																
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •									✓	✓	✓	✓	✓	✓ ²⁾

- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

²⁾ For voltages in the 200 V range, please contact your local Siemens representative.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without **-Z** supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of the Order No.	Additional identification code with order code and, if required, with plain text	Motor type frame size														315 S/M	315 L	2-pole	4-, 6-, 8-pole	
			56	63	71	80	90	100	112	132	160	180	200	225	250	280					
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																					
										1LA7 (aluminium)		1LA5 (aluminium)									
Without flange																					
IM V5 with protective cover ¹⁾	9	M1F								✓	✓	✓	✓	✓	✓	✓					
With flange																					
IM V3 ²⁾	9	M1G								–	–	–	–	✓	✓	✓					
With standard flange																					
IM V18 with protective cover ¹⁾	9	M2A								✓	✓	✓	✓	–	–	–					
With special flange																					
IM V18 with protective cover ¹⁾	9	M2B								✓	✓	✓	✓	–	–	–					
IM B34	9	M2C								✓	✓	✓	✓	–	–	–					
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																					
														1LG6 (cast-iron)							
Without flange																					
IM V5 without protective cover ⁴⁾	9	M1D												–	–	–	–	–	–	✓ ³⁾	○
IM V6 ⁴⁾	9	M1E												–	–	–	–	–	–	✓ ³⁾	○
IM V5 with protective cover ^{1) 4)}	9	M1F												✓	✓	✓	✓	✓	✓	✓ ³⁾	✓
With flange																					
IM V3 ⁵⁾	9	M1G												✓	✓	✓	✓	✓	✓	–	–

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.
²⁾ For frame sizes 180 M to 225 M, the 1LA5 motors can be supplied with two additional eyebolts; state Order No. suffix **"Z"** and order code **K32**.
³⁾ 60 Hz version is possible on request

⁴⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.
⁵⁾ 1LG6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																
							1LA7 (aluminium)				1LA5 (aluminium)					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓			
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓			
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23						✓	✓	✓	✓	✓	✓	✓			
3 temperature detectors for tripping ¹⁾	A31						✓	✓	✓	✓	✓	✓	✓			
Installation of 3 PT 100 resistance thermometers ¹⁾	A60						✓	✓	✓	✓	✓	✓	✓			
Motor connection and connection boxes																
Connection box on RHS	K09						✓	✓	✓	✓	✓	✓	✓			
Connection box on LHS	K10						✓	✓	✓	✓	✓	✓	✓			
Cable entry, standard configuration	K54						✓	✓	✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from DE (AS)	K83						✓	✓	✓	✓	✓	✓	✓			
Rotation of the connection box through 90°, entry from NDE (BS)	K84						✓	✓	✓	✓	✓	✓	✓			
Rotation of connection box through 180°	K85						○	○	○	○	✓	✓	✓			
Next larger connection box	L00						–	–	–	–	✓	✓	✓			
External earthing	L13						✓	✓	✓	✓	✓	✓	✓			
3 cables protruding, 0.5 m long ²⁾	L44						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
3 cables protruding, 1.5 m long ²⁾	L45						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 0.5 m long ²⁾	L47						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 1.5 m long ²⁾	L48						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
6 cables protruding, 3 m long ²⁾	L49						–	–	–	–	O. R.	O. R.	O. R.			
Connection box on NDE (BS)	M64						✓	✓	✓	✓	✓	✓	✓			

For legend and footnotes, see page 5/26.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																		
							1LA7 (aluminium)				1LA5 (aluminium)							
Windings and insulation																		
Temperature class H at rated output and max. CT 60°C ³⁾	C18						✓	✓	✓	✓	✓	✓	✓					
Increased air humidity/temper- ature with 30 to 60 g water per m³ of air	C19						✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22						✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23						✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24						✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25						✓	✓	✓	✓	✓	✓	✓					
Increased air humidity/temper- ature with 60 to 100 g water per m³ of air	C26						✓	✓	✓	✓	✓	✓	✓					
Colours and paint finish																		
Special finish in RAL 7030 stone gray							□	□	□	□	□	□	□					
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 6011 mignonetta green	K27						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 7001 silver gray	M20						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 7031 blue gray	K28						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 7032 pebble gray	L42						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 7035 light gray	M21						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 9002 gray white	M23						✓	✓	✓	✓	✓	✓	✓					
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓					
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54• and special fin- ish RAL						✓	✓	✓	✓	✓	✓	✓					
Special finish in special RAL colours: For RAL colours, see “Special finish in special RAL colours” on Page 1/18	Y51• and special fin- ish RAL						✓	✓	✓	✓	✓	✓	✓					
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○					
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓					

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																	
							1LA7 (aluminium)				1LA5 (aluminium)						
Modular technology - Basic versions ⁴⁾																	
Mounting of separately-driven fan	G17						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake ⁵⁾	G26						✓	✓	✓	✓	✓	✓	✓				
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57						✓	✓	✓	✓	✓	✓	✓				
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58						✓	✓	✓	✓	✓	✓	✓				
Modular technology - Combinations of basic versions ⁴⁾																	
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁵⁾	H62						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake and separately driven fan ⁵⁾	H63						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁵⁾	H64						✓	✓	✓	✓	✓	✓	✓				
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁵⁾	H98						✓	✓	✓	✓	✓	✓	✓				
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁵⁾	H99						✓	✓	✓	✓	✓	✓	✓				
Modular technology - Additional versions																	
Brake supply voltage 24 V DC	C00						✓	✓	✓	✓	✓	✓	✓				
Brake supply voltage 400 V AC	C01						✓	✓	✓	✓	✓	✓	✓				
Brake supply voltage 180 V DC, for operation on MM411-ECOFAST	C02						✓	✓	✓	–	–	–	–				
Mechanical manual brake release with lever (no locking)	K82						✓	✓	✓	✓	✓	✓	✓				
Special technology ⁴⁾																	
Mounting of LL 861 900 220 rotary pulse encoder	H70						✓	✓	✓	✓	✓	✓	✓				
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71						✓	✓	✓	✓	✓	✓	✓				
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72						✓	✓	✓	✓	✓	✓	✓				
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73						✓	✓	✓	✓	✓	✓	✓				
Mounting of HOG 9 rotary pulse encoder to be provided	H74						✓	✓	✓	✓	✓	✓	✓				
Mounting of HOG 10 rotary pulse encoder to be provided	H75						✓	✓	✓	✓	✓	✓	✓				
Prepared for mounting LL 861 900 220	H78						✓	✓	✓	✓	✓	✓	✓				
Prepared for mounting HOG 9 D 1024 I	H79						✓	✓	✓	✓	✓	✓	✓				
Prepared for mounting HOG 10 D 1024 I	H80						✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 5/26.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																
							1LA7 (aluminium)				1LA5 (aluminium)					
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction.	K17						✓	✓	✓	✓	✓	✓	✓			
With two additional eyebolts for IM V1/IM V3	K32						–	–	–	–	✓	✓	✓			
Low-noise version for 2-pole motors with clockwise direction of rotation	K37						–	–	✓	✓	✓	✓	✓			
Low-noise version for 2-pole motors with anticlockwise direction of rotation	K38						–	–	✓	✓	✓	✓	✓			
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓			
IP56 degree of protection (non-heavy-sea)	K52						✓	✓	✓	✓	✓	✓	✓			
Vibration-proof version	L03						✓	✓	✓	✓	✓	✓	✓			
Condensation drainage holes ⁶⁾	L12						✓	✓	✓	✓	✓	✓	✓			
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓			
Mechanical protection for encoder ⁷⁾	M68						✓	✓	✓	✓	✓	✓	✓			
Coolant temperature and site altitude																
Coolant temperature -40 to +40 °C	D03						O. R.	O. R.	O. R.	O. R.	✓	✓	✓			
Coolant temperature -30 to +40 °C	D04						✓	✓	✓	✓	✓	✓	✓			
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ⁸⁾	D01						✓	✓	–	–	–	–	–			
Electrical according to NEMA MG1-12	D30						✓	✓	✓	✓	✓	✓	✓			
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ⁹⁾	G50						✓	✓	✓	✓	✓	✓	✓			
Bearing design for increased cantilever forces	K20						✓	✓	✓	✓	✓	✓	✓			
Regreasing device ⁹⁾	K40						✓	✓	✓	✓	✓	✓	✓			
Located bearing DE (AS)	K94						✓	✓	✓	✓	✓	✓	✓			
Located bearing NDE (BS)	L04						✓	✓	✓	□	□	□	□			
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓			
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01						✓	✓	✓	✓	✓	✓	✓			
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02						✓	✓	✓	✓	✓	✓	✓			
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04						✓	✓	✓	✓	✓	✓	✓			
Second standard shaft extension	K16						✓	✓	✓	✓	✓	✓	✓			
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39						✓	✓	✓	✓	✓	✓	✓			
Standard shaft made of non-rusting steel	M65						✓	✓	✓	✓	✓	✓	✓			
Non-standard cylindrical shaft extension ¹¹⁾	Y55						✓	✓	✓	✓	✓	✓	✓			

For legend and footnotes, see page 5/26.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V - Aluminium series 1LA7 and 1LA5																	
							1LA7 (aluminium)				1LA5 (aluminium)						
Heating and ventilation																	
Fan cover for textile industry	H17						✓	✓	✓	✓	✓	✓	✓				
Metal external fan ¹²⁾	K35						✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 230 V	K45						✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 115 V	K46						✓	✓	✓	✓	✓	✓	✓				
Rating plate and extra rating plates																	
Second rating plate, loose	K31						✓	✓	✓	✓	✓	✓	✓				
Extra rating plate or rating plate with deviating rating plate data	Y80• and identification code						✓	✓	✓	✓	✓	✓	✓				
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓				
Additional information on rating plate and on package label	Y84• and identification code						✓	✓	✓	✓	✓	✓	✓				
Packaging, safety notes, documentation and test certificates																	
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○	○	○	○				
With one safety and startup guide per box pallet	B01						○	○	○	○	○	–	–				
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99						○	○	○	○	○	–	–				
Connected in star for dispatch	M32						✓	✓	✓	✓	✓	✓	✓				
Connected in delta for dispatch	M33						✓	✓	✓	✓	✓	✓	✓				

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- .R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For appropriate tripping unit, see Catalog LV 1.
- ²⁾ In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- ³⁾ The grease lifetime specified in the "Introduction" section of this catalog refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- ⁴⁾ A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology - Basic versions
 - Modular technology - Combination of basic versions
 - Special technology
- ⁵⁾ The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00**, **C01** and **C02**.
- ⁶⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- ⁷⁾ Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- ⁸⁾ CCC certification is required for
 - 2-pole motors ≤2.2 kW
 - 4-pole motors ≤1.1 kW
 - 6-pole motors ≤0.75 kW
 - 8-pole motors ≤0.55 kW

- ⁹⁾ Not possible when brake is mounted.
- ¹⁰⁾ Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder fitting.
- ¹¹⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively.
Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.
The add-on prices also apply for "Shaft extension DE without featherkey way".
For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ Inner diameter of roller bearing (see tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x Length E (normal) of the shaft extension
 For explanation of the order codes, see "Introduction".
- ¹²⁾ For 1LA5, 1LA6, 1LA7, 1LA9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Motor protection																
Motor protection with PTC ther- mistors with 3 embedded tem- perature sensors for tripping ¹⁾	A11										✓	✓	✓	✓	✓	✓
Motor protection with PTC ther- mistors with 6 embedded tem- perature sensors for tripping and alarm ¹⁾	A12										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23										✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25										✓	✓	✓	✓	✓	✓
3 temperature detectors for tripping ¹⁾	A31										✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60										✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ^{1) 15)}	A72										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermo- meters (3-wire circuit) for rolling- contact bearings ¹⁾	A78										✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80										✓	✓	✓	✓	✓	✓
Motor connection and connection boxes																
Two-part plate on connection box	K06										–	✓	✓	✓	✓	✓
Connection box on RHS	K09										✓	✓	✓	✓	✓	✓
Connection box on LHS	K10										✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11										✓	✓	✓	✓	✓	✓
Connection box in cast-iron version	K15										✓	✓	✓	–	–	–
Cable entry, standard configuration	K54										✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K55										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83										✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84										✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85										✓	✓	✓	✓	✓	✓
Next larger connection box	L00										✓	✓	✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	L48										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - right side ^{2) 3)}	L51										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - left side ^{2) 3)}	L52										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identifica- tion code - Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																	
												1LG6 (cast-iron)					
Motor connection and connection boxes (continued)																	
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓
Stud terminal for cable connec- tion, accessories pack (3 items)	M46											–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	✓
Windings and insulation																	
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25											✓	✓	✓	✓	✓	✓
Colours and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53• and standard finish RAL											✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 mignonetta green	K27											✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 5/31.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Colours and paint finish (continued)																
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54• and special finish RAL										✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on page 1/18	Y51• and special finish RAL										✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23										○	○	○	○	○	○
Unpainted, only primed	K24										✓	✓	✓	✓	✓	✓
Modular technology - Basic versions ⁴⁾																
Mounting of separately driven fan ⁵⁾	G17										✓	✓	✓	✓	✓	✓
Mounting of brake ^{5) 6)}	G26										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57										✓	✓	✓	✓	✓	✓
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58										✓	✓	✓	✓	✓	✓
Modular technology - Combinations of basic versions ⁴⁾																
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁶⁾	H62										✓	✓	✓	✓	✓	✓
Mounting of brake and separately-driven fan ⁶⁾	H63										✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁶⁾	H64										✓	✓	✓	✓	✓	✓
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97										✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁶⁾	H98										✓	✓	✓	✓	✓	✓
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁶⁾	H99										✓	✓	✓	✓	✓	✓
Modular technology - Additional versions																
Brake supply voltage 24 V DC	C00										✓	✓	✓	✓	✓	✓
Brake supply voltage 400 V AC	C01										✓	✓	✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	K82										✓	✓	✓	✓	✓	✓
Special technology ⁴⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓	✓
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71										✓	✓	✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓	✓
Mounting of HOG 9 rotary pulse encoder to be provided	H74										✓	✓	✓	✓	✓	✓
Mounting of HOG 10 rotary pulse encoder to be provided	H75										✓	✓	✓	✓	✓	✓
Prepared for mounting LL 861 900 220	H78										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 9 D 1024 I	H79										✓	✓	✓	✓	✓	✓
Prepared for mounting HOG 10 D 1024 I	H80										✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 5/31.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																	
1LG6 (cast-iron)																	
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction and 2-pole motors.	K17										✓	✓	✓	✓	✓	✓	
Low-noise version for 2-pole motors with clockwise direction of rotation ⁷⁾	K37										–	–	–	–	–	–	
Low-noise version for 2-pole motors with anticlockwise direction of rotation ⁷⁾	K38										–	–	–	–	–	–	
IP65 degree of protection	K50										✓	✓	✓	✓	✓	✓	
IP56 degree of protection (non-heavy-sea)	K52										✓	✓	✓	✓	✓	✓	
Condensation water holes ¹⁶⁾	L12										□	□	□	□	□	□	
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓	✓	
Earth brushes for converter-fed operation	M44										–	–	–	–	O. R.	O. R.	
Mechanical protection for encoder ⁸⁾	M68										✓	✓	✓	✓	✓	✓	
Coolant temperature and site altitude																	
Coolant temperature -50 to +40 °C	D02										✓	✓	✓	✓	✓	✓	
Coolant temperature -40 to +40 °C	D03										✓	✓	✓	✓	✓	✓	
Coolant temperature -30 to +40 °C	D04										✓	✓	✓	✓	✓	✓	
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50										✓	✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces ⁹⁾	K20										✓	✓	✓	✓	✓	✓	
Special bearing for drive-end and non-drive-end, bearing size 63	K36										✓	✓	✓	✓	✓ ¹⁰⁾	✓ ¹⁰⁾	
Regreasing device	K40										✓	✓	✓	✓	□	□	
Located bearing DE	K94										✓	✓	✓	✓	✓	✓	
Located bearing NDE	L04										□	□	□	□	□	□	
Insulated bearing cartridge ¹⁷⁾	L27										–	–	✓	✓	✓	✓	
Balance and vibration severity																	
Full key balancing	L68										✓	✓	✓	✓	✓	✓	
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01										✓	✓	✓	✓	✓	✓	
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02										✓	✓	✓	✓	✓	✓	
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹¹⁾	K04										✓	✓	✓	✓	✓	✓	
Second standard shaft extension ¹²⁾	K16										✓	✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39										✓	✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ¹³⁾	Y55 • and identification code										✓	✓	✓	✓	✓	✓	

For legend and footnotes, see page 5/31.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors with special insulation for voltages up to 690 V - Cast-iron series 1LG6																
											1LG6 (cast-iron)					
Heating and ventilation																
Metal external fan ¹⁴⁾	K35										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45										✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46										✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36										✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second rating plate, loose	K31										✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80• and identification code										✓	✓	✓	✓	✓	✓
Extra rating plate with identification code	Y82• and identification code										✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84• and identification code										✓	✓	✓	✓	✓	✓
Packaging, safety notes; documentation and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02										✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.

- O.R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For appropriate tripping unit, see Catalog LV 1.
- ²⁾ In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- ³⁾ Possible in combination with order code **L44** to **L49** or length specification in plain text.
- ⁴⁾ A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology - Basic versions
 - Modular technology - Combination of basic versions
- ⁵⁾ For 1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with rotary pulse encoders, see the "Special technology" range.
- ⁶⁾ The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- ⁷⁾ Not necessary for 1LG6 motors because these motors are already noise optimized.
- ⁸⁾ Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- ⁹⁾ Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1LG6 motors. Not possible for 1LG6 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- ¹⁰⁾ Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- ¹¹⁾ Can be combined with deep-groove bearings of series 60... 62... and 63... . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder fitting.
- ¹²⁾ Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- ¹³⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively.

Not applicable for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts.

Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case.

The extra charges on the list price also apply for "Shaft extension without featherkey way".

For order codes **Y55** and **K16**:

 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension

For an explanation of the order codes, see "Introduction".
- ¹⁴⁾ For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted. The external metal fan is not possible in combination with the low-noise version – order code **K37** or **K38**.
- ¹⁵⁾ This option is not possible for frame sizes 225 to 315 in combination with the option "Insulated bearing cartridge" - Order code **L27**.
- ¹⁶⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- ¹⁷⁾ This option is not possible for frame sizes 225 to 315 in combination with the option "Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings" - Order code **A72**.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Accessories and spare parts

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardised slide rails (please enquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)711-13880
Fax +49 (0)711-1388233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

In most cases, the motor is connected to the driving machine through coupling.

Available from:
A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

Mounting of encoder

In the case of supply or mounting by the customer.

Options H74, H79, H75, H80

Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0)30-69003-0
Fax +49 (0)30-69003-104

<http://www.huebner-berlin.de>
e-mail: info@huebner-berlin.de

Options H71, H78

Leine & Linde (Deutschland) GmbH
73430 Aalen
Bahnhofstraße 36
Tel. +49 (0)7361-78093-0
Fax +49 (0)7361-78093-11

<http://www.leinelinde.de>
e-mail: info@leinelinde.de

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

**Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

IEC Squirrel-Cage Motors

Motors operating with frequency converters

Dimensions

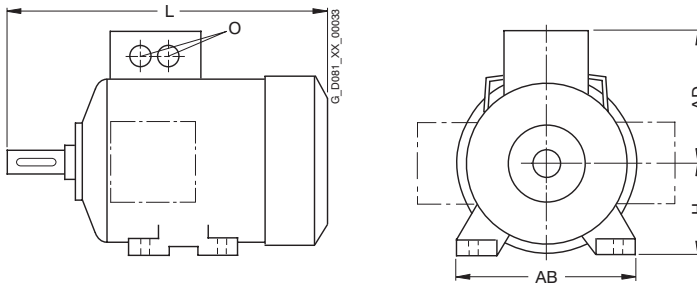
Overview

Note

The following overall dimensions and dimension drawings are only applicable for self-ventilated 1LA7/1LA5 and 1LG6 motors with special insulation for voltages up to 690 V. For overall dimensions of 1LA8/1PQ8 motors with special insulation for voltages up to 690 V, see the section "Non-standard motors".

For overall dimensions and dimension drawings for surface-cooled motors with standard insulation for voltages up to 500 V, see the relevant section.

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
100 L	1LA7		372	135	100	196	2 x M32 x 1.5
112 M	1LA7		393	148	112	226	2 x M32 x 1.5
132 S/ 132 M	1LA7		452.5	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA7		588	197	160	300	2 x M40 x 1.5
180 M/ 180 L	1LA5		712	258	180	339	2 x M40 x 1.5
	1LG6 183	2	720	262	180	339	2 x M40 x 1.5
	1LG6 183	4	669	262	180	339	2 x M40 x 1.5
	1LG6 186	4, 6, 8	720	262	180	339	2 x M40 x 1.5
200 L	1LA5		769.5	305	200	388	2 x M50 x 1.5
	1LG6 206		720	300	200	378	2 x M50 x 1.5
	1LG6 207		777	300	200	378	2 x M50 x 1.5
	1LG6 207	4, 8	720	300	200	378	2 x M50 x 1.5
	1LA5		806	305	225	426	2 x M50 x 1.5
225 S/ 225 M	1LA5	2	776	305	225	426	2 x M50 x 1.5
	1LG6 220	4, 8	789	325	225	436	2 x M50 x 1.5
	1LG6 223	2	819	325	225	436	2 x M50 x 1.5
	1LG6 223	4, 6, 8	849	325	225	436	2 x M50 x 1.5
	1LG6 228	2	869	325	225	436	2 x M50 x 1.5
	1LG6 228	4, 6	899	325	225	436	2 x M50 x 1.5

Notes on the dimensions

■ Dimension designations according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation ISO fit DIN ISO 286-2

D, DA to 30 j6
 over 30 to 50 k6
 over 50 m6

N to 250 j6
 over 250 h6

F, FA h9

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
250 M	1LG6 253	2, 6, 8	887	392	250	490	2 x M63 x 1.5
	1LG6 253	4	957	392	250	490	2 x M63 x 1.5
	1LG6 258	2, 4, 6	957	392	250	490	2 x M63 x 1.5
280 S/ 280 M	1LG6 280	2, 4, 6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 283	2, 4	1070	432	280	540	2 x M63 x 1.5
	1LG6 283	6, 8	960	432	280	540	2 x M63 x 1.5
	1LG6 288	2, 4, 6	1070	432	280	540	2 x M63 x 1.5
315 S/ 315 M/ 315 L	1LG6 310	2	1072	500	315	610	2 x M63 x 1.5
	1LG6 310	4, 6, 8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	8	1102	500	315	610	2 x M63 x 1.5
	1LG6 313	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 313	4, 6	1262	500	315	610	2 x M63 x 1.5
	1LG6 316	2	1232	500	315	610	2 x M63 x 1.5
	1LG6 316	4, 6, 8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	8	1262	500	315	610	2 x M63 x 1.5
	1LG6 317	2	1372	500	315	610	2 x M63 x 1.5
	1LG6 317	4, 6	1402	500	315	610	2 x M63 x 1.5
	1LG6 318	2	1372	651	315	610	2 x M63 x 1.5
	1LG6 318	4	1402	651	315	610	2 x M63 x 1.5
	1LG6 318	6, 8	1402	500	315	610	2 x M63 x 1.5

■ Dimension tolerances

For the following dimensions, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
A, B	to 250	± 0.75
	over 250 to 500	± 1.0
	over 500 to 750	± 1.5
	over 750 to 1000	± 2.0
	over 1000	± 2.5
M	to 200	± 0.25
	over 200 to 500	± 0.5
	over 500	± 1.0
H	to 250	- 0.5
	over 250	- 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

■ All dimensions are specified in mm.

IEC Squirrel-Cage Motors

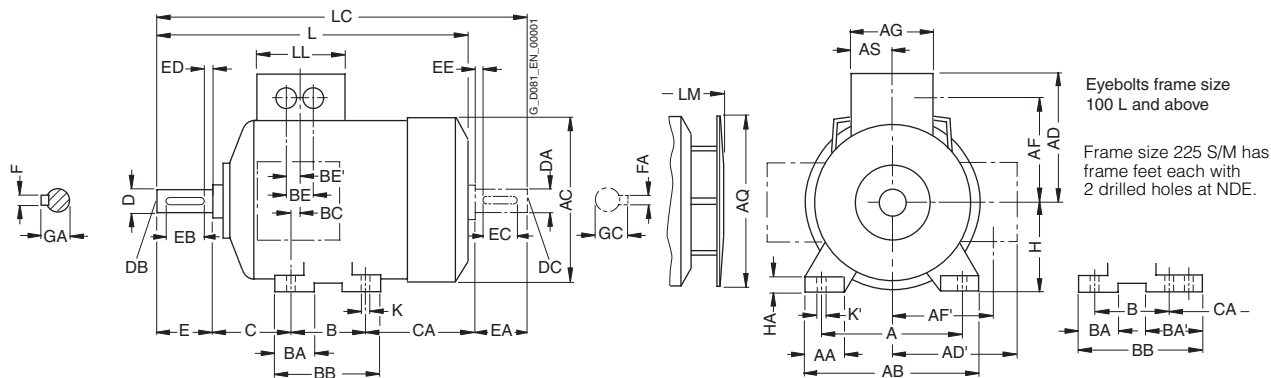
Motors operating with frequency converters

Dimensions

Dimensional drawings

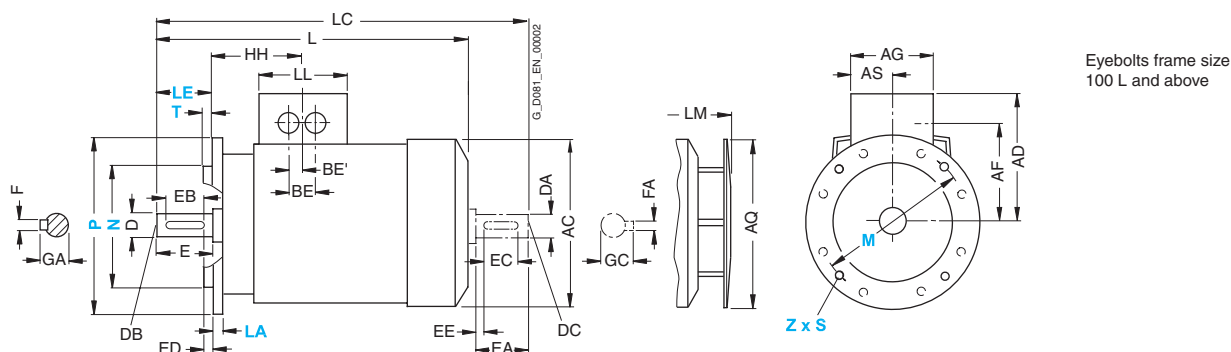
Aluminium series 1LA7 and 1LA5, frame sizes 100 L to 225 M · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ⁽¹⁾	AD ⁽²⁾	AD'	AF ⁽²⁾	AF'	AG ⁽²⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ⁽²⁾	BE' ⁽²⁾	C	CA*	H	HA
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	170	60	140	47	–	176	39	42	21	63	125	100	12
112 M	1LA7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	170	60	140	47	–	176	32	42	21	70	141	112	12
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	250	70	140	49	–	180	39	42	21	89	162.5	132	15
132 M	1LA7 133 1LA7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	250	70	178	49	–	218	39	42	21	89	124.5	132	15
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	250	82.5	210	57	–	256	52.5	54	27	108	183	160	18
160 L	1LA7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	250	82.5	254	57	–	300	52.5	54	27	108	139	160	18
180 M	1LA5 183	2, 4	279	69.5	339	363	258	258	216	216	152	340	71	241	50	–	287	38	54	27	121	259	180	18
180 L	1LA5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	340	71	279	50	–	325	38	54	27	121	221	180	18
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	340	96	305	58.5	–	355	45	85	42.5	133	239	200	24
225 S	1LA5 220	4, 8	356	103	426	402	305	305	252	252	260	340	96	286	58	83	361	36	85	42.5	149	248.5	225	24
225 M	1LA5 223	2 4, 6, 8	356	103	426	402	305	305	252	252	260	340	96	311	58	83	361	36	85	42.5	149	223.5	225	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

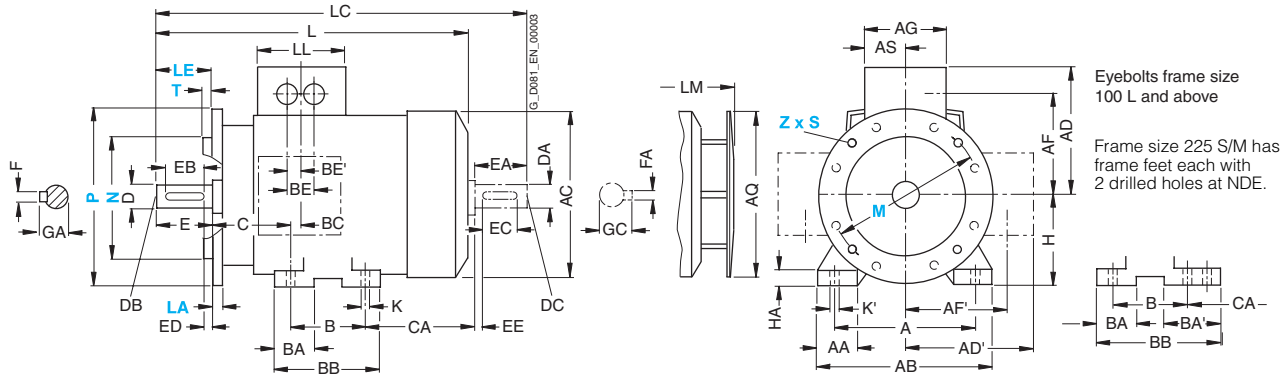
2) The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

Dimensional drawings

Aluminium series 1LA7 and 1LA5, frame sizes 100 L to 225 M · with special insulation for voltages up to 690 V

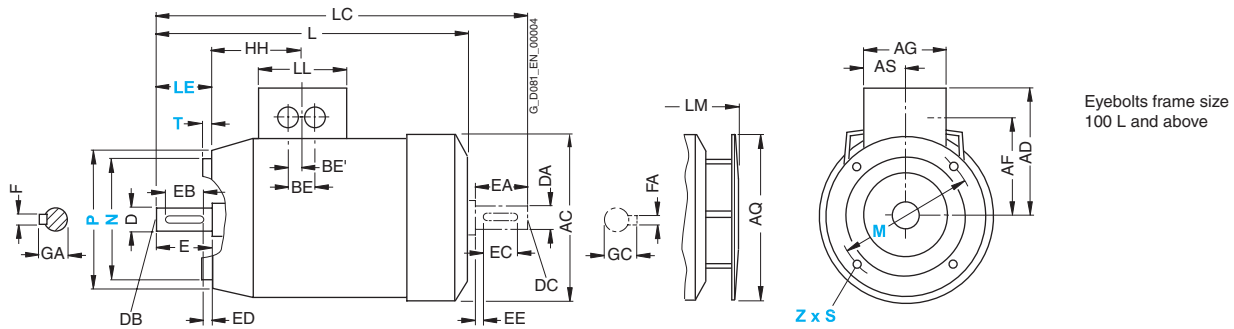
Type of construction IM B35

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC								DE shaft extension							NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
100 L	1LA7 106 1LA7 107	2, 4, 6, 8 4, 8	102	12	16	372	438	120	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
112 M	1LA7 113	2, 4, 6, 8	102	12	16	393	461	120	444.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
132 S	1LA7 130 1LA7 131	2, 4, 6, 8 2	128	12	16	452.5 ¹⁾	551.5	140	505 ¹⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
132 M	1LA7 133 1LA7 134	4, 6, 8 6	128	12	16	452.5 ¹⁾	551.5	140	505 ¹⁾	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41		
160 M	1LA7 163 1LA7 164	2, 4, 6, 8 2, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		
160 L	1LA7 166	2, 4, 6, 8	160.5	15	19	588	721	165	640.5	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		
180 M	1LA5 183	2, 4	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
180 L	1LA5 186	4, 6, 8	159	15	19	712	841	132	793.5	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
200 L	1LA5 206 1LA5 207	2, 6 2, 4, 6, 8	178	19	25	769.5	897	192	850	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
225 S	1LA5 220	4, 8	184.5	19	25	806	933.5	192	887.5	60	M20	140	125	7.5	18	64	55	M20	110	100	5	16	59		
225 M	1LA5 223	2 4, 6, 8	184.5	19	25	776 806	903.5 933.5	192	857.5 887.5	55 60	M20 M20	110 140	100 125	5 7.5	16 18	59 64	55	M20	110	100	5	16	59		

¹⁾ In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

IEC Squirrel-Cage Motors

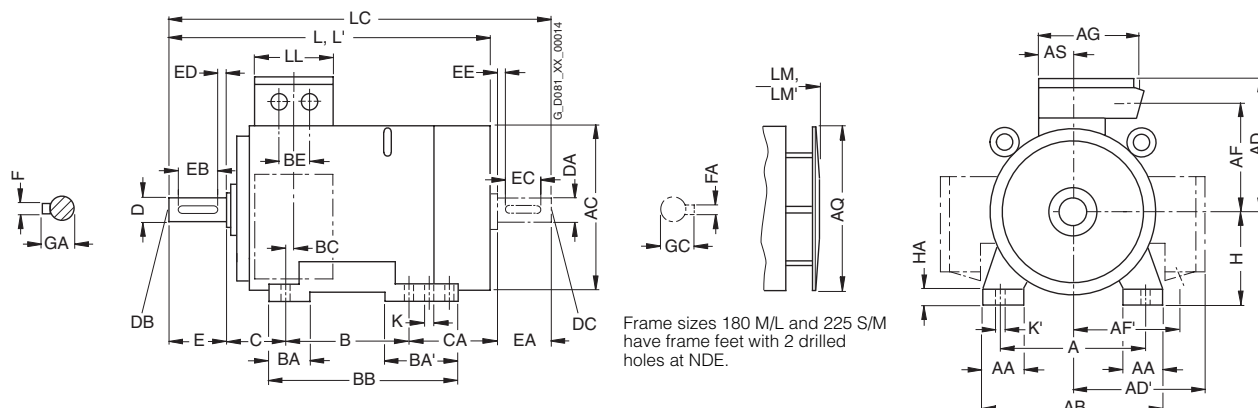
Motors operating with frequency converters

Dimensions

Dimensional drawings

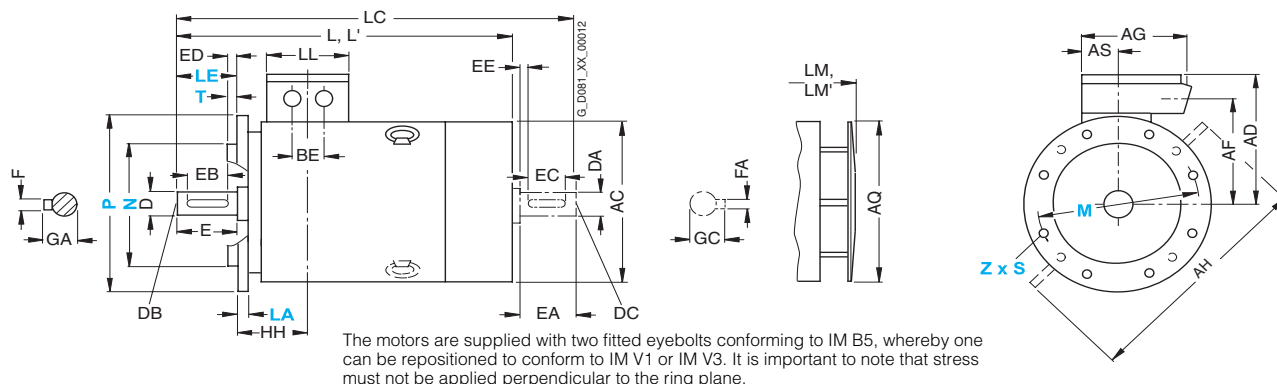
Cast-iron series 1LG6, frame sizes 180 M to 250 M · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG6 183	2	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	253	180	20
		4																			202			
180 L	1LG6 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20
200 L	1LG6 206	2, 6	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25
	1LG6 207	2, 6 4, 8	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	234	200	25
																					177			
225 S	1LG6 220	4, 8	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG6 223	2	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		4, 6, 8																						
	1LG6 228	2 4, 6	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	303	225	34
250 M	1LG6 253	2	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		4																			305			
		6, 8																				235		
	1LG6 258	2 4, 6	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

IEC Squirrel-Cage Motors

Motors operating with frequency converters

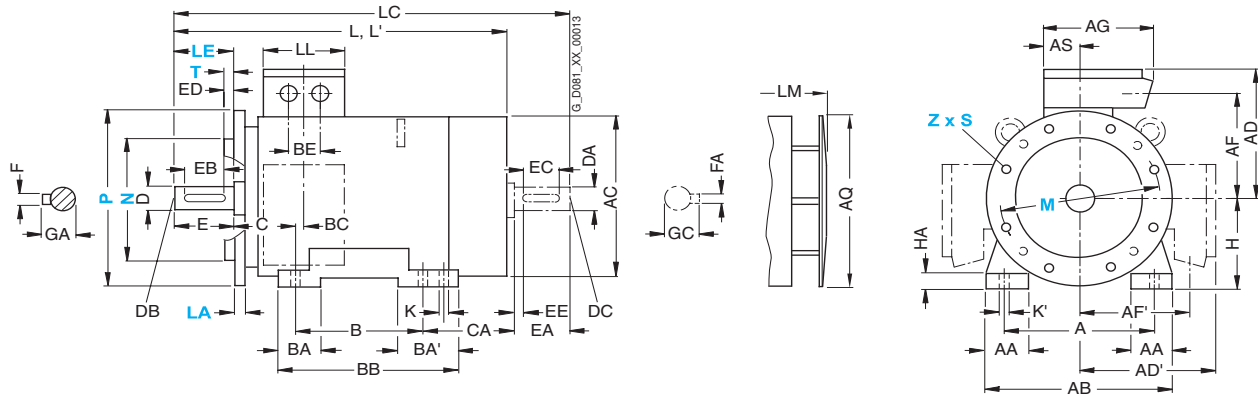
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M · with special insulation for voltages up to 690 V

Type of construction IM B35

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



5

For motor			Dimension designation acc. to IEC									DE shaft extension								NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC		
180 M	1LG6 183	2	157	15	19	720	720	835	132	810	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
		4				669	—	784		759	—																
180 L	1LG6 186	4, 6, 8	157	15	19	720	—	835	132	810	—	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
200 L	1LG6 206	2, 6	196	19	25	720	754	835	192	810	844	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
	1LG6 207	2, 6	196	19	25	777	811	892	192	867	901	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
		4, 8				720	—	835		810	—																
225 S	1LG6 220	4, 8	196	19	25	789	—	903	192	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
225 M	1LG6 223	2	196	19	25	819	853	933	192	919	953	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
		4, 6, 8				849	—	963		949	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
	1LG6 228	2	196	19	25	869	903	983	192	969	1003	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5		
		4, 6				899	—	1013		999	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
250 M	1LG6 253	2	237	24	30	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		4				957	—	1102		1057	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		6, 8				887	—	1032		987	—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG6 258	2	237	24	30	957	994	1102	236	1057	1094	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		4, 6					—				—	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		

¹⁾ For version with low-noise fan for 2-pole motors.

IEC Squirrel-Cage Motors

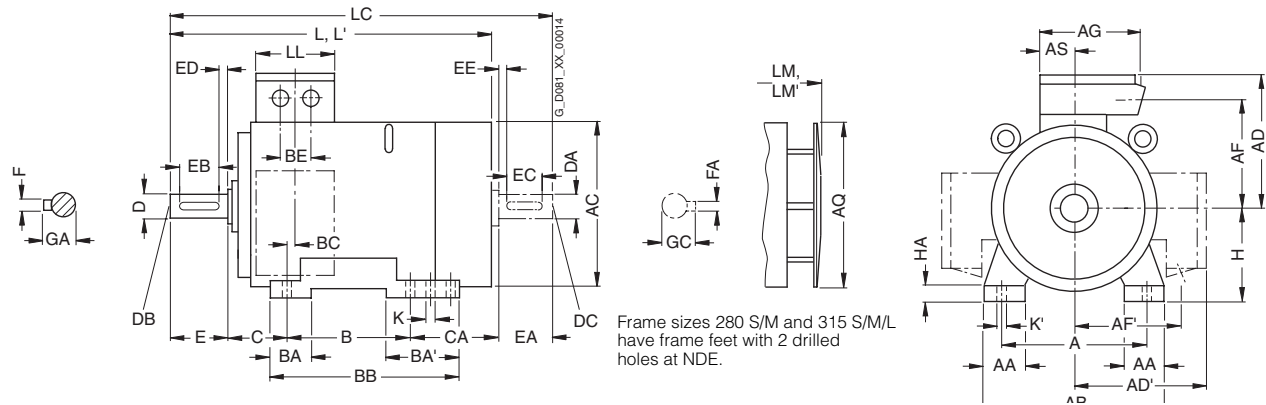
Motors operating with frequency converters

Dimensions

Dimensional drawings

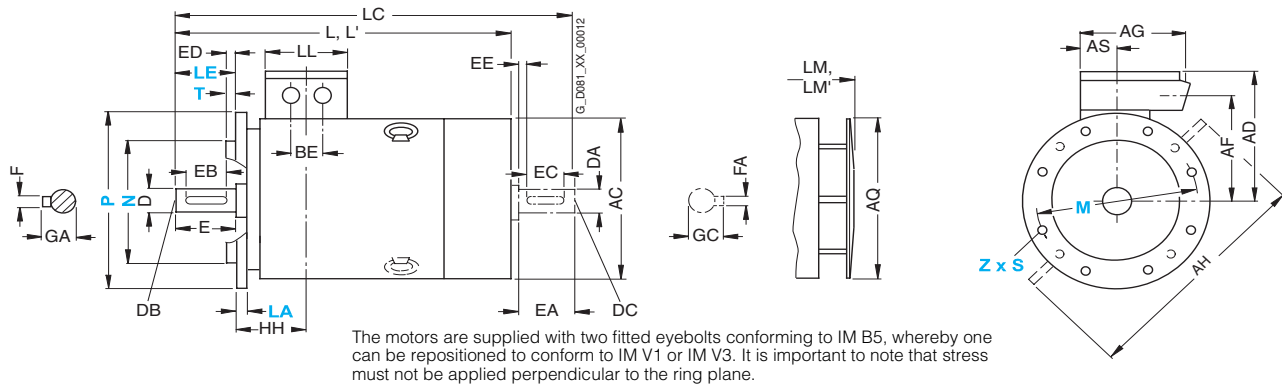
Cast-iron series 1LG6, frame sizes 280 S to 315 L · with special insulation for voltages up to 690 V

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																					
Frame size	Type	Number of poles	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
280 S	1LG6 280	2	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
		4, 6, 8	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
	1LG6 288	2	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	326	280	40
		4, 6																				216		
315 S	1LG6 310	2	508	120	610	610	500	500	400	400	380	780	590	154	406	125	176	527	69	110	216	315	315	50
	1LG6 310	4, 6, 8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	527	69	110	216	264	315	50
315 M ²⁾	1LG6 313	8	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
	1LG6 313	2	508	120	610	610	500	500	400	400	380	780	590	154	457	125	176	578	69	110	216	424	315	50
	1LG6 313	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
315 L ²⁾	1LG6 316	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 316	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 316	8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 317	2	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 317	4, 6	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 317	8	508	120	610	610	500	500	400	400	380	780	590	154	508	125	176	578	69	110	216	373	315	50
	1LG6 318	2	508	120	610	610	651	651	524	524	470	780	590	165	508	125	176	578	69	110	216	513	315	50
	1LG6 318	4	508	120	610	610	651	651	524	524	470	780	590	165	508	125	176	578	69	110	216	513	315	50
	1LG6 318	6, 8	508	120	610	610	651	651	524	524	470	780	590	165	508	125	176	578	69	110	216	513	315	50

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

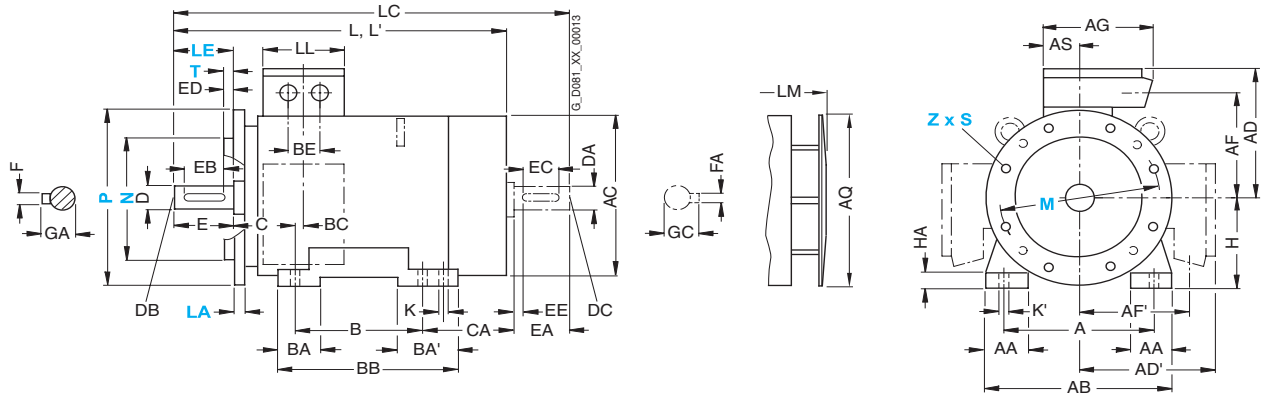
²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L · with special insulation for voltages up to 690 V

Type of construction IM B35

For flange dimensions, see page 5/40 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC									DE shaft extension							NDE shaft extension						
Frame size	Type	Number of poles	HH	K	K'	L	L ⁽¹⁾	LC ⁽²⁾	LL	LM	LM ⁽¹⁾	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
280 S	1LG6 280	2	252	24	30	960	998	1105	236	1070	1108	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 M	1LG6 283	4, 6, 8					—				—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	4					—				—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
	6, 8				960	—	1105		1070	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69	
	1LG6 288	2	252	24	30	1070	1108	1215	236	1180	1218	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
		4, 6					—				—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
315 S	1LG6 310	2	285	28	35	1072	1142	1217	307	1182	1252	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 M ²⁾	1LG6 310	4, 6, 8				1102	—	1247		1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 313	8	285	28	35	1102	—	1247	307	1212	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 313	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 L ²⁾	1LG6 313	4, 6				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	2	285	28	35	1232	1302	1377	307	1342	1412	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 316	4, 6				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 316	8					—				—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	2	285	28	35	1372	1442	1517	307	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 317	4, 6				1402	—	1547		1512	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 317	8				1262	—	1407		1372	—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	2	285	28	35	1372	1442	1517	330	1482	1552	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 318	4				1402	—	1547		1512	—	80 ³⁾	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LG6 318	6, 8					—		307		—	80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5

¹⁾ For version with low-noise fan for 2-pole motors.

²⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 508 mm). BB will then be 666 mm.

³⁾ Diameters up to 90 mm are possible.

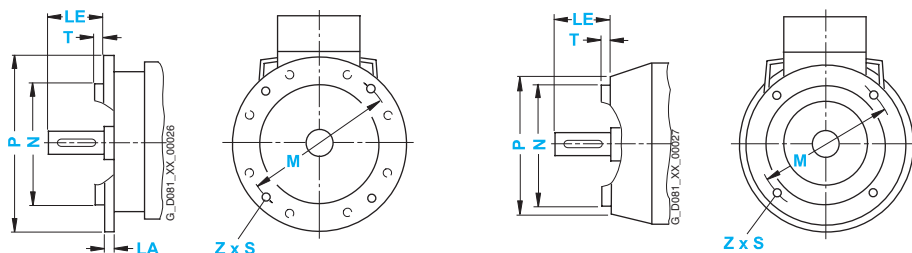
IEC Squirrel-Cage Motors

Motors operating with frequency converters

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

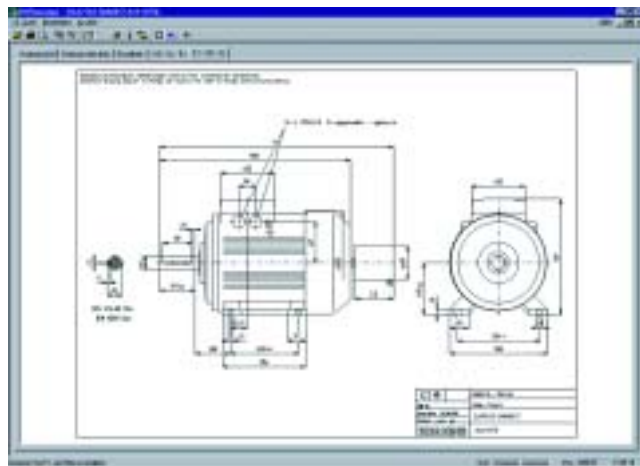
Frame size	Type of construction	Flange type	Flange with through holes (FF/A) tapped holes (FT/C) According to DIN EN 50347	Acc. to DIN 42948	Dimension designation acc. to IEC							
					LA	LE	M	N	P	S	T	Z
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	A 450	16	110 140	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140 170	600	550	660	24	6	8

More information

Dimension sheet generator

(part of the SD configurator)

A dimensional drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimensional drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic catalog CA 01 as a selection aid (for more information, see "Technical information", "Project planning aids").

The interactive catalog CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2006, english international:

CD-ROM: E86060-D4001-A110-C5-7600

DVD: E86060-D4001-A510-C5-7600

Pump motors



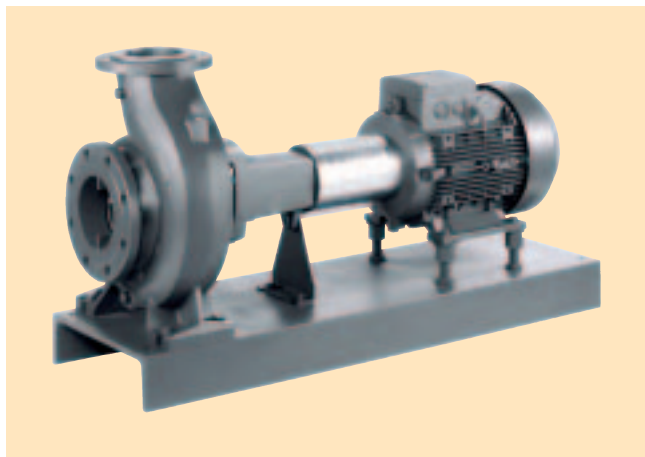
6/2	Orientation
6/2	Overview
6/2	Benefits
6/2	Application
6/2	More information
6/3	Surface-cooled motors up to frame size 315 L Aluminium and cast-iron series
6/3	Overview
6/3	Surface-cooled motors frame size 315 and above Cast-iron series
6/3	Overview
6/3	Special versions
6/3	Overview
6/4	Accessories and spare parts
6/4	Overview
6/4	Dimensions
6/4	Overview

IEC Squirrel-Cage Motors

Pump motors

Orientation

Overview



Pump motors are motors specially designed for use in various pump applications that can either be driven directly or through a belt drive.

The different application areas and types of construction of the pumps demand special technical characteristics of the motors and compactness through

- Using motors with increased output
- Reinforced bearings and use of a located bearing at the drive end (DE) of the motor
- Special materials for shafts, lubricants and seals as well as special flanges and special housings; these are possible on request

For converter-fed operation, winding monitoring through embedded KTY 84-130 temperature sensors is recommended as well as insulated bearings in the case of large output ranges.

Benefits

The pump motors offer the user a number of advantages:

- Pump motors with located bearings at the drive end of the motor and with embedded thermistors can, in most cases, be supplied from stock
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 500 V (voltage rise times $t_s > 0.1$ ms)
- Extensive experience is available in customised applications especially with regard to special flanges and special bearings

Application

Pump motors are particularly suitable for the following pump types:

- Close-coupled pumps
- Industrial pumps
- Submersible pumps

With regard to the ambient conditions of the pump motors, it is important to ensure that the motor is located outside the pumped medium, i.e. the motor must be selected in accordance with the degree of protection. Further requirements are available on request.

More information

For more information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

Overview

Recommended motor types:

- Self-ventilated motors with improved efficiency according to CEMEP EFF 2 – Aluminium series 1LA7 and 1LA5 in the output range from 0.06 to 45 kW
- Self-ventilated motors with improved efficiency according to CEMEP EFF 2 – Cast-iron series 1LA6 and 1LG4 in the output range from 0.75 to 200 kW
- Self-ventilated motors with increased output – Aluminium series 1LA9 with outputs from 0.14 to 53 kW
- Self-ventilated motors with increased output – Cast-iron series 1LG4 with outputs from 15 to 110 kW

Recommended specifications:

Most applications require a non-variable speed, i.e. it is sufficient to feed the drive motors with a fixed, unchanging rated frequency. In an ever-increasing number of applications, it is necessary to match the pump to the overall plant accurately (based on the pump characteristic). The pumps must respond quickly to changing conditions in the plant, supplying the drive motors with a variable rated frequency (converter-fed operation) is desirable.

Pole-changing motors can also be used. In this way, coarse adaptation of the pump characteristic can be achieved (in accordance with the possible motor speeds). For information about adapting the drive motors to the requirements of the pump with reference to the type of construction (e.g. flange, feet or special) as well as for a number of other options, see "Special versions".

For technical specifications, selection and ordering data and "Special versions", see the "Standard motors up to frame size 315 L".

Surface-cooled motors frame size 315 and above Cast-iron housing

Overview

Recommended motor types:

- Non-standard motors for mains-fed and converter-fed operation, cast-iron series 1LA8, with outputs from 160 to 1000 kW

For technical specifications and selection and ordering data, see "Non-standard motors frame size 315 and above".

Special versions

Overview

Recommended special versions for mains-fed and converter-fed operation

- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11**
- Located bearing at drive-end of motor – Order code **K94**
- Insulated bearing cartridge at non-drive-end (NDE) - Order code **K27**
- Bearings for increased cantilever forces – Order code **K20**
- Screwed-on feet for type of construction IM B35 frame size 112 and above in standard version or order code **K11**

Pump version from stock – Order code X66

The pump version from stock comprises 3 embedded temperature sensors for tripping (order code **A11**), located bearing at drive-end (DE) of the motor (order code **K94**) as well as screwed-on feet (for type of construction IM B35 frame size 112 and above in standard version or order code **K11**) and is defined for the following motors:

- Self-ventilated motors with improved efficiency – Aluminium series 1LA7, 2-pole and 4-pole – Output range 0.25 to 18.5 kW
- Self-ventilated motors with improved efficiency – Cast-iron series 1LG4, 2-pole and 4-pole – Output range 18.5 to 37 kW

If other special versions are required, order codes **A11+K94+K11**, that are included in **X66**, must be specified individually in the order.

IEC Squirrel-Cage Motors

Pump motors

Special versions

Overview (continued)

Pump motors that can be supplied from stock according to CEMEP "Improved Efficiency" EFF 2, IP55 degree of protection, 50/60 Hz and temperature class F for a service factor of 1.1 with order code X66.

Certified in accordance with	Rated output at 50 Hz	Frame size	Efficiency Class acc. to CEMEP	Pump version for		Voltage:		Voltage:		Voltage:	
				230 VΔ / 400 VY, 50 Hz, 460 VY, 60 Hz		400 VΔ / 690 VY, 50 Hz, 460 VY, 60 Hz		400 VΔ / 690 VY, 50 Hz, 460 VY, 60 Hz		400 VΔ / 690 VY, 50 Hz, 460 VY, 60 Hz	
				Type: IM B5, IM V1 without protective cover IM V3		Type: IM B5, IM V1 without protective cover IM V3		Type: IM B5, IM V1 without protective cover IM V3		Type: IM B35	
				Order No. (extra charge)	Order code	Order No. (extra charge)	Order code	Order No. (extra charge)	Order code		
3000 rpm, 2-pole											
CCC	0.75	80 M		1LA7 080-2AA11-Z	X66	—		—			
CCC	1.1		EFF 2	1LA7 083-2AA11-Z	X66	—		—			
CCC	1.5	90 S	EFF 2	1LA7 090-2AA11-Z	X66	—		—			
CCC	2.2	90 L	EFF 2	1LA7 096-2AA11-Z	X66	—		—			
	3	100 L	EFF 2	—		1LA7 106-2AA61-Z	X66	—			
	4	112 M	EFF 2	—		1LA7 113-2AA61-Z	X66	—			
	5.5	132 S	EFF 2	—		—		1LA7 130-2AA66-Z	X66		
	7.5		EFF 2	—		—		1LA7 131-2AA66-Z	X66		
	11	160 M	EFF 2	—		—		1LA7 163-2AA66-Z	X66		
	15		EFF 2	—		—		1LA7 164-2AA66-Z	X66		
	18.5	160 L	EFF 2	—		—		1LA7 166-2AA66-Z	X66		
	22	180 M	EFF 2	—		—		1LG4 183-2AA66-Z	X66		
	30	200 L	EFF 2	—		—		1LG4 206-2AA66-Z	X66		
	37		EFF 2	—		—		1LG4 207-2AA66-Z	X66		
1500 rpm, 4-pole											
CCC	0.25	71 M		1LA7 070-4AB11-Z	X66	—		—			
CCC	0.37			1LA7 073-4AB11-Z	X66	—		—			
CCC	0.55	80 M		1LA7 080-4AA11-Z	X66	—		—			
CCC	0.75			1LA7 083-4AA11-Z	X66	—		—			
CCC	1.1	90 S	EFF 2	1LA7 090-4AA11-Z	X66	—		—			
	1.5	90 L	EFF 2	1LA7 096-4AA11-Z	X66	—		—			
	2.2	100 L	EFF 2	1LA7 106-4AA11-Z	X66	—		—			
	3		EFF 2	—		1LA7 107-4AA61-Z	X66	—			
	4	112 M	EFF 2	—		1LA7 113-4AA61-Z	X66	—			
	5.5	132 S	EFF 2	—		—		1LA7 130-4AA66-Z	X66		
	7.5	132 M	EFF 2	—		—		1LA7 133-4AA66-Z	X66		
	11	160 M	EFF 2	—		—		1LA7 163-4AA66-Z	X66		
	15		EFF 2	—		—		1LA7 166-4AA66-Z	X66		
	18.5	180 M	EFF 2	—		—		1LG4 183-4AA66-Z	X66		
	22	180 L	EFF 2	—		—		1LG4 186-4AA66-Z	X66		
	30	200 L	EFF 2	—		—		1LG4 207-4AA66-Z	X66		

– Pump version (order code **X66**) not supplied from stock.

CCC (China Compulsory Certification) for export to China:

The motors supplied from stock marked with "CCC" include the order code **D01**; i.e. the "CCC" logo complete with "Factory code" is indicated on the rating plate and on the packaging.

Other special versions

For other special versions, see "Standard motors up to frame size 315 L" and "Non-standard motors frame size 315 and above".

Accessories and spare parts

Overview

See "Standard motors frame size 315 L and above" and "Non-standard motors frame size 315 and above".

Dimensions

Overview

See dimensions under "Standard motors frame size 315 L and above" and "Non-standard motors frame size 315 and above".

Fan motors



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IEC Squirrel-Cage Motors

Fan motors

Orientation

Overview



The fan motors are suitable for driving fans. The fan wheel can be located directly on the motor shaft or the fan shaft can be coupled with the motor shaft over a coupling or over a belt drive.

For fans with a belt drive, it is important to note the cantilever forces that are applied to the motor.

The different application areas for the fans demand special technical characteristics of the motors, such as:

- The use of reinforced bearings and a located bearing at the drive-end (DE) of the motor, especially with belt drive
- In confined spaces, it is recommended that the motor is ordered with the connection box located at the non-drive end (NDE) or with protruding cable ends instead of a connection box
- For flange types of construction with the shaft end pointing upwards (e.g. IM V6) and when condensation is a possibility, a flange drainage hole is recommended
- For converter-fed operation, winding monitoring through embedded KTY 84-130 temperature sensors is recommended as well as insulated bearings in the case of large output ranges.

The resonance of mountings and reactions from driven machines can cause high levels of vibration in the overall equipment unit. This has a significant effect on the expected service life of the bearing.

For evaluation of these vibrations, vibration levels N, R and S are used in accordance with DIN EN 60034-14 (corresponding to evaluation zones A and B according to ISO 10816).

Note:

For information about motors according to EN 12101-3 for driving smoke extraction fans, see "Smoke extraction motors".

Benefits

The fan motors offer the user numerous advantages:

- Reduced construction volume and therefore lower weight thanks to motors with increased output
- Uniform forced-air cooled motor series 1PP from 0.09 to 200 kW
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty; efficiency requirements that exceed this are possible on request
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 500 V (voltage rise times $t_s > 0.1$ ms)
- Extensive experience is available in customised applications especially with regard to special bearing design.

Application

The fan motors are mainly used to drive fans:

- Axial-flow fans
- Radial-flow fans
- Side channel compressor

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors in pole-changing version

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1LA7 and 1LA5						
1500/3000, 4/2-pole	80 M ... 200 L	0.15 ... 17	1385 ... 2930	1 ... 55	0.39 ... 31	7/4 ... 7/5
1000/1500, 6/4-pole	80 M ... 200 L	0.1 ... 26	680 ... 1470	1.4 ... 182	0.57 ... 52	7/6 ... 7/7
750/1500, 8/4-pole	80 M ... 200 L	0.12 ... 28	930 ... 1470	1.2 ... 170	0.51 ... 49	7/8 ... 7/9
750/1000/1500, 8/6/4-pole	90 S ... 200 L	0.15 ... 22	700 ... 980	2 ... 143	0.72 ... 42	7/10 ... 7/11
Cast-iron series 1LG4						
1000/1500, 6/4-pole	180 M ... 280 M	5.5 ... 82	960 ... 1480	55 ... 529	12 ... 148	7/12 ... 7/13
750/1500, 8/4-pole	180 M ... 280 M	4.5 ... 83	725 ... 1485	59 ... 534	12.6 ... 146	7/14 ... 7/15

Forced-air cooled motors without external fan, without fan cover with high efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminium series 1PP7 and 1PP5						
3000, 2-pole	63 M ... 200 L	0.18 ... 37	2820 ... 2945	0.61 ... 120	0.5 ... 65	7/16
1500, 4-pole	63 M ... 200 L	0.12 ... 30	1350 ... 1465	0.85 ... 196	0.42 ... 55	7/17
1000, 6-pole	63 M ... 200 L	0.09 ... 22	850 ... 975	1.0 ... 215	0.44 ... 5	7/18
750, 8-pole	71 M ... 200 L	0.09 ... 15	630 ... 725	1.4 ... 198	0.36 ... 31.5	7/19
Cast-iron series 1PP4						
3000, 2-pole	180 M ... 315 L	22 ... 200	2945 ... 2982	71 ... 641	40.5 ... 325	7/20
1500, 4-pole	180 M ... 315 L	18.5 ... 200	1465 ... 1486	121 ... 1285	35 ... 340	7/21
1000, 6-pole	180 M ... 315 L	15 ... 160	965 ... 988	148 ... 1276	29.5 ... 235	7/22
750, 8-pole	180 M ... 315 L	11 ... 132	725 ... 738	145 ... 1423	25 ... 205	7/23

Forced-air cooled motors without external fan, without fan cover with increased output

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Cast-iron series 1PP4						
3000, 2-pole	180 M ... 280 M	30 ... 110	2950 ... 2975	97 ... 353	54 ... 184	7/24
1500, 4-pole	180 M ... 280 M	30 ... 110	1465 ... 1488	196 ... 706	59 ... 198	7/24
1000, 6-pole	180 M ... 315 L	18.5 ... 160	970 ... 988	182 ... 1547	37.5 ... 285	7/25
750, 8-pole	180 M ... 315 L	15 ... 132	720 ... 738	199 ... 1708	34 ... 245	7/25

More information

For more information, please contact your local Siemens contact
– see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Efficiency at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1500 rpm	3000 rpm		1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm	1500 rpm	3000 rpm			
P_{rated} kW	kW		n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$		I_{rated} A	A			m kg
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class F, IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
0.15	0.7	80 M	1400	2745	1	2.4	67	63	0.83	0.91	0.39	1.76	1LA7 080-0BA□□		10
0.25	0.95	80 M	1385	2780	1.7	3.3	67	64	0.88	0.89	0.61	2.4	1LA7 083-0BA□□		11
0.33	1.4	90 S	1420	2835	2.2	4.8	75	70	0.84	0.83	0.76	3.5	1LA7 090-0BA□□		13
0.5	2	90 L	1420	2835	3.4	6.8	77	70	0.87	0.86	1.08	4.8	1LA7 096-0BA□□		16
0.65	2.5	100 L	1430	2865	4.4	8.4	73	75	0.89	0.89	1.44	5.4	1LA7 106-0BA□□		21
0.8	3.1	100 L	1425	2860	5.4	10	79	77	0.86	0.83	1.7	7	1LA7 107-0BA□□		24
1.1	4.4	112 M	1445	2885	7.3	15	77	74	0.83	0.8	2.5	10.7	1LA7 113-0BA□□		31
1.45	5.9	132 S	1455	2920	9.5	19	83	80	0.84	0.83	3	12.8	1LA7 130-0BA□□		41
2	8	132 M	1455	2930	13	26	85	86	0.85	0.84	4	16	1LA7 133-0BA□□		50
2.9	11.5	160 M	1455	2930	19	37	85.5	85	0.86	0.89	5.7	22	1LA7 163-0BA□□		74
4.3	17	160 L	1455	2930	28	55	86	86	0.86	0.92	8.4	31	1LA7 166-0BA□□		92

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz, direct online starting				Without flange				With flange			
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover	With special flange
	1	6	5	0	0	1	4	6	2	7	3	
1LA7 08 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement **"Z"** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1500 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple 3000 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1500 rpm I_{LR}/I_{rated}	Locked-rotor current 3000 rpm I_{LR}/I_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Breakdown torque 3000 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class F, IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LA7 080-0BA□□	1.8	1.6	3.8	4	2	2	10	0.0014	4200
1LA7 083-0BA□□	1.8	1.9	3.8	4.2	2	2	10	0.0017	4200
1LA7 090-0BA□□	1.9	1.8	4.5	4.3	2.1	2	10	0.0024	4200
1LA7 096-0BA□□	2.2	2.2	5.1	5	2.5	2.5	10	0.0033	4200
1LA7 106-0BA□□	1.7	2.2	5	5.5	2.3	2.3	10	0.0048	4200
1LA7 107-0BA□□	1.8	2.3	5.7	6.1	2.6	2.6	10	0.0055	4200
1LA7 113-0BA□□	2.1	2.2	6.2	6.2	2.4	2.4	10	0.011	4200
1LA7 130-0BA□□	2	2.1	6.8	6.5	2.8	2.8	10	0.018	4200
1LA7 133-0BA□□	1.9	2.1	7.6	7.5	2.6	2.6	10	0.023	4200
1LA7 163-0BA□□	1.8	1.8	6.9	7.4	2.5	2.4	10	0.043	4200
1LA7 166-0BA□□	1.9	2.2	7.1	8.5	2.5	2.6	10	0.06	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Efficiency at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
1000 rpm	1500 rpm	FS	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm			
P_{rated} kW	kW		n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$	I_{rated} A	A				
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection															
Double pole-changing for driving fans with two windings															
0.12	0.4	80 M	940	1430	1.2	2.7	45	55	0.75	0.76	0.51	1.38	1LA7 080-1BD□□	9	
0.18	0.55	80 M	930	1420	1.9	3.7	49	66	0.72	0.74	0.73	1.62	1LA7 083-1BD□□	10	
0.29	0.8	90 S	950	1430	2.9	5.3	55	68	0.71	0.81	1.07	2.1	1LA7 090-1BD□□	13	
0.38	1.1	90 L	950	1430	3.8	7.3	58	74	0.71	0.81	1.33	2.65	1LA7 096-1BD□□	16	
0.6	1.7	100 L	950	1410	6	11	67	75	0.74	0.86	1.75	3.8	1LA7 106-1BD□□	21	
0.75	2.1	100 L	950	1420	7.5	14	63	78	0.75	0.86	2.3	4.55	1LA7 107-1BD□□	24	
0.9	3	112 M	980	1450	8.8	20	71	81	0.61	0.8	3	6.7	1LA7 113-1BD□□	31	
1.2	3.9	132 S	975	1460	12	26	72	81	0.69	0.83	3.5	8.4	1LA7 130-1BD□□	41	
1.7	5.4	132 M	975	1460	17	35	75	82.5	0.72	0.83	4.55	11.4	1LA7 133-1BD□□	49	
2.5	7.2	160 M	980	1470	24	47	78	86	0.72	0.84	6.4	14.4	1LA7 163-1BD□□	74	
3.7	12	160 L	980	1470	36	78	77	89.5	0.75	0.83	9.3	23.3	1LA7 166-1BD□□	92	
5.5	16	180 M	965	1470	54	104	84	90.5	0.8	0.81	11.8	31.5	1LA5 183-1BD□□	114	
6.5	19	180 L	965	1460	64	124	84	88.5	0.81	0.85	13.8	36.5	1LA5 186-1BD□□	128	
9.5	26	200 L	980	1470	93	170	87	92.3	0.79	0.83	20	49	1LA5 207-1BD□□	157	

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz, direct online starting				Without flange	With flange			With standard flange		With special flange
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3
1LA7 08 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement **"Z"** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1000 rpm T_{LR}/T_{rated}	Locked-rotor torque with multiple starting 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1000 rpm I_{LR}/I_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Breakdown torque 1000 rpm T_B/T_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection									
Double pole-changing for driving fans with two windings									
1LA7 080-1BD□□	1.7	1.7	2.8	4	1.8	2	10	0.0014	4200
1LA7 083-1BD□□	1.5	1.7	2.5	4	1.8	2	10	0.0017	4200
1LA7 090-1BD□□	1.5	1.5	3.4	4.3	2	2	10	0.0027	4200
1LA7 096-1BD□□	1.8	1.8	3.8	4.9	2.3	2.3	10	0.0033	4200
1LA7 106-1BD□□	1.8	1.8	4.2	5.2	2.2	2.2	10	0.0049	4200
1LA7 107-1BD□□	1.6	1.9	3.9	5.2	2	2.2	10	0.0057	4200
1LA7 113-1BD□□	2	2.1	4.5	6.1	2.5	2.5	10	0.012	4200
1LA7 130-1BD□□	1.9	1.7	5.1	6.1	2.5	2.2	10	0.018	4200
1LA7 133-1BD□□	2.1	1.9	5.1	6.6	2.6	2.5	10	0.023	4200
1LA7 163-1BD□□	1.9	2	5.6	7.3	1.9	2	10	0.043	4200
1LA7 166-1BD□□	1.9	2.4	5.7	8.1	2.3	3	10	0.06	4200
1LA5 183-1BD□□	1.8	1.9	4.3	5.9	1.9	2.6	10	0.081	4200
1LA5 186-1BD□□	1.8	1.9	4.3	5.6	2.1	2.6	10	0.094	4200
1LA5 207-1BD□□	1.9	1.5	5.3	5.5	2.1	2.1	10	0.16	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Efficiency at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor
750 rpm	1500 rpm	FS	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rp	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm			
P_{rated}			n_{rated}		T_{rated}		η_{rated}		$\cos\phi_{rated}$		I_{rated}				
kW	kW		rpm	rpm	Nm	Nm	%	%			A	A			
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection															
Double pole-changing for driving fans with a winding in a Dahlander circuit															
0.1	0.5	80 M	680	1375	1.4	3.5	42	69	0.61	0.82	0.57	1.28	1LA7 080-0BB□□		9
0.15	0.7	80 M	685	1380	2.1	4.8	46	70	0.61	0.82	0.77	1.76	1LA7 083-0BB□□		10
0.22	1	90 S	695	1370	3	7	41	70	0.62	0.86	1.25	2.4	1LA7 090-0BB□□		13
0.33	1.5	90 L	700	1375	4.5	10	43	75	0.61	0.88	1.8	3.3	1LA7 096-0BB□□		16
0.5	2	100 L	710	1415	6.7	13	51	79	0.57	0.85	2.5	4.3	1LA7 106-0BB□□		21
0.65	2.5	100 L	700	1400	8.9	17	55	77	0.61	0.88	2.8	5.3	1LA7 107-0BB□□		24
0.9	3.6	112 M	720	1440	12	24	55	78	0.5	0.83	4.7	11	1LA7 113-0BB□□		31
1.1	4.7	132 S	720	1455	15	31	76	79	0.6	0.78	3.5	10.3	1LA7 130-0BB□□		41
1.4	6.4	132 M	720	1455	19	42	77	83.5	0.6	0.83	4.4	13.3	1LA7 133-0BB□□		49
2.2	9.5	160 M	725	1465	29	62	79	84	0.62	0.83	6.5	19.7	1LA7 163-0BB□□		73
3.3	14	160 L	730	1470	43	91	85.5	88.5	0.6	0.8	9.3	28.6	1LA7 166-0BB□□		91
4.5	16	180 M	730	1470	59	104	81	86	0.59	0.83	13.1	32.3	1LA5 183-0BB□□		111
5	18.5	180 L	730	1470	65	120	80	88	0.6	0.83	15	36.5	1LA5 186-0BB□□		118
7.5	28	200 L	732	1470	98	182	85	90.4	0.62	0.86	20.5	52	1LA5 207-0BB□□		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange			IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35			
	1	6	5	0	0	1	4	6	2	7	3
1LA7 08 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 - □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 - □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement **"Z"** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque 750 rpm T_{LR}/T_{rated}	Locked-rotor torque torque 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 750 rpm I_{LR}/I_{rated}	Locked-rotor current current 1500 rpm I_{LR}/I_{rated}	Breakdown torque torque 750 rpm T_B/T_{rated}	Breakdown torque torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LA7 080-0BB□□	1.4	1.7	2.3	4.1	1.7	1.8	10	0.0014	4200
1LA7 083-0BB□□	1.4	1.8	2.4	4.2	1.7	1.8	10	0.0017	4200
1LA7 090-0BB□□	1.3	1.5	2.4	3.7	1.8	2	10	0.0024	4200
1LA7 096-0BB□□	1.5	1.8	2.6	4.2	1.8	2	10	0.0033	4200
1LA7 106-0BB□□	1.1	1.9	3.1	5.2	1.8	2.1	10	0.0047	4200
1LA7 107-0BB□□	1.1	1.9	3.1	5.4	1.8	2.1	10	0.0054	4200
1LA7 113-0BB□□	1.6	2.6	3.2	6.5	2.4	2.6	10	0.012	4200
1LA7 130-0BB□□	2	2.3	4.3	6.4	2.5	2.9	10	0.018	4200
1LA7 133-0BB□□	2.2	1.9	4.6	6.8	2.7	2.5	10	0.023	4200
1LA7 163-0BB□□	1.7	2	4.1	7	2	2.6	10	0.043	4200
1LA7 166-0BB□□	2	2.6	4.7	8.1	2.2	3.1	10	0.06	4200
1LA5 183-0BB□□	1.4	2.3	3.8	7	2.1	2.9	10	0.13	4200
1LA5 186-0BB□□	1.5	2.3	3.8	7	2.1	2.7	10	0.15	4200
1LA5 207-0BB□□	1.9	2.5	4.3	7.1	2.2	2.5	10	0.24	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Rated output at 50 Hz			Frame size	Rated speed n _{rated} at 50 Hz			Rated torque at 50 Hz			Efficiency at 50 Hz, 4/4-load			Power factor at 50 Hz, 4/4-load			Rated current I _{rated} at 50 Hz			Order No.	Price	Weight motor
750 rpm	1000 rpm	1500 rpm	FS	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm	750 rpm	1000 rpm	1500 rpm			m
P _{rated} kW				n _{rated} rpm			T _{rated} Nm			η _{rated} %			cos φ _{rated}			I _{rated} A					kg
8/6/4-pole, 750/1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection																					
Triple pole-changing for driving fans with two windings, of which 750/1500 rpm in a Dahlander circuit																					
0.15	0.22	0.7	90 S	705	960	1430	2	2.3	4.7	48	56	70	0.63	0.69	0.83	0.72	0.82	1.74	1LA7 090-1BJ□□		12
0.22	0.3	0.95	90 L	705	955	1435	3	3	6.4	50	51	74	0.6	0.75	0.81	1.06	1.13	2.3	1LA7 096-1BJ□□		15
0.37	0.55	1.5	100 L	700	955	1400	5	5.5	10	51	63	76	0.63	0.74	0.88	1.66	1.71	3.25	1LA7 106-1BJ□□		20
0.45	0.7	1.8	100 L	700	970	1400	6.1	7	12	54	63	75	0.65	0.75	0.89	1.85	2.15	3.9	1LA7 107-1BJ□□		22
0.6	0.85	2.4	112 M	715	970	1445	8	8.4	16	53	66	79	0.59	0.66	0.86	2.75	2.8	5.1	1LA7 113-1BJ□□		29
0.75	1.1	3.1	132 S	730	980	1460	9.8	11	20	65	69	77	0.62	0.68	0.81	2.7	3.4	7.2	1LA7 130-1BJ□□		39
1	1.5	4.4	132 M	730	980	1460	13	15	29	68	71	79	0.6	0.68	0.83	3.55	4.5	9.7	1LA7 133-1BJ□□		46
1.6	2.2	6.6	160 M	730	980	1470	21	21	43	78	74	83	0.58	0.66	0.81	5.1	6.5	14.2	1LA7 163-1BJ□□		67
2.4	3.5	10	160 L	730	980	1470	31	34	65	79	78	85	0.58	0.69	0.82	7.6	9.4	20.7	1LA7 166-1BJ□□		85
3	4.5	13	180 M	730	980	1470	40	44	85	84.5	84	87.5	0.61	0.76	0.84	8.4	10.2	25.5	1LA5 183-1BJ□□		114
3.7	5.5	16	180 L	725	975	1465	49	54	104	83.5	86.5	87.5	0.62	0.76	0.85	10.3	12.1	31	1LA5 186-1BJ□□		128
5	8	22	200 L	730	975	1465	65	78	143	84	86	89	0.64	0.81	0.85	13.4	16.6	42	1LA5 207-1BJ□□		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange			IM B14, IM V19, IM V18 without protective cover	IM B34	
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V1 without protective cover, IM V3 ¹⁾	IM V1 with protective cover ^{1) 2)}	IM B35			
	1	6	5	0	0	1	4	6	2	7	3
1LA7 09 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 - □□	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 - □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–
1LA5 20 - □□	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For type of construction IM V1 with/without protective cover, motors 1LA5 183-... to 1LA5 223-... (motor series 1LA5 frame sizes 180 M to 225 M) can be supplied with two additional eyebolts; specify order supplement **"Z"** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, in pole-changing version
aluminium series 1LA7/5

Selection and ordering data (continued)

Order No.	Locked- rotor torque with direct torque 750 rpm T_{LR}/T_{rated}	Locked- rotor torque starting as torque 1000 rpm T_{LR}/T_{rated}	Locked- rotor torque multiple of torque 1500 rpm T_{LR}/T_{rated}	Locked- rotor current rated current 750 rpm I_{LR}/I_{rated}	Locked- rotor current current 1000 rpm I_{LR}/I_{rated}	Locked- rotor current current 1500 rpm I_{LR}/I_{rated}	Break- down torque torque 750 rpm T_B/T_{rated}	Break- down torque torque 1000 rpm T_B/T_{rated}	Break- down torque torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechani- cal limit speed at maximum supply fre- quency n_{max} rpm
8/6/4-pole, 750/1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection Triple pole-changing for driving fans with two windings, of which 750/1500 rpm in a Dahlander circuit												
1LA7 090-1BJ□□	1.3	1.3	1.3	2.5	2.9	4.3	1.9	1.9	1.9	10	0.0028	4200
1LA7 096-1BJ□□	1.4	1.2	1.4	2.5	3.1	4.6	2.1	1.9	2.2	10	0.0035	4200
1LA7 106-1BJ□□	0.9	1.2	1.5	2.8	3.8	4.7	1.9	1.9	2.1	7	0.0048	4200
1LA7 107-1BJ□□	0.9	1.2	1.7	2.8	3.8	4.7	1.9	2	2.1	7	0.0058	4200
1LA7 113-1BJ□□	1.1	1.3	1.9	3.1	4.4	6	2.1	2.3	2.5	7	0.011	4200
1LA7 130-1BJ□□	1.7	1.7	1.5	3.7	4.5	5.5	2.3	2.3	2.5	10	0.018	4200
1LA7 133-1BJ□□	1.8	1.9	1.6	3.9	4.9	5.8	2.4	2.4	2.5	10	0.024	4200
1LA7 163-1BJ□□	1.4	1.7	1.7	3.9	5.1	7	2.1	2.4	2.7	7	0.04	4200
1LA7 166-1BJ□□	1.6	1.8	2	4.1	5.3	7.7	2.2	2.3	3	7	0.054	4200
1LA5 183-1BJ□□	1.2	1.8	1.3	3.9	5	5.4	1.6	2.2	2.3	7	0.081	4200
1LA5 186-1BJ□□	1.1	1.9	1.3	3.9	5	5.4	1.6	2.2	2.3	7	0.094	4200
1LA5 207-1BJ□□	1.2	1.9	1.3	3.6	5	5.4	1.8	2.2	2.6	7	0.16	4200

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
cast-iron series 1LG4

Selection and ordering data

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Efficiency at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor		
1000 rpm	1500 rpm		1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm	1000 rpm	1500 rpm					
P_{rated} kW	kW	FS	n_{rated} rpm	rpm	T_{rated} Nm	Nm	η_{rated} %	%	$\cos\phi_{rated}$		I_{rated} A	A					m kg
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection																	
Double pole-changing for driving fans with two windings																	
5.5	16	180 M	960	1460	55	105	81.3	88.8	0.82	0.83	12	31.5	1LG4 183-1BD□□		155		
6.5	19	180 L	960	1460	65	124	81.4	89.3	0.82	0.84	14	36.5	1LG4 186-1BD□□		175		
9.5	26	200 L	975	1460	93	170	84	90.3	0.82	0.85	20	49	1LG4 207-1BD□□		235		
12	34	225 S	980	1465	117	222	86.2	90.8	0.82	0.86	24.5	63	1LG4 220-1BD□□		285		
14.5	40	225 M	980	1470	141	260	88	92.2	0.83	0.87	28.5	72	1LG4 223-1BD□□		340		
18	52	250 M	980	1475	175	337	88.7	93.3	0.86	0.88	34	91	1LG4 253-1BD□□		380		
25	70	280 S	982	1478	243	452	89.3	92.4	0.86	0.88	47	124	1LG4 280-1BD□□		540		
30	82	280 M	984	1480	291	529	90.3	93	0.86	0.86	56	148	1LG4 283-1BD□□		580		

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code				With standard flange		With special flange
	50 Hz, direct online starting				Without flange	With flange					
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ²⁾³⁾	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3
1LG4 18 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	□	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1000 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current 1000 rpm I_{LR}/I_{rated}	Locked-rotor current 1500 rpm I_{LR}/I_{rated}	Breakdown torque 1000 rpm T_B/T_{rated}	Breakdown torque 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
6/4-pole, 1000/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection									
Double pole-changing for driving fans with two windings									
1LG4 183-1BD□□	1.6	1.7	4	5.3	1.8	2.5	10	0.08	4200
1LG4 186-1BD□□	1.6	1.7	4	5.2	1.8	2.4	10	0.08	4200
1LG4 207-1BD□□	1.9	1.7	5	5.1	2.2	2.4	10	0.15	4200
1LG4 220-1BD□□	2.3	1.7	5.7	5.6	2.1	2.3	10	0.29	4500
1LG4 223-1BD□□	2.2	1.9	5.6	5.8	2.1	2.3	10	0.37	4500
1LG4 253-1BD□□	2	2	4.9	5.9	2	2.7	10	0.44	3700
1LG4 280-1BD□□	2.1	2.2	5	6.2	1.9	2.6	10	1.19	3000
1LG4 283-1BD□□	2.5	2.4	5.5	6.6	2.2	2.8	10	1.39	3000

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
cast-iron series 1LG4

Selection and ordering data (continued)

Rated output at 50 Hz,		Frame size	Rated speed at 50 Hz,		Rated torque at 50 Hz,		Efficiency at 50 Hz 4/4-load		Efficiency at 50 Hz 4/4-load		Rated current at 400 V, 50 Hz		Order No.	Price	Weight motor		
750 rpm	1500 rpm		750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm	750 rpm	1500 rpm					
P_{rated}		FS	n_{rated}		T_{rated}		η_{rated}		$\cos\phi_{rated}$		I_{rated}						m
kW	kW		rpm	rpm	Nm	Nm	%	%			A	A					kg
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection																	
Double pole-changing for driving fans with a winding in a Dahlander circuit																	
4.5	16	180 M	725	1465	59	104	81.6	88.6	0.63	0.84	12.6	31	1LG4 183-0BB□□		155		
5	18.5	180 L	725	1470	66	120	82.5	91	0.62	0.85	14.2	35	1LG4 186-0BB□□		180		
7.5	28	200 L	730	1465	98	183	84.7	91	0.6	0.86	21.5	52	1LG4 207-0BB□□		220		
9.5	35	225 S	738	1478	123	226	86	92	0.61	0.86	26	64	1LG4 220-0BB□□		295		
11.5	42	225 M	738	1475	149	272	87.8	92.7	0.62	0.87	30.5	75	1LG4 223-0BB□□		330		
14.5	52	250 M	740	1482	187	335	88.3	93.2	0.62	0.86	38	94	1LG4 253-0BB□□		430		
19	70	280 S	742	1482	245	451	90.7	94	0.62	0.86	49	124	1LG4 280-0BB□□		530		
23	83	280 M	742	1485	296	534	91	94.2	0.63	0.87	58	146	1LG4 283-0BB□□		665		

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz, direct online starting				Without flange	With flange			With standard flange		With special flange
	230 V	400 V	500 V	690 V	IM B3, IM B6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 with protective cover ^{2) 3)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	5	0	0	1	4	6	2	7	3
1LG4 18 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 20 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 22 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 25 □□	○	○	○	○	□	✓	✓	✓	–	–	–
1LG4 28 □□	○	○	○	○	□	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1LG4 183-... to 1LG4 318-... (motor series 1LG4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1LG4 220-... to 1LG4 318-... motors (motor series 1LG4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Fan motors

Self-ventilated, pole-changing version
cast-iron series 1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting at 750 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple at 1500 rpm T_{LR}/T_{rated}	Locked-rotor current of rated current at 750 rpm I_{LR}/I_{rated}	Locked-rotor current at 1500 rpm I_{LR}/I_{rated}	Breakdown torque at 750 rpm T_B/T_{rated}	Breakdown torque at 1500 rpm T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Mechanical limit speed at maximum supply frequency n_{max} rpm
8/4-pole, 750/1500 rpm at 50 Hz, temperature class F, IP55 degree of protection									
Double pole-changing for driving fans with a winding in a Dahlander circuit									
1LG4 183-0BB□□	1.4	2.2	3.6	6.8	2	3.1	10	0.11	4200
1LG4 186-0BB□□	1.6	2.4	3.7	7.2	2.1	3.3	10	0.14	4200
1LG4 207-0BB□□	2.1	2.7	4.3	7.3	2.5	2.9	10	0.19	4200
1LG4 220-0BB□□	2	1.7	4.4	6.9	2.3	2.9	10	0.44	4500
1LG4 223-0BB□□	1.9	2.4	4.5	6.9	2.2	3	10	0.48	4500
1LG4 253-0BB□□	2	2.5	4	6.8	1.8	2.6	10	0.85	3700
1LG4 280-0BB□□	1.8	2	4	6.3	1.8	2.5	10	1.19	3000
1LG4 283-0BB□□	1.9	2.2	4.2	7.2	1.8	2.7	10	1.71	3000

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Aluminium series 1PP7/5

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated}	FS	n_{rated}	T_{rated}	Efficiency Class "Improved Efficiency" according to CEMEP	η_{rated}	$\cos\phi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m
kW		rpm	Nm	EFF 2	%		A				CL	kg m ²			kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection															
0.18	63 M	2820	0.61		63.0	0.82	0.50	2.0	3.7	2.2	16	0.00018	1PP7 060-2AA□□		4
0.25	63 M	2830	0.84		65.0	0.82	0.68	2.0	4.0	2.2	16	0.00022	1PP7 063-2AA□□		4
0.37	71 M	2740	1.3		66.0	0.82	1.00	2.3	3.5	2.3	16	0.00029	1PP7 070-2AA□□		5
0.55	71 M	2800	1.9		71.0	0.82	1.36	2.5	4.3	2.6	16	0.00041	1PP7 073-2AA□□		6
0.75	80 M	2855	2.5		73.0	0.86	1.73	2.3	5.6	2.4	16	0.00079	1PP7 080-2AA□□		9
1.1	80 M	2845	3.7	EFF 2	77.0	0.87	2.40	2.6	6.1	2.7	16	0.0010	1PP7 083-2AA□□		11
1.5	90 S	2860	5.0	EFF 2	79.0	0.85	3.25	2.4	5.5	2.7	16	0.0014	1PP7 090-2AA□□		13
2.2	90 L	2880	7.3	EFF 2	82.0	0.85	4.55	2.8	6.3	3.1	16	0.0018	1PP7 096-2AA□□		16
3	100 L	2890	9.9	EFF 2	84.0	0.85	6.10	2.8	6.8	3.0	16	0.0035	1PP7 106-2AA□□		22
4	111 M	2905	13	EFF 2	86.0	0.86	7.80	2.6	7.2	2.9	16	0.0059	1PP7 113-2AA□□		29
5.5	132 S	2925	18	EFF 2	86.5	0.89	10.4	2.0	5.9	2.8	16	0.015	1PP7 130-2AA□□		39
7.5	132 S	2930	24	EFF 2	88.0	0.89	13.8	2.3	6.9	3.0	16	0.019	1PP7 131-2AA□□		48
11	160 M	2940	36	EFF 2	89.5	0.88	20.0	2.1	6.5	2.9	16	0.034	1PP7 163-2AA□□		68
15	160 M	2940	49	EFF 2	90.0	0.90	26.5	2.2	6.6	3.0	16	0.043	1PP7 164-2AA□□		77
18.5	160 L	2940	60	EFF 2	91.0	0.91	32.0	2.4	7.0	3.1	16	0.051	1PP7 166-2AA□□		86
22	180 M	2940	71	EFF 2	91.7	0.88	39.5 ¹⁾	2.5	6.9	3.2	16	0.077	1PP5 183-2AA□□		111
30	200 L	2945	97	EFF 2	92.3	0.89	53	2.4	7.2	2.8	16	0.14	1PP5 206-2AA□□		159
37	200 L	2945	120	EFF 2	92.8	0.89	65.0 ¹⁾	2.4	7.7	2.8	16	0.16	1PP5 207-2AA□□		179

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6/5 without protective cover	With flange IM B5, IM V3 ²⁾	IM V1 without protective cover ^{2) 3)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	With special flange IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	1	6	2	7	3
1PP7 06 □□	○	○	○	–	□	✓	✓	–	✓	–	✓
1PP7 07 □□	○	○	○	–	□	✓	✓	–	✓	–	✓
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	–	✓
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	–	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	–	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	–	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	–	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	–	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	–	–	–
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection boxes").
- ²⁾ 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

- ³⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Aluminium series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated}	FS	Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	multiple of rated current	torque		J			Type of construction IM B3 approx. m
kW		rpm	Nm	EFF2	%		A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	kg m ²			kg
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection															
0.12	63 M	1350	0.85		55.0	75	0.42	1.9	2.8	2.0	13	0.00029	1PP7 060-4AB□□		4
0.18	63 M	1350	1.3		60.0	77	0.56	1.9	3.0	1.9	13	0.00037	1PP7 063-4AB□□		4
0.25	71 M	1350	1.8		60.0	78	0.77	1.9	3.0	1.9	13	0.00052	1PP7 070-4AB□□		5
0.37	71 M	1370	2.6		65.0	78	1.06	1.9	3.3	2.1	13	0.00077	1PP7 073-4AB□□		6
0.55	80 M	1395	3.8		67.0	82	1.44	2.2	3.9	2.2	16	0.0014	1PP7 080-4AA□□		9
0.75	80 M	1395	5.1	EFF 2	72.0	81	1.91	2.3	4.2	2.3	16	0.0017	1PP7 083-4AA□□		10
1.1	90 S	1415	7.4	EFF 2	77.0	81	2.55	2.3	4.6	2.4	16	0.0024	1PP7 090-4AA□□		13
1.5	90 L	1420	10	EFF 2	79.0	81	3.40	2.4	5.3	2.6	16	0.0033	1PP7 096-4AA□□		16
2.2	100 L	1420	15	EFF 2	82.0	82	4.70	2.5	5.6	2.8	16	0.0047	1PP7 106-4AA□□		21
3	100 L	1420	20	EFF 2	83.0	82	6.40	2.7	5.6	3.0	16	0.0055	1PP7 107-4AA□□		24
4	112 M	1440	27	EFF 2	85.0	83	8.20	2.7	6.0	3.0	16	0.012	1PP7 113-4AA□□		31
5.5	132 S	1455	36	EFF 2	86.0	81	11.4	2.5	6.3	3.1	16	0.018	1PP7 130-4AA□□		41
7.5	132 M	1455	49	EFF 2	87.0	82	15.2	2.7	6.7	3.2	16	0.023	1PP7 133-4AA□□		49
11	160 M	1460	72	EFF 2	88.5	84	21.5	2.2	6.2	2.7	16	0.043	1PP7 163-4AA□□		73
15	160 L	1460	98	EFF 2	90.0	84	28.5	2.6	6.5	3.0	16	0.055	1PP7 166-4AA□□		85
18.5	180 M	1460	121	EFF 2	90.5	83	35.5 ¹⁾	2.3	7.5	3.0	16	0.13	1PP5 183-4AA□□		108
22	180 L	1460	144	EFF 2	91.2	84	41.5 ¹⁾	2.3	7.5	3.0	16	0.15	1PP5 186-4AA□□		118
30	200 L	1465	196	EFF 2	91.8	86	55	2.6	7.0	3.2	16	0.24	1PP5 207-4AA□□		157

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange				With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3, IM B6/7/8, IM V6/5 without protective cover	IM B5, IM V3 ²⁾	IM V1 without protective cover ^{2) 3)}	IM B35		IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	1	6		2	7	3
1PP7 06 □□	○	○	○	–	□	✓	✓	–		✓	–	✓
1PP7 07 □□	○	○	○	–	□	✓	✓	–		✓	–	✓
1PP7 08 □□	○	○	○	–	□	✓	✓	–		✓	–	✓
1PP7 09 □□	○	○	○	–	□	✓	✓	–		✓	–	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	–		✓	–	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	–		✓	–	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	–		✓	–	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	–		✓	–	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–		–	–	–
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–		–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- ¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection boxes").
- ²⁾ 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

- ³⁾ The "Second shaft extension" option, order code **K16** is not possible.
- ⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Aluminium series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting torque	as multiple of rated current						Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection														
0.09	63 M	850	1.0	45.0	0.66	0.44	1.8	2.0	1.9	13	0.00037	1PP7 063-6AA□□		4
0.18	71 M	850	2.0	53.0	0.73	0.67	2.1	2.3	1.9	16	0.00055	1PP7 070-6AA□□		5
0.25	71 M	860	2.8	60.0	0.76	0.79	2.2	2.7	2.0	16	0.00080	1PP7 073-6AA□□		6
0.37	80 M	920	3.8	62.0	0.72	1.20	1.9	3.1	2.1	16	0.0014	1PP7 080-6AA□□		9
0.55	80 M	910	5.8	67.0	0.74	1.60	2.1	3.4	2.2	16	0.0017	1PP7 083-6AA□□		10
0.75	90 S	915	7.8	69.0	0.76	2.05	2.2	3.7	2.2	16	0.0024	1PP7 090-6AA□□		13
1.1	90 L	915	11	72.0	0.77	2.85	2.3	3.8	2.3	16	0.0033	1PP7 096-6AA□□		16
1.5	100 L	925	15	74.0	0.75	3.90	2.3	4.0	2.3	16	0.0047	1PP7 106-6AA□□		21
2.2	112 M	940	22	78.0	0.78	5.20	2.2	4.6	2.5	16	0.0091	1PP7 113-6AA□□		26
3	132 S	950	30	79.0	0.76	7.20	1.9	4.2	2.2	16	0.015	1PP7 130-6AA□□		38
4	132 M	950	40	80.5	0.76	9.40	2.1	4.5	2.4	15	0.019	1PP7 133-6AA□□		44
5.5	132 M	950	55	83.0	0.76	12.6	2.3	5.0	2.6	16	0.025	1PP7 134-6AA□□		52
7.5	160 M	960	75	86.0	0.74	17.0	2.1	4.6	2.5	16	0.044	1PP7 163-6AA□□		74
11	160 L	960	109	87.5	0.74	24.5	2.3	4.8	2.6	16	0.063	1PP7 166-6AA□□		95
15	180 M	970	148	89.5	0.77	31.5	2.0	5.2	2.4	16	0.15	1PP5 186-6AA□□		124
18.5	200 L	975	181	90.2	0.77	38.5	2.7	5.5	2.8	16	0.24	1PP5 206-6AA□□		161
22	200 L	975	215	90.8	0.77	45.5	2.8	5.5	2.9	16	0.28	1PP5 207-6AA□□		183

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange		With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3, IM B6/7/8, IM V6/5 without protective cover		IM B5, IM V3 ²⁾	IM V1 without protective cover ^{2) 3)}	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0		1	1	6	2	7	3
1PP7 06 □□	○	○	○	–	□		✓	✓	–	✓	–	✓
1PP7 07 □□	○	○	○	–	□		✓	✓	–	✓	–	✓
1PP7 08 □□	○	○	○	–	□		✓	✓	–	✓	–	✓
1PP7 09 □□	○	○	○	–	□		✓	✓	–	✓	–	✓
1PP7 10 □□	○	○	○	○	□		✓	✓	–	✓	–	✓
1PP7 11 □□	○	○	○	○	□		✓	✓	–	✓	–	✓
1PP7 13 □□	○	○	○	○	□		✓	✓	–	✓	–	✓
1PP7 16 □□	○	○	○	○	□		✓	✓	–	✓	–	✓
1PP5 18 □□	○	○	○	○	□		✓ ⁴⁾	✓	–	–	–	–
1PP5 20 □□	○	○	○	○	□		✓ ⁴⁾	✓	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection boxes").
- 2) 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Aluminium series 1PP7/5

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	with direct starting as multiple of rated current						Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection														
0.09	71 M	630	1.4	53.0	0.68	0.36	1.9	2.2	1.7	13	0.0008	1PP7 070-8AB□□		6
0.12	71 M	645	1.8	53.0	0.64	0.51	2.2	2.2	2.0	13	0.0008	1PP7 073-8AB□□		6
0.18	80 M	675	2.5	51.0	0.68	0.75	1.7	2.3	1.9	13	0.0014	1PP7 080-8AB□□		9
0.25	80 M	685	3.5	55.0	0.64	1.02	2.0	2.6	2.2	13	0.0017	1PP7 083-8AB□□		10
0.37	90 S	675	5.2	63.0	0.75	1.14	1.6	2.9	1.8	13	0.0023	1PP7 090-8AB□□		11
0.55	90 L	675	7.8	66.0	0.76	1.58	1.7	3.0	1.9	13	0.0031	1PP7 096-8AB□□		13
0.75	100 L	680	11	66.0	0.76	2.15	1.6	3.0	1.9	13	0.0051	1PP7 106-8AB□□		19
1.1	100 L	680	15	72.0	0.76	2.90	1.8	3.3	2.1	13	0.0063	1PP7 107-8AB□□		22
1.5	112 M	705	20	74.0	0.76	3.85	1.8	3.7	2.1	13	0.013	1PP7 113-8AB□□		24
2.2	132 S	700	30	75.0	0.74	5.70	1.9	3.9	2.3	13	0.014	1PP7 130-8AB□□		38
3	132 M	700	41	77.0	0.74	7.60	2.1	4.1	2.4	13	0.019	1PP7 133-8AB□□		44
4	160 M	715	53	80.0	0.72	10.0	2.2	4.5	2.6	13	0.036	1PP7 163-8AB□□		64
5.5	160 L	710	74	83.5	0.73	13.0	2.3	4.7	2.7	13	0.046	1PP7 164-4AB□□		74
7.5	160 L	715	100	85.5	0.72	17.6	2.7	5.3	3.0	13	0.064	1PP7 166-8AB□□		94
11	180 M	725	145	87.0	0.75	24.5	2.0	5.0	2.2	13	0.21	1PP5 186-8AB□□		126
15	200 L	725	198	87.5	0.78	31.5	2.1	5.0	2.2	13	0.37	1PP5 207-8AB□□		176

Order No. supplements

Motor type	Penultimate position: Voltage code					Final position: Type of construction code						
	50 Hz					Without flange	With flange		With standard flange	With special flange		
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ		IM B3/6/7/8, IM V6/5 without protective cover	IM B5, IM V3 ²⁾	IM V1 without protective cover ^{2) 3)}	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	1	6	2	7	3	
1PP7 07 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	–	✓	
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	–	✓	
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	–	–	–	
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ For connection to 230 V, parallel feeders are necessary (see the "Technical information" section, "Connection, circuit and connection boxes").
²⁾ 1PP5 183... to 1PP5 223... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement "Z" and order code **K32**.

³⁾ The "Second shaft extension" option, order code **K16** is not possible.
⁴⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Cast-iron series 1PP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated}	FS	Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Im-proved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m
kW		rpm	Nm	EFF2	%		A				CL	kg m ²			kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection															
22	180 M	2945	71	EFF 2	92.1	0.86	40	2.5	6.4	3.4	16	0.068	1PP4 183-2FA□□		140
30	200 L	2950	97	EFF 2	92.4	0.88	53	2.3	6.5	3.0	16	0.129	1PP4 206-2FA□□		195
37	200 L	2955	120	EFF 2	93.4	0.89	64	2.5	7.2	3.3	16	0.153	1PP4 207-2FA□□		215
45	225 M	2960	145	EFF 2	93.9	0.88	79	2.4	6.7	3.1	16	0.217	1PP4 223-2FA□□		275
55	250 M	2970	177	EFF 2	94.1	0.88	96	2.1	6.7	3.1	13	0.403	1PP4 253-2FB□□		360
75	280 S	2975	241	EFF 2	94.9	0.88	130	2.5	7.5	3.1	13	0.715	1PP4 280-2FB□□		480
90	280 M	2975	289	EFF 2	95.4	0.89	152	2.6	7.2	3.1	13	0.832	1PP4 283-2FB□□		520
110	315 S	2982	352		95.2	0.88	190	2.4	7.2	3.1	13	1.19	1PP4 310-2FB□□		700
132	315 M	2982	423		95.6	0.90	220	2.4	6.9	3.0	13	1.39	1PP4 313-2FB□□		755
160	315 L	2982	512		96.0	0.91	265	2.4	7.0	3.0	13	1.62	1PP4 316-2FB□□		880
200	315 L	2982	641		96.3	0.92	325	2.3	6.7	2.9	13	2.09	1PP4 317-2FB□□		995

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM B35	IM B14, IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover	
	1	6	3	5	0	1	8	6	2	7	3	
1PP4 18 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 20 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 22 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 25 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 28 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 310 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 313 -... □□	○	○	○	○	□	✓	–	✓	–	–	–	
1PP4 316 -... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	
1PP4 317 -... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 317-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated}	FS	Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class "Improved Efficiency" according to CEMEP	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m
kW		rpm	Nm	EFF2	%		A				CL	kg m ²			kg
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection															
18.5	180 M	1465	121	EFF 2	90.8	0.84	35	2.4	6.7	3.1	16	0.099	1PP4 183-4FA□□		135
22	180 L	1465	143	EFF 2	91.4	0.84	41.5	2.5	6.9	3.2	16	0.117	1PP4 186-4FA□□		150
30	200 L	1465	196	EFF 2	92.0	0.85	55	2.5	6.7	3.4	16	0.191	1PP4 207-4FA□□		195
37	225 S	1475	240	EFF 2	92.5	0.85	68	2.5	6.7	3.1	16	0.374	1PP4 220-4FA□□		255
45	225 M	1475	291	EFF 2	93.4	0.86	81	2.7	7.2	3.2	16	0.447	1PP4 223-4FA□□		290
55	250 M	1480	355	EFF 2	93.8	0.85	100	2.4	6.1	2.8	16	0.688	1PP4 253-4FA□□		375
75	280 S	1485	482	EFF 2	94.6	0.85	134	2.5	7.1	3.0	16	1.19	1PP4 280-4FA□□		515
90	280 M	1485	579	EFF 2	95.0	0.86	160	2.5	7.4	3.0	16	1.39	1PP4 283-4FA□□		560
110	315 S	1488	706		95.0	0.85	196	2.5	6.4	2.8	16	1.94	1PP4 310-4FA□□		710
132	315 M	1488	847		95.5	0.85	235	2.7	6.8	2.9	16	2.31	1PP4 313-4FA□□		790
160	315 L	1486	1028		95.9	0.86	280	2.7	6.8	2.8	16	2.88	1PP4 316-4FA□□		935
200	315 L	1486	1285		96.1	0.88	340	2.6	6.5	2.8	16	3.46	1PP4 317-4FA□□		1040

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 - ... □□	□	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 317-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting torque	multiple of rated current	as torque					Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection														
15	180 L	965	148	89.1	0.83	29.5	2.3	5.3	2.5	16	0.175	1PP4 186-6FA□□		145
18.5	200 L	975	181	90.2	0.81	36.5	2.5	5.6	2.5	16	0.238	1PP4 206-6FA□□		185
22	200 L	975	215	90.6	0.81	43.5	2.6	5.7	2.5	16	0.287	1PP4 207-6FA□□		195
30	225 M	978	293	92.0	0.83	57	2.7	5.6	2.5	16	0.492	1PP4 223-6FA□□		270
37	250 M	980	361	92.7	0.83	69	2.7	6.0	2.3	16	0.762	1PP4 253-6FA□□		355
45	280 S	985	436	92.7	0.85	82	2.4	6.1	2.4	16	1.12	1PP4 280-6FA□□		455
55	280 M	985	533	93.0	0.86	99	2.5	6.3	2.5	16	1.37	1PP4 283-6FA□□		490
75	315 S	988	725	93.8	0.84	138	2.5	6.5	2.8	16	2.10	1PP4 310-6FA□□		665
90	315 M	988	870	94.2	0.84	164	2.6	6.8	2.9	16	2.50	1PP4 313-6FA□□		730
110	315 L	988	1063	94.5	0.86	196	2.5	6.8	2.9	16	3.20	1PP4 316-6FA□□		870
132	315 L	988	1276	95.0	0.86	235	3.1	7.3	3.0	16	4.02	1PP4 317-6FA□□		960

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V1 without protective cover ²⁾	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 317-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with high efficiency - Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	with direct starting as multiple of rated current						Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²			
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection														
11	180 L	725	145	87.7	0.73	25	1.7	4.2	2.1	13	0.169	1PP4 186-8FB□□		145
15	200 L	725	198	87.9	0.76	32.5	2.2	4.9	2.6	13	0.290	1PP4 207-8FB□□		195
18.5	225 S	730	242	89.5	0.78	38.5	2.3	5.5	2.7	13	0.482	1PP4 220-8FB□□		260
22	225 M	730	288	89.8	0.79	45	2.3	5.6	2.8	13	0.551	1PP4 223-8FB□□		280
30	250 M	730	392	91.6	0.81	58	2.3	5.5	2.6	13	0.837	1PP4 253-8FB□□		370
37	280 S	735	481	92.2	0.81	72	2.2	5.0	2.1	13	1.11	1PP4 280-8FB□□		455
45	280 M	735	585	92.6	0.81	87	2.2	5.1	2.1	13	1.35	1PP4 283-8FB□□		495
55	315 S	740	710	93.2	0.81	106	2.2	5.8	2.6	13	2.08	1PP4 310-8FB□□		660
75	315 M	738	971	93.4	0.83	140	2.2	5.7	2.6	13	2.48	1PP4 313-8FB□□		725
90	315 L	738	1165	93.5	0.83	168	2.2	5.8	2.7	13	3.14	1PP4 316-8FB□□		845
110	315 L	738	1423	94.1	0.83	205	2.4	6.1	2.8	13	3.95	1PP4 317-8FB□□		1000

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange			With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM V1 without protective cover 2)	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 18 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 20 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 22 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 25 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 28 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 310 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 313 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 316 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–
1PP4 317 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 183-... to 1PP4 317-... (motor series 1PP4 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 317-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover with increased output - Cast-iron series 1PP4

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz	Power factor at 50 Hz	50 Hz 4/4-load	50 Hz 3/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	with direct starting as multiple of rated current					Type of construction IM B3 approx. m
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	$\cos \varphi_{rated}$	$\cos \varphi_{rated}$	$\cos \varphi_{rated}$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	J			
kW		rpm	Nm	%	%			A				kg m ²			kg
2-pole, 3000 rpm at 50 Hz, temperature class F, IP55 degree of protection															
30	180 L	2950	97	93.2	93.3	0.86	0.82	54	2.4	7.1	3.4	16	0.086	1PP4 188-2FA□□	170
45	200 L	2955	145	94.0	94.1	0.89	0.87	78	2.5	6.9	3.2	16	0.182	1PP4 208-2FA□□	245
55	225 M	2960	177	95.1	95.3	0.89	0.86	94	2.6	7.3	3.2	16	0.266	1PP4 228-2FA□□	325
75	250 M	2970	241	94.9	94.9	0.88	0.85	130	2.4	7.1	3.1	16	0.483	1PP4 258-2FA□□	405
110	280 M	2975	353	95.8	95.9	0.90	0.88	184	2.5	7.0	3.0	13	1.00	1PP4 288-2FB□□	610
4-pole, 1500 rpm at 50 Hz, temperature class F, IP55 degree of protection															
30	180 L	1465	196	92.0	92.2	0.80	0.76	59	2.6	6.3	2.9	16	0.144	1PP4 188-4FA□□	175
37	200 L	1465	241	92.8	93.1	0.83	0.78	70	2.6	6.5	3.0	16	0.234	1PP4 208-4FA□□	220
55	225 M	1475	356	93.6	94.1	0.86	0.83	99	2.5	6.5	2.7	16	0.486	1PP4 228-4FA□□	320
75	250 M	1482	483	94.5	94.6	0.85	0.81	136	2.5	7.0	3.0	16	0.856	1PP4 258-4FA□□	445
110	280 M	1488	706	95.5	95.2	0.84	0.78	198	2.8	7.9	3.3	16	1.71	1PP4 288-4FA□□	660

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code						
	50 Hz				Without flange	With flange		With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V1 without protective cover 2)	IM B35	IM B14, IM V19 IM V18 without protective cover	IM B34	IM B14 IM V19 IM V18 without protective cover	
	1	6	3	5	0	1	6	2	7	3	
1PP4 188 - ... □□	○	○	○	○	□	✓	✓	–	–	–	
1PP4 208 - ... □□	○	○	○	○	□	✓	✓	–	–	–	
1PP4 228 - ... □□	○	○	○	○	□	✓	✓	–	–	–	
1PP4 258 - ... □□	○	○	○	○	□	✓	✓	–	–	–	
1PP4 288 - ... □□	○	○	○	○	□	✓	✓	–	–	–	

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 188-... to 1PP4 318-... (motor series 1PP4 frame sizes 180 L to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 318-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Fan motors

Forced-air cooled, without external fan and fan cover
with increased output - Cast-iron series 1PP4

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Rated current at 50 Hz 400 V	Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Power factor at 50 Hz 3/4-load									
P_{rated}	FS	n_{rated}	T_{rated}	η_{rated}	η_{rated}	$\cos \varphi_{rated}$	$\cos \varphi_r$	I_{rated}	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}		J			Type of construction IM B3 approx. m
kW		rpm	Nm	%	%			A				CL	kg m ²			kg
6-pole, 1000 rpm at 50 Hz, temperature class F, IP55 degree of protection																
18.5	180 L	970	182	89.8	90.5	0.80	0.75	37.5	2.3	4.9	2.4	16	0.203	1PP4 188-6FA□□		170
30	200 L	975	294	91.1	91.5	0.80	0.75	60	2.6	5.8	2.6	16	0.362	1PP4 208-6FA□□		235
37	225 M	978	361	92.3	93.1	0.83	0.80	70	2.5	5.9	2.8	16	0.624	1PP4 228-6FA□□		315
45	250 M	982	438	93.6	94.1	0.83	0.80	84	2.7	6.3	2.3	16	0.934	1PP4 258-6FA□□		390
75	280 M	985	727	94.0	94.5	0.85	0.80	136	3.0	6.8	2.8	16	1.65	1PP4 288-6FA□□		550
160	315 L	988	1547	95.2	95.3	0.86	0.82	285	3.0	7.5	3.0	16	4.71	1PP4 318-6FA□□		1160
8-pole, 750 rpm at 50 Hz, temperature class F, IP55 degree of protection																
15	180 L	720	199	88.0	88.7	0.73	0.63	34	2.0	4.5	2.4	13	0.206	1PP4 188-8FB□□		160
18.5	200 L	725	244	88.4	89.3	0.78	0.72	39	2.4	5.2	2.6	13	0.367	1PP4 208-8FB□□		220
30	225 M	730	392	90.5	91.3	0.79	0.74	61	2.6	5.6	2.8	13	0.658	1PP4 228-8FB□□		330
37	25 M	730	484	92.1	93.0	0.82	0.77	71	2.4	5.6	2.6	13	1.06	1PP4 258-8FB□□		415
55	280 M	735	715	93.1	93.9	0.81	0.77	106	2.4	5.6	2.3	13	1.63	1PP4 288-8FB□□		545
132	315 L	738	1708	94.3	94.7	0.83	0.79	245	2.5	6.5	2.9	13	4.52	1PP4 318-8FB□□		1080

Order No. supplements

Motor type	Penultimate position: Voltage code 50 Hz				Final position: Type of construction code						
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	Without flange IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	With flange IM B5, IM V1 without protective cover ²⁾		IM B35	With standard flange IM B14, IM V19 IM V18 without protective cover		With special flange IM B14 IM V19 IM V18 without protective cover
	1	6	3	5	0	1	8	6	2	7	3
1PP4 188 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 208 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 228 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 258 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 288 - ... □□	○	○	○	○	□	✓	–	✓	–	–	–
1PP4 318 - ... □□	–	○	–	○	□ ³⁾	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP4 188-... to 1PP4 318-... (motor series 1PP4 frame sizes 180 L to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP4 220-... to 1PP4 318-... motors (motor series 1PP4 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V6 and IM V5 without protective cover is only possible using type of construction code **9** and order code **M1E** or **M1D**.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Overview

Recommended special versions:

- The connection box is at the non-drive-end NDE (BS) – Order code **M64**
- 6 protruding cable ends
 - 0.5 m long - Order code **L47**
 - 1.5 m long - Order code **L48**
 - 3.0 m long - Order code **L49**
- Bearings for increased cantilever forces – Order code **K20**

- Special bearing for drive-end of the motor, reinforced deep-groove bearing (bearing size 63) – Order code **K36**
- Located bearing at drive-end of motor – Order code **K94**
- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11**
- 3 temperature monitors (bi-metal strip) in motor winding for tripping – Order code **A31**

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes (without "-Z" supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 11th position of the Order No. and the appropriate order code.

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors in pole-changing version																		
				1LA7 (aluminium)						1LA5 (aluminium)								
Voltage at 60 Hz																		
220 V; 50 Hz output	9	L4A					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
220 V; 60 Hz output	9	L4B					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
380 V; 50 Hz output	9	L4C					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
380 V; 60 Hz output	9	L4D					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
440 V; 50 Hz output	9	L4G					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
440 V; 60 Hz output	9	L4E					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
460 V; 50 Hz output	9	L4J					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
460 V; 60 Hz output	9	L4H					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
575 V; 50 Hz output	9	L4N					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
575 V; 60 Hz output	9	L4M					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard voltage and/or frequencies																		
Standard winding (winding according to voltage codes 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ¹⁾	9	L8Y •					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for Y/Δ starting at low speed		L3Y •					–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1LG4 (cast-iron)																		
Voltage at 60 Hz																		
220 V; 50 Hz output at 60 Hz	9	L4A												✓	✓	✓	✓	✓
220 V; 60 Hz output at 60 Hz	9	L4B												✓	✓	✓	✓	✓
380 V; 50 Hz output	9	L4C												✓	✓	✓	✓	✓
380 V; 60 Hz output	9	L4D												✓	✓	✓	✓	✓
440 V; 50 Hz output	9	L4G												✓	✓	✓	✓	✓
440 V; 60 Hz output	9	L4E												✓	✓	✓	✓	✓
460 V; 50 Hz output	9	L4J												✓	✓	✓	✓	✓
460 V; 60 Hz output	9	L4H												✓	✓	✓	✓	✓
575 V; 50 Hz output	9	L4N												✓	✓	✓	✓	✓
575 V; 60 Hz output	9	L4M												✓	✓	✓	✓	✓

For legend and footnotes, see page 7/28.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size														315 S/M	315 L
			56	63	71	80	90	100	112	132	160	180	200	225	250	280		
			1LG4 (cast-iron)															
Non-standard voltage and/or frequencies																		
Standard winding (winding according to voltage codes 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ¹⁾	9	L8Y •											✓	✓	✓	✓	✓	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •											✓	✓	✓	✓	✓	
Forced-air cooled motors without external fan, without fan cover																		
			1PP7 (aluminium)										1PP5 (aluminium)					
Voltage at 50 Hz																		
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A	○	○	○	○	○	○	○	○	○	○	○	○				
400 VΔ (460 VΔ at 60Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U	○	○	○	○	○	○	○	○	○	○	○	○				
Voltage at 60 Hz																		
220 VΔ/380 VY; 50 Hz output	9	L2A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
220 VΔ/380 VY; 60 Hz output	9	L2B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 50 Hz output	9	L2C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
380 VΔ/660 VY; 60 Hz output	9	L2D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 50 Hz output	9	L2Q	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VY; 60 Hz output	9	L2W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 50 Hz output	9	L2R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
440 VΔ; 60 Hz output	9	L2X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 50 Hz output	9	L2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VY; 60 Hz output	9	L2E	○	○	○	○	○	○	○	○	○	○	○	○				
460 VΔ; 50 Hz output	9	L2T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
460 VΔ; 60 Hz output	9	L2F	○	○	○	○	○	○	○	○	○	○	○	○				
575 VY; 50 Hz output	9	L2U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VY; 60 Hz output	9	L2L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 50 Hz output	9	L2V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
575 VΔ; 60 Hz output	9	L2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Voltage changeover at 60 Hz																		
230 VY/460 VY 60 Hz; 50 Hz output, 9 main terminals and electrical design to NEMA	9	L3E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA	9	L3F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔ/460 VΔ 60 Hz; 50 Hz output, 12 main terminals and electrical design to NEMA	9	L3G	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔ/460 VΔ 60 Hz; 60 Hz output, 12 main terminals and electrical design to NEMA	9	L3H	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓				

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size																315 S/M	315 L
			56	63	71	80	90	100	112	132	160	180	200	225	250	280				
			1PP7 (aluminium)									1PP5 (aluminium)								
Non-standard voltage and/or frequencies																				
Standard winding (winding according to voltage codes 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ¹⁾	9	L8Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
			1PP4 (cast-iron)																	
Voltage at 50 Hz																				
220 VΔ/380 VY (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ²⁾	9	L1R											✓	✓	✓	✓	✓	✓	–	
380 VΔ/660 VY (360 ... 400 VΔ/625 ... 695 VY); 50 Hz output ²⁾	9	L1L											✓	✓	✓	✓	✓	✓	✓	
415 VY (395 ... 435 VY); 50 Hz output ²⁾	9	L1C											✓	✓	✓	✓	✓	✓	–	
415 VΔ (395 ... 435 VΔ); 50 Hz output ²⁾	9	L1D											✓	✓	✓	✓	✓	✓	✓	
400 VY (380 ... 420 VY); 50 Hz output ²⁾	9	L1A											○	○	○	○	○	○	–	
400 VΔ (460 VΔ at 60Hz) (380 ... 420 VΔ); 50 Hz output ²⁾	9	L1U											○	○	○	○	○	○	○	
Voltage at 60 Hz																				
220 VΔ/380 VY; 50 Hz output	9	L2A											✓	✓	✓	✓	✓	✓	–	
220 VΔ/380 VY; 60 Hz output	9	L2B											✓	✓	✓	✓	✓	✓	–	
380 VΔ/660 VY; 50 Hz output	9	L2C											✓	✓	✓	✓	✓	✓	✓	
380 VΔ/660 VY; 60 Hz output	9	L2D											✓	✓	✓	✓	✓	✓	✓	
440 VY; 50 Hz output	9	L2Q											✓	✓	✓	✓	✓	✓	–	
440 VY; 60 Hz output	9	L2W											✓	✓	✓	✓	✓	✓	–	
440 VΔ; 50 Hz output	9	L2R											✓	✓	✓	✓	✓	✓	✓	
440 VΔ; 60 Hz output	9	L2X											✓	✓	✓	✓	✓	✓	✓	
460 VY; 50 Hz output	9	L2S											✓	✓	✓	✓	✓	✓	–	
460 VY; 60 Hz output	9	L2E											○	○	○	○	○	○	–	
460 VΔ; 50 Hz output	9	L2T											✓	✓	✓	✓	✓	✓	✓	
460 VΔ; 60 Hz output	9	L2F											○	○	○	○	○	○	○	
575 VY; 50 Hz output	9	L2U											✓	✓	✓	✓	✓	✓	–	
575 VY; 60 Hz output	9	L2L											✓	✓	✓	✓	✓	✓	–	
575 VΔ; 50 Hz output	9	L2V											✓	✓	✓	✓	✓	✓	✓	
575 VΔ; 60 Hz output	9	L2M											○	○	○	○	○	○	○	
Non-standard voltage and/or frequencies																				
Standard winding (winding according to voltage codes 0, 1, 3, 5 or 6; rating plate will be stamped in accordance with order) ¹⁾	9	L8Y •											✓	✓	✓	✓	✓	✓	✓	
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ¹⁾	9	L1Y •											✓	✓	✓	✓	✓	✓	✓	

- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ Plain text must be specified in the order: Voltage, frequency, circuit, required rated output in kW.

²⁾ With order codes **L1A**, **L1C**, **L1D**, **L1L**, **L1R** and **L1U**, a rated voltage range is also specified on the rating plate.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Types of construction

Additional order codes for other types of construction or type of construction codes (without "-Z" supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit **9** for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Voltage code 12th position of Order No.	Additional identification code with order code and, if required, with plain text data	Motor type frame size																315 S/M	315 L
			56	63	71	80	90	100	112	132	160	180	200	225	250	280				
Self-ventilated motors in pole-changing version																				
							1LA7 (aluminium)				1LA5 (aluminium)									
Without flange																				
IM V5 with protective cover ¹⁾	9	M1F					✓	✓	✓	✓	✓	✓	✓	✓						
With flange (acc. to DIN EN 50347)																				
IM V3 ²⁾	9	M1G					–	–	–	–	–	–	✓	✓						
With standard flange																				
IM V18 with protective cover ¹⁾	9	M2A					✓	✓	✓	✓	✓	✓	–	–						
With special flange																				
IM V18 with protective cover ¹⁾	9	M2B					✓	✓	✓	✓	✓	✓	–	–						
IM B34	9	M2C					✓	✓	✓	✓	✓	✓	–	–						
																			1LG4 (cast-iron)	
Without flange																				
IM V5 with protective cover ^{1) 3)}	9	M1F											✓	✓	✓	✓	✓			
With flange (acc. to DIN EN 50347):																				
IM V3 ⁴⁾	9	M1G											✓	✓	✓	✓	✓			
Forced-air cooled motors without external fan, without fan cover																				
							1PP7 (aluminium)				1PP5 (aluminium)									
Without flange																				
IM V5 with protective cover ¹⁾	9	M1F					✓	✓	✓	✓	✓	✓	✓	✓	✓					
With flange (acc. to DIN EN 50347)																				
IM V3 ²⁾	9	M1G					–	–	–	–	–	–	–	✓	✓					
With standard flange																				
IM V18 with protective cover ¹⁾	9	M2A					✓	✓	✓	✓	✓	✓	✓	✓	–	–				
With special flange																				
IM V18 with protective cover ¹⁾	9	M2B					✓	✓	✓	✓	✓	✓	✓	✓	–	–				
IM B34	9	M2C					✓	✓	✓	✓	✓	✓	✓	✓	–	–				
																			1PP4 (cast-iron)	
Without flange																				
IM V5 without protective cover ³⁾	9	M1D											–	–	–	–	–	–	✓ ⁵⁾	○
IM V6 ³⁾	9	M1E											–	–	–	–	–	–	✓ ⁵⁾	○
IM V5 with protective cover ^{1) 3)}	9	M1F											✓	✓	✓	✓	✓	✓	✓ ⁵⁾	✓
With flange (acc. to DIN EN 50347)																				
IM V3 ⁴⁾	9	M1G											✓	✓	✓	✓	✓	✓	–	–

- With no extra charge
- ✓ With extra charge
- Not possible

¹⁾ The "Second shaft extension" option, order code K16 is not possible.
²⁾ For frame sizes 180 M to 225 M, the 1LA5/1PP5 motors can be supplied with two additional eyebolts; state Order No. suffix "Z" and order code **K32**.
³⁾ If motors of frame sizes 180 M to 315 L are mounted on the wall, it is recommended that the motor feet are supported.

⁴⁾ 1LG4 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.
⁵⁾ 60 Hz version is possible on request.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
					1LA7 (aluminium)						1LA5 (aluminium)						
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11				✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12				✓	✓	✓	✓	✓	✓	✓	✓					
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23				✓	✓	✓	✓	✓	✓	✓	✓					
3 temperature detectors for tripping ¹⁾	A31				✓	✓	✓	✓	✓	✓	✓	✓					
Installation of 3 PT 100 resistance thermometers ¹⁾	A60				–	–	✓	✓	✓	✓	✓	✓					
Motor connection and connection boxes																	
Connection box on RHS	K09				✓	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10				✓	✓	✓	✓	✓	✓	✓	✓					
Cable entry, standard configuration	K54				✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83				✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84				✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85				✓	✓	○	○	○	○	✓	✓					
next larger connection box	L00				–	–	–	–	–	–	✓	✓					
External earthing	L13				✓	✓	✓	✓	✓	✓	✓	✓					
3 cables protruding, 0.5 m long ²⁾	L44				✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
3 cables protruding, 1.5 m long ²⁾	L45				✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 0.5 m long ²⁾	L47				✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 1.5 m long ²⁾	L48				✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.				
6 cables protruding, 3 m long ²⁾	L49				–	–	–	–	–	–	–	O. R.	O. R.				
Connection box on NDE	M64				✓	✓	✓	✓	✓	✓	✓	✓	✓				
Terminal strip for main and auxiliary terminals	M69				✓	✓	–	–	–	–	–	–	–				
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11				✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, with increased output	C12				✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, with increased coolant temperature	C13				✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class H at rated output and max. KT 60 °C	C18				✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 7/34.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in pole-changing version																
			1LA7 (aluminium)						1LA5 (aluminium)							
Windings and insulation (continued)																
Increased air humidity/temperature with 30 to 60 g water per m³ of air	C19					✓	✓	✓	✓	✓	✓	✓	✓			
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22					✓	✓	✓	✓	✓	✓	✓	✓			
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23					✓	✓	✓	✓	✓	✓	✓	✓			
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24					✓	✓	✓	✓	✓	✓	✓	✓			
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25					✓	✓	✓	✓	✓	✓	✓	✓			
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26					✓	✓	✓	✓	✓	✓	✓	✓			
Temperature class F, used acc. to F, other requirements	Y52 • and specify output AT...°C or SA m above sea level					✓	✓	✓	✓	✓	✓	✓	✓			
Colours and paint finish																
Special finish in RAL 7030 stone gray						□	□	□	□	□	□	□	□			
Special finish in RAL 1002 sand yellow	M16					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 1013 pearl white	M17					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 3000 flame red	M18					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 6011 mignonetta green	K27					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 6021 pale green	M19					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 7001 silver gray	M20					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 7031 blue gray	K28					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 7032 pebble gray	L42					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 7035 light gray	M21					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 9001 cream	M22					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 9002 gray white	M23					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in RAL 9005 jet black	L43					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL					✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL					✓	✓	✓	✓	✓	✓	✓	✓			
Unpainted (only cast iron parts primed)	K23					○	○	○	○	○	○	○	○			
Unpainted, only primed	K24					✓	✓	✓	✓	✓	✓	✓	✓			

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
			1LA7 (aluminium)						1LA5 (alu- minium)								
Modular technology - Basic versions ³⁾																	
Mounting of separately-driven fan	G17					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake ⁴⁾	G26					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Modular technology - Combinations of basic versions ³⁾																	
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁴⁾	H62					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake and separately-driven fan	H63					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁴⁾	H64					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁴⁾	H98					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁴⁾	H99					–	–	✓	✓	✓	✓	✓	✓	✓			
Modular technology - Additional versions																	
Brake supply voltage 24 V DC	C00					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Brake supply voltage 400 V AC	C01					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mechanical manual release of the brake with operating lever	K82					✓	✓	✓	✓	✓	✓	✓	✓	✓			
Special technology ³⁾																	
Prepared for mounting MMI ⁵⁾	H15					✓	✓	✓	✓	✓	–	–	–	–			
Mounting of LL 861 900 220 rotary pulse encoder	H70					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of HOG 9 rotary pulse encoder to be provided	H74					–	–	✓	✓	✓	✓	✓	✓	✓			
Mounting of HOG 10 rotary pulse encoder to be provided	H75					–	–	✓	✓	✓	✓	✓	✓	✓			
Prepared for mounting LL 861 900 220	H78					–	–	✓	✓	✓	✓	✓	✓	✓			
Prepared for mounting HOG 9 D 1024 I	H79					–	–	✓	✓	✓	✓	✓	✓	✓			
Prepared for mounting HOG 10 D 1024 I	H80					–	–	✓	✓	✓	✓	✓	✓	✓			
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction	K17					✓	✓	✓	✓	✓	✓	✓	✓	✓			
With two additional eyebolts for IM V1/IM V3	K32					–	–	–	–	–	–	–	–	✓	✓		
IP65 degree of protection	K50					✓	✓	✓	✓	✓	✓	✓	✓	✓			
IP56 degree of protection (non-heavy-sea)	K52					✓	✓	✓	✓	✓	✓	✓	✓	✓			

For legend and footnotes, see page 7/34.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
			1LA7 (aluminium)						1LA5 (alu- minium)								
Mechanical design and degrees of protection (continued)																	
Vibration-proof version	L03				✓	✓	✓	✓	✓	✓	✓	✓					
Condensation drainage holes ⁶⁾	L12				✓	✓	✓	✓	✓	✓	✓	✓					
Non-rusting screws (externally)	M27				✓	✓	✓	✓	✓	✓	✓	✓					
Mechanical protection for encoder ⁷⁾	M68				✓	✓	✓	✓	✓	✓	✓	✓					
Coolant temperature and site altitude																	
Coolant temperature -40 to +40 °C	D03				O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	✓	✓					
Coolant temperature -30 to +40 °C	D04				✓	✓	✓	✓	✓	✓	✓	✓					
Designs in accordance with standards and specifications																	
CCC China Compulsory Certification ⁸⁾	D01				✓	✓	✓	✓	–	–	–	–					
Electrical according to NEMA MG1-12	D30				✓	✓	✓	✓	✓	✓	✓	✓					
Design according to UL with "Recognition Mark" ⁹⁾	D31				✓	✓	✓	✓	✓	✓	✓	✓					
Canadian regulations (CSA) ¹⁰⁾	D40				✓	✓	✓	✓	✓	✓	✓	✓					
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹¹⁾	G50				–	–	✓	✓	✓	✓	✓	✓					
Bearing design for increased cantilever forces	K20				–	–	✓	✓	✓	✓	✓	✓					
Regreasing device ¹¹⁾	K40				–	–	✓	✓	✓	✓	✓	✓					
Located bearing DE	K94				✓	✓	✓	✓	✓	✓	✓	✓					
Located bearing NDE	L04				✓	✓	✓	✓	✓	✓	□	□	□				
Balance and vibration severity																	
Full key balancing	L68				✓	✓	✓	✓	✓	✓	✓	✓					
Vibration severity level R ¹²⁾ (valid until 11/30/2006; then vibration severity level A as stan- dard version without order code)	K01				✓	✓	✓	✓	✓	✓	✓	✓					
Vibration severity level S ¹²⁾ (valid until 11/30/2006; then vibration severity level B)	K02				✓	✓	✓	✓	✓	✓	✓	✓					
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹³⁾	K04				✓	✓	✓	✓	✓	✓	✓	✓					
Second standard shaft extension	K16				✓	✓	✓	✓	✓	✓	✓	✓					
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39				✓	✓	✓	✓	✓	✓	✓	✓					
Standard shaft made of non-rusting steel	M65				✓	✓	✓	✓	✓	✓	✓	✓					
Non-standard cylindrical shaft extension ¹⁴⁾	Y55 • and identifica- tion code				✓	✓	✓	✓	✓	✓	✓	✓					
Heating and ventilation																	
Fan cover for textile industry	H17				✓	✓	✓	✓	✓	✓	✓	✓					
Metal external fan ¹⁵⁾	K35				✓	✓	✓	✓	✓	✓	✓	✓					
Anti-condensation heaters for 230 V	K45				✓	✓	✓	✓	✓	✓	✓	✓					
Anti-condensation heaters for 115 V	K46				✓	✓	✓	✓	✓	✓	✓	✓					

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
			1LA7 (aluminium)						1LA5 (aluminium)								
Rating plate and extra rating plates																	
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Extra rating plate with identification code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Packaging, safety notes, documentation and test certificates																	
Without safety and commissioning note. Customer's declaration of renouncement required.	B00		○	○	○	○	○	○	○	○	○						
With one safety and startup guide per box pallet	B01		○	○	○	○	○	○	○	○	○	–					
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	–					
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓						
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓						

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- O. R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For associated tripping unit, see Catalog LV 1. For pole-changing motors with separate windings, the number of temperature sensors must be doubled (order code **A11**, price of **A12** or order code **A12**, price available on request).
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 3) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 4) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 5) Converter mounting is possible for 230 VΔ/400 VY, please also specify Order No. of the MICROMASTER 411 according to Catalogue DA 51.3.
- 6) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 7) Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- 8) CCC certification is required for
 - 2-pole motors ≤ 2.2 kW
 - 4-pole motors ≤ 1.1 kW
 - 6-pole motors ≤ 0.75 kW
 - 8-pole motors ≤ 0.55 kW
- 9) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 10) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 11) Not possible when brake is mounted.
- 12) For pole-changing motors, please enquire.
- 13) Can be combined with deep-groove bearings of series 60... 62.. and 63. . . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**), brake or encoder mounting.
- 14) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA $\leq$ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA $\leq$ x length E (normal) of the shaft extensionFor an explanation of the order codes, see "Introduction".
- 15) For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted.

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
												1LG4 (cast-iron)					
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	
3 temperature detectors for tripping ¹⁾	A31											✓	✓	✓	✓	✓	
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓ ²⁾	✓	✓	✓	
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓ ²⁾	✓	✓	✓	
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓ ²⁾	✓	✓	✓	
Motor connection and connection boxes																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	
Connection box on RHS	K09											✓	✓	✓	✓	✓	
Connection box on LHS	K10											✓	✓	✓	✓	✓	
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	
Connection box in cast-iron version	K15											✓	✓	✓	□	□	
Cable entry, standard configuration	K54											✓	✓	✓	✓	✓	
Cable entry, maximum configuration	K55											✓	✓	✓	✓	✓	
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	
Next larger connection box	L00											✓	✓	✓	✓	✓	
6 cables protruding, 1.5 m long ³⁾	L48											O. R.	O. R.	O. R.	O. R.	O. R.	
6 cables protruding, 3 m long ³⁾	L49											O. R.	O. R.	O. R.	O. R.	O. R.	

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-ventilated motors in pole-changing version																		
													1LG4 (cast-iron)					
Motor connection and connection boxes (continued)																		
Protruding cable ends - right side ^{3) 4)}	L51											O. R.	O. R.	O. R.	O. R.	O. R.		
Protruding cable ends - left side ^{3) 4)}	L52											O. R.	O. R.	O. R.	O. R.	O. R.		
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓		
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓		
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓		
Windings and insulation																		
Temperature class F, used acc. to F, with service factor (SF)	C11											✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, with increased output ⁵⁾	C12											✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, with increased coolant tem- perature	C13											✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4% ⁵⁾	C22											✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8% ⁵⁾	C23											✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13% ⁵⁾	C24											✓	✓	✓	✓	✓		
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18% ⁵⁾	C25											✓	✓	✓	✓	✓		
Temperature class F, used acc. to F, other requirements	Y52 • and specify out- put AT..°C or SA m above sea level											✓	✓	✓	✓	✓		
Colours and paint finish																		
Standard finish in RAL 7030 stone gray												□	□	□	□	□		
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 Page 1/17	Y53 • and standard finish RAL											✓	✓	✓	✓	✓		
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓		
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓		
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓		
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓		
Special finish in RAL 6011 mignonetta green	K27											✓	✓	✓	✓	✓		
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓		
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓		
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓		
Special finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓		

For legend and footnotes, see page 7/39.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
												1LG4 (cast-iron)					
Colours and paint finish (continued)																	
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	
Special finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL											✓	✓	✓	✓	✓	
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL											✓	✓	✓	✓	✓	
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	
Unpainted, only primed	K24											✓	✓	✓	✓	✓	
Modular technology - Basic versions ⁶⁾																	
Mounting of separately driven fan ⁷⁾	G17											✓	✓	✓	✓	✓	
Mounting of brake ^{7) 8)}	G26											✓	✓	✓	✓	✓	
Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	H57											✓	✓	✓	✓	✓	
Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	H58											✓	✓	✓	✓	✓	
Modular technology - Combinations of basic versions ⁶⁾																	
Mounting of separately-driven fan and 1XP8 001-1 rotary pulse encoder	H61											✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁸⁾	H62											✓	✓	✓	✓	✓	
Mounting of brake and separately driven fan ^{7) 8)}	H63											✓	✓	✓	✓	✓	
Mounting of brake, separately-driven fan and 1XP8 001-1 rotary pulse encoder ⁸⁾	H64											✓	✓	✓	✓	✓	
Mounting of separately-driven fan and 1XP8 001-2 rotary pulse encoder	H97											✓	✓	✓	✓	✓	
Mounting of brake and 1XP8 001-2 rotary pulse encoder	H98											✓	✓	✓	✓	✓	
Mounting of brake, separately-driven fan and 1XP8 001-2 rotary pulse encoder ⁸⁾	H99											✓	✓	✓	✓	✓	
Modular technology - Additional versions																	
Brake supply voltage 24 V DC	C00											✓	✓	✓	✓	✓	
Brake supply voltage 400 V AC	C01											✓	✓	✓	✓	✓	
Mechanical manual release of the brake with operating lever	K82											✓	✓	✓	✓	✓	
Special technology ⁶⁾																	
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓	
Mounting of LL 861 900 220 rotary pulse encoder to be provided	H71											✓	✓	✓	✓	✓	
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											✓	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											✓	✓	✓	✓	✓	
Mounting of HOG 9 rotary pulse encoder to be provided	H74											✓	✓	✓	✓	✓	
Mounting of HOG 10 rotary pulse encoder to be provided	H75											✓	✓	✓	✓	✓	

For legend and footnotes, see page 7/39.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size																				
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315						
Self-ventilated motors in pole-changing version																						
		1LG4 (cast-iron)																				
Special technology (continued)																						
Prepared for mounting LL 861 900 220	H78																✓	✓	✓	✓	✓	
Prepared for mounting HOG 9 D 1024 I	H79																✓	✓	✓	✓	✓	
Prepared for mounting HOG 10 D 1024 I	H80																✓	✓	✓	✓	✓	
Mechanical design and degrees of protection																						
Drive-end seal for flange- mounting motors (not possible for IM V3 type of construction)	K17																✓	✓	✓	✓	✓	
IP65 degree of protection	K50																✓	✓	✓	✓	✓	
IP56 degree of protection (non-heavy-sea)	K52																✓	✓	✓	✓	✓	
Condensation water holes ¹⁸⁾	L12																□	□	□	□	□	
Non-rusting screws (externally)	M27																✓	✓	✓	✓	✓	
Earth brushes for converter-fed operation	M44																–	–	–	–	O. R.	
Mechanical protection for encoder ⁹⁾	M68																✓	✓	✓	✓	✓	
Coolant temperature and site altitude																						
Coolant temperature -50 to +40 °C	D02																✓	✓	✓	✓	✓	
Coolant temperature -40 to +40 °C	D03																✓	✓	✓	✓	✓	
Coolant temperature -30 to +40 °C	D04																✓	✓	✓	✓	✓	
Designs in accordance with standards and specifications																						
Electrical according to NEMA MG1-12	D30																✓	✓	✓	✓	✓	
Design according to UL with "Recognition Mark" ¹⁰⁾	D31																✓	✓	✓	✓	✓	
Canadian regulations (CSA) ¹¹⁾	D40																✓	✓	✓	✓	✓	
Bearings and lubrication																						
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50																✓	✓	✓	✓	✓	
Bearing design for increased cantilever forces ¹²⁾	K20																✓	✓	✓	✓	✓	
Special bearing for drive-end and non-drive-end, bearing size 63	K36																✓	✓	✓	✓	✓ ¹³⁾	
Regreasing device	K40																✓	✓	✓	✓	–	
Located bearing DE	K94																✓	✓	✓	✓	✓	
Insulated bearing cartridge	L27																–	–	✓	✓	✓	
Balance and vibration severity																						
Full key balancing	L68																✓	✓	✓	✓	✓	
Vibration severity level R ¹⁴⁾ (valid until 11/30/2006; then vibration severity level A as stan- dard version without order code)	K01																✓	✓	✓	✓	✓	
Vibration severity level S ¹⁴⁾ (valid until 11/30/2006; then vibration severity level B)	K02																✓	✓	✓	✓	✓	
Shaft and rotor																						
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁵⁾	K04																✓	✓	✓	✓	✓	
Second standard shaft extension	K16																✓	✓	✓	✓	✓	
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39																✓	✓	✓	✓	✓	
Non-standard cylindrical shaft extension ¹⁶⁾	Y55 • and identifica- tion code																✓	✓	✓	✓	✓	

For legend and footnotes, see page 7/39.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
												1LG4 (cast-iron)					
Heating and ventilation																	
Metal external fan ¹⁷⁾	K35											✓	✓	✓	✓	✓	
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	
Sheet metal fan cover	L36											✓	✓	✓	✓	✓	
Rating plate and extra rating plates																	
Second rating plate, loose	K31											✓	✓	✓	✓	✓	
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code											✓	✓	✓	✓	✓	
Extra rating plate with identification code	Y82 • and identification code											✓	✓	✓	✓	✓	
Additional information on rating plate and on package label	Y84 • and identification code											✓	✓	✓	✓	✓	
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- ¹⁾ For associated tripping unit, see Catalog LV 1. For pole-changing motors with separate windings, the number of temperature sensors must be doubled (order code **A11**, price of **A12** or order code **A12**, price available on request).
- ²⁾ PT 100 bearing monitoring only possible at drive end (DE).
- ³⁾ In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- ⁴⁾ Only possible in combination with order code **L44** to **L49** or length specification in plain text.
- ⁵⁾ Only the 50 Hz data are specified on the rating plate.
- ⁶⁾ A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various mounting technologies nor with each other within the same mounting technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- ⁷⁾ For 1LG4/1LG6 motors, order codes **G17**, **G26** and **H63** frame size 225 and above can also be combined with all rotary pulse encoders in the "Special technology" range.
- ⁸⁾ The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- ⁹⁾ Not necessary when a rotary pulse encoder is combined with a separately-driven fan, because in this case the rotary pulse encoder is installed under the fan cover.
- ¹⁰⁾ Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- ¹¹⁾ Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- ¹²⁾ Bearings for increased cantilever forces at vibration severity level R on request for 1LG4 motors. Not possible for 1LG4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- ¹³⁾ Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- ¹⁴⁾ For pole-changing motors, please enquire.
- ¹⁵⁾ Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- ¹⁶⁾ When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".
- ¹⁷⁾ For 1LA5/6/7/9 motors and 1LG with external metal fan, converter-fed operation is permitted.
- ¹⁸⁾ Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE (IP55, IP56, IP65). If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
			1PP7 (aluminium)									1PP5 (aluminium)					
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
3 temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	✓	✓	✓	✓	✓	✓	✓				
Motor connection and connection boxes																	
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	–	–	–					
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	–	–	–					
Connection box on RHS	K09		–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Connection box on LHS	K10		–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Cable entry, standard configuration	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from DE	K83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of the connection box through 90°, entry from NDE	K84		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rotation of connection box through 180°	K85		✓	✓	✓	✓	○	○	○	○	✓	✓					
Next larger connection box	L00		–	–	–	–	–	–	–	–	✓	✓					
External earthing	L13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3 cables protruding, 0.5 m long ⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	○. R.	○. R.					
3 cables protruding, 1.5 m long ⁴⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	○. R.	○. R.					
6 cables protruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	○. R.	○. R.					
6 cables protruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	○. R.	○. R.					
Connection box on NDE	M64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Terminal strip for main and auxiliary terminals	M69		✓	✓	✓	✓	–	–	–	–	–	–					
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to F, with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Temperature class F, used acc. to F, with increased coolant temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Temperature class H at rated output and max. KT 60 °C	C18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					

For legend and footnotes, see page 7/43.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors without external fan, without fan cover																
		1PP7 (aluminium)										1PP5 (alu- minium)				
Windings and insulation (continued)																
Increased air humidity/tem- perature with 30 to 60 g water per m³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/tem- perature with 60 to 100 g water per m³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class F, used acc. to F, other requirements	Y52 • and identifica- tion code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Colours and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□				
Special finish in RAL 1002 sand yellow	M16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 1013 pearl white	M17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 3000 flame red	M18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6011 mignonetta green	K27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 6021 pale green	M19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7001 silver gray	M20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7031 blue gray	K28		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7032 pebble gray	L42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 7035 light gray	M21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9001 cream	M22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9002 gray white	M23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in RAL 9005 jet black	L43		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colours: For RAL colours, see "Special finish in special RAL colours" on Page 1/18	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
		1PP7 (aluminium)										1PP5 (aluminium)					
Colours and paint finish (continued)																	
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○					
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors Not possible for IM V3 type of construction	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	✓	✓				
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Condensation drainage holes ⁵⁾	L12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-rusting screws (externally)	M27		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Coolant temperature and site altitude																	
Coolant temperature -40 to +40 °C	D03		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	✓	✓				
Coolant temperature -30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Designs in accordance with standards and specifications																	
Design according to UL with "Recognition Mark" ⁶⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Canadian regulations (CSA) ⁷⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50		–	–	–	–	✓	✓	✓	✓	✓	✓	✓				
Bearing design for increased cantilever forces	K20		–	–	–	–	✓	✓	✓	✓	✓	✓	✓				
Regreasing device	K40		–	–	–	–	✓	✓	✓	✓	✓	✓	✓				
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	–	–	–	–				
Balance and vibration severity																	
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ⁸⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Standard shaft made of non-rusting steel	M65		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard cylindrical shaft extension ⁹⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Heating and ventilation																	
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see page 7/43.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors without external fan, without fan cover																
		1PP7 (aluminium)										1PP5 (alu- minium)				
Rating plate and extra rating plates																
Second rating plate, loose	K31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Extra rating plate with identifi- cation code	Y82 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Additional information on rating plate and on package label	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Packaging, safety notes, documentation and test certificates																
Without safety and commission- ing note. Customer's declaration of renouncement required.	B00		–	○	○	○	○	○	○	○	○	–	–			
With one safety and startup guide per box pallet	B01		–	○	○	○	○	○	○	○	○	–	–			
Acceptance test certificate 3.1 according to EN 10204	B02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	–			
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Connected in delta for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G55**: **A12, C02, C18, D31, D40, G26, G50, H15, H17, H62, H63, H64, H90, H91, H92, H93, H94, H95, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) Not possible for pole-changing motors. Only one sensor (temperature sensor or PTC thermistor) can be connected. Only possibilities are voltage code **1** with voltage of 230 VΔ/400 VY and special voltage with voltage code **9** and order code **L1U** (400 VΔ). The following order codes cannot be used in combination with the ECOFAST plugs, order code **G56**: **A12, A23, A31, C00, C18, D31, D40, G50, H15, H17, H90, H91, H92, H93, H94, H95, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 5) Supplied with the condensation drainage holes sealed at the drive end DE and non-drive end NDE for IP55, IP56 and IP65 degrees of protection. If condensation drainage holes are required in motors of the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to relocate the bearing plates at the drive end (DE) and non-drive end (NDE) so that the condensation drainage holes situated between the feet on delivery are underneath.
- 6) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 7) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**) brake or encoder mounting.
- 9) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Fan motors

Special versions

Options or order codes (supplement **-Z** is required)

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
												1PP4 (cast-iron)					
Motor protection																	
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11											✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	A23											✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensors 2 x KTY 84-130 ¹⁾	A25											✓	✓	✓	✓	✓	✓
3 temperature detectors for tripping	A31											✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers ¹⁾	A60											✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding ¹⁾	A61											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings ¹⁾	A72											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A78											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings ¹⁾	A80											✓	✓	✓	✓	✓	✓
Motor connection and connection boxes																	
Two-part plate on connection box	K06											–	✓	✓	✓	✓	✓
Connection box on RHS	K09											✓	✓	✓	✓	✓	✓
Connection box on LHS	K10											✓	✓	✓	✓	✓	✓
Connection box on top, feet screwed on	K11											✓	✓	✓	✓	✓	✓
Cable entry, standard configuration	K54											✓	✓	✓	✓	✓	✓
Cable entry, maximum configuration	K55											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	K83											✓	✓	✓	✓	✓	✓
Rotation of the connection box through 90°, entry from NDE	K84											✓	✓	✓	✓	✓	✓
Rotation of connection box through 180°	K85											✓	✓	✓	✓	✓	✓
Next larger connection box	L00											✓	✓	✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	L48											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - right side ^{2) 3)}	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends - left side ^{2) 3)}	L52											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 7/47.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
												1PP4 (cast-iron)					
Motor connection and connection boxes (continued)																	
Stud terminal for cable connection, accessories pack (3 items)	M46											–	–	–	✓	✓	✓
Saddle terminal for connection without cable lug, accessories pack (6 items)	M47											–	–	–	✓	✓	✓
Windings and insulation																	
Temperature class F, used acc. to F, with service factor (SF)	C11											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, with increased output ⁴⁾	C12											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, with increased coolant temperature	C13											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 45 °C, derating approx. 4%	C22											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	C23											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 55 °C, derating approx. 13%	C24											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	C25											✓	✓	✓	✓	✓	✓
Temperature class F, used acc. to F, other requirements	Y52 • and identification code											✓	✓	✓	✓	✓	✓
Colours and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□
Standard finish in other standard RAL colours: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓
Special finish in RAL 1002 sand yellow	M16											✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17											✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18											✓	✓	✓	✓	✓	✓
Special finish in RAL 6011 mignonetta green	K27											✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19											✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver gray	M20											✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue gray	K28											✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble gray	L42											✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light gray	M21											✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22											✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 gray white	M23											✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43											✓	✓	✓	✓	✓	✓

IEC Squirrel-Cage Motors

Fan motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
												1PP4 (cast-iron)					
Colours and paint finish (continued)																	
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓
Special finish in special RAL colours: For RAL colours, see 'Special finish in special RAL colours' on Page 1/18	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors (Not possible for type of construction IM V3) ⁵⁾	K17											✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50											✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52											✓	✓	✓	✓	✓	✓
Non-rusting screws (externally)	M27											✓	✓	✓	✓	✓	✓
Coolant temperature and site altitude																	
Coolant temperature -50 to +40 °C	D02											✓	✓	✓	✓	✓	✓
Coolant temperature -40 to +40 °C	D03											✓	✓	✓	✓	✓	✓
Coolant temperature -30 to +40 °C	D04											✓	✓	✓	✓	✓	✓
Designs in accordance with standards and specifications																	
Design according to UL with 'Recognition Mark' ⁶⁾	D31											✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ⁷⁾	D40											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ⁸⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for drive-end and non-drive-end, bearing size 63	K36											✓	✓	✓	✓	✓ ⁹⁾	✓
Regreasing device	K40											✓	✓	✓	✓	–	–
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Insulated bearing cartridge	L27											–	–	✓	✓	✓	✓
Balance and vibration severity																	
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Vibration severity level R (valid until 11/30/2006; then vibration severity level A as standard version without order code)	K01											✓	✓	✓	✓	✓	✓
Vibration severity level S (valid until 11/30/2006; then vibration severity level B)	K02											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ¹⁰⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ¹¹⁾	K16											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹²⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 7/47.

Special versions	Additional identifica- tion code -Z with order code and plain text if required	Motor type frame size																			
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315					
Forced-air cooled motors without external fan, without fan cover																					
																	1PP4 (cast-iron)				
Heating and ventilation																					
Anti-condensation heaters for 230 V	K45															✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46															✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																					
Second rating plate, loose	K31															✓	✓	✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identifica- tion code															✓	✓	✓	✓	✓	✓
Extra rating plate with identifi- cation code	Y82 • and identifica- tion code															✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identifica- tion code															✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																					
Acceptance test certificate 3.1 according to EN 10204	B02															✓	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- This order code only determines the price of the version - Additional plain text is required.
- R. Possible on request
- ✓ With extra charge
- Not possible

- 1) For appropriate tripping unit, see Catalog LV 1.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please enquire before ordering.
- 3) Possible in combination with order code **L44** to **L49** or length specification in plain text.
- 4) Only the 50 Hz data are indicated on the rating plate.
- 5) Not available for 2-pole motors.
- 6) Possible up to 600 V max. Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 7) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 8) Not possible for 2-pole 1PP4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration severity level R available on request for 1PP4 motors. Not possible for 1PP4 motors in the combination "Concentricity of the shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors" – Order code **K04**.
- 9) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 10) Can be combined with deep-groove bearings of series 60.., 62.. and 63.. . Not possible with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 11) Possible for motors of frame size 315 and above in vertical types of construction or 2-pole for version with second shaft extension on request. Version with protective cover not possible.
- 12) When motors are ordered that have a longer or shorter shaft extension than normal, the required position and length of the featherkey way must be specified in a sketch. It must be ensured that only featherkeys in accordance with DIN 6885, Form A are permitted to be used. The featherkey way is positioned centrally on the shaft extension. The length is defined by the manufacturer normatively. Not valid for: Conical shafts, non-standard threaded journals, non-standard shaft tolerances, friction welded journals, extremely "thin" shafts, special geometry dimensions (e.g. square journals), hollow shafts. Valid for non-standard shaft extensions DE or NDE. The featherkeys are supplied in every case. The add-on prices also apply for "Shaft extension DE without featherkey way". For order codes **Y55** and **K16**:
 - Dimensions D and DA ≤ internal diameter of roller bearing (see dimension tables under "Dimensions")
 - Dimensions E and EA ≤ 2 x length E (normal) of the shaft extension
 For an explanation of the order codes, see "Introduction".

IEC Squirrel-Cage Motors

Fan motors

Accessories and spare parts

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardised slide rails (please enquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)7 11-1388-0
Fax +49 (0)7 11-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Available from:
A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

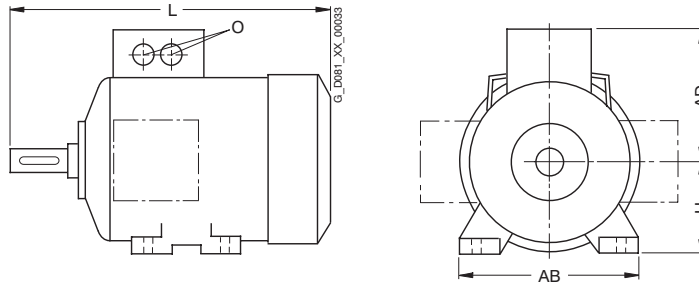
**Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018**

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions	L	AD	H	AB	O
63 M	1PP7			172	101	63	120	1 x M16 x 1.5
71 M	1PP7			207	111	71	132	1 x M16 x 1.5
80 M	1LA7			273.5	120	80	150	1 x M16 x 1.5
	1PP7			237	120	80	150	1 x M16 x 1.5
90 S/ 90 L	1LA7			331	128	90	165	1 x M16 x 1.5
	1PP7			286	128	90	165	1 x M16 x 1.5
100 L	1LA7			372	135	100	196	2 x M32 x 1.5
	1PP7			331	135	100	196	2 x M32 x 1.5
112 M	1LA7			393	148	112	226	2 x M32 x 1.5
	1PP7			349	148	112	226	2 x M32 x 1.5
132 S/ 132 M	1LA7			452.5	167	132	256	2 x M32 x 1.5
	1PP7			397	167	132	256	2 x M32 x 1.5
160 M/ 160 L	1LA7			588	197	160	300	2 x M40 x 1.5
	1PP7			529	197	160	300	2 x M40 x 1.5
180 M/ 180 L	1LA5			712	258	180	339	2 x M40 x 1.5
	1LG4			669	262	180	339	2 x M40 x 1.5
	1PP4			562	262	180	339	2 x M40 x 1.5
	1PP4 188			613	262	180	339	2 x M40 x 1.5
	1PP5			611	258	180	339	2 x M40 x 1.5

Frame size	Type	Number of poles	Dimensions	L	AD	H	AB	O
200 L	1LA5			769.5	305	200	388	2 x M50 x 1.5
	1LG4			720	300	200	378	2 x M50 x 1.5
	1PP4			617	300	200	378	2 x M50 x 1.5
	1PP4 208	2, 6		674	300	200	378	2 x M50 x 1.5
	1PP5			675	305	200	388	2 x M50 x 1.5
225 S/ 225 M	1LG4			789	325	225	436	2 x M50 x 1.5
	1PP4			670	325	225	436	2 x M50 x 1.5
	1PP4 223	2		640	325	225	436	2 x M50 x 1.5
	1PP4 228	2		700	325	225	436	2 x M50 x 1.5
	1PP4 228	4, 6, 8		730	325	225	436	2 x M50 x 1.5
250 M	1LG4			887	392	250	490	2 x M63 x 1.5
	1PP4			764	392	250	490	2 x M63 x 1.5
	1PP4 258	4		834	392	250	490	2 x M63 x 1.5
280 S/ 280 M	1LG4			960	432	280	540	2 x M63 x 1.5
	1PP4			830	432	280	540	2 x M63 x 1.5
	1PP4 288	2, 4		940	432	280	540	2 x M63 x 1.5
315 L	1PP4 310	2		925	500	315	610	2 x M63 x 1.5
	1PP4 310	4, 6, 8		955	500	315	610	2 x M63 x 1.5
	1PP4 313	2		925	500	315	610	2 x M63 x 1.5
	1PP4 313	4, 6, 8		955	500	315	610	2 x M63 x 1.5
	1PP4 316	2		1085	500	315	610	2 x M63 x 1.5
	1PP4 316	4, 6, 8		1115	500	315	610	2 x M63 x 1.5
	1PP4 317	2		1085	500	315	610	2 x M63 x 1.5
	1PP4 317	4, 6, 8		1115	500	315	610	2 x M63 x 1.5
	1PP4 318	6		1255	500	315	610	2 x M63 x 1.5
	1PP4 318	8		1115	500	315	610	2 x M63 x 1.5

Notes on the dimensions

- Dimension designations according to DIN EN 50347 and IEC 60072.
- Fits
The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit	DIN ISO 286-2
D, DA	to 30	j6
	over 30 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

- Dimension tolerances
For the following dimension designations, the permissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
A, B	to 250 over 250 to 500 over 500 to 750 over 750 to 1000 over 1000	± 0.75 ± 1.0 ± 1.5 ± 2.0 ± 2.5
M	to 200 over 200 to 500 over 500	± 0.25 ± 0.5 ± 1.0
H	to 250 over 250	- 0.5 - 1.0
E, EA		- 0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

- All dimensions are specified in mm.

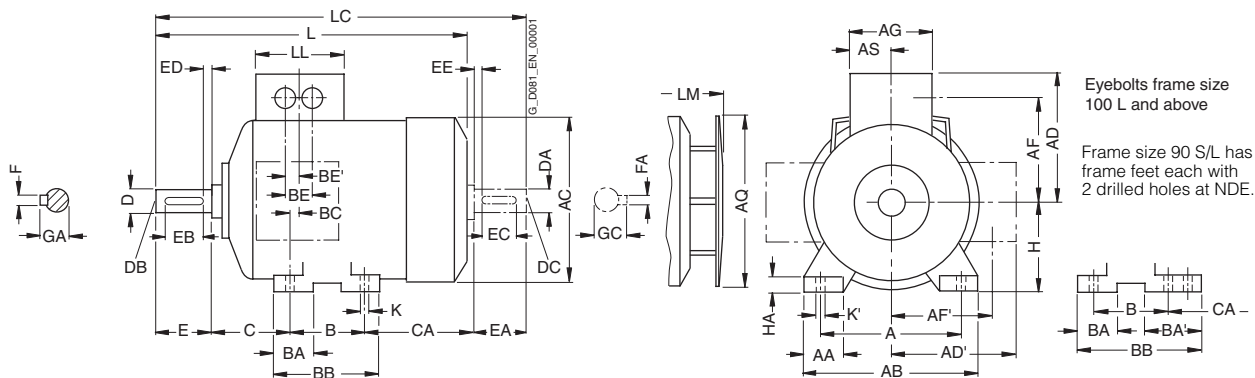
Fan motors

Dimensions

Dimensional drawings

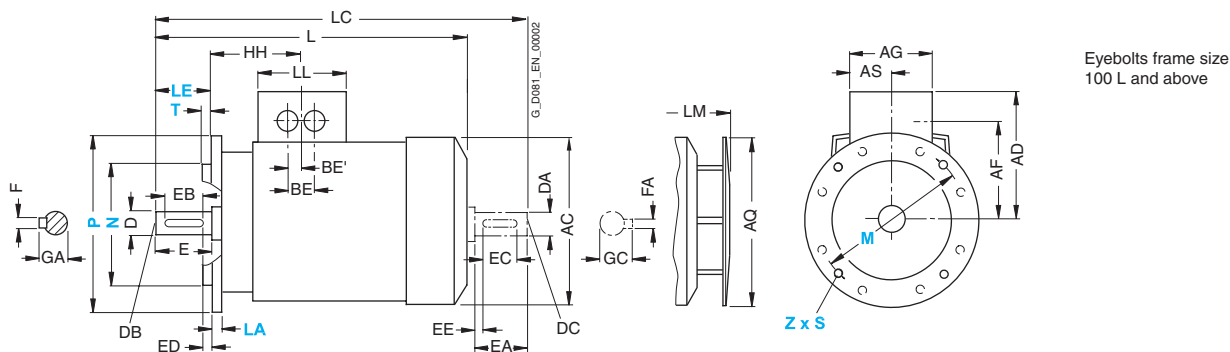
Aluminium series 1LA7 and 1LA5, frame sizes 80 M to 200 L · pole-changing version

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																					
Frame size	Type	A	AA	AB	AC ⁽¹⁾	AD ⁽²⁾	AD'	AF ⁽²⁾	AF'	AG ⁽³⁾	AQ	AS	B*	BA	BA'	BB	BC	BE ⁽²⁾	BE' ⁽²⁾	C	CA*	H	HA
80 M	1LA7 080 1LA7 083	125	30.5	150	163	120	120	97	97	75	124	37.5	100	32	–	118	14	32	18	50	94	80	8
90 S 90 L	1LA7 090 1LA7 096	140	30.5	165	180	128	128	105	105	75	170	37.5	100 125	33	54	143	23	32	18	56	143 118	90	10
100 L	1LA7 106 1LA7 107	160	42	196	203	135	163	78	123	120	170	60	140	47	–	176	39	42	21	63	125	100	12
112 M	1LA7 113	190	46	226	227	148	176	91	136	120	170	60	140	47	–	176	32	42	21	70	141	112	12
132 S	1LA7 130 1LA7 131	216	53	256	267	167	194	107	154	140	250	70	140	49	–	180	39	42	21	89	162.5	132	15
132 M	1LA7 133 1LA7 134	216	53	256	267	167	194	107	154	140	250	70	178	49	–	218	39	42	21	89	124.5	132	15
160 M	1LA7 163 1LA7 164	254	60	300	320	197	226	127	183	165	250	82.5	210	57	–	256	52.5	54	27	108	183	160	18
160 L	1LA7 166	254	60	300	320	197	226	127	183	165	250	82.5	254	57	–	300	52.5	54	27	108	139	160	18
180 M	1LA5 183	279	69.5	339	363	258	258	216	216	152	340	71	241	50	–	287	38	54	27	121	259	180	18
180 L	1LA5 186	279	69.5	339	363	258	258	216	216	152	340	71	279	50	–	325	38	54	27	121	221	180	18
200 L	1LA5 206 1LA5 207	318	83	388	402	305	305	252	252	260	340	96	305	58.5	–	355	45	85	42.5	133	239	200	24

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Measured across the bolt heads.

2) The values increase if the connection box is rotated or if a brake is mounted. Further information is provided by the dimension sheet generator in SD configurator.

IEC Squirrel-Cage Motors

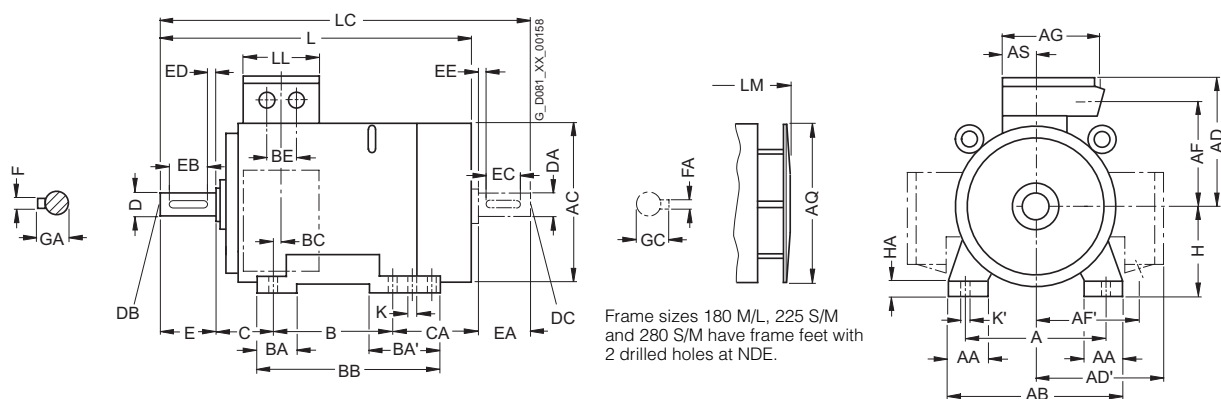
Fan motors

Dimensions

Dimensional drawings

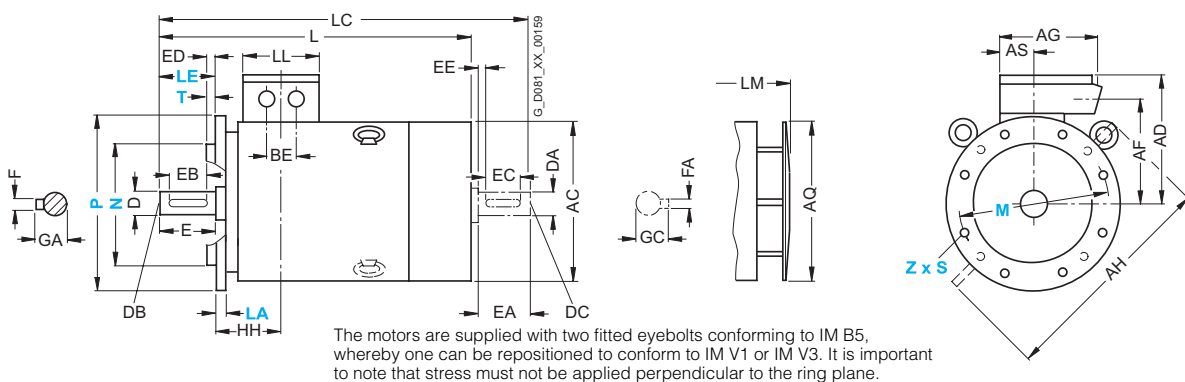
Cast-iron series 1LG4, frame sizes 180 M to 280 M · pole-changing version

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																					
Frame size	Type	A	AA	AB	AC ¹⁾	AD	AD'	AF	AF'	AG	AH	AQ	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA
180 M	1LG4 183	279	65	339	363	262	262	220	220	152	452	340	71	241	70	111	328	36	54	121	202	180	20
180 L	1LG4 186	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	164	180	20
200 L	1LG4 207	318	70	378	402	300	300	247	247	260	486	340	96	305	80	80	355	63	85	133	177	200	25
225 S	1LG4 220	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34
225 M	1LG4 223	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	193	225	34
250 M	1LG4 253	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
280 S	1LG4 280	457	100	540	555	432	432	348	348	300	672	525	118	368	100	151	479	62	110	190	267	280	40
280 M	1LG4 283	457	100	540	555	432	432	348	348	300	672	525	118	419	100	151	479	62	110	190	216	280	40

* This dimension is assigned in DIN EN 50347 to the frame size listed.

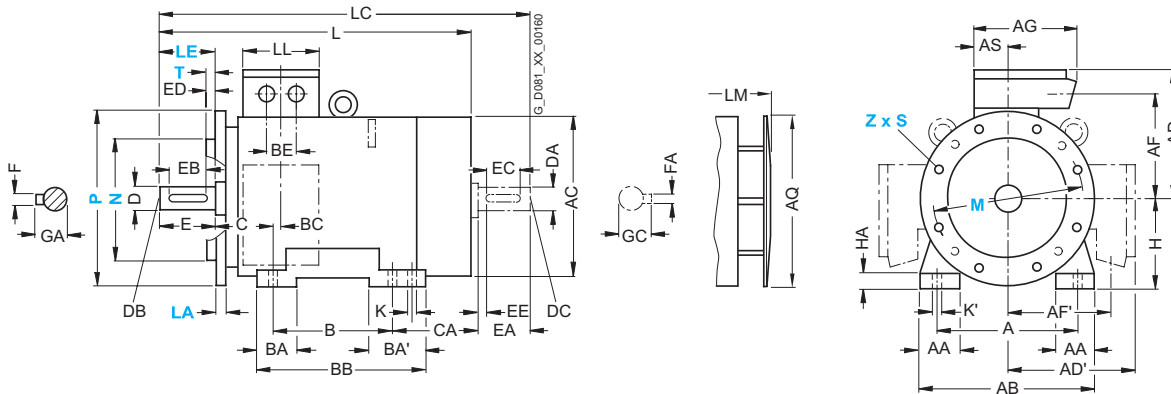
¹⁾ Measured across the bolt heads.

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 280 M · pole-changing version

Type of construction IM B35

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC							DE shaft extension							NDE shaft extension						
Frame size	Type	HH	K	K'	L	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
180 M	1LG4 183	157	15	19	669	784	132	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1LG4 186	157	15	19	669	784	132	759	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1LG4 207	196	19	25	720	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59
225 S	1LG4 220	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
225 M	1LG4 223	196	19	25	789	903	192	889	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
250 M	1LG4 253	237	24	30	887	1032	236	987	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
280 S	1LG4 280	252	24	30	960	1105	236	1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
280 M	1LG4 283	252	24	30	960	1105	236	1070	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69

IEC Squirrel-Cage Motors

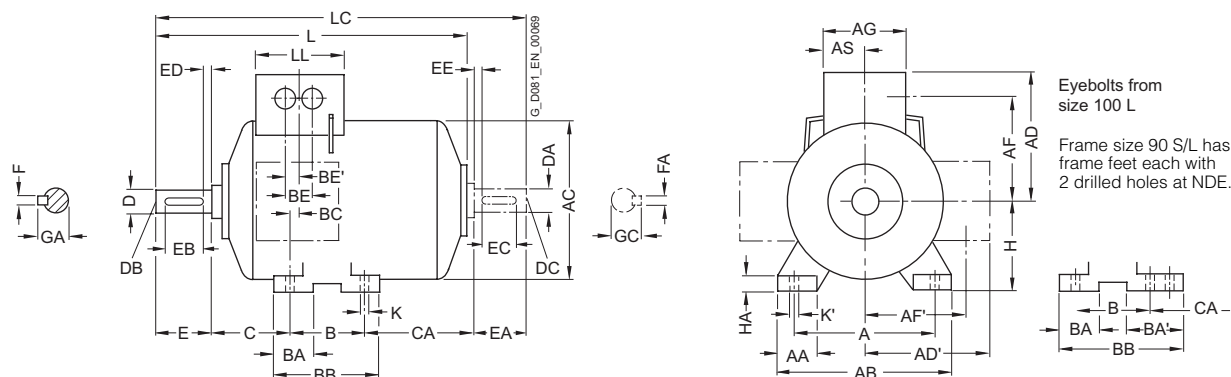
Fan motors

Dimensions

Dimensional drawings

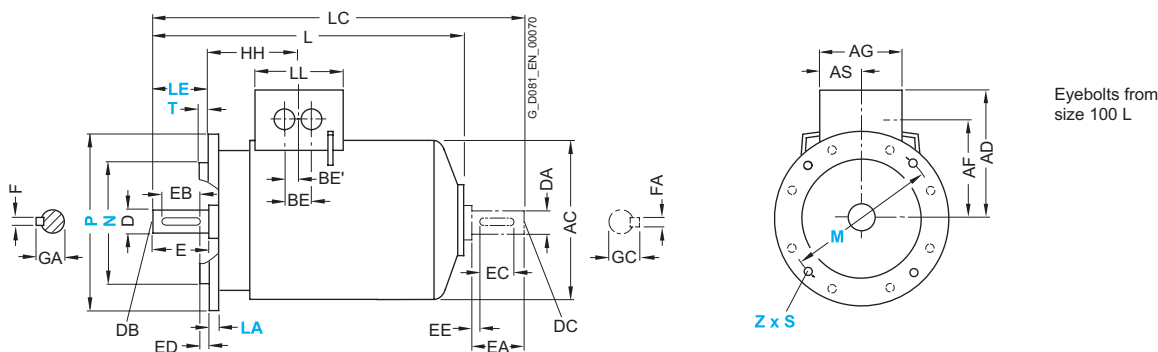
Aluminium series 1PP7 and 1PP5, frame sizes 63 M to 200 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC																				
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA
63 M	1PP7 060 1PP7 063	2, 4, 6	100	27	120	124	101	101	78	78	74	37	80	28	–	96	30	32	18	40	40	63	7
71 M	1PP7 070 1PP7 073	2, 4, 6, 8	112	27	132	145	111	111	88	88	74	37	90	27	–	106	18	32	18	45	42	71	7
80 M	1PP7 080 1PP7 083	2, 4, 6, 8	125	30.5	150	163	120	120	97	97	75	37.5	100	32	–	118	14	32	18	50	47	80	8
90 S 90 L	1PP7 090 1PP7 096	2, 4, 6, 8	140	30.5	165	180	128	128	105	105	75	37.5	100 125	33	54	143	23	32	18	56	80 55	90	10
100 L	1PP7 106 1PP7 107	2, 4, 6, 8 4, 8	160	42	196	203	135	163	78	123	120	60	140	47	–	176	39	42	21	63	68	100	12
112 M	1PP7 113	2, 4, 6, 8	190	46	226	227	148	176	91	136	120	60	140	47	–	176	32	42	21	70	79	112	12
132 S	1PP7 130 1PP7 131	2, 4, 6, 8 2	216	53	256	267	167	194	107	154	140	70	140	49	–	180	39	42	21	89	96	132	15
132 M	1PP7 133 1PP7 134	4, 6, 8 6	216	53	256	267	167	194	107	154	140	70	178	49	–	218	39	42	21	89	58	132	15
160 M	1PP7 163 1PP7 164	2, 4, 6, 8 2, 8	254	60	300	320	197	226	127	183	165	82.5	210	57	–	256	52.5	54	27	108	107	160	18
160 L	1PP7 166	2, 4, 6, 8	254	60	300	320	197	226	127	183	165	82.5	254	57	–	300	52.5	54	27	108	63	160	18
180 M	1PP5 183	2, 4	279	69.5	339	363	258	258	216	216	152	71	241	50	–	287	38	54	27	121	145	180	18
180 L	1PP5 186	4, 6, 8	279	69.5	339	363	258	258	216	216	152	71	279	50	–	325	38	54	27	121	107	180	18
200 L	1PP5 206 1PP5 207	2, 6 2, 4, 6, 8	318	83	388	402	305	305	252	252	260	96	305	58.5	–	355	45	85	42.5	133	133	200	24

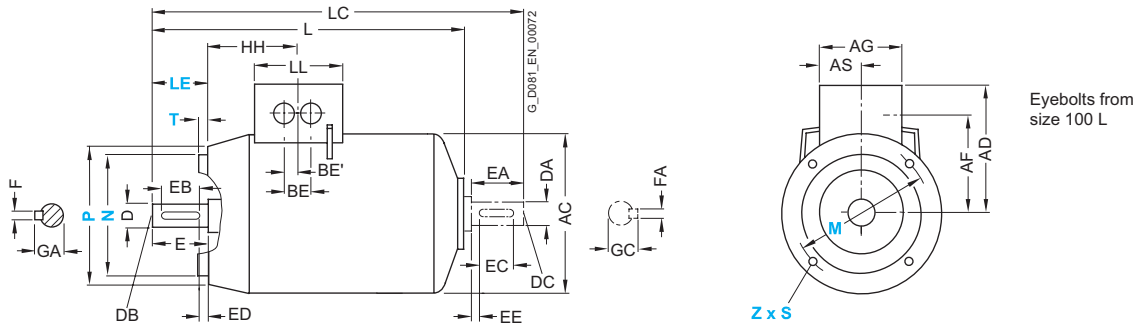
* This dimension is assigned in DIN EN 50347 to the frame size listed.

Dimensional drawings

Aluminium series 1PP7 and 1PP5, frame sizes 63 M to 200 L

Type of construction IM B14

Type of construction IM B14 not possible for 1PP5 motors, frame sizes 180 M to 200 L
For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor			Dimension designation acc. to IEC						DE shaft extension						NDE shaft extension							
Frame size	Type	Number of poles	HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
63 M	1PP7 060 1PP7 063	2, 4, 6	69.5	7	10	172	206	74	11	M4	23	16	3.5	4	12.5	11	M4	23	16	3.5	4	12.5
71 M	1PP7 070 1PP7 073	2, 4, 6, 8	63.5	7	10	207	240	74	14	M5	30	22	4	5	16	14	M5	30	22	4	5	16
80 M	1PP7 080 1PP7 083	2, 4, 6, 8	63.5	9.5	13.5	237	280	75	19	M6	40	32	4	6	21.5	19	M6	40	32	4	6	21.5
90 S 90 L	1PP7 090 1PP7 096	2, 4, 6, 8	79	10	14	286	333	75	24	M8	50	40	5	8	27	19	M6	40	32	4	6	21.5
100 L	1PP7 106 1PP7 107	2, 4, 6, 8 4, 8	102	12	16	331	385 ³⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
112 M	1PP7 113	2, 4, 6, 8	102	12	16	349 ¹⁾	403 ²⁾	120	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
132 S	1PP7 130 1PP7 131	2, 4, 6, 8 2	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
132 M	1PP7 133 1PP7 134	4, 6, 8 6	128	12	16	397	485	140	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
160 M	1PP7 163 1PP7 164	2, 4, 6, 8 2, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	1PP7 166	2, 4, 6, 8	160.5	15	19	529	645	165	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
180 M	1PP5 183	2, 4	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
180 L	1PP5 186	4, 6, 8	159	15	19	611	727	132	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5
200 L	1PP5 206 1PP5 207	2, 6 2, 4, 6, 8	178	19	25	675	791	192	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59

1) 345 mm for IM B5 type of construction.

2) 399 mm for IM B5 type of construction.

3) 381 mm for IM B14 type of construction.

IEC Squirrel-Cage Motors

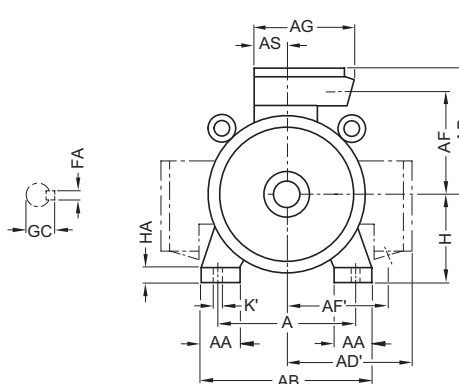
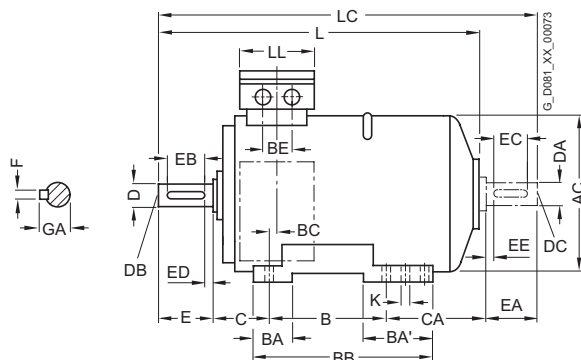
Fan motors

Dimensions

Dimensional drawings

Cast-iron series 1PP4, frame sizes 180 M to 315 L

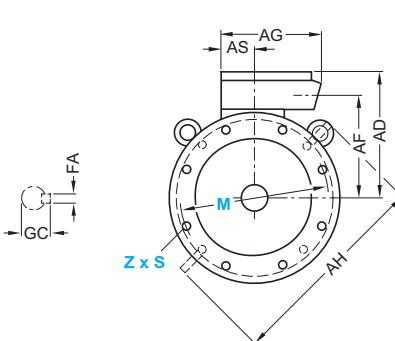
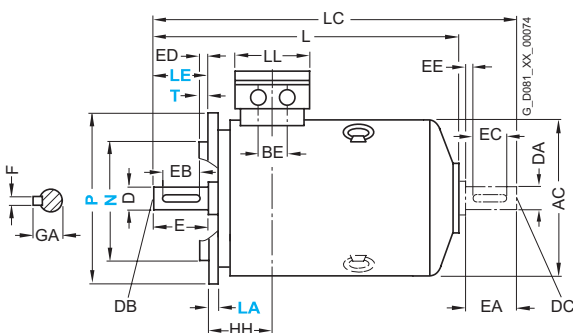
Type of construction IM B3



Frame sizes 180 M/L, 225 S/M, 280 S/M/L and 315 S/M/L have frame feet each with 2 drilled holes at NDE.

Types of construction IM B5 and IM V1 (IM B5 only up to frame size 315 M)

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



The motors are supplied with two fitted eyebolts conforming to IM B5, whereby one can be repositioned to conform to IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

For motor			Dimension designation acc. to IEC																							
Frame size	Type	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AH	AS	B*	BA	BA'	BB	BC	BE	C	CA*	H	HA			
180 M 180 L	1PP4 183	2, 4	279	65	339	363	262	262	220	220	152	452	71	241	70	111	328	36	54	121	94	180	20			
	1PP4 186	4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	56	180	20			
	1PP4 188	2, 4, 6, 8	279	65	339	363	262	262	220	220	152	452	71	279	70	111	328	36	54	121	107	180	20			
200 L	1PP4 206	2, 6	318	70	378	402	300	300	247	247	260	486	96	305	80	80	355	63	85	133	76	200	25			
	1PP4 207	2, 4, 6, 8	318	70	378	402	300	300	247	247	260	486	96	305	80	80	355	63	85	133	76	200	25			
	1PP4 208	2, 6 4, 8	318	70	378	402	300	300	247	247	260	486	96	305	80	80	355	63	85	133	133 76	200	25			
225 S 225 M	1PP4 220	4, 8	356	80	436	442	325	325	272	272	260	556	96	286	85	110	361	47	85	149	99	225	34			
	1PP4 223	2 4, 6, 8	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	74	225	34			
	1PP4 228	2 4, 6, 8	356	80	436	442	325	325	272	272	260	556	96	311	85	110	361	47	85	149	134	225	34			
250 M	1PP4 253	2 4, 6, 8	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111	250	40			
	1PP4 258	2 4 6, 8	406	100	490	495	392	392	308	308	300	620	118	349	100	100	409	69	110	168	111 181 111	250	40			
280 S	1PP4 280	2 4, 6, 8	457	100	540	555	432	432	348	348	300	672	118	368	100	151	479	62	110	190	137	280	40			
280 M	1PP4 283	2 4, 6, 8	457	100	540	555	432	432	348	348	300	672	118	414	100	151	479	62	110	190	86	280	40			
	1PP4 288	2 4 6, 8	457	100	540	555	432	432	348	348	300	672	118	419	100	151	479	62	110	190	196	280	40			
																					86					
315 S	1PP4 310	2	508	120	610	610	500	500	400	400	380	780	154	406	125	176	527	69	110	216	168	315	50			
	1PP4 310	4, 6, 8																								
315 M ¹⁾	1PP4 313	2	508	120	610	610	500	500	400	400	380	780	154	457	125	176	527	69	110	216	117	315	50			
	1PP4 313	4, 6, 8																								
315 L ¹⁾	1PP4 316/317	2	508	120	610	610	500	500	400	400	380	780	154	508	125	176	578	69	110	216	226	315	50			
	1PP4 316/317	4, 6, 8																								
	1PP4 318	8																								
	1PP4 318	6	508	120	610	610	500	500	400	400	380	780	154	508	155	206	648	69	110	216	366	315	50			

* This dimension is assigned in DIN EN 50347 to the frame size listed.

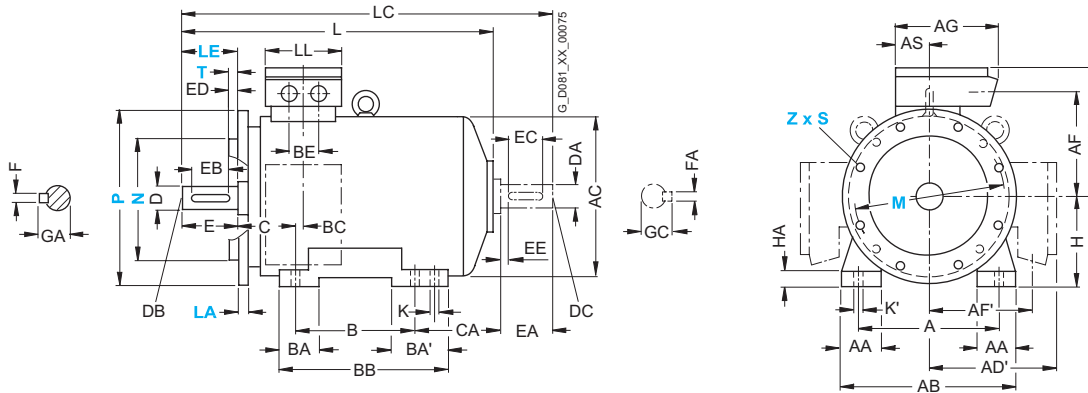
¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 506 mm). BB will then be 666 mm.

Dimensional drawings

Cast-iron series 1PP4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 7/58 (Z = the number of retaining holes)



For motor	Dimension designation acc. to IEC	DE shaft extension	NDE shaft extension
Frame size	Type	Number of poles	HH K K' L LC LL D DB E EB ED F GA DA DC EA EC EE FA GC
180 M	1PP4 183	2, 4	157 15 19 562 676 132 48 M16 110 100 5 14 51.5 48 M16 110 100 5 14 51.5
180 L	1PP4 186	4, 6, 8	157 15 19 562 676 132 48 M16 110 100 5 14 51.5 48 M16 110 100 5 14 51.5
	1PP4 188	2, 4, 6, 8	157 15 19 613 727 132 48 M16 110 100 5 14 51.5 48 M16 110 100 5 14 51.5
200 L	1PP4 206	2, 6	196 19 25 617 734 192 55 M20 110 100 5 16 59 55 M20 110 100 5 16 59
	1PP4 207	2, 4, 6, 8	196 19 25 617 734 192 55 M20 110 100 5 16 59 55 M20 110 100 5 16 59
	1PP4 208	2, 6	196 19 25 674 791 192 55 M20 110 100 5 16 59 55 M20 110 100 5 16 59
		4, 8	617 734
225 S	1PP4 220	4, 8	196 19 25 670 784 192 60 M20 140 125 10 18 64 55 M20 110 100 5 16 59
225 M	1PP4 223	2	196 19 25 640 754 192 55 M20 110 100 5 16 59 48 M16 110 100 5 14 51.5
		4, 6, 8	670 784 60 M20 140 125 10 18 64 55 M20 110 100 5 16 59
	1PP4 228	2	196 19 25 700 814 192 55 M20 110 100 5 16 59 48 M16 110 100 5 14 51.5
		4, 6, 8	730 844 60 M20 140 125 10 18 64 55 M20 110 100 5 16 59
250 M	1PP4 253	2	237 24 30 764 878 236 60 M20 140 125 10 18 64 55 M20 110 100 5 16 59
		4, 6, 8	908 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
	1PP4 258	2	237 24 30 764 878 236 60 M20 140 125 10 18 64 55 M20 110 100 5 16 59
		4	834 978 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		6, 8	764 908 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
280 S	1PP4 280	2	252 24 30 830 975 236 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4, 6, 8	75 M20 140 125 10 20 79.5 65 M20 140 125 10 18 69
280 M	1PP4 283	2	252 24 30 830 975 236 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4, 6, 8	75 M20 140 125 10 20 79.5 65 M20 140 125 10 18 69
	1PP4 288	2	252 24 30 940 1085 236 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4	75 M20 140 125 10 20 79.5 65 M20 140 125 10 18 69
		6, 8	830 975 75 M20 140 125 10 20 79.5 65 M20 140 125 10 18 69
315 S	1PP4 310	2	285 28 35 925 1070 307 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4, 6, 8	955 1100 80 M20 170 140 25 22 85 70 M20 140 125 10 20 74.5
315 M ¹⁾	1PP4 313	2	285 28 35 925 1070 307 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4, 6, 8	955 1100 80 M20 170 140 25 22 85 70 M20 140 125 10 20 74.5
315 L ¹⁾	1PP4 316/317	2	285 28 35 1085 1230 307 65 M20 140 125 10 18 69 60 M20 140 125 10 18 64
		4, 6, 8	1115 1260 80 M20 170 140 25 22 85 70 M20 140 125 10 20 74.5
	1PP4 318	8	80 M20 170 140 25 22 85 70 M20 140 125 10 20 74.5
		6	285 28 35 1255 1400 307 80 M20 170 140 25 22 85 70 M20 140 125 10 20 74.5

¹⁾ With order codes for connection box positions (K09, K10, K11) only fitted feet with 3 drilled holes with dimension "B" (406, 457 and 506 mm). BB will then be 666 mm.

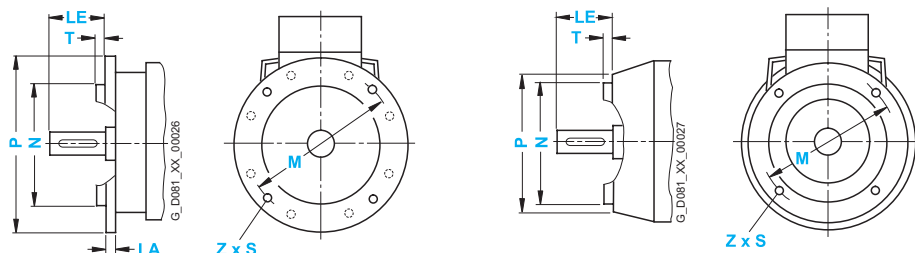
IEC Squirrel-Cage Motors

Fan motors

Dimensions

Dimensional drawings

Flange dimensions



In DIN EN 50347, the frame sizes are allocated flange FF with through holes and flange FT with tapped holes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with through holes (FF/A) Tapped holes (FT/C)		Dimension designation acc. to IEC							
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z
63 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 115	A 140	8	23	115	95	140	10	3	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 75	C 90	–	23	75	60	90	M5	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 100	C 120	–	23	100	80	120	M6	3	4
71 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 130	A 160	9	30	130	110	160	10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 85	C 105	–	30	85	70	105	M6	2.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 115	C 140	–	30	115	95	140	M8	3	4
80 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	40	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 120	–	40	100	80	120	M6	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	40	130	110	160	M8	3.5	4
90 S, 90 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 165	A 200	10	50	165	130	200	12	3.5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 100	C 140	–	50	115	95	140	M8	3	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 130	C 160	–	50	130	110	160	M8	3.5	4
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 165	C 200	–	60	165	130	200	M10	3.5	4
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 215	C 250	–	80	215	180	250	M12	4	4
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4
	IM B14, IM B34, IM V18, IM V19	Special flange	FT 265	C 300	–	110	265	230	300	M12	4	4
180 M, 180 L	IM B5, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5	Flange	FF 350	A 400	15	110	350	300	400	18.5	5	4
225 S, 225 M 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 400	A 450	16	110	400	350	450	18.5	5	8
250 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
280 S, 280 M	IM B5, IM V1, IM V3	Flange	FF 500	A 550	18	140	500	450	550	18.5	5	8
315 S, 315 M, 315 L 2-pole 4-pole to 8-pole	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140	600	550	660	24	6	8

IEC Squirrel-Cage Motors

Fan motors

Notes

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Compressor motors



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IEC Squirrel-Cage Motors

Compressor motors

Orientation

Overview



The compressor motors are used preferentially in compressors for direct drive. In compressors with belt drive, the cantilever forces must be taken into account.

Due to the necessary compactness and confined space within the compressor, it is recommended that the following are used:

- Motors with increased output
- If required, versions with protruding cables instead of a connection box
- Special versions for high-speed applications – possible on request
- With converter-fed operation, winding monitoring with embedded KTY 84-130 temperature sensors or bimetal temperature sensors and additional insulated bearings for wide output ranges.

Benefits

The implemented motors offer the user the following advantages:

- Depending on the motor type used, service factors of up to 1.25 are possible, i.e. the motor can be continuously overloaded with 25% of the rated output.
- Motors with increased efficiency to CEMEP EFF 1 or EPACT lead to significant energy savings under typical continuous duty. Please enquire regarding any efficiency requirements that exceed this.
- Noise-optimised versions.
- Under converter-fed operation, by setting the precise speed and therefore the operating point, a considerable energy saving can be achieved combined with reduced stress on the plant.
- The motors are suitable, in general, for mains-fed operation up to 690 V and converter-fed operation up to 500 V (voltage rise times $t_s > 0.1$ ms).
- Extensive experience is available in customised applications especially with regard to special flanges and special bearings.

Application

The motors can be used for the following compressor types:

- Screw compressors
- Reciprocating compressors
- Rotary blowers

More information

For more information, please contact your local Siemens AG contact – see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Compressor motors

Surface-cooled motors up to frame size 315 L
Aluminium and cast-iron series

Overview

Recommended motor types:

- Self-ventilated motors with increased output – aluminium series 1LA9 and cast-iron series 1LG4 in output range from 3 to 110 kW, 50 and 60 Hz.
- Self-ventilated motors with high efficiency with increased output are available on request.

For technical specifications and selection and ordering data, see "Standard motors up to frame size 315 L".

Surface-cooled motors frame size 315 and above
Cast-iron housing

Overview

Recommended motor types:

- Non-standard motor for mains-fed and converter-fed operation – cast-iron series 1LA8

For technical specifications and selection and ordering data, see "Non-standard motors frame size 315 and above".

IEC Squirrel-Cage Motors

Compressor motors

Special versions

Overview

Recommended special versions for mains-fed and converter-fed operation

- Motor temperature sensing using built-in temperature sensor KTY 84-130 - order code **A23**
- Insulated bearing cartridge at non-drive-end (NDE) - order code **L27**
- External earthing - order code **L13**
- 6 protruding cable ends
 - 0.5 m long - order code **L47**
 - 1.5 m long - order code **L48**
 - 3.0 m long - order code **L49**

Other special versions

For other special versions, see "Standard motors up to frame size 315 L" and "Non-standard motors frame size 315 and above".

Accessories and spare parts

Overview

See "Standard motors up to frame size 315 L" and "Non-standard motors frame size 315 and above".

Dimensions

Overview

See dimensions under "Standard motors up to frame size 315 L" and "Non-standard motors frame size 315 and above".

Smoke-extraction motors



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IEC Squirrel-Cage Motors

Smoke-extraction motors

Orientation

Overview



The low-voltage motors with squirrel-cage rotors for implementation in automatic smoke and heat extraction units to EN 12101-3 are mainly designed for driving smoke extraction fans. For this reason, they are known as smoke-extraction motors. They are mainly used in buildings or structures in which smoke control is necessary due to their shape and arrangement.

Temperature/time classification according to EN 12101-3

- F200 corresponds to 200 °C for 120 min
- F300 corresponds to 300 °C for 60 min
- F400 corresponds to 400 °C for 120 min

Testing and test certificates

The smoke-extraction motors are tested by the Research and Testing Laboratory of the Department of Air-Conditioning Systems and Building Services Installations of the Technical University of Munich in accordance with EN 12101-3.

Test conditions for F200/F300:

- Temperature **300 °C**
- Time **120 min**

The test certificates are available.



The motors are manufactured with aluminium or cast-iron housings in accordance with the smoke classes. The smoke-extraction motors are based on the standard motors and comprise the following motor types:

- **Temperature/time classes F200 and F300**
 - Self-ventilated motors - Aluminium series 1LA7 and 1LA5, cast-iron series 1LG6 - Version with integrated fan (metal)
 - Self-ventilated motors - Aluminium series 1LA7 and 1LA5 **double pole-changing with square-law load torque** - Version with integrated fan (metal)
 - Forced-air cooled motors - Aluminium series 1PP7 and 1PP5, cast-iron series 1PP6 - Version without integrated fan, located in air flow of fan to be driven
 - Forced-air cooled motors - Aluminium series 1PP7 and 1PP5 **double pole-changing with square-law load torque** - Version without integrated fan, located in air flow of fan to be driven
- **Temperature/time classes F400**
 - Self-ventilated motors - Cast-iron series 1LA6 and 1LG6 - Version with integrated fan (metal)
 - Self-ventilated motors - Cast-iron series 1LA6 **double pole-changing with square-law load torque** - Version with integrated fan (metal)
 - Forced-air cooled motors - Cast-iron series 1PP6 - Version without integrated fan, located in air flow of fan to be driven
 - Forced-air cooled motors - Cast-iron series 1PP6 **double pole-changing with square-law load torque** - Version without integrated fan, located in air flow of fan to be driven

The resonance of mountings and reactions from driven machines can cause high levels of vibration in the overall equipment unit. This has a significant effect on the expected service life of the bearing.

These vibrations are evaluated in accordance with Zones A and B according to ISO 10816.

Benefits

The smoke-extraction motors operate as so-called "Dual-function motors":

- Normal operation (no instance of fire):
Incoming/outgoing air flow
- Fault operation (in case of fire):
 - Removal of smoke from escape and access routes
 - Supporting fire fighting by creating a smoke-free zone
 - Protecting devices and equipment
 - Reducing the heat stress of components during a fire
 - Reducing secondary damage due to thermal bi-products and hot gases

The smoke-extraction motors offer the user a number of advantages:

- The assignment of standard outputs is unchanged. This means that a larger construction size is not required for smoke-extraction motors.
- Smoke-extraction motors are generally equipped with located bearings at the drive-end (DE) of the motor.
- A rating plate for conditions of fire is screwed onto the motor.
- Cables protruding from the non-drive-end (NDE) are included in the scope of supply.
- Radial-flow and axial-flow fan drive are possible.
 - Self-ventilated motors of series 1LA/1LG with a metal fan impeller can be used as radial-flow fan drives.
 - Forced-air cooled motors of series 1PP can be used as axial-flow fan drives taking into account the required volumetric flow for motor cooling. In this case the driven fan performs the ventilation.

Application

The smoke-extraction motors are designed for use in automatic smoke and heat extraction units to EN 12101-3.
Typical application examples include:

- Tunnels
- Single and multi-storey shopping centres
- Industrial buildings and warehouses
- Building complexes and atriums
- Theatres
- Indoor car parks
- Staircases

IEC Squirrel-Cage Motors

Smoke-extraction motors

Orientation

Technical specifications

Standards and regulations

In addition to the relevant standards and regulations, EN 12101-3 applies for non-portable fire-fighting systems:

Systems for controlling smoke and heat flows, part 3, specifications for smoke and heat extraction units.

Voltage and frequency

Rated voltages according to IEC 60034-1

- 230 VΔ 50 Hz
- 400 VΔ 50 Hz and 400 VY 50 Hz
- 500 VΔ 50 Hz and 500 VY 50 Hz
- 690 VY 50 Hz

Non-standard voltages (voltage code 9 and order code L1Y) as well as 60 Hz are available on request.

The following rating plates are available for the smoke-extraction motors:

- Rating plate
For the listed rated voltages with 50 Hz output data.
- Fire event plate
Complete with number and year of issue of the European standard, temperature/time class and minimum duration of function.

All plates are resistant to corrosion. A second set of plates is included with the motor, loose.

Rated output, duty type, number of poles

The rated output applied for continuous duty (normal duty) according to IEC 60034-1, for a frequency of 50 Hz, coolant temperatures of up to 40 °C, site altitude of up to 1000 m above sea level.

Derating is necessary at higher ambient temperatures and site altitudes (reduction factor k_{HT}), see table below.

Reduction factor k_{HT} for different site altitudes and/or coolant temperatures

Site altitude above sea level	Coolant temperature in °C					
in m	<30	30-40	45	50	55	60
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.9	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Coolant temperature and site altitude are rounded up to 5 °C or 500 m.

Operation in the event of fire

In addition to normal duty, operation in the event of a fire as specified in EN 12101-3 is available.

At the end of the fire incident, the motor may be unfit for normal duty. **It is therefore specified that the motor is removed and overhauled or replaced with a new motor.**

In the event of a fire, any "thermal motor protection" must be deactivated.

Standard number of poles

- 2, 4 and 6
- For more poles and pole-changing motors, please enquire.

Insulation system

Special insulation systems adapted to the respective temperature/time classes. Maximum thermal utilisation to temperature class F.

The insulation of the smoke extraction motors is designed such that converter-fed operation is possible without limitation at voltages ≤500 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_s > 0.1 \mu s$ at the motor terminals.

In the event of fire, the motors must be switched over from converter-fed operation to mains-fed operation. If converter-fed operation is also required in the event of fire, system testing and acceptance testing must be performed in accordance with this (please enquire).

Drainage holes

Generally available, but closed if ordered according to IP55 degree of protection.

Bearing plates

All bearing plates are in cast-iron.

Termination system

Protruding cable with casing, without connection box with cover plate or "Nozzle cap". Cable length depends on the shaft height.

- Frame sizes 80 to 112: 1.0 m
- Frame sizes 132 to 200: 1.5 m
- Frame sizes 225 to 315: 2.5 m

Special versions of connecting cables are available on request.

Position of the connecting cable

- Frame sizes 80 to 160:
 - On the top at non-drive-end (NDE) as standard. Optionally left or right at non-drive-end (NDE) (for type of construction with screwed-on feet).
- Frame sizes 180 to 315:
 - Flange types of construction without feet:
 - On the top at non-drive-end (NDE) as standard. Optionally on left or right at non-drive-end (NDE).
 - All types of construction with feet:
 - On the top at drive-end (DE) as standard with connection cable routed towards the non-drive-end (NDE). Optionally on left or right at drive-end (DE) with connection cable routed towards the non-drive-end (NDE) (for types of construction with screwed-on feet).

The equipment is earthed with a protruding cable.

Technical specifications (continued)

Bearings, grease

Special bearing systems are used that are matched to the respective temperature classes.

Deep-groove bearings of series 62 or 63 without play are used depending on the fire classes F200/F300, F400 and the frame sizes.

The located bearing is generally at the drive-end (DE).

The nominal bearing lifetime L_{10h} (fan drive) is at least 20,000 hours at full rated load.

The motors of frame sizes 80 to 250 generally have bearings that are greased for life.

Paint finish

The motors have a two-component finish (worldwide) as standard in the color RAL 7030.

Required minimum cooling air flow under normal operation

Frame size	1LA7/1PP7	1LA5/1PP5	1LA6/1PP6	Required cooling air flow for number of poles		
				2 m ³ /min	4 m ³ /min	6 m ³ /min
80	X			1.74	0.90	0.60
90	X			3.12	1.56	1.08
100	X		X	3.96	1.86	1.26
112	X		X	4.98	3.00	1.98
132	X		X	8.04	5.04	3.36
160	X		X	12.90	9.54	6.36
180		X		10.98	10.98	7.27
200		X		15.12	13.02	8.58
225		X		12.12	13.02	8.58

Frame size	1LG6/1PP6	Required cooling air flow for number of poles		
		2 m ³ /min	4 m ³ /min	6 m ³ /min
180	X	12.0	13.0	8.5
200	X	20.5	17.0	11.0
225	X	20.5	18.5	12.5
250	X	25.5	22.5	17.0
280	X	24.5	28.0	21.5
315	X	47	36.0	26.5

In the motor version without an integrated fan (1PP5, 1PP6 and 1PP7), the motor is located in the air flow of the ventilator to be driven which must drive the minimum cooling air-flow over the motor housing. For a faster air flow, the operating temperature of the motor can be reduced.

Permissible loading on the shaft extension

The values specified in the table "Permissible loading on shaft extension" are the tested and approved maximum values (test duration two hours, temperature in case of fire 300 or 400 °C).

Under normal operation at coolant temperatures of up to 40 °C, a bearing lifetime $L_{10h} > 20000$ hours was achieved.

The values apply to all horizontal mounting positions and to all vertical mounting positions with shaft pointing downwards.

Please enquire in the case of :

- Higher force pairings
- Motors with more poles or pole-changing motors
- Vertical arrangement, depending on the rotor mass and mounting location (shaft pointing downwards or shaft pointing upwards) of the smoke-extraction motor. If necessary, higher forces can be approved.

IEC Squirrel-Cage Motors

Smoke-extraction motors

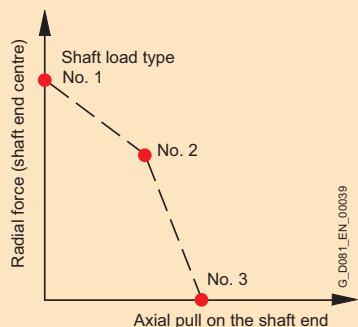
Orientation

Technical specifications (continued)

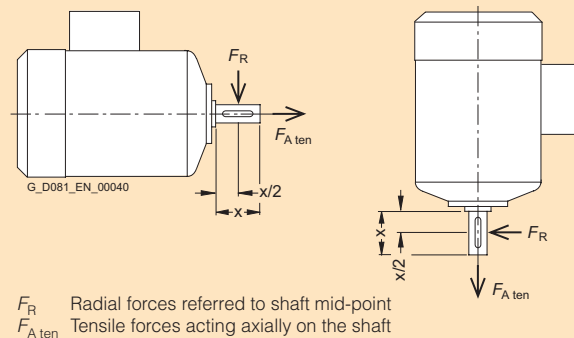
Permissible loading on the shaft extension (continued)

Frame size	Bearings DE	Type of loading on shaft No.	Horizontal shaft						Shaft pointing vertically downwards					
			2-pole		4-pole		6-pole		2-pole		4-pole		6-pole	
			F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N	F_R N	$F_{A \text{ tens}}$ N
80	6004	1 Radial force	400	0	490	0	540	0	360	0	450	0	540	0
		2 Radial force + axial tensile force	150	130	170	170	190	200	40	172	40	225	40	275
		3 Axial tensile force	0	215	0	265	0	320	0	197	0	250	0	300
90	6205	1 Radial force	650	0	730	0	795	0	590	0	730	0	795	0
		2 Radial force + axial tensile force	250	205	280	260	310	305	100	259	100	330	100	390
		3 Axial tensile force	0	343	0	415	0	480	0	310	0	384	0	450
100	6206	1 Radial force	890	0	1000	0	1080	0	820	0	1000	0	1080	0
		2 Radial force + axial tensile force	400	265	500	325	600	345	300	265	300	385	300	455
		3 Axial tensile force	0	490	0	600	0	675	0	432	0	540	0	625
112	6206	1 Radial force	870	0	980	0	1055	0	760	0	970	0	1055	0
		2 Radial force + axial tensile force	400	252	500	310	600	330	250	260	250	380	250	450
		3 Axial tensile force	0	478	0	595	0	675	0	403	0	510	0	590
132	6208	1 Radial force	1070	0	1415	0	1530	0	810	0	1060	0	1220	0
		2 Radial force + axial tensile force	450	315	550	450	650	480	250	300	250	520	250	585
		3 Axial tensile force	0	580	0	775	0	850	0	450	0	640	0	820
160	6209	1 Radial force	1440	0	1630	0	1760	0	1210	0	1580	0	1780	0
		2 Radial force + axial tensile force	700	450	800	570	900	650	500	335	500	525	500	665
		3 Axial tensile force	0	824	0	1015	0	1140	0	620	0	790	0	920
180	6210	1 Radial force	1540	0	1750	0	1900	0	1020	0	1400	0	1670	0
		2 Radial force + axial tensile force	770	430	900	545	1000	630	550	218	550	420	550	575
		3 Axial tensile force	0	815	0	1040	0	1183	0	453	0	733	0	875
200	6212	1 Radial force	2050	0	2380	0	2620	0	1450	0	1700	0	2090	0
		2 Radial force + axial tensile force	1200	770	1350	970	1500	1075	500	460	500	750	500	1600
		3 Axial tensile force	0	1350	0	1650	0	1875	0	720	0	1040	0	1905
225	6213	1 Radial force	2460	0	2720	0	2970	0	1910	0	2450	0	2900	0
		2 Radial force + axial tensile force	1370	900	1500	1095	1700	1200	500	660	500	1000	500	1250
		3 Axial tensile force	0	1560	0	1910	0	2170	0	920	0	1290	0	1520
250	6215	1 Radial force	2770	0	3230	0	3500	0	1490	0	2230	0	2700	0
		2 Radial force + axial tensile force	1400	840	1600	1095	1800	1340	500	460	500	815	500	1080
		3 Axial tensile force	0	1500	0	1865	0	2130	0	710	0	1090	0	1375
280	6217 (2-pole), 6317 (4-, 6-pole)	1 Radial force	3180	0	5000	0	5500	0	3000	0	5600	0	6100	0
		2 Radial force + axial tensile force	1700	1820	2000	2000	2300	2200	600	1085	600	2300	600	2750
		3 Axial tensile force	0	2630	0	3050	0	3500	0	1380	0	2600	0	3100
315	6219 (2-pole), 6319 (4-, 6-pole)	1 Radial force	3470	0	5300	0	5900	0	1000	0	3600	0	3850	0
		2 Radial force + axial tensile force	1750	2200	2000	2170	2300	2530	200	363	1000	1150	1000	1610
		3 Axial tensile force	0	3000	0	3080	0	3560	0	463	0	1690	0	2100

9



Load types



Forces on shaft extension

Selection and ordering data

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

Self-ventilated motors for temperature/time classes F200 and F300

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminium series 1LA7 and 1LA5, cast-iron series 1LG6 (motors with external fan)						
3000, 2-pole	80 M ... 315 L	0.75 ... 200	2830 ... 2985	2.5 ... 640	2.1 ... 325	9/8
1500, 4-pole	80 M ... 315 L	0.55 ... 200	1395 ... 1488	3.7 ... 1284	1.86 ... 345	9/8
1000, 6-pole	80 M ... 315 L	0.37 ... 160	910 ... 990	3.9 ... 1543	1.2 ... 285	9/10
1500/3000, 4/2-pole	80 M ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/12
1000/1500, 6/4-pole	80 M ... 200 L					9/12
750/1500, 8/4-pole	80 M ... 200 L					9/12

Forced-air cooled motors for temperature/time classes F200 and F300

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminium series 1PP7 and 1PP5, cast-iron series 1PP6 (motors without an external fan)						
3000, 2-pole	80 M ... 315 L	0.75 ... 200	2830 ... 2985	2.5 ... 640	2.1 ... 325	9/14
1500, 4-pole	80 M ... 315 L	0.55 ... 200	1395 ... 1488	3.7 ... 1284	1.86 ... 345	9/14
1000, 6-pole	80 M ... 315 L	0.37 ... 160	910 ... 990	3.9 ... 1543	1.2 ... 285	9/16
1500/3000, 4/2-pole	80 M ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/18
1000/1500, 6/4-pole	80 M ... 200 L					9/18
750/1500, 8/4-pole	80 M ... 200 L					9/18

Self-ventilated motors for temperature/time class F400

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1LA6 and 1LG6 (motors with external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 190	2875 ... 2982	10 ... 608	6.5 ... 325	9/20
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1410 ... 1490	15 ... 1284	5.5 ... 345	9/20
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 990	15 ... 1546	4.5 ... 285	9/22
1500/3000, 4/2-pole	100 L ... 160 L	The electrical data can be calculated and supplied on receipt of order.				9/24
1000/1500, 6/4-pole	100 L ... 160 L					9/24
750/1500, 8/4-pole	100 L ... 160 L					9/24

Forced-air cooled motors for temperature/time class F400

Speed (No. of poles)	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Cast-iron series 1PP6 (motors without external fan)						
3000, 2-pole	100 L ... 315 L	3 ... 190	2875 ... 2982	10 ... 608	6.5 ... 325	9/26
1500, 4-pole	100 L ... 315 L	2.2 ... 200	1410 ... 1490	15 ... 1284	5.5 ... 345	9/26
1000, 6-pole	100 L ... 315 L	1.5 ... 160	925 ... 990	15 ... 1546	4.5 ... 285	9/28
1500/3000, 4/2-pole	100 L ... 160 M	The electrical data can be calculated and supplied on receipt of order.				9/30
1000/1500, 6/4-pole	100 L ... 160 L					9/30
750/1500, 8/4-pole	100 L ... 160 L					9/30

More information

For more information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²				
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.75	80 M	2830	2.5	63.0	0.82	2.1	2.3	5.6	2.4	16	0.00085	1LA7 080-2TA□□			10.2
1.1	80 M	2845	3.7	74.0	0.80	2.7	2.6	6.1	2.7	16	0.0011	1LA7 083-2TA□□			11.9
1.5	90 S	2860	5.0	73.0	0.80	3.7	2.4	5.5	2.7	16	0.0015	1LA7 090-2TA□□			15.2
2.2	90 L	2880	7.3	78.0	0.80	5.1	2.8	6.3	3.1	16	0.002	1LA7 096-2TA□□			18
3	100 L	2890	9.9	77.0	0.83	6.8	2.8	6.8	3.0	16	0.0038	1LA7 106-2TA□□			24
4	112 M	2905	13	82.0	0.83	8.5	2.6	7.2	2.9	16	0.0055	1LA7 113-2TA□□			32
5.5	132 S	2925	18	85.5	0.87	10.7	2.0	5.9	2.8	16	0.016	1LA7 130-2TA□□			45
7.5	132 S	2930	24	88.0	0.89	13.8	2.3	6.9	3.0	16	0.021	1LA7 131-2TA□□			53
11	160 M	2940	36	88.0	0.86	21	2.1	6.5	2.9	16	0.034	1LA7 163-2TA□□			74
15	160 M	2940	49	90.8	0.90	26.5	2.2	6.6	3.0	16	0.04	1LA7 164-2TA□□			85
18.5	160 L	2940	60	90.3	0.91	32.5	2.4	7.0	3.1	16	0.052	1LA7 166-2TA□□			98
22	180 M	2940	71	91.1	0.85	41	2.5	6.9	3.2	16	0.077	1LA5 183-2TA□□			125
30	200 L	2945	97	91.8	0.89	53	2.4	7.2	2.8	16	0.14	1LA5 206-2TA□□			176
37	200 L	2945	120	92.3	0.89	65	2.4	7.7	2.8	16	0.16	1LA5 207-2TA□□			199
45	225 M	2960	145	93.6	0.89	78	2.8	7.7	3.4	16	0.2	1LA5 223-2TA□□			235
55	250 M	2975	177	94.2	0.90	94	2.5	7.4	3.3	13	0.466	1LG6 253-2TB□□			420
75	280 S	2975	241	94.8	0.91	126	2.6	7.5	2.9	13	0.832	1LG6 280-2TB□□			530
90	280 M	2975	289	95.2	0.90	152	3.0	7.5	3.0	13	1.00	1LG6 283-2TB□□			615
110	315 S	2985	352	95.0	0.90	186	2.6	7.5	3.2	13	1.39	1LG6 310-2TB□□			790
132	315 M	2984	422	95.3	0.91	220	2.7	7.4	3.0	13	1.62	1LG6 313-2TB□□			915
160	315 L	2984	512	95.7	0.93	260	2.8	7.5	3.1	13	2.09	1LG6 316-2TB□□			1055
200	315 L	2984	640	95.9	0.93	325	2.5	7.0	2.8	13	2.46	1LG6 317-2TB□□			1245
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.55	80 M	1395	3.7	57.0	0.75	1.85	2.2	3.9	2.2	16	0.0015	1LA7 080-4TA□□			10
0.75	80 M	1405	5.1	63.0	0.73	2.35	2.3	4.2	2.3	16	0.0018	1LA7 083-4TA□□			11.4
1.1	90 S	1415	7.4	68.0	0.74	3.15	2.3	4.6	2.4	16	0.0028	1LA7 090-4TA□□			14.6
1.5	90 L	1420	10	73.0	0.74	4.0	2.4	5.3	2.6	16	0.0035	1LA7 096-4TA□□			17.9
2.2	100 L	1420	15	75.0	0.78	5.4	2.5	5.6	2.8	16	0.0048	1LA7 106-4TA□□			24
3	100 L	1415	20	77.0	0.78	7.2	2.7	5.6	3.0	16	0.0058	1LA7 107-4TA□□			27
4	112 M	1440	27	78.0	0.80	9.2	2.7	6.5	3.0	16	0.011	1LA7 113-4TA□□			34
5.5	132 S	1450	36	88.5	0.78	11.5	2.5	6.3	3.1	16	0.018	1LA7 130-4TA□□			47
7.5	132 M	1455	49	84.0	0.78	16.5	2.7	6.7	3.2	16	0.024	1LA7 133-4TA□□			53
11	160 M	1455	72	89.0	0.81	22	2.2	6.2	2.7	16	0.04	1LA7 163-4TA□□			73
15	160 L	1460	98	84.5	0.80	32	2.6	6.5	3.0	16	0.052	1LA7 166-4TA□□			98
18.5	180 M	1460	121	86.5	0.79	39	2.3	7.5	3.0	16	0.13	1LA5 183-4TA□□			125
22	180 L	1460	144	88.0	0.80	45	2.3	7.5	3.0	16	0.15	1LA5 186-4TA□□			139
30	200 L	1465	196	89.0	0.81	60	2.6	7.0	3.2	16	0.24	1LA5 207-4TA□□			184
37	225 S	1470	241	92.1	0.84	69	2.8	7.0	3.2	16	0.32	1LA5 220-4TA□□			230
45	225 M	1470	293	92.2	0.81	87	2.8	7.7	3.3	16	0.36	1LA5 223-4TA□□			256
55	250 M	1485	354	94.7	0.86	97	2.9	7.5	3.3	16	0.856	1LG6 253-4TA□□			460
75	280 S	1486	482	94.6	0.87	132	2.6	7.3	2.8	16	1.40	1LG6 280-4TA□□			575
90	280 M	1485	579	94.6	0.88	156	2.5	7.3	2.8	16	1.70	1LG6 283-4TA□□			675
110	315 S	1488	706	95.0	0.87	192	2.6	6.9	2.8	16	2.31	1LG6 310-4TA□□			810
132	315 M	1488	847	95.3	0.87	230	2.7	7.0	2.7	16	2.88	1LG6 313-4TA□□			965
160	315 L	1488	1027	95.7	0.87	275	2.9	7.4	2.9	16	3.46	1LG6 316-4TA□□			1105
200	315 L	1488	1284	95.5	0.88	345	3.2	7.3	3.1	16	4.22	1LG6 317-4TA□□			1305

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange					With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V3 2) 3)	IM V1 without protective cover 2) 3)	IM V1 with protective cover 3) 4)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LA5 183... to 1LA5 223... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.
- 3) 1LG6 253... to 1LG6 317... motors (motor series 1LG6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque								Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²				
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.37	80 M	920	3.9	62.0	0.72	1.2	1.9	3.1	2.1	16	0.0015		1LA7 080-6TA□□		9.5
0.55	80 M	910	5.8	67.0	0.74	1.6	2.1	3.4	2.2	16	0.0018		1LA7 083-6TA□□		11.4
0.75	90 S	915	7.8	68.0	0.76	2.1	2.2	3.7	2.2	16	0.0028		1LA7 090-6TA□□		14.8
1.1	90 L	915	11.5	71.0	0.77	2.9	2.3	3.8	2.3	16	0.0035		1LA7 096-6TA□□		18
1.5	100 L	925	15	74.0	0.75	3.9	2.3	4	2.3	16	0.0063		1LA7 106-6TA□□		26
2.2	112 M	940	22	76.0	0.70	6.0	2.2	4.6	2.5	16	0.011		1LA7 113-6TA□□		30
3	132 S	950	30	72.0	0.75	8.0	1.9	4.2	2.2	16	0.015		1LA7 130-6TA□□		45
4	132 M	950	40	81.0	0.76	9.4	2.1	4.5	2.4	16	0.019		1LA7 133-6TA□□		50
5.5	132 M	950	55	70.0	0.74	15.4	2.3	5	2.6	16	0.025		1LA7 134-6TA□□		58
7.5	160 M	960	75	83.5	0.72	18	2.1	4.6	2.5	16	0.041		1LA7 163-6TA□□		81
11	160 L	960	109	87.5	0.74	24.5	2.3	4.8	2.6	16	0.049		1LA7 166-6TA□□		107
15	180 L	970	148	89.5	0.70	34.5	2.0	5.2	2.4	16	0.15		1LA5 186-6TA□□		139
18.5	200 L	975	181	90.1	0.77	38.5	2.7	5.5	2.8	16	0.24		1LA5 206-6TA□□		184
22	200 L	975	215	93.5	0.73	46.5	2.8	5.5	2.9	16	0.28		1LA5 207-6TA□□		204
30	225 M	978	294	92.2	0.77	61	2.8	5.7	2.9	16	0.36		1LA5 223-6TA□□		246
37	250 M	984	359	92.4	0.84	69	2.7	6.4	2.4	16	0.934		1LG6 253-6TA□□		405
45	280 S	986	436	92.7	0.86	81	2.5	6.6	2.5	16	1.40		1LG6 280-6TA□□		520
55	280 M	986	533	92.6	0.87	99	2.5	6.5	2.5	16	1.60		1LG6 283-6TA□□		570
75	315 S	990	723	93.8	0.85	136	2.7	7.0	2.9	16	2.50		1LG6 310-6TA□□		760
90	315 M	990	868	94.2	0.86	160	2.7	7.3	3.0	16	3.20		1LG6 313-6TA□□		935
110	315 L	990	1061	94.6	0.87	192	2.6	7.4	3.0	16	4.02		1LG6 316-6TA□□		1010
132	315 L	988	1276	94.7	0.87	230	3.0	7.2	2.8	16	4.71		1LG6 317-6TA□□		1180
160	315 L	990	1543	94.9	0.86	285	3.1	7.5	3.0	16	5.39		1LG6 318-6TA□□		1245

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange		With flange			With standard flange		With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V3 2) 3)	IM V1 without protective cover 2) 3)	IM V1 with protective cover 3) 4)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 20 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LA5 22 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁵⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–
1LG6 318 □□	–	○	–	○	□ ⁶⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.
- 3) 1LG6 253-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) The "Second shaft extension" option, order code **K16** is not possible.
- 5) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 6) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm 3000 rpm		Frame size	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx.
P_{rated} kW	P_{rated} kW	FS			m kg
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.14	0.63	80 M	1LA7 080-0TA□□		11.0
0.23	0.86	80 M	1LA7 083-0TA□□		12.4
0.3	1.26	90 S	1LA7 090-0TA□□		14.6
0.45	1.8	90 L	1LA7 096-0TA□□		17.9
0.59	2.25	100 L	1LA7 106-0TA□□		24.0
0.72	2.8	100 L	1LA7 107-0TA□□		27.0
0.99	3.95	112 M	1LA7 113-0TA□□		34.0
1.3	5.3	132 S	1LA7 130-0TA□□		47.0
1.8	7.2	132 M	1LA7 133-0TA□□		53.0
2.6	10.4	160 M	1LA7 163-0TA□□		74.0
3.85	15.3	160 L	1LA7 166-0TA□□		105.0
Rated output at 50 Hz 1000 rpm 1500 rpm					
P_{rated} kW	P_{rated} kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.11	0.36	80 M	1LA7 080-1TD□□		10.0
0.16	0.5	80 M	1LA7 083-1TD□□		11.4
0.26	0.72	90 S	1LA7 090-1TD□□		14.6
0.34	0.99	90 L	1LA7 096-1TD□□		17.9
0.54	1.53	100 L	1LA7 106-1TD□□		24.0
0.68	1.89	100 L	1LA7 107-1TD□□		27.0
0.81	2.7	112 M	1LA7 113-1TD□□		34.0
1.08	3.5	132 S	1LA7 130-1TD□□		47.0
1.53	4.85	132 M	1LA7 133-1TD□□		53.0
2.25	6.5	160 M	1LA7 163-1TD□□		73.0
3.35	10.8	160 L	1LA7 166-1TD□□		98.0
4.95	14.4	180 M	1LA5 183-1TD□□		125.0
5.9	17.1	180 L	1LA5 186-1TD□□		139.0
8.6	23.5	200 L	1LA5 207-1TD□□		184.0
Rated output at 50 Hz 750 rpm 1500 rpm					
P_{rated} kW	P_{rated} kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.09	0.45	80 M	1LA7 080-0TB□□		10.0
0.14	0.63	80 M	1LA7 083-0TB□□		11.4
0.2	0.9	90 S	1LA7 090-0TB□□		14.6
0.3	1.35	90 L	1LA7 096-0TB□□		17.9
0.45	1.8	100 L	1LA7 106-0TB□□		24.0
0.59	2.25	100 L	1LA7 107-0TB□□		27.0
0.81	3.25	112 M	1LA7 113-0TB□□		34.0
0.99	4.25	132 S	1LA7 130-0TB□□		47.0
1.26	5.8	132 M	1LA7 133-0TB□□		53.0
1.98	8.6	160 M	1LA7 163-0TB□□		73.0
3	12.6	160 L	1LA7 166-0TB□□		98.0
4.05	14.4	180 M	1LA5 183-0TB□□		125.0
4.5	16.7	180 L	1LA5 186-0TB□□		139.0
6.8	25	200 L	1LA5 207-0TB□□		184.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time classes F200, F300 -
Aluminium series 1LA7/5, cast-iron series 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code								
	50 Hz, direct online starting			Without flange	With flange				With standard flange			With special flange
	230 V	400 V	500 V		IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3 ¹⁾	IM V1 without protective cover ¹⁾	IM V1 with protective cover ¹⁾²⁾	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14 IM V19/18 without protective cover
	1	6	5	0	1	1	8	4	6	2	7	3
1LA7 08 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 09 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 10 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 11 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 13 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA7 16 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA5 18 □□	○	○	○	□	✓ ³⁾	✓	–	✓	✓	–	–	–
1LA5 20 □□	○	○	○	□	✓ ³⁾	✓	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1LA5 183-... to 1LA5 223-... motors (motor series 1LA5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

²⁾ The "Second shaft extension" option, order code **K16** is not possible.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²				
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.75	80 M	2830	2.5	63.0	0.82	2.1	2.3	5.6	2.4	16	0.00085	1PP7 080-2TA□□			9.8
1.1	80 M	2845	3.7	74.0	0.80	2.7	2.6	6.1	2.7	16	0.0011	1PP7 083-2TA□□			11.5
1.5	90 S	2860	5.0	73.0	0.80	3.7	2.4	5.5	2.7	16	0.0015	1PP7 090-2TA□□			14.6
2.2	90 L	2880	7.3	78.0	0.80	5.1	2.8	6.3	3.1	16	0.002	1PP7 096-2TA□□			17.4
3	100 L	2890	9.9	77.0	0.83	6.8	2.8	6.8	3.0	16	0.0038	1PP7 106-2TA□□			23
4	112 M	2905	13	82.0	0.83	8.5	2.6	7.2	2.9	16	0.0055	1PP7 113-2TA□□			31
5.5	132 S	2925	18	85.5	0.87	10.7	2.0	5.9	2.8	16	0.016	1PP7 130-2TA□□			44
7.5	132 S	2930	24	88.0	0.89	13.8	2.3	6.9	3.0	16	0.021	1PP7 131-2TA□□			52
11	160 M	2940	36	88.0	0.86	21	2.1	6.5	2.9	16	0.034	1PP7 163-2TA□□			71
15	160 M	2940	49	90.8	0.90	26.5	2.2	6.6	3.0	16	0.04	1PP7 164-2TA□□			82
18.5	160 L	2940	60	90.3	0.91	32.5	2.4	7.0	3.1	16	0.052	1PP7 166-2TA□□			95
22	180 M	2940	71	91.1	0.85	41	2.5	6.9	3.2	16	0.077	1PP5 183-2TA□□			119
30	200 L	2945	97	91.8	0.89	53	2.4	7.2	2.8	16	0.14	1PP5 206-2TA□□			168
37	200 L	2945	120	92.3	0.89	65	2.4	7.7	2.8	16	0.16	1PP5 207-2TA□□			191
45	225 M	2960	145	93.6	0.89	78	2.8	7.7	3.4	16	0.2	1PP5 223-2TA□□			226
55	250 M	2975	177	95.1	0.90	94	2.5	7.4	3.3	13	0.466	1PP6 253-2TB□□			405
75	280 S	2975	241	95.3	0.91	126	2.6	7.5	2.9	13	0.832	1PP6 280-2TB□□			510
90	280 M	2975	289	95.6	0.90	152	3.0	7.5	3.0	13	1.00	1PP6 283-2TB□□			595
110	315 S	2985	352	95.9	0.90	186	2.6	7.5	3.2	13	1.39	1PP6 310-2TB□□			770
132	315 M	2984	422	96.1	0.91	220	2.7	7.4	3.0	13	1.62	1PP6 313-2TB□□			895
160	315 L	2984	512	96.3	0.93	260	2.8	7.5	3.1	13	2.09	1PP6 316-2TB□□			1035
200	315 L	2984	640	96.4	0.93	325	2.5	7.0	2.8	13	2.46	1PP6 317-2TB□□			1225
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.55	80 M	1395	3.7	57.0	0.75	1.85	2.2	3.9	2.2	16	0.0015	1PP7 080-4TA□□			9.6
0.75	80 M	1405	5.1	63.0	0.73	2.35	2.3	4.2	2.3	16	0.0018	1PP7 083-4TA□□			11
1.1	90 S	1415	7.4	68.0	0.74	3.15	2.3	4.6	2.4	16	0.0028	1PP7 090-4TA□□			14
1.5	90 L	1420	10	73.0	0.74	4.0	2.4	5.3	2.6	16	0.0035	1PP7 096-4TA□□			17.3
2.2	100 L	1420	15	75.0	0.78	5.4	2.5	5.6	2.8	16	0.0048	1PP7 106-4TA□□			23
3	100 L	1415	20	77.0	0.78	7.2	2.7	5.6	3.0	16	0.0058	1PP7 107-4TA□□			26
4	112 M	1440	27	78.0	0.80	9.2	2.7	6.5	3.0	16	0.011	1PP7 113-4TA□□			33
5.5	132 S	1450	36	88.5	0.78	11.5	2.5	6.3	3.1	16	0.018	1PP7 130-4TA□□			46
7.5	132 M	1455	49	84.0	0.78	16.5	2.7	6.7	3.2	16	0.024	1PP7 133-4TA□□			52
11	160 M	1455	72	89.0	0.81	22	2.2	6.2	2.7	16	0.04	1PP7 163-4TA□□			70
15	160 L	1460	98	84.5	0.80	32	2.6	6.5	3.0	16	0.052	1PP7 166-4TA□□			95
18.5	180 M	1460	121	86.5	0.79	39	2.3	7.5	3.0	16	0.13	1PP5 183-4TA□□			116
22	180 L	1460	144	88.0	0.80	45	2.3	7.5	3.0	16	0.15	1PP5 186-4TA□□			130
30	200 L	1465	196	89.0	0.81	60	2.6	7.0	3.2	16	0.24	1PP5 207-4TA□□			173
37	225 S	1470	241	92.1	0.84	69	2.8	7.0	3.2	16	0.32	1PP5 220-4TA□□			218
45	225 M	1470	293	92.2	0.81	87	2.8	7.7	3.3	16	0.36	1PP5 223-4TA□□			244
55	250 M	1485	354	94.9	0.86	97	2.9	7.5	3.3	16	0.856	1PP6 253-4TA□□			445
75	280 S	1486	482	95.0	0.87	132	2.6	7.3	2.8	16	1.39	1PP6 280-4TA□□			555
90	280 M	1485	579	94.9	0.88	156	2.5	7.3	2.8	16	1.71	1PP6 283-4TA□□			655
110	315 S	1488	706	95.3	0.87	192	2.6	6.9	2.8	16	2.31	1PP6 310-4TA□□			790
132	315 M	1488	847	95.5	0.87	230	2.7	7.0	2.7	16	2.88	1PP6 313-4TA□□			945
160	315 L	1488	1027	95.9	0.87	275	2.9	7.4	2.9	16	3.46	1PP6 316-4TA□□			1085
200	315 L	1488	1284	95.7	0.88	345	3.2	7.3	3.1	16	4.22	1PP6 317-4TA□□			1285

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code					Final position: Type of construction code						
	50 Hz					Without flange	With flange			With standard flange	With special flange	
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ		IM B3/6/7/8, IM V6/5 without protective cover 1)	IM B5, IM V3 2) 3)	IM V1 without protective cover 2)	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover
	1	6	3	5	0	1	1	8	6	2	7	3
1PP7 08 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–
1PP6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.
- 3) 1PP6 253-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output						Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V	with direct starting as multiple of rated torque	with direct starting as multiple of rated current							Type of construction IM B3 approx. m kg
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kg m ²				
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3															
0.37	80 M	920	3.9	62.0	0.72	1.2	1.9	3.1	2.1	16	0.0015	1PP7 080-6TA□□			9.6
0.55	80 M	910	5.8	67.0	0.74	1.6	2.1	3.4	2.2	16	0.0018	1PP7 083-6TA□□			11
0.75	90 S	915	7.8	68.0	0.76	2.1	2.2	3.7	2.2	16	0.0028	1PP7 090-6TA□□			14.2
1.1	90 L	915	11.5	71.0	0.77	2.9	2.3	3.8	2.3	16	0.0035	1PP7 096-6TA□□			17.4
1.5	100 L	925	15	74.0	0.75	3.9	2.3	4	2.3	16	0.0063	1PP7 106-6TA□□			25
2.2	112 M	940	22	76.0	0.70	6.0	2.2	4.6	2.5	16	0.011	1PP7 113-6TA□□			29
3	132 S	950	30	72.0	0.75	8.0	1.9	4.2	2.2	16	0.015	1PP7 130-6TA□□			44
4	132 M	950	40	81.0	0.76	9.4	2.1	4.5	2.4	16	0.019	1PP7 133-6TA□□			49
5.5	132 M	950	55	70.0	0.74	15.4	2.3	5	2.6	16	0.025	1PP7 134-6TA□□			57
7.5	160 M	960	75	83.5	0.72	18	2.1	4.6	2.5	16	0.041	1PP7 163-6TA□□			78
11	160 L	960	109	87.5	0.74	24.5	2.3	4.8	2.6	16	0.049	1PP7 166-6TA□□			104
15	180 L	970	148	89.5	0.70	34.5	2.0	5.2	2.4	16	0.15	1PP5 186-6TA□□			130
18.5	200 L	975	181	90.1	0.77	38.5	2.7	5.5	2.8	16	0.24	1PP5 206-6TA□□			173
22	200 L	975	215	93.5	0.73	46.5	2.8	5.5	2.9	16	0.28	1PP5 207-6TA□□			193
30	225 M	978	294	92.2	0.77	61	2.8	5.7	2.9	16	0.36	1PP5 223-6TA□□			234
37	250 M	984	359	92.6	0.84	69	2.7	6.4	2.4	16	0.934	1PP6 253-6TA□□			390
45	280 S	986	436	92.8	0.86	81	2.5	6.6	2.5	16	1.37	1PP6 280-6TA□□			500
55	280 M	986	533	92.7	0.87	99	2.5	6.5	2.5	16	1.65	1PP6 283-6TA□□			550
75	315 S	990	723	93.9	0.85	136	2.7	7.0	2.9	16	2.50	1PP6 310-6TA□□			740
90	315 M	990	868	94.3	0.86	160	2.7	7.3	3.0	16	3.20	1PP6 313-6TA□□			915
110	315 L	990	1061	94.7	0.87	192	2.6	7.4	3.0	16	4.02	1PP6 316-6TA□□			990
132	315 L	988	1276	94.8	0.87	230	3.0	7.2	2.8	16	4.71	1PP6 317-6TA□□			1160
160	315 L	990	1543	95.0	0.86	285	3.1	7.5	3.0	16	5.39	1PP6 318-6TA□□			1225

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code					Final position: Type of construction code						
	50 Hz					Without flange	With flange			With standard flange	With special flange	
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ		IM B3/6/7/8, IM V6/5 without protective cover ¹⁾	IM B5, IM V3 ^{2) 3)}	IM V1 without protective cover ²⁾	IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover
	1	6	3	5	0	1	1	8	6	2	7	3
1PP7 08 .-... □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 .-... □□	○	○	○	–	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 .-... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 .-... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 .-... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 .-... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 20 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP5 22 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 25 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 28 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 310 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 313 .-... □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	–	–	–
1PP6 316 .-... □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	–	–	–
1PP6 317 .-... □□												
1PP6 318 .-... □□												

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors frame sizes 180 M to 315 L in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1PP5 183... to 1PP5 223... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.
- 3) 1PP6 253... to 1PP6 318... motors (motor series 1PP6 frame sizes 250 M to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm 3000 rpm		Frame size	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx.
P_{rated} kW	P_{rated} kW	FS			
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.14	0.63	80 M	1PP7 080-0TA□□		10.6
0.23	0.86	80 M	1PP7 083-0TA□□		12.0
0.3	1.26	90 S	1PP7 090-0TA□□		14.0
0.45	1.8	90 L	1PP7 096-0TA□□		17.3
0.59	2.25	100 L	1PP7 106-0TA□□		23.0
0.72	2.8	100 L	1PP7 107-0TA□□		26.0
0.99	3.95	112 M	1PP7 113-0TA□□		33.0
1.3	5.3	132 S	1PP7 130-0TA□□		46.0
1.8	7.2	132 M	1PP7 133-0TA□□		52.0
2.6	10.4	160 M	1PP7 163-0TA□□		70.0
3.85	15.3	160 L	1PP7 166-0TA□□		101.0
Rated output at 50 Hz 1000 rpm 1500 rpm					
P_{rated} kW	P_{rated} kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.11	0.36	80 M	1PP7 080-1TD□□		9.6
0.16	0.5	80 M	1PP7 083-1TD□□		11.0
0.26	0.72	90 S	1PP7 090-1TD□□		14.0
0.34	0.99	90 L	1PP7 096-1TD□□		17.3
0.54	1.53	100 L	1PP7 106-1TD□□		23.0
0.68	1.89	100 L	1PP7 107-1TD□□		26.0
0.81	2.7	112 M	1PP7 113-1TD□□		33.0
1.08	3.5	132 S	1PP7 130-1TD□□		46.0
1.53	4.85	132 M	1PP7 133-1TD□□		52.0
2.25	6.5	160 M	1PP7 163-1TD□□		70.0
3.35	10.8	160 L	1PP7 166-1TD□□		95.0
4.95	14.4	180 M	1PP5 183-1TD□□		116.0
5.9	17.1	180 L	1PP5 186-1TD□□		130.0
8.6	23.5	200 L	1PP5 207-1TD□□		173.0
Rated output at 50 Hz 750 rpm 1500 rpm					
P_{rated} kW	P_{rated} kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN12101-3					
0.09	0.45	80 M	1PP7 080-0TB□□		9.6
0.14	0.63	80 M	1PP7 083-0TB□□		11.0
0.2	0.9	90 S	1PP7 090-0TB□□		14.0
0.3	1.35	90 L	1PP7 096-0TB□□		17.3
0.45	1.8	100 L	1PP7 106-0TB□□		23.0
0.59	2.25	100 L	1PP7 107-0TB□□		26.0
0.81	3.25	112 M	1PP7 113-0TB□□		33.0
0.99	4.25	132 S	1PP7 130-0TB□□		46.0
1.26	5.8	132 M	1PP7 133-0TB□□		52.0
1.98	8.6	160 M	1PP7 163-0TB□□		70.0
3	12.6	160 L	1PP7 166-0TB□□		95.0
4.05	14.4	180 M	1PP5 183-0TB□□		116.0
4.5	16.7	180 L	1PP5 186-0TB□□		130.0
6.8	25	200 L	1PP5 207-0TB□□		173.0

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time classes F200, F300 - Aluminium series 1PP7/5, cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code							
	50 Hz, direct online starting			Without flange	With flange				With standard flange		With special flange
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3 1)	IM V 1 without protective cover 1)		IM B35	IM B14, IM V19/18 without protective cover	IM B34	IM B14, IM V19/18 without protective cover
	1	6	5	0	1	1	8	6	2	7	3
1PP7 08 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 09 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 10 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 11 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 13 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP7 16 .-... □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP5 18 .-... □□	○	○	○	□	✓ 2)	✓	–	✓	–	–	–
1PP5 20 .-... □□	○	○	○	□	✓ 2)	✓	–	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ 1PP5 183-... to 1PP5 223-... motors (motor series 1PP5, frame size 180 M to 225 M) can be supplied with two additional eyebolts; specify supplement **"Z"** and order code **K32**.

²⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²			Type of construction IM B3 approx. m kg
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
3	100 L	2875	10	78.0	0.85	6.5	2.5	6.2	2.8	16	0.0038	1LA6 106-2UA□□		32
4	112 M	2900	13	78.0	0.85	8.7	2.5	6.8	2.9	16	0.0055	1LA6 113-2UA□□		41
5.5	132 S	2920	18	82.5	0.89	10.8	1.9	5.7	2.7	16	0.016	1LA6 130-2UA□□		51
7.5	132 S	2930	24	84.0	0.89	14.5	2.0	6.5	2.8	16	0.021	1LA6 131-2UA□□		56
11	160 M	2940	36	88.0	0.88	20.5	1.8	6.4	2.7	16	0.034	1LA6 163-2UA□□		93
15	160 M	2930	49	88.5	0.89	27.5	2.0	6.5	2.80	16	0.04	1LA6 164-2UA□□		102
18.5	160 L	2930	60	87.5	0.90	34	2.0	7.0	2.70	16	0.05	1LA6 166-2UA□□		112
22	180 M	2955	71	92.6	0.88	39	2.4	7.0	3.2	16	0.086	1LG6 183-2UA□□		180
30	200 L	2955	97	92.2	0.88	53	2.3	6.7	3.1	16	0.151	1LG6 206-2UA□□		225
37	200 L	2958	119	92.5	0.89	65	2.4	7.1	3.2	16	0.182	1LG6 207-2UA□□		255
45	225 M	2962	145	94.6	0.89	77	2.4	7.1	3.1	16	0.266	1LG6 223-2UA□□		330
55	250 M	2972	177	94.3	0.90	94	2.3	6.7	2.9	16	0.466	1LG6 253-2UA□□		420
75	280 S	2975	241	94.5	0.89	128	2.4	6.8	2.9	13	0.832	1LG6 280-2UB□□		530
90	280 M	2976	289	94.9	0.90	152	2.5	7.4	3.0	13	1.00	1LG6 283-2UB□□		615
110	315 S	2982	352	94.7	0.91	184	2.4	6.8	2.7	13	1.39	1LG6 310-2UB□□		790
132	315 M	2980	423	95.2	0.91	220	2.5	6.9	2.8	13	1.62	1LG6 313-2UB□□		915
160	315 L	2982	512	95.6	0.92	265	2.4	7.1	2.8	13	2.09	1LG6 316-2UB□□		1055
190	315 L	2982	608	95.9	0.93	325	2.6	7.2	2.9	13	2.46	1LG6 317-2UB□□		1245
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
2.2	100 L	1410	15	74.0	0.78	5.5	2.2	5.2	2.7	16	0.0048	1LA6 106-4UA□□		32
3	100 L	1410	20	76.0	0.80	7.1	2.5	5.0	2.6	16	0.0058	1LA6 107-4UA□□		34
4	112 M	1440	27	79.0	0.75	9.8	2.7	5.7	3.0	16	0.011	1LA6 113-4UA□□		43
5.5	132 S	1455	36	78.0	0.75	13.5	2.5	6.3	3.0	16	0.018	1LA6 130-4UA□□		53
7.5	132 M	1455	49	84.0	0.75	17.2	2.7	6.7	3.1	16	0.024	1LA6 133-4UA□□		60
11	160 M	1460	72	82.5	0.80	24	2.2	6.2	2.7	16	0.04	1LA6 163-4UA□□		97
15	160 L	1460	98	81.5	0.78	34	2.4	6.4	2.8	16	0.052	1LA6 166-4UA□□		110
18.5	180 M	1470	120	90.7	0.84	35	2.4	6.1	2.8	16	0.122	1LG6 183-4UA□□		155
22	180 L	1472	143	91.7	0.85	40.5	2.4	6.4	2.9	16	0.144	1LG6 186-4UA□□		180
30	200 L	1470	195	92.2	0.86	55	2.4	6.4	3.1	16	0.234	1LG6 207-4UA□□		225
37	225 S	1480	239	92.6	0.86	67	2.6	6.5	2.8	16	0.398	1LG6 220-4UA□□		290
45	225 M	1480	290	93.3	0.86	81	2.7	6.6	2.9	16	0.486	1LG6 223-4UA□□		330
55	250 M	1485	354	94.2	0.87	97	2.5	7.4	2.9	16	0.856	1LG6 253-4UA□□		460
75	280 S	1484	483	94.2	0.87	132	2.4	6.7	2.8	16	1.39	1LG6 280-4UA□□		574
90	280 M	1486	578	94.7	0.86	160	2.6	7.3	3.0	16	1.71	1LG6 283-4UA□□		675
110	315 S	1488	706	95.0	0.87	192	2.7	7.0	2.8	16	2.31	1LG6 310-4UA□□		810
132	315 M	1488	847	95.3	0.88	225	2.6	7.1	2.8	16	2.88	1LG6 313-4UA□□		965
160	315 L	1490	1025	95.6	0.88	275	2.9	7.2	2.9	16	3.46	1LG6 316-4UA□□		1105
200	315 L	1488	1284	95.7	0.88	345	3.1	7.5	2.9	16	4.22	1LG6 317-4UA□□		1305

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange					With standard flange	With special flange	
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V3 2)	IM V1 without protective cover 2)	IM V1 with protective cover 2) 3)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LG6 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors 1LG6 183-... to 1LG6 317-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LG6 220-... to 1LG6 317-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting as multiple of rated torque	Locked-rotor current as multiple of rated current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²			
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
1.5	100 L	925	15	69.0	0.70	4.5	2.3	4.0	2.3	16	0.0063	1LA6 106-6UA□□		32
2.2	112 M	955	22	72.0	0.74	6.0	2.1	4.4	2.3	16	0.011	1LA6 113-6UA□□		43
3	132 S	950	30	74.0	0.75	7.8	1.6	4.1	1.7	16	0.015	1LA6 130-6UA□□		54
4	132 M	950	40	76.0	0.76	10	1.7	4.6	2.1	16	0.019	1LA6 133-6UA□□		63
5.5	132 M	950	55	75.0	0.76	14	2.0	5.0	2.3	16	0.025	1LA6 134-6UA□□		74
7.5	160 M	960	75	75.0	0.72	20	2.0	5.0	2.4	16	0.041	1LA6 163-6UA□□		110
11	160 L	960	109	80.0	0.72	27.5	2.0	5.0	2.5	16	0.049	1LA6 166-6UA□□		132
15	180 L	974	147	88.7	0.82	30	2.2	5.2	2.3	16	0.203	1LG6 186-6UA□□		175
18.5	200 L	975	181	89.4	0.82	36.5	2.2	5.3	2.3	16	0.285	1LG6 206-6UA□□		210
22	200 L	975	215	90.5	0.83	42.5	2.2	5.4	2.3	16	0.362	1LG6 207-6UA□□		240
30	225 M	980	292	92.2	0.84	56	2.7	6.3	2.8	16	0.629	1LG6 223-6UA□□		325
37	250 M	984	359	92.6	0.84	69	2.8	6.5	2.4	16	0.934	1LG6 253-6UA□□		405
45	280 S	986	436	92.3	0.86	82	2.8	6.3	2.5	16	1.37	1LG6 280-6UA□□		520
55	280 M	986	533	92.8	0.86	99	3.1	6.8	2.7	16	1.65	1LG6 283-6UA□□		570
75	315 S	990	723	93.7	0.84	138	2.7	7.0	2.9	16	2.50	1LG6 310-6UA□□		760
90	315 M	988	870	94.2	0.85	162	2.6	7.1	2.8	16	3.20	1LG6 313-6UA□□		935
110	315 L	988	1063	94.5	0.85	198	2.8	7.2	2.8	16	4.02	1LG6 316-6UA□□		1010
132	315 L	990	1273	94.9	0.85	235	3.0	7.5	3.0	16	4.71	1LG6 317-6UA□□		1180
160	315 L	988	1546	94.9	0.86	285	3.1	7.5	3.0	16	5.39	1LG6 318-6UA□□		1245

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code								
	50 Hz				Without flange	With flange					With standard flange		With special flange
	230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover 1)	IM B5, IM V3 2)	IM V1 without protective cover 2)	IM V1 with protec-tive cover 2) 3)	IM B35	IM B14, IM V19, IM V18 without protec-tive cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LG6 18 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 20 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 22 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 25 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 28 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 310 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 313 □□	○	○	○	○	□	✓ ⁴⁾	✓	–	✓	✓	–	–	–
1LG6 316 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–
1LG6 317 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–
1LG6 318 □□	–	○	–	○	□ ⁵⁾	–	–	✓	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

- 1) If motors 1LG6 183-... to 1LG6 318-... (motor series 1LG6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.
- 2) 1LG6 220-... to 1LG6 318-... motors (motor series 1LG6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

- 3) The "Second shaft extension" option, order code **K16** is not possible.
- 4) Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.
- 5) Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm 3000 rpm		Frame size	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx.
P_{rated} kW	P_{rated} kW	FS			m kg
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.52	2	100 L	1LA6 106-0UA□□		32
0.64	2.5	100 L	1LA6 107-0UA□□		35
0.88	3.5	112 M	1LA6 113-0UA□□		43
1.16	4.7	132 S	1LA6 130-0UA□□		53
1.6	6.4	132 M	1LA6 133-0UA□□		60
2.3	9.2	160 M	1LA6 163-0UA□□		97
3.45	13.6	160 L	1LA6 166-0UA□□		110
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.48	1.36	100 L	1LA6 106-1UD□□		32
0.6	1.68	100 L	1LA6 107-1UD□□		35
0.72	2.4	112 M	1LA6 113-1UD□□		43
0.96	3.1	132 S	1LA6 130-1UD□□		53
1.36	4.3	132 M	1LA6 133-1UD□□		60
2	5.75	160 M	1LA6 163-1UD□□		97
2.95	9.6	160 L	1LA6 166-1UD□□		110
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.3	1.6	100 L	1LA6 106-0UB□□		32
0.52	2	100 L	1LA6 107-0UB□□		35
0.72	2.85	112 M	1LA6 113-0UB□□		43
0.88	3.75	132 S	1LA6 130-0UB□□		53
1.12	5.1	132 M	1LA6 133-0UB□□		60
1.76	7.6	160 M	1LA6 163-0UB□□		97
2.6	11.2	160 L	1LA6 166-0UB□□		110

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Self-ventilated, for temperature/time class F400
Cast-iron series 1LA6, 1LG6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code								
	50 Hz, direct online starting			Without flange	With flange					With standard flange	With special flange	
	230 V	400 V	500 V	IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3	IM V1 without protective cover	IM V1 with protective cover 1)	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	5	0	1	1	8	4	6	2	7	3
1LA6 10 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 11 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 13 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓
1LA6 16 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ The "Second shaft extension" option, order code **K16** is not possible.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²			Type of construction IM B3 approx. m kg
2-pole, 3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
3	100 L	2875	10	78.0	0.85	6.5	2.5	6.2	2.8	16	0.0038	1PP6 106-2UA□□		31
4	112 M	2900	13	78.0	0.85	8.7	2.5	6.8	2.9	16	0.0055	1PP6 113-2UA□□		40
5.5	132 S	2920	18	82.5	0.89	10.8	1.9	5.7	2.7	16	0.016	1PP6 130-2UA□□		49
7.5	132 S	2930	24	84.0	0.89	14.5	2.0	6.5	2.8	16	0.021	1PP6 131-2UA□□		54
11	160 M	2940	36	88.0	0.88	20.5	1.8	6.4	2.7	16	0.034	1PP6 163-2UA□□		91
15	160 M	2930	49	88.5	0.89	27.5	2.0	6.5	2.80	16	0.04	1PP6 164-2UA□□		99
18.5	160 L	2930	60	87.5	0.90	34	2.0	7.0	2.70	16	0.052	1PP6 166-2UA□□		109
22	180 M	2955	71	93.1	0.88	39	2.4	7.0	3.2	16	0.086	1PP6 183-2UA□□		175
30	200 L	2955	97	92.8	0.88	53	2.3	6.7	3.1	16	0.151	1PP6 206-2UA□□		215
37	200 L	2958	119	93.0	0.89	65	2.4	7.1	3.2	16	0.182	1PP6 207-2UA□□		245
45	225 M	2962	145	95.0	0.89	77	2.4	7.1	3.1	16	0.266	1PP6 223-2UA□□		320
55	250 M	2972	177	94.9	0.90	94	2.3	6.7	2.9	16	0.466	1PP6 253-2UA□□		405
75	280 S	2975	241	94.9	0.89	128	2.4	6.8	2.9	13	0.832	1PP6 280-2UB□□		510
90	280 M	2976	289	95.2	0.90	152	2.5	7.4	3.0	13	1.00	1PP6 283-2UB□□		595
110	315 S	2982	352	95.3	0.91	184	2.4	6.8	2.7	13	1.39	1PP6 310-2UB□□		770
132	315 M	2980	423	95.7	0.91	220	2.5	6.9	2.8	13	1.62	1PP6 313-2UB□□		895
160	315 L	2982	512	96.0	0.92	265	2.4	7.1	2.8	13	2.09	1PP6 316-2UB□□		1035
190	315 L	2982	608	96.3	0.93	325	2.6	7.2	2.9	13	2.46	1PP6 317-2UB□□		1225
4-pole, 1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
2.2	100 L	1410	15	74.0	0.78	5.5	2.2	5.2	2.7	16	0.0048	1PP6 106-4UA□□		31
3	100 L	1410	20	76.0	0.80	7.1	2.5	5.0	2.6	16	0.0058	1PP6 107-4UA□□		34
4	112 M	1440	27	79.0	0.75	9.8	2.7	5.7	3.0	16	0.011	1PP6 113-4UA□□		42
5.5	132 S	1455	36	78.0	0.75	13.5	2.5	6.3	3.0	16	0.018	1PP6 130-4UA□□		51
7.5	132 M	1455	49	84.0	0.75	17.2	2.7	6.7	3.1	16	0.024	1PP6 133-4UA□□		58
11	160 M	1460	72	82.5	0.80	24	2.2	6.2	2.7	16	0.04	1PP6 163-4UA□□		95
15	160 L	1460	98	81.5	0.78	34	2.4	6.4	2.8	16	0.052	1PP6 166-4UA□□		108
18.5	180 M	1470	120	91.2	0.84	35	2.4	6.1	2.8	16	0.122	1PP6 183-4UA□□		150
22	180 L	1472	143	92.1	0.85	40.5	2.4	6.4	2.9	16	0.144	1PP6 186-4UA□□		175
30	200 L	1470	195	92.6	0.86	55	2.4	6.4	3.1	16	0.234	1PP6 207-4UA□□		215
37	225 S	1480	239	92.9	0.86	67	2.6	6.5	2.8	16	0.398	1PP6 220-4UA□□		280
45	225 M	1480	290	93.6	0.86	81	2.7	6.6	2.9	16	0.486	1PP6 223-4UA□□		320
55	250 M	1485	354	94.5	0.87	97	2.5	7.4	2.9	16	0.856	1PP6 253-4UA□□		445
75	280 S	1484	483	94.6	0.87	132	2.4	6.7	2.8	16	1.39	1PP6 280-4UA□□		554
90	280 M	1486	578	95.1	0.86	160	2.6	7.3	3.0	16	1.71	1PP6 283-4UA□□		655
110	315 S	1488	706	95.3	0.87	192	2.7	7.0	2.8	16	2.31	1PP6 310-4UA□□		790
132	315 M	1488	847	95.6	0.88	225	2.6	7.1	2.8	16	2.88	1PP6 313-4UA□□		945
160	315 L	1490	1025	95.8	0.88	275	2.9	7.2	2.9	16	3.46	1PP6 316-4UA□□		1085
200	315 L	1488	1284	95.9	0.88	345	3.1	7.5	2.9	16	4.22	1PP6 317-4UA□□		1285

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange				With standard flange	With special flange	
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover	IM B35		IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	3	5	0	1	1	8	6	2	7	3
1PP6 10... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 11... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 13... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 16... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 18... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 20... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 22... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 25... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 28... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 310... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 313... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 316... □□	–	○	–	○	□ ⁴⁾	–	–	✓	✓	–	–	–
1PP6 317... □□	–	○	–	○	□ ⁴⁾	–	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP6 183... to 1PP6 318... (motor series 1PP6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP6 220... to 1PP6 318... motors (motor series 1PP6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁴⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight Type of construction IM B3 approx. m kg
		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency at 50 Hz 4/4-load	Power factor at 50 Hz 4/4-load	Rated current at 50 Hz 400 V								
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	$T_{\text{LR}}/T_{\text{rated}}$	$I_{\text{LR}}/I_{\text{rated}}$	$T_{\text{B}}/T_{\text{rated}}$	CL	J kg m ²			
6-pole, 1000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, with test certificate according to EN 12101-3														
1.5	100 L	925	15	69.0	0.70	4.5	2.3	4.0	2.3	16	0.0063	1PP6 106-6UA□□		31
2.2	112 M	955	22	72.0	0.74	6.0	2.1	4.4	2.3	16	0.011	1PP6 113-6UA□□		42
3	132 S	950	30	74.0	0.75	7.8	1.6	4.1	1.7	16	0.015	1PP6 130-6UA□□		52
4	132 M	950	40	76.0	0.76	10	1.7	4.6	2.1	16	0.019	1PP6 133-6UA□□		62
5.5	132 M	950	55	75.0	0.76	14	2.0	5.0	2.3	16	0.025	1PP6 134-6UA□□		72
7.5	160 M	960	75	75.0	0.72	20	2.0	5.0	2.4	16	0.041	1PP6 163-6UA□□		107
11	160 L	960	109	80.0	0.72	27.5	2.0	5.0	2.5	16	0.049	1PP6 166-6UA□□		129
15	180 L	974	147	88.9	0.82	30	2.2	5.2	2.3	16	0.203	1PP6 186-6UA□□		170
18.5	200 L	975	181	89.8	0.82	36.5	2.2	5.3	2.3	16	0.285	1PP6 206-6UA□□		200
22	200 L	975	215	90.8	0.83	42.5	2.2	5.4	2.3	16	0.362	1PP6 207-6UA□□		230
30	225 M	980	292	92.3	0.84	56	2.7	6.3	2.8	16	0.629	1PP6 223-6UA□□		315
37	250 M	984	359	93.0	0.84	69	2.8	6.5	2.4	16	0.934	1PP6 253-6UA□□		390
45	280 S	986	436	92.6	0.86	82	2.8	6.3	2.5	16	1.37	1PP6 280-6UA□□		500
55	280 M	986	533	93.1	0.86	99	3.1	6.8	2.7	16	1.65	1PP6 283-6UA□□		550
75	315 S	990	723	94.0	0.84	138	2.7	7.0	2.9	16	2.50	1PP6 310-6UA□□		740
90	315 M	988	870	94.5	0.85	162	2.6	7.1	2.8	16	2.50	1PP6 313-6UA□□		915
110	315 L	988	1063	94.7	0.85	198	2.8	7.2	2.8	16	2.50	1PP6 316-6UA□□		990
132	315 L	990	1273	95.1	0.85	235	3.0	7.5	3.0	16	2.50	1PP6 317-6UA□□		1160
160	315 L	988	1546	95.1	0.86	285	3.1	7.5	3.0	16	2.50	1PP6 318-6UA□□		1225

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code				Final position: Type of construction code							
	50 Hz				Without flange	With flange				With standard flange		With special flange
	230 VΔ/ 400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B3/6/7/8, IM V6, IM V5 without protective cover ¹⁾	IM B5, IM V3 ²⁾	IM V1 without protective cover	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover	
	1	6	3	5	0	1	1	8	6	2	7	3
1PP6 10 -... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 11 -... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 13 -... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 16 -... □□	○	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 18 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 20 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 22 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 25 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 28 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 310 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 313 -... □□	○	○	○	○	□	✓ ³⁾	✓	–	✓	–	–	–
1PP6 316 -... □□	–	○	–	○	□ ⁴⁾	–	–	✓	✓	–	–	–
1PP6 317 -... □□	–	○	–	○	□ ⁴⁾	–	–	✓	✓	–	–	–
1PP6 318 -... □□	–	○	–	○	□ ⁴⁾	–	–	✓	✓	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

¹⁾ If motors 1PP6 183-... to 1PP6 318-... (motor series 1PP6 frame sizes 180 M to 315 L) in types of construction with feet IM B6, IM B7, IM V6 or IM V5 without protective cover are fixed to the wall, it is recommended that the motor feet are supported.

²⁾ 1PP6 220-... to 1PP6 318-... motors (motor series 1PP6 frame sizes 225 S to 315 L) are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1 or IM V3. It is important to note that stress must not be applied perpendicular to the ring plane.

³⁾ Type of construction IM V3 is only possible using type of construction code **9** and order code **M1G**.

⁴⁾ Not possible for type of construction IM V6 and IM V5 without protective cover.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Rated output at 50 Hz 1500 rpm 3000 rpm		Frame size	Order No. For order No. supplements for voltage and type of construction, see table below	Price	Weight for type of construction IM B3 approx. <i>m</i> kg
<i>P_{rated}</i> kW	<i>P_{rated}</i> kW	FS			
4/2-pole, 1500/3000 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.52	2	100 L	1PP6 106-0UA□□		31
0.64	2.5	100 L	1PP6 107-0UA□□		34
0.88	3.5	112 M	1PP6 113-0UA□□		42
1.16	4.7	132 S	1PP6 130-0UA□□		51
1.6	6.4	132 M	1PP6 133-0UA□□		58
2.3	9.2	160 M	1PP6 163-0UA□□		95
3.45	13.6	160 M	1PP6 166-0UA□□		108
Rated output at 50 Hz 1000 rpm 1500 rpm					
<i>P_{rated}</i> kW	<i>P_{rated}</i> kW				
6/4-pole, 1000/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with two windings, with test certificate in accordance with EN 12101-3					
0.48	1.36	100 L	1PP6 106-1UD□□		31
0.6	1.68	100 L	1PP6 107-1UD□□		34
0.72	2.4	112 M	1PP6 113-1UD□□		42
0.96	3.1	132 S	1PP6 130-1UD□□		51
1.36	4.3	132 M	1PP6 133-1UD□□		58
2	5.75	160 M	1PP6 163-1UD□□		95
2.95	9.6	160 L	1PP6 166-1UD□□		108
Rated output at 50 Hz 750 rpm 1500 rpm					
<i>P_{rated}</i> kW	<i>P_{rated}</i> kW				
8/4-pole, 750/1500 rpm at 50 Hz, cooling method IC 411, IP55 degree of protection, double pole-changing for driving smoke-extraction fans with one winding in Dahlander circuit, with test certificate in accordance with EN 12101-3					
0.3	1.6	100 L	1PP6 106-0UB□□		31
0.52	2	100 L	1PP6 107-0UB□□		34
0.72	2.85	112 M	1PP6 113-0UB□□		42
0.88	3.75	132 S	1PP6 130-0UB□□		51
1.12	5.1	132 M	1PP6 133-0UB□□		58
1.76	7.6	160 M	1PP6 163-0UB□□		95
2.6	11.2	160 L	1PP6 166-0UB□□		108

The rated outputs and weights may change slightly after they have been checked.

Further electrical data can be calculated and supplied on receipt of order.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Forced-air cooled, for temperature/time class F400
Cast-iron series 1PP6

Selection and ordering data (continued)

Order No. supplements

Motor type	Penultimate position: Voltage code			Final position: Type of construction code							
	50 Hz, direct online starting	230 V	400 V	500 V	Without flange	With flange			With standard flange	With special flange	
					IM B3/6/7/8, IM V6, IM V5 without protective cover	IM B5, IM V3	IM V1 without protective cover	IM B35	IM B14, IM V19, IM V18 without protective cover	IM B34	IM B14, IM V19, IM V18 without protective cover
	1	6	5	0	1	1	8	6	2	7	3
1PP6 10 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 11 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 13 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓
1PP6 16 □□	○	○	○	□	✓	✓	–	✓	✓	✓	✓

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible

Order other voltages with voltage code **9** in the penultimate position and with order code **L1Y** (see "Special versions" in the "Selection and ordering data" under "Voltages").

Order other types of construction with type of construction code **9** in the final position and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Types of construction").

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without "-Z" supplement)

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit 9 for voltage in the 11th position of the Order No. and the appropriate order code.

Plain text must be specified in the order:

Voltage, frequency, circuit, required rated output in kW.

Special versions	Voltage code 11th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	

Self-ventilated motors

			1LA7 (aluminium) temperature/time classes F200 and F300							1LA5 (aluminium) temperature/ time classes F200 and F300						
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
			1LA6 (cast-iron) temperature/time class F400							1LG6 (cast-iron) temperature/time classes F200, F300 and F400						
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Forced-air cooled motors

			1PP7 (aluminium) temperature/time classes F200 and F300							1PP5 (aluminium) temperature/ time classes F200 and F300						
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
			1PP6 (cast-iron) temperature/time classes F200, F300 and F400													
Non-standard winding for voltages between 200 V and 690 V, (voltages outside this range are available on request) ¹⁾	9	L1Y •	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ With extra charge
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ When ordering, specify in plain text: Voltage, frequency, circuit, required rated output in kW

Types of construction

Additional order codes for other types of construction or type of construction codes (without "-Z" supplement)

Order codes have been defined for some special types of construction. They are ordered by specifying the code digit 9 for the type of construction in the 12th position of the Order No. and the appropriate order code.

Special versions	Type of construction code 12th position of Order No.	Additional identification code with order code and plain text if required	Motor type frame size															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315 S/M	315 L
Self-ventilated motors																		
						1LA7 (aluminium) temperature/time classes F200 and F300						1LA5 (aluminium) temperature/ time classes F200 and F300						
With flange																		
IM V3	9	M1G				-	-	-	-	-	-	✓	✓	✓				
With special flange																		
IM B34	9	M2C				✓	✓	✓	✓	✓	✓	-	-	-				
						1LA6 (cast-iron) temperature/time class F400						1LG6 (cast-iron) temperature/time classes F200, F300 and F400						
With flange																		
IM V3 ¹⁾	9	M1G				-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-
With special flange																		
IM B34	9	M2C				✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-
Forced-air cooled motors																		
						1PP7 (aluminium) temperature/time classes F200 and F300						1PP5 (aluminium) temperature/ time classes F200 and F300						
With flange																		
IM V3	9	M1G				-	-	-	-	-	-	✓	✓	✓				
With special flange																		
IM B34	9	M2C				✓	✓	✓	✓	✓	✓	-	-	-				
						1PP6 (cast-iron) temperature/time classes F200, F300 and F400												
With flange																		
IM V3 ¹⁾	9	M1G				-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-
With special flange																		
IM B34	9	M2C				✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-

✓ With extra charge
 – Not possible

¹⁾ 1LG6/1PP6 motors of frame sizes 225 S to 315 M are supplied with two screw-in eyebolts in accordance with IM B5, whereby one can be rotated in accordance with IM V1; four eyebolts (instead of two) with frame size 315 L. It is important to note that stress must not be applied perpendicular to the ring plane.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Options

Options or order codes (supplement **-Z** is required)[illegible]

For legend and footnotes, see page 9/35.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																
					1LA7 (aluminium) temperature/time classes F200 and F300						1LA5 (aluminium) temperature/time classes F200 and F300					
Colours and paint finish (continued)																
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Unpainted (only cast iron parts primed)	K23				○	○	○	○	○	○	○	○	○			
Unpainted, only primed	K24				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mechanical design and degrees of protection																
IP65 degree of protection	K50				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50				–	–	–	–	–	–	✓	✓	✓			
Regreasing device	K40				–	–	✓	✓	✓	✓	✓	✓	✓			
Balance and vibration severity																
Full key balancing	L68				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Heating and ventilation																
Anti-condensation heaters for 230 V	K45				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 115 V	K46				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Rating plate and extra rating plates																
Second rating plate, loose (standard version)					□	□	□	□	□	□	□	□	□			
Extra rating plate with identification code	Y82 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Additional information on rating plate and on package label	Y84 • and identification code				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Wire-lattice pallet	L99				○	○	○	○	○	○	○	○	–	–		

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

1) For appropriate tripping unit, see catalog LV 1. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code A11, price of A12 or order code A12, prices on request).

2) No extra charge with types of construction without feet: IM B5, IM V1, IM V3.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																
							1LA6 (cast-iron) temperature/time class F400				1LG6 (cast-iron) temperature/time classes F200, F300 and F400					
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers	A60						–	–	–	–	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding	A61						–	–	–	–	–	✓	✓	✓	✓	✓
Motor connection and connection boxes																
External earthing	L13						✓	✓	✓	✓	□	□	□	□	□	□
Protruding cable ends - right side ²⁾	L51						✓	○	○	○	✓	✓	✓	✓	✓	✓
Protruding cable ends - left side ²⁾	L52						✓	○	○	○	✓	✓	✓	✓	✓	✓
Colours and paint finish																
Special finish in RAL 7030 stone gray							□	□	□	□	□	□	□	□	□	□
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special paint finish in RAL 6011, mignonetta green	K27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver grey	M20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue grey	K28						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7032 pebble grey	L42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light grey	M21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 grey white	M23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 9/37.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors																
							1LA6 (cast-iron) temperature/time class F400				1LG6 (cast-iron) temperature/time classes F200, F300 and F400					
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						–	–	–	–	✓	✓	✓	✓	✓	✓
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Anti-condensation heaters for 230 V	K45						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second rating plate, loose (standard version)							□	□	□	□	□	□	□	□	□	□
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99						○	○	○	○	–	–	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ No extra charge with types of construction without feet: IM B5, IM V1, IM V3.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

[illegible]

For legend and footnotes, see page 9/39.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors																
					1PP7 (aluminium) temperature/time classes F200 and F300					1PP5 (aluminium) temperature/time classes F200 and F300						
Colours and paint finish (continued)																
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and spe- cial finish RAL				✓	✓	✓	✓	✓	✓	✓	✓				
Unpainted (only cast iron parts primed)	K23				○	○	○	○	○	○	○	○				
Unpainted, only primed	K24				✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																
IP65 degree of protection	K50				✓	✓	✓	✓	✓	✓	✓	✓				
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50				–	–	–	–	–	–	✓	✓	✓			
Regreasing device	K40				–	–	✓	✓	✓	✓	✓	✓	✓			
Balance and vibration severity																
Full key balancing	L68				✓	✓	✓	✓	✓	✓	✓	✓				
Heating and ventilation																
Anti-condensation heaters for 230 V	K45				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Anti-condensation heaters for 115 V	K46				✓	✓	✓	✓	✓	✓	✓	✓	✓			
Rating plate and extra rating plates																
Second rating plate, loose (standard version)					□	□	□	□	□	□	□	□				
Extra rating plate with identification code	Y82 • and identi- fication code				✓	✓	✓	✓	✓	✓	✓	✓				
Additional information on rating plate and on package label	Y84 • and identi- fication code				✓	✓	✓	✓	✓	✓	✓	✓				
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02				✓	✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99				○	○	○	○	○	○	○	○				

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For appropriate tripping unit, see catalog LV 1. Double the number of temperature sensors are required for pole-changing motors with separate windings. (Order code A11, price of A12 or order code A12, prices on request).

²⁾ No extra charge with types of construction without feet: IM B5, IM V1, IM V3.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors																
			1PP6 (cast-iron) temperature/time classes F200, F300 and F400													
Motor protection																
Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	A11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor protection with PTC thermistors with 6 embedded temperature sensors for tripping and alarm ¹⁾	A12						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Motor temperature detection with embedded temperature sensor KTY 84-130	A23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of 3 PT 100 resistance thermometers	A60						–	–	–	–	✓	✓	✓	✓	✓	✓
Installation of 6 PT 100 resistance thermometers in stator winding	A61						–	–	–	–	✓	✓	✓	✓	✓	✓
Motor connection and connection boxes																
External earthing	L13						✓	✓	✓	✓	□	□	□	□	□	□
Protruding cable ends - right side ²⁾	L51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protruding cable ends - left side ²⁾	L52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colours and paint finish																
Special finish in RAL 7030 stone gray							□	□	□	□	□	□	□	□	□	□
Special finish in RAL 1002 sand yellow	M16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 1013 pearl white	M17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 3000 flame red	M18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special paint finish in RAL 6011, mignonetta green	K27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 6021 pale green	M19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7001 silver grey	M20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7031 blue grey	K28						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special paint finish in RAL 7032, pebble grey	L42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7035 light grey	M21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9001 cream	M22						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9002 grey white	M23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 9005 jet black	L43						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033 Page 1/17	Y54 • and special finish RAL						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unpainted (only cast iron parts primed)	K23						○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
IP65 degree of protection	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend and footnotes, see page 9/41.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Forced-air cooled motors																
			1PP6 (cast-iron) temperature/time classes F200, F300 and F400													
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						–	–	–	–	✓	✓	✓	✓	✓	✓
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Balance and vibration severity																
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Anti-condensation heaters for 230 V	K45						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rating plate and extra rating plates																
Second rating plate, loose (standard version)							□	□	□	□	□	□	□	□	□	□
Extra rating plate with identification code	Y82 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Additional information on rating plate and on package label	Y84 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																
Acceptance test certificate 3.1 according to EN 10204	B02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99						○	○	○	○	–	–	–	–	–	–

- Standard version
- With no extra charge
- ✓ With extra charge
- Not possible
- This order code only determines the price of the version - Additional plain text is required.

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ No extra charge with types of construction without feet: IM B5, IM V1, IM V3.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Accessories and spare parts

Overview

Slide rails with fixing bolts and tensioning screws to DIN 42923

Slide rails are used to tension the belt of a machine easily and conveniently when a belt tightener is not available. They are fixed to the base using stone bolts or foundation blocks.

The assignment of slide rails to motor size can be found in DIN 42923. For motors of frame sizes 355 to 450, there are no standardised slide rails (please enquire).

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Foundation block acc. to DIN 799

The foundation blocks are inserted into the stone foundation and embedded in concrete. They are used for fixing machines of medium size, slide rails, pedestal bearings, baseframes, etc. After the fixing bolts have been unscrewed, the machine can be dragged without it having to be lifted.

When the machine is initially installed, the foundation block that is bolted to the machine (without washers) and fitted with tapered pins is not embedded with concrete until the machine has been fully aligned. In this case, the machine is positioned 2 to 3 mm lower. The difference in shaft height is compensated by inserting shims on final installation. The tapered pins safeguard the exact position of the machine when it is repeatedly removed and replaced without the need for realignment.

Available from:
Lütgert & Co. GmbH
Postfach 42 51
33276 Gütersloh, Germany
Tel. +49 (0)5241-7407-0
Fax +49 (0)5241-7407-90

<http://www.luetgert-antriebe.de>
e-mail: info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

Taper pins are used for components that are repeatedly removed. The drilled hole is ground conical using a conical reamer until the pin can be pushed in by hand until the cone shoulder lies 3 to 4 mm above the rim of the hole.

It can then be driven in using a hammer until it is correctly seated. The pin is removed from the drilled hole by screwing on the nut and tightening it.

Standardised taper pins are available from general engineering suppliers.

Available from:
Otto Roth GmbH & Co. KG
Rutesheimer Straße 22
70499 Stuttgart, Germany
Tel. +49 (0)711-1388-0
Fax +49 (0)711-1388-233

<http://www.ottoroth.de>
e-mail: info@ottoroth.de

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

Available from:
A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0)2871-922185
Fax +49 (0)2871-922579

<http://www.flender.com>
e-mail: couplings@flender.com

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor

Example for ordering a fan cover 1LA7,
frame size 160 M, 4-pole:

Fan cover No. 7.40,
1LA7 163-4AA60, factory number J783298901018

- For bearing types, see the "Introduction".
- Repair parts for 1MJ6, 1MJ7, 1MJ8, 1MJ1, 1ME8, 1ML8, 1LG8 motors and smoke-extraction motors are available on request.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 0180/5050448

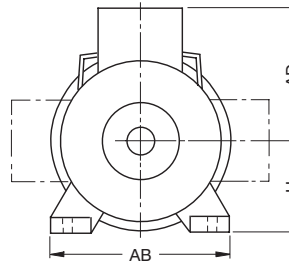
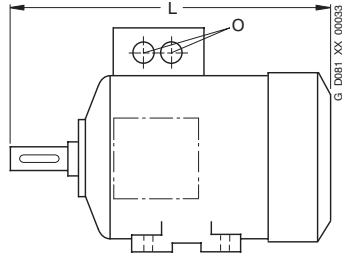
National telephone numbers can be found on the Internet page:
<http://www.siemens.com/automation/service&support>

Overview

Overall dimensions

The overall dimensions of the smoke-extraction motors are listed below. The relevant dimensional drawings can be ordered.

Dimension O is not specified because the motors are connected to the supply by means of protruding multi-core cables.



Frame size	Type	Dimensions L	AD ¹⁾	H	AB
80 M	1LA7 08.-T...	274	100	80	150
	1PP7 08.-T...	240	100	80	150
90 S/ 90 L	1LA7 09.-T...	332	107	90	165
	1PP7 09.-T...	240	107	90	165
100 L	1LA6 10.-U...	373	120	100	196
	1LA7 10.-T...	373	120	100	196
	1PP6 10.-U...	335	120	100	196
	1PP7 10.-T...	335	120	100	196
112 M	1LA6 11.-U...	394	128	112	226
	1LA7 11.-T...	394	128	112	226
	1PP6 11.-U...	354	128	112	226
	1PP7 11.-T...	354	128	112	226
132 S/ 132 M	1LA6 13.-0U...	454	148	132	256
	1LA6 13.-1UD..	454	148	132	256
	1LA6 13.-2UA..	454	148	132	256
	1LA6 13.-4UA..	454	148	132	256
	1LA6 13.-6UA..	492	148	132	256
	1LA7 13.-T...	454	148	132	256
	1PP6 13.-0U...	403	148	132	256
	1PP6 13.-1UD..	403	148	132	256
	1PP6 13.-2UA..	403	148	132	256
	1PP6 13.-4UA..	403	148	132	256
	1PP6 13.-6UA..	443	148	132	256
	1PP7 13.-T...	403	148	132	256
160 M/ 160 L	1LA6 16.-0U...	588	170	160	300
	1LA6 16.-1UD..	588	170	160	300
	1LA6 16.-2UA..	588	170	160	300
	1LA6 16.-4UA..	588	170	160	300
	1LA6 16.-6UA..	628	170	160	300
	1LA7 16.-T...	588	170	160	300
	1PP6 16.-0U...	535	170	160	300
	1PP6 16.-1UD..	535	170	160	300
	1PP6 16.-2UA..	535	170	160	300
	1PP6 16.-4UA..	535	170	160	300
	1PP6 16.-6UA..	575	170	160	300
	1PP7 16.-T...	535	170	160	300

Frame size	Type	Dimensions L	AD ¹⁾	H	AB
180 M/ 180 L	1LA5 18.-T...	712	243	180	339
	1LG6 183-2UA..	720	244	180	339
	1LG6 183-4UA..	669	244	180	339
	1LG6 186-.UA..	720	244	180	339
	1PP5 18.-T...	611	243	180	339
	1PP6 183-2UA..	613	244	180	339
	1PP6 183-4UA..	562	244	180	339
	1PP6 186-.UA..	613	244	180	339
200 L	1LA5 20.-T...	770	292	200	388
	1LG6 206-.UA..	720	285	200	378
	1LG6 207-2UA..	777	285	200	378
	1LG6 207-4UA..	720	285	200	378
	1LG6 207-6UA..	777	285	200	378
	1PP5 20.-T...	675	292	200	388
	1PP6 206-.UA..	617	285	200	378
	1PP6 207-2UA..	674	285	200	378
	1PP6 207-4UA..	617	285	200	378
	1PP6 207-6UA..	674	285	200	378
225 S/ 225 M	1LA5 220-4TA..	807	292	225	426
	1LA5 223-2TA..	777	292	225	426
	1LA5 223-4TA..	807	292	225	426
	1LA5 223-6TA..	807	292	225	426
	1LG6 220-4UA..	789	310	225	436
	1LG6 223-2UA..	819	310	225	436
	1LG6 223-4UA..	849	310	225	436
	1LG6 223-6UA..	849	310	225	436
	1PP5 220-4TA..	711	292	225	426
	1PP5 223-2TA..	681	292	225	426
	1PP5 223-4TA..	711	292	225	426
	1PP5 223-6TA..	711	292	225	426
250 M	1PP6 220-4UA..	670	310	225	436
	1PP6 223-2UA..	700	310	225	436
	1PP6 223-4UA..	730	310	225	436
	1LG6 253-2.B..	887	340	250	490
	1LG6 253-4.A..	957	340	250	490
	1LG6 253-6.A..	887	340	250	490
	1PP6 253-2....	764	340	250	490
	1PP6 253-4....	834	340	250	490
	1PP6 253-6....	764	340	250	490

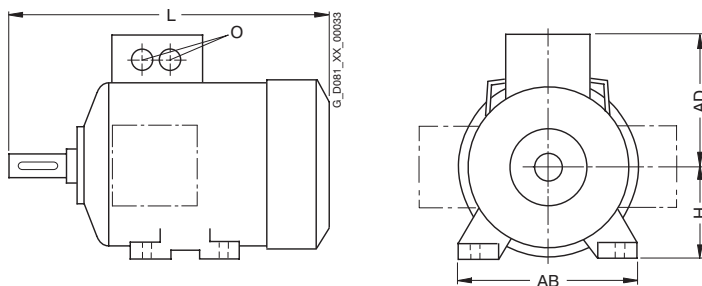
¹⁾ Dimension AD without cable gland.

IEC Squirrel-Cage Motors

Smoke-extraction motors

Dimensions

Overview (continued)



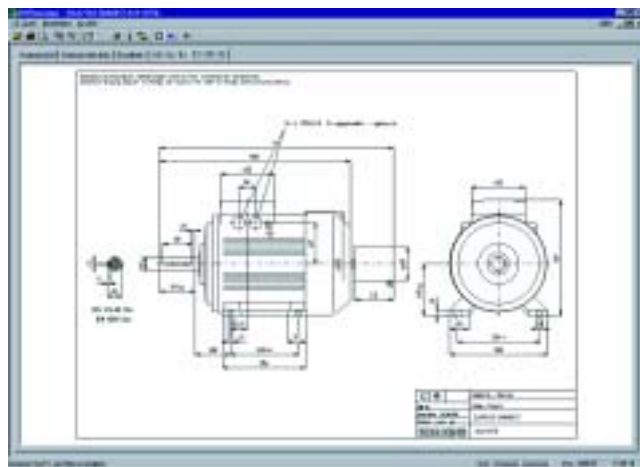
Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
280 S/ 280 M	1LG6 280-.....	960	378	280	540
	1LG6 283-2....	1070	378	280	540
	1LG6 283-4....	1070	378	280	540
	1LG6 283-6....	960	378	280	540
	1PP6 280-.....	830	378	280	540
	1PP6 283-.....	940	378	280	540
315 S/ 315 M/ 315 L	1LG6 310-2.B..	1072	440	315	610
	1LG6 310-4.A..	1102	440	315	610
	1LG6 310-6.A..	1102	440	315	610
	1LG6 313-2.B..	1232	440	315	610
	1LG6 313-4.A..	1262	440	315	610
	1LG6 313-6.A..	1262	440	315	610
	1LG6 316-2.B..	1232	440	315	610
	1LG6 316-4.A..	1262	440	315	610
	1LG6 316-4.B..	1262	440	315	610
	1LG6 316-6.A..	1262	440	315	610
	1LG6 317-2.B..	1372	440	315	610
	1LG6 317-4.A..	1402	440	315	610
	1LG6 317-6.A..	1402	440	315	610
	1LG6 318-6.A..	1402	440	315	610

Frame size	Type	Dimensions			
		L	AD ¹⁾	H	AB
315 S/ 315 M/ 315 L	1PP6 310-2.B..	925	440	315	610
	1PP6 310-4.A..	955	440	315	610
	1PP6 310-6.A..	955	440	315	610
	1PP6 313-2.B..	1085	440	315	610
	1PP6 313-4.A..	1115	440	315	610
	1PP6 313-6.A..	955	440	315	610
	1PP6 316-2.B..	1085	440	315	610
	1PP6 316-4.A..	1260	440	315	610
	1PP6 316-6.A..	1260	440	315	610
	1PP6 317-2.B..	1225	440	315	610
	1PP6 317-4.A..	1255	440	315	610
	1PP6 317-6.A..	1255	440	315	610
	1PP6 318-6.A..	1255	440	315	610

More information

Dimension sheet generator (part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the electronic catalogue CA 01 as a selection aid (for further information, see "Technical information", "Project planning aids").

The interactive catalogue CA 01 can be ordered from your local Siemens sales representative or on the Internet at

<http://www.siemens.com/automation/CA01>

At this address, you will also find links to Tips & Tricks and to downloads for function or content updates.

Order number for CA 01 10/2006, english international:

CD-ROM: E86060-D4001-A110-C5-7600

DVD: E86060-D4001-A510-C5-7600

¹⁾ Dimension AD without cable gland.



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10/2	Overview
10/3	Benefits
10/3	Application
10/3	Technical specifications
10/5	More information
10/6	Type approved standard motors up to frame size 315 L
10/6	Overview
10/7	Type approved explosion-proof motors up to frame size 315 L
10/7	Overview
10/7	Type approved fan motors
10/7	Overview
10/8	Standard motors up to frame size 315 L (individual acceptance required)
10/8	Overview
10/9	Non-standard motors frame size 315 and above (individual acceptance required)
10/9	Overview
10/9	Explosion-proof motors frame size 315 and above (individual acceptance required)
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10/22	Overview

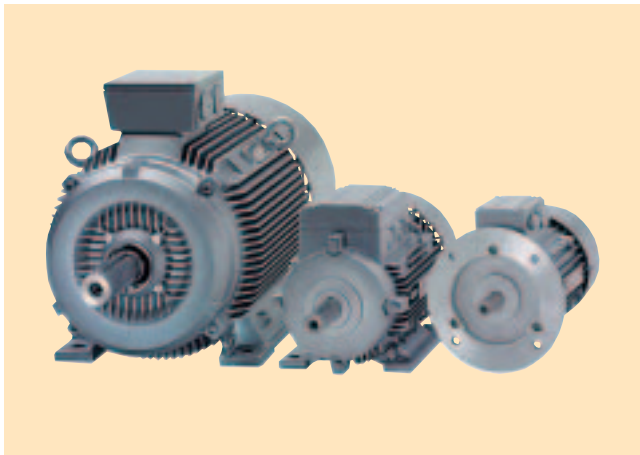


IEC Squirrel-Cage Motors

Marine motors

Orientation

Overview



Low-voltage motors in the marine version can be used as main and auxiliary drives below deck on ships and in the offshore industry. The thermal utilisation of the motors is matched to the generally higher ambient temperatures on board ship. If the application demands compliance with additional regulations, e.g. protection against explosion hazards, the appropriate motor series must be chosen.

The classification authorities categorise the drives on board ships into "essential services" and "non-essential services", depending on their field of application. These include the following requirements of the classification authorities:

	Drives for "essential services"	Drives for "non-essential services"
Manufacture in accordance with regulations of the classification authorities	Required	Required
Acceptance test certificate 3.1 according to EN 10204	Required	Only required for motors with certificate
Type test certificate of the classification authority	Required	Not required
Individual acceptance test by classification authority	Required above a specific output	Only required for motors with certificate
Supervision of construction and acceptance test certificate 3.2 according to EN 10204	Required by some classification authorities above a specific output	Not required

Type test

All motors (with the exception of 1LA8, 1PQ8, 1LL8 and 1LH8 motors) are manufactured and type approved in accordance with the regulations of the following leading international classification authorities:

- GL (Germanischer Lloyd, Germany)



Germanischer Lloyd

- DNV (Det Norske Veritas, Norway)



- LR (Lloyds Register, United Kingdom)



- BV (Bureau Veritas, France)



Individual acceptance testing is required in general for motor series 1LA8, 1PQ8, 1LL8 and 1LH8.

As an option, we can manufacture motors in accordance with the following classification authorities:

- ABS (American Bureau of Shipping, USA)
- RINA (Registro Italiano Navale, Italy)
- CCS (Chinese Classification Society, China)

A type test certificate will however only be issued following individual acceptance testing.

Special versions that differ from the range defined in the catalogue are possible on request.

Individual acceptance and supervision of construction

Individual acceptance testing by a representative of the relevant classification authority is required for motors used in essential auxiliary drives, depending on their output:

- GL ≥ 50 kW
- LR ≥ 100 kW
- DNV ≥ 300 kW
- BV ≥ 100 kW

For individual acceptance testing of more than one identical motor in an order, a type test complete with heat run and the corresponding acceptance test must be performed for at least one motor.

In special cases, in addition to the acceptance test, supervision of construction may also be required. Supervision of construction involves monitoring of the separate manufacturing stages of a motor by an inspector from the classification authority.

Benefits

The marine motors offer the user a number of advantages:

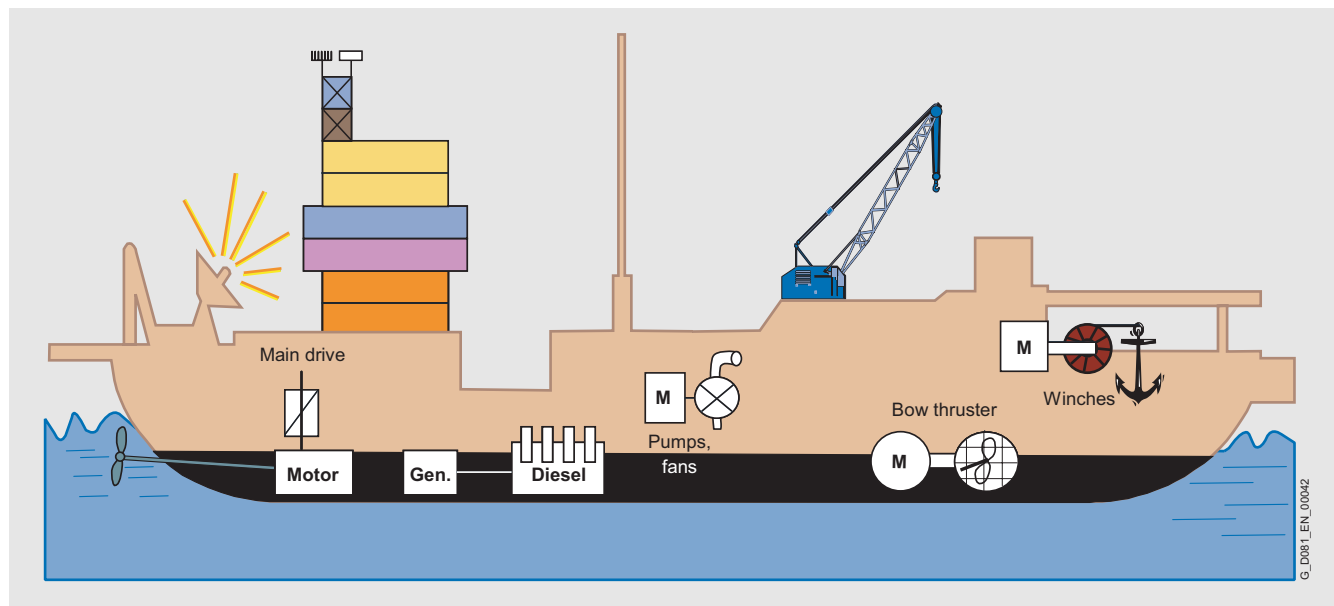
- Cast-iron versions can be supplied for corrosive atmospheres especially for high humidity levels and salty air
- Increased corrosion protection using specially designed paint finishes is available
- Certified marine motors can be supplied for use in areas to be protected against explosion

- Due to the type tests already performed, individual acceptance testing in the low-end output range is not necessary which means shorter delivery times
- Distinctive expertise for customer requirements
- Worldwide service network with 24 h service hotline for motors and converters (Tel.: +49 180 173 7373; e-mail: shipservice@siemens.com)

Application

Our type approved marine motors are specially designed for use on board ship below deck and for the offshore industry:

- Applications on board ship as main and auxiliary drives below deck, e.g.:
 - Fans (air conditioning, refrigeration plants)
 - Pumps (for fire-extinguishing water, fuels, oils)
 - Winches (anchor winches, warping winches, lifting gear)
 - Compressors
 - Bow thruster drives
 - Ex motors for areas subject to explosion hazards
- Application in the offshore industry
 - Coastal areas, e.g. production platforms, production ships



Typical areas of application

Technical specifications

Frame design

Motors can be supplied depending on the motor series in a corrosion-resistant aluminum housing and in a rugged low-vibration cast-iron version.

Motor connection

Cable glands are not included in the standard scope of supply with the exception of explosion-proof motors (see "Special versions").

All marine motors generally have an external earthing terminal.

Standards and regulations

In addition to the relevant standards and regulations, IEC 92-301 also applies for electrical installation on board ship as well as the regulations of the marine classification authorities.

Specifications of the IEC standards

	Coolant temperature KT	Maximum temperature for temperature class	
		B	F
	°C	K	K
IEC/EN 60034-1	40	80	105
IEC 92-301	50	70	90

IEC Squirrel-Cage Motors

Marine motors

Orientation

Technical specifications (continued)

Specifications of the individual classification authorities with order codes for ordering

Classification authorities	Coolant temperature KT	Maximum temperature for relevant classification authorities		Individual acceptance for "essential services" drive	Supervision of construction for "essential services" drive	Order codes for surface-cooled motors up to frame size 315L		Order codes for surface-cooled motors frame size 315 and above		
		Temperature class B	Temperature class F	Required from a rated output	Required from a rated output	With type test certificate	Without type test certificate	Without type test certificate	With type test certificate and individual acceptance	With type test certificate and individual acceptance and supervision of construction
	°C	K	K	kW	kW					
GL	45	75	100	≥ 50	–	E11	–	E11	E11+E10	E11+E09
LR	45	70	95	≥100	≥100	E21	–	E21	E21+E10	E21+E09
BV	45	75	100	≥100	–	E31	–	E31	E31+E10	E31+E09
DNV	45	75	100	≥300	–	E51	–	E51	E51+E10	E51+E09
ABS	50	70	95	≥100	≥100	–	E00	E61	E61+E10	E61+E09
RINA	45	75	95	≥100	–	–	E00	–	–	–
CCS	45	75	100	≥100	–	–	E00	E71	E71+E10	E71+E09

Type test certificates



Technical specifications (continued)

Temperature class and coolant temperature

Marine motors are designed in general for a coolant temperature KT 45 °C in temperature class F – used according to F – with thermal reserve. 1MA and 1MJ motors as well as motors in Zones 2, 21 and 22 are designed in temperature class F – used according to temperature class B – with derating of approximately 4%. 1LA9 motors with increased output in temperature class F – used according to temperature class F – are also derated by approximately 4%.

If temperature class F is used according to B, further derating of approximately 10% (for non-standard motors 1LA8, 1PQ8 15%) is required.

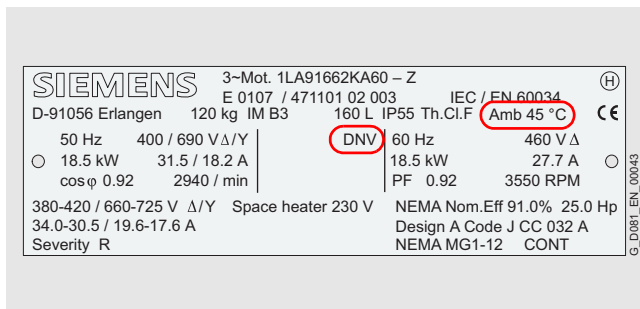
Please enquire for further details.

Ambient temperatures that exceed 45 °C require appropriate derating as shown in the table below:

	Coolant temperature AT (for temperature class F used according to F)			
	45 °C	50	55	60
Derating factor	1.00	0.96	0.92	0.87

Rating plate and acceptance test certificate

The metal rating plate indicates the relevant classification authority and the associated coolant temperature.



Rating plate for a marine motor according to DNV

In addition, an acceptance test certificate 3.1 according to EN 10204 complete with the certificate number of the marine classification authority will be supplied.

Degree of protection

The standard version is IP55 degree of protection or IP23 for motors with through ventilation (series 1LL8), IP56 (non-heavy sea) – not for 1PQ8 and 1LL8 or IP65 (not possible for "Non-standard motors frame size 315 and above") are available optionally (see "Special versions").

Winding and motor protection

For monitoring the winding and bearings, the motors can be equipped with thermistors, temperature sensors and resistance thermometers. Anti-condensation heaters can also be fitted to the marine motors to prevent condensation building up on the winding.

Paint finish

The standard paint finish is suitable for indoor installations or outdoor installations which are roof-protected against weathering.

When motors are installed in corrosive sea atmospheres or in rooms that are constantly wet, the special paint finish for the "world wide" climatic group according to DIN IEC 60721-2-1 is recommended because this ensures a higher degree of corrosion protection. Most marine motors are finished in this special paint type as standard (see "Special versions").

The offshore paint finish CERAM-KOTE 54 can be supplied for excessively aggressive atmospheres. Please enquire in this case.

Special coatings with thicker layers are available on request.

Converter-fed operation

The standard insulation of the marine motors is implemented such that converter-fed operation is possible without limits for mains voltages of 500 V + 10%; exception: 1MA motors are only certified for mains operation.

At higher voltages, the motors require greater insulation resistance.

1LA5, 1LA7 and 1LG6 standard motors as well as 1LA8 and 1PQ8 non-standard motors are also available for converter-fed operation with supply voltages of up to 690 V also with improved insulation in the winding system.

It is important to note the extent to which the converter used must also be acceptance tested by the marine classification authority.

More information

For more information, please contact your local Siemens contact – see "Siemens contacts worldwide" in the Appendix.

Overview

Most standard motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the standard motor series that are available with type testing up to frame size 315 L:

Motor type	Standard degree of protection	Frame design	Motor series 1)	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F, used according to F.
Self-ventilated motors with improved efficiency	IP55	Aluminium	1LA7	56M ... 160L	0.06 ... 18.5
			1LA5	180M ... 225M	11 ... 45
		Cast-iron	1LA6	100L ... 160L	0.75 ... 18.5
			1LG4	180M ... 315L	11 ... 200
Self-ventilated motors with high efficiency	IP55	Aluminium	1LA9	56M ... 200L	0.06 ... 37
		Cast-iron	1LG6	180M ... 315L	11 ... 200

The type approved and self-cooled motor series 1LP4, 1LP5, 1LP6 and 1LP7 in frame sizes 63 M to 315 L with reduced output without external fan and fan cover can be supplied on request.

For technical specifications and selection and ordering data, see the relevant sections of "Standard motors up to frame size 315 L".

Ordering example:

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with improved efficiency, IP55 degree of protection, cast-iron version	1LG4
No. of poles/speed	4-pole/1500 rpm	1LG4 253-4AA
Rated output	55 kW	
Voltage and frequency	400 VΔ/690 VY, 50 Hz	1LG4253-4AA 6
Type of construction	IM B3	1LG4253-4AA 60
Paint finish	Non-standard paint finish in RAL 5007	1LG4253-4AA60- Z Y54 Plain text: RAL 5007
Marine version	Drive for "essential services" with type test certificate according to Germanischer Lloyd with coolant temperature KT 45 °C	1LG4253-4AA60-Z Y54+ E11 Plain text: RAL 5007
	Individual acceptance (by marine classification society)	1LG4253-4AA60-Z Y54+E11+ E10 Plain text: RAL 5007
	Type test with heat run for horizontal motors, with acceptance	1LG4253-4AA60-Z Y54+E11+E10+ F83 Plain text: RAL 5007

The ordering example is valid for an order quantity of 1 item. For larger order quantities, a type test with heat run (order code **F83**) only has to be ordered for one motor. For all other identical motors, order code F83 is not required. The order must be subdivided into two order items.

Example for ordering 5 items:

Order item	Quantity (items)	Order No.
1	1	1LG4253-4AA60-Z Y54+E11+E10+ F83 Plain text: RAL 5007
2	4	1LG4253-4AA60-Z Y54+E11+E10 Plain text: RAL 5007

For further information about order codes see "Special versions".

1) For 1LA9 motors with increased output, derating is necessary. Please contact your local Siemens office for advice.

IEC Squirrel-Cage Motors

Marine motors

Type approved explosion-proof motors
up to frame size 315 L

Overview

Most explosion-proof motors up to frame size 315 L from Siemens AG can be used as marine motors if ordered with the relevant order codes. The following table shows the series of explosion-proof motors that are available with type testing up to frame size 315 L:

Motor type	Standard degree of protection	Frame design	Motor series ¹⁾	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F, used according to F.
Self-ventilated motors in Zone 1 with type of protection "e" (Zone 1 EExe II T3)	IP55	Aluminium	1MA7	63 M ... 160 L	0.12 ... 16
		Cast-iron	1MA6	100 L ... 315 L	1.3 ... 165
Self-ventilated motors in Zone 1 with type of protection "d" (Zone 1 EExde IIC T4)	IP55	Cast-iron	1MJ6	71 M ... 200 L	0.25 ... 37
			1MJ7	225 S ... 315 M	30 ... 132
Self-ventilated motors in Zone 2 with type of protection "n"	IP55	Aluminium	1LA7	63 M ... 160 L	0.09 ... 18.5
			1LA9	63 M ... 160 L	0.12 ... 18.5
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 21 with protection against dust explosions	IP55	Aluminium	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LG4/1LG6	180 M ... 315 L	11 ... 200
Self-ventilated motors in Zone 22 with protection against dust explosions	IP55	Aluminium	1LA7	56 M ... 160 L	0.06 ... 18.5
			1LA5	180 M ... 225 M	11 ... 45
			1LA9	56 M ... 200 L	0.06 ... 37
		Cast-iron	1LA6	100 L ... 160 L	0.75 ... 18.5
			1LG4/1LG6	180 M ... 315 L	11 ... 200

For technical specifications and selection and ordering data, see the relevant sections of "Explosion-proof motors".

For further information about order codes see "Special versions".

Type approved fan motors

Overview

Most fan motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the series of fan motors that are available with type testing:

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F, used according to F.
Self-ventilated motors in pole-changing version	IP55	Aluminium	1LA7	80 M ... 160 L	0.15 ... 17
			1LA5	180 M ... 200 L	18 ... 31
		Cast-iron	1LG4	180 M ... 280 M	11 ... 200
Forced-air cooled motors without external fan, without fan cover	IP55	Aluminium	1PP7	63 M ... 160 L	0.09 ... 18.5
			1PP5	180 M ... 200 L	15 ... 37
		Cast-iron	1PP4	180 M ... 315 L	11 ... 200

For technical specifications and selection and ordering data, see the relevant sections of "Fan motors".

For further information about order codes see "Special versions".

¹⁾ With explosion-proof motors, derating is necessary. Please contact your local Siemens office for advice.

IEC Squirrel-Cage Motors

Marine motors

Standard motors up to frame size 315 L
(individual acceptance required)

Overview

Most standard motors of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the series of self-ventilated standard motors that are available with reduced output without an external fan and without a fan cover:

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F, used according to F.
Self-cooled motors without external fan	IP55	Aluminium	1LP7	63 M ... 160 L	0.045 ... 7
			1LP5	180 M ... 200 L	5.5 ... 16.5
		Cast-iron	1LP4	180 M ... 315 L	3.7 ... 67

For technical specifications and selection and ordering data, see the relevant sections of "Standard motors up to frame size 315 L".

For further information about order codes see "Special versions".

Overview

Most non-standard motors frame size 315 and above of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the available series of non-standard motors frame size 315 and above (individual acceptance required):

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F _i used according to F.
Self-ventilated motors for mains-fed and converter-fed operation	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ¹⁾
Forced-air cooled motors with externally mounted fan for converter-fed operation	IP55	Cast-iron	1PQ8	315 ... 450	160 ... 1000 ¹⁾
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation	IP23	Cast-iron	1LL8	315 ... 450	200 ... 1250 ¹⁾
Water-cooled motors for mains-fed and converter-fed operation (technical specifications can be supplied on request)	IP55	Steel	1LH8	450	485 ... 1150 ¹⁾

Motor series 1LH8 (please enquire).

For technical specifications and selection and ordering data, see the relevant sections of "Non-standard motors frame size 315 and above".

For further information about order codes see "Special versions".

Explosion-proof motors frame size 315 and above (individual acceptance required)

Overview

Most explosion-proof motors frame size 315 and above of Siemens AG can be used as marine motors if the appropriate order codes are used. The following table shows the available series of explosion-proof motors frame size 315 and above (individual acceptance required):

Motor type	Standard degree of protection	Frame design	Motor series	Motor frame sizes	Output range in kW Output data for mains-fed operation 50 Hz at KT 45 °C in temperature class F
Self-ventilated motors in Zone 2 with type of protection "n"	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ²⁾
Self-ventilated motors in Zone 22 with protection against dust explosions	IP55	Cast-iron	1LA8	315 ... 450	160 ... 1000 ¹⁾

For technical specifications and selection and ordering data, see the relevant sections of "Explosion-proof motors".

For further information about order codes see "Special versions".

¹⁾ At a coolant temperature of 45 °C when used according to temperature class F, the output is reduced by 4%.
²⁾ At a coolant temperature of 45° C, the output is reduced by 4%. When used in accordance with temperature class B, the output is reduced by a further 15 %.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Overview

Recommended special versions:

- Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping – Order code **A11**
- Mounting of PT 100 resistance thermometers for winding temperature monitoring – Order codes **A60, A61**
- Specially for motor series 1LA8, 1PQ8 and 1LL8: Mounting of 2 screw-in PT 100 resistance thermometers in basic circuit for roller bearings – Order code **A72**
- Anti-condensation heaters for 230 V – Order code **K45**
- Anti-condensation heaters for 115 V – Order code **K46**

- IP56 degree of protection (non-heavy-sea) for protection against harmful dust deposits, protection against water jets from any direction – Order code **K52**
- IP65 degree of protection for complete protection against dust deposits, protection against water jets from any direction – Order code **K50**
Not possible for non-standard motors 1LA8, 1PQ8 and 1LL8.
- Special bearing for drive-end (DE) and non-drive-end (NDE) bearing size 63 – Order code **K36**
- External metal fan for self-ventilated motors – Order code **K35**

Selection and ordering data

Order information

The fees levied by the classification authorities for individual acceptance testing are included in order code **E09/E10** for motor types 1LG4, 1LG6, 1PP4, 1LA8, 1PQ8, 1LL8 and 1LH8. For the other motor types, 1LA5, 1LA6, 1LA7, 1LA9, 1MA, 1MJ, 1PP5, 1PP7, individual acceptance testing must be ordered in plain text and will be invoiced separately (please enquire).

When ordering, add the supplement "-Z" to the Order No. as well as plain text details. For 1LA8 motors, supplement the Order No. with order code **E80** and plain text.

For other special versions, see the relevant sections under "Standard motors up to frame size 315 L", "Non-standard motors frame size 315 and above", "Explosion-proof motors" and "Fan motors". In addition to this, for marine motors, the following special versions are the Standard version and therefore included in the order codes for the basic marine version.

Standard version:

Description	Order code
Acceptance test certificate 3.1 according to EN 10204 (not included in order code E00)	B02
External earthing terminal	L13

Type approved standard motors up to frame size 315 L in marine version

Special versions	Order No. supple- ment -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency																
		1LA7 (aluminium)										1LA5 (aluminium)				
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Acceptance/certification																
Individual acceptance by marine classification society	E10		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with warm run for horizontal motors, with acceptance	F83 ²⁾		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			

For legend and footnotes, see page 10/12.

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with increased efficiency																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10						–	–	–	–	✓	✓	✓	✓	✓	✓
	Details in plain text						O. R.	O. R.	O. R.	O. R.	–	–	–	–	–	–
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾						–	–	–	–	✓	✓	✓	✓	✓	✓
	Details in plain text						O. R.	O. R.	O. R.	O. R.	–	–	–	–	–	–
Type test with heat run for vertical motors, with acceptance	Details in plain text						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Self-ventilated energy-saving motors with high efficiency																
		1LA9 (aluminium)														
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Acceptance/certification																
Individual acceptance by marine classification society	E10 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.				

For legend and footnotes, see page 10/12.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated energy-saving motors with high efficiency																
		1LG6 (cast-iron)														
Basic marine version ¹⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00										✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11										✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21										✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31										✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51										✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10										✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾										✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾										O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- ✓ With extra charge
 – Not possible
 O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as F in accordance with B, order with details in plain text. The order codes for the basic marine version (E00, E11, E21, E31, E51) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

Type approved explosion-proof motors up to frame size 315 L in marine version

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "e"																
		1MA7 (aluminium)														
Basic marine version ¹⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00		✓	✓	✓	✓	✓	✓	✓	✓						
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11		✓	✓	✓	✓	✓	✓	✓	✓						
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21		✓	✓	✓	✓	✓	✓	✓	✓						
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31		✓	✓	✓	✓	✓	✓	✓	✓						
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51		✓	✓	✓	✓	✓	✓	✓	✓						
Acceptance/certification																
Individual acceptance by marine classification society	Details in plain text		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.						
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.						
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.						
		1MA6 (cast-iron)														
Basic marine version ¹⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	Details in plain text						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

For legend and footnotes, see page 10/14.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zone 1 with type of protection "d"																
		1MJ6 (cast-iron)										1MJ7 (cast-iron)				
Basic marine version ¹⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	Details in plain text			O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for horizontal motors, with acceptance	Details in plain text ²⁾			O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾			O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

✓ With extra charge
O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as F in accordance with B, order with details in plain text. The order codes for the basic marine version (E00, E11, E21, E31, E51) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions																
		1LA7 (aluminium) ¹⁾										1LA5 (aluminium) ²⁾				
Basic marine version ³⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Acceptance/certification																
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
		1LA9 (Alu) ⁵⁾														
Basic marine version ³⁾																
Without type test certificate according to ABS 50°C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Acceptance/certification																
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size														
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Self-ventilated motors in Zones 2, 21 and 22 with type of protection "n" or protection against dust explosions																
							1LA6 (cast-iron) ⁶⁾				1LG4 (cast-iron)/1LG6 (cast-iron)					
Basic marine version ³⁾																
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance/certification																
Individual acceptance by marine classification society	E10						–	–	–	–	✓	✓	✓	✓	✓	✓
	Details in plain text						O. R.	O. R.	O. R.	O. R.	–	–	–	–	–	–
Type test with heat run for horizontal motors, with acceptance	F83 ⁴⁾						–	–	–	–	✓	✓	✓	✓	✓	✓
	Details in plain text ⁴⁾						O. R.	O. R.	O. R.	O. R.	–	–	–	–	–	–
Type test with heat run for vertical motors, with acceptance	Details in plain text ⁴⁾						O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

✓ With extra charge
 – Not possible
 O. R. Possible on request

- 1) Zone 2 for 1LA7 motors not possible in frame size 56.
- 2) Zone 2 for 1LA5 motors not possible, for Zone 2 use 1LG4 motors instead of 1LA5 motors.
- 3) Motor for use in shipping for higher ambient temperature and/or used as F in accordance with B, order with details in plain text. The order codes for the basic marine version (E00, E11, E21, E31, E51) cannot be combined with each other.

- 4) Option or details in plain text only necessary for one motor when ordering several motors of the same type.
- 5) Zone 2 not possible for 1LA9 motors in frame sizes 56, 180 and 200.
- 6) Zone 21 not possible for 1LA6 motors.

Type approved fan motors in marine version

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated motors in pole-changing version																	
		1LA7 (aluminium)							1LA5 (aluminium)								
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00				✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11				✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21				✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31				✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51				✓	✓	✓	✓	✓	✓	✓	✓					
Acceptance/certification																	
Individual acceptance by marine classification society	E10				✓	✓	✓	✓	✓	✓	✓	✓					
Type test with warm run for horizontal motors, with acceptance	F83 ²⁾				✓	✓	✓	✓	✓	✓	✓	✓					
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾				O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.					
												1LG4 (cast-iron)					
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00											✓	✓	✓	✓	✓	
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11											✓	✓	✓	✓	✓	
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21											✓	✓	✓	✓	✓	
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31											✓	✓	✓	✓	✓	
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51											✓	✓	✓	✓	✓	
Acceptance/certification																	
Individual acceptance by marine classification society	E10											✓	✓	✓	✓	✓	
	Details in plain text											–	–	–	–	–	
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾											✓	✓	✓	✓	✓	
	Details in plain text ²⁾											–	–	–	–	–	
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾											O. R.	O. R.	O. R.	O. R.	O. R.	

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size															
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Forced-air cooled motors without external fan, without fan cover																	
		1PP7 (aluminium)										1PP5 (aluminium)					
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Acceptance/certification																	
Individual acceptance by marine classification society	E10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.					
		1PP4 (cast-iron)															
Basic marine version ¹⁾																	
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00											✓	✓	✓	✓	✓	✓
With type test certificate according to GL (Germanischer Lloyd), Germany, KT45 °C, temperature class F, used in accordance with F	E11											✓	✓	✓	✓	✓	✓
With type test certificate according to LR (Lloyds Register), Great Britain, KT45 °C, temperature class F, used in accordance with F	E21											✓	✓	✓	✓	✓	✓
With type test certificate according to BV (Bureau Veritas), France, KT45 °C, temperature class F, used in accordance with F	E31											✓	✓	✓	✓	✓	✓
With type test certificate according to DNV (Det Norske Veritas), Norway, KT45 °C, temperature class F, used in accordance with F	E51											✓	✓	✓	✓	✓	✓
Acceptance/certification																	
Individual acceptance by marine classification society	E10											✓	✓	✓	✓	✓	✓
	Details in plain text											–	–	–	–	–	–
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾											✓	✓	✓	✓	✓	✓
	Details in plain text ²⁾											–	–	–	–	–	–
Type test with heat run for vertical motors, with acceptance	Details in plain text ²⁾											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- ✓ With extra charge
 – Not possible
 O. R. Possible on request

¹⁾ Motor for use in shipping for higher ambient temperature and/or used as F in accordance with B, order with details in plain text. The order codes for the basic marine version (E00, E11, E21, E31, E51) cannot be combined with each other.

²⁾ Option or details in plain text only necessary for one motor when ordering several motors of the same type.

Special versions

Special versions	Order No. supplement -Z with order code or plain text details	Motor type frame size																
		56	63	71	80	90	100	112	132	160	180	200	225	250	280	315		
Self-cooled motors without external fan																		
			1LP7 (aluminium)										1LP5 (aluminium)					
Basic marine version ^{1) 2)}																		
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Acceptance/certification																		
Individual acceptance by marine classification society	E10		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Type test with heat run for horizontal motors, with acceptance	F83 ³⁾		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Type test with heat run for vertical motors, with acceptance	Details in plain text ³⁾		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.					
1LP4 (cast-iron)																		
Basic marine version ^{1) 2)}																		
Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class F used according to F (if acceptance test certificate 3.1 according to EN 10204 is required, this must be ordered with the additional order code B02)	E00												✓	✓	✓	✓	✓	✓
Acceptance/certification																		
Individual acceptance by marine classification society	E10												✓	✓	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ³⁾												✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	Details in plain text ³⁾												O. R.	O. R.	O. R.	O. R.	O. R.	O. R.

- 1) Motor for use in shipping for higher ambient temperature and/or used as F in accordance with B, order with details in plain text. The order codes for the basic marine version (E00, E11, E21, E31, E51) cannot be combined with each other.
- 2) Certification is possible on request in accordance with the marine classification authorities GL, LR, BV and DNV.
- 3) Option or details in plain text only necessary for one motor when ordering several motors of the same type.

IEC Squirrel-Cage Motors

Marine motors

Special versions

Non-standard motors frame size 315 and above in marine version (individual acceptance required)

Special versions	Order No. supplement -Z with order code and/or plain text details	Motor type frame size				
		315	355	400	450	
Self-ventilated motors for mains-fed and converter-fed operation						
			1LA8 (cast-iron)			
Basic marine version ¹⁾						
Without type test certificate according to GL (Germanischer Lloyd), Germany, KT 45 °C, temperature class F used in accordance with F	E11		✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, KT 45 °C, temperature class F used in accordance with F	E21		✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, KT 45 °C, temperature class F used in accordance with F	E31		✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, KT 45 °C, temperature class F used in accordance with F	E51		✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, KT 50 °C, temperature class F, used in accordance with F	E61		✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, KT 45 °C, temperature class F, used in accordance with F	E71		✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class F in accordance with B	E80 + plain text details		✓	✓	✓	✓
Acceptance/certification						
Individual acceptance by marine classification society	E10		✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09		✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾		✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾		✓	✓	✓	✓
Forced-air cooled motors with externally mounted fan for converter-fed operation						
			1PQ8 (cast-iron)			
Basic marine version ¹⁾						
Without type test certificate according to GL (Germanischer Lloyd), Germany, KT 45 °C, temperature class F used in accordance with F	E11		✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, KT 45 °C, temperature class F used in accordance with F	E21		✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, KT 45 °C, temperature class F used in accordance with F	E31		✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, KT 45 °C, temperature class F used in accordance with F	E51		✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, KT 50 °C, temperature class F, used in accordance with F	E61		✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, KT 45 °C, temperature class F, used in accordance with F	E71		✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class F in accordance with B	E80 + plain text details		✓	✓	✓	✓
Acceptance/certification						
Individual acceptance by marine classification society	E10		✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09		✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾		✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾		✓	✓	✓	✓

IEC Squirrel-Cage Motors

Marine motors

Special versions

Special versions	Order No. supplement -Z with order code and/or plain text details	Motor type frame size				
		315	355	400	450	
Self-ventilated motors with through ventilation for mains-fed and converter-fed operation						
				1LL8 (cast-iron)		
Basic marine version ¹⁾						
Without type test certificate according to GL (Germanischer Lloyd), Germany, KT 45 °C, temperature class F used in accordance with F	E11		✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, KT 45 °C, temperature class F used in accordance with F	E21		✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, KT 45 °C, temperature class F used in accordance with F	E31		✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, KT 45 °C, temperature class F used in accordance with F	E51		✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, KT 50 °C, temperature class F, used in accordance with F	E61		✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, KT 45 °C, temperature class F, used in accordance with F	E71		✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class F in accordance with B	E80 + plain text details		✓	✓	✓	✓
Acceptance/certification						
Individual acceptance by marine classification society	E10		✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09		✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾		✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾		✓	✓	✓	✓

✓ With extra charge

Explosion-proof motors frame size 315 and above in marine version (individual acceptance required)

Special versions	Order No. supplement -Z with order code and/or plain text details	Motor type frame size			
		315	355	400	450
Self-ventilated motors in Zone 22 with type of protection "n" or protection against dust explosions					
		1LA8 (cast-iron)			
Basic marine version ¹⁾					
Without type test certificate according to GL (Germanischer Lloyd), Germany, KT 45 °C, temperature class F used in accordance with F	E11	✓	✓	✓	✓
Without type test certificate according to LR (Lloyds Register), Great Britain, KT 45 °C, temperature class F used in accordance with F	E21	✓	✓	✓	✓
Without type test certificate according to BV (Bureau Veritas), France, KT 45 °C, temperature class F used in accordance with F	E31	✓	✓	✓	✓
Without type test certificate according to DNV (Det Norske Veritas), Norway, KT 45 °C, temperature class F used in accordance with F	E51	✓	✓	✓	✓
Without type test certificate according to ABS (American Bureau of Shipping), USA, KT 50 °C, temperature class F, used in accordance with F	E61	✓	✓	✓	✓
Without type test certificate according to CCS (Chinese Classification Society), China, KT 45 °C, temperature class F, used in accordance with F	E71	✓	✓	✓	✓
Motor for use in shipping, higher ambient temperature and/or used as temperature class F in accordance with B	E80 + plain text details	✓	✓	✓	✓
Acceptance/certification					
Individual acceptance by marine classification society	E10	✓	✓	✓	✓
Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	E09	✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	F83 ²⁾	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F93 ²⁾	✓	✓	✓	✓

✓ With extra charge

¹⁾ Option only necessary for one motor when ordering several motors of the same type. Type testing is also performed for converter-fed operation.

²⁾ The order codes for the basic marine version (E11, E21, E31, E51, E61, E71, E80) cannot be combined with each other.

IEC Squirrel-Cage Motors

Marine motors

Accessories and spare parts

Overview

See the relevant sections under "Standard motors up to frame size 315 L", "Non-standard motors frame size 315 and above", "Explosion-proof motors" and "Fan motors".

Dimensions

Overview

See dimensions under "Standard motors up to frame size 315 L", "Non-standard motors frame size 315 and above", "Explosion-proof motors" and "Fan motors".

Appendix

11



11/2	Overview of products
11/2	SIMATIC ET 200S FC
11/3	SINAMICS G110
11/4	MICROMASTER 410/420/430/440
11/5	MICROMASTER 411/ COMBIMASTER 411
11/5	Geared motors
11/6	Customized motors
11/7	Motors acc. to NEMA standard
11/8	Training
11/9	Training courses for drive systems
11/9	The courses at a glance
11/10	Siemens contact worldwide
11/11	A&D online services - Information and ordering options on the Internet and on CD-ROM
11/11	A&D in the WWW
11/11	Product selection with the Offline Mall from Automation and Drives
11/11	Easy shopping with the A&D Mall
11/12	Customer support
11/12	Online support
11/12	Technical support
11/12	Technical consulting
11/12	Configuration and software engineering
11/12	Field service
11/12	Spare parts and repairs
11/12	Optimisation and modernisation
11/13	Knowledge base on CD-ROM
11/13	Automation Value Card
11/14	Subject index
11/19	Order No. index
11/22	Conditions of sale and delivery, export regulations



Overview of products

Frequency converter for distributed I/O SIMATIC ET 200S FC

The SIMATIC ET 200S FC is a frequency converter with a broad spectrum of possibilities. The table shows an overview of the features of this product. You will find the complete product spectrum with ordering data, technical specifications and descriptions

in catalog IK PI "Industrial Communication for Automation and Drives" and on the Internet at <http://www.siemens.com/et-200s-fc>

SIMATIC ET 200S FC	
Main characteristics	"The key to vast opportunities" the ET 200S FC frequency converter opens up new application possibilities for the ET 200S distributed I/O system in the field of drive systems wherever stepless control of the speed of asynchronous motors is required. This frequency converter handles simple drive tasks (frequency control) or even more complex tasks with vector control. Integral safety functions permit drive solutions without high overhead even in plant components where there is a hazard potential.
Rated outputs	750 W, 2.2 kW, 4.0 kW
Input voltage	3 AC 380 V ... 480 V +10% -15%
Overall module width	Closed-loop control module + power module 80 mm to 750 W rated output, otherwise 145 mm
Power frequency	47 to 63 Hz
Overload Capability	- Overload current 1.5 x rated output current (i.e. 150% overload capability) for 60 s, cycle time 300 s - Overload current 2 x rated output current (i.e. 200% overload capability) for 3 s, cycle time 300 s
Output frequency	0 Hz to 650 Hz
Pulse frequency	8 kHz (standard), 2 kHz to 16 kHz (in 2 kHz increments)
Skipped frequency range	1, programmable
Efficiency	≥96%
Ports	- Connection to PROFIBUS or PROFINET over the ET 200 S backplane bus - Activation of the integrated safety functions via PROFIsafe (PM-D F PROFIsafe) or terminals (PM-D F X1) - RS232 interface with USS protocol for commissioning on the PC using the STARTER commissioning software - Slot for an optional Micro Memory Card (MMC) for uploading or downloading parameter settings - PTC/KTY84 interface for motor monitoring - Speed sensor interface (Sub-D connector) for unipolar HTL incremental position encoder
Conformity to standards	UL, cUL, CE and C-tick, low-voltage directive 73/23/EEC, EMC directive 89/336/EEC
Functional safety	Closed-loop control module with Integral safety functions according to Category 3 of EN 954-1 or according to SIL 2 of IEC 61508: - Safe stop - Safe stop ramp - Safely reduced speed The safety functions "Safely reduced speed" and "Safe braking ramp" are certified for asynchronous motors without encoders - these safety functions are not permitted for pull-through loads as in the case of lifting gear and winders.
Degree of protection	IP 20



SIMATIC ET 200S FC
Closed-loop control modules



SIMATIC ET 200S FC
Power modules

SINAMICS G110 chassis converters

The SINAMICS G110 chassis converter is a flexible drive. The table shows an overview of the features of this product. You will find the complete product spectrum with ordering data, technical specifications and descriptions in Catalog D 11.1

"SINAMICS G110 Converter Chassis Units" and on the Internet at

<http://www.siemens.com/sinamics-g110>

SINAMICS G110	
Main characteristics	"The versatile drive in the low power range" is the frequency converter for converter chassis units, SINAMICS G110 which can be used for a wide range of industrial drive applications using variable speeds. The particularly compact SINAMICS G110 converter uses voltage/frequency control (U/f) and is the ideal frequency converter solution in the lower output and performance ranges of the SINAMICS product family. The converter is available in three housing sizes for connection to single-phase supply systems.
Output range	0.12 kW ... 3.0 kW
Line voltages	1 AC 200 V ... 240 V, $\pm 10\%$;
Network types	IT, TN, TT
Power frequency	50/60 Hz
Output frequency	0 Hz ... 650 Hz
Control methods	U/f control, linear ($M \sim n$) U/f control, quadratic ($M \sim n^2$) U/f control, programmable
Fixed frequencies	3, programmable
Skipped frequency ranges	1, programmable
Digital inputs	3 programmable 24 V DC digital inputs
Analog input (for analog version)	1 analog input for setpoints from 0 V to 10 V, scaleable or for use as 4th digital input
Digital output	1 digital output 24 V DC
Communication interface (for USS version)	RS 485 serial interface for use with USS protocol
Software functions	• Automatic restart following interruptions in operation due to a power failure • Smooth connection of the converter to the rotating motor • Programmable ramp-up/ramp-down times • Ramp smoothing
Protective functions	• Undervoltage • Overvoltage • Ground fault • Short-circuit • Stall prevention • Thermal motor protection I^2t • Converter overtemperature • Motor overtemperature
Connectable motors	Asynchronous motors
Degree of protection	IP20
Cooling method for	
• Converters ≤ 0.75 kW	Finned heat dissipater with convection cooling; version with flat heat dissipater also available
• Converters > 0.75 kW	Internal air cooling (integral fan)
Compliance with standards	CE, UL, cUL, c-tick



SINAMICS G110 Chassis converters

IEC Squirrel-Cage Motors

Appendix

Overview of products

MICROMASTER 410/420/430/440 frequency converters

MICROMASTER converters from Siemens perfectly complement the motors. The table shows an overview of the features of these converters. For the full range of products complete with ordering data, technical details and explanations, see Catalog DA 51.2.

For up-to-date information on MICROMASTER 410/420/430/440 frequency converters, visit the Internet at <http://www.siemens.com/micromaster>

	MICROMASTER 410	MICROMASTER 420	MICROMASTER 430	MICROMASTER 440
Main characteristics	"The low-price solution" for variable speeds with three-phase motors on single-phase networks, e.g. with pumps, fans, billboards, barriers, gate drives and automatic machines	"The universal converter" for three-phase networks and optional fieldbus interfacing, e.g. for conveyor belts, material transport, pumps, fans and machine tools	"The specialist for pumps and fans" with optimized OP (manual/automatic changeover), adapted software functionality and optimised output utilisation	"The all-rounder" with advanced vector control (with and without encoder feedback) for versatile applications in sectors such as conveyor systems, textiles, lifts, lifting gear and machine construction
Output range	0.12 kW ... 0.75 kW	0.12 kW ... 11 kW	7.5 kW ... 250 kW	0.12 kW ... 250 kW
Voltage ranges	1 AC 100 V ... 120 V 1 AC 200 V ... 240 V	1 AC 200 V ... 240 V 3 AC 200 V ... 240 V 3 AC 380 V ... 480 V	3 AC 380 V ... 480 V	1 AC 200 V ... 240 V 3 AC 200 V ... 240 V 3 AC 380 V ... 480 V 3 AC 500 V ... 600 V
Closed-loop Control	- V/f characteristic - Multipoint characteristic (parameterisable V/f characteristic) - FCC (Flux Current Control)	- V/f characteristic - Multipoint characteristic (parameterisable V/f characteristic) - FCC (Flux Current Control)	- V/f characteristic - Multipoint characteristic (parameterisable V/f characteristic) - FCC (Flux Current Control)	- V/f characteristic - Multipoint characteristic (parameterisable V/f characteristic) - FCC (Flux Current Control) - Vector control
Process control	–	Internal PI controller	Internal PID controller	Internal PID controller (autotuning)
Inputs	3 Digital inputs 1 Analog input	3 Digital inputs 1 Analog input	6 Digital inputs 2 Analog inputs 1 PTC/KTY input	6 Digital inputs 2 Analog inputs 1 PTC/KTY input
Outputs	1 Relay output	1 Analog output 1 Relay output	2 Analog outputs 3 Relay outputs	2 Analog outputs 3 Relay outputs
Interfacing to automation system	The PLC partner for LOGO! and SIMATIC S7-200	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION
Additional features	- Natural ventilation (no fan unit) - Position of connections as with conventional switching elements (e.g. contactors) - Variant with flat heat sink	- BICO technology - Compound braking for controlled rapid braking	- Energy-saving mode - Load torque monitoring (detects dry run of pumps) - Motor staging - Bypass mode - BICO technology	3 selectable drive data records - Integrated brake chopper (up to 75 kW) - Torque control - BICO technology



Examples of MICROMASTER 410/420/430/440

Distributed drive solutions - MICROMASTER 411/COMBIMASTER 411 converters and geared motors

The MICROMASTER 411/COMBIMASTER 411 converters and geared motors from Siemens are available as a distributed drives solution. The table shows an overview of the features of this product. The complete product spectrum with ordering data, technical details and descriptions can be found in Catalog DA 51.3 MICROMASTER 411/COMBIMASTER 411, M 15 geared motors and in M 15 News · June 2005.

For up-to-date information on MICROMASTER 411 and COMBIMASTER 411 as well as geared motors, visit the Internet at

<http://www.siemens.com/combimaster> or
<http://www.siemens.com/gearedmotors>

	MICROMASTER 411	COMBIMASTER 411	Geared motors				
Main characteristics	"The distributed converter" for a wide drive range, for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems.		Helical geared 2KG31, 2KG36, 2KG41, 2KG46	Offset geared 2KG32, 2KG42	Bevel helical geared 2KG33, 2KG43	Helical worm geared 2KG34	Worm geared 2KG35
Output range	0.37 kW ... 3 kW		0.09 kW ... 45 kW			0.09 kW ... 7.5 kW	0.09 kW ... 1.5 kW
Voltage ranges	3 AC 380 V ... 480 V		230/400 VΔ/Y; 500 VΔ/Y; 400/690 VΔ/Y				
Case/ frame sizes	CS B CS C	71 ... 100 90/100	63 ... 225			63 ... 132	63 ... 90
Types of construction		IM B3 IM B5 IM V1 (without protective cover) IM V1 (with protective cover) IM B14 (with standard flange) IM B14 (with special flange) IM B35	Foot-mount- ing type Flange-mount- ing type	Foot-mounting type Flange-mounting type Torque arm			
Degree of protection	IP65	IP55	IP55 (IP65, IP56)				
Further technical characteristics	• V/f characteristic • Multipoint characteristic (parameterisable V/f characteristic) • FCC (Flux Current Control) • Internal PI controller • 3 Digital inputs • 1 Analog input • 1 Relay output • Compound braking for controlled rapid braking • ECOFAST variants with plug connector for power supply, communication interfaces and motor connections to support quick and problem-free replacement. The ECOFAST variants are totally compatible with the ECOFAST technology systems.		Aluminium or cast iron case Torque 82 ... 20000 Nm	Aluminium or cast iron case Torque 150 ... 20000 Nm	Aluminium or cast iron case Torque 130 ... 20000 Nm	Aluminium or cast iron case Torque 120 ... 1590 Nm	Cast aluminium case Torque 50 ... 185 Nm



Examples of MICROMASTER 411



Examples for geared motors



Examples of COMBIMASTER 411

IEC Squirrel-Cage Motors

Appendix

Overview of products

Customized motors

In addition to the products offered in the catalog, our range of motors also includes "Customized motors".

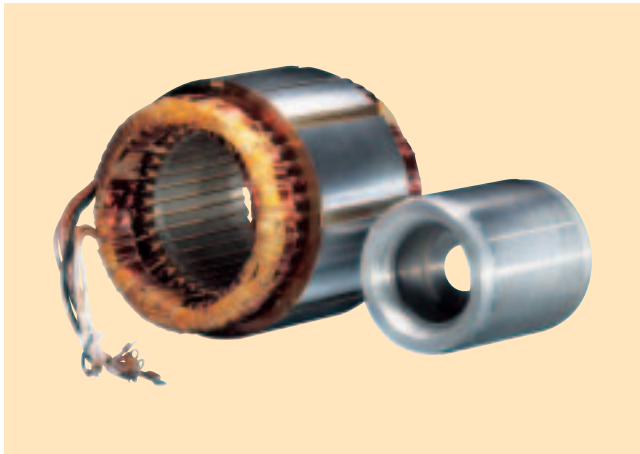
We can develop individual drive solutions for your special requirements, provide samples and supply them in accordance with your logistical requirements.

Our worldwide network of Siemens offices as well as our regional offices in Germany are, of course, at your disposal for advice (see "Siemens contact worldwide").

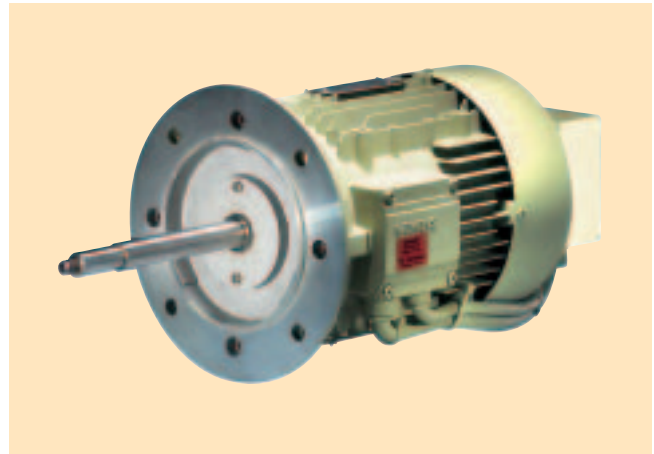
Please enquire for details.

We have listed below some of the "Customized solutions" already realised:

- High-speed motors for textile machines and compressors
- Motors with increased output/size ratio
- Liquid-cooled motors
- Synchronous generators for standby supply systems
- Motors for wood processing plants
- Built-in motors for refrigerating motors/compressors (freezer proof)
- Rolling motors for harsh conditions (e.g. roller drives)
- Pump motors with special shafts/special materials
- Single-phase motors for industrial applications
- Lifting gear motors



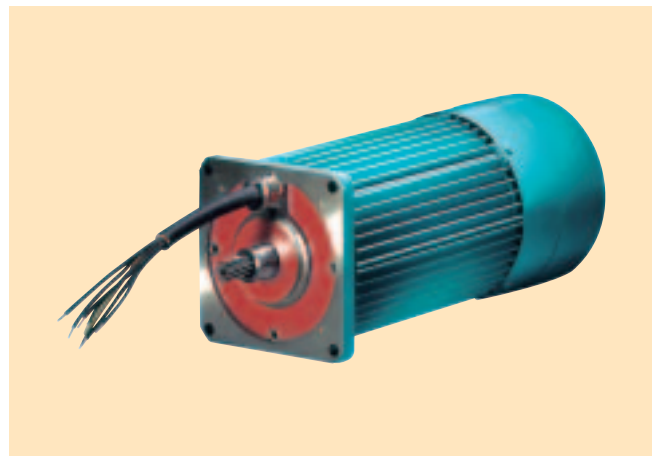
Built-in motor for refrigeration



Pump motor with special shaft/special materials



Roller motor for harsh conditions



Lifting gear motor

NEMA motors

For compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico), we manufacture low-voltage motors acc. to the NEMA standard for a wide range of different application areas. This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels: Our NEMA motor series provide the highest operating reliability and maximum service life. Designed and manufactured for rugged operation, our NEMA motors conquer even the harshest industrial conditions strictly in accordance with the ISO 9001 international quality standard; with maximum performance, reliability and efficiency.

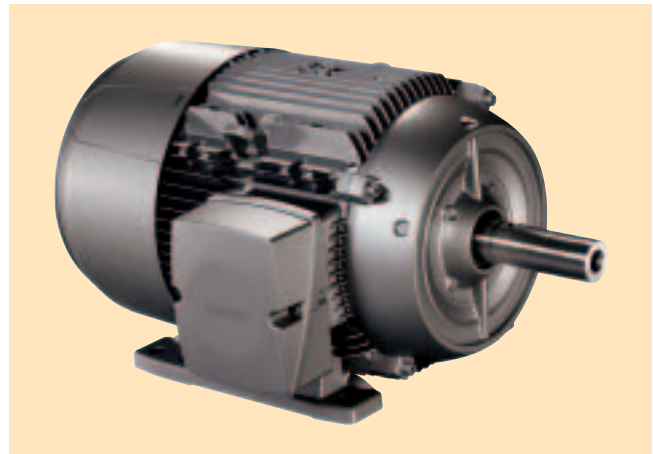
You will find the complete product spectrum with ordering data, technical specifications and information in Catalog D 81.2 U.S./Canada on the Internet at

<http://www.sea.siemens.com/motors>

NEMA motors (NEMA = National Electrical Manufacturers Association)	
Frame size	NEMA frame size 56 ... 449
Output range	0.25 HP ... 500 HP
Number of poles	2/4/6/8
Voltages	3 AC 230/460/575 V
Frequency	60 Hz, 50 Hz on request
Type of construction	Foot-mounted, D flange, C flange, P flange
Casing	Cast-iron, aluminium or steel depending on the version
Cooling method	Surface-cooling or internal ventilation depending on the version
Temperature class	F used acc. to B
Type spectrum	General purpose motors • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Standard motors for general industrial use • Aluminium or cast-iron case depending on the version Severe duty motors • Legally specified minimum efficiency levels or NEMA premium efficiency levels • Cast-iron case • Motors for use under extremely difficult environmental conditions Severe duty IEEE841 motors • Efficiency levels required by IEEE that exceed the EPACT act • Motors with increased requirements for use in the petrochemical industry (according to IEEE841) • Cast-iron case Explosion-proof motors • Efficiency levels better than or equal to EPACT • Multi label according to Division 1, Class I, Group D and Class II, Groups F&G • Single label according to Division 1, Class I, Groups C&D



Example of NEMA motor, Severe Duty SD100, cast-iron case



Example of NEMA motor, General Purpose GP10A, aluminium case

Training



Training is decisive for your success

SITRAIN® – Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation, plant installation and plant support enables you to make your decisions with certainty and full command. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.

All in all, this represents an enormous gain for your company: Shortened startup times, optimized plant components, faster troubleshooting, reduced down times. In other words, increased profits and lower costs.

Top trainers

Our trainers know their topics in practice, and possess comprehensive didactic experience. Course developers have a direct wire to product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers makes it possible for them to pass on theoretical matter in a plausible manner. But since it is known that all theory is drab, we attach great importance to practical exercises which can comprise up to half of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. You feel absolutely certain when trained in this manner.

Wide variety

With a total of approx. 300 local attendance courses, we train the complete range of A&D products and a large portion of the system solutions from I&S. Telecourses, teach-yourself software and seminars presented on the Web supplement our classical range of courses.

Close to customer

We are only a short distance away. You can find us approx. 60 times in Germany, and worldwide in 62 countries. You wish to have individual training instead of one of our 300 courses? Our solution: we will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

The right mixture: blended learning

Blended learning is understood to be the combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Furthermore, SITRAIN utilizes supported online training for live instruction on the Internet at agreed times.

The right mixture is the solution. Therefore, blended learning can convey complex topics well, and train networked thinking. Additional effect: reduced traveling costs and periods of absence through training sequences independent of location and time.

The international training portal

More information is available on the Internet at

<http://www.siemens.com/sitrain>

All training facilities at a glance: search in the worldwide range of courses at leisure, call up all course dates online, utilize the daily updated display of vacant course spaces - and register directly.

Or let us advise you personally:

Course office, Infoline Germany

Tel.: +49 (0)1805-23 56 11

Fax: +49 (0)1805-23 56 12

... and request our latest training catalog on:

	Language	Order No.
Catalog ITC (paper version)	German	E86060-K6850-A101-B6
Dates and price list including CD-ROM	German	E86060-P6850-A101-D2
SITRAINonCD interactive course information system on CD-ROM	German/ English	E86060-D6850-A100-C4-7400
Overview of training worldwide	German/ English	E86060-K6899-A101-B5-7400

Training courses for drive systems

This is intended to give you an overview of the training courses offered for three-phase motors and drive systems.

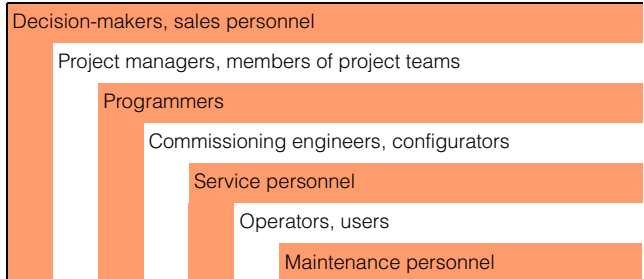
Our courses are tailored to different target groups as well as to individual customer requirements.

You can select from a range of courses on the fundamentals of drive technology and on the Micromaster drive system (converter/motor).

All courses contain as many practical exercises as possible, in order to enable intensive and direct training on the drive system and with the tools in small groups.



The courses at a glance



Title	Target group						Duration/ Medium	Course code
Motor workshop for service		✓	✓	✓		✓	2 days	SD-MOT-WS
MICROMASTER								
MICROMASTER 4 Advanced Course, Commissioning		✓	✓	✓			3 days	SD-MM4-AUF
MICROMASTER MM4/G110 Compact Course	✓			✓	✓	✓	1 day	SD-WSMM4
Commissioning MICROMASTER 420	✓	✓	✓	✓	✓	✓	CD-ROM	SM-MM4
Commissioning MICROMASTER 420	✓	✓	✓	✓	✓	✓	WBT	WT-MM4
AC converters								
Handling drive faults - AC drives			✓		✓	✓	3 days	SD-IHAC02
Fundamentals of drive technology			✓	✓	✓		5 days	SD-GAT
Drive technology for beginners	✓	✓	✓	✓	✓	✓	WBT	WT-ANTREIN
Drive technology for beginners	✓	✓	✓	✓	✓	✓	CD-ROM	SM-ANTREIN

IEC Squirrel-Cage Motors

Appendix

Siemens contact worldwide



At

<http://www.siemens.com/automation/partner>

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- technical support,
- spare parts/repairs,
- service,
- training,
- sales or
- consultation/engineering.

You start by selecting a

- country,
- product or
- sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

A&D in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

<http://www.siemens.com/automation>

you will find everything you need to know about products, systems and services.

Product selection with the Offline Mall from Automation and Drives



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.

All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found on the Internet under

<http://www.siemens.com/automation/ca01>

or on CD-ROM or DVD.

Easy shopping with the A&D Mall



The A&D Mall is the virtual department store of Siemens AG on the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

<http://www.siemens.com/automation/mall>

Customer support

Our services for every phase of your project



In the face of harsh competition you need optimum conditions to keep ahead all the time: a strong starting position, as sophisticated strategy and a team for the necessary support – in every phase. Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and commissioning to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online support



The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

<http://www.siemens.com/automation/service&support>

Technical support



Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Phone: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223

E-Mail: adsupport@siemens.com

In the United States, call toll-free:

Phone: +1 800 333 7421,
Fax: +1 423 262 2200

E-Mail: solutions.support@sea.siemens.com

In Canada, call:

Phone: +1 888 303 3353

E-Mail: cic@siemens.ca

In Asia:

Phone: +86 10 6475 7575,
Fax: +86 10 6474 7474

E-Mail: adsupport.asia@siemens.com

Technical consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consul-

ting on product and system questions right to the creation of the automation solution.¹⁾

Optimization and upgrading

To enhance productivity and save costs in your project we

offer high-quality services in optimization and upgrading.¹⁾

Configuration and software engineering



Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.¹⁾

Service on site



With Service On Site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
Phone: 0180 50 50 444¹⁾

In the United States, call toll-free:

Phone: +1 800 333 7421

In Canada, call:

Phone: +1 888 303 3353

Repairs and spare parts



In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
Phone: 0180 50 50 448¹⁾

In the United States, call toll-free:

Phone: +1 800 241 4453

In Canada, call:

Phone: +1 888 303 3353

¹⁾ You will find telephone numbers for other countries on our Internet site <http://www.siemens.com/automation/service&support>

Knowledge Base on CD-ROM



For those applications in which an online link to the Internet is not available, an extract from the information area that can be accessed free of charge is available on CD-ROM (Service & Support Knowledge Base). This CD-ROM contains all the product information (FAQs, downloads, tips and tricks, news) that was available at the time the CD was generated as well as general information about service and technical support.

On the CD-ROM you will also find a full text search and our Knowledge Manager to search for specific solutions. The CD-ROM is updated every 4 months.

As is the case with our online information on the Internet, the Service & Support Knowledge Base CD is available complete with 5 languages (English, German, French, Italian and Spanish).

You can order the CD **Service and Support Knowledge Base** from your Siemens contact.

Order No.: **6ZB5310-0EP30-0BA2**

Ordering via the Internet
(with the Automation Value Card or credit card) at:

<http://www.siemens.com/automation/service&support>

in the shop.

Automation Value Card



Small card – lots of support

The Automation Value Card is an integral part of the comprehensive service concept with which Siemens Automation and Drives accompanies you in every phase of your automation project.

Whether you require certain services from our Technical Support or want to buy high-quality support tools in our online shop: You can always pay with the Automation Value Card. No costs for processing invoices, transparent and secure. With the card number that is only known to you and the associated PIN, you can check your current balance at any time as well as all the debits and credits.

Services on the card. This is how it works.

The card number and PIN are printed on the back of the Automation Value Card. When it is supplied, the PIN is covered by a scratch field so the full credit is guaranteed to be on the card.

By specifying the card number and PIN, you have complete access to the current range of Service and Support. The amount for the service obtained is deducted in the form of credits from the balance on your Automation Value Card.

All the offered services are priced in terms of credits independently of national currencies, so you can use the Automation Value Card worldwide.

Order Numbers for the Automation Value Card

Credits	Order No.
200	6ES7 997-0BA00-0XA0
500	6ES7 997-0BB00-0XA0
1000	6ES7 997-0BC00-0XA0
10000	6ES7 997-0BG00-0XA0

For detailed information about the offered services, visit our Internet site:

<http://www.siemens.com/automation/service&support>

Service & Support à la Card: Some examples

Technical Support

"Priority"	Priority handling for urgent cases
"24 h"	Availability round-the-clock
"Extended"	Technical advice for complex questions

Support tools in the Support Shop

"System Utilities"	Ready-to-use tools for design, analysis and checking
"Applications"	Complete topics including fully tested software
"Functions & Samples"	Modifiable function blocks to speed up your developments

IEC Squirrel-Cage Motors

Appendix

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