

IEC Squirrel-Cage Motors

Frame sizes 56 to 450

Power range 0.06 to 1250 kW

Catalog D 81.1 • 2008



Motors

SIEMENS

Related catalogs

MOTOX Geared motors

D 87.1

E86060-K5287-A111-A2-7600



Industry Automation and Motion Control

Information and ordering platform on the Internet at:

www.siemens.com/automation/mall



FLENDER Standard Couplings

MD 10.1

E86060-K5710-A111-A2-7600



SINAMICS G110/SINAMICS G120

D 11.1

Inverter Chassis Units

SINAMICS G120D

Distributed Frequency Converters

E86060-K5511-A111-A5-7600



SINAMICS G130

D 11

Drive Converter Chassis Units

SINAMICS G150

Drive Converter Cabinet Units

E86060-K5511-A101-A4-7600



MICROMASTER

DA 51.2

MICROMASTER 420/430/440

Inverters

0.12 kW to 250 kW

E86060-K5151-A121-A6-7600



MICROMASTER/COMBIMASTER

DA 51.3

MICROMASTER 411 Inverter

COMBIMASTER 411

Distributed Drive Solutions

E86060-K5251-A131-A2-7600



Industrial Communication

IK PI

Part 5: ET 200 Distributed I/O

ET 200S FC Frequency converter

E86060-K6710-A101-B6-7600



AC NEMA & IEC Motors

D81.2

Further details available on the Internet at:

U.S./
Canada

Only PDF

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



Industry Automation and Motion Control

CA 01

The Offline-Mall
(DVD)

E86060-D4001-A510-C7-7600



Additional documentation

You will find all information material, such as brochures, catalogs, 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).

Catalog CA 01 – Selection tool SD configurator

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



Furthermore, the SD configurator can now be used on the Internet without installation.

The SD configurator can be found in the Siemens Mall under the following address:

<http://www.siemens.com/sd-configurator>

In the main menu of the CA 01 under the tab "selection tool", you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency converters and SIMATIC ET 200S FC and SIMATIC ET 200pro 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 1.5 GHz CPU or faster
- Operating systems
 - Windows 98/ME
 - Windows 2000
 - Windows XP
 - Windows NT (Service Pack 6 or higher)
 - Windows Vista
- 1024 MB work memory (minimum)
- Screen resolution 1024 x 768, graphic with more than 256 colors
- Small fonts
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

You can install this catalog directly from the DVD as a partial version or full version on your hard disk or in the network.

Motors

IEC Squirrel-Cage Motors

Frame sizes 56 to 450

Power range 0.06 to 1250 kW

Catalog D 81.1 · 2008



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

Supersedes:

Catalog D 81.1 · 2007

Catalog News D 81.1 N · October 2007

The products contained in this catalog can also be found in the e-Catalog CA 01.

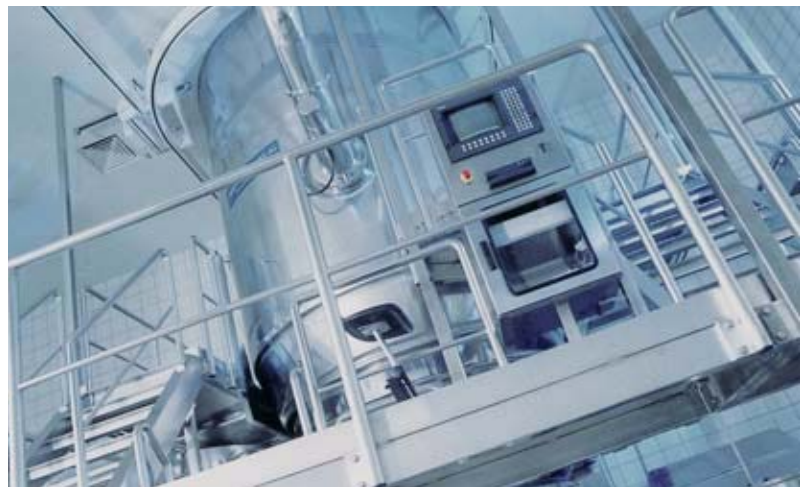
Order No.:

E86060-D4001-A510-C7-7600 (DVD)

Please contact
your local
Siemens branch

© Siemens AG 2008

Introduction	0
New Generation 1LE1/1PC1	1
Standard motors up to frame size 315 L	2
Non-standard motors frame size 315 and above	3
Explosion-proof motors	4
Motors operating with frequency converters	5
Pump motors	6
Fan motors	7
Compressor motors	8
Smoke-extraction motors	9
Marine motors	10
Appendix	11





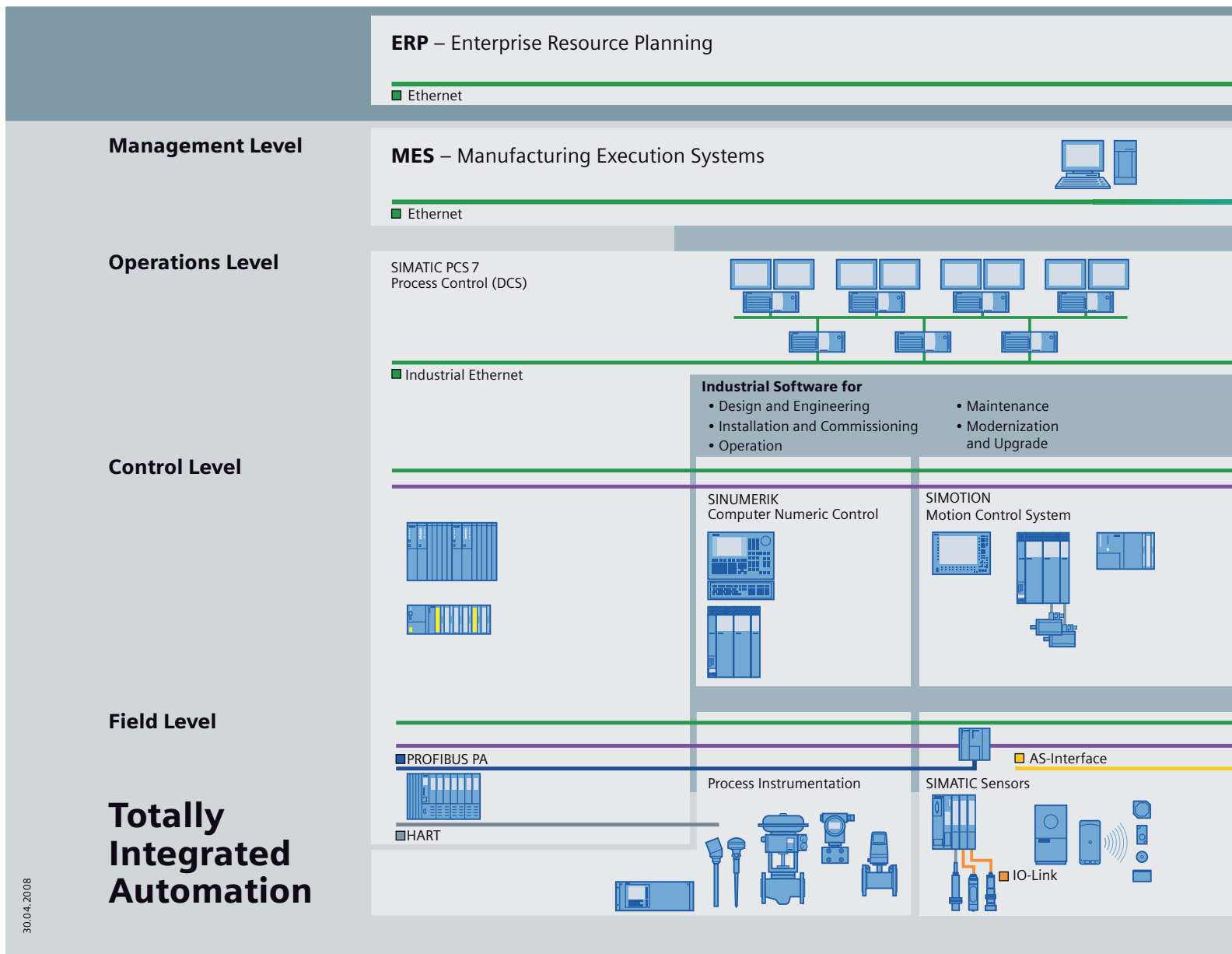
Answers for Industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

The high quality of our products sets industry-wide benchmarks. High environmental aims are part of our eco-management, and we implement these aims consistently. Right from product design, possible effects on the environment are examined. Hence many of our products and systems are RoHS compliant (Restriction of Hazardous Substances). As a matter of course, our production sites are certified according to DIN EN ISO 14001, but to us, environmental protection also means most efficient utilization of valuable resources. The best example are our energy-efficient drives with energy savings up to 60 %.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.

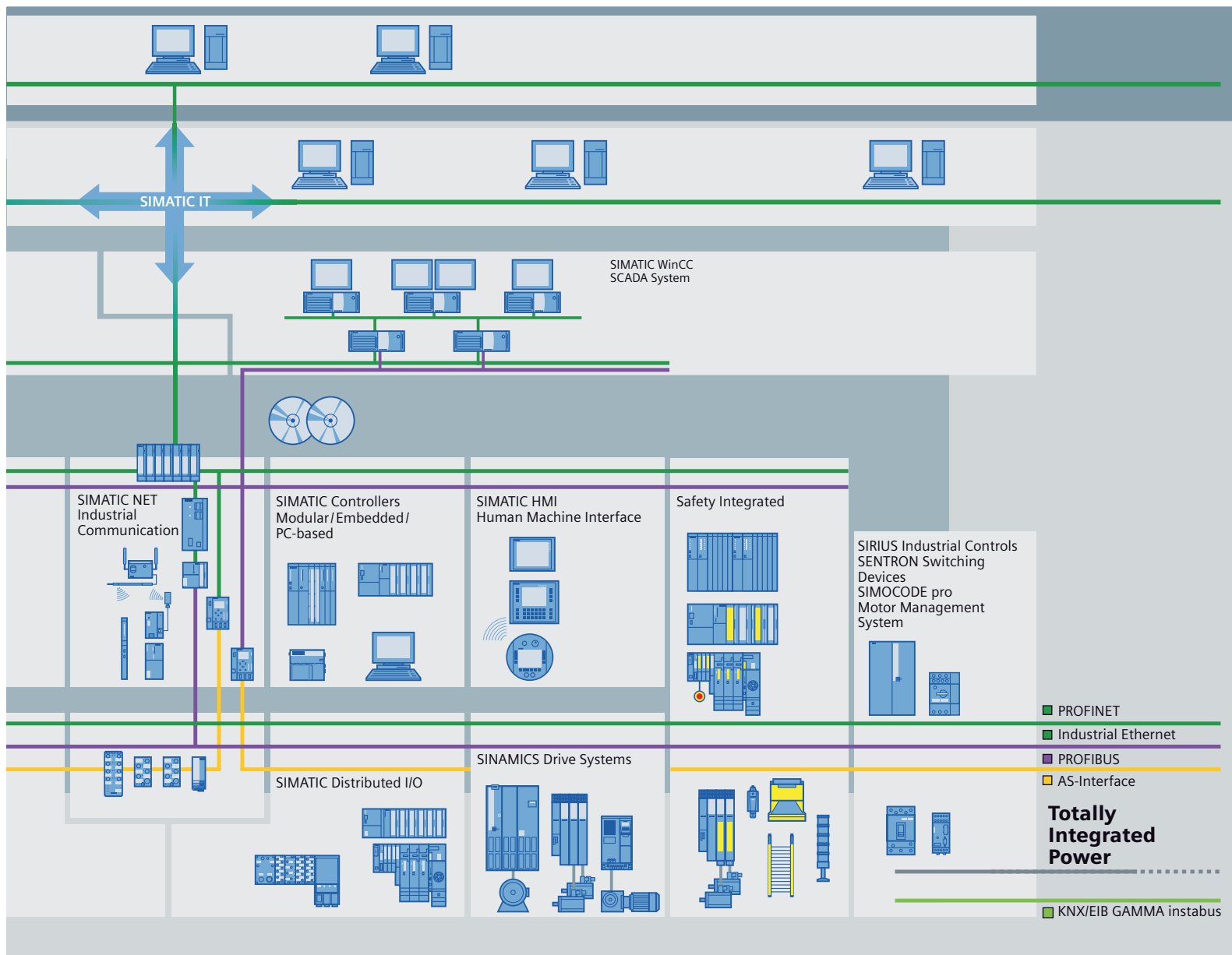


30.04.2008

Setting standards in productivity and competitiveness.

Totally Integrated Automation.

Thanks to Totally Integrated Automation, Siemens is the only provider of an integrated basis for implementation of customized automation solutions – in all industries from inbound to outbound.



TIA is characterized by its unique continuity.

It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

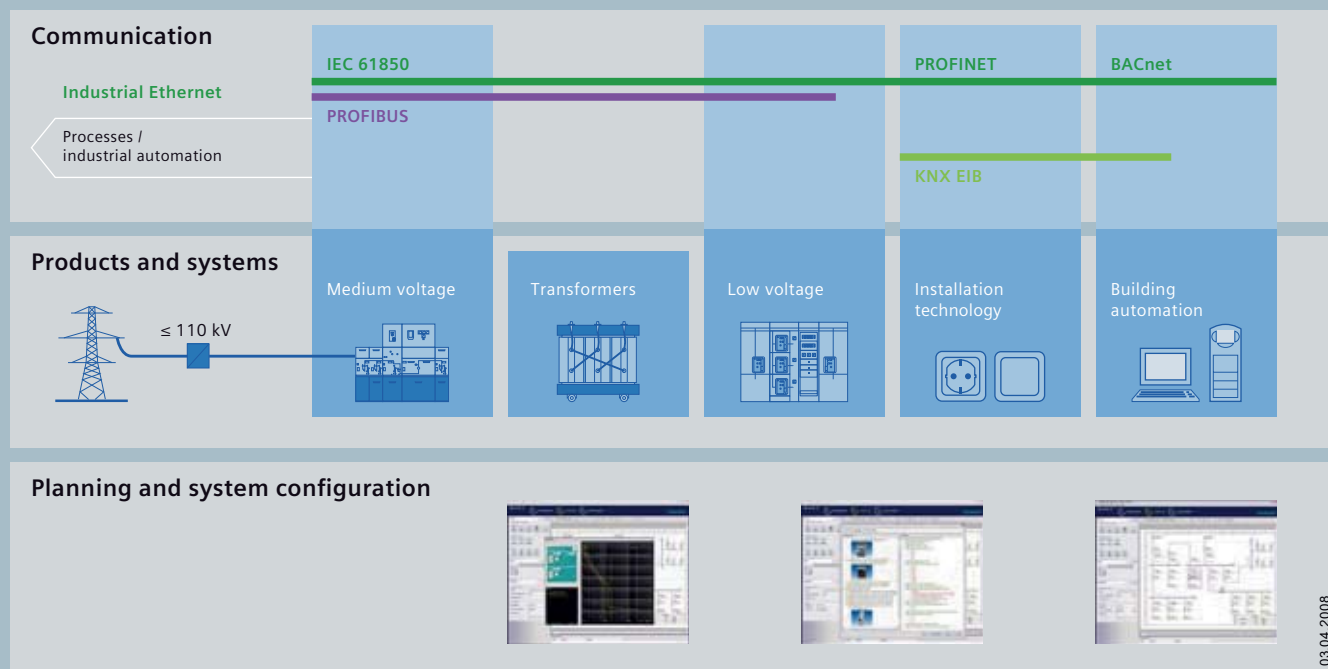
The unique continuity is already a defined characteristic at the development stage of our products and systems.

The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.



Integrated power distribution from one source.

Totally Integrated Power.



Electrical power distribution in buildings requires integrated solutions. Our response: Totally Integrated Power. This means innovative and integrated, interface-optimized products and systems which have been optimally coordinated and complemented with communication and software modules that link power distribution to building automation or industrial automation. Totally Integrated Power accompanies power distribution projects from one end to the other. From A to Z. From the planning to the building's use: Totally Integrated Power offers significant advantages in every project stage and to everyone involved in the project – the investors, electrical planning engineers, electricians, users and building facility managers.

Our portfolio comprises everything from engineering tools to the matching hardware: from switchgear and distribution systems for medium voltage to transformers, from switching and circuit-protection devices to low-voltage switchgear and busbar trunking systems, as far as to the small distribution board and the wall outlet. It goes without saying that both the medium-voltage switchgear, which requires no maintenance, and the low-voltage switchgear are type-tested, and their busbar connections, too. Comprehensive protection systems ensure the safety of man and machine at any time.

Introduction



0/2 Guide to selecting and ordering the motors

0/2 Overview

- 0/2 • Recommendations for drive selection – step-by-step to the required motor
- 0/3 • Determining the motor type according to cooling method, degree of protection and frame design

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0/7 Order No. code

0/7 Overview

0/8 Special versions

0/8 Overview

0/13 General technical data

0/13 Overview

- 0/13 • Cut-away diagram of a low-voltage motor
- 0/14 • Designs in accordance with standards and specifications
- 0/17 • Colors and paint finish
- 0/20 • Packaging, safety notes, documentation and test certificates
- 0/22 • Voltages, currents and frequencies
- 0/28 • Outputs
- 0/29 • Efficiency, power factor, rated torque, rated speed and direction of rotation
- 0/30 • Rating plate and extra rating plates
- 0/31 • Coolant temperature and site altitude
- 0/32 • Windings and insulation
- 0/34 • Motor protection
- 0/36 • Heating and ventilation
- 0/38 • Motor connection and connection box
- 0/52 • Types of construction
- 0/54 • Mechanical design and degrees of protection
- 0/56 • Balance and vibration quantity
- 0/56 • Shaft and rotor
- 0/58 • Bearings and lubrication
- 0/75 • Modular technology
 - 0/75 – 1XP8 001 rotary pulse encoder
 - 0/76 – Separately driven fan
 - 0/77 – Brakes
 - 0/84 – Combinations of basic versions
- 0/85 • Special technology

Introduction motors 1LE1/1PC1

0/94 Order No. code

0/94 Overview

0/95 Special versions

0/95 Overview

0/97 General technical data

0/97 Overview

- 0/97 • Cut-away diagram of a low-voltage motor
- 0/98 • Designs in accordance with standards and specifications
- 0/100 • Colors and paint finish
- 0/102 • Packaging, safety notes, documentation and test certificates
- 0/103 • Voltages, currents and frequencies
- 0/105 • Outputs
- 0/105 • Efficiency, power factor, rated torque, rated speed and direction of rotation
- 0/106 • Rating plate and extra rating plates
- 0/107 • Coolant temperature and site altitude
- 0/108 • Windings and insulation
- 0/110 • Motor protection
- 0/111 • Heating and ventilation
- 0/113 • Motor connection and connection box
- 0/116 • Types of construction
- 0/118 • Mechanical design and degrees of protection
- 0/120 • Balance and vibration quantity
- 0/121 • Shaft and rotor
- 0/122 • Bearings and lubrication
- 0/127 • Modular technology
 - 0/128 – 1XP8 012 rotary pulse encoder
 - 0/129 – Separately driven fan
 - 0/130 – Brakes
- 0/134 • Special technology

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

0

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” – “Coolant 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 different catalog parts		
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 technology, etc.) .		
Step 6			
Select 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 catalog part. The availability of individual technical designs can be established from catalog parts 1 to 10.

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

0

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 catalog parts 1 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		
New generation motors 1LE1/1PC1				Catalog Part 1																			
General Line motors with shorter delivery time	Self-ventilated	IP55	Aluminum	1LE1 1.5 ... 18.5 kW																			
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LE1 0.75 ... 18.5 kW																			
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum	1LE1 0.75 ... 18.5 kW																			
Motors with increased output and improved efficiency	Self-ventilated	IP55	Aluminum	1LE1 2.2 ... 22 kW																			
Motors with increased output and high efficiency	Self-ventilated	IP55	Aluminum	1LE1 2.2 ... 22 kW																			
Motors without external fan and fan cover with improved efficiency	Forced-air-cooled	IP55	Aluminum	1LE1 0.75 ... 18.5 kW																			
Motors without external fan and fan cover with high efficiency	Forced-air-cooled	IP55	Aluminum	1LE1 0.75 ... 18.5 kW																			
Motors without external fan and fan cover with improved efficiency	Self-cooled	IP55	Aluminum	1PC1 0.3 ... 7.4 kW																			
Motors without external fan and fan cover with high efficiency	Self-cooled	IP55	Aluminum	1PC1 0.37 ... 9 kW																			
Standard motors (up to frame size 315 L)				Catalog Part 2																			
Energy-saving motors with improved efficiency (Improved Efficiency EFF 2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW		1LE1/1PC1		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		1LE1/1PC1		1LP5 5.5 ... 16.5 kW															
		IP55	Cast iron							1LP4 3.7 ... 67 kW													
Non-standard motors (frame size 315 and above)				Catalog Part 3																			
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 mounted separately driven 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							

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

0

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				
Explosion-proof motors				Catalog Part 4																					
Motors in Zone 1 with type of protection “e” (Zone 1 Exe 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 “de” (Zone 1 Exde IIC T4)	Self-ventilated	IP55	Cast iron	1MJ6 0.25 ... 37 kW								1MJ7 18.5 ... 132 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					
Motors operating with frequency converters				Catalog Part 5																					
Surface-cooled motors with standard insulation for voltages ≤500 V																									
For standard motors, non-standard motors, explosion-proof motors and fan motors, see catalog part 5.																									
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 mounted separately driven fan with special insulation for voltages up to 690 V	Forced-air cooled	IP55	Cast iron																			1PQ8 145 ... 980 kW			

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

0

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				
Pump motors						Catalog Part 6																					
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum	1LA7 0.06 ... 18.5 kW		1LE1/1PC1		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						Catalog Part 7																					
Motors in pole-changing version	Self-ventilated	IP55	Aluminum	1LA7 0.15 ... 17 kW		1LA5 18 ... 31 kW																					
		IP55	Cast iron			1LG4 4.5 ... 175 kW																					
Motors without external fan and without fan cover	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW		1LE1/1PC1		1PP5 11 ... 37 kW																			
		IP55	Cast iron					1PP4 11 ... 200 kW																			
Compressor motors						Catalog Part 8																					
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						Catalog Part 9																					
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)																					
Marine motors (motors for drives on ships below deck)						Catalog Part 10																					
Type approved standard motors up to frame size 315 L – 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																			
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 Exe II T3)	Self-ventilated	IP55	Aluminum	1MA7 0.12 ... 16 kW																							
		IP55	Cast iron					1MA6 1.3 ... 165																			

IEC Squirrel-Cage Motors

Introduction

Guide to selecting and ordering the motors

0

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) (continue)																			Catalog Part 10	
Type approved, explosion-proof motors up to frame size 315 L – Motors in Zone 1 with type of protection “de” (Zone 1 Exde 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							1LG4/1LG6 11 ... 200 kW										
Type approved 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										
Type approved fan motors – Motors without external fan and without fan cover	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW						1PP5 15 ... 37 kW										
		IP55	Cast iron							1PP4 11 ... 200 kW										
Standard motors up to frame size 315 L	Self-cooled	IP55	Aluminum	1LP7 0.045 ... 7 kW						1LP5 5.5 ... 16.5 kW										
		IP55	Cast iron							1LP4 3.7 ... 67 kW										
Smoke-extraction motors Temperature/time classes F200 and F300	Self-ventilated	IP55	Aluminum	1LA7 0.09 ... 18.5 kW						1LA5 4.05 ... 45 kW										
		IP55	Cast iron							1LG6 37 ... 200 kW										
	Forced-air cooled	IP55	Aluminum	1PP7 0.09 ... 18.5 kW						1PP5 4.05 ... 45 kW										
		IP55	Cast iron													1PP6 37 ... 200 kW				
Smoke-extraction motors Temperature/time class F400	Self-ventilated	IP55	Cast iron	1LA6 0.3 ... 22 kW						1LG6 15 ... 200 kW										
	Forced-air cooled	IP55	Cast iron	1PP6 0.3...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) 1)	
Explosion-proof motors frame size 315 and above – Self-ventilated motors in Zones 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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Order No. code

0

Overview

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 block (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:																								
IEC squirrel-cage motors, surface-cooled														1	2	3	4	5	6	7	-	8	9	10	11	12
Positions 1 to 3: Digit, letter, letter	• Self-ventilated by fan mounted on and driven by rotor, aluminum or cast-iron housing	1	L	A																						
	• Self-ventilated by fan mounted on and driven by rotor, cast-iron housing	1	L	G																						
	• Self-ventilated by fan mounted on and driven by rotor, increased safety, type of protection Ex e II	1	M	A																						
	• Self-ventilated by fan mounted on and driven by rotor, explosion-proof enclosure, type of protection Ex de IIC	1	M	J																						
	• Self-ventilated with through-ventilation, cast-iron housing	1	L	L																						
	• Self-cooled without external fan, aluminum and cast-iron housing	1	L	P																						
	• Forced-air cooled by air flow from the fan to be driven, aluminum 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																									

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with improved efficiency, IP55 degree of protection, aluminum 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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview

The order codes and availability are assigned to the individual motor series in the "Selection and ordering data" in the individual catalog parts 2 to 10.

For voltages, see "Voltages, currents and frequencies" in the "Introduction" as well as in catalog parts 2 to 10.

For types of construction, see "Types of construction" in the "Introduction" as well as in catalog parts 2 to 10.

All available options are listed according to topics in the following table. An alphanumerical listing according to order codes can be found in the appendix under "Overview of order codes".

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	0/33, 4/82
A11	Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping	0/34, 0/38
A12	Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	0/35
A15	Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping	0/35, 4/3, 4/82
A16	Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping	0/33, 4/3, 4/82
A23	Motor temperature detection with embedded temperature sensor KTY 84-130	0/35
A25	Motor temperature detection with embedded temperature sensors 2 x KTY 84-130	0/35
A31	Temperature detectors for tripping	0/34
A60	Installation of 3 PT 100 resistance thermometers in stator winding	0/36
A61	Installation of 6 PT 100 resistance thermometers in stator winding	0/36
A72	Installation of 2 PT 100 screw-in resistance thermometers (basic circuit) for rolling-contact bearings	0/36
A78	Installation of 2 PT 100 screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36
A80	Installation of 2 PT 100 double screw-in resistance thermometers (3-wire circuit) for rolling-contact bearings	0/36
Motor connection and connection box		
G55	ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY	0/51
G56	ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400 VY	0/51
K06	Two-part plate on connection box	0/39
K09	Connection box on RHS	0/38
K10	Connection box on LHS	0/38
K11	Connection box on top, feet screwed on	0/38
K15	Connection box in cast-iron version	0/38, 0/47 ...
K53	Explosion-proof connection box, Ex d IIC type of protection	0/38, 0/48 ...
K54	One cable gland, metal	0/39
K55	Cable gland, maximum configuration	0/39
K57	Cable gland DIN 89280, maximum configuration	0/39
K83	Rotation of the connection box through 90°, entry from DE	0/39
K84	Rotation of the connection box through 90°, entry from NDE	0/39
K85	Rotation of connection box through 180°	0/39
L00	Next larger connection box	0/38
L01	Undrilled entry plate	0/40
L13	External earthing	0/38
L44	3 cables protruding, 0.5 m long	0/40
L45	3 cables protruding, 1.5 m long	0/40
L47	6 cables protruding, 0.5 m long	0/40
L48	6 cables protruding, 1.5 m long	0/40
L49	6 cables protruding, 3 m long	0/40
L51	Protruding cable ends – right side	0/40
L52	Protruding cable ends – left side	0/40
L97	Auxiliary connection box 1XB3 020	0/50
M46	Stud terminal for cable connection, accessories pack (3 items)	0/49
M47	Saddle terminal for connection without cable lug, accessories pack	0/49
M50	Auxiliary connection box 1XB9 016	0/50
M58	Next larger connection box 1XB1 621	0/38
M64	Connection box on NDE	0/38
M69	Terminal strip for main and auxiliary terminals	0/49
M88	Auxiliary connection box 1XB9 014 (aluminum)	0/50
Windings and insulation		
C11	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	0/32
C12	Temperature class 155 (F), used acc. to 155 (F), with increased power rating	0/32
C13	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	0/33
C18	Temperature class 180 (H) at rated output and max. CT 60 °C	0/33
C19	Increased air humidity/temperature with 30 to 60 g water per m³ of air	0/33

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview (continued)

Order code	Special versions	For further information, see Page
Windings and insulation (continued)		
C22	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	0/33
C23	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	0/33
C24	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	0/33
C25	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	0/33
C26	Increased air humidity/temperature with 60 to 100 g water per m ³ of air	0/33
Y50 <i>New!</i>	Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	0/33
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	0/33
Colors and paint finish		
K23	Unpainted (only cast-iron parts primed)	0/17
K24	Unpainted, only primed	0/17
K26	Special finish in RAL 7030 stone gray	0/18
M91 <i>New!</i>	Offshore special finish	0/17
M94 <i>New!</i>	Sea air resistant special finish	0/17
Y51	Special finish in special RAL colors	0/17, 0/19
Y53	Standard finish in other standard RAL colors	0/17, 0/18
Y54	Special finish in other standard RAL colors	0/17, 0/18
Modular technology – Basic versions		
G17	Mounting of separately driven fan	0/76
G26	Mounting of brake	0/77 ...
H57	Mounting of 1XP8 001-1 (HTL) rotary pulse encoder	0/75
H58	Mounting of 1XP8 001-2 (TTL) rotary pulse encoder	0/75
Modular technology – Combinations of basic versions		
H61	Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	0/84
H62	Mounting of brake and 1XP8 001-1 rotary pulse encoder	0/84
H63	Mounting of brake and separately driven fan	0/84
H64	Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder	0/84
H97	Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	0/84
H98	Mounting of brake and 1XP8 001-2 rotary pulse encoder	0/84
H99	Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder	0/84
Modular technology – Additional versions		
C00	Brake supply voltage 24 V DC	0/83
C01	Brake supply voltage 400 V AC	0/83
C02	Brake supply voltage 180 V DC, for operation on MM411-ECOFAS	0/83
K82	Manual brake release with lever	0/83
Special technology		
H15	Prepared for mounting MMI	0/15, 0/85
H47	Mounting of brake NFA (Stomag)	0/85
H70	Mounting of LL 861 900 220 rotary pulse encoder	0/85
H72	Mounting of HOG 9 D 1024 I rotary pulse encoder	0/86
H73	Mounting of HOG 10 D 1024 I rotary pulse encoder	0/87
H78	Prepared for mounting LL 861 900 220	0/85
H79	Prepared for mounting HOG 9 D 1024 I	0/86
H80	Prepared for mounting HOG 10 D 1024 I	0/87
H86 <i>New!</i>	Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22	4/5, 4/6
H87 <i>New!</i>	Mounting of explosion-proof rotary pulse encoder for use on Ex d/de motors in Zone 1	4/5, 4/6
J15 <i>New!</i>	Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	0/87
J16 <i>New!</i>	Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	0/88
M95 <i>New!</i>	Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2	4/5, 4/8
M96 <i>New!</i>	Mounting of explosion-proof separately driven fan II 2D for use in Zone 21	4/5, 4/8
M97 <i>New!</i>	Mounting of explosion-proof separately driven fan II 3D for use in Zone 22	4/5, 4/8
M98 <i>New!</i>	Mounting of explosion-proof separately driven fan Ex de for use in Zone 1	4/5, 4/8
Y70	Mounting a special type of rotary pulse encoder	0/85
Y74 <i>New!</i>	Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	0/88
Y76 <i>New!</i>	Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	0/89
Y79 <i>New!</i>	Mounting of rotary pulse encoder HOG 10 DN 1024 I + E SL 93, (speed rpm), connection box protection against moisture	0/89

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview (continued)

Order code	Special versions	For further information, see Page
Mechanical design and degrees of protection		
K17	Drive-end seal for flange-mounting motors with oil resistance to 0.1 bar	0/54
K32	With two additional eyebolts for IM V1/IM V3	0/54
K37	Low-noise version for 2-pole motors with clockwise direction of rotation	0/55
K38	Low-noise version for 2-pole motors with counter-clockwise direction of rotation	0/55
K50	IP65 degree of protection	0/54
K52	IP56 degree of protection (non-heavy-sea)	0/54
L03	Vibration-proof version	0/55
L12	Condensation drainage holes	0/54
M27	Non-rusting screws (externally)	0/55
M44	Earth brushes for converter-fed operation	0/55
M68	Mechanical protection for encoder	0/55
Coolant temperature and site altitude		
D02	Coolant temperature -50 to +40 °C	0/32
D03	Coolant temperature -40 to +40 °C	0/32
D04	Coolant temperature -30 to +40 °C	0/32
D11	Coolant temperature 45 °C, derating 4 %	0/32
D12	Coolant temperature 50 °C, derating 8 %	0/32
D13	Coolant temperature 55 °C, derating 13 %	0/32
D14	Coolant temperature 60 °C, derating 18 %	0/32
D19 <i>New!</i>	Coolant temperature -40 °C to + 40 °C for EX motor	4/5
Designs in accordance with standards and specifications		
D01	CCC China Compulsory Certification	0/16
D30	Electrical according to NEMA MG1-12	0/15
D31	Design according to UL with "Recognition Mark"	0/15
D32	Ex certification for China	4/83
D33 <i>New!</i>	Certified for Korea according to KS C4202	0/16
D40	Canadian regulations (CSA)	0/15, 0/16
D46 <i>New!</i>	PSE Mark Japan	0/16
Design for Zones 1, 2, 21 and 22 according to ATEX		
C27	Stamping of Ex nA II on VIK rating plate	4/83
C30	Outputs T1/T2 on rating plate	4/81
K30	VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	4/83
M34	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	4/4, 4/81
M35	Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	4/4, 4/81
M38	Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	4/4, 4/83
M39	Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	4/4, 4/83
M72	Design for Zone 2 for mains-fed operation Ex nA II T3 to IEC/EN 60079-15	4/4, 4/81 ...
M73	Design for Zone 2 for converter-fed operation, derating Ex nA II T3 to IEC/EN 60079-15	4/4, 4/83
M74 <i>New!</i>	Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation	4/81
M75 <i>New!</i>	Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating	4/83
M76 <i>New!</i>	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for mains-fed operation	4/81
M77 <i>New!</i>	Design for Zones 1 and 21, as well as for Zone 22 for conducting dust (IP65), for converter-fed operation, derating	4/82
Y68	Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200 S FC)	4/82
Marine version – Basic marine version		
E00	Without type test certificate according to ABS 50 °C/CCS 45 °C/RINA 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E11	With/without type test certificate according to GL (Germanischer Lloyd), Germany, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E21	With/without type test certificate according to LR (Lloyds Register), Great Britain, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E31	With/without type test certificate according to BV (Bureau Veritas), France, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E51	With/without type test certificate according to DNV (Det Norske Veritas), Norway, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E61	With/without type test certificate according to ABS (American Bureau of Shipping), USA, CT 50 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E71	With/without type test certificate according to CCS (Chinese Classification Society), China, CT 45 °C, temperature class 155 (F), used according to 155 (F)	10/4 ...
E80	Motor for use in shipping, higher ambient temperature and/or used as 155 (F) according to 130 (B)	10/10 ...

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview (continued)

Order code	Special versions	For further information, see Page
Marine version – Acceptance/certification		
E09	Individual acceptance by marine classification society with supervision of construction and acceptance test certificate 3.2 according to EN 10204	10/4 ...
E10	Individual acceptance by marine classification society	10/4 ...
F83	Type test with heat run for horizontal motors, with acceptance	10/6 ...
F93	Type test with heat run for vertical motors, with acceptance	10/23 ...
Standardline (only for motor series 1LA8)		
B20	Standardline version	3/13
Bearings and lubrication		
G50	Measuring nipple for SPM shock pulse measurement for bearing inspection	0/58
K20	Bearing design for increased cantilever forces	0/58, 0/62 ...
K36	Special bearing for DE and NDE, bearing size 63	0/58, 0/63 ...
K40	Regreasing device	0/58
K94	Located bearing DE	0/58
L04	Located bearing NDE	0/58
L27	Insulated bearing cartridge	0/58
Balance and vibration quantity		
K02	Vibration quantity level B	0/56
L68	Full key balancing	0/56
M37 <i>New!</i>	Balancing without key	0/56
Shaft and rotor		
K04	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	0/57
K16	Second standard shaft extension	0/56
K42	Shaft extension with standard dimensions, without featherkey way	0/57
L39	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	0/57
M65	Standard shaft made of non-rusting steel	0/57
Y55	Non-standard cylindrical shaft extension	0/57
Heating and ventilation		
H17	Fan cover for textile industry	0/37
K34	Cast-iron fan cover	0/37
K35	Metal external fan	0/37
K45	Anti-condensation heaters for 230 V	0/36
K46	Anti-condensation heaters for 115 V	0/36
L36	Sheet metal fan cover	0/37
M14 <i>New!</i>	Anti-condensation heater, Ex. 115 V	0/36
M15 <i>New!</i>	Anti-condensation heater, Ex. 230 V	0/36
Y81	Separately driven fan with non-standard voltage and/or frequency	0/37
Rating plate and extra rating plates		
B06 <i>New!</i>	Second lubricating plate, supplied loose	0/30
K31	Second rating plate, loose	0/30
Y80	Extra rating plate or rating plate with deviating rating plate data	0/30
Y82	Extra rating plate with identification code	0/30
Y84	Additional information on rating plate and on package label (maximum of 20 characters)	0/30
Packaging, safety notes, documentation and test certificates		
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	0/21
B01	Complete with one set of safety and commissioning notes per wire-lattice pallet	0/21
B02	Acceptance test certificate 3.1 according to EN 10204	0/21
B23	Operating instructions German/English enclosed in print	0/21
B31	Document – Electrical data sheet	0/21, 3/52 ...
B32	Document – Order dimension drawing	0/21, 3/52 ...
B37	Document – Load characteristics	0/21, 3/52 ...
F01	Standard test (routine test) with acceptance	0/21, 3/52 ...
F03	Visual acceptance and report handover with acceptance	0/21, 3/52 ...
F04	Temperature-rise test, without acceptance	0/21, 3/53 ...
F05	Temperature-rise test, with acceptance	0/21, 3/53 ...
F28	Noise measurement during idling, no noise analysis, no acceptance	0/21, 3/53 ...
F29	Noise measurement during idling, no noise analysis, with acceptance	0/21, 3/53 ...

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

Special versions

0

Overview *(continued)*

Order code	Special versions	For further information, see Page
Packaging, safety notes, documentation and test certificates (continued)		
F34	Recording of current and torque curves with torque metering shaft during starting, without acceptance	0/21, 3/53 ...
F35	Recording of current and torque curves with torque metering shaft during starting, with acceptance	0/21, 3/53 ...
F52	Measurement of the locked-rotor torque and locked-rotor current, without acceptance	0/21, 3/53 ...
F53	Measurement of the locked-rotor torque and locked-rotor current, with acceptance	0/21, 3/53 ...
F62	Noise analysis, without acceptance	0/21, 3/53 ...
F63	Noise analysis, with acceptance	0/21, 3/53 ...
F82	Type test with heat run for horizontal motors, without acceptance	0/21, 3/53 ...
F83	Type test with heat run for horizontal motors, with acceptance	0/21, 3/53 ... 10/6, 10/10 ...
F92	Type test with heat run for vertical motors, without acceptance	0/21, 3/53 ...
F93	Type test with heat run for vertical motors, with acceptance	0/21, 3/53 ...
L99	Wire-lattice pallet	0/20
M32	Connected in star for dispatch	0/20
M33	Connected in delta for dispatch	0/20

IEC Squirrel-Cage Motors

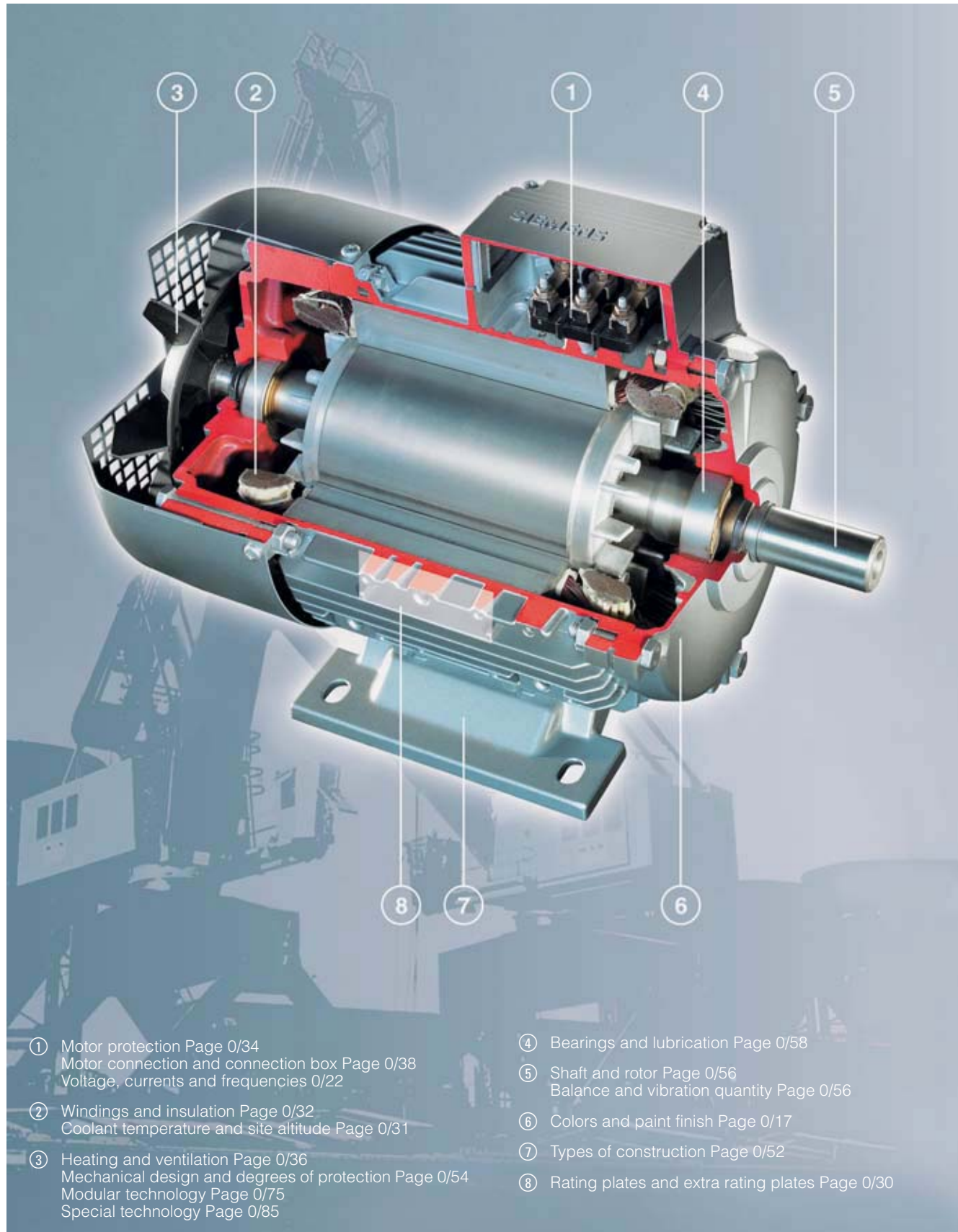
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Overview

Cut-away diagram of a low-voltage motor



- ① Motor protection Page 0/34
Motor connection and connection box Page 0/38
Voltage, currents and frequencies 0/22
- ② Windings and insulation Page 0/32
Coolant temperature and site altitude Page 0/31
- ③ Heating and ventilation Page 0/36
Mechanical design and degrees of protection Page 0/54
Modular technology Page 0/75
Special technology Page 0/85

- ④ Bearings and lubrication Page 0/58
- ⑤ Shaft and rotor Page 0/56
Balance and vibration quantity Page 0/56
- ⑥ Colors and paint finish Page 0/17
- ⑦ Types of construction Page 0/52
- ⑧ Rating plates and extra rating plates Page 0/30

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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/EN	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 Ex motors:		
General regulations	IEC/EN 60079-0	DIN EN 60079-0
Explosion-proof enclosure "d"	IEC/EN 60079-1	DIN EN 60079-1
Increased safety "e"	IEC/EN 60079-7	DIN EN 60079-7
Type of protection "n" (non sparking)	IEC/EN 60079-15	DIN EN 60079-15
Areas containing flammable dust	IEC/EN 61241	DIN EN 61241

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 IS 4722	India
NEK – IEC 60034-1	Norway

Explosion-proof motors:

Since the requirements of explosion-proof motors comply with the European standards EN 60079-0, EN 60079-1, EN 60079-7 and Directive 94/9/EG (ATEX 95), 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.

The EU is currently changing the standard series from EN 50014ff to IEC / EN 60079-xx and IEC / EN 61241-xx. The transition period is approximately 2 years. After changing the standards, the first E of the marking of the type of protection will be omitted. For example: Old: EEx de – New: Ex de. The first E represented Euronorm.

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. Rated voltage and rated voltage range see Page 0/23.

Efficiency η for
 $P_{\text{rated}} \leq 150 \text{ kW}$: $-0.15 \cdot (1 - \eta)$
 $P_{\text{rated}} > 150 \text{ kW}$: $-0.1 \cdot (1 - \eta)$

with η being a decimal number.

Power factor – $\frac{1 - \cos \phi}{6}$

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

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

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 150 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 Ex e motors or Ex de motors as well as marine motors, there is no listing.

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code **C18**.

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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 without additional charge with connection box 1XB1 621. The connection boxes are designed with an undrilled 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 Ex e motors or Ex de motors as well as marine motors, there is no approval.

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code C18, for 1LA5, 1LG4, 1PP4 and 1PP5 motor series.

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 ±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 catalog part 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

Export of low-voltage motors to Japan

PSE Mark Japan – Order Code D46

PSE marking is a mandatory certification in Japan in accordance with the electrical devices and safety of materials act. "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking. Marking is only applicable to motor series 1LA7, 1LP7, 1PP7 in catalog parts 2 "Standard motors up to frame size 315 L" and 7 "Motors with fans".

The motors concerned are marked on the rating plate with the following "PSE" logo.



Export of low-voltage motors to Korea

Korea certification – Order Code D33

Certification confirms that the efficiency and power factor are in compliance with KSC 4202 (KEMCO). The certification is applicable to EFF1 motors of the 1LA9 and 1LG6 series in 2, 4 and 6 pole versions from 0.75 kW to 200 kW 400 V 50 Hz.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Colors and paint finish

To protect the drives against corrosion and external influences, high-quality coatings based on 2-K epoxy resin are offered in various different colors.

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

“Sea air resistant” special finish system – Order code **M94**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for indoor installations or outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure, inshore maritime climate, but not offshore maritime climate, e.g. for crane drives and also in the paper industry Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C4 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 50 °C Thermal stability from –40 to 140 °C

“Offshore” special finish system – Order code **M91**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure and offshore maritime climate, e.g. for crane drives Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C5 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 60 °C Thermal stability from –40 to 140 °C

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 an additional charge (for an overview of the available RAL No./RAL colors see the following table for order code **Y53**).

Other colors in special finish must be ordered with the order code **Y51** or **Y54** and the RAL number in plain text (for an overview of the available RAL No./RAL colors, see the following tables for order codes **Y51** and **Y54**).

Direct sunlight can change the color. If color stability is required, it is recommended to use a polyurethane-based paint (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 be supplied only coated in primer, order code **K24**, or unpainted (unworked cast-iron surfaces in primer) using order code **K23**.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

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

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

Special finish in standard RAL color with defined order codes
(special finish in other standard RAL colors can be ordered
indicating 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 gray (order code **K26**) standard version.

RAL No.	Color name	Order code
7030	Stone gray	K26

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

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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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

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

Coating structure and colors not specified in the catalog are available on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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	–	–	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 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

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 frame size 315 and above (catalog part 3) 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)

For non-standard motors from frame size 315 and above (catalog part 3) 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 mains-fed operation)

Optionally available documents for other motors:

- Operating instructions German/English enclosed in print – Order code **B23**
- "SD Manual Collection": all manuals for low-voltage motors, geared motors and low-voltage converters on DVD in 5 languages, see catalog part 11 "Appendix".

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 (catalog part 3). The assignment of order codes to motor types can be found in the "Special versions" section of the relevant catalog parts.

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 external representative (e.g. customer) and handover of the routine test report to 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 mains-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 mains-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).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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.

Standard	Category	Category
EN 60034 – 1	A	B
Voltage deviation	$\pm 5\%$	$\pm 10\%$
Frequency deviation	$\pm 2\%$	$+3\%/-5\%$
Rating plate data stamped with rated voltage (e.g. 230 V)	a $\pm 5\%$ (e.g. 230 V $\pm 5\%$)	a $\pm 10\%$ (e.g. 230 $\pm 10\%$)
Rating plate data stamped with rated voltage ranges b to c (e.g. 220 to 240 V)	b -5% to c $+5\%$ (e.g. 220 -5% to 240 $+5\%$)	b -10% to c $+10\%$ (e.g. 220 -10% to 240 $+10\%$)

According to the standard, longer operation is not recommended for Category B, therefore this is not permitted for explosion-proof motors. See Page 0/31 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 mains 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 motors 660 V or 725 V are listed in the table on Pages 0/26, 0/27 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.

Mains 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, 4, 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, 4, 5, 6, 7 or 8). The order code **L8Y** is only possible for non-standard motors of the motor series 1LA8, 1PQ8 and 1LL8. Order code **L8Y** does not apply to explosion-proof motors, converter-fed 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 outputs.

For voltages and rated outputs outside these ranges, please inquire.

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 **L8Y**, **L1Y** and **L3Y**, state in plain text: Voltage, frequency and connection.

Order codes for other rated voltages in the relevant catalog parts

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 catalog parts.

¹⁾ Not 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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Further voltages for standard 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 motor					
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1LP5, 1LP7	1LP4
220 VΔ/380 VY ²⁾ (210 ... 230 VΔ/ 360 ... 400 VY)	50 Hz output	L1R	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 L
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 200	180 ... 315 M
380 VΔ/660 VY ³⁾ (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 (380 ... 420 VΔ)	50 Hz output	L1B	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	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, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U**, a rated voltage range is also included on the rating plate.

²⁾ For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

³⁾ For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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)	Frame sizes for motors						
			1LA5, 1LA7	1LA6	1LA9	1LG4, 1LG6	1MA6, 1MA7 ²⁾	1MJ6	1MJ7
220 VΔ/380 VY ³⁾ (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
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	56 ... 225	100 ... 160	56 ... 200	180 ... 315 M	63 ... 315 M	71 ... 200	225 ... 315 M
380 VΔ/660 VY ⁴⁾ (360 ... 400 VΔ/ 625 ... 695 VY)	50 Hz output	L1L	56 ... 225	100 ... 160	56 ... 200	180 ... 315 L	71 ... 315 L	71 ... 200	225 ... 315 M
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	71 ... 315 L	71 ... 200	225 ... 315 M
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	L1B⁵⁾	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 ⁶⁾	1MJ6	1MJ7
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
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
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
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
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
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
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
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

1) For order codes **L1A**, **L1C**, **L1D**, **L1E**, **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 Ex n II T3.

2) For further information on the rated voltage range see Page 4/84.

3) For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

4) For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1LA5, 1LA7, 1LA9, 1LP5 and 1LP7 motor series.

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

6) A special certificate is required.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 ²⁾ (210 ... 230 VΔ/ 360 ... 400 VY)	50 Hz output	L1R	63 ... 200	180 ... 315 M
230 VΔ (220 ... 240 VΔ)	50 Hz output	L1E	63 ... 200	180 ... 315 M
380 VΔ/660 VY ³⁾ (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 (380 ... 420 VΔ)	50 Hz output	L1B	63 ... 200	180 ... 315 L
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, L1B, L1C, L1D, L1E, L1L, L1R** and **L1U** a rated voltage range is also included on the rating plate.

²⁾ For the order code **L1R** a voltage of 440 VY 60 Hz is also possible for 1PP5 and 1PP7 motor series.

³⁾ For the order code **L1L** a voltage of 440 VΔ 60 Hz is also possible for 1PP5 and 1PP7 motor series.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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

	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
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	0.69	0.71	0.58	0.59	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	2.12	2.17	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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

	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 catalog part 3 "Non-standard motors frame size 315 and above"; but in 660 V design.

²⁾ Only available for 690 V, see catalog part 3 "Non-standard motors frame size 315 and above"; but in 725 V design.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Outputs

The outputs and the rated outputs are listed in the selection tables and in the separate catalog parts for 50 Hz and in most

Table of rated output at 60 Hz for single-speed motors

Motor type			Admissible 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	0.1
1LA7 073	–	1MJ6 073	0.63	0.43	0.29	0.14
1LA7 080	–	1MJ6 080	0.86	0.63	0.43	0.21
1LA7 083	–	1MJ6 083	1.3	0.86	0.63	0.29
1LA7 090	–	1MJ6 096	1.75	1.3	0.86	0.43
1LA7 096	–	1MJ6 097	2.55	1.75	1.3	0.63
1LA7 106	1LA6 106	1MJ6 106	3.45	2.55	1.75	0.86
1LA7 107	1LA6 107	1MJ6 107	–	3.45	–	1.3
1LA7 113	1LA6 113	1MJ6 113	4.6	4.6	2.55	1.75
1LA7 130	1LA6 130	1MJ6 130	6.3	6.3	3.45	2.55
1LA7 131	1LA6 131	1MJ6 131	8.6	–	–	–
1LA7 133	1LA6 133	1MJ6 133	–	8.6	4.6	3.45
1LA7 134	1LA6 134	1MJ6 134	–	–	6.3	–
1LA7 163	1LA6 163	1MJ6 163	12.6	12.6	8.6	4.6
1LA7 164	1LA6 164	1MJ6 164	17.3	–	–	6.3
1LA7 166	1LA6 166	1MJ6 166	21.3	17.3	12.6	8.6
1LA5 183	1LG . 183	1MJ6 183	24.5	21.3	–	–
1LA5 186	1LG . 186	1MJ6 186	–	25.3	18	3.2
–	1LG . 188	–	33.5	34.5	22	18
1LA5 206	1LG . 206	1MJ6 206	33.5	–	22	–
1LA5 207	1LG . 207	1MJ6 207	41.5	34.5	26.5	18
–	1LG . 208	–	51	42.5	36	22
1LA5 220	1LG . 220	1MJ7 220	–	42.5	–	22
1LA5 223	1LG . 223	1MJ7 223	51	52	36	26.5
–	1LG . 228	–	62	63	44.5	36
–	1LG . 253	1MJ7 253	62	63	44.5	36
–	1LG . 258	–	84	86	54	44.5
–	1LG . 280	1MJ7 280	84	86	54	44.5
–	1LG . 283	1MJ7 283	101	104	66	54
–	1LG . 288	–	123	127	90	66
–	1LG . 310	1MJ7 310	123	127	90	66
–	1LG . 313	1MJ7 313	148	152	108	90
–	1LG . 316	–	180	184	132	108
–	1LG . 317	–	224	230	158	132
–	1LG . 318	–	–	–	192	158

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	60 Hz
	50 Hz with foot	60 Hz with foot	50 Hz with flange	60 Hz with flange	50 Hz	
56 to 315 M	•	•	•	•	•	•
315 L	•	•	–	–	•	•
315	•	•	•	•	•	•
355 and 400	•	•	•	•	•	–
450	•	–	•	–	•	–

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			Admissible 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

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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

Assignment of the standard power kW-HP and vice versa in accordance with IEC

$$\text{kW} \cdot 1,341 = \text{HP}$$

$$\text{HP} \cdot 0,746 = \text{kW}$$

P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP
0.06	0.08	0.37	0.5	2.2	3	11	15	37	50	110	150
0.09	0.12	0.55	0.75	3	4	15	20	45	60	132	200
0.12	0.16	0.75	1	4	5	18.5	25	55	75	160	250
0.18	0.25	1.1	1.5	5.5	7.5	22	30	75	100	200	300
0.25	0.33	1.5	2	7.5	10	30	40	90	125		

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

General technical data

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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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, 1MJ6, 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 or extra rating plate and on the packaging label (maximum of 20 characters), order code **Y84**.

An extra rating plate can also be supplied for the identification code, order code **Y82**.

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

An extra rating plate can be supplied loose for all motors of frame sizes 100 to 315, order code **B06**.

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 Hz and 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	230 VΔ/ 400 VY and 460 VY 500 VΔ and 575 VΔ 400 VΔ/ 690 VY and 460 VΔ
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	□		○							
1MJ6	71 ... 200	□		○							
1MJ7	225 ... 315				□	○	○	○	✓		
1PP4	180 ... 315				□				✓		□
1PP5	180 ... 200	□		○						□	□
1PP6	100 ... 315				□				✓		□
1PP7	63 ... 160	□		○						□	□
1PQ8	315 ... 450				□	○	○	○			

- Standard version
 ○ Without additional charge
 ✓ With additional charge

IEC Squirrel-Cage Motors

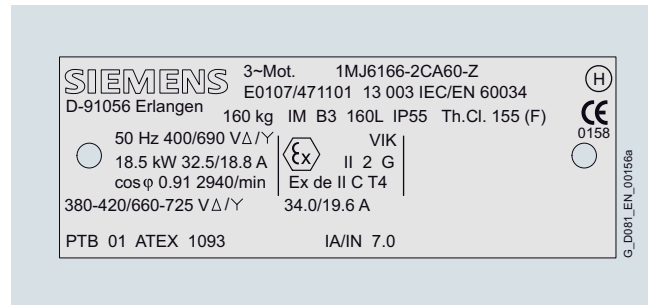
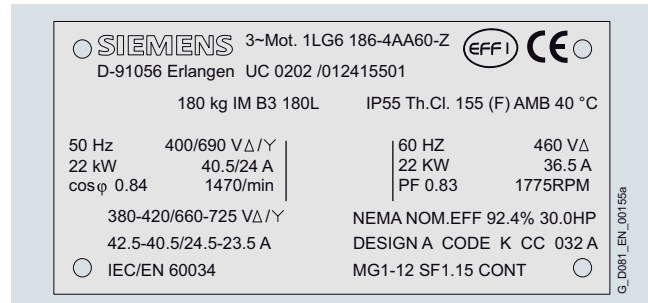
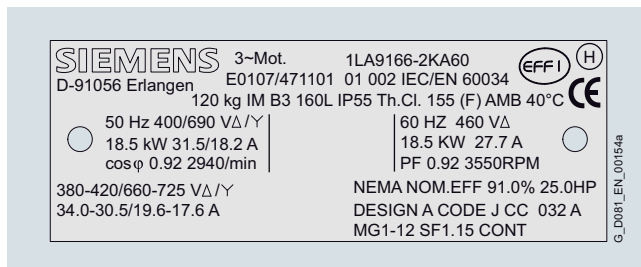
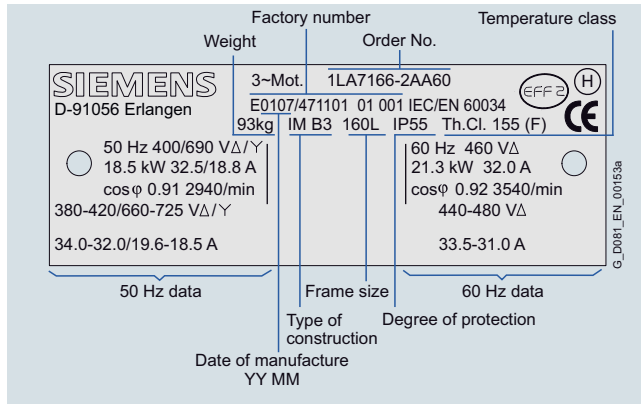
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Examples of rating plates

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



Coolant 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 (CT) or ambient temperature (AT) of 40 °C and a site altitude (SA) or up to 1000 m above sea level.

For higher coolant 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 an admissible output of the motor of:

$$P_{adm.} = P_{rated} \cdot k_{HT}$$

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

Site altitude above sea level	Site altitude above sea level	Coolant temperature	30 °C ... 40 °C	45 °C	50 °C	55 °C	60 °C
m	<30 °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	

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

If the admissible 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.

Abbreviation	Description	Units
$P_{adm.}$	Admissible motor output	kW
P_{rated}	Rated output	kW
k_{HT}	Factor for abnormal coolant temperature and/or site altitude	

The motors are designed for temperature class 155 (F) and used in temperature class 130 (B). Under non-standard operating conditions, if they are to be used in class 130 (B), the admissible output must be determined from the tables below.

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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

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

Power (kW)	Admissible output at 50 Hz	
	For CT 45 °C	For CT 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 155 (F), see "DURIGNIT IR 2000" insulation system.

Motors for coolant temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class 130 (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 special versions are possible for 1LG4, 1LG6, 1LP4, 1PP4 and 1LA8 motors:

- Motors for coolant temperatures from -50 to +40 °C order code **D02** (not for 1LA8)
- Motors for coolant temperatures from -40 to +40 °C order code **D03**
- Motors for coolant temperatures from -30 to +40 °C order code **D04**

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

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

For details of order codes for use in temperature class 155 (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 155 (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 130 (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 coolant 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, vapors, 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 inquire about extreme applications.

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

All motors are designed for temperature class 155 (F).

At rated output with mains-fed operation, the motors can be used in temperature class 130 (B).

Temperature class 155 (F), used according to 155 (F), with service factor (SF)

For all 1LA motors (with the exception of 1LA9 with increased output, as these are already used according to temperature class 155 (F)), 1LG, 1LL8 and 1PP motors for mains-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 155 (F), used according to 155 (F), for increased output

For motors supplied from stock (with the exception of 1LA9 with increased output, as these are already used according to temperature class 155 (F)) and 1LA8 motors, the service factor is indicated on the rating plate as standard. For use according to temperature class 155 (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**.

Temperature class 155 (F), used according to 155 (F), with increased coolant temperature

At the output specified in the catalog under mains-fed operation, the coolant 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 catalog, the motors are used according to temperature class 155 (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 180 (H), used according to 155 (F), with Service Factor (SF1.1)

For all 1LA8, 1PQ8 and 1LL8 motors for mains-fed operation in frame sizes 315 to 355 for the rated output given in the selection table and rated voltage, a service factor of 1.1 and 1.05 can be specified (for frame sizes 400 and 450). For use according to temperature class 180 (H), as service factor of 1.1 for mains-fed operation is also permissible.

For all 1LA8, 1PQ8 and 1LL8 motors for converter-fed operation in frame sizes 315 to 450 for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified. The thermal service life of the motor winding increases by at least 5 times when used in converter-fed operation.

Use according to temperature class 180 (H) is not possible for all motors. All 400 V versions are available only on request. Due to the rated current, a larger connection box of type 1XB9600 is generally provided for frame sizes 400 (2 and 4 pole) and 450 (all pole numbers) – part of order code C14. The temperature class 180 (H) does not apply to motors with separately driven fan with 1PQ8.

Order code **C14**

Temperature class 155 (F), used according to 130 (B), with increased coolant temperature and/or site altitude

For standard motors, explosion-proof motors and fan motors 1LA5, 1LA6, 1LA7, 1LA9 (with the exception of 1LA9 with increased output since these are already used according to temperature class 155 (F)), 1LG4, 1LG6, 1LP4, 1MJ6, 1MJ7, 1PP4, 1PP5, and 1PP7, a version designed for temperature class 155 (F) for use according to temperature class 130 (B) can be ordered with other customized requirements with specification in plain text.

Order code **Y50**

Temperature class 155 (F), used according to 155 (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 155 (F), for use according to temperature class 155 (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 180 (H) at rated output and maximum coolant temperature (CT) 60 °C

For motor series 1LA5, 1LA6, 1LA7, 1LG4, 1PP4, 1PP5 and 1PP7, use according to temperature class 180 (H) is permitted at rated output and at a maximum coolant 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**). Not possible for CSA approval (order code **D40**) for 1LA5, 1LG4, 1PP4 and 1PP5 motor series. The specified grease life applies to a coolant temperature of 40 °C. For a 10 K increase in coolant temperature, the grease life or lubrication interval is halved.

Order code **C18**

Temperature class 155 (F), used according to 130 (B), coolant 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 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 45 °C at 4 % derating.

Order code **C22**

Temperature class 155 (F), used according to 130 (B), coolant 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 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 50 °C at 8 % derating.

Order code **C23**

Temperature class 155 (F), used according to 130 (B), coolant 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 155 (F), for use according to temperature class 130 (B) at a maximum coolant temperature of 55 °C at 13 % derating.

Order code **C24**

Temperature class 155 (F), used according to 130 (B), coolant 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 155 (F), for use according to temperature class 130 (B) at a maximum coolant 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, 1LG4, 1LG6, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 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. This version includes condensation drainage holes (order code L12) – with the exception of 1MJ motors. A condensation protection by means of anti-condensation heaters for 230 V (order code K45) is included in 1MJ6 and 1MJ7 motors.

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, 1LG4, 1LG6, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP4, 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. This version includes condensation drainage holes (order code L12) – with the exception of 1MJ motors. A condensation protection by means of anti-condensation heaters for 230 V (order code K45) is included in 1MJ6 and 1MJ7 motors.

Order code **C26**

Please contact your local Siemens office if order code **C26** is to be combined with additional mountings (e.g. rotary pulse encoders, brakes).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 gray 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 gray 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 mains 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.

Motor-temperature-dependent protection devices

Temperature detectors 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.

Temperature detectors for tripping

Order code **A31**

The temperature monitors have the following current carrying capacity and switching capacity:

230 V AC cosφ: 2.5 A

24 V DC: 1.6 A

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 re-starting 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 box". 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 box").

Order code **A11**

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**

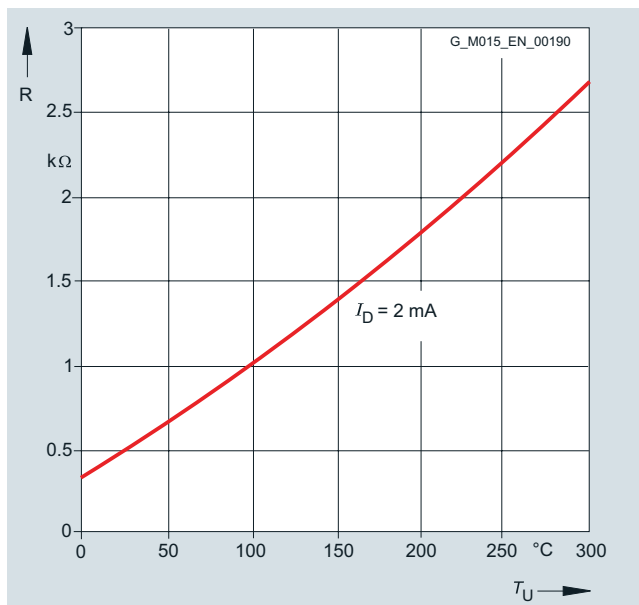
- All 1LA8 motors are equipped in the standard version with 6 PTC thermistors for alarm and tripping.
- For 1LA, 1MJ and 1LG motors, the tripping temperature corresponds to PTC thermistors for temperature class 155 (F).
- For 1LA8, 1LL and 1PQ motors, the tripping temperature corresponds to PTC thermistors for temperature class 155 (F), also for 1LA8 in Zone 22.
- For 1LA and 1LG motors for Zones 2, 21, 22 or VIK thermistors temperature class 130 (B) (see catalog part "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 inquire.

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 box".

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 box").

Order code **A23**

For 1LA8 motors, the standard PTC thermistors are omitted when ordering with order code **A23**. A combination of A12 and A23 is possible, price on request.

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 mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV 1, Order No.: E86060-K1002-A101-A7-7600.

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 catalog parts.

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 Catalog LV 1,

Order No.: E86060-K1002-A101-A7-7600.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 box". 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 box"); 3-wire or 4-wire connection (from the terminal strip) is also possible (please inquire).

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 admissible 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. A combination of A12 and A61 is possible, price on request.

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 box". 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 box"). 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 (3-wire circuit) for rolling-contact bearings.

In the connection box, 12 auxiliary terminals are required.

Order code **A80**

Heating and ventilation

Anti-condensation heaters

Supply voltage 230 V (1~)

Order code **K45**

or

Order code **M15**

Supply voltage 115 V (1~)

Order code **K46**

or

Order code **M14**

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 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 (without additional charge) 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 of the anti-condensation heaters in Watt (W)	
		Supply voltage at 230 V Order code K45	Supply voltage at 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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 0/76.

1LA8 and 1LL8 (frame size 355 and above) 2-pole motors have an axial-flow fan for clockwise rotation in the standard version. The fan can be subsequently reinstalled for counter-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).

Supply 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** (additional charge).

Supply voltage of separately driven fan for 1LG motors:

The supply voltage of the separately driven fan conforms to the stated rated voltage ranges of table "Technical data of the separately driven fan", see Page 0/76. Deviating voltages/frequencies can be ordered with order code Y81 and plain text (additional charge).

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 already included for the low-noise version.

Up to frame size 160, the metal external fan impeller is manufactured from sheet aluminum or steel and for frame size 180 and above 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⁾

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

Motor series	Frame size	Fan material ³⁾	Fan cover material
		Number of poles	Number of poles
		2	4 ... 8
1LA8, 1LL8	315	Radial-flow fan, plastic	Radial-flow fan, plastic
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel
1LA8, 1LL8	355 ... 400	Axial-flow fan, cast aluminum	Radial-flow fan, plastic
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel
1LA8, 1LL8	450	Axial-flow fan, hub: cast aluminum, vane: plastic	Radial-flow fan, plastic
1PQ8		Radial-flow fan, sheet steel	Radial-flow fan, sheet steel

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⁾ 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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Motor connection and connection box

Connection, circuit and connection box

Location of the connection box

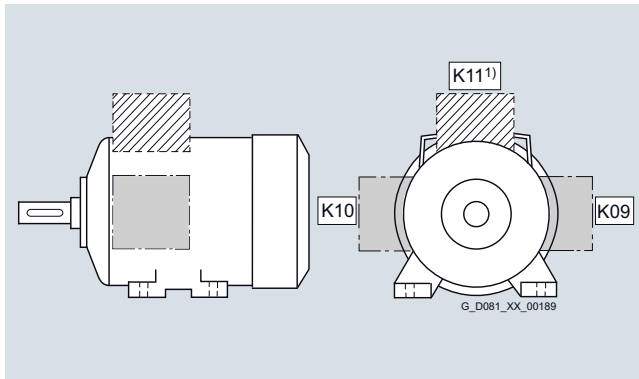
The connection box of the motor can be mounted in four different locations or positions. The position of the connection box must always be viewed from the drive end (DE). The standard position of the connection box is on top, with the exception of non-standard motors in which case the standard position 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, 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 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 Ex 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 Ex 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 and 1MJ motors: Next larger connection box (only frame size 180 and above)

Order code **L00**

Detailed assignment of connection boxes, see Page 0/43 and 0/46.

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 0/43 and 0/44.

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 admissible current in accordance with DIN VDE 0298

Parallel feeders

Some motors must be fitted with parallel feeders due to the admissible current per terminal. These motors are indicated in the selection and ordering data in the respective catalog parts. 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⁾ Possible for frame size IM B3, IM B6, IM B7, IM B8, IM V6 with/without protective cover, IM B35.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 catalog parts.

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 catalog parts 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**).

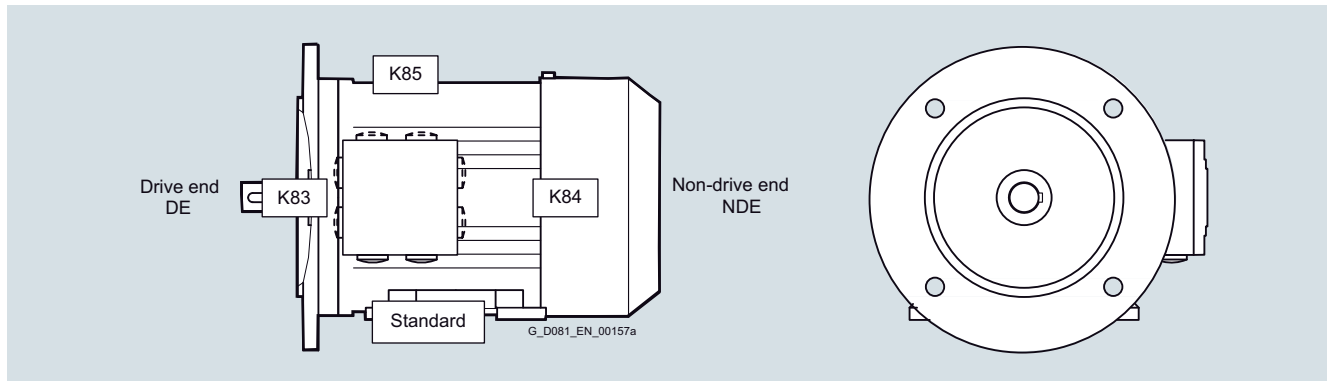
Ordering example

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

If no other order code is specified, cable entry is from below.

With additional order code **K83**:

Cable entry from drive end (DE)



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

One cable gland, metal

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 glands are supplied in metal as standard. For temperatures below -30 °C and/or higher than +60 °C, the material is selected/used according to the temperature.

Cable gland, 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 glands in the connection box.

Order code **K57**

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

Order code **K06**

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

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 catalog part 9 "Smoke extraction motors".

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

- 3 cables protruding, 0.5 m long ¹⁾
Order code **L44**
- 3 cables protruding, 1.5 m long ¹⁾
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**

The cross-section of the named cables refers to a coolant temperature up to CT 40 °C

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

- Cable connection on right side, as viewed from drive end (DE) ²⁾
Order code **L51**
- Cable connection on left side, as viewed from non-drive end (NDE) ²⁾
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 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)

¹⁾ With only 3 protruding cables additional plain text specifying star or delta connection is required.

²⁾ For motor series 1LA5, 1LA6, 1LA7, 1PP5 and 1PP6 only possible for smoke-extraction motors.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Connection, circuit and connection box

Type gk 030



Type gk 127

Type gk 130, gk 230, gk 330
(not for 1LA5, 1LG4, 1LG6)

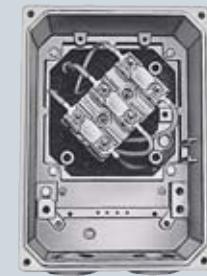
Type gk 330 (for 1LA5, 1LG4, 1LG6)



Type gk 135, gk 235, gk 335



Type gk 430, gk 431



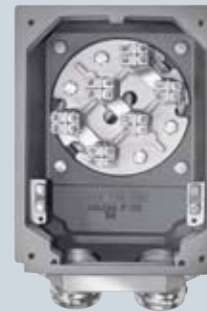
Type 1XB7 222



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



Type 1XB7 422, 1XB7 522



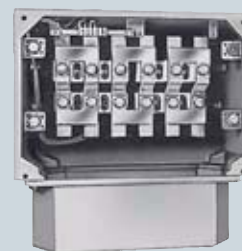
Type 1XB7 622



Type 1XB1 621



Type 1XB1 631



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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)}	4 holes with plugs	Cast iron	
	400 ... 450			

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**).

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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

See the next section of the catalog 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)}	Cable entry for CSA version order code D40 ³⁾
Type				mm ²	mm	Size	Size
1LA5, 1LA7, 1LA9, 1LP5, 1LP7, 1PP5 and 1PP7							
56	gk 030	6	M4	1.5	9 ... 17	M25 x 1.5	NPT 1/2"
63	(gk 127) ⁴⁾			(2.5 with cable lug)	4.5 ... 10	M16 x 1.5	
71							
80							
90	gk 130	6	M4	4	11 ... 21	2 x M32 x 1.5	NPT 3/4"
100							
112							
132	gk 230	6	M4	6	11 ... 21	2 x M32 x 1.5	NPT 3/4"
160	gk 330	6	M5	16	19 ... 28	2 x M40 x 1.5	NPT 1"
180	gk 430	6	M6	25	27 ... 35	2 x M50 x 1.5	NPT 2"
200							
225							
250	gk 431	6	M8	35	27 ... 35	2 x M50 x 1.5	
1LA6							
100	gk 135	6	M4	4	11 ... 21	2 x M32 x 1.5	NPT 1/2"
112	gk 235	6	M4	6	11 ... 21	2 x M32 x 1.5	NPT 3/4"
132							
160							
180	gk 335	6	M5	16	19 ... 28	2 x M40 x 1.5	NPT 1"
1LG4, 1LG6, 1LP4, 1PP4 and 1PP6							
180	gk 330	6	M5	16	19 ... 28	M40 x 1.5	M40 x 1.5 ¹³⁾
200	gk 430	6	M6	25	27 ... 35	M50 x 1.5	M50 x 1.5 ¹³⁾
225	gk 431	6	M8	35	27 ... 35	M50 x 1.5	M50 x 1.5 ¹³⁾
250	gt 520	6	M10	120	34 ... 42	M63 x 1.5	M63 x 1.5 ¹³⁾
280	gt 620	6	M12	240 ⁵⁾	38 ... 45	M63 x 1.5	M63 x 1.5 ¹³⁾
315							

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

A two-part plate can be supplied. Order code **K06**. For frame size 250 M and above, with strain relief.

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

Mains-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	Auxiliary lead outer cable diameter
Type				mm ²	mm	Size	Size	mm	Size	mm	mm
1LA8 ... 1PQ8 ...											
... 315	gt 640 ^{8) 9) 11)}	6	M12	185	41.0 ... 56.5	2 x M72x2 + 2 x M20x1.5	2 x M72x2	7 ... 13	2 x M20x1.5	–	–
... 317											
... 353	1XB1 621 ^{8) 10)}	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
... 355											
... 357-6											
... 357-8	1XB1 631 ¹⁰⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 75	4 x D80 + 2 x M25x1.5
... 357-2											
... 357-4											
... 40	1XB1 631 ¹²⁾										
... 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⁾ Not possible for motors in Zone 22.

⁴⁾ (gk 127) For frame sizes 63 to 90, with additional installation of several temperature sensors, order code **A12**, terminal strip for main and auxiliary terminals order code **M69** or a brake, a larger connection box will be necessary. The specified values do not change. The gk 127 is standard for Zone 22.

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 $> 185 \text{ mm}^2$).

¹²⁾ With option **K11** connection box on top the 1XB1 634 connection box will be supplied.

¹³⁾ NPT-thread can be ordered with order code **Y61**.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

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 ... 357-6 ... 357-8	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
... 357-2 ... 357-4 ... 40 ... 45	1XB1 631 ^{5) 7)}	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

Mains-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 ⁸⁾	Auxiliary lead Outer cable diameter	Cable gland option K57 ⁸⁾	Two-part plate option K06 Admissible outer cable diameter	Cable entry	Auxiliary lead outer cable diameter
Type				mm ²	mm	Size	Size	mm	Size	mm	Size	mm
1LL8 ...												
... 31	1XB1 621 ^{9) 5)}	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
... 35	1XB1 631 ⁵⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11.5 ... 15.5	2 x M25x1.5	40 ... 75	4 x D80 + 2 x M25x1.5	11.5 ... 15.5
... 40 ... 45	1XB1 631 ⁷⁾											

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	1XB1 621 ^{9) 5)}	6	M16	240	56.0 ... 68.5	2 x M80x2 + 2 x M25x1.5	2 x M80x2	11 ... 16	2 x M25x1.5
... 35	1XB1 631 ⁵⁾	12	M16	240	56.0 ... 68.5	4 x M80x2 + 2 x M25x1.5	4 x M80x2	11 ... 16	2 x M25x1.5
... 40 ... 45	1XB1 631 ⁷⁾								

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 **K11** connection box on top the 1XB1 634 connection box will be supplied.

⁸⁾ With option **K57**, the cable glands can be supplied.

⁹⁾ With option **L00**, the motor can be supplied with the 1XB1 631 connection box.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Connection boxes for 1MA6 and 1MA7 explosion-proof motors and for 1LA6/7/9 and 1LG4/6 motors in 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 Ex n 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 Ex n 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 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 Zones 2, 21	56 ¹⁰⁾ ... 71	○	–	–	○	○	Yes
	80 ... 90	○	○	–	○	○	Yes
	100 ... 160	○	○	○	–	○ ¹¹⁾	Yes
1MA6 and 1LA6 in Zones 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 ≥240 mm²).

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 frame size 100 upwards.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

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

Frame size	Connection box	Number of terminals	Contact screw thread	Max. connectable cross-section	Sealing range	Cable entry ¹⁾	Two-part plate Max. outer cable diameter
Type				mm ²	mm	Size	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 Ex de IIC type of protection for explosion-proof motors 1MJ6 and 1MJ7

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			

Possible positions of the connection boxes in Ex de type of protection for explosion-proof motors 1MJ6 and 1MJ7

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

○ 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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Standard connection boxes in Ex de type of protection for explosion-proof motors 1MJ6 and 1MJ7

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	2 x M25 x 1.5
80						1 x M16 x 1.5
90						
100	gk 420	6	M4	6	11 ... 21	2 x M32 x 1.5
112						1 x M16 x 1.5
132						
160 M	gk 420	6	M4	6	19 ... 28	2 x M40 x 1.5
160 L	gk 465	6	M5	16		1 x M16 x 1.5
180	1XC1 270	6	M6	25	19 ... 28	2 x M40 x 1.5
						Version with auxiliary circuit 2 x M40 x 1.5 2 x M16 x 1.5
200	1XC1 380	6	M8	50	26 ... 35	2 x M50 x 1.5
225						Version with auxiliary circuit 2 x M50 x 1.5 2 x M16 x 1.5
250	1XC1 480	6	M10	120	34 ... 42	2 x M63 x 1.5
280						
315	1XC1 580	6	M12	240	38 ... 45	2 x M63 x 1.5

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

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	2 holes incl. 1 certified cable gland with sealing washer and 1 certified plug	Cast iron	Without cable lug ³⁾ or with cable lug
	180 ... 200			
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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

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	2 x M25 x 1.5 1 x M16 x 1.5
80						
90				6		
100	gk 065	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
112	gk 265	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
132	gk 465	6	M4	6	11 ... 21	2 x M32 x 1.5 1 x M16 x 1.5
160 M	gk 465	6	M4	6	19 ... 28	2 x M40 x 1.5 1 x M16 x 1.5
160 L ²⁾	gk 465	6	M5	16	19 ... 28	2 x M40 x 1.5 1 x M16 x 1.5
180	1XC1 290	6	M6	25	26 ... 35	2 x M50 x 1.5 Version with auxiliary circuit: 2 x M50 x 1.5 2 x M16 x 1.5
200	1XC1 390	6	M8	50	26 ... 35	2 x M50 x 1.5 Version with auxiliary circuit: 2 x M50 x 1.5 2 x M16 x 1.5
1LG4, 1LG6						
180	gt 320	6	M5	16	19 ... 28	M40 x 1.5
200	gt 420	6	M6	25	24 ... 35	M50 x 1.5
225	gt 421	6	M8	25	24 ... 35	M50 x 1.5
1MA6						
180	1XB7 323	6	M8	50	24 ... 35	M50 x 1.5
200	1XB7 323	6	M8	50	24 ... 35	M50 x 1.5

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

Explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection ³⁾
1MJ6	71 ... 200	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	In standard version: 1 certified cable gland and 1 certified plug In versions with auxiliary circuit: 2 certified cable glands	Welded steel	
	250 ... 315			

Possible positions of the explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

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 ... 200	○	○	–	○	○	Yes
1MJ7	225 ... 315	○	○	–	○	○	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 – does not apply to 1MJ7 motors.

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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Explosion-proof connection boxes in Ex d IIC type of protection (order code K53) for explosion-proof motors 1MJ6 and 1MJ7

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 M25 x 1.5 ¹⁾ Version with auxiliary circuit: 1 x M25 x 1.5 1 x M20 x 1.5
80						
90				6		
100	gk 065d	6	M4	6		Standard: 1 x M32 x 1.5 ¹⁾ Version with auxiliary circuit: 1 x M32 x 1.5 1 x M20 x 1.5
112	gk 265d	6	M4	6		
132	gk 465d	6	M4	6		
160 M	gk 465d	6	M4	6		Standard: 1 x M40 x 1.5 ¹⁾ Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
160 L	gk 465d	6	M5	16		
180	1XC3 22.	6	M6	25		Standard: 1 x M40 x 1.5 ¹⁾ Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
200	1XC3 32.	6	M8	50		Standard: 1 x M50 x 1.5 ¹⁾ Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5
225	1XC3 32.	6	M8	50	M40: 23.5 ... 32 M20: 6.5 ... 12	Standard: 1 x M40 x 1.5 1 x plug M40 x 1.5 Version with auxiliary circuit: 1 x M40 x 1.5 1 x M20 x 1.5
250	1XC3 42.	6	M10	120	M50: 31.5 ... 44 M20: 6.5 ... 12	Standard: 1 x M50 x 1.5 1 x plug M50 x 1.5 Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5
280						
315	1XC3 52.	6	M12	240	M50: 31.5 ... 44 M20: 6.5 ... 12	Standard: 1 x M50 x 1.5 1 x plug M50 x 1.5 Version with auxiliary circuit: 1 x M50 x 1.5 1 x M20 x 1.5

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 for motor series 1LG4/1LG6/1LP4/1PP4 frame sizes 250 to 315. In the connection box of 1MJ7 Ex motors, frame sizes 250 M to 315 L, 6 low saddle terminals are enclosed as standard for connection without cable lugs. When connecting cables with a large cross-section (not stranded), they can be connected optionally in two tiers. For this purpose, high saddle terminals can be supplied in the future as an accompanying pack (3 items).
Order code **M47**

For Exe and Exde 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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

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 (aluminum) – 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		
	315	gt 620	18
1MA6	225	1XB7 322	8
	250	1XB7 422	12
	280		
	315	1XB7 522	14
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		

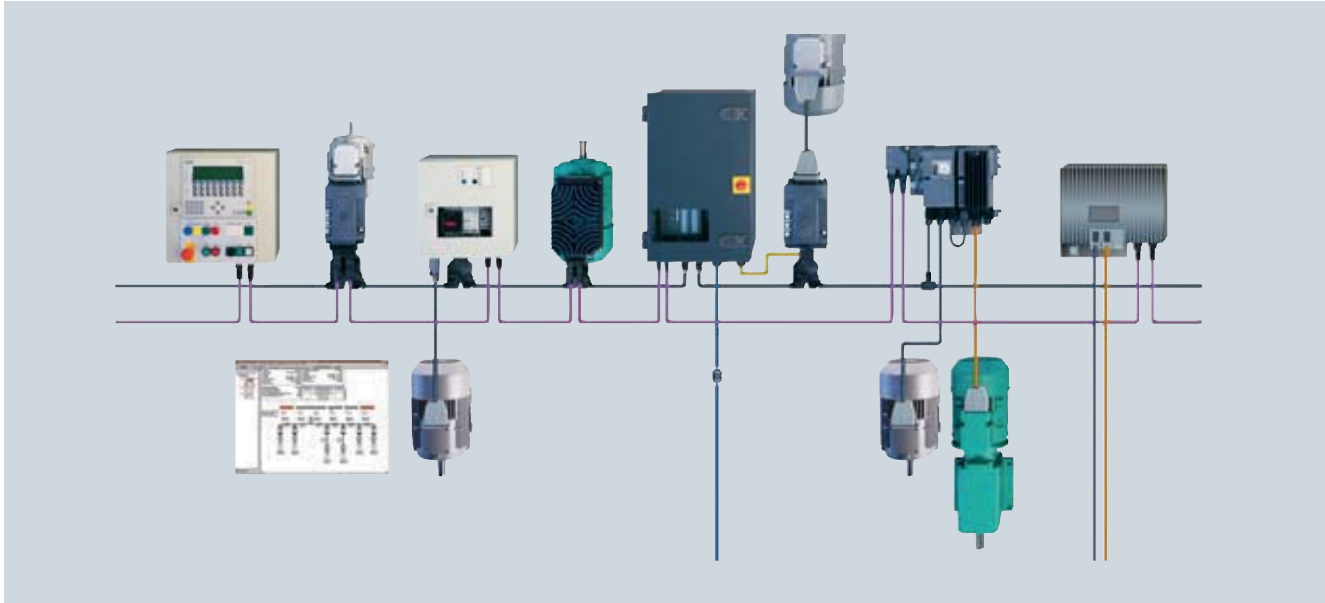
IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 tool "Selection tool SD configurator" (see Appendix). 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 x 90°. 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 admissible mains 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 Catalog IK PI and in Catalog DA 51.3 "Distributed Drive Solutions MICROMASTER 411 COMBIMASTER 411" as well as on the Internet at:

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

IEC Squirrel-Cage Motors


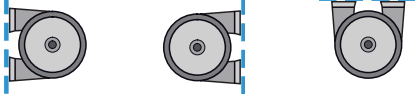



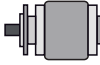




Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0


Types of construction

Standard types of construction and special types of construction

Type of construction 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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Type of construction 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 (DIN EN 1492-1) and/or clamping bands (DIN 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 extension 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.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Mechanical design and degrees of protection

Preparation for gear mounting

The flange-mounting motors can be equipped with a radial seal 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 > 0.1 bar).

We recommend that the admissible bearing loads are carefully checked.

Please inquire 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 relocated 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	Aluminum alloy Aluminum alloy	Cast Screwed on
1MA7	63 to 100 ¹⁾ 112 to 160	Aluminum alloy Aluminum 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, 1PQ8, 1LL8	315 to 450	Cast iron	Cast

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 IP55 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 CT 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 brake 2LM8 (used for motors up to and including frame size 225, order code G26) and/or in combination with order code (K23) without paint finish, cast iron primed.

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 rotary pulse encoder HOG 9 D 1024I (order code H72, H79) and / or brake 2LM8 (used for motors up to and including frame size 225, order code G26) and/or in combination with order code (K23) without paint finish, cast iron primed.

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**

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**

For availability of individual options for the relevant motor series, see Section "Special versions" in the individual catalog parts.

Noise levels for mains-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 at rated output (see the selection and ordering data in the appropriate catalog parts). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please inquire 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 catalog part 3 "Non-standard motors of frame size 315 and above".

Clockwise rotation

Order code **K37**

Counter-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 catalog parts).

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
1LG4, 1LG6¹⁾	315	74	86
	180	65	78
	200	70	83
	225	68	81
	250	70	83
	280	72	85
	315	74	87

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

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

Order code **M44**

Only available on request.

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**

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Balance and vibration quantity

All of the rotors are dynamically balanced with half key. This corresponds to vibration quantity level A (normal). The vibrational characteristics and behaviour of electrical machinery is specified in DIN EN 60034-14. Feather key agreement for balancing "half-key" (H) is specified here based on DIN ISO 8821.

The feather key agreement type for balancing is stamped on the face of the customer-specific drive-end (DE) / non-drive end (NDE) shaft extension.

F = Balancing with full key
(Agreement full-key)

H = Balancing with half key
(Agreement half-key)

N = Balancing without key – Plain text required
(without feather key agreement)

Motors up to frame size 112 have the type of balancing marked exclusively on the rating plate.

Full key balancing or balancing with full key can be supplied if order code **L68** is specified (additional charge).

Balancing without key (N) is possible with order code **M37** on request (additional charge).

The vibration quantity level A is the standard version and is valid for a rated frequency up to 60 Hz.

For special requirements concerning smooth running, a low-vibration version B can be supplied (additional charge).

Vibration quantity level B.

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. supply frequency speed).

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

Limits (rms values) for max. vibration quantity of vibration distance (s), vibration speed (v) and acceleration (a) for the shaft height H										
Vibration quantity level	Machine installation	Shaft height H in mm			132 < H ≤ 280			H > 280		
		s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²
A	Free suspension	25	1.6	2.5	35	2.2	3.5	45	2.8	4.4
	Rigid clamping	21	1.3	2.0	29	1.8	2.8	37	2.3	3.6
B	Free suspension	11	0.7	1.1	18	1.1	1.7	29	1.8	2.8
	Rigid clamping	–	–	–	14	0.9	1.4	24	1.5	2.4

For details, see standard DIN EN 60034-14 Sept. 2004.

Shaft and rotor

Shaft extension

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

Second standard shaft extension.

Order code **K16**.

Not possible for the motor version with protective cover.

The second shaft extension can transmit the full rated output via a coupling output up to frame size 315 M (please inquire 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 a coupling output. (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 smaller size.

Please also inquire about the transmitted power and admissible 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 inquire 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 center 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 center hole, DS form.

Shaft extension (DE)

Diameter mm	Thread 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 designed to DIN EN 50347. The motors are always supplied with a key inserted in the shaft.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Shaft extension with standard dimensions, without featherkey way

For motor series 1LA5, 1LA6, 1LA7, 1LA8, 1LA9, 1LG4, 1LG6, 1LL8, 1LP4, 1LP5, 1LP7, 1MA6, 1MA7, 1PP4, 1PP5, 1PP7 and 1PQ8, the standard shaft extension can be ordered with standard dimensions without a featherkey way.

Order code **K42**

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 inquire about other rust-resistant materials.

Please inquire 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 which 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

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

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 catalog parts)
- 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 "Admissible 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 admissible cantilever forces are reduced in accordance with the non-standard shaft extension.

Admissible 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, 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
1LA5, 1LA9, 1LG4, 1LG6, 1MA6, 1LP4, 1LP5, 1PP4, 1PP5	180	2 ... 8			48	48
	200				55	55
	225	2				60
		4 ... 8	140	280	60	
	250	2				70
		4 ... 8			65	
	280	2				75
		4 ... 8			75	80
	315	2			65	
		4 ... 8			80	90
	315 ²⁾	2	140	280	65	70
		4 ... 8	170	340	85	85
1LA8, 1PQ8	355 ²⁾	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 admissible diameter, a step increase in shaft diameter is not possible.

²⁾ For bearing design for increased cantilever forces order code **K20** a shaft diameter of 95 mm for frame size 315 and a shaft diameter of 100 mm for frame size 355 is possible for 4, 6 and 8-pole motors. See dimension drawings Page 3/65 and 3/67.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Bearings and lubrication

Bearing lifetime (nominal lifetime)

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

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 coupling output and at least 20,000 hours with the admissible 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 admissible 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 inquire).

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 0/64).

For ordering standard motors quote order code **K94**.

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).

Price on request.

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 0/64).

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 0/64).

Order code **L04**

For frame size 160 and above, bearings are usually axially located (see Figures 2, 4 and 5, Page 0/64).

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 at both ends (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 0/62 and 0/63 – admissible loading on Pages 0/67 and 0/68.

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. In a version in combination with mounting of brake (order code G26), the insulated motor bearings are mounted on the drive end (DE).

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 catalog 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**

In the case of motors equipped with regreasing devices, information regarding greasing intervals, quantity and type of grease and any additional data is provided on the lubrication or rating plate. (Re-greasing intervals for basic version on Page 0/59). The regreasing device cannot be mounted in combination with mounting of the brake, order Code G26.

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 inquire where applicable).

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{adm} at admissible supply frequency f_{max} is essential, see catalog part 5 "Motors operating with frequency converters".

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Grease lifetime and regreasing intervals for horizontal installation

Permanent lubrication ¹⁾				
Type series	Frame size	Type	Number of poles	Grease lifetime up to CT 40 °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 CT 40 °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
		.... 22 . to 28 .	2	4000 h
	225 to 280		4 to 8	8000 h
			2	3000 h
1MA7	100 to 160	.... 10 . to 16 .	2 to 8	8000 h
		.... 18 . to 20 .	2 to 8	8000 h
	180 to 200	.... 22 . to 28 .	2	4000 h
			4 to 8	8000 h
1MJ6, 1MJ7	225 to 280		2	4000 h
			4 to 8	8000 h
	315	.... 315	2	4000 h
			4 to 8	8000 h

¹⁾ For special uses and special greases, please inquire 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⁾ 40 000 h applies for horizontally installed motors with coupling output without additional axial loads.

⁴⁾ Regreasing interval for IM V1 type of construction.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 lubricating 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 0/64).

For motors frame size	Type	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figures on Pages 0/64 and 0/65
			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 ...							
56 M05.	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
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/M13.	2 to 8	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 2
160 M/L	....16.	2 to 8	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾
180 M/L18.	2 to 8	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾	6210 ZC3 ²⁾	Fig. 4
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⁾
280 S/M28.	2 4 to 8	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3	6216 C3 6317 C3	Fig. 5
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/L18.	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/M28.	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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 0/64 and 0/65
			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 0/65
			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	
315 S/M	1MJ7 31 .	2	NU 217 ¹⁾	NU 217 ¹⁾	6217 C3	6217 C3	
		4 to 8	NU 218 ²⁾	NU 218 ²⁾	6218 C3	6218 C3	

¹⁾ Special version with deep groove bearing 6216 C3 on request. Recommended for coupling output or low cantilever forces.

²⁾ Special version with deep groove bearing 6217 C3 on request. Recommended for coupling output or low cantilever forces.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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

Please inquire about noise and vibration data.

For NU bearings (parallel roller bearings), in contrast to standard bearings, a minimum cantilever force is required. Parallel roller bearings are not suitable for coupling output.

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 lubricating 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	Vertical type of construction	Non-drive end NDE bearing	Vertical type of construction	Figure on Page 0/64
			Horizontal type of construction		Horizontal 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 4 to 8	NU 216 E NU 317 E	NU 216 E NU 317 E	6216 C3 6317 C3	6216 C3 6317 C3
315 S/M	.... 310 313	2 4 to 8	NU 217 E NU 319 E	NU 217 E NU 319 E	6217 C3 6319 C3	6217 C3 6319 C3
315 L	.... 316 317 318	2 4 to 8	NU 217 E NU 319 E	– NU 319 E	6217 C3 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 4 to 8	NU 217 NU 317	NU 217 NU 317	6217 C3 6317 C3	6217 C3 6317 C3	Fig. 5
315 S/M	.... 310 313	2 4 to 8	NU 219 ⁵⁾ NU 319	NU 219 ⁵⁾ NU 319	6219 C3 6319 C3	6219 C3 6319 C3
315 L	.... 316 317 318	2 4 to 8	NU 219 ⁵⁾ NU 319	NU 219 ⁵⁾ NU 319	6219 C3 6319 C3	6219 C3 6319 C3

¹⁾ Bearings with a side plate 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 drive end.

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

⁵⁾ Only at 50 Hz.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 inquire 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 0/64
			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 regreasable versions (order code **K40**).

²⁾ As for basic version.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Diagrams of bearings

Fig. 1 Drive-end bearing Non-drive end bearing

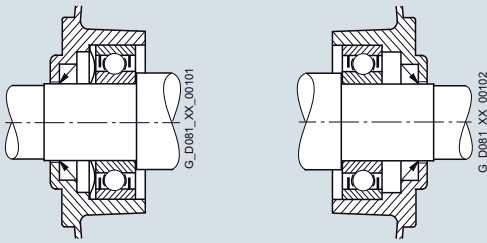


Fig. 2 Drive-end bearing Non-drive end bearing

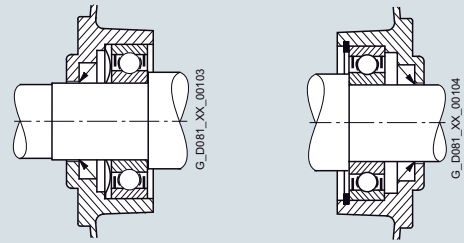
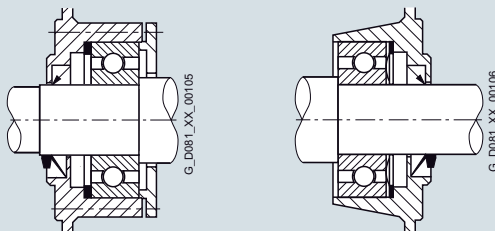


Fig. 3 Drive-end bearing Non-drive end bearing
Located bearing for 1LA7, 1LA9, 1MA7, frame sizes 56 to 160



Located bearings for 1LA5, frame sizes 180 to 225;
1LA9, 1MA6, frame sizes 180 to 200

Fig. 4 Drive-end bearing Non-drive end bearing

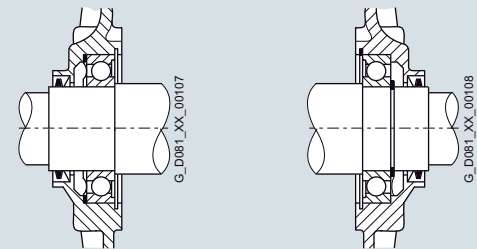
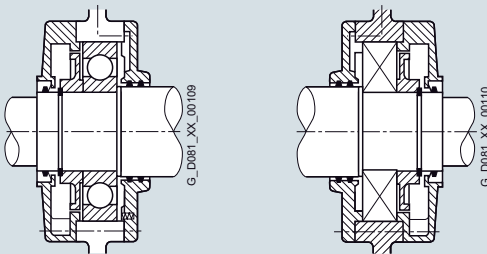
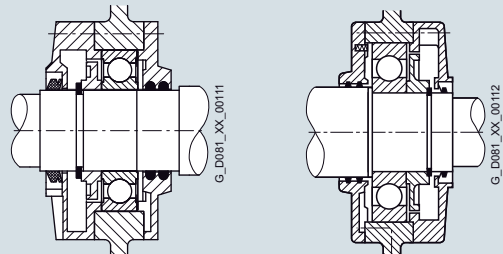


Fig. 5 Drive-end bearing Non-drive end bearing



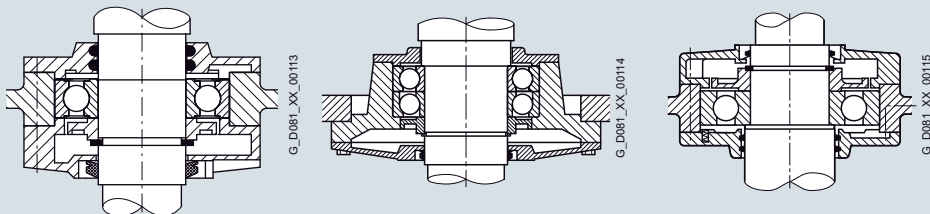
Frame sizes
280 S to 315 L, 2-pole to 8-pole

Fig. 6 Drive-end bearing Non-drive end bearing



Frame sizes
315 to 450, 2-pole to 8-pole, IM B3

Fig. 7 Drive-end bearing Drive-end bearing Non-drive end bearing



Frame size
315, 2-pole to 8-pole, IM V1

Frame sizes
355 and 450, 2-pole to 8-pole, IM V1

Frame sizes
315 to 450, 2-pole to 8-pole, IM V1

IEC Squirrel-Cage Motors

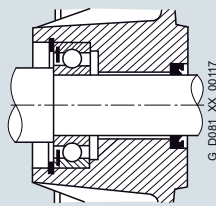
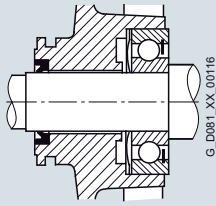
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

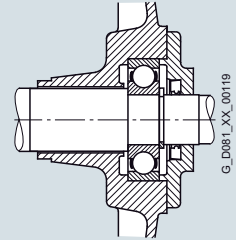
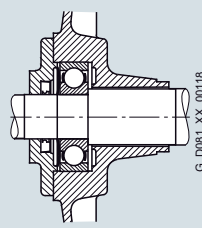
0

Fig. 8 Drive-end bearing

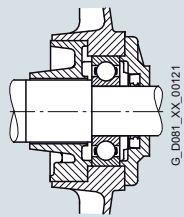
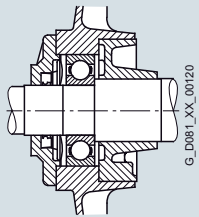
Non-drive end bearing

**Fig. 9** Drive-end bearing

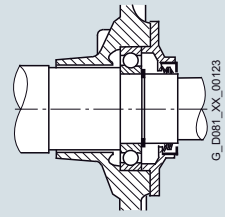
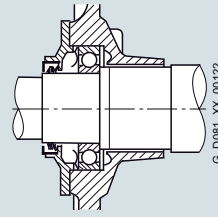
Non-drive end bearing

**Fig. 10** Drive-end bearing

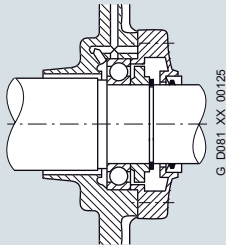
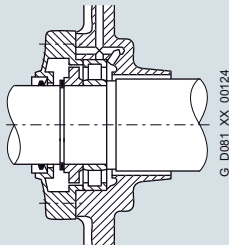
Non-drive end bearing

**Fig. 11** Drive-end bearing

Non-drive end bearing

**Fig. 12** Drive-end bearing

Non-drive end bearing



IEC Squirrel-Cage Motors

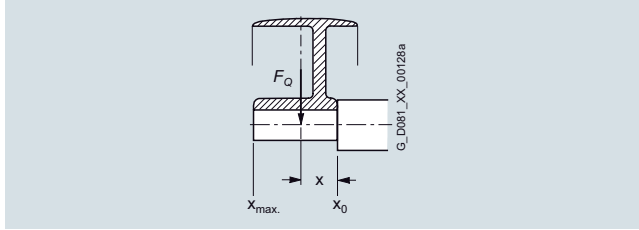
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Admissible cantilever forces

Admissible cantilever forces, basic version



In order to calculate the admissible cantilever forces for a radial load, the line of force (i.e. the centerline 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 rated motor speed

D pulley diameter in mm

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

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

Admissible 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	Admissible cantilever force for x_0			Admissible cantilever force for x_{\max}		
			Type	N	N	Type	N	N
				1LG4	1MA6	1MJ6	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		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		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

Admissible 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	Admissible cantilever force for x_0			Admissible cantilever force for x_{\max}		
			Type	N	N	Type	N	N
				1LA5	1LG4	1MJ6	1LA5	1LG4
				1LA7	1LG6	1MJ7	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	–	260	355	–
		4		530	–	260	450	–
		6		630	–	260	535	–
		8		690	–	–	585	–
80 M		2		485	–	485	400	–
		4		625	–	560	515	–
		6		735	–	560	605	–
		8		815	–	–	675	–
90 S		2		725	–	725	605	–
		4		920	–	920	775	–
		6		1090	–	1090	910	–
		8		1230	–	1230	1030	–
90 L		2		1030	–	1030	840	–
		4		1310	–	1310	1060	–
		6		1550	–	1550	1250	–
		8		1720	–	1720	1400	–
100 L		2		1030	–	1030	840	–
		4		1310	–	1310	1060	–
		6		1550	–	1550	1250	–
		8		1720	–	1720	1400	–
112 M		2		1010	–	1680	830	–
		4		1270	–	1960	1040	–
		6		1520	–	2140	1240	–
		8		1690	–	2450	1380	–
132 S		2		1490	–	2250	1180	–
		4		1940	–	2720	1530	–
		6		2260	–	3100	1780	–
		8		2500	–	3400	1980	–
132 M		2		1540	–	2800	1210	–
		4		2040	–	3330	1590	–
		6		2330	–	3750	1820	–
		8		2660	–	3750	2080	–
160 M		2		2000	1780	2000	1550	1410
		4		2350	2240	2350	1950	1820
		6		2800	2550	2800	2250	2120
		8		3050	2860	3050	2500	2330
160 L		2		2550	2380	2550	2100	1930
		4		3350	3050	3350	2750	2530
		6		3900	3500	3900	3200	2930
		8		4150	3800	4150	3450	3210
180 M		2		3050	2820	3050	2550	2290
		4		3750	3500	3750	2950	2760
		6		4550	4050	4550	3600	3240
		8		4850	4500	4850	3900	3500
180 L		2		2550	2380	2550	2100	1930
		4		3350	3050	3350	2750	2530
		6		3900	3500	3900	3200	2930
		8		4150	3800	4150	3450	3210
200 L		2		3050	2820	3050	2550	2290
		4		3750	3500	3750	2950	2760
		6		4550	4050	4550	3600	3240
		8		4850	4500	4850	3900	3500
225 S		2		3050	2820	3050	2550	2290
		4		3750	3500	3750	2950	2760
		6		4550	4050	4550	3600	3240
		8		4850	4500	4850	3900	3500
225 M		2		3050	2820	3050	2550	2290
		4		3750	3500	3750	2950	2760
		6		4550	4050	4550	3600	3240
		8		4850	4500	4850	3900	3500

Table continues overleaf

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Admissible 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)

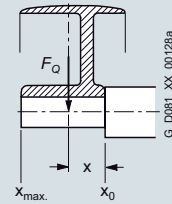
For motors		Admissible cantilever force for x_0	Admissible cantilever force for $x_{\max.}$
Frame size	Number of poles	Type	Type
		N	N
		1LA8, 1PQ8 ¹⁾	1LA8, 1PQ8 ¹⁾
315 ... 450	2 ... 8	See diagrams Page 0/69	See diagrams Page 0/69

For 1LA8 motors in horizontal type of construction, the admissible 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 0/67 to 0/68 if the cantilever forces are higher than those listed above.

Bearing design for increased cantilever forces



Admissible 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 Frame size	Type	Number of poles	Admissible cantilever force F_Q	
			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 . 1LP5 ... 1PP5 ...	2	5200	4300
		4	6450	5350
		6	7300	6100
		8	7900	6550

¹⁾ Data for 1LL8 is available on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Admissible 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	Admissible 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⁾ 310 313	2	14700	12300
315 L ¹⁾ 316 317	2	14600	12700

Admissible 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	Admissible 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	.... 310 313	2	5650	4650
315 L	.... 316 317	2	5450	4650

Admissible 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	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		(horizontal type of construction)	
1LA8 1PQ8				
315 to 355		2 to 8	See diagrams Page 0/70	

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.

¹⁾ Admissible cantilever forces for 1LG4, 1LG6, 1LP4, 1PP4 and 1MA6 frame sizes 280 to 315 L in 4-pole to 8-pole version, see Page 0/70.

²⁾ Not applicable to 1MJ motors with frame sizes 280 to 315, because this is the standard version.

IEC Squirrel-Cage Motors

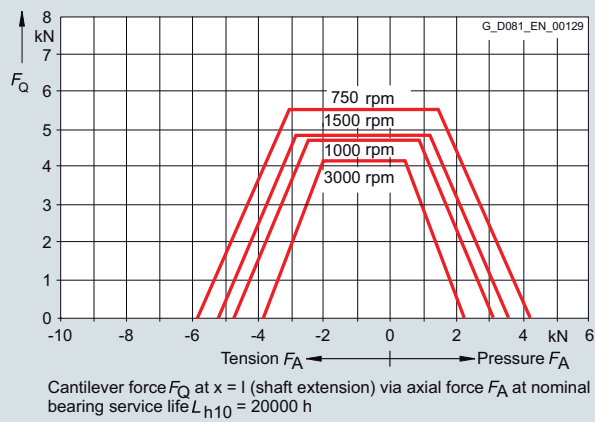
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

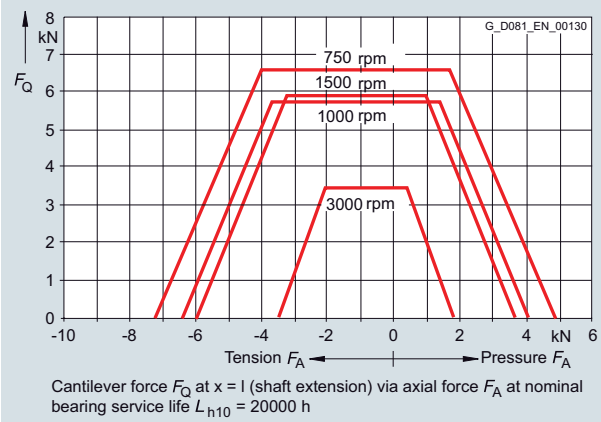
0

Admissible cantilever forces at 50 Hz for 1LA8 and 1PQ8 motors – basic version

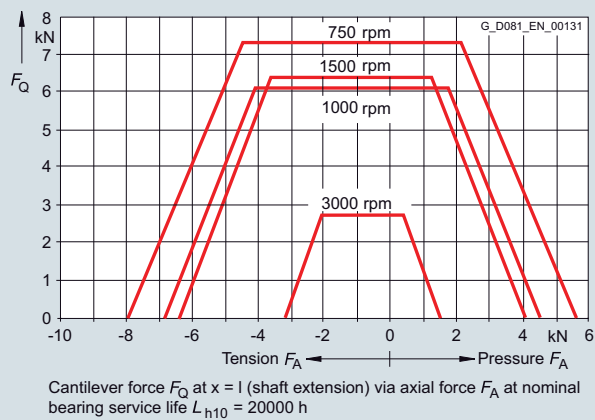
Frame size 315, 1LA8 and 1PQ8 – Type of construction IM B3



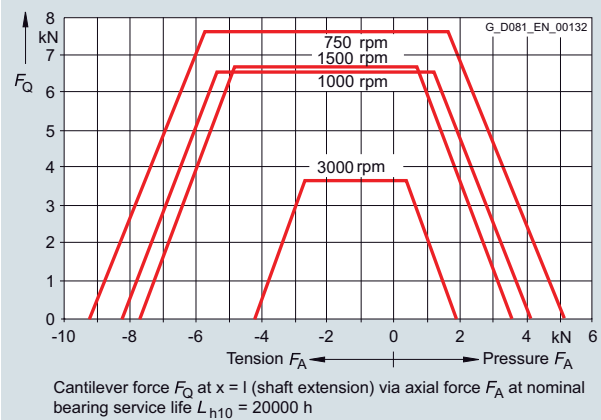
Frame size 355, 1LA8 and 1PQ8 – Type of construction IM B3



Frame size 400, 1LA8 and 1PQ8 – Type of construction IM B3



Frame size 450, 1LA8 and 1PQ8 – Type of construction IM B3



IEC Squirrel-Cage Motors

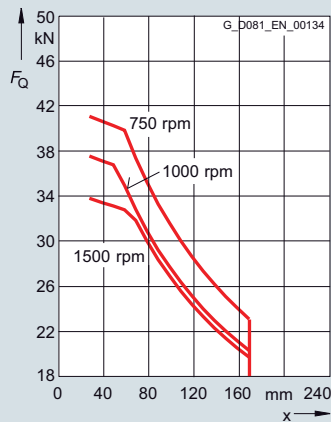
Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

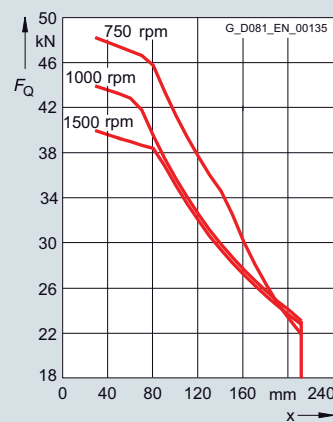
0

Admissible 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

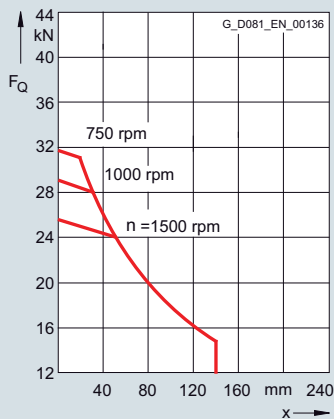


At 60 Hz, the admissible cantilever force must be reduced to 80 %.

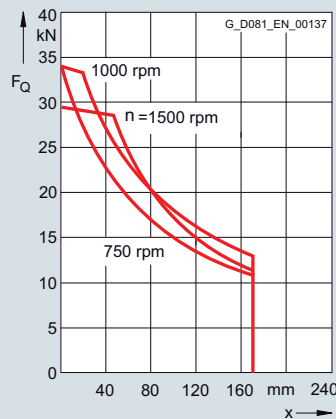
For all motors of frame sizes 400 and 450, IM V1 and 1LL8 motors with reinforced bearings available on request. Please specify cantilever force and lever arm.

Admissible cantilever forces at 50 Hz for 1LG motors – Bearings for increased cantilever forces – Order code **K20**

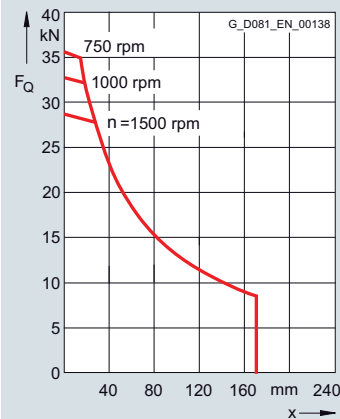
Frame size 280, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4



Frame size 315, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

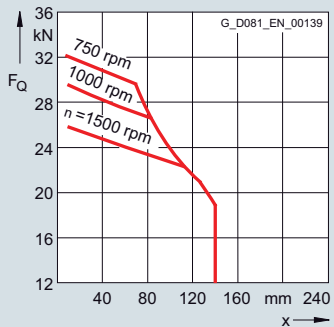


Frame size 315 S/M, 4-pole to 8-pole, 1LG4/1LG6, 1LP4/1PP4

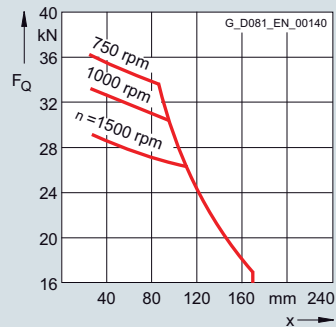


Admissible cantilever forces at 50 Hz for 1MA motors – Bearings for increased cantilever forces – Order code **K20**

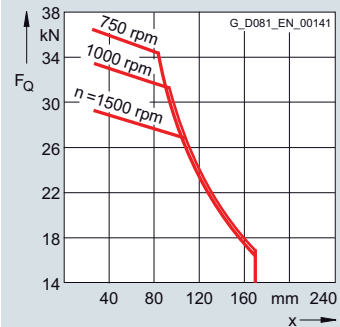
Frame size 280, 4-pole to 8-pole, 1MA6



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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Admissible axial load

1LA5, 1LA6, 1LA7, 1LP5, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 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	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load
	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	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 Frame size	Shaft extension 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	
	Type	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..	1LA5... 1MJ6..
		1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6	1LA5... 1MA6
	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
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 admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the load direction alternates.

* The values in brackets for frame sizes 112 to 160 apply to 1MJ6 motors.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

1LA5, 1LA6, 1LA7, 1LP7, 1MA6, 1MA7, 1MJ6, 1MJ7, 1PP6, 1PP7 motors in horizontal type of construction – Basic version

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Tensile load	Thrust load (N)			Tensile load	Thrust load (N)			Tensile load	Thrust load (N)			Tensile load	Thrust load (N)		
		with radial load at		without radial load		with radial load at		without radial load		with radial load at		without radial load		with radial load at		without radial load
		X ₀	X _{max.}			X ₀	X _{max.}			X ₀	X _{max.}			X ₀	X _{max.}	
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	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 admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant catalog part, section "Accessories".

Please inquire 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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

1LG4, 1LG6, 1LP4, 1PP4 and 1PP6 motors in vertical type of construction – Basic version

For motors		3000 rpm		1500 rpm		1000 rpm		750 rpm	
Frame size	Type	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
	1LG4 ...								
	1LG6 ...								
	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
200 L	... 206	1610	1480	–	–	2420	2550	–	–
	... 207	1510	1530	2030	2100	2220	2610	2610	2970
	... 208	1510	1590	1990	2120	2210	2680	2600	3060
225 S	... 220	–	–	2110	2690	–	–	2830	3710
225 M	... 223	1540	1990	1920	2770	2260	3300	2620	3770
	... 228	1540	2070	1950	2840	2240	3430	2610	3880
250 M	... 253	1680	2760	2110	3740	2740	4350	3070	4920
	... 258	1660	2870	2110	3960	2740	4520	3070	5160
280 S	... 280	390	4670	3190	8200	4510	9290	5510	10300
280 M	... 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
200 L	... 206	2760	330	–	–	3570	1400	–	–
	... 207	2660	380	3180	950	3370	1460	3760	1820
	... 208	2660	440	3140	970	3360	1530	3750	1910
225 S	... 220	–	–	3130	1670	–	–	3850	2690
225 M	... 223	2560	970	2940	1750	3280	2280	3640	2750
	... 228	2560	1050	2970	1820	3260	2410	3630	2860
250 M	... 253	2480	1960	2910	2940	3540	3550	3870	4120
	... 258	2460	2070	2910	3160	3540	3720	3870	4360
280 S	... 280	1960	3100	4760	6630	6080	7720	7080	8730
280 M	... 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 admissible loads apply to operation at 50 Hz; please inquire about 60 Hz.

The figures for the admissible axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the loading direction alternates.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 S	... 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 S	... 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 S	... 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 extension facing downwards				1000 rpm		750 rpm	
		3000 rpm		1500 rpm		Load down		Load down	
		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 admissible cantilever forces are specified with regard to the axial forces, see Page 0/69.

Data is available for 1LL8 motors on request.

Values shown without assuming a cantilever force on the shaft extension.

The admissible loads apply to operation at 50 Hz; please inquire about 60 Hz.

The figures for the admissible axial loads have been calculated assuming that standard coupling types are used for the drive.

For suppliers, see the relevant catalog part, section "Accessories".

Please inquire if the loading direction alternates.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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 "Technology", "Dimensions and weights".

1XP8 001 rotary pulse encoder



1XP8 001 rotary pulse encoder

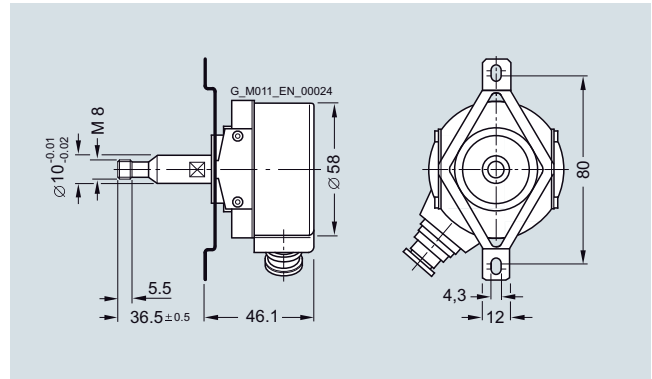
The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 001-1** with order code **H57** or in a TTL version as **1XP8 001-2** with order code **H58**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension or protective cover cannot be supplied.

It can also be ordered separately and retrofitted (please inquire beforehand), Order No. **1XP8 001-1** or **1XP8 001-2** (see catalog part 2 "Standard motors", "Accessories").

The 1XP8 001 rotary pulse encoder is suitable for standard applications. The encoder does not have insulated bearings; therefore, it cannot be recommended at the risk of bearing currents in combination with insulated bearing cartridge NDE, order code L27, or with insulated bearing cartridge DE. For further encoders, see "Special technology" from Page 0/85.

All 1LG4 and 1LG6 motors that are listed in the catalog have an M16 center 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 "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 "Mechanical design and degrees of protection".



Mounting dimensions of 1XP8 001 rotary pulse encoder

Mounting of encoder at temperatures below -20°C and higher than $+40^{\circ}\text{C}$ on request.

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
Admissible 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	$90^{\circ} \pm 20\%$	$90^{\circ} \pm 20\%$
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 $+80^{\circ}\text{C}$	-20 to $+100^{\circ}\text{C}$
Degree of protection	IP66	IP66
Admissible radial cantilever force	60 N	60 N
Admissible 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

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Separately driven fan

The use of a separately driven fan is recommended to increase motor utilization 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 inquire 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 catalog part 2 "Standard motors", "Accessories". A rating plate listing all the important data is fitted to the separately driven fan. Order code **Y81** and

plain text are required for supply voltages outside the rated voltage ranges for 1LG motors. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. The admissible coolant temperatures for frame sizes 100 to 225 ¹⁾ are $CT_{min.} -25\text{ °C}$ and $CT_{max.} +65\text{ °C}$ ²⁾, lower/higher coolant temperatures on request. The admissible coolant temperatures for frame sizes 250 to 315 are $CT_{min.} -20\text{ °C}$ and $CT_{max.} +50\text{ °C}$, lower/higher coolant temperatures on request.

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 "Technology", "Dimensions and weights".

Technical data of the separately driven fan (in accordance with tolerance DIN EN 60034-1)

Frame size	Rated voltage range V		Frequency Hz	Rated speed rpm	Power consumption kW	Rated current A
100	1 AC	230 to 277	50	2790	0.075	0.29
	3 AC	220 to 290 Δ	50	2830	0.086	0.27
	3 AC	380 to 500 Y	50	2830	0.086	0.16
	1 AC	230 to 277	60	3280	0.094	0.28
	3 AC	220 to 332 Δ	60	3490	0.093	0.27
	3 AC	380 to 575 Y	60	3490	0.093	0.16
112	1 AC	230 to 277	50	2720	0.073	0.26
	3 AC	220 to 290 Δ	50	2770	0.085	0.27
	3 AC	380 to 500 Y	50	2770	0.085	0.15
	1 AC	230 to 277	60	3000	0.107	0.31
	3 AC	220 to 332 Δ	60	3280	0.094	0.28
	3 AC	380 to 575 Y	60	3280	0.094	0.16
132	1 AC	230 to 277	50	2860	0.115	0.40
	3 AC	220 to 290 Δ	50	2880	0.138	0.45
	3 AC	380 to 500 Y	50	2880	0.138	0.24
	1 AC	230 to 277	60	3380	0.185	0.59
	3 AC	220 to 332 Δ	60	3470	0.148	0.41
	3 AC	380 to 575 Y	60	3470	0.148	0.24
160 to 225 ³⁾	1 AC	230 to 277	50	2780	0.236	0.96
	3 AC	220 to 290 Δ	50	2840	0.220	0.76
	3 AC	380 to 500 Y	50	2830	0.220	0.43
	3 AC	220 to 332 Δ	60	3400	0.284	0.94
	3 AC	380 to 575 Y	60	3400	0.284	0.56
250 M to 280 M	3 AC	200 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	200 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	200 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

¹⁾ Separately driven fans with order numbers **1PP. ...** are used for 1LG motors of frame size 225 and above. The admissible coolant temperatures are $CT_{min.} -20\text{ °C}$ and $CT_{max.} +50\text{ °C}$.

²⁾ The admissible coolant temperature for single phase versions (1AC) for frame size 160 and above is $CT_{max.} +50\text{ °C}$.

³⁾ 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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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⁾
	315	4 to 8	1PP9 063-2LA12-Z A11+K50 ³⁾
Separately driven fan and rotary pulse encoder 1XP8 001-1 (HTL) ⁴⁾ incl. mounting parts ¹⁾	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 "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 225 as standard.

The 2LM8 brake has IP55 degree of protection.

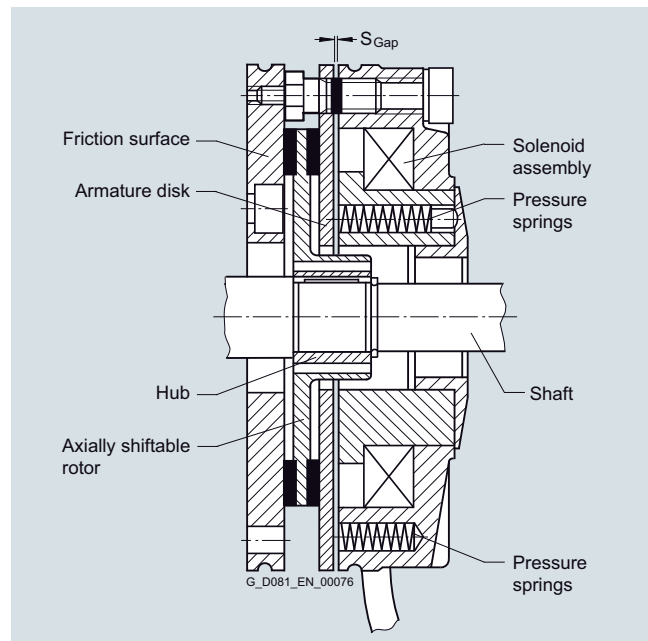
Please inquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times.

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.

⁴⁾ Rotary pulse encoder **1XP8001-2** (TTL) on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

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			Supply 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	5	87	80	65	AC 230	0.1	20	25	56	0.000013	77	105	16
	2LM8 005-1NA60					AC 400	0.11							
	2LM8 005-1NA80					DC 24	0.83							
71	2LM8 005-2NA10	5	87	80	65	AC 230	0.12	20	25	56	0.000013	77	105	16
	2LM8 005-2NA60					AC 400	0.11							
	2LM8 005-2NA80					DC 24	0.83							
80	2LM8 010-3NA10	10	85	78	65	AC 230	0.12	25	26	70	0.000045	75	270	29
	2LM8 010-3NA60					AC 400	0.14							
	2LM8 010-3NA80					DC 24	1.04							
90	2LM8 020-4NA10	20	83	76	66	AC 230	0.15	32	37	90	0.00016	75	740	79
	2LM8 020-4NA60					AC 400	0.17							
	2LM8 020-4NA80					DC 24	1.25							
100	2LM8 040-5NA10	40	81	74	66	AC 230	0.2	40	43	140	0.00036	80	1350	115
	2LM8 040-5NA60					AC 400	0.22							
	2LM8 040-5NA80					DC 24	1.67							
112	2LM8 060-6NA10	60	80	73	65	AC 230	0.25	53	60	210	0.00063	77	1600	215
	2LM8 060-6NA60					AC 400	0.28							
	2LM8 060-6NA80					DC 24	2.1							
132	2LM8 100-7NA10	100	79	72	65	AC 230	0.27	55	50	270	0.0015	77	2450	325
	2LM8 100-7NA60					AC 400	0.31							
	2LM8 100-7NA80					DC 24	2.3							
160	2LM8 260-8NA10	260	75	68	65	AC 230	0.5	100	165	340	0.0073	79	7300	935
	2LM8 260-8NA60					AC 400	0.47							
	2LM8 260-8NA80					DC 24	4.2							
180	2LM8 315-0NA10	315	75	68	65	AC 230	0.5	100	152	410	0.0073	79	5500	470
	2LM8 315-0NA60					AC 400	0.56							
	2LM8 315-0NA80					DC 24	4.2							
200, 225	2LM8 400-0NA10	400	73	68	65	AC 230	0.55	110	230	390	0.0200	93	9450	1260
	2LM8 400-0NA60					AC 400	0.61							
	2LM8 400-0NA80					DC 24	4.6							

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.

Lifetime of the brake lining

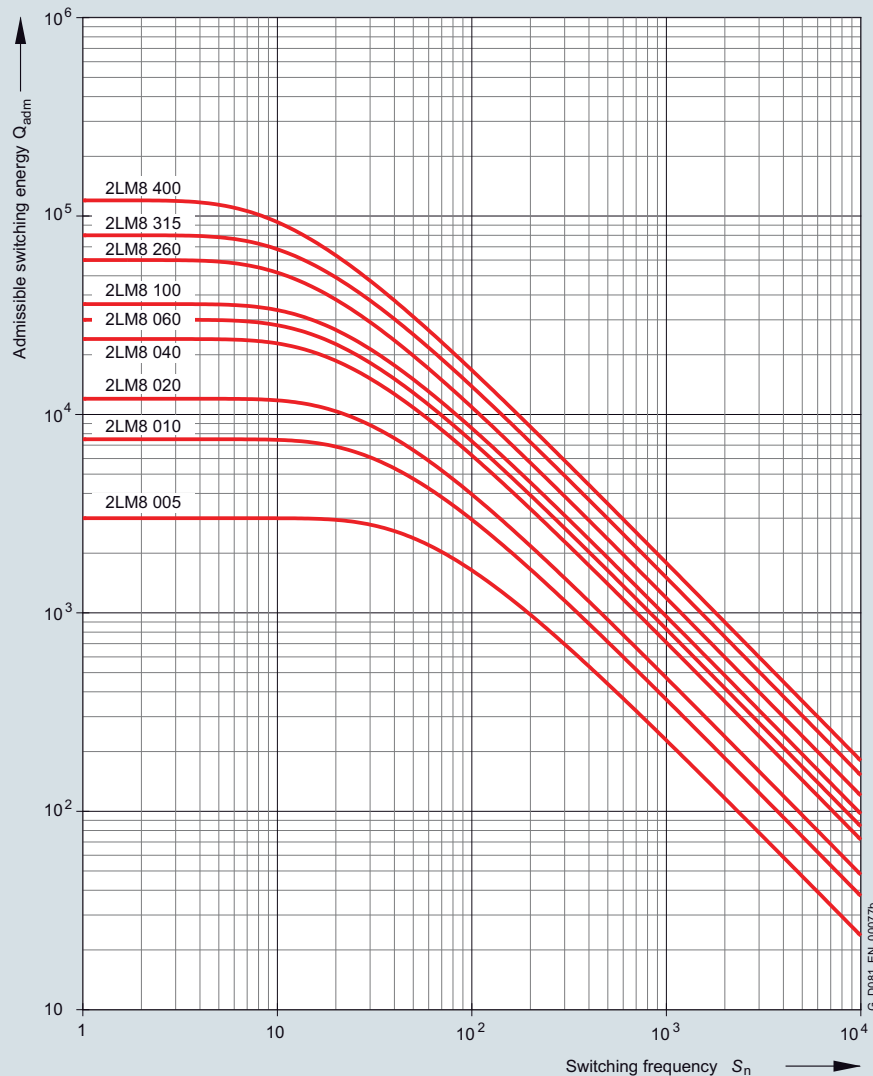
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the switching frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value 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.

Admissible speeds

The maximum admissible 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 admissible friction energy depends on the switching frequency and is shown for the various brakes in the figure "Admissible switching energy as a function of the switching frequency". Increased wear can be expected when the brakes are used for emergency stops.



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

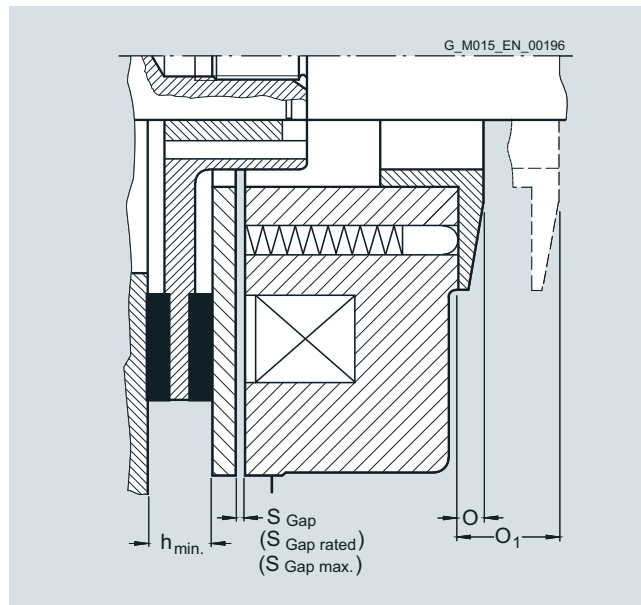
For motor frame size	Brake type	Admissible speeds			Changing the braking torque			Readjusting the air gap		
		Max. operating rpm if max. operating energy utilised	Max. no-load rpm with emergency stop function		Reduction per notch	Dim. "O ₁ "	Min. braking torque	Rated air gap S _{Gap Rated}	Max. air gap S _{Gap max.}	Min. rotor thickness h _{min.}
			Horizontal mounting	Vertical mounting						
		rpm	rpm	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.

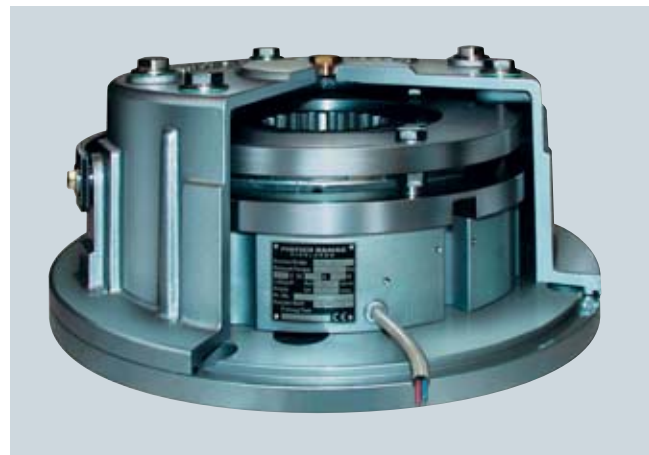
Readjusting the air gap

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 250 to 315. For frame sizes 180 to 225, 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

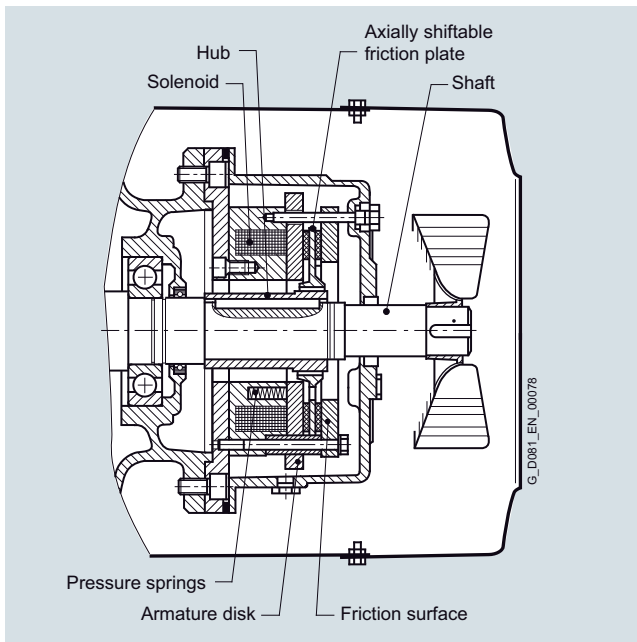
When the brake current is switched on, an electromagnetic field develops which overcomes the spring force of the brake. The corresponding modules, including the motor shaft, can rotate freely. The brake is released. If the brake current is switched off or if there is a power failure, the electromagnetic field of the brake disappears. The mechanical braking energy is transferred to the motor shaft. The motor is braked.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0



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 ¹⁾	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 DC coil voltage)	A	0.77	0.91	0.91	1	1.53	1.64
Current at 400 V AC (180 V DC 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 to 225 is the 2LM8 brake. KFB brake on request.

²⁾ The standard brake for frame sizes 250 to 315 is the KFB brake.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

Configuration of motors with brakes

Braking time

The time it takes the motor to come to a standstill comprises two components:

a.) The application time of the brake t_2

b.) 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_{adm}

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.

$$Q_{adm} = Q_{Kin} + Q_L$$

a.) 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

b.) 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_{adm} :

$$S_{max} = \frac{L}{Q_{adm}}$$

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_{adm} :

$$N = \frac{L_N}{Q_{adm}}$$

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

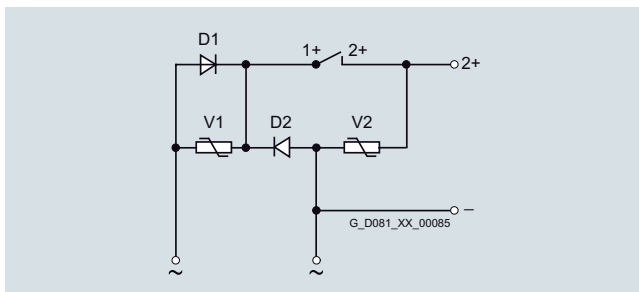
Additional versions

Depending on the selected motor, brake types 2LM8 or KFB are used.

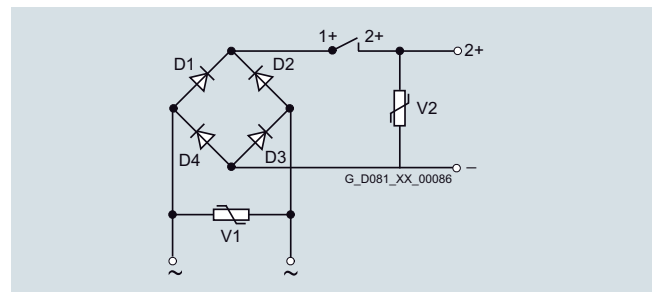
2LM8 spring-operated disk brake	KFB spring-operated brake
Motor series	
This brake is mounted on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in the frame sizes 180 to 225 as standard.	This brake is the standard brake for 1LG motors in frame sizes 250 to 315.
Voltage and frequency	
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 $\pm 10\%$	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!	When 60 Hz is used, the voltage for the brake must not be increased!
The brake can also be supplied for other voltages:	The brake can also be supplied for other voltages:
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Brake supply voltage: 24 V DC Order code C00 • Brake supply voltage: 400 V AC (directly at the terminal strip) Order code C01
Order codes C00 , C01 and C02 may only be used in conjunction with order code G26 .	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 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.
The AC voltage for the brake excitation winding is connected to the two free terminals of the rectifier block (~).	KFB brakes are connected through a standard bridge or half-wave rectifier. See the circuit diagrams below.
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.	A special circuit is not required. Optimal switching times are achieved without the need to use special circuits.
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.	
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).	Not available for the KFB brake.
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.	
Manual brake release with lever	
The brakes can be supplied with a mechanical manual release with lever. Order code K82 .	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.	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



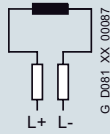
Bridge rectifier, 230 V AC

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0



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 ¹⁾ 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 ¹⁾ 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, ¹⁾ 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 "Technology", "Dimensions and weights".

¹⁾ The spring-operated brake 2LM8 (see from Page 0/77) is mounted as standard on 1LA5 and 1LA7 motors in the frame sizes 63 to 225 and on 1LG motors in frame sizes 180 to 225.
For 1LG motors in the frame sizes 250 to 315 the spring-operated brake KFB is the standard brake (see from Page 0/80).

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 and 1PQ8 motor series)

For motor series 1LA8 and 1PQ8, 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**, price on request

For motors	Brake size	Holding brake torque T_H Nm
1LA8, 1PQ8	NFA	Nm
31	160/250	2500
35	160/250	2500
	250/400	4000
40	250/400	4000
	400/630	6300
45	400/630	6300
	630/1000	10000

When a brake is mounted, the length of the motor increases by ΔI . For an explanation of the additional dimensions and weights, see "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 inquire 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 ΔI . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

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**.

General technical data

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 (Ex n), a special rotary pulse encoder can be supplied (please inquire).

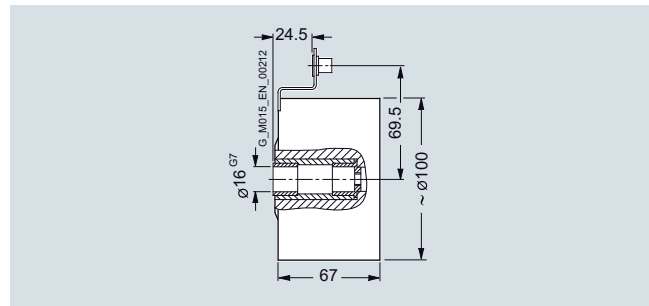
The version of the rotary pulse encoder with a diagnostics system (ADS) can be supplied by Leine and Linde.

Manufacturer:

Leine and Linde (Germany) GmbH
Bahnhofstraße 36
73430 Aalen
Tel. +49 (0)73 61-78093-0
Fax +49 (0)73 61-78093-11

<http://www.leinelinde.com>

e-mail: info@leinelinde.se



Mounting dimensions of LL 861 900 220 rotary pulse encoder

Technical data for LL 861 900 220 (HTL version)

Mounting of encoder at temperatures below -20°C and higher than $+40^\circ\text{C}$ on request.

Supply voltage U_B	9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0', High Current HTL
Pulse offset between the two outputs	$90^\circ \pm 25^\circ$ el.
Output amplitude	$U_{\text{High}} > U_B - 4\text{ V}$ $U_{\text{Low}} < 2.5\text{ V}$
Mark space ratio	1:1 $\pm 10\%$
Edge steepness	50 V/ μs (without load)
Maximum frequency	100 kHz for 350 m cable
Admissible speed	4000 rpm
Temperature range	-20 to $+80^\circ\text{C}$
Degree of protection	IP65
Admissible radial cantilever force	300 N
Admissible 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**. Price and availability on request.

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

HOG9 D 1024 I rotary pulse encoder



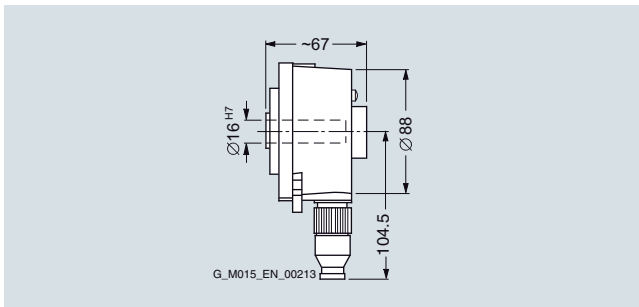
The encoder is fitted with insulated bearings.

The HOG 9 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **H72**.

The HOG 9 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:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



HOG 9 D 1024 I rotary pulse encoder

Technical data for HOG 9 D 1024 I rotary pulse encoder (HTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	50 to 100 mA
Admissible 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	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	$-30\text{ to }+100\text{ °C}$
Degree of protection	IP56
Admissible radial cantilever force	300 N
Admissible axial force	200 N
Termination system	Radial plug (mating connector is part of the scope of supply)
Mech. design acc. to Hübner Ident. No.	73 522 E
Weight	Approx. 0.7 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

HOG 10 D rotary pulse encoder



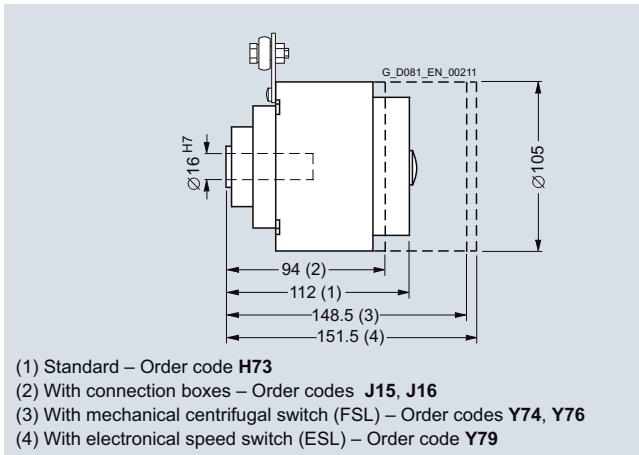
This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG 10 D rotary pulse encoder can be supplied already mounted in different versions. The manufacturer is the same; only the technical data and the respective dimensions and weights change.

Mounting of encoder at temperatures below -20°C and higher than $+40^{\circ}\text{C}$ on request.

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



HOG 10 D 1024 rotary pulse encoder

HOG 10 D 1024 I rotary pulse encoder

The rotary pulse encoder HOG 10 D 1024 I can be supplied already mounted.

Order code **H73**

The rotary pulse encoder HOG 10 D 1024 I can also be retrofitted to a motor 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.

Technical data for HOG 10 D 1024 I (HTL version)

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible 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	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to $+100^{\circ}\text{C}$
Degree of protection	IP66
Admissible radial cantilever force	400 N
Admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 055 E
Weight	Approx. 1.6 kg

Rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against moisture (IP56).

Order code **J15**

Technical data HOG 10 DN 1024 I (HTL version), connection box protection against moisture

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	$90^{\circ} \pm 20\%$
Output amplitude	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to $+100^{\circ}\text{C}$
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 007E-HOG10
Weight	Approx. 1.6 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

0

General technical data

Rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65).

Order code **J16**

Technical data HOG 10 DN 1024 I (HTL version), connection box protection against dust

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{\text{High}} \geq U_B - 3.5 \text{ V}$ $U_{\text{Low}} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	−40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Termination system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 006E-HOG10
Weight	Approx. 1.6 kg

Rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed ... rpm), connection box protection against moisture

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against moisture (IP56) and mechanical centrifugal switch (FSL).

An operating speed of the centrifugal switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y74**

Technical data HOG 10 DN 1024 I (HTL version) + FSL, (speed rpm), connection box protection against moisture

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{\text{High}} \geq U_B - 3.5 \text{ V}$ $U_{\text{Low}} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	−40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Centrifugal switch	
Operating speed	850 ... 4900 rpm
Maximum speed	1.25 x n
Differential gap, clockwise/counter-clockwise	≈ 3 %
Speed hysteresis	≈ 40 %
Switching capacity	6 A/230 V AC; 1 A 125 V DC
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 035F-HOG10
Weight	Approx. 2.1 kg

General technical data

0

**Rotary pulse encoder HOG 10 DN 1024 I +FSL,
connection box protection against dust**

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65) and mechanical centrifugal switch (FSL). An operating speed of the centrifugal switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y76**

*Technical data HOG 10 DN 1024 I (HTL version +) + FSL,
(speed rpm), connection box protection against dust*

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{\text{high}} \geq U_B - 3.5 \text{ V}$ $U_{\text{Low}} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Centrifugal switch	
Operating speed	850 ... 4900 rpm
Maximum speed	1.25 x n
Differential gap, clockwise/counter-clockwise	≈ 3 %
Speed hysteresis	≈ 40 %
Switching capacity	6 A/230 V AC; 1 A 125 V DC
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 022F-HOG10
Weight	Approx. 2.1 kg

**Rotary pulse encoder HOG 10 DN 1024 I + ESL 93,
(speed ... rpm), connection box protection against dust**

The rotary pulse encoder HOG 10 DN 1024 I can be supplied with the already mounted connection box in version with protection against dust (IP65) and electronic speed switch (ESL). One up to three operating speeds of the electronic switch within the admissible range must be specified in plain text, see technical data of the rotary pulse encoder.

Order code **Y79**

*Technical data HOG 10 DN 1024 I (HTL version) + ESL 93,
(speed rpm), connection box protection against dust*

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B', N, N'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{\text{high}} \geq U_B - 3.5 \text{ V}$ $U_{\text{Low}} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-40 to +100 °C
Degree of protection	IP66
Max. admissible radial cantilever force	400 N
Max. admissible axial force	250 N
Electronical switch	
Operating speed	3 x 200 ... 5000 rpm
Maximum speed	6000 rpm
Switching accuracy	± (2-4) %
Switching capacity	3 x 49 mADC
With relay module (external relay module required!)	3 x 6 A/230 V AC; 1 A 125 V DC
Differential gap, clockwise/ counter-clockwise	≈ 3 %
Speed hysteresis	max. 30 %
Principle	Electronics
Auxiliary power	12 V/5 mA
Termination system	Terminals, cable connection M20 x 1.5 + M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 031E-HOG10
Weight	Approx. 2.9 kg

IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Dimensions and weight

Fig. 1 Brake
Order code **G26**
[optionally with manual release, order code **K82**]

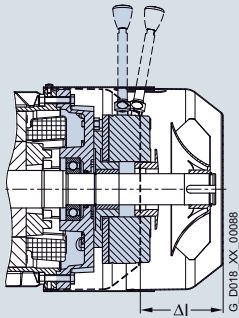


Fig. 2 Brake for 1LA8 and 1PQ8 motor series at drive end (DE)
Order code **H47**

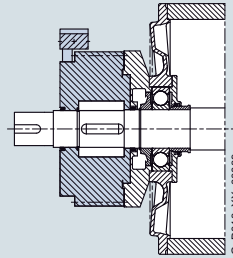


Fig. 3 Rotary pulse encoders (on cover)
Order codes **H57, H58, H70, H72, H73, (H78), (H79), (H80), J15, J16, Y74, Y76, Y79**

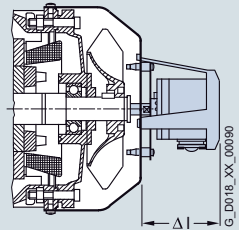
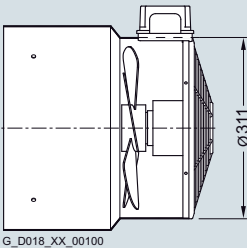
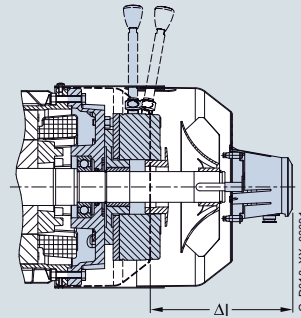


Fig. 4 Brake and rotary pulse encoder (on cover) 1XP8 001
Order codes **H62, H98**
[optionally with manual release, order code **K82**]



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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

1LA frame sizes 100 to 225,
1LG frame sizes 180 and 200

1LG frame size 225 and above

Fig. 5 Separately driven fan
Order code **G17**

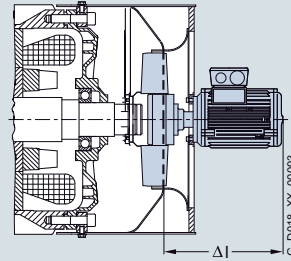
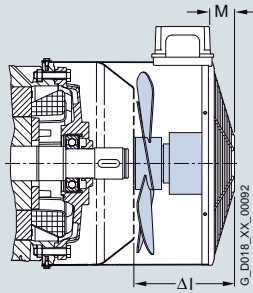


Fig. 6 Brake and separately driven fan
Order code **H63**
[optionally with manual release **K82**]

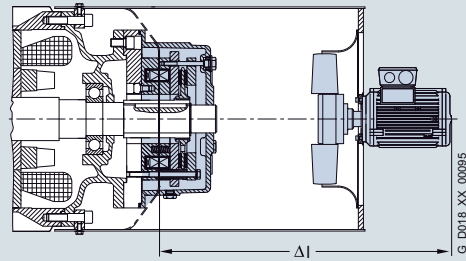
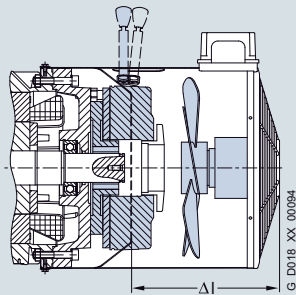


Fig. 7 Rotary pulse encoder (under cover) 1XP8 001 and separately driven fan
Order codes **H61, H97**

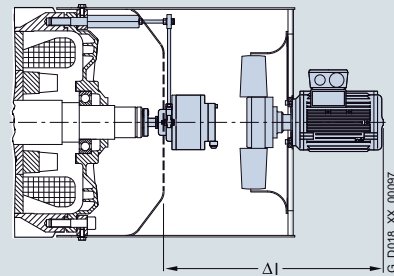
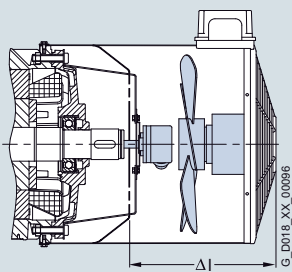
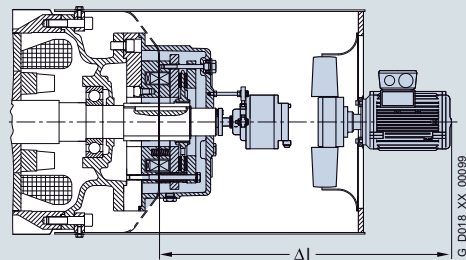
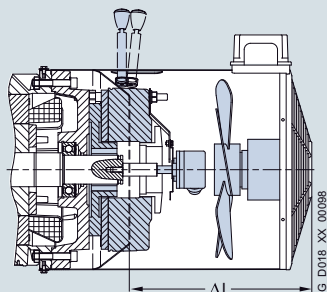


Fig. 8 Brake, rotary pulse encoder (under cover) 1XP8 001 and separately driven fan
Order codes **H64, H99**
[optionally with manual release (**K82**)]



IEC Squirrel-Cage Motors

Introduction motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Frame size	Assignment																	
	Fig. 1		Fig. 2		Fig. 3													
	Brake		Brake		Pulse encoder													
					1XP8 001		LL 861 900220		HOG9 D 1024 I		HOG10 D 1024 I							
	Order code G26		Order code H47		Order code H57, H58		Order codes H70		Order codes H72		Order codes H73		J15, J16		Y74, Y76		Y79	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	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	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	134	1.6	116	1.6	–	–	–	–
112	–	–	–	–	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	–	–	–	–
132	–	–	–	–	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	–	–	–	–
160	–	–	–	–	78	0.3	91	1.3	89	0.9	134	1.6	116	1.6	–	–	–	–
1LG4, 1LG6																		
180	125	22	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
200	137	32	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
225	239	63	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
250	225	83	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
280	227	118	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
315	265	255	–	–	63	0.3	86	1.3	72	0.9	116	1.6	98	1.6	153	2.1	156	2.9
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 motors 1LA, 1LG, 1LL, 1LP, 1MA, 1MJ, 1PP, 1PQ

General technical data

0

Frame size	Assignment												
	Fig. 4		Fig. 5			Fig. 6		Fig. 7		Fig. 8			
	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⁾			Diameter of the fan cowl
	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	mm	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 0/90).

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.

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

Order No. code

0

Overview

The order number consists of a combination of figures and letters and is divided into three blocks linked with hyphens for a better overview, e.g.

1LE1001-1DB20-1AA5-Z
H00

The first block (Positions 1 to 7) identifies the motor type; the second block (Positions 8 to 12) defines the motor frame size and length, the number of poles and in some cases the frequency/output; and in the third block (Positions 13 to 16), the frequency/output, type of construction and other design features are encoded.

For deviations in the second and third 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 - 13 14 15 16															
IEC squirrel-cage motors, surface-cooled																	
Positions 1 to 4: Digit, letter, letter, digit	New generation Design or version (motor type) <ul style="list-style-type: none">• Standard: Self-ventilated by fan mounted on and driven by rotor• Expansion option (F90): Forced-air cooled by air flow from the fan to be driven• Special: Self-cooled without external fan and fan cover					1 L E 1											
						1 P C 1											
Positions 5 to 7: 3 digits	<ul style="list-style-type: none">• Motors with high efficiency (High Efficiency, EFF1), aluminum housing• Motors with improved efficiency (Improved Efficiency, EFF2), aluminum housing					0 0 1											
						0 0 2											
Positions 8, 9 and 11: Digit, letter, digit	Motor frame size (frame size as a combination of shaft height and overall length, encoded)							1 A ... D		0 ... 6							
Position 10: Letter	Number of poles A ... D = 2-, 4-, 6-, 8-pole									A ... D							
Positions 12 and 13: 2 digits	Voltage, circuit and frequency									0 ... 9		0 ... 8					
Position 14: Letter	Type of construction (A – V)													A ... V			
Position 15: Letter	Motor protection (A – Z; special versions encoded)															A ... Z	
Position 16: Digit	Mechanical design (motor version and connection box position) <ul style="list-style-type: none">• General Line motors with shorter delivery times, limited options (connection box on top, cast feet, only basic versions possible, non-drive-end (NDE) cannot be modified)• All options are possible or can be modified<ul style="list-style-type: none">- Connection box on top- Connection box on RHS (viewed from DE)- Connection box on LHS (viewed from DE)- Connection box below															0 4 5 6 7	
	Special order versions: encoded – additional order code required not encoded – additional plain text required																

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	New generation Standard motor with high efficiency EFF1, IP55 degree of protection, aluminum version	1LE1001-000000-0000
Motor frame size/No. of poles/speed	160/4-pole/1500 rpm	1LE1001-1DB20-0000
Rated output	11 kW	
Voltage and frequency	230 VΔ/400 VY, 50 Hz	1LE1001-1DB22-2000
Type of construction	IM V5 with protective cover ¹⁾	1LE1001-1DB22-2C00-Z
(Special versions)	3 PTC thermistors (motor protection with 3 embedded temperature sensors for tripping ²⁾)	H00 1LE1001-1DB22-2CB0-Z H00
Mechanical design (motor version)	Connection box on RHS (viewed from DE)	1LE1001-1DB22-2CB5-Z H00
	Mounted separately driven fan	1LE1001-1DB22-2CB5-Z H00 F70

¹⁾ Standard without protective cover – the protective cover is defined with option **H00** and this option must be ordered in addition.

²⁾ No additional option must be specified in the order.

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

Special versions

0

Overview

The order codes and availability are assigned to the individual motor series in the "Selection and ordering data" in catalog part 1.

For

- Voltages
- Types of constructions
- Motor protection
- Motor connection and connection box

see the relevant heading in section "General technical data" in this catalog part.

All available options are listed according to topics in the following table. An alphanumeric listing according to order codes can be found in the appendix under "Overview of order codes".

Attention:

For 1LE1 and 1PC1 motors apply only the "Special versions" of the following table and of catalog part 1. Motor protection and motor connection or connection box can be defined as Order No. supplement with the positions 15 or 16 of the Order No.

Order code	Special versions	For further information, see Page
Motor connection and connection box		
R15	One cable gland, metal	0/114
R10	Rotation of the connection box through 90°, entry from DE	0/114
R11	Rotation of the connection box through 90°, entry from NDE	0/114
R12	Rotation of the connection box through 180°	0/114
R50 <i>New!</i>	Larger connection box	0/113
R30 <i>New!</i>	Reduction piece for M cable gland in accordance with British standard, both cable entries mounted	0/114
H04	External earthing	0/113
R20 <i>New!</i>	3 cables protruding, 0.5 m long	0/114
R21 <i>New!</i>	3 cables protruding, 1.5 m long	0/114
R22 <i>New!</i>	6 cables protruding, 0.5 m long	0/114
R23 <i>New!</i>	6 cables protruding, 1.5 m long	0/114
R24 <i>New!</i>	6 cables protruding, 3 m long	0/114
H08 <i>New!</i>	Connection box on NDE	0/113
Windings and insulation		
N01	Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	0/108
N02	Temperature class 155 (F), used acc. to 155 (F), with increased output	0/108
N03	Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	0/108
N11 <i>New!</i>	Temperature class 180 (H) at rated power and max. CT 60 °C	0/108
N20 <i>New!</i>	Increased air humidity/temperature with 30 to 60 g water per m ³ of air	0/108
N05	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	0/108
N06	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	0/108
N07	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	0/108
N08	Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	0/108
N21 <i>New!</i>	Increased air humidity/temperature with 60 to 100 g water per m ³ of air	0/108
Y52	Temperature class 155 (F), used acc. to 155 (F), other requirements	0/108
Colors and paint finish		
Y54	Special finish in other standard RAL colors	0/101
Y51	Special finish in special RAL colors	0/101
S03 <i>New!</i>	Special finish sea air resistant	0/100
S00	Unpainted (only cast iron parts primed)	0/100
S01	Unpainted, only primed	0/100
Modular technology – Basic versions		
F70	Mounting of separately driven fan	0/129
F01	Mounting of brake	0/130 ...
G01	Mounting of 1XP8012-10 (HTL) rotary pulse encoder	0/128
G02	Mounting of 1XP8012-20 (TTL) rotary pulse encoder	0/128
Modular technology – Additional versions		
F10	Brake supply voltage 24 V DC	0/133
F11	Brake supply voltage 230 V AC, 50/60 Hz	0/133
F12	Brake supply voltage 400 V AC, 50/60 Hz	0/133
F50	Mechanical manual brake release with lever (no locking)	0/133
Special technology		
G04	Mounting of LL 861 900 220 rotary pulse encoder	0/134
G05	Mounting of HOG 9 D 1024 I rotary pulse encoder	0/135
G06	Mounting of HOG 10 D 1024 I rotary pulse encoder	0/136

IEC Squirrel-Cage Motors

Introduction motors 1LE1, 1PC1

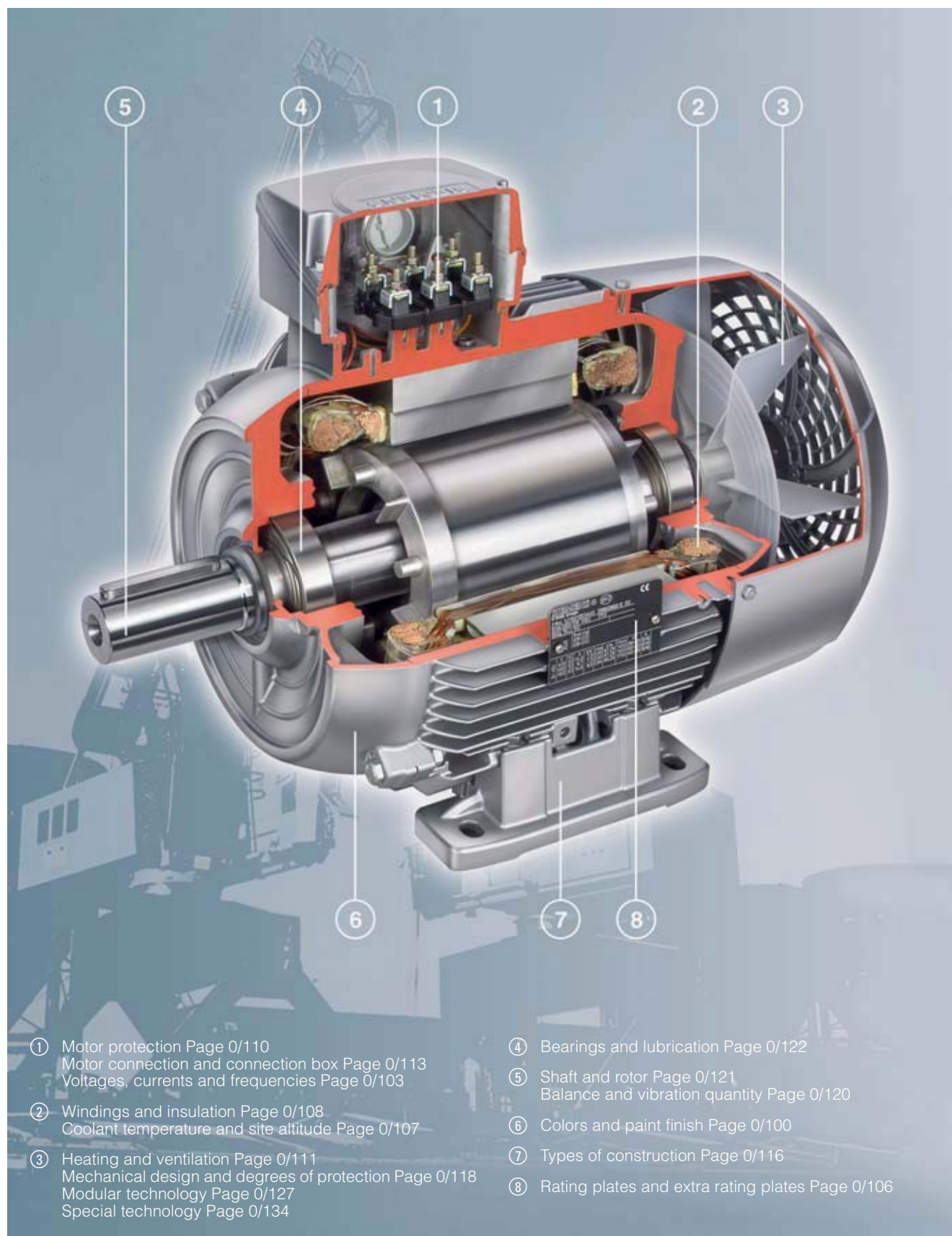
Special versions

Overview "Special versions" (Fortsetzung)

Order code	Special versions	For further information, see Page
Mechanical design and degrees of protection		
H00	Protective cover for types of construction	0/119
H01	Screwed-on feet (instead of cast)	0/113
H23 <i>New!</i>	Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar	0/118
F77 <i>New!</i>	Low-noise version for 2-pole motors with clockwise direction of rotation	0/119
F78 <i>New!</i>	Low-noise version for 2-pole motors with counter-clockwise direction of rotation	0/119
H20 <i>New!</i>	IP65 degree of protection	0/119
H22 <i>New!</i>	IP56 degree of protection (non-heavy-sea)	0/119
H02 <i>New!</i>	Vibration-proof version	0/119
H03	Condensation drainage holes	0/119
H07 <i>New!</i>	Non-rusting screws (externally)	0/119
G40	Prepared for mountings, only center hole	0/118
G41	Prepared for mountings with D12 shaft	0/118
G42	Prepared for mountings with D16 shaft	0/118
G43 <i>New!</i>	Protective cover for encoder (loosely enclosed – only for mountings acc. to order codes G40, G41 and G42)	0/118
Coolant temperature and site altitude		
D03 <i>New!</i>	Coolant temperature –40 °C to +40 °C	0/107
D04 <i>New!</i>	Coolant temperature –30 °C to +40 °C	0/107
Designs in accordance with standards and specifications		
D30 <i>New!</i>	Electrical according to NEMA MG1-12	0/99
D31 <i>New!</i>	Design according to UL with "Recognition Mark"	0/99
D40 <i>New!</i>	Canadian regulations (CSA)	0/98, 0/99
D46 <i>New!</i>	PSE Mark Japan	0/99
Bearings and lubrication		
Q01	Measuring nipple for SPM shock pulse measurement for bearing inspection	0/122
L22	Bearing design for increased cantilever forces	0/122, 0/124 ...
L25	Special bearing for DE and NDE, bearing size 63	0/122, 0/124 ...
L23	Regreasing device	0/122
L20	Located bearing at DE	0/122
L21	Located bearing at NDE	0/122
Balance and vibration quantity		
L00	Vibration quantity level B	0/120
L02	Full-key balancing	0/120
L01	Balancing without fitted key	0/120
Shaft and rotor		
L08	Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	0/121
L05	Second standard shaft extension	0/121
L04 <i>New!</i>	Shaft extension with standard dimensions, without featherkey way	0/121
L07	Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	0/121
L06	Standard shaft made of non-rusting steel	0/121
Y55 <i>New!</i>	Non-standard cylindrical shaft extension	0/121
Heating and ventilation		
F75 <i>New!</i>	Fan cover for textile industry	0/111
F76 <i>New!</i>	Metal external fan	0/111
Q02	Anti-condensation heaters for 230 V	0/111
Q03	Anti-condensation heaters for 115 V	0/111
F74	Sheet metal fan cover	0/111
Rating plate and extra rating plates		
M10	Second rating plate, loose	0/106
M11	Nirosta rating plate	0/106
Y80	Extra rating plate or rating plate with deviating rating plate data	0/106
Y82	Extra rating plate with identification codes	0/106
Y84	Additional information on rating plate and on package label (max. of 20 characters)	0/106
Packaging, safety notes, documentation and test certificates		
B00	Without safety and commissioning note. Customer's declaration of renouncement required.	0/102
B01	With one safety and start-up guide per box pallet	0/102
B02	Acceptance test certificate 3.1 in accordance with EN 10204	0/102
B04	Printed operating instructions English/German enclosed	0/102
B83 <i>New!</i>	Type test with heat run for horizontal motors, with acceptance	0/102
B99	Wire-lattice pallet	0/102
M01	Connected in star for dispatch	0/102
M02	Connected in delta for dispatch	0/102

Overview

Cut-away diagram of a low-voltage motor



IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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/EN	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 mounting dimensions 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 connection box position	IEC 60034-7	DIN EN 60034-7
Entry to connection 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

National standards

The motors comply with the IEC or European standards listed above. The European standards replace the national standards in the following EU member states: 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 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.

Title	Country
CSAC22.2, No. 100	Canada
IS 325 IS 4722	India
NEK – IEC 60034-1	Norway

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 admissible 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. For rated voltage and rated voltage range, see Page 0/103.

Efficiency η at

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

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

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 admissible)

Locked-rotor current $+20\%$

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

Breakdown torque -10%

Moment of inertia $\pm 10\%$

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 EFF (Improved Efficiency) or EFF (High Efficiency).

So that the requirements of efficiency classes EFF and EFF 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 150 kW).

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 1LE1 and can be ordered with order code **D40** and are also marked with the CSA-E verification on the rating plate.



IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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 EPACT and **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).

All other 1LE1/1PC1 motors must be ordered with order code **D30**.

Data on the rating plate: Rated voltage (voltage tolerance of 10 %), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12.

UL approval – Order code D31

The motors based on the 1LE1/1PC1 basic series are listed for up to 600 V by Underwriters Laboratories Inc. ("Recognition Mark" = R/C).

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code N11.

According to UL, motor voltages are only certified up to 600 V, i.e. voltage codes 22, 27 or 40. For this reason, the indication 690 VY for voltage code "34" (400 VΔ/690 VY/ 50 Hz or 460 VΔ/60 Hz), for example, is omitted on the rating plate.

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 and includes the following data on the rating plate: Rated voltage (voltage tolerance of 10 %), nominal efficiency, design letter, code letter, CONT and NEMA MG1-12. The motors must only be ordered with order code **D31**.

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 with 50/60 Hz.

Deviating frequency settings must be tested at final acceptance.

The following versions are possible:

- 2-pole motors, only in combination with F77 or F78 low-noise versions
- 4, 6 and 8-pole motors, only in combination with F76 metal external fan

CSA approval – Order code D40

Motors based on the 1LE1/1PC1 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.

This is not possible in combination with the option "temperature class 180 (H) at rated output and maximal coolant temperature of 60 °C", order code N11, for 1LE1 and 1PC1 motor series.

The motors must be ordered with the order code **D40**, voltage code "**90**" and order code for voltage and frequency. The CSA mark and the rated voltage (voltage tolerance of 10 %) are included on the rating plate.



When energy-saving motors (1LE1 in design EFF1) are ordered, they also include the CSA-E mark on the rating plate.



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 **1LE1 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

Export of low-voltage motors to Japan

PSE Mark Japan – Order Code D46

PSE marking is a mandatory certification in Japan in accordance with the electrical devices and safety of materials act. "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.

The motors concerned are marked on the rating plate with the following "PSE" logo.



IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Colors and paint finish

To protect the drives against corrosion and external influences, high-quality coatings based on 2-K epoxy resin are offered in various different colors.

Type	Suitability of paint finish for climate group in accordance with DIN IEC 60721, Part 2-1	
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 concentrations or permanent dampness in sheltered rooms

Special finish system "sea air resistant" – Order code **S03**

Field of application	Resistance
<ul style="list-style-type: none"> Recommended for indoor installations or outdoor installations exposed to direct weather conditions Industrial climate with moderate SO₂ exposure, inshore maritime climate, but not offshore maritime climate, e.g. for crane drives and also in the paper industry Complies with the test requirements of DIN EN ISO 12944-2 Corrosion Category C4 	<ul style="list-style-type: none"> Chemical exposure to 5 % acid and caustic solution concentration Suitable for use in the tropics up to 75 % relative humidity at 50 °C Thermal stability from –40 to 140 °C

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

Other colors in special finish must be ordered with order codes **Y51** or **Y54** and the required RAL number in plain text (for a selection of the available RAL numbers/colors, see the following page for tables for order codes **Y51** and **Y54**).

Direct sunlight may change the color. If consistent colors are required, we recommend paint based on polyurethane. Please inquire.

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

If required, the motors can be supplied coated only in primer, order code **S01**, or unpainted (unmachined cast-iron surfaces, but primed) using order code **S00**.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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

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

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

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

Coating structure and colors not specified in the catalog are available on request.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Packaging, safety notes, documentation and test certificates

Connected in star for dispatch – Order code **M01**

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

Connected in delta for dispatch – Order code **M02**

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

Packing weights

Packing weights		For land transport							
For motors		Type of construction IM B3				Type of construction IM B5, IM V1			
Frame size	Type 1LE1 ... - 1PC1 ... -	In box Tare	On wooden board ISPM covered by cardboard on top and sides Tare	On battens Tare	In crate Tare	In box Tare	On wooden board ISPM covered by cardboard on top and sides Tare	On battens Tare	In crate Tare
		kg	kg	kg	kg	kg	kg	kg	kg
100 L	1A.4	–	5.0	–	–	–	5.0	–	–
	1A.5	–	5.0	–	–	–	5.0	–	–
	1A.6	–	5.0	–	–	–	5.0	–	–
112 M	1B.2	–	5.0	–	–	–	5.0	–	–
	1B.6	–	5.0	–	–	–	5.0	–	–
132 S	1C.0	4.7	–	–	–	5.2	–	–	–
	1C.1	4.7	–	–	–	5.2	–	–	–
132 M	1C.2	4.7	–	–	–	5.2	–	–	–
	1C.3	4.7	–	–	–	5.2	–	–	–
	1C.6	8.7	–	–	–	9.2	–	–	–
160 M	1D.2	4.8	–	–	–	5.7	–	–	–
	1D.3	4.8	–	–	–	5.7	–	–	–
160 L	1D.4	4.8	–	–	–	5.7	–	–	–
	1D.6	8.8	–	–	–	9.7	–	–	–

Data apply for individual packaging. Packing in wire-lattice pallets can be used, order code **B99**.

Safety notes

If the motors are to be delivered without safety and commissioning notes, 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 following documents are optionally available:

- Printed operating instructions English/German enclosed – Order code **B04**
- All manuals for low-voltage motors, geared motors and low-voltage converters are now available on DVD in 5 languages, see "SD Manual Collection for CA 01" in catalog part 11 "Appendix".

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.

Type test with heat run for horizontal motors, with acceptance – Order code **B83**

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. The acceptance is carried out by an external representative (e.g. customer, classification society).

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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 rated duty.

Standard	Category	Category
60034 – 1	A	B
Voltage deviation	$\pm 5\%$	$\pm 10\%$
Frequency deviation	$\pm 2\%$	$+3\%/-5\%$
Rating plate data stamped with rated voltage a (e.g. 230 V)	a $\pm 5\%$ (e.g. 230 V $\pm 5\%$)	a $\pm 10\%$ (e.g. 230 $\pm 10\%$)
Rating plate data stamped with rated voltage ranges b to c (e.g. 220 to 240V)	b -5% to c $+5\%$ (e.g. 220 -5% to 240 $+5\%$)	b -10% to c $+10\%$ (e.g. 220 -10% to 240 $+10\%$)

According to the standard, longer duty is not recommended for Category B. See "Rating plates and extra rating plates" for details of the rating plate inscriptions and corresponding examples. The selection and ordering data state the rated current at 400 V. The DIN IEC 60038 standard specifies a tolerance of $\pm 10\%$ for mains voltages of 230 V, 400 V and 690 V. The rating plates of motors with voltage code 22 or 34 specify a rated voltage range in addition to the rated voltage (see table below).

The rated currents at 380/420 V are specified in the table "Rated currents for rated voltage range 380 V to 420 V at 50 Hz" and on the rating plate.

Mains voltages	Rated voltage range	Voltage code
1LE1 motors		
230 V Δ /400 VY, 50 Hz	220 ... 240 V Δ /380 ... 420 VY, 50 Hz	22
400 V Δ /690 VY, 50 Hz	380 ... 420 V Δ /660 ... 725 VY, 50 Hz	34
500 VY, 50 Hz	–	27
500 V Δ , 50 Hz	–	40

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 12th position of the Order No. as well as the code digit 0 in the 13th position of the Order No. and the appropriate order code.

M1Y Non-standard winding for voltages between 200 V and 690 V and rated outputs.

For voltages and rated outputs outside the range, please inquire.

Motor series	Frame size	Rated voltages that are available for M1Y	
		Lowest/highest voltage in V for	
		Delta connection	Star connection
1LE1	100 ... 160	200/690	250/690

Order codes for other rated voltages are listed under "Order No. supplements" in the "Selection and ordering data" as well as "Special versions" under "Voltages".

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

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

Motor type	Frame size	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		4-pole		6-pole		8-pole	
		/	/	/	/	/	/	/	/
		A	A	A	A	A	A	A	A
General Line motors with shorter delivery time									
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LE1									
Forced-air cooled motors without external fan and fan cover with improved efficiency – Aluminum series 1LE1									
1LE1002-1A.4	100 L	6.3	5.7	5.0	4.9	3.75	4.15	2.8	3.3
1LE1002-1A.5	100 L	–	–	6.4	6.1	–	–	3.65	4.1
1LE1002-1B.2	112 M	8.3	7.5	8.4	8.1	5.4	5.5	4.0	4.4
1LE1002-1C.0	132 S	10.9	10.3	11.5	11.4	7.3	7.7	5.9	6.0
1LE1002-1C.1	132 S	14.5	13.9	–	–	–	–	–	–
1LE1002-1C.2	132 M	–	–	15.2	15.2	9.3	9.4	7.9	8.1
1LE1002-1C.3	132 M	–	–	–	–	13.7	12.9	–	–
1LE1002-1D.2	160 M	21.7	20.7	22.4	22.8	17.0	17.7	10.5	11.6
1LE1002-1D.3	160 M	29.6	28.9	–	–	–	–	13.8	14.6
1LE1002-1D.4	160 L	35.0	33.5	30.0	30.2	22.3	24.7	18.9	19.4
Self-ventilated energy-saving motors with high efficiency – Aluminum series 1LE1									
Forced-air cooled motors without external fan and fan cover with high efficiency – Aluminum series 1LE1									
1LE1001-1A.4	100 L	6.1	6.1	4.65	4.65	3.55	3.55	2.65	2.95
1LE1001-1A.5	100 L	–	–	6.2	6.1	–	–	3.85	4.35
1LE1001-1B.2	112 M	7.8	7.6	8.3	8.2	5.1	5.0	4.3	4.3
1LE1001-1C.0	132 S	10.1	10.5	11.4	11.4	7.0	7.1	6.6	6.6
1LE1001-1C.1	132 S	14.2	13.7	–	–	–	–	–	–
1LE1001-1C.2	132 M	–	–	14.8	14.4	8.6	8.9	7.9	8.2
1LE1001-1C.3	132 M	–	–	–	–	12	11.9	–	–
1LE1001-1D.2	160 M	20.0	21.0	21.5	20.5	16.1	15.8	9.8	9.6
1LE1001-1D.3	160 M	28.0	27.0	–	–	–	–	13.4	13.3
1LE1001-1D.4	160 L	34.0	33.0	28.5	27.5	22.5	21.5	17.5	16.8
Self-ventilated motors with increased output with improved efficiency – Aluminum series 1LE1									
1LE1002-1A.6	100 L	8.1	7.9	8.5	8.5	5.4	5	–	–
1LE1002-1B.6	112 M	11.2	10.2	12	10.8	7.5	8.0	–	–
1LE1002-1C.6	132 M	20.3	18.9	21.8	21.3	17.0	17.6	–	–
1LE1002-1D.6	160 L	40.2	37.9	36.1	35.5	33.5	34.0	–	–
Self-ventilated motors with increased output and high efficiency – Aluminum series 1LE1									
1LE1001-1A.6	100 L	7.8	7.6	8.3	8.4	5.0	4.95	–	–
1LE1001-1B.6	112 M	10.4	9.8	11.2	11.1	6.6	6.5	–	–
1LE1001-1C.6	132 M	20	19.1	21.5	21	16.5	16.5	–	–
1LE1001-1D.6	160 L	40.0	37.5	35.5	34.5	30.5	29.0	–	–

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Outputs

The outputs or rated outputs are listed in the selection tables for both 50 Hz and 60 Hz.

Assignment of the standard power kW-HP and vice versa in accordance with IEC

$$\text{kW} \cdot 1.341 = \text{HP}$$

$$\text{HP} \cdot 0.746 = \text{kW}$$

P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP	P_{rated} kW	P_{rated} HP
0.06	0.08	0.37	0.5	2.2	3	11	15	37	50	110	150
0.09	0.12	0.55	0.75	3	4	15	20	45	60	132	200
0.12	0.16	0.75	1	4	5	18.5	25	55	75	160	250
0.18	0.25	1.1	1.5	5.5	7.5	22	30	75	100	200	300
0.25	0.33	1.5	2	7.5	10	30	40	90	125		

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 in the selection tables.

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

Part-load efficiency in % at				
1/4 of full load	1/2	3/4	4/4	5/4
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

Part-load power factor at

1/4 of full load	1/2	3/4	4/4	5/4
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 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.

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", Page 0/111).

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 admissible 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 practice is to start squirrel-cage motors directly on line. The torque class indicates that with direct-on-line starting, even if there is an undervoltage of -5 %, 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.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Rating plate and extra rating plates

DIN EN 60034-1 lays down that the approximate total weight for all motors is indicated on the rating plate.

An extra rating plate can be supplied loose for all motors, order code **M10**.

Non-rusting steel rating plate, for scratch, heat, cold and acid resistance can be obtained, order code **M11**.

Supplementary data (max. of 20 characters) can be indicated on the rating plate or extra rating plate and on the packaging label, order code **Y84**.

An extra rating plate for identification codes is also possible, order code **Y82**.

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

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

Overview of the languages on the rating plate

Motor type	Frame size	Rating plate							Double rating plate 50/60 Hz data for	
		International	German (de)	English (en)	German (de)/ English (en)	French (fr)/ Spanish (es)	Italian (it)	Portuguese (pt)	Russian (ru)	
										500 VY and 575 VY
										230 VΔ/ 400 VY and 460 V
										500 VΔ and 575 VΔ
										400 VΔ/ 690 VY and 460 VΔ
1LE1/1PC1	100 ... 160	□		○						□

- Standard version
○ Without additional charge

Example of a rating plate

SIEMENS
D-91056 Erlangen
3-Mot. 1LE1 002-1DB43-4AA0
IEC/EN 60034 160L IMB3 IP55
73 kg Th.Cl. 155(F)
Bearing 6209-2ZC3
DE 6209-2ZC3
NE 6209-2ZC3

V	Hz	A	kW	cos φ	eta	1/min	V	A
400 Δ	50	29,5	15	0,82	89,4%	1460	380-420	30,0-30,2
690 Y	50	17,1	15	0,82	89,4%	1460	660-725	17,4-17,5
460 Δ	60	29,5	17,3	0,82	89,4%	1760	440-480	30,2-29,8

1 Machine type: Three-phase Low-voltage motor
2 Order No.
3 Factory number (Ident No., serial number)
4 Type of construction
5 Degree of protection
6 Rated voltage [V] and winding connections
7 Frequency [Hz]
8 Rated current [A]
9 Rated output [kW]
10 Power factor [cos φ]
11 Efficiency
12 Rated speed [rpm]
13 Voltage range [V]
14 Current range [A]
15 Machine weight [kg]
16 Standards and regulations
17 Temperature class
18 Frame size
19 Additional details (optional)
20 Operating temperature range (only if it deviates from normal)
21 Site altitude (only when higher than 1000 m)
22 Customer data (optional)
23 Date of manufacture YYMM

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Coolant 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 the frequency of 50 Hz, a coolant temperature (CT) or ambient temperature of 40 °C and a site altitude (SA) up to 1000 m above sea level.

For higher coolant temperatures and/or site altitudes greater 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 different operating conditions.

This results in an admissible output of the motor of:

$$P_{adm.} = P_{rated} \cdot k_{HT}$$

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

Site altitude above sea level m	Site altitude above sea level Coolant temperature <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

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

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

Power kW	Admissible output at 50 Hz for CT 45 °C for CT 50 °C	
11	10.5	10
15	14.5	13.8
18.5	17.8	17
22	21	20
30	29	27.5

For details of derating for use in class 155 (F), see "DURIGNIT IR 2000 insulation system".

Motors for coolant temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class 130 (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 also be less favorable due to partial utilization.

The following special versions are possible for 1LE1 and 1PC1 motors:

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

When ordering with order codes **D03** and **D04** in combination with mountings, the respective technical data have to be observed; request required.

For details of order codes for use in temperature class 155 (F), see "DURIGNIT IR 2000 insulation system" under "Windings and insulation", Page 0/108.

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).

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

Abbrevia- tion	Description	Unit
$P_{adm.}$	Admissible motor output	kW
P_{rated}	Rated output	kW
k_{HT}	Factor for abnormal coolant temperature and/or site altitude	

The motors are designed for temperature class 155 (F) and used in temperature class 130 (B). Under non-standard operating conditions, if they are to be used in class 130 (B), the admissible output must be determined from the tables below.

Ambient temperature:

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

Motors can be used in temperature class 155 (F)

- at 40 °C with service factor 1.1, i.e. the motor can be continuously overloaded with 10 % of the rated output in the case of EFF2 motors
- at 40 °C with service factor 1.15, i.e. the motor can be continuously overloaded with 15 % of the rated output in the case of EFF1 motors
- above 40 °C at rated output.

When motors are used in temperature class 130 (B) for higher ambient temperatures and/or site altitudes, derating occurs in accordance with the table "Reduction factor k_{HT} for different site altitudes and/or coolant 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 at temperatures below freezing, please inquire.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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, vapors, 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 inquire if higher values are required.

Please inquire about extreme applications.

Restarting against residual field and opposite phase

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

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

All motors are designed for temperature class 155 (F).

At rated output with mains-fed operation, the motors can be used in temperature class 130 (B).

Temperature class 155 (F), used according to 155 (F), with service factor (SF)

For all 1LE1/1PC1 motors for mains-fed operation for the rated output given in the selection table and rated voltage, a service factor of 1.1 can be specified for EFF2 motors (SF = 1.15 for EFF1 motors) also for motors with increased output.

Order code **N01**

Temperature class 155 (F), used according to 155 (F), for increased output

When used according to temperature class 155 (F), the rated output as specified in the selection and ordering data can be increased by 10 % for EFF2 motors (15 % for EFF1 motors) also for motors with increased output.

Order code **N02**

Temperature class 155 (F), used according to 155 (F), with increased coolant temperature

For mains-fed motors at outputs in accordance with the catalog, the coolant temperature can be raised to 55 °C.

Order code **N03**

The service factor (SF) is not indicated on the rating plate for order codes N02 and N03.

For converter-fed operation at the output specified in the catalog, the motors are used in accordance with temperature class 155 (F). Order codes N01, N02 and N03 are not possible. This applies to motors up to 460 V.

Temperature class 155 (F), used according to 155 (F), other requirements

The motors can be ordered according to temperature class 155 (F) for use according to temperature class 155 (F) with other customized requirements if they are specified in plain text in the order.

Order code **Y52**

Temperature class 180 (H) at rated output and maximum coolant temperature CT 60 °C

For motor series 1LE1 and 1PC1, use according to temperature class 180 (H) is permitted at rated output and at a maximum coolant temperature of 60 °C. This does not apply to motor series 1LE1 and 1PC1 with UL approval (order code D31) and CSA approval (order code D40). The specified grease life applies to a coolant temperature of 40 °C. For a 10 K increase in coolant temperature, the grease life or lubrication interval is halved. Order code **N11**

Temperature class 155 (F), used according to 130 (B), coolant temperature 45 °C, approx. 4 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 45 °C with a 4 % reduction in rated output.

Order code **N05**

Temperature class 155 (F), used according to 130 (B), coolant temperature 50 °C, approx. 8 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 50 °C with a 8 % reduction in rated output.

Order code **N06**

Temperature class 155 (F), used according to 130 (B), coolant temperature 55 °C, approx. 13 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 55 °C with a 13 % reduction in rated output.

Order code **N07**

Temperature class 155 (F), used according to 130 (B), coolant temperature 60 °C, approx. 18 % derating

For the 1LE1 motor series, a version for temperature class 155 (F) can be used according to temperature class 130 (B) at a maximum coolant temperature of 60 °C with a 18 % reduction in rated output.

Order code **N08**

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

For motors of series 1LE1 and 1PC1, 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. This option includes condensation drainage holes (order code H03).

Order code **N20**

Please contact your local Siemens office if order code N20 is to be combined with additional mountings (eg. rotary pulse encoders, brakes).

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

For motors of series 1LE1 and 1PC1, a version can be ordered for increased air humidity of between 60 and 100 g water per m³ of air depending on the temperature as listed in the table below. This option includes condensation drainage holes (order code H03).

Order code **N21**

Please contact your local Siemens office if order code N21 is to be combined with additional mountings (eg. rotary pulse encoders, brakes).

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

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 gray background are covered by order code **N20** (30 to 60 g of water per m³ of air).

The values in the table with a dark gray background are covered by order code **N21** (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 mains voltage failure.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Motor protection

The order variants for motor protection are coded with letters in the 15th position of the Order No. and, if necessary, using order codes.

In the standard version, the motor is designed without motor protection.

15th position of Order No. letter **A**

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 heavy 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.

Motor-temperature-dependent protection devices

Temperature detectors 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.

Temperature detectors for tripping

15th position of Order No. letter **Z** and order code **Q3A**

The most comprehensive protection against thermal overloading of the motor is provided by **PTC thermistors (thermistor motor protection)** installed in the motor winding. The temperature of the winding can be accurately monitored thanks to its low heating capacity and the excellent heat contact with the winding. When a limit temperature is reached (rated tripping temperature), the PTC thermistors undergo 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 starting of the drive. Motors with this type of protection are recommended for heavy 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.

15th position of Order No. letter **B**

The temperature detectors have the following current carrying capacity and switching capacity:

230 V AC cosφ: 2.5 A
24 V DC: 1.6 A

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 alarm and tripping. In the connection box, 4 auxiliary terminals are required.

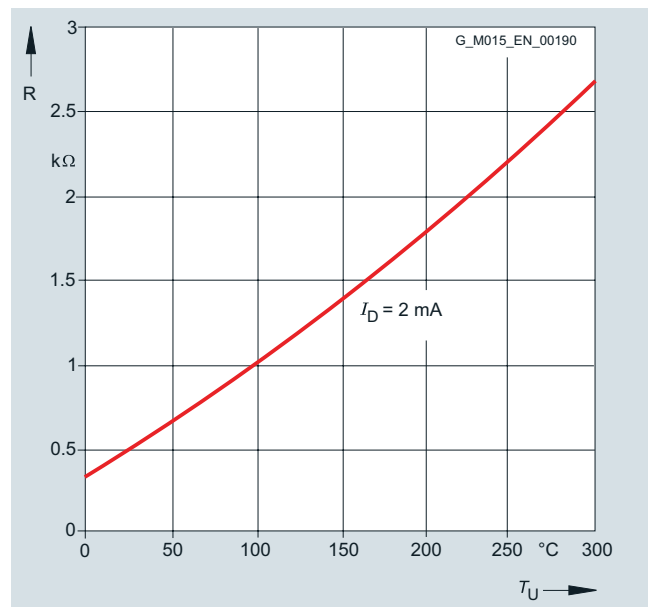
15th position of Order No. letter **C**

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 inquire.

Motor temperature detection with converter-fed operation

KTY 84-130 temperature sensor

This sensor is a semiconductor 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. Two auxiliary terminals are required in the connection box.

15th position of Order No. letter **F**

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 mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV 1, Order No.: E86060-K1002-A101-A7-7600.

With NTC thermistors (mainly in the case of special machines), the tripping temperature can also be adjusted later on the tripping unit. NTC thermistors for tripping

15th position of Order No. letter **Z** and order code **Q2A**

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Heating and ventilation

Anti-condensation heaters

Supply voltage 230 V (1~)
Order code **Q02**

Supply voltage 115 V (1~)
Order code **Q03**

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 M16 x 1.5 cable entry is provided for the connecting cable in the connection box.

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

Motor series	Frame size	Heater output of anti-condensation heaters in Watt (W)	
		Supply voltage at 230 V	115 V
		Order code	Order code
		Q02	Q03
1LE1/1PC1	100 ... 112	50	50
1LE1/1PC1	132 ... 160	100	100

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 the rated motor current are sufficient to heat the motor.

Fans/Separately driven fans

1LE1 motors of frame sizes 100 ... 160 have radial-flow fans in the standard version (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”) that cool regardless of the direction of rotation of the motor (cooling method IC 411 acc. to DIN EN 60034-6). The air flow is forced from the non-drive-end (NDE) to the drive end (DE). For details of separately driven fans for frame sizes 100 ... 160, see Page 0/129.

Supply voltage of separately driven fan for 1LE1 motors:
The supply voltage tolerance of the separately driven fan is $\pm 5\%$; for voltage ranges, Page 0/129.

When the motor is mounted and the air intake is restricted, 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 (differential dimension LM – L) or is specified in the detailed dimension drawing (see also Dimensional drawings from Page 1/68).

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

Motor series	Frame size	Fan material	Fan cover material
1LE1	100 ... 160	plastic	plastic ¹⁾

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 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”). With the 1LE1 motor series, the metal fan can also be used for converter-fed operation.

A metal external fan is already included for the low-noise version.

Up to frame size 160, the metal external fan impeller is manufactured from sheet aluminum or steel.

Order codes **F76**

Fan cover for textile industry

For motors 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), the fan cover can be used in the standard version for the textile industry.

For motor series 1LE1 (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), 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.

When a fan cover is mounted for the textile industry, the length of the motor increases by 64 mm for frame sizes 100/112 and by 71 mm for frame sizes 132/160.

Order code **F75**

Sheet metal fan cover

For 1LE1 motor series (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”), the fan cover can be supplied in sheet metal instead of plastic.

Order code **F74**

¹⁾ The sheet metal fan cover is used for type of construction codes **A, D, F, H, J, K, L, N, T, U, V** in combination with option **H03** (condensation drainage holes). Mounted separately driven fans and brakes are only available for versions with sheet metal fan covers.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Necessary minimum cooling air flow for forced-air-cooled motors in standard duty

The required cooling air flow indicated in the selection table applies to continuous duty according to DIN EN 60034-1 at a coolant temperature (CT) and ambient temperature, respectively, of 40 °C and a site altitude (SA) of up to 1000 m above sea level.

In the motor version without external fan and fan cover, order code **F90**, the motor is located in the air flow of the fan to be

driven which must drive the minimum cooling air flow over the motor housing. The minimum air flow must pass closely over the housing (comparable to self-ventilation of the motor). Otherwise, higher air flows are required to comply with admissible motor heating levels. For a higher cooling air flow, the operating temperature of the motor can be reduced.

Frame size	Required cooling air flow for number of poles									
	2		4		6		8			
	EFF1/EFF2		EFF1		EFF2		EFF1/EFF2		EFF1/EFF2	
	50 Hz m ³ /min.	60 Hz m ³ /min.	50 Hz m ³ /min.	60 Hz m ³ /min.	50 Hz m ³ /min.	60 Hz m ³ /min.	50 Hz m ³ /min.	60 Hz m ³ /min.	50 Hz m ³ /min.	60 Hz m ³ /min.
100	3.8	4.4	2.1	2.6	2.3	2.8	1.5	1.8	1.2	1.3
112	5.0/5.4 ¹⁾	5.7/6.1 ¹⁾	2.9	3.5	2.9	3.5	1.9	2.3	1.4	1.6
132	6.3	7.3	4.6	5.7	4.6	5.7	3.1	3.8	2.4	2.9
160	10.9	13.3	6.7	8.1	7.6	9.1	5	6.1	3.8	4.5

¹⁾ Value: EFF1/EFF2

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Motor connection and connection box

Connection, circuit and connection box

Location of the connection box

The order variants for motor connection are coded with digits in the 16th position of the Order No.

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 for *General Line motors* is on top
16th position of Order No. digit **0**.

The standard position of the connection box for all other motors is on top
16th position of Order No. digit **4**.

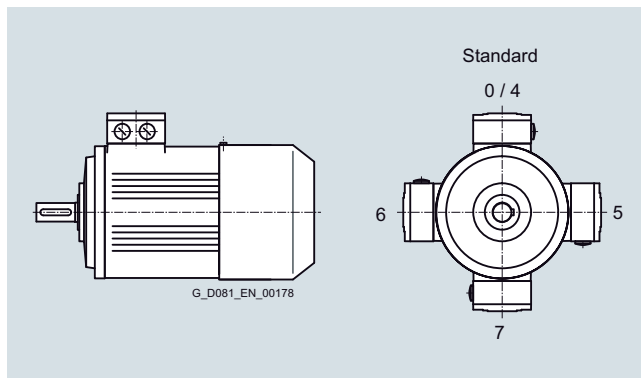
For all motors with feet (apart from motors with increased output), cast feet are standard. If rotation of the connection box in the future has to be provided for, it is recommended that the option "Screwed-on feet" (instead of cast feet), order code **H01**, is ordered.

For motors with feet and increased output, screwed-on feet are standard. The connection box can be rotated later.

Connection box on RHS
16th position of Order No. digit **5**.

Connection box on LHS
16th position of Order No. digit **6**.

Connection box bottom
16th position of Order No. digit **7**.



Location of the connection box with the corresponding digits in the 16th position of the order number

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 PE terminal is provided in the connection box for grounding. A grounding terminal is provided on the outside of the motor frame – special version for 1LE1/1PC1 motors.

Order code **H04**.

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

The number of terminals and the size of the connection box are designed for standard requirements.

For special requirements or upon the customer's request, a larger connection box, can be delivered.

Order code **R50**

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). Only use according to temperature class 155 (F) possible.

Order code **H08**

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:

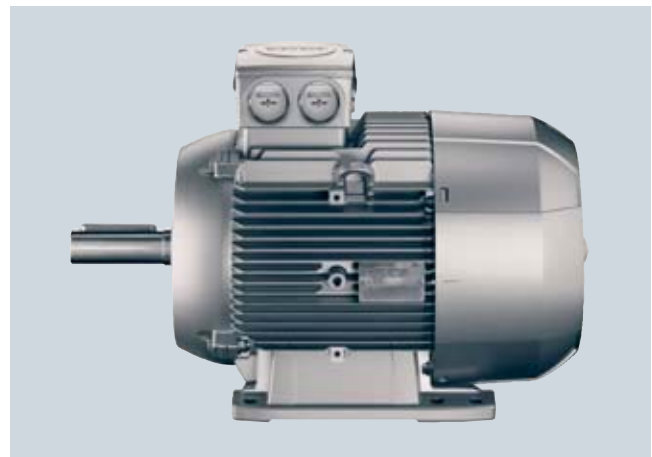
- The max. cable cross-section which can be connected
- The cable type
- Routing
- Ambient temperature and the corresponding admissible current in accordance with DIN VDE 0298

For motors with auxilliary terminals (e.g. 15th position of Order No. is letter **B**) an M16 x 1.5 cable gland with plug is additionally provided.

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

The connection box is located on the housing and bolted in place. The connection box can be turned 4 x 90° on the terminal base of the machine's housing in the case of a terminal board with 6 terminal studs (standard design).

There are 2 entry holes at the standard position complete with sealing plugs and locknuts (see figure).



Connection box in standard position

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Cable entry on connection box

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

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 **R10**
- Towards the non-drive end (NDE)
(rotation of connection box by 90°, entry from NDE)
Order code **R11**
- Opposite
(rotation of connection box by 180°, entry from opposite end)
Order code **R12**

The dimensions of the connection box are listed in part "Dimensions", see Pages 1/65 to 1/75 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 (**R10**, **R11** and **R12**).

Ordering example:

Connection box on RHS (16th position of Order No. digit 5):
Without additional order code, cable entry from below.

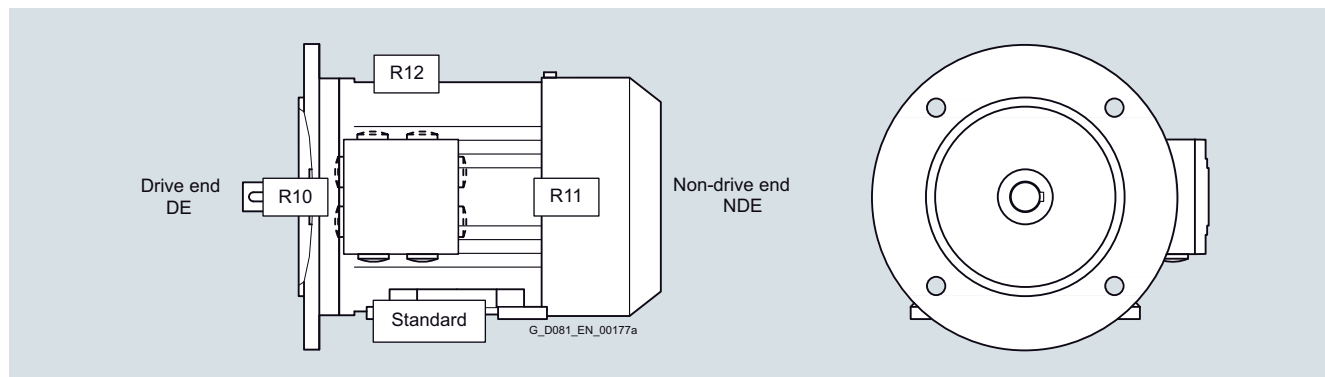
With additional order code **R10**:
Cable entry from drive end (DE)



Connection box in standard position, detailed view

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

One cable gland, metal
Order code **R15**



Locations of the cable entries with corresponding order codes

For special requirements for which standard holes for the cable entries are inadequate for the British market in UK, reduction pieces for M cable glands in accordance with British Standard that are mounted on both cable entries can be supplied.

Order code **R30**

Frame size	Cable entry acc. to IEC	British Standard
100	2 x M32	2 x M20
112/132	2 x M32	2 x M25
160	2 x M40	2 x M32

Protruding cable ends

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

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

- 3 cables protruding, 0.5 m long ¹⁾
Order code **R20**
- 3 cables protruding, 1.5 m long ¹⁾
Order code **R21**
- 6 cables protruding, 0.5 m long
Order code **R22**
- 6 cables protruding, 1.5 m long
Order code **R23**
- 6 cables protruding, 3.0 m long
Order code **R24**

The cross-section of the named cables refers to a coolant temperature up to CT 40 °C.

¹⁾ With only 3 protruding cables additional plain text specifying star or delta connection is required.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

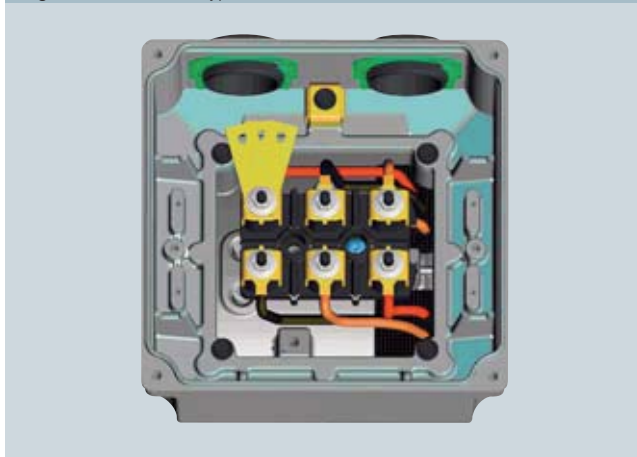
0

Connection, circuit and connection box

Standard connection box TB1 F00, TB1 H00, TB1 J00



Larger connection box type TB1F10, TB1H10, TB1J10



Standard connection boxes/larger connection box for 1LE1/1PC1 motors – basic data

Motors	Frame size	Number of cable entries	Connection box material	Feeder connection
1LE1	100 ... 160	2 entries complete with sealing plugs and locknuts Connection box is mounted and bolted in place.	Aluminum alloy	Without cable lug

Possible positions of the standard connection boxes/Larger connection box for 1LE1/1PC1 motors

Motors	Frame size	Connection box position			Rotation of connection box		Retrofitting possible
		Above	Side, right or left	Retrofitting possible	90°	180°	
1LE1	100 ... 160	○	○	– ¹⁾	○	○	Yes

○ Available version

Standard connection boxes/larger connection box for 1LE1/1PC1 motors in standard version

Frame size	Connection box	Number of terminals	Contact screw thread	Max. connectable cross-section	Outer cable diameter (sealing range)	Cable entry ²⁾	Two-part plate Adm. outer cable diameter
	standard / larger			mm ²	mm		mm
1LE1							
100	TB1 F00/TB1F10	6	M4	4	11 ... 21	2 x M32 x 1.5	–
112							
132	TB1 H00/TB1H10	6	M4	6	11 ... 21	2 x M32 x 1.5	–
160	TB1 J00/TB1J10	6	M5	16	19 ... 28	2 x M40 x 1.5	–

– Not available

Terminal connection

The terminal board accommodates the terminals that are connected to the leads to the motor windings. The terminals are designed so that for frame sizes 100 ... 160 the external (line) connections can be made without the need for cable lugs.

¹⁾ Retrofittable screwed-on feet (16th position of Order No. digit **5, 6, 7** and **4** with order code **H01**).

²⁾ Designed for cable glands with O-ring.

IEC Squirrel-Cage Motors







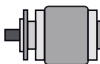

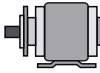
Introduction motors 1LE1/1PC1

General technical data

0

Types of construction

Standard types of construction and special types of construction

Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
Without flange				
IM B3		100 L to 160 L	A	–
IM B6/IM 1051		100 L to 160 L	T	–
IM B7/IM 1061		100 L to 160 L	U	–
IM B8/IM 1071		100 L to 160 L	V	–
IM V5/IM 1011 without protective cover		100 L to 160 L	C	–
IM V6/IM 1031		100 L to 160 L	D	–
IM V5/IM 1011 with protective cover		100 L to 160 L	C	+ H00 ¹⁾
With flange				
IM B5/IM 3001		100 L to 160 L	F	–
IM V1/IM 3011 without protective cover		100 L to 160 L	G	–
IM V1/IM 3011 with protective cover		100 L to 160 L	G	+ H00 ¹⁾
IM V3/IM 3031		100 L to 160 L	H	–
IM B35/IM 2001		100 L to 160 L	J	–

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




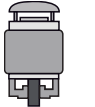




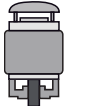

¹⁾ A second shaft extension **L05** is not possible.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
With standard flange				
IM B14/IM 3601		100 L to 160 L	K	–
IM V19/IM 3631		100 L to 160 L	L	–
IM V18/IM 3611 without protective cover		100 L to 160 L	M	–
IM V 18/IM 3611 with protective cover		100 L to 160 L	M	+ H00 ¹⁾
IM B34/IM 2101		100 L to 160 L	N	–
With special flange (next larger standard flange)				
IM B14/IM 3601		100 L to 160 L	K	+ P01
IM V19/IM 3631		100 L to 160 L	L	+ P01
IM V18/IM 3611 without protective cover		100 L to 160 L	M	+ P01
IM V 18/IM 3611 with protective cover		100 L to 160 L	M	+ P01 + H00 ¹⁾
IM B34/IM 2101		100 L to 160 L	N	+ P01

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 and IM B14 and can be operated in the following 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 (DIN EN 1492-1) and/or clamping bands (DIN EN 12195-2) must be used.

If mounting position IM V1 is ordered, eyebolts are supplied for vertical mounting.

The motors are designated in accordance with the types of construction on the rating plate.

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 extension down, the version “with protective cover” is urgently recommended, see the section “Degrees of protection”, Page 0/119.

Frame design

Motors in the types of construction with feet have, in some cases, two fixing holes at the feet at the non-drive end (NDE), see dimension tables, Pages 1/68 to 1/75. A code is cast into the motor close to the fixing retaining holes to identify the frame size.

A metal fan cover is used as standard for horizontal types of construction and types of constructions with shaft extension facing upwards (14th position of Order No. letter **A**, **T**, **U**, **V**, **D**, **F**, **H**, **J**, **K**, **L** or **N**) in combination with condensation drainage holes, order code **H03**.

¹⁾ A second shaft extension **L05** is not possible.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Mechanical design and degrees of protection

Preparation for gear mounting

The flange-mounting motors can be equipped with a radial seal in order to mount gearing.

Order code **H23**

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 > 0.1 bar).

We recommend that the admissible bearing loads are carefully checked.

Eyebolts and transport

1LE1/1PC1 motors without feet have four cast eyebolts as standard, each offset by 90°; in the case of screwed-on feet, two eyebolts are covered by the feet, so in this case only two eyebolts are available for use.

Frame material			
Type series	Frame size	Frame material	Frame feet
1LE1/1PC1	100 ... 160	Aluminum alloy	Cast ¹⁾

Preparation for mountings

The encoders of the "modular and special technology" can be fitted at a later time. The motor must be prepared for this. Possible for all 1LE1 motors (with the exception of 1LE1 with option F90 – version "Forced-air cooled motors without external fan and fan cover").

For the brake with order code F01 and for all encoders from the "modular and special technology", this preparation of the shaft extension on NDE can be ordered with the option "Prepared for mounting, only center hole".

Order code **G40**

The length of the motor does not change because the shaft extension is still under the fan cover.

For the encoders

- 1XP8 012-10 order code G01
- 1XP8 012-20 order code G02

from the "modular technology", this preparation of the shaft extension on NDE can be ordered with the option "Prepared for mounting with shaft D12".

Order code **G41**

By using option **G41**, the motor length increases by dimension ΔI. For explanations of additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

For the encoders

- LL 861 900 220 order code G04
- HOG 9 D 1024 I order code G05
- HOG 10 D 1024 I order code G06

from the "special technology", this preparation of the shaft extension on NDE can be ordered with the option "Prepared for mounting with shaft D16".

Order code **G42**

By using option **G42**, the motor length increases by dimension ΔI. For explanations of additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

Motors that are prepared for additional mountings (order codes G40, G41, G42) are supplied without protective cover as standard.

If a protective cover is requested as cover or as mechanical protection for mounting provided by the customer, it can be ordered with order code **G43**. It must be mounted according to the supplied installation instructions. The protective cover has supports of different lengths that, depending on the height of the mounting, can be used during the installation.

The standard protective cover (order code **H00**) is not suitable for protecting additional mountings such as the rotary pulse encoder.

The order codes **G40**, **G41** and **G42** are not possible in combination with order code **L00**, vibration quantity level B.

¹⁾ Basic version, cast feet: Special version "Screwed-on feet (instead of cast)" with digit **5**, **6** and **7** in the 16th position of the Order No. or digit **4** with order code **H01**. Screwed-on feet are standard for motors with increased output.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Degrees of protection

All motors are designed to IP55 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 CT 40 °C. Other requirements are available on request.

Brief explanation of the degree 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 **H22**

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". Not possible in combination with brake 2LM8 (order code **F01**).

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

Order code **H20**

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 rotary pulse encoder HOG 9 D 1024I (order code **G05**) and/or brake 2LM8 (order code **F01**) and/or in combination with option "unpainted, only cast iron parts primed" (**S00**).

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 "protective cover for types of construction", order code **H00**, is urgently recommended, see also "Types of construction", Page 0/116.

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).

The condensation drainage holes at the drive end (DE) and non-drive end (NDE) are sealed (IP55) on delivery. If the condensation drainage holes are ordered for motors for the IM B6, IM B7 or IM B8 type of construction (feet located on side or top), the position of the drainage holes will be in the correct position for the type of construction.

Order code **H03**

A metal fan cover is used as standard for horizontal types of construction and types of constructions with shaft extension facing upwards (14th position of Order No. letter **A, T, U, V, D, F, H, J, K, L** or **N**) in combination with condensation drainage holes, order code **H03**, to facilitate mounting/demounting.

When the motors are used or stored outdoors we recommend that they are kept under some sort of cover so that they are not subjected 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 **H07**

Vibration-proof version

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

Order code **H02**

For availability of individual options for the relevant motor series, see section "Special versions" in catalog part 1.

Noise levels for mains-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-valued 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 at rated output (see the Selection and ordering data). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please inquire about the noise levels for motors with converter-fed operation.

To reduce noise levels, 2-pole motors with frame size 132 S 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.

Clockwise rotation

Order code **F77**

Counter-clockwise rotation

Order code **F78**

A second shaft extension and/or mountings (mounting of brake, external fan, or encoder) are not possible.

Low-noise version

Type series	Frame size	2-pole motors	
		L_{pA} dB (A)	L_{WA} dB (A)
1LE1 ¹⁾	132	60	72
	160	60	72

¹⁾ With the exception of 1LE1 with option F90 – version "Forced-air cooled motors without external fan and fan cover".

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Balance and vibration quantity

All of the rotors are dynamically balanced with an inserted half key. This corresponds to vibration quantity level A (normal/standard). The vibrational characteristics and behavior of electrical machinery is specified in DIN EN 60034-14 Sept. 2004. Based on DIN ISO 8821, the key convention "half key" (H) must be used for balancing.

The type of key convention used for balancing is stamped on the face of the DE/NDE.

F = Balancing with full key
(Full-key convention)

H = Balancing with half key
(Half-key convention) – standard

N = Balancing without key –
Plain text required (Convention without key)

This is indicated on the rating plate of motors up to frame size 112. Full-key balancing or balancing with full-key (F) is possible on request with order code **L02** (additional charge).

Balancing without featherkey (N) is possible on request by specifying code **L01** (additional charge).

Vibration quantity level A is the standard version and is valid for a rated frequency of 60 Hz.

Low-vibration version B can be supplied to fulfill stricter requirements on smooth running (additional charge).

Vibration quantity level B
Not possible with parallel roller bearings.
Order code **L00**

The order code **L00** vibration quantity level B is not possible in combination with order codes **G40**, **G41** and **G42**.

The limits stated in the table are applicable for uncoupled, idling motors in free suspension.

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

For further details, see the online help in the SD configurator (available soon).

Limits (rms values) for max. vibration quantity of vibration distance (s), vibration speed (v) and acceleration (a) for the shaft height H

Vibration quantity level	Machine installation	Shaft height H in mm								
		56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
		s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²
A	Free suspension	25	1.6	2.5	35	2.2	3.5	45	2.8	4.4
	Rigid clamping	21	1.3	2.0	29	1.8	2.8	37	2.3	3.6
B	Free suspension	11	0.7	1.1	18	1.1	1.7	29	1.8	2.8
	Rigid clamping	–	–	–	14	0.9	1.4	24	1.5	2.4

For details, see standard DIN EN 60034-14, Sept. 2004.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Shaft and rotor

Shaft extension

60° center hole to DIN 332, Part 2 with M3 to M24 tapped hole depending on the shaft diameter (see dimension tables, Pages 1/68 to 1/75.)

Second standard shaft extension.

Order code **L05**

Possible for all 1LE1 motors (with the exception of 1LE1 with option F90 – version “Forced-air cooled motors without external fan and fan cover”).

The second shaft extension can transmit the full rated output via coupling output.

Please also inquire about the transmitted power and admissible 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. Please inquire if a brake is mounted.

DE (shaft extension)	
Diameter mm	Thread 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 designed to DIN EN 50347. The motors are always supplied with a key inserted in the shaft.

Admissible changes to the shaft extension:

Motor series	Frame size	Shaft extension length E in mm		Shaft extension diameter D in mm	
		Standard	Up to max.	Standard	Up to max. ¹⁾
1LE1, 1PC1	100	60	120	28	30
	112				
	132	80	160	38	40
	160	110	220	42	45

Shaft extension with standard dimensions, without featherkey way

For motor series 1LE1 and 1PC1, the standard shaft extension can be ordered with standard dimensions without featherkey way.

Order code **L04**

Standard shaft made of non-rusting steel

For motor series 1LE1, a standard shaft made of non-rusting steel 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 **L06**

Please inquire about other non-rusting materials.

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 which 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 center of 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 order code **Y55** and second standard shaft extension **L05** (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 catalog part 1)
- 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 “Admissible 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 admissible cantilever forces are reduced in accordance with the non-standard shaft extension.

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 **L08**. 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 brake or encoder mounting.

Concentricity of the shaft extension can be ordered according to DIN 42955 Tolerance R for types of construction without flange with order code **L07**.

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

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Bearings and lubrication

Bearing lifetime (nominal lifetime)

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

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 coupling output and at least 20 000 hours with the maximum admissible 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 admissible 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 inquire).

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

The bearing system is axially preloaded with a spring element at the drive end (DE) to ensure smooth running of the motor without play. (see Figure 1 of the Diagrams of bearings, Page 0/124).

For frame size 160 and above, the located bearing is axially secured at the non-drive end (NDE). 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 of the Diagrams of bearings, Page 0/124).
Order code **L21**

On request, the located bearing can also be supplied at the drive end (DE) (see Figure 3 of the Diagrams of bearings, Page 0/124).
Order code **L20**

For increased cantilever forces (e.g. belt drives), reinforced bearings can be used at the drive end (DE).
Order code **L22**

Motors 1LE1/1PC1 can be supplied with reinforced deep-groove bearings at both ends (size range 03).
Special bearings for DE and NDE, bearing size 63, the bearing plates are manufactured from cast-iron for this purpose.
Order code **L25**

A measuring nipple for SPM shock pulse measurement is mounted to check bearing vibration. The motors have a tapped hole for each bearing plate and a measuring nipple with a protective plug. If a second tapped hole is provided, it is fitted with a sealing plug.
Order code **Q01**

Bearing selection for increased cantilever forces (see the table "Bearing selection for 1LE1/1PC1 motors – Bearing for increased cantilever forces", Page 0/124) – "Admissible axial load" from Page 0/126.

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 catalog specifications.
In the basic version, the motors have permanent lubrication.

Regreasing

For motors which can be regreased at defined regreasing intervals, the bearing lifetime can be extended and/or unfavorable factors such as temperature, mounting conditions, speed, bearing size and mechanical load can be compensated.

It is possible to regrease motors, shaft heights 100 to 160. A lubricating nipple is optionally provided.
Order code **L23**

For motors with regreasing device, data concerning regreasing intervals, grease quantity, type of grease and, where applicable, additional data are stated on the rating plate or lubricating plate. For regreasing intervals for basic versions see table "Grease lifetime and regreasing intervals for horizontal installation".
The regreasing device cannot be mounted in combination with mounting of the brake, order code F01.

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 inquire 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 following table "Mechanical limit speeds $n_{max.}$ at maximum supply frequency $f_{max.}$ ".

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Mechanical limit speeds $n_{\max.}$ at maximum supply frequency $f_{\max.}$ (standard values)

Motor frame size	2-pole		4-pole		6-pole		8-pole	
	$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz	$n_{\max.}$ rpm	$f_{\max.}$ Hz
1LE1/1PC1								
100 L	6000	100	4200	140	3600	180	3000	200
112 M	6000	100	4200	140	3600	180	3000	200
132 S/M	5600	90	4200	140	3600	180	3000	200
160 M/L	4800	80	4200	140	3600	180	3000	200

Grease lifetime and regreasing intervals for **horizontal** installation

Permanent lubrication ¹⁾			
Type series	Frame size	Number of poles	Grease lifetime up to CT 40 °C ²⁾
1LE1/1PC1	100 ... 160	2 to 8	20000 h or 40000 h ³⁾
Regreasing (basic version) ¹⁾			
Type series	Frame size	Number of poles	Regreasing interval up to CT 40 °C ²⁾
1LE1/1PC1	100 ... 160	2 to 8	8000 h

¹⁾ For special uses and special greases, please inquire 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 apply to horizontally installed motors with coupling output without additional axial loads.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Bearing selection table for 1LE1/1PC1 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 rating plate.

When deep-groove ball bearings with side plates are used, the side plate is on the inside. Located bearing at drive end (DE) for 1LE1/1PC1 motors, see special version Figure 2 in the “Diagrams of bearings”, below on this page.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
112 M	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
132 S/M	2 to 8	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

Bearing selection table for 1LE1/1PC1 motors – Bearings for increased cantilever forces – Order code **L22**

Please inquire about noise and vibration data. 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 rating plate. When deep-groove ball bearings with side plates are used, the side plate is on the inside.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

Bearing selection table for 1LE1/1PC1 motors – Deep-groove bearings reinforced at both ends – Order code **L25**

Please inquire about noise and vibration data. 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 rating plate. When deep-groove ball bearings with side plates are used, the side plate is on the inside.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, below on this page
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1/1PC1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	Fig. 2

Diagrams of bearings

Fig. 1: Drive-end bearing

Non-drive end bearing

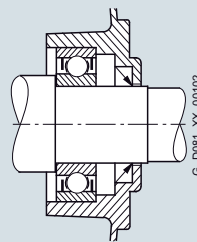
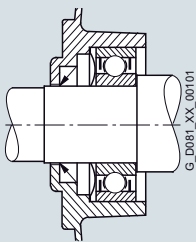


Fig. 2: Drive-end bearing

Non-drive end bearing

Located bearings for 1LE1 frame size 160

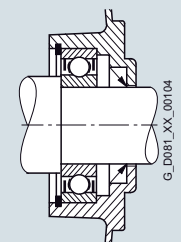
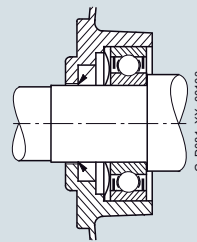
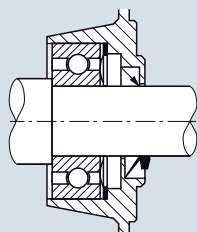
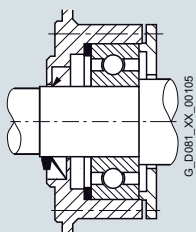


Fig. 3: Drive-end bearing

Non-drive end bearing



¹⁾ Bearings with a side plate are used for regreasable versions (order code **L23**).

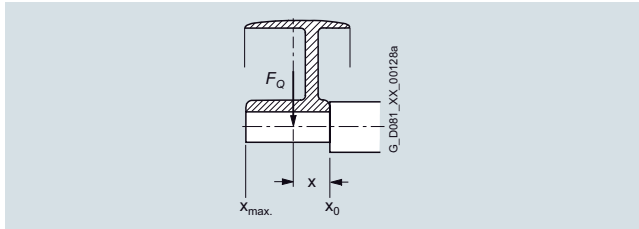
IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

0

Admissible cantilever forces

Admissible cantilever forces, basic version



In order to calculate the admissible cantilever forces for a radial load, the line of force (i.e. the centerline 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 of load and type of belt) $c = 2$ 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 output (transmitted power) in kW
 n fan speed in rpm
 D belt pulley diameter in mm

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

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

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 "Bearing design for increased cantilever forces", Page 0/126.

General technical data

Admissible cantilever forces for the basic 50 Hz version

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

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0 Type	at x_{max} Type
			N	N

1LE1 motor values for EFF1 motors with increased output ¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1010	825
	1LE1001-1AB	4	1230	1010
	1LE1001-1AC	6	1440	1180
112	1LE1001-1BA	2	970	785
	1LE1001-1BB	4	1235	1000
	1LE1001-1BC	6	1440	1165
132	1LE1001-1CA	2	1470	1180
	1LE1001-1CB	4	1830	1470
	1LE1001-1CC	6	2150	1730
160	1LE1001-1DA	2	1550	1270
	1LE1001-1DB	4	1910	1550
	1LE1001-1DC	6	2230	1810

Admissible cantilever forces for the basic 50 Hz version

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

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0 Type	at x_{max} Type
			N	N

1LE1 motors, standard values for EFF1 motors ¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency) 1PC1 motors, standard values for EFF1 motors ¹⁾ (Self-cooled motors with high efficiency):

100	1LE1001-1AA	2	1020	815
	1PC1001-1AA			
	1LE1001-1AB	4	1250	1000
	1PC1001-1AB			
	1LE1001-1AC	6	1450	1155
112	1PC1001-1AC			
	1LE1001-1AD	8	1615	1290
	1PC1001-1AD			
	1LE1001-1BA	2	1000	790
	1PC1001-1BA			
132	1LE1001-1BB	4	1250	990
	1PC1001-1BB			
	1LE1001-1BC	6	1450	1150
	1PC1001-1BC			
	1LE1001-1BD	8	1610	1275
160	1PC1001-1BD			
	1LE1001-1CA	2	1505	1170
	1PC1001-1CA			
	1LE1001-1CB	4	1880	1460
	1PC1001-1CB			
160	1LE1001-1CC	6	2170	1680
	1PC1001-1CC			
	1LE1001-1CD	8	2420	1880
	1PC1001-1CD			
160	1LE1001-1DA	2	1560	1240
	1PC1001-1DA			
	1LE1001-1DB	4	2040	1590
	1PC1001-1DB			
	1LE1001-1DC	6	2350	1820
160	1PC1001-1DC			
	1LE1001-1DD	8	2610	2030
160	1PC1001-1DD			

¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5 %.

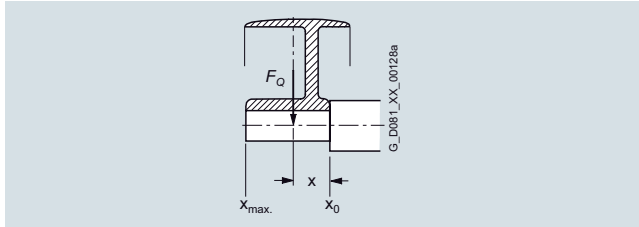
IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Bearing design for increased cantilever 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-mounted types of construction.

Admissible cantilever forces for the basic 50 Hz version Deep-groove ball bearings at the drive end (DE) – Order code L22 Valid are: x_0 values for $x = 0$ and x_{max} values für $x = l$ (l = shaft extension)

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{max}
			Type	Type
			N	N

1LE1 motor values for EFF 1 motors with increased output ¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1585	1300
	1LE1001-1AB	4	1960	1610
	1LE1001-1AC	6	2270	1865
112	1LE1001-1BA	2	1545	1250
	1LE1001-1BB	4	1960	1585
	1LE1001-1BC	6	2270	1835
132	1LE1001-1CA	2	2285	1840
	1LE1001-1CB	4	2860	2300
	1LE1001-1CC	6	3320	2670
160	1LE1001-1DA	2	2800	2240
	1LE1001-1DB	4	3450	2270
	1LE1001-1DC	6	4000	3200

Admissible cantilever forces for the basic 50 Hz version

Deep-groove ball bearings at the drive end (DE) – Order code L22

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

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{max}
			Type	Type
			N	N

1LE1 motors standard values for EFF1 motors ¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency) 1PC1 motors, standard values for EFF1 motors ¹⁾ (Self-cooled motors with high efficiency):

100	1LE1001-1AA	2	1590	1270
	1PC1001-1AA			
	1LE1001-1AB	4	1970	1575
	1PC1001-1AB			
	1LE1001-1AC	6	2270	1815
	1PC1001-1AC			
	1LE1001-1AD	8	2520	2015
	1PC1001-1AD			
112	1LE1001-1BA	2	1565	1240
	1PC1001-1BA			
	1LE1001-1BB	4	1965	1555
	1PC1001-1BB			
	1LE1001-1BC	6	2270	1800
	1PC1001-1BC			
	1LE1001-1BD	8	2510	1990
	1PC1001-1BD			
132	1LE1001-1CA	2	2310	1795
	1PC1001-1CA			
	1LE1001-1CB	4	2900	2250
	1PC1001-1CB			
	1LE1001-1CC	6	3330	2580
	1PC1001-1CC			
	1LE1001-1CD	8	3700	2870
	1PC1001-1CD			
160	1LE1001-1DA	2	2810	2170
	1PC1001-1DA			
	1LE1001-1DB	4	3540	2750
	1PC1001-1DB			
	1LE1001-1DC	6	4070	3160
	1PC1001-1DC			
	1LE1001-1DD	8	4510	3500
	1PC1001-1DD			

Admissible axial load

1LE1 motors in vertical type of construction – basic version (except motors with increased output)

Frame size	Shaft extension pointing				1500 rpm				1000 rpm				750 rpm			
	3000 rpm															
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load
	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140	710	550	300	130	1000	820	310	130	1290	1110	310	130	1570	1390	310
132	200	1200	950	470	180	1680	1200	470	180	1900	1600	470	190	2200	1900	440
160	1500	1400	950	1900	1900	1800	1300	2200	2200	2200	1600	2700	2700	2700	1950	2900

The values shown do not assume a cantilever force on the shaft extension.
The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog, section "Accessories", Page 1/64.
Please inquire if the load direction alternates.

¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5 %.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

1LE1/1PC1 motors in horizontal type of construction – basic version (except motors with increased output)

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Ten-sile load	Thrust load (N)			Ten-sile load	Thrust load (N)			Ten-sile load	Thrust load (N)			Ten-sile load	Thrust load (N)		
		with radial load at	without radial load			with radial load at	without radial load			with radial load at	without radial load			with radial load at	without radial load	
		x_0	$x_{max.}$			x_0	$x_{max.}$			x_0	$x_{max.}$			x_0	$x_{max.}$	
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
112	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
132	350	650	520	1200	350	850	700	1600	350	1020	890	1900	350	1150	1020	2200
160	1500	850	720	1500	1500	1050	920	1800	1500	1250	1120	2200	1500	1350	1220	2600

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog "Accessories", Page 1/64. Please inquire if the load direction alternates.

Modular technology

Basic versions

The range of potential applications for the 1LE1 motors (with the exception of 1LE1 with option F90 – version "Forced-air cooled motors without external fan and fan cover" and 1PC1) can be broadened considerably by mounting the following modules (e.g. as brake motors).

- **1XP8 012** rotary pulse encoder
- Separately driven fan
- Brake

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 "Technology", "Dimensions and weights" from Page 0/137.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

1XP8 012 rotary pulse encoder

The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 012-10** with order code **G01** or in a TTL version as **1XP8 012-20** with order code **G02**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension cannot be supplied.

The encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D12", order code **G41**, must be specified (see "Mechanical design and degrees of protection", Page 0/118).

The 1XP8 012 rotary pulse encoder is suitable for standard applications. For further encoders, see "Special technology", Page 0/134.

When the rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Technical data of rotary pulse encoders		
Supply voltage U_B	1XP8 012-10 (HTL version) +10 V to +30 V	1XP8 012-20 (TTL version) 5V $\pm 10\%$
Current input without load	150 mA	120 mA
Admissible 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°	90°
Output amplitude	$U_{\text{High}} = U_B - 2.5\text{ V}$ $U_{\text{Low}} = 1.6\text{ V}$	$U_{\text{High}} > 2.5\text{ V}$ $U_{\text{Low}} < 0.5\text{ V}$
Edge interval	$\geq 0.43\text{ }\mu\text{s}$	$\geq 0.43\text{ }\mu\text{s}$
Sampling rate	$\leq 300\text{ kHz}$	$\leq 300\text{ kHz}$
Maximum speed	6000 rpm	6000 rpm
Transportation/storage temperature range	$-30\text{ to }+80\text{ °C}$	$-30\text{ to }+80\text{ °C}$
Operating temperature range flange socket or fixed cable	$-40\text{ to }+100\text{ °C}$	$-40\text{ to }+100\text{ °C}$
Operating temperature range flexible cable	$-10\text{ to }+100\text{ °C}$	$-10\text{ to }+100\text{ °C}$
Degree of protection	IP66	IP66
Maximum admissible radial cantilever force	60 N	60 N
Maximum admissible axial force	40 N	40 N
Connection system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Separately driven fan

The use of a separately driven fan is recommended to increase motor utilization 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 inquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted, order code **F70**.

It can also be ordered separately and retrofitted. For selection information and order numbers, see the section "Accessories" (available soon). A rating plate listing all the important data is fitted to the separately driven fan. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Admissible coolant temperatures $CT_{min.}$ -25 °C , $CT_{max.}$ $+65\text{ °C}$ ¹⁾, lower/higher coolant temperatures on request. When the separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

Technical data of the separately driven fan (acc. to DIN EN 60034-1 Tolerance)

Frame size	Rated voltage range V		Frequency Hz	Rated speed rpm	Power consumption kW	Rated current A
100	1 AC	230 to 277	50	2790	0.075	0.29
	3 AC	220 to 290 Δ	50	2830	0.086	0.27
	3 AC	380 to 500 Y	50	2830	0.086	0.16
	1 AC	230 to 277	60	3280	0.094	0.28
	3 AC	220 to 332 Δ	60	3490	0.093	0.27
	3 AC	380 to 575 Y	60	3490	0.093	0.16
112	1 AC	230 to 277	50	2720	0.073	0.26
	3 AC	220 to 290 Δ	50	2770	0.085	0.27
	3 AC	380 to 500 Y	50	2770	0.085	0.15
	1 AC	230 to 277	60	3000	0.107	0.31
	3 AC	220 to 332 Δ	60	3280	0.094	0.28
	3 AC	380 to 575 Y	60	3280	0.094	0.16
132	1 AC	230 to 277	50	2860	0.115	0.40
	3 AC	220 to 290 Δ	50	2880	0.138	0.45
	3 AC	380 to 500 Y	50	2880	0.138	0.24
	1 AC	230 to 277	60	3380	0.185	0.59
	3 AC	220 to 332 Δ	60	3470	0.148	0.41
	3 AC	380 to 575 Y	60	3470	0.148	0.24
160	1 AC	230 to 277	50	2780	0.236	0.96
	3 AC	220 to 290 Δ	50	2840	0.220	0.76
	3 AC	380 to 500 Y	50	2830	0.220	0.43
	3 AC	220 to 332 Δ	60	3400	0.284	0.94
	3 AC	380 to 575 Y	60	3400	0.284	0.56

¹⁾ The admissible coolant temperature for single phase versions (1 AC) for frame size 160 is $CT_{max.}$ $+50\text{ °C}$.

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Brakes

Spring-operated disk brakes are used for the brakes with order code **F01**. When the brake is ordered, the supply voltage must be specified. The supply voltage for brakes is explained under "Modular technology – Additional versions", Page 0/133.

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", Page 0/132.

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights" from Page 0/137.

The brake can be retrofitted by authorized partners. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code G40, must be specified (see "Mechanical design and degrees of protection", Page 0/118).

2LM8 spring-operated disk brake

The 2LM8 brake has IP55 degree of protection.

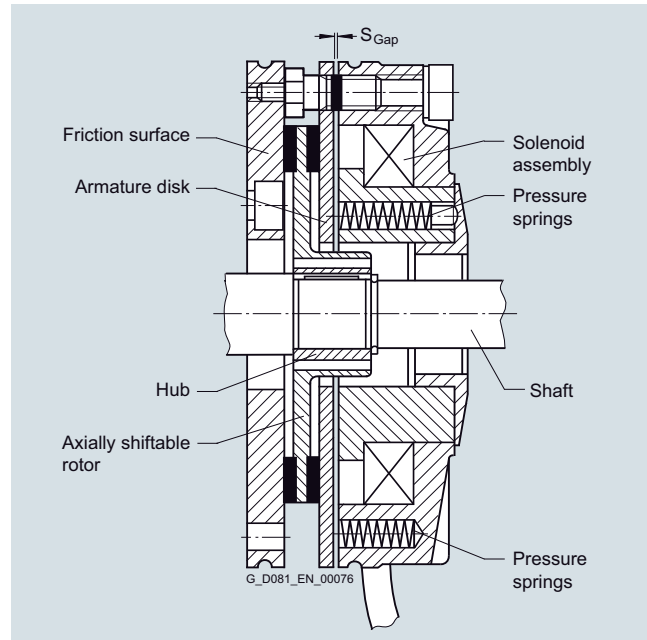
Please inquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times. Please inquire if the brake motors are used for converter-fed operation with low speeds.

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 following brake data are specified on the motor rating plate.

Brake type, supply voltage, frequency, current, temperature class, braking torque

Operating values for spring-operated brakes with standard excitation													Service capability of the brake	
For motor Frame size	Brake type	Rated braking torque at 100 rpm	Rated braking torque at 100 rpm in % at the following speeds			Supply voltage	Current/power input ¹⁾		Brake applica- tion time <i>t</i> ₂ ²⁾	Brake release time	Brake moment of inertia	Noise level <i>L</i> _p with rated air gap	Lifetime of brake lining <i>L</i>	Air gap adjust- ment required after braking energy <i>L</i> _N
			1500 rpm	3000 rpm	Max. speed		A	W						
		Nm	%	%	%	V	A	W	ms	ms	kgm ²	dB (A)	Nm · 10 ⁶	Nm · 10 ⁶
100	2LM8 040-5NA10	40	81	74	66	AC 230	0.2	40	43	140	0.00036	80	1350	115
	2LM8 040-5NA60					AC 400	0.22							
	2LM8 040-5NA80					DC 24	1.67							
112	2LM8 060-6NA10	60	80	73	65	AC 230	0.25	53	60	210	0.00063	77	1600	215
	2LM8 060-6NA60					AC 400	0.28							
	2LM8 060-6NA80					DC 24	2.1							
132	2LM8 100-7NA10	100	79	72	65	AC 230	0.27	55	50	270	0.0015	77	2450	325
	2LM8 100-7NA60					AC 400	0.31							
	2LM8 100-7NA80					DC 24	2.3							
160	2LM8 260-8NA10	260	75	68	65	AC 230	0.5	100	165	340	0.0073	79	7300	935
	2LM8 260-8NA60					AC 400	0.47							
	2LM8 260-8NA80					DC 24	4.2							

¹⁾ For 400 V AC and for 24 V DC, the power can deviate by up to +10 % as a result 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 motors 1LE1/1PC1

General technical data

0

Lifetime of the brake lining

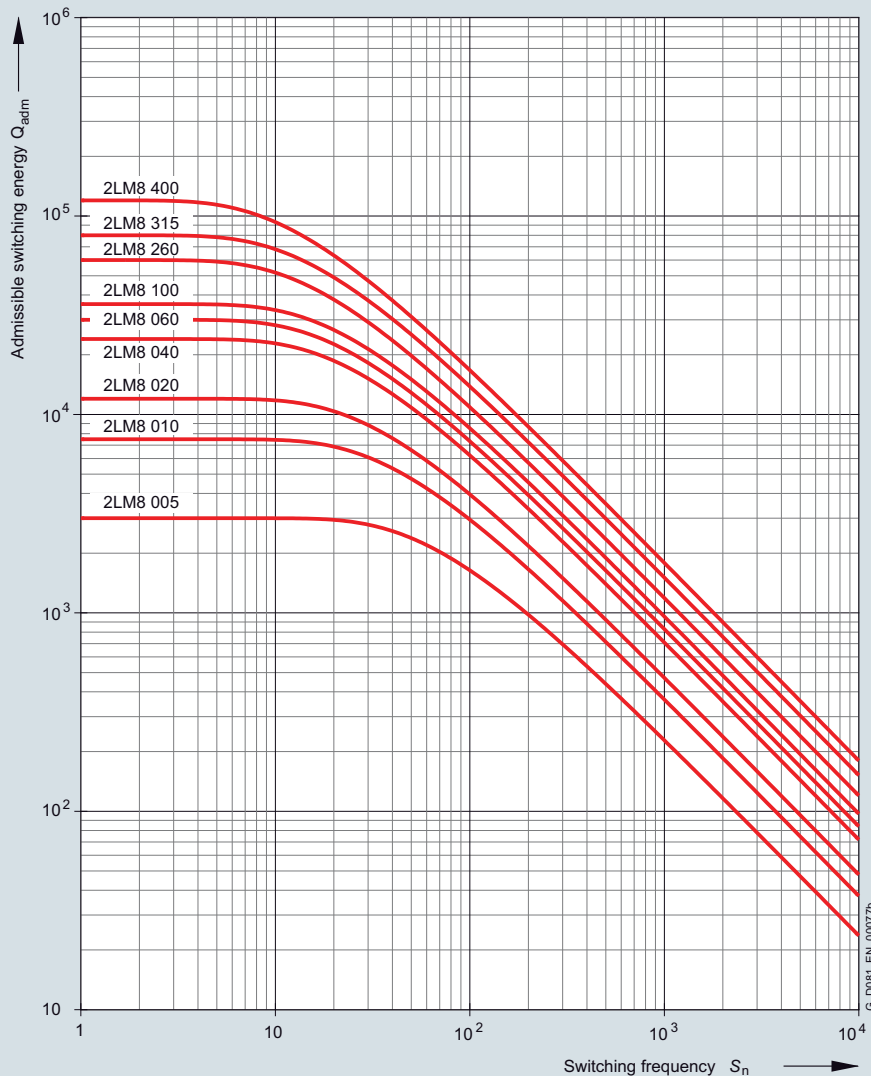
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the switching frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value for the friction energy until readjustment that is valid for all operating conditions.

When used as operating brake, the specific frictional surface wear (wear volume for the frictional work) is approximately 0.05 up to 2 cm³/kWh.

Maximum admissible speeds

The maximum admissible speeds from which emergency stops can be made, are listed in the next table. These speeds should be considered as recommended values and must be checked under actual operating conditions.

The maximum admissible friction energy depends on the switching frequency and is shown for the individual brakes in the following diagram. Increased wear can be expected when the brakes are used for emergency stops.



For motor Frame size	Brake type	Maximum admissible speeds			Changing the braking torque			Readjusting the air gap		
		Max. adm. operating speed if max. adm. operating energy utilized	Max. adm. no-load speed with emergency stop function		Reduction per notch	Dimension "O1"	Min. brak- ing torque	Rated air gap $S_{Gap \text{ Rated}}$	Maximum air gap $S_{Gap \text{ max.}}$	Min. rotor thickness $h_{min.}$
			Horizontal mounting	Vertical mounting						
		rpm	rpm	rpm	Nm	mm	Nm	mm	mm	mm
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

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

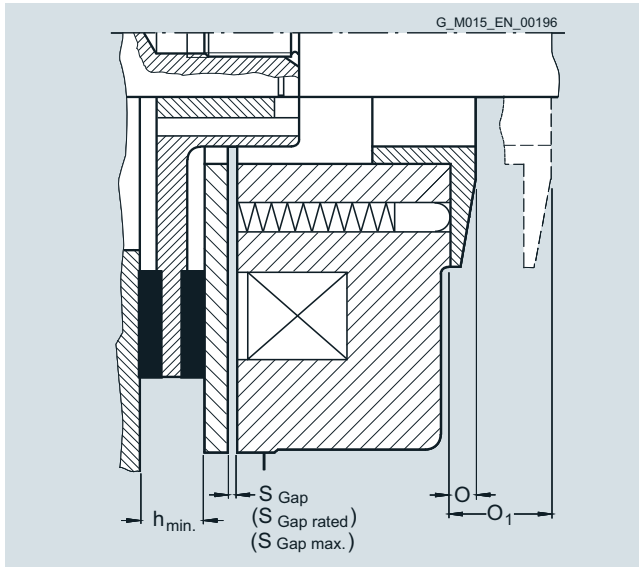
0

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 O_1 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 $S_{\text{Gap rated}}$ at the latest when the maximum air gap $S_{\text{Gap max.}}$ is reached.



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}

$$t_{\text{Br}} = \frac{J \cdot n_{\text{rated}}}{9.55 \cdot (T_{\text{B}} \pm T_{\text{L}})}$$

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_{adm}

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:

$$Q_{\text{adm}} = Q_{\text{Kin}} + Q_{\text{L}}$$

- The energy of the moments of inertia in Nm

$$Q_{\text{Kin}} = \frac{J \cdot n_{\text{rated}}^2}{182.4}$$

n_{rated} Rated speed before braking in rpm
 J Total moment of inertia in kg m^2

- The braking energy in Nm against a load torque

$$Q_{\text{L}} = \frac{\pm T_{\text{L}} \cdot n_{\text{rated}} \cdot t_{\text{Br}}}{19.1}$$

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:

$$U = \frac{n_{\text{rated}}}{60} \left(t_2 + \frac{t_{\text{Br}}}{2} \right)$$

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} , the lifetime of the brake lining L in Nm must be divided by the braking energy Q_{adm} :

$$S_{\text{max}} = \frac{L}{Q_{\text{adm}}}$$

The interval between adjustments N in switching frequencies can be calculated in terms of operations by dividing the braking energy L_{N} which the brake can output until it is necessary to re-adjust the working air gap by Q_{adm} :

$$N = \frac{L_{\text{N}}}{Q_{\text{adm}}}$$

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Additional versions

2LM8 spring-operated disk brake

Motor series

This brake is mounted on 1LE1 motors as standard (with the exception of 1LE1 with order code F90 – version “Forced-air cooled motors without external fan and fan cover”, and 1PC1).

Voltage and frequency

The solenoid coil and the brake rectifier can be connected to the following voltages or can be supplied for the following voltages:

- Brake supply voltage: 24 V DC
Order code **F10**
- Brake supply voltage: 230 V AC
Order code **F11**
- Brake supply voltage: 400 V AC
(directly at the terminal strip)
Order code **F12**

When 60 Hz is used, the voltage for the brake must not be increased!

Order codes **F10**, **F11** and **F12** may only be used in conjunction with order code **F01**.

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.

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 contacts of an external switch (see circuit diagrams below).

Manual brake release with lever

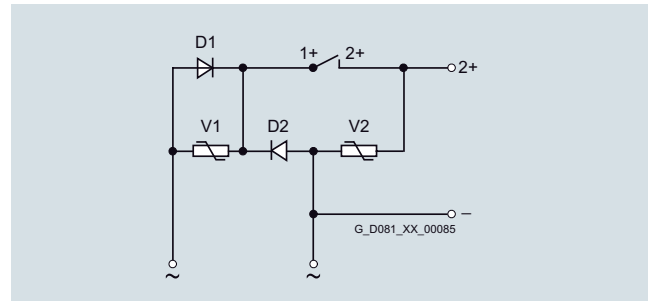
The brakes can be supplied with a mechanical manual release with lever.

Order code **F50**.

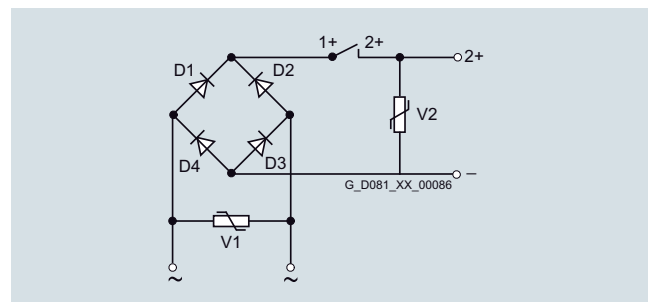
The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.

Bridge rectifier / half-wave rectifier

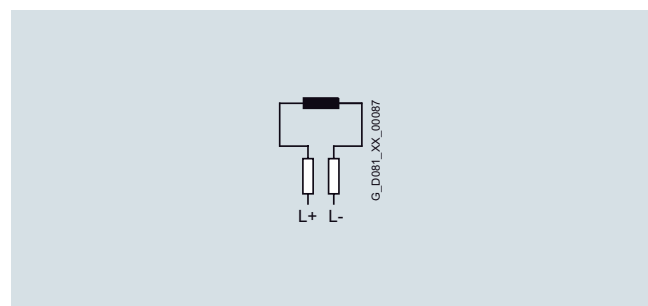
Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 brake. See the circuit diagrams below.



Half-wave rectifier, 400 V AC



Bridge rectifier, 230 V AC



Brake connection for 24 V DC

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Special technology

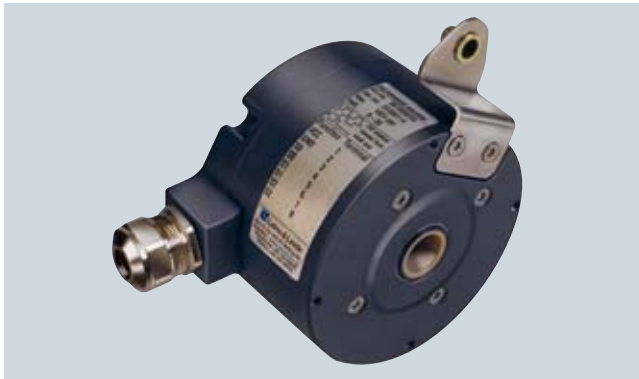
The range of "Special technology" comprises rotary pulse encoders for the 1LE1 motors (with the exception of 1LE1 with order code F90 – version "Forced-air cooled motors without external fan and fan cover", and 1PC1).

The 1LE1 motors with the order codes **F70** (mounted separately driven fan), **F01** (mounted brake) and **F01 + F70** (mounted brake and separately driven fan) from the "Modular technology" range can be combined with the LL 861 900 200, HOG 9 D 1024 I and HOG 10 D 1024 I rotary pulse encoders from the "Special technology" range.

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 "Technology", "Dimensions and weights" from Page 0/137.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Rotary pulse encoder LL 861 900 220



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 **G04**.

*The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.*

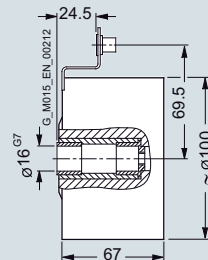
The version of the rotary pulse encoder with a diagnostics system (ADS) can be supplied by Leine and Linde.

Manufacturer:

Leine and Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen
Tel. +49 (0) 73 61-78093-0
Fax +49 (0) 73 61-78093-11

<http://www.leinelinde.com>

e-mail: info@leinelinde.se



Mounting dimensions of rotary pulse encoder LL 861 900 220

Technical data for LL 861 900 220 (HTL version)

Mounting of encoder at temperatures below $-20\text{ }^{\circ}\text{C}$ and higher than $+40\text{ }^{\circ}\text{C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	max. 80 mA
Admissible 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	$90^{\circ} \pm 25^{\circ}$ 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 $+80\text{ }^{\circ}\text{C}$
Degree of protection	IP65
Maximum adm. radial cantilever force	300 N
Maximum adm. axial force	100 N
Connection system	Terminal strips in encoder Cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

HOG 9 D 1024 rotary pulse encoder



The encoder is fitted with insulated bearings.

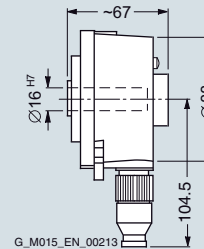
The HOG 9 D 1024 I rotary pulse encoder can be supplied already mounted.

Order code **G05**.

*The HOG 9 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.*

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



Mounting dimensions for HOG 9 D 1024 I rotary pulse encoder

Technical data for HOG 9 D 1024 (TTL version)

Mounting of encoder at temperatures below -20°C and higher than $+40^{\circ}\text{C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	50 mA to 100 mA
Admissible 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	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to $+100^{\circ}\text{C}$
Degree of protection	IP56
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	100 N
Connection 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 motors 1LE1/1PC1

General technical data

0

HOG 10 D 1024 I rotary pulse encoder



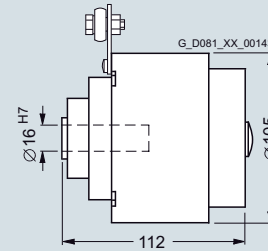
This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG 10 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G06**.

*The HOG 10 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 0/118). The rotary pulse encoder is not part of the scope of supply in this case.*

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com



Mounting dimensions for HOG 10 D 1024 I rotary pulse encoder

Technical data for HOG 10 D 1024 (HTL version)

Mounting of encoder at temperatures below -20 °C and higher than $+40\text{ °C}$ on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible 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	$U_{\text{High}} \geq U_B - 3.5\text{ V}$ $U_{\text{Low}} \leq 1.5\text{ V}$
Mark space ratio	$1:1 \pm 20\%$
Edge steepness	10 V/ μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	$-20\text{ to }+100\text{ °C}$
Degree of protection	IP66
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	80 N
Connection system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 055 B
Weight	Approx. 1.6 kg

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Dimensions and weight

Fig. 1 Brake
Order code **F01**
[optionally with manual release, order code **F50**]

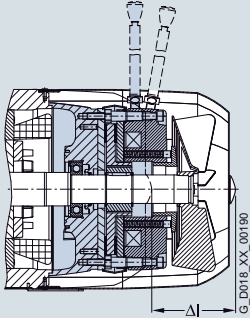


Fig. 2 Standard protective cover for types of construction
Order code **H00**

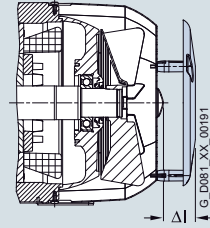


Fig. 3 Rotary pulse encoder (on cover)
Order code **G01/G02/G04/G05/G06**
[protective cover as standard]

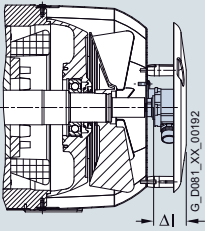


Fig. 4 Brake and rotary pulse encoder (on cover)
Order code **F01**
+ **G01/G02/G04/G05/G06**
[optionally with manual release, order code **F50**;
protective cover as standard]

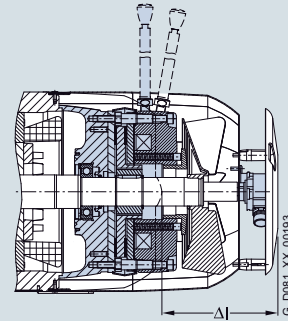


Fig. 5 Separately driven fan
Order code **F70**

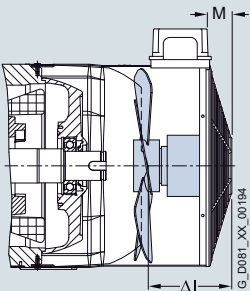
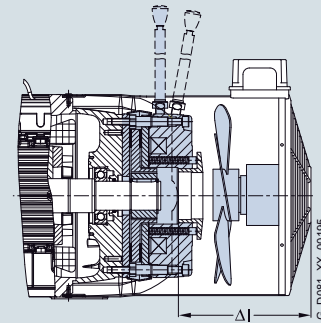


Fig. 6 Brake and separately driven fan
Order code **F01 + F70**
[optionally with manual release, order code **F50**]



IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Fig. 7 Rotary pulse encoder (under the cover) and separately driven fan
Order code **F70**
+ **G01/G02/G04/G05/G06**

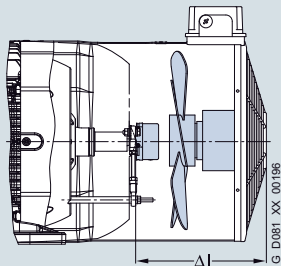


Fig. 8 Brake, rotary pulse encoder (under the cover) and separately driven fan
Order code **F01 + F70**
+ **G01/G02/G04/G05/G06**
[optionally with manual release, order code **F50**]

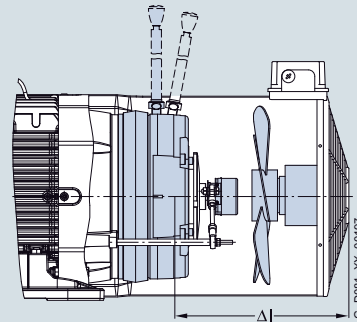


Fig. 9 Protective cover for separately driven fan
Order code **H00**

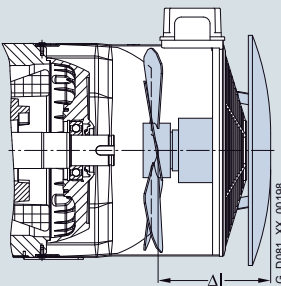


Fig. 10 Prepared for mountings – only center hole
(for brake order code **F01** and/or rotary pulse encoder
order codes **G01/G02/G04/G05/G06**)
Order code **G40**

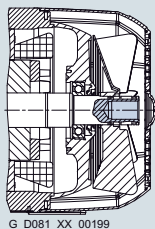
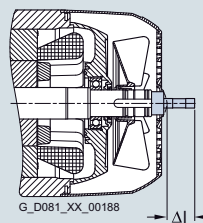


Fig. 11 Prepared for mountings with shaft D12/D16
Order codes **G41/G42**



IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Frame size	Assignment											
	Fig. 1				Fig. 2				Fig. 3			
	Brake				Protective cover				Rotary pulse encoder including protective cover			
	Order code F01		Order code H00		Order codes 1XP8 012 G01, G02		Order code LL 861 900 220 G04		Order code HOG9 D 1024 I G05		Order code HOG10 D 1024 I G06	
	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
1LE1												
100	81	5.9	33	0.4	49	0.9	76	1.9	76	1.5	119	2.2
112	88	7.8	33	0.4	49	0.8	76	1.9	76	1.5	119	2.2
132	114	11.9	51.5	0.7	51.5	1.3	78.5	2.4	78.5	2	121.5	2.7
160	130	30.7	50	0.7	50	1.5	77	2.7	77	2.3	120	3

Frame size	Assignment									
	Fig. 4								Fig. 5	
	Brake and rotary pulse encoder (on cover)								Separately driven fan	
	Order codes 1XP8 012 F01 + G01/G02		Order codes LL 861 900 220 F01 + G04		Order codes HOG9 D 1024 I F01 + G05		Order codes HOG10 D 1024 I F01 + G06		Order code F70	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	M
	mm	kg	mm	kg	mm	kg	mm	kg	mm	mm
1LE1										
100	130	6.8	157	7.8	157	7.4	200	8.1	86.5	30
112	137	8.6	164	9.7	164	9.3	207	10	81.5	30
132	165.5	13.2	192.5	14.3	192.5	13.9	235.5	14.6	116	40
160	180	32.2	207	33.4	207	33	250	33.7	135.5	40

Frame size	Assignment									
	Fig. 6				Fig. 7					
	Brake and separately driven fan				Separately driven fan and rotary pulse encoder (under cover)					
	Order codes F01 + F70		Order codes F70 + G01/G02		Order codes F70 + G04		Order codes F70 + G05		Order codes F70 + G06	
	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
1LE1										
100	161.5	8.3	161.5	3.3	161.5	4.3	161.5	3.9	196.5	4.6
112	156.5	10.4	156.5	3.4	156.5	4.5	156.5	4.1	191.5	4.8
132	186	15.7	186	5.1	186	6.2	186	5.8	241	6.5
160	205.5	37.2	205.5	8	205.5	9.2	205.5	8.8	270.5	9.5

Frame size	Assignment										
	Fig. 8								Fig. 9		
	Brake, separately driven fan and rotary pulse encoder (under cover)								Protective cover for separately driven fan		
	Order codes F01 + F70 + G01/G02		Order codes F01 + F70 + G04		Order codes F01 + F70 + G05		Order codes F01 + F70 + G06		Order code H00		
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Diameter of the fan cover
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm
1LE1											
100	196.5	9.2	196.5	10.2	196.5	9.8	246.5	10.5	30	1.4	210
112	191.5	11.2	191.5	12.3	191.5	11.9	241.5	12.6	33	1.8	249
132	241	17	241	18.1	241	17.7	291	18.4	24	2.4	300
160	270.5	38.7	270.5	39.9	270.5	39.5	320.5	40.2	31	3	338

IEC Squirrel-Cage Motors

Introduction motors 1LE1/1PC1

General technical data

0

Assignment						
Fig. 10			Fig. 11			
Frame size	Prepared for mountings – only center hole (for Brake order code F01 and/or rotary pulse encoder order codes G01/G02/G04/G05/G06)			Prepared for mountings with shaft D12/D16		
	Order code G40			Order codes G41/G42		
	Order code G40			Order code G41		
	Order code G42			Order code G42		
	Δl	Weight approx.		Δl	Weight approx.	Δl
	mm	kg		mm	kg	mm
1LE1						
100	0	0	11.3	0.15	47.3	0.2
112	0	0	7.5	0.15	47.3	0.2
132	0	0.1	10.3	0.3	50.3	0.4
160	0	0.2	5.6	0.4	45.6	0.7

New Generation 1LE1/1PC1



1/2	Orientation
1/2	Overview
1/3	Benefits
1/4	Application
1/4	Technical specifications
1/5	Selection and ordering data
1/7	More information
1/8	General Line motors with shorter delivery time
1/8	Selection and ordering data
1/18	Self-ventilated energy-saving motors with improved efficiency
1/18	Selection and ordering data
1/22	Self-ventilated energy-saving motors with high efficiency
1/22	Selection and ordering data
1/30	Self-ventilated motors with increased output and improved efficiency
1/30	Selection and ordering data
1/34	Self-ventilated motors with increased output and high efficiency
1/34	Selection and ordering data
1/38	Forced-air cooled motors without external fan and fan cover with improved efficiency
1/38	Selection and ordering data
1/42	Forced-air cooled motors without external fan and fan cover with high efficiency
1/42	Selection and ordering data
1/46	Self-cooled motors without external fan and fan cover with improved efficiency
1/46	Selection and ordering data
1/50	Self-cooled motors without external fan and fan cover with high efficiency
1/50	Selection and ordering data
1/54	Special versions
1/54	Selection and ordering data
1/54	• Voltages
1/55	• Options
1/64	Accessories
1/64	Overview
1/64	More information
1/65	Dimensions
1/65	Overview
1/67	More information
1/68	Dimensional drawings

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

Overview

1



Increasing energy costs have resulted in greater emphasis on the power consumption of drive systems. It is extremely important to utilize the full potential for minimization here to secure competitiveness today and in the future. The environment will also profit from reduced energy consumption.

With this in mind, we have already developed a new generation of low-voltage motors that you can use in drives to move even more than before. Innovative copper rotors that we develop and manufacture entirely in-house create the perfect conditions for motors with a high degree of efficiency (EFF2 and EFF1 motors are located in the same housing). The new motors for EFF1 (High Efficiency) offer considerable energy savings and protect our environment.

The modular mounting concept also provides total flexibility: Each motor is based on a uniform concept for all markets worldwide. Our motors are manufactured in accordance with modern ecological principles and give machines and plants more drive. Worldwide and for every application. Efficiency over the complete life cycle is a clear benefit of our motors especially for the use of 1LE1/1PC1 designed to EFF1. All machine manufacturers and plant operators can profit from this – not to mention the environment. We will be launching our new 1LE1/1PC1 motors onto the market step by step.

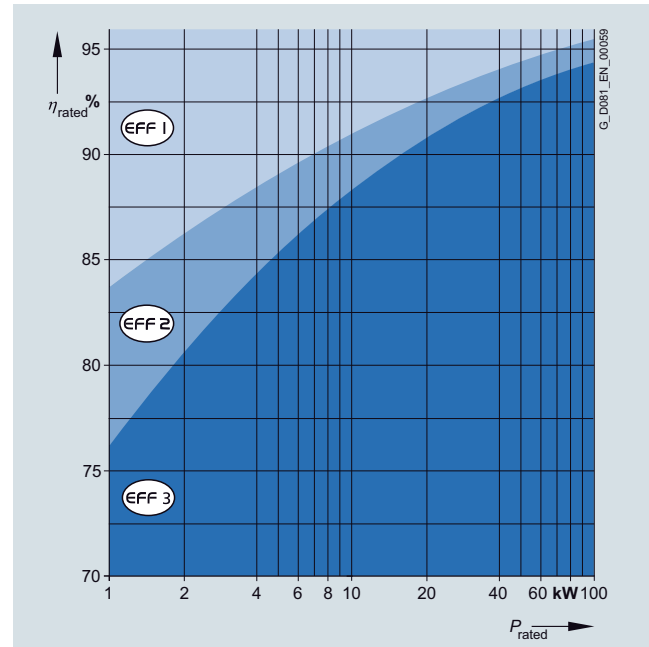
Classified energy-saving motors for an efficient energy balance

Depending on requirements, energy-saving motors are available for an efficient energy balance for the EU in accordance with CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics) as well as 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_{rated} , $\eta_{3/4}$ load and efficiency class in the documentation

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 150 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

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

1

Overview (continued)

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_{rated} on the motor rating plate

Motors with increased output and compact construction (1LE1)

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 larger shaft height. These compact motors are also optimized for efficiency. They are available in EFF1 and EFF2 and therefore reduce the operating costs.

Benefits

There is considerable potential in our new 1LE1/1PC1 series of low-voltage motors. As a consistent further development of our existing motors, the 1LE1/1PC1 motors offer numerous advantages:

Greater efficiency

Instead of cast-aluminum rotors, the new copper technology is used in the EFF1 motors. The motors are therefore considerably more compact. EFF2 and EFF1 motors are based on the same housing. For changeover to the higher efficiency class – from EFF2 to EFF1 – reconstruction of the machine is no longer necessary. Savings are achieved in time and costs. And what is more: You can save a considerable amount of energy with EFF1 motors because they have power losses of up to 40 % less than EFF2 motors. The energy saving potential and life cycle costs of the new motors can be calculated with our SinaSave™ software. You can download the SinaSave program in the Internet using the following link: <http://www.siemens.com/energysaving>. For more information, see catalog part 11 "Appendix", "Energy-saving program SinaSave". Our 1LE1 motors also impress customers with their extremely long life and their weight-optimized design has a positive effect on the stability of the equipment unit.

Motors without fan cover and external fan (1LE1 with order code F90)

Forced-air cooled motors with surface cooling without fan cover and external fan are mainly used for driving fans.

Standard motors with reduced output without fan cover and external fan (1PC1)

Self-cooled motors with surface cooling without fan cover and 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)

Motors delivered ex-stock with shorter delivery time – General Line 1LE1

The most popular basic versions of the 1LE1 motor series can be supplied ex-stock and are termed the "General Line".

A so-called "Sector version" will be available soon 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 General Line motors 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.

More application

The motors are approved and certified for worldwide use and meet high quality standards (confirmed, for example, by CSA¹⁾, UL²⁾, and CQC³⁾).

Improved design

The new, optimized housing in modern EMC design has an attractive appearance and enhances functionality. The rotatable, accessible connection boxes, integral eyebolts, screwed-on feet and reinforced bearing plates ensure this.

Greater output

For the same shaft height, our high-performance motors offer an additional complete rated output level. The best is: We are also consistently implementing energy efficiency improvements here, too. The motors are offered – based on the categories of CEMEP – in high efficiency and improved efficiency versions.

More flexibility

The optimized architecture of the motors makes installation easier in general. Encoders, brakes and separately driven fans can be retrofitted easily. Connection boxes and feet for flexible mounting can be selected. Smaller inventories make stockkeeping easier and motor suppliers can respond to customer requirements more quickly. Optimized manufacturing processes support fast availability. All motors up to 460 V can be operated either directly on line or converter-fed – without the need for any additional measures.

¹⁾ Canadian Standard Association

²⁾ Underwriters Laboratories Inc.

³⁾ China Quality Certification

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

Application

As soon as the range of motors and options is complete, it will be possible to use the 1LE1/1PC1 motors from Siemens in all areas and sectors of industry due to their numerous options. They are suitable both for special environmental conditions such as those that predominate in the chemical or petrochemical industries as well as for most climatic requirements such as those of offshore applications. Their large range of mains 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

Technical specifications

Technical data at a glance

This table lists the most important technical data. For more information and details, see catalog part 0 "Introduction".

Type of motor	IEC Squirrel-Cage Motors 1LE1/1PC1
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
Frame sizes	100 L to 160 L
Rated output	0.75 ... 22 kW (motor series 1LE1)/0.3 ... 9 kW (motor series 1PC1)
Frequencies	50 Hz and 60 Hz
Versions	Self-ventilated 1LE1 energy-saving motors with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-ventilated 1LE1 motors with increased output and: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Forced-air-cooled 1LE1 motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-cooled 1PC1 motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency • High efficiency
Marking	EU/CEMEP efficiency classification, EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPEAT: 2-, 4-, 6-pole
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated torque	9.9 ... 150 Nm (motor series 1LE1)/4.05 ... 60 Nm (motor series 1PC1)
Insulation of the stator winding according to EN 60034-1 (IEC 60034-1)	Temperature class 155 (F), used acc. to temperature class 130 (B) (also for motors with increased output) 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-ventilated (motor series 1LE1) frame sizes 100 L to 160 L (IC 411) Forced-air-cooled (motor series 1LE1 with order code F90) frame sizes 100 L to 160 L (IC 416) Self-cooled (motor series 1PC1) frame sizes 100 L to 160 L (IC 410)
Admissible coolant temperature and site altitude	-20 °C ... +40 °C as standard, site altitude up to 1000 m above sea level. See "Coolant temperature and site altitude" in catalog part 0 "Introduction".
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 230 V, 400 V, 500 V, 690 V The voltage to be 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 and special flange (next larger 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 See "Paint finish" in catalog part 0 "Introduction".
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (normal – without special vibration requirements) Optionally: Level B (with special vibration requirements) See "Balance and vibration quantity" in catalog part 0 "Introduction".
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing as standard See "Balance and vibration quantity" in catalog part 0 "Introduction".
Sound pressure level according 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.
Modular mounting concept	Rotary pulse encoder, brake, separately driven fan or prepared for mountings
Consistent series concept	<ul style="list-style-type: none"> • Cast housing feet, screw-mounted feet available as an option and retrofittable • Connection box obliquely partitioned and rotatable through 4 x 90° • Bearings at DE and NDE are of identical design, reinforced bearings available as an option
Options	See the selection and ordering data for "Special versions"

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

1

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

General Line motors with shorter delivery time

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/8 ... 1/11
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/12 ... 1/15
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/16 ... 1/17

Self-ventilated energy-saving motors with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/18 ... 1/19
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/18 ... 1/19
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/18 ... 1/19
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	700 ... 720	10.4 ... 100	2.65 ... 18.6	1/18 ... 1/19

Self-ventilated energy-saving motors with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW/HP	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
For use according to CEMEP						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/22 ... 1/23
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/22 ... 1/23
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/22 ... 1/23
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	720 ... 735	9.9 ... 98	2.75 ... 17.4	1/22 ... 1/23
For use in the North American market according to EPACT						
3000, 2-pole	100 L ... 160 L	4 ... 25	3520 ... 3565	8.1 ... 50	5.2 ... 29	1/26 ... 1/27
1500, 4-pole	100 L ... 160 L	3 ... 20	1760 ... 1780	12 ... 80	4.05 ... 24.5	1/26 ... 1/27
1000, 6-pole	100 L ... 160 L	2 ... 15	1170 ... 1180	12 ... 89	3.15 ... 19.6	1/26 ... 1/27

Self-ventilated motors with increased output and improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2850 ... 2930	13.3 ... 72	7.9 ... 39.5	1/30 ... 1/31
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1430 ... 1460	26.8 ... 121	8.5 ... 35	1/30 ... 1/31
1000, 6-pole	100 L ... 160 L	2.2 ... 15	930 ... 965	22.5 ... 148	5.3 ... 33	1/30 ... 1/31

Self-ventilated motors with increased output and high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2905 ... 2955	13 ... 71	7.6 ... 38.5	1/34 ... 1/35
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1460 ... 1475	26 ... 120	8.2 ... 34	1/34 ... 1/35
1000, 6-pole	100 L ... 160 L	2.2 ... 15	960 ... 975	22 ... 147	4.95 ... 29.5	1/34 ... 1/35

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

1

Selection and ordering data (continued)

Forced-air cooled motors without external fan and fan cover with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/38 ... 1/39
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/38 ... 1/39
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.95 ... 23.5	1/38 ... 1/39
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	700 ... 720	10.4 ... 100	2.65 ... 18.6	1/38 ... 1/39

Forced-air cooled motors without external fan and fan cover with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/42 ... 1/43
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/42 ... 1/43
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/42 ... 1/43
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	720 ... 735	9.9 ... 98	2.75 ... 17.4	1/42 ... 1/43

Self-cooled motors without external fan and fan cover with improved efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PC1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	1.2 ... 7.4	2830 ... 2935	4.05 ... 24	2.3 ... 12.9	1/46 ... 1/47
1500, 4-pole	100 L ... 160 L	0.88 ... 6	1420 ... 1460	5.92 ... 39	1.8 ... 10.9	1/46 ... 1/47
1000, 6-pole	100 L ... 160 L	0.6 ... 4.4	930 ... 970	6.12 ... 43	1.4 ... 8.9	1/46 ... 1/47
750, 8-pole	100 L ... 160 L	0.3 ... 3	695 ... 730	4.05 ... 24	0.97 ... 6.8	1/46 ... 1/47

Self-cooled motors without external fan and fan cover with high efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1PC1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	1.4 ... 9	2920 ... 2960	4.6 ... 29	2.6 ... 15.2	1/50 ... 1/51
1500, 4-pole	100 L ... 160 L	1.1 ... 6.2	1460 ... 1480	7.2 ... 40	2.2 ... 11.4	1/50 ... 1/51
1000, 6-pole	100 L ... 160 L	0.85 ... 6.5	960 ... 975	8.5 ... 64	1.92 ... 13.2	1/50 ... 1/51
750, 8-pole	100 L ... 160 L	0.37 ... 4.6	720 ... 730	4.8 ... 60	1.28 ... 10.8	1/50 ... 1/51

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Orientation

1

More information

For further information, please get in touch with your local Siemens contact.

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
- technical support/engineering

The selection procedure starts with:

- a country
- a product or
- a sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.


IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data

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 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		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2AA0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2AA0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2AA0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA12-2AA0	40	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2FA0	21	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2FA0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2FA0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA12-2FA0	45	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA42-2FB0	21	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.3	0.87	6	1LE1002-1AA42-2KA0	22	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2KA0	27	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA42-2AA0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA22-2AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA02-2AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA12-2AA0	2.2	6.4	3	16	0.01601	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA42-2FA0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
1LE1002-1BA22-2FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA02-2FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA12-2FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA42-2FB0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AA42-2KA0	3.2	6.2	2.9	16	0.0034	67	79	FT 130
1LE1002-1BA22-2KA0	2.7	7.3	3.7	16	0.0067	69	81	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.


³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

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 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		η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A		m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4AA0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AA0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AA0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4AA0	40	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4AA0	60	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4AA0	68	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AA0	78	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4AB0	20	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AB0	25	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AB0	35	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4AB0	40	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4AB0	60	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4AB0	68	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AB0	78	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA43-4FA0	21	
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FA0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FA0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4FA0	45	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4FA0	69	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4FA0	77	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FA0	87	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FB0	26	
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FB0	40	
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA13-4FB0	45	
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA23-4FB0	69	
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA33-4FB0	77	
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FB0	87	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA43-4AA0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA23-4AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AA0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AA0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AA0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AA0	2.5	7	3.2	16	0.04395	70	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA43-4AB0	3.2	6.2	2.9	16	0.0034	67	79	
1LE1002-1BA23-4AB0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AB0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AB0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AB0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AB0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AB0	2.5	7	3.2	16	0.04395	70	82	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA43-4FA0	3.2	6.2	2.9	16	0.0034	67	79	FF 215
1LE1002-1BA23-4FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FA0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FA0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FA0	2.5	7	3.2	16	0.04395	70	82	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BA23-4FB0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FB0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FB0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FB0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FB0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FB0	2.5	7	3.2	16	0.04395	70	82	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.


IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

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 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		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AB0	18	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FB0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FB0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FB0	28	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2KA0	20	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2KA0	24	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2KA0	29	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB42-2AA0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB52-2AA0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB22-2AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB02-2AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB22-2AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB22-2AA0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB42-2AA0	2.5	7	3.4	16	0.05616	65	77	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2AB0	2.3	5.1	2.7	16	0.0059	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB42-2FA0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB52-2FA0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB22-2FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB02-2FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB22-2FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB22-2FA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB42-2FA0	2.5	7	3.4	16	0.05616	65	77	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2FB0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB52-2FB0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB22-2FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AB42-2KA0	2.3	5.1	2.7	16	0.0059	60	72	FT 130
1LE1002-1AB52-2KA0	2.4	5.4	2.6	16	0.0078	63	75	FT 130
1LE1002-1BB22-2KA0	2.2	5.3	2.6	16	0.0102	58	70	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)


1) Only the type of construction IM B3 will be stamped on the rating plate.
 2) Only the type of construction IM B5 will be stamped on the rating plate.
 3) Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

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 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		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AB0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AB0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AB0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AB0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AB0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AB0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AB0	73	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FB0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FB0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FB0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FB0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FB0	82	
• With flange: IM B35												
- Without motor protection												
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4JA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4JA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4JA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4JA0	82	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB43-4AA0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB53-4AA0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB23-4AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AA0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB43-4AA0	2.5	7	3.4	16	0.05616	65	77	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB43-4AB0	2.3	5.1	2.7	16	0.0059	60	72	
1LE1002-1AB53-4AB0	2.4	5.4	2.6	16	0.0078	60	72	
1LE1002-1BB23-4AB0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AB0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AB0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AB0	2.3	6.4	3.1	16	0.04395	65	77	
1LE1002-1DB43-4AB0	2.5	7	3.4	16	0.05616	65	77	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB43-4FA0	2.3	5.1	2.7	16	0.0059	60	72	FF 215
1LE1002-1AB53-4FA0	2.4	5.4	2.6	16	0.0078	60	72	FF 215
1LE1002-1BB23-4FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4FA0	2.5	7	3.4	16	0.05616	65	77	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BB23-4FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FB0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FB0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FB0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4FB0	2.5	7	3.4	16	0.05616	65	77	FF 300
• With flange: IM B35								
- Without motor protection								
1LE1002-1CB03-4JA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4JA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4JA0	2.3	6.4	3.1	16	0.04395	65	77	FF 300
1LE1002-1DB43-4JA0	2.5	7	3.4	16	0.05616	65	77	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.


²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

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 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		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2AA0	19	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2AA0	25	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2AA0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2AA0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC32-2AA0	48	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2FA0	20	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FA0	26	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FA0	39	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2FA0	44	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2FB0	20	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FB0	26	
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FB0	39	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC42-2KA0	21	
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2KA0	27	
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AA0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AA0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AA0	48	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4AA0	72	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AA0	92	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AB0	34	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AB0	39	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AB0	48	
7.5	8.6	160 M	970	75		86	86.5	0.73	17.2	1LE1002-1DC23-4AB0	72	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AB0	92	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4FA0	39	
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FA0	44	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FA0	53	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FA0	81	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FA0	101	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FB0	44	
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FB0	53	
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FB0	81	
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FB0	101	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AC42-2AA0	2	4	2.2	16	0.0065	59	71	
1LE1002-1BC22-2AA0	2.1	4.1	2.4	16	0.0065	57	69	
1LE1002-1CC02-2AA0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC22-2AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC32-2AA0	2.5	5.2	2.8	16	0.02734	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AC42-2FA0	2	4	2.2	16	0.0065	59	71	FF 215
1LE1002-1BC22-2FA0	2.3	4.1	2.5	16	0.0092	57	69	FF 215
1LE1002-1CC02-2FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC22-2FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AC42-2FB0	2	4	2.2	16	0.0065	59	71	FF 215
1LE1002-1BC22-2FB0	2.3	4.1	2.5	16	0.0092	68	80	FF 215
1LE1002-1CC02-2FB0	2	4.6	2.6	16	0.0167	63	75	FF 265
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AC42-2KA0	2	4	2.2	16	0.0065	59	71	FT 130
1LE1002-1BC22-2KA0	2.3	4.1	2.5	16	0.0092	68	80	FT 130
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1CC03-4AA0	2	4.6	2.6	16	0.017	63	75	
1LE1002-1CC23-4AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AA0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AA0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AA0	1.9	5.9	2.7	16	0.0678	68	80	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC03-4AB0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC23-4AB0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AB0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AB0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AB0	1.9	5.9	2.7	16	0.0678	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1CC03-4FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC23-4FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FA0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FA0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FA0	1.9	5.9	2.7	16	0.0678	68	80	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC23-4FB0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FB0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FB0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FB0	1.9	5.9	2.7	16	0.0678	68	80	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with improved efficiency

Selection and ordering data

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 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, type of construction, motor protection and connection box, see table from Page 1/20.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA4Q-0000Q		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-0000Q		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-0000Q		35
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA1Q-0000Q		40
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA2Q-0000Q		60
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA3Q-0000Q		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-0000Q		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-0000Q		18
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-0000Q		22
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-0000Q		27
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-0000Q		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-0000Q		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-0000Q		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-0000Q		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC4Q-0000Q		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-0000Q		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-0000Q		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-0000Q		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-0000Q		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-0000Q		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-0000Q		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	705	10.4		65.4	60.2	0.62	2.65	1LE1002-1AD4Q-0000Q		17
1.1	1.3	100 L	705	15.1		68.3	67.6	0.63	3.7	1LE1002-1AD5Q-0000Q		22
1.5	1.75	112 M	700	20		75.9	72.8	0.68	4.2	1LE1002-1BD2Q-0000Q		25
2.2	2.55	132 S	715	29		81	80.4	0.66	5.9	1LE1002-1CD0Q-0000Q		37
3	3.45	132 M	710	40		81.6	81.4	0.68	7.8	1LE1002-1CD2Q-0000Q		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-0000Q		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-0000Q		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-0000Q		91

Note:

The 2-, 4-, and 6-pole motors listed above can be delivered ex stock with shorter delivery time.

These motors can be selected from defined versions (voltages, types of construction, motor protection and position of the connection box) in section "General Line motors with shorter delivery time" on Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with improved efficiency

1

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 at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-□□□□	3.2	6.2	2.9	16	0.0034	67	79
1LE1002-1BA2Q-□□□□	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-□□□□	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-□□□□	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-□□□□	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-□□□□	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-□□□□	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-□□□□	2.3	5.1	2.7	16	0.0059	60	72
1LE1002-1AB5Q-□□□□	2.4	5.4	2.6	16	0.0078	60	72
1LE1002-1BB2Q-□□□□	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-□□□□	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-□□□□	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-□□□□	2.3	6.4	3.1	16	0.04395	65	77
1LE1002-1DB4Q-□□□□	2.5	7	3.4	16	0.05616	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-□□□□	2	4	2.2	16	0.0065	61	73
1LE1002-1BC2Q-□□□□	2.3	4.1	2.5	16	0.0092	68	80
1LE1002-1CC0Q-□□□□	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-□□□□	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-□□□□	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-□□□□	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-□□□□	1.9	5.9	2.7	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-□□□□	1.9	3	2.2	16	0.0056	60	72
1LE1002-1AD5Q-□□□□	2	3.2	2.3	16	0.0078	60	72
1LE1002-1BD2Q-□□□□	1.9	3.4	2.1	16	0.0094	63	75
1LE1002-1CD0Q-□□□□	1.7	3.9	2.4	13	0.0186	63	75
1LE1002-1CD2Q-□□□□	1.8	3.9	2.2	13	0.02372	63	75
1LE1002-1DD2Q-□□□□	1.7	3.8	2.3	13	0.0439	63	75
1LE1002-1DD3Q-□□□□	1.6	4	2.2	13	0.0562	63	75
1LE1002-1DD4Q-□□□□	1.7	3.8	2.2	13	0.0772	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...Q-Q...	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...Q-Q...	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	—	—	—	—	—	—	-Z H00		—	—	-Z H00	—
1LE1002-1A...-Q..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1B...-Q..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1C...-Q..	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1002-1D...-Q..	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)						With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34	Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34
			K	L	M	M	N		K	L	M	M	N
		Order No. supplement -Z with order code							-Z	-Z	-Z	-Z H00	-Z
						-Z H00			P01	P01	P01	P01	P01
1LE1002-1A...-Q-Q...	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1002-1B...-Q-Q...	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1002-1C...-Q-Q...	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1002-1D...-Q-Q...	160 M/L	FT 215	✓	✓	✓	✓	✓						

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with improved efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motortyp	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

1

Selection and ordering data

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 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	EFF I	η_{rated} %	η_{rated} %	$\cos \varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/24.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
For use according to CEMEP												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-0000Q		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-0000Q		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-0000Q		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-0000Q		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-0000Q		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-0000Q		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-0000Q		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-0000Q		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-0000Q		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-0000Q		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-0000Q		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-0000Q		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-0000Q		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-0000Q		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.5	0.73	3.5	1LE1001-1AC4Q-0000Q		25
2.2	2.55	112 M	965	22		85	85	0.75	5	1LE1001-1BC2Q-0000Q		29
3	3.45	132 S	970	30		85	85	0.74	6.9	1LE1001-1CC0Q-0000Q		38
4	4.6	132 M	970	39		86	86	0.78	8.6	1LE1001-1CC2Q-0000Q		43
5.5	6.3	132 M	970	54		88	88	0.77	11.8	1LE1001-1CC3Q-0000Q		52
7.5	8.6	160 M	975	73		89	89	0.77	15.8	1LE1001-1DC2Q-0000Q		77
11	12.6	160 L	975	108		89.5	89	0.80	22	1LE1001-1DC4Q-0000Q		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		68	65	0.58	2.75	1LE1001-1AD4Q-0000Q		21
1.1	1.3	100 L	725	14		68	64.5	0.58	4.05	1LE1001-1AD5Q-0000Q		25
1.5	1.75	112 M	720	20		77	75.5	0.67	4.2	1LE1001-1BD2Q-0000Q		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-0000Q		41
3	3.45	132 M	730	40		84	82	0.65	7.9	1LE1001-1CD2Q-0000Q		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-0000Q		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-0000Q		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-0000Q		94

Order No. supplements, see from Page 1/24.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated torque	as multiple of rated current	torque			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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
For use according to CEMEP							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ	2.3	7	3.3	16	0.0044	67	79
1LE1001-1BA2Q-QQQQ	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ	2.1	6.9	3.3	16	0.0086	60	72
1LE1001-1AB5Q-QQQQ	2	6.9	3.1	16	0.0109	60	72
1LE1001-1BB2Q-QQQQ	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ	2.2	6.7	2.8	16	0.06495	65	77
1LE1001-1DB4Q-QQQQ	2.5	7.3	3	16	0.08281	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ	2	6.2	2.9	16	0.0113	59	71
1LE1001-1BC2Q-QQQQ	2.1	6	3.1	16	0.0139	57	69
1LE1001-1CC0Q-QQQQ	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ	1.8	6.3	2.8	16	0.0754	67	79
1LE1001-1DC4Q-QQQQ	1.7	6.2	2.7	16	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ	1.6	4	2.8	13	0.0086	60	72
1LE1001-1AD5Q-QQQQ	1.8	4	2.8	13	0.0109	60	72
1LE1001-1BD2Q-QQQQ	1.4	4.2	2.4	13	0.014	63	75
1LE1001-1CD0Q-QQQQ	1.4	3.6	1.8	10	0.02698	63	75
1LE1001-1CD2Q-QQQQ	1.4	5	2.4	10	0.03463	63	75
1LE1001-1DD2Q-QQQQ	1.8	4.3	2	13	0.0649	63	75
1LE1001-1DD3Q-QQQQ	2.1	4.4	2.1	13	0.0828	63	75
1LE1001-1DD4Q-QQQQ	1.9	4.5	2.1	13	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...Q-Q...	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...Q-Q...	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	—	—	—	—	—	—	-Z H00		—	—	-Z H00	—
1LE1001-1A...-Q..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)						With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34	Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34
			K	L	M	M	N		K	L	M	M	N
		Order No. supplement -Z with order code	-	-	-	-Z H00	-		-Z	-Z	-Z	-Z H00	-Z
			P01	P01	P01	P01	P01						
1LE1001-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...-□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-□	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

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 60 Hz	Rated torque at 60 Hz	EPACT with CC-No. CCxxx	Nominal efficiency at 60 Hz	Power factor at 60 Hz 4/4-load	Rated current at 460 V, 60 Hz	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/28	IM B3 type of construction	IM B3 type of construction approx. m kg			
P_{rated} kW	P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{rated}$	I_{rated} A						
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)														
For use in the North American market according to EPACT														
2-pole – 3600 rpm at 60 Hz														
3	4	100 L	3520	8.1	A. S.	86.5	0.83	5.2	1LE1001-1AA4Q-0000Q		21			
4	5	112 M	3565	9.9	A. S.	87.5	0.84	6.3	1LE1001-1BA2Q-0000Q		27			
5.5	7.5	132 S	3560	15	A. S.	89.5	0.86	9	1LE1001-1CA0Q-0000Q		39			
7.5	10	132 S	3560	20	A. S.	90.2	0.87	12	1LE1001-1CA1Q-0000Q		43			
11	15	160 M	3560	30	A. S.	90.2	0.86	17.8	1LE1001-1DA2Q-0000Q		67			
15	20	160 M	3565	40	A. S.	91	0.87	24	1LE1001-1DA3Q-0000Q		75			
18.5	25	160 L	3565	50	A. S.	91.7	0.87	29	1LE1001-1DA4Q-0000Q		84			
4-pole – 1800 rpm at 60 Hz														
2.2	3	100 L	1760	12	A. S.	87.5	0.78	4.05	1LE1001-1AB4Q-0000Q		21			
3	4	100 L	1765	16	A. S.	87.5	0.79	5.4	1LE1001-1AB5Q-0000Q		25			
4	5	112 M	1770	20	A. S.	88.5	0.77	6.8	1LE1001-1BB2Q-0000Q		29			
5.5	7.5	132 S	1770	30	A. S.	89.5	0.78	9.9	1LE1001-1CB0Q-0000Q		42			
7.5	10	132 M	1770	40	A. S.	89.5	0.82	12.8	1LE1001-1CB2Q-0000Q		49			
11	15	160 M	1775	59	A. S.	91	0.84	18.1	1LE1001-1DB2Q-0000Q		71			
15	20	160 L	1780	80	A. S.	91.7	0.84	24.5	1LE1001-1DB4Q-0000Q		83			
6-pole – 1200 rpm at 60 Hz														
1.5	2	100 L	1175	12	A. S.	86.5	0.69	3.15	1LE1001-1AC4Q-0000Q		25			
2.2	3	112 M	1170	18	A. S.	87.5	0.73	4.3	1LE1001-1BC2Q-0000Q		29			
3	4	132 S	1175	24	A. S.	87.5	0.7	6.1	1LE1001-1CC0Q-0000Q		38			
4	5	132 M	1180	30	A. S.	87.5	0.73	7.3	1LE1001-1CC2Q-0000Q		43			
5.5	7.5	132 M	1175	45	A. S.	89.5	0.74	10.4	1LE1001-1CC3Q-0000Q		52			
7.5	10	160 M	1180	61	A. S.	89.5	0.74	14.2	1LE1001-1DC2Q-0000Q		77			
11	15	160 L	1180	89	A. S.	90.2	0.78	19.6	1LE1001-1DC4Q-0000Q		93			

A. S. Available soon

Order No. supplements, see from Page 1/28.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breaddown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			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	$L_{p(A)}$ dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
For use in the North American market according to EPACT							
2-pole – 3600 rpm at 60 Hz							
1LE1001-1AA4Q-□□□□	2.56	7.3	3.83	16	0.0044	71	83
1LE1001-1BA2Q-□□□□	2.9	7.8	4	16	0.0092	73	85
1LE1001-1CA0Q-□□□□	2.04	6.9	3.3	16	0.02012	72	84
1LE1001-1CA1Q-□□□□	2.3	7.4	3.56	16	0.02353	72	84
1LE1001-1DA2Q-□□□□	2.38	7.4	3.63	16	0.04471	77	89
1LE1001-1DA3Q-□□□□	2.76	7.6	3.91	16	0.05277	77	89
1LE1001-1DA4Q-□□□□	3.31	7.9	4.1	16	0.06085	77	89
4-pole – 1800 rpm at 60 Hz							
1LE1001-1AB4Q-□□□□	2.45	7.3	3.85	16	0.0086	62	74
1LE1001-1AB5Q-□□□□	2.38	7.5	3.68	16	0.0109	62	74
1LE1001-1BB2Q-□□□□	3	7.5	4	16	0.014	62	74
1LE1001-1CB0Q-□□□□	2.61	7.3	3.29	16	0.02698	68	80
1LE1001-1CB2Q-□□□□	2.7	7.1	3.407	16	0.03353	68	80
1LE1001-1DB2Q-□□□□	2.65	7	3.22	16	0.06495	69	81
1LE1001-1DB4Q-□□□□	2.79	7.7	3.37	16	0.08281	69	81
6-pole – 1200 rpm at 60 Hz							
1LE1001-1AC4Q-□□□□	2.33	6.4	3.38	16	0.0113	62	74
1LE1001-1BC2Q-□□□□	2.3	6.5	3.4	16	0.0139	60	72
1LE1001-1CC0Q-□□□□	1.75	5.8	3.03	13	0.02371	67	79
1LE1001-1CC2Q-□□□□	2.08	5.8	3.166	13	0.02918	67	79
1LE1001-1CC3Q-□□□□	2.04	6.3	3.17	16	0.03673	67	79
1LE1001-1DC2Q-□□□□	1.95	6.3	3.213	16	0.0754	70	82
1LE1001-1DC4Q-□□□□	1.834	6.2	2.98	16	0.0975	70	82

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)	
		Standard voltages	
		60 Hz	
		460 VY	460 VΔ
		see "Selection and ordering data" for outputs at 60 Hz	
		22	34
1LE1001-1A...Q-Q...	100 L	○	○
1LE1001-1B...Q-Q...	112 M	○	○
1LE1001-1C...Q-Q...	132 S/M	○	○
1LE1001-1D...Q-Q...	160 M/L	○	○

- Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)												
		With flange							With flange (acc. to DIN EN 50347)					
		IM B3 1) 2)	IM B6 2)	IM B7 2)	IM B8 2)	IM V6 2)	IM V5 without protection cover 2)	IM V5 with protection cover 2) 3) 4)	Flange size	IM B5 2) 5)	IM V1 without protection cover 2)	IM V1 with protection cover 2) 3) 4)	IM V3 2)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	-	-	-	-	-	-	-Z H00		-	-	-Z H00	-
1LE1001-1A...-□..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-□..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-□..	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-□..	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)						With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B 14 2) 6)	IM V 19 2)	IM V 18 without protective cover 2)	IM V 18 with protective cover 2) 3) 4)	IM B 34	Flange size	IM B 14 2) 6)	IM V 19 2)	IM V 18 without protective cover 2)	IM V 18 with protective cover 2) 3) 4)	IM B 34
			K	L	M	M	N		K	L	M	M	N
			—	—	—	-Z H00	—		-Z	-Z	-Z	-Z H00	-Z
		Order No. supplement -Z with order code							P01	P01	P01	P01	P01
1LE1001-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	✓	—	—	—	—	—	—

- Standard version
✓ With additional charge

- The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
- Option second shaft extension (order code **L05**) not possible
- In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

- The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated energy-saving motors
with high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and improved efficiency

Selection and ordering data

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 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, type of construction, motor protection and connection box, see table from Page 1/32.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B) ¹⁾												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
4	4.6	100 L	2850	13.3	EFF2	85.6	86.2	0.85	7.9	1LE1002-1AA6Q-□□□□		25
5.5	6.3	112 M	2935	18	EFF2	87	85.5	0.86	10.6	1LE1002-1BA6Q-□□□□		31
11	12.6	132 M	2920	36	EFF2	90	90.7	0.90	19.6	1LE1002-1CA6Q-□□□□		53
22	24.5	160 L	2930	72	EFF2	91.6	91.4	0.88	39.5	1LE1002-1DA6Q-□□□□		85
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
4	4.6	100 L	1430	26.8	EFF2	84.2	85.1	0.81	8.5	1LE1002-1AB6Q-□□□□		27
5.5	6.3	112 M	1420	37	EFF2	85.7	86.5	0.81	11	1LE1002-1BB6Q-□□□□		33
11	12.6	132 M	1450	72	EFF2	88.8	89.3	0.84	21.5	1LE1002-1CB6Q-□□□□		58
18.5	21.3	160 L	1460	121	EFF2	90	90.2	0.85	35	1LE1002-1DB6Q-□□□□		85
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
2.2	2.55	100 L	930	22.5		76	77.3	0.78	5.3	1LE1002-1AC6Q-□□□□		24
3	3.45	112 M	945	30		79	78.2	0.72	7.6	1LE1002-1BC6Q-□□□□		32
7.5	8.6	132 M	950	75		85.5	85.7	0.74	17.2	1LE1002-1CC6Q-□□□□		54
15	17.3	160 L	965	148		88	88	0.75	33	1LE1002-1DC6Q-□□□□		109

Order No. supplements, see from Page 1/32.

¹⁾ For Order No. 1LE1002-1CC6Q-□□□□ use acc. to temperature class 155 (F).

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and improved efficiency

1

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 at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA6Q-□□□□	4.5	7	4.1	16	0.0044	67	79
1LE1002-1BA6Q-□□□□	2.9	7.5	3.8	16	0.0085	69	81
1LE1002-1CA6Q-□□□□	2.8	7.5	3.7	16	0.02233	68	80
1LE1002-1DA6Q-□□□□	2.6	7.5	3.4	16	0.04913	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB6Q-□□□□	2.9	5.8	3.1	16	0.01	60	72
1LE1002-1BB6Q-□□□□	3	5.8	3.1	16	0.0124	58	70
1LE1002-1CB6Q-□□□□	2.5	7.2	3	16	0.03259	64	76
1LE1002-1DB6Q-□□□□	2.7	7.2	3.2	16	0.06843	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC6Q-□□□□	2	4	2.2	16	0.0084	59	71
1LE1002-1BC6Q-□□□□	2.9	4.6	3	16	0.0128	57	69
1LE1002-1CC6Q-□□□□	2.4	5.3	3	16	0.032	63	75
1LE1002-1DC6Q-□□□□	2.9	6	3.4	16	0.0936	67	79

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...Q-Q...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...Q-Q...	160 L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	—	—	—	—	—	—	-Z H00	—	—	-Z H00	—	—
1LE1002-1A...-□..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1B...-□..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1C...-□..	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1002-1D...-□..	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)						
		Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34	Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34
			K	L	M	M	N		K	L	M	M	N
		Order No. supplement -Z with order code					-Z H00		-Z	-Z	-Z	-Z H00	-Z
									P01	P01	P01	P01	P01
1LE1002-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1002-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1002-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1002-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and improved efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...□	132 M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 M	□	✓	✓	✓
1LE1002-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data

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 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	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/36.	IM B3 type of construction	IM B3 type of construction approx. <i>m</i> kg	
<i>P</i> _{rated} kW	<i>P</i> _{rated} kW	FS	<i>n</i> _{rated} rpm	<i>T</i> _{rated} Nm	<div>EFF I</div>	<i>η</i> _{rated} %	<i>η</i> _{rated} %	<i>cos φ</i> _{rated}	<i>I</i> _{rated} A				
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)													
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz													
4	4.6	100 L	2905	13	EFF1	88	89	0.86	7.6	1LE1001-1AA6Q-QQQQQ		26	
5.5	6.3	112 M	2950	18	EFF1	89	88.5	0.89	10	1LE1001-1BA6Q-QQQQQ		34	
11	12.6	132 M	2955	36	EFF1	91.5	92.5	0.89	19.4	1LE1001-1CA6Q-QQQQQ		57	
22	25.3	160 L	2955	71	EFF1	92.8	93.5	0.89	38.5	1LE1001-1DA6Q-QQQQQ		94	
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz													
4	4.6	100 L	1460	26	EFF1	88.3	88.3	0.8	8.2	1LE1001-1AB6Q-QQQQQ		30	
5.5	6.3	112 M	1460	36	EFF1	89.2	89.2	0.81	11	1LE1001-1BB6Q-QQQQQ		34	
11	12.6	132 M	1465	72	EFF1	91	91.0	0.84	21	1LE1001-1CB6Q-QQQQQ		64	
18.5	21.3	160 L	1475	120	EFF1	92.4	92.4	0.85	34	1LE1001-1DB6Q-QQQQQ		100	
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz													
2.2	2.55	100 L	965	22		84.5	85.6	0.76	4.95	1LE1001-1AC6Q-QQQQQ		30	
3	3.45	112 M	960	30		84.5	84.7	0.79	6.5	1LE1001-1BC6Q-QQQQQ		34	
7.5	8.6	132 M	970	74		88.5	88.5	0.77	15.4	1LE1001-1CC6Q-QQQQQ		64	
15	17.3	160 L	975	147		90.6	91	0.81	29.5	1LE1001-1DC6Q-QQQQQ		115	

Order No. supplements, see from Page 1/36.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and high efficiency

1

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 at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA6Q-□□□□	2.5	7.6	3.5	16	0.0054	67	79
1LE1001-1BA6Q-□□□□	2.2	7.7	3.3	16	0.0119	73	85
1LE1001-1CA6Q-□□□□	2.5	7.9	3.2	16	0.03143	68	80
1LE1001-1DA6Q-□□□□	3.1	8.4	3.7	16	0.06764	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB6Q-□□□□	2.2	7.5	3.5	16	0.0137	60	72
1LE1001-1BB6Q-□□□□	2.5	7.1	3.1	16	0.0166	58	70
1LE1001-1CB6Q-□□□□	2.9	7.7	3.1	16	0.04571	64	76
1LE1001-1DB6Q-□□□□	2.8	7.7	3.3	16	0.09854	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC6Q-□□□□	1.9	5.7	2.9	16	0.0137	59	71
1LE1001-1BC6Q-□□□□	2.1	6	3.1	16	0.0166	57	69
1LE1001-1CC6Q-□□□□	2.1	6.5	3	16	0.04572	63	75
1LE1001-1DC6Q-□□□□	1.9	6.5	2.9	16	0.1208	67	79

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...Q-Q...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...Q-Q...	160 L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 without protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	–	–	–	–	–	–	-Z H00	–	–	-Z H00	–	–
1LE1001-1A...-Q..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)											
		With standard flange (acc. to DIN EN 50347)						With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B14 3)7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3)4)5)	IM B34	Flange size	IM B14 3)7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3)4)5)	IM B34
		K	L	M	M	N	N	K	L	M	M	N	N
		Order No. supplement -Z with order code											
		-	-	-	-	-Z H00	-	-Z P01	-Z P01	-Z P01	-Z H00 P01	-Z H00 P01	-Z P01
1LE1001-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓	FT 165	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	✓	FT 215	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	✓	-	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft extension (order code **L05**) not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-ventilated motors with increased output
and high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...-□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-□	132 M	□	✓	✓	✓	✓	✓
1LE1001-1D...-□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 M	□	✓	✓	✓
1LE1001-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
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} %	$\cos\varphi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/40.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2835	10	EFF2	82.6	83.2	0.87	6	1LE1002-1AA4Q-0000Q-Z F90		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-0000Q-Z F90		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-0000Q-Z F90		35
7.5	8.6	132 S	2925	24	EFF2	87.6	88.7	0.88	14	1LE1002-1CA1Q-0000Q-Z F90		40
11	12.6	160 M	2920	36	EFF2	88.4	88.5	0.85	21	1LE1002-1DA2Q-0000Q-Z F90		60
15	17.3	160 M	2930	49	EFF2	89.5	89.7	0.84	29	1LE1002-1DA3Q-0000Q-Z F90		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-0000Q-Z F90		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-0000Q-Z F90		18
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-0000Q-Z F90		22
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-0000Q-Z F90		27
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-0000Q-Z F90		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-0000Q-Z F90		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-0000Q-Z F90		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-0000Q-Z F90		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	940	15.3		74	72.6	0.74	3.95	1LE1002-1AC4Q-0000Q-Z F90		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-0000Q-Z F90		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-0000Q-Z F90		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-0000Q-Z F90		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-0000Q-Z F90		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-0000Q-Z F90		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-0000Q-Z F90		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	705	10.4		65.4	60.2	0.62	2.65	1LE1002-1AD4Q-0000Q-Z F90		17
1.1	1.3	100 L	705	15.1		68.3	67.6	0.63	3.71	1LE1002-1AD5Q-0000Q-Z F90		22
1.5	1.75	112 M	700	20		75.9	72.8	0.68	4.2	1LE1002-1BD2Q-0000Q-Z F90		25
2.2	2.55	132 S	715	29		81	80	0.66	5.9	1LE1002-1CD0Q-0000Q-Z F90		37
3	3.45	132 M	710	40		81.6	81	0.68	7.8	1LE1002-1CD2Q-0000Q-Z F90		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-0000Q-Z F90		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-0000Q-Z F90		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-0000Q-Z F90		91

Order No. supplements, see from Page 1/40.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

1

Selection and ordering data (continued)

Order No. with -Z and order code	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 at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-QQQQ-Z F90	3.2	6.2	2.9	16	0.0034	67	79
1LE1002-1BA2Q-QQQQ-Z F90	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-QQQQ-Z F90	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-QQQQ-Z F90	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-QQQQ-Z F90	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-QQQQ-Z F90	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-QQQQ-Z F90	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-QQQQ-Z F90	2.3	5.1	2.7	16	0.0059	60	72
1LE1002-1AB5Q-QQQQ-Z F90	2.4	5.4	2.6	16	0.0078	60	72
1LE1002-1BB2Q-QQQQ-Z F90	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-QQQQ-Z F90	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-QQQQ-Z F90	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-QQQQ-Z F90	2.3	6.4	3.1	16	0.04395	65	77
1LE1002-1DB4Q-QQQQ-Z F90	2.5	7	3.4	16	0.05616	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-QQQQ-Z F90	2	4	2.2	16	0.0065	59	71
1LE1002-1BC2Q-QQQQ-Z F90	2.3	4.1	2.5	16	0.0092	57	69
1LE1002-1CC0Q-QQQQ-Z F90	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-QQQQ-Z F90	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-QQQQ-Z F90	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-QQQQ-Z F90	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-QQQQ-Z F90	1.9	5.9	2.7	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-QQQQ-Z F90	1.9	3	2.2	16	0.0056	60	72
1LE1002-1AD5Q-QQQQ-Z F90	2	3.2	2.3	16	0.0078	60	72
1LE1002-1BD2Q-QQQQ-Z F90	1.9	3.4	2.1	16	0.0094	63	75
1LE1002-1CD0Q-QQQQ-Z F90	1.7	3.9	2.4	13	0.0186	63	75
1LE1002-1CD2Q-QQQQ-Z F90	1.8	3.9	2.2	13	0.02372	63	75
1LE1002-1DD2Q-QQQQ-Z F90	1.7	3.8	2.3	13	0.0439	63	75
1LE1002-1DD3Q-QQQQ-Z F90	1.6	4	2.2	13	0.0562	63	75
1LE1002-1DD4Q-QQQQ-Z F90	1.7	3.8	2.2	13	0.0772	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)								
		Standard voltages					Further voltages			
		50 Hz					50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ		220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz					Rated voltage range			
		460 VY	460 VΔ				(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
see "Selection and ordering data" for outputs at 60 Hz										
		22	34	27	40	21	33	23	35	
1LE1002-1A..□-□...-Z F90	100 L	○	○	○	○	✓	✓	✓	✓	
1LE1002-1B..□-□...-Z F90	112 M	○	○	○	○	✓	✓	✓	✓	
1LE1002-1C..□-□...-Z F90	132 S/M	○	○	○	○	✓	✓	✓	✓	
1LE1002-1D..□-□...-Z F90	160 M/L	○	○	○	○	✓	✓	✓	✓	

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange						With flange (acc. to DIN EN 50347)				
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	Flange size	IM B5 3) 4)	IM V1 without protective cover 3)	IM V3 3)	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. sup- plement -Z with order code	–	–	–	–	–	–	–	–	–	–
1LE1002-1A...-□...-Z F90	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1B...-□...-Z F90	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1C...-□...-Z F90	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1002-1D...-□...-Z F90	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)				With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34	Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-	-	-	-		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1LE1002-1A...Q-Q...-Z F90	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1002-1B...Q-Q...-Z F90	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1002-1C...Q-Q...-Z F90	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1LE1002-1D...Q-Q...-Z F90	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.

⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with improved efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1002-1A...-Z F90	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-Z F90	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-Z F90	132 S/M	□	✓	✓	✓	✓	✓
1LE1002-1D...-Z F90	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-Z F90	100 L	□	✓	✓	✓
1LE1002-1B...-Z F90	112 M	□	✓	✓	✓
1LE1002-1C...-Z F90	132 S/M	□	✓	✓	✓
1LE1002-1D...-Z F90	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
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	EFF I	η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/44.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-0000Q-Z F90		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-0000Q-Z F90		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-0000Q-Z F90		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-0000Q-Z F90		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-0000Q-Z F90		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-0000Q-Z F90		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-0000Q-Z F90		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-0000Q-Z F90		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-0000Q-Z F90		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-0000Q-Z F90		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-0000Q-Z F90		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-0000Q-Z F90		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-0000Q-Z F90		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-0000Q-Z F90		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.5	0.73	3.5	1LE1001-1AC4Q-0000Q-Z F90		25
2.2	2.55	112 M	965	22		85	85	0.75	5	1LE1001-1BC2Q-0000Q-Z F90		29
3	3.45	132 S	970	30		85	85	0.74	6.9	1LE1001-1CC0Q-0000Q-Z F90		38
4	4.6	132 M	970	39		86	86	0.78	8.6	1LE1001-1CC2Q-0000Q-Z F90		43
5.5	6.3	132 M	970	54		88	88	0.77	11.8	1LE1001-1CC3Q-0000Q-Z F90		52
7.5	8.6	160 M	975	73		89	89	0.77	15.8	1LE1001-1DC2Q-0000Q-Z F90		77
11	12.6	160 L	975	108		89.5	89	0.80	22	1LE1001-1DC4Q-0000Q-Z F90		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		68	65	0.58	2.75	1LE1001-1AD4Q-0000Q-Z F90		21
1.1	1.3	110 L	725	14		68	64.5	0.58	4.05	1LE1001-1AD5Q-0000Q-Z F90		25
1.5	1.75	112 M	720	20		77	75.5	0.67	4.2	1LE1001-1BD2Q-0000Q-Z F90		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-0000Q-Z F90		41
3	3.45	132 M	730	40		84	82	0.65	7.9	1LE1001-1CD2Q-0000Q-Z F90		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-0000Q-Z F90		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-0000Q-Z F90		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-0000Q-Z F90		94

Order No. supplements, see from Page 1/44.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

1

Selection and ordering data (continued)

Order No. with -Z and order code	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 at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ-Z F90	2.3	7	3.3	16	0.0044	67	79
1LE1001-1BA2Q-QQQQ-Z F90	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ-Z F90	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ-Z F90	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ-Z F90	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ-Z F90	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ-Z F90	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ-Z F90	2.1	6.9	3.3	16	0.0086	60	72
1LE1001-1AB5Q-QQQQ-Z F90	2	6.9	3.1	16	0.0109	60	72
1LE1001-1BB2Q-QQQQ-Z F90	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ-Z F90	2.2	6.7	2.8	16	0.06495	65	77
1LE1001-1DB4Q-QQQQ-Z F90	2.5	7.3	3	16	0.08281	65	77
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ-Z F90	2	6.2	2.9	16	0.0113	59	71
1LE1001-1BC2Q-QQQQ-Z F90	2.1	6	3.1	16	0.0139	57	69
1LE1001-1CC0Q-QQQQ-Z F90	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ-Z F90	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ-Z F90	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ-Z F90	1.8	6.3	2.8	16	0.0754	67	79
1LE1001-1DC4Q-QQQQ-Z F90	1.7	6.2	2.7	16	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ-Z F90	1.6	4	2.8	13	0.0086	60	72
1LE1001-1AD5Q-QQQQ-Z F90	1.8	4	2.8	13	0.0109	60	72
1LE1001-1BD2Q-QQQQ-Z F90	1.4	4.2	2.4	13	0.014	63	75
1LE1001-1CD0Q-QQQQ-Z F90	1.4	3.6	1.8	10	0.02698	63	75
1LE1001-1CD2Q-QQQQ-Z F90	1.4	5	2.4	10	0.03463	63	75
1LE1001-1DD2Q-QQQQ-Z F90	1.8	4.3	2	13	0.0649	63	75
1LE1001-1DD3Q-QQQQ-Z F90	2.1	4.4	2.1	13	0.0828	63	75
1LE1001-1DD4Q-QQQQ-Z F90	1.9	4.5	2.1	13	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...Q-Q...-Z F90	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...Q-Q...-Z F90	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...Q-Q...-Z F90	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...Q-Q...-Z F90	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange						With flange (acc. to DIN EN 50347)				
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	Flange size	IM B5 3) 4)	IM V1 without protective cover 3)	IM V3 3)	IM B35
		A	T	U	V	D	C		F	G	H	J
	Order No. supplement -Z with order code	–	–	–	–	–	–		–	–	–	–
1LE1001-1A...-Q...-Z F90	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1B...-Q...-Z F90	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1C...-Q...-Z F90	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1001-1D...-Q...-Z F90	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)				
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34	Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34
			K	L	M	N		K	L	M	N
			–	–	–	–		–Z	–Z	–Z	–Z
		Order No. sup- plement -Z with order code						P01	P01	P01	P01
1LE1001-1A...-Q...-Z F90	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1001-1B...-Q...-Z F90	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1LE1001-1C...-Q...-Z F90	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1LE1001-1D...-Q...-Z F90	160 M/L	FT 215	✓	✓	✓	✓	–	–	–	–	–

□ Standard version
✓ With extra price

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.

⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Forced-air cooled motors without external fan and fan cover with high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...Q-Z F90	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...Q-Z F90	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...Q-Z F90	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...Q-Z F90	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...Q-Z F90	100 L	□	✓	✓	✓
1LE1001-1B...Q-Z F90	112 M	□	✓	✓	✓
1LE1001-1C...Q-Z F90	132 S/M	□	✓	✓	✓
1LE1001-1D...Q-Z F90	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data

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 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		η_{rated} %	η_{rated} %	$\cos\phi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/48	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
1.2		100 L	2830	4.05		81.4		0.92	2.3	1PC1002-1AA4Q-00000		20
1.6		112 M	2925	5.2		83.6		0.93	2.95	1PC1002-1BA2Q-00000		25
2.2		132 S	2910	7.24		84		0.94	4	1PC1002-1CA0Q-00000		35
3		132 S	2920	9.8		87		0.93	5.35	1PC1002-1CA1Q-00000		40
4.4		160 M	2830	15		89.6		0.9	7.9	1PC1002-1DA2Q-00000		60
6		160 M	2935	20		90		0.91	10.6	1PC1002-1DA3Q-00000		68
7.4		160 L	2930	24		90.6		0.92	12.9	1PC1002-1DA4Q-00000		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
0.88		100 L	1420	5.92		80.7		0.88	1.8	1PC1002-1AB4Q-00000		18
1.2		100 L	1420	8.06		83		0.89	2.35	1PC1002-1AB5Q-00000		22
1.6		112 M	1430	11		83.7		0.89	3.1	1PC1002-1BB2Q-00000		27
2.2		132 S	1450	14.53		85.8		0.89	4.15	1PC1002-1CB0Q-00000		38
3		132 M	1450	19.8		87.2		0.89	5.58	1PC1002-1CB2Q-00000		44
4.4		160 M	1460	29		88		0.88	8.2	1PC1002-1DB2Q-00000		62
6		160 L	1460	39		89.5		0.89	10.9	1PC1002-1DB4Q-00000		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
0.6		100 L	935	6.12		76.1		0.81	1.4	1PC1002-1AC4Q-00000		19
0.88		112 M	930	9		79		0.82	1.96	1PC1002-1BC2Q-00000		25
1.2		132 S	950	12		80.7		0.83	2.58	1PC1002-1CC0Q-00000		34
1.6		132 M	950	16		83.2		0.83	3.35	1PC1002-1CC2Q-00000		39
2.2		132 M	950	22.13		85.1		0.83	4.5	1PC1002-1CC3Q-00000		48
3		160 M	970	30		86.5		0.81	6.2	1PC1002-1DC2Q-00000		72
4.4		160 L	970	43		88		0.81	8.9	1PC1002-1DC4Q-00000		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.3		100 L	710	4.05		66.3		0.67	0.97	1PC1002-1AD4Q-00000		17
0.44		100 L	705	6		71		0.69	1.3	1PC1002-1AD5Q-00000		22
0.6		112 M	695	8.2		75.2		0.72	1.6	1PC1002-1BD2Q-00000		25
0.88		132 S	720	11.66		80.6		0.71	2.2	1PC1002-1CD0Q-00000		37
1.2		132 M	720	16		81.5		0.72	2.95	1PC1002-1CD2Q-00000		44
1.6		160 M	730	21		82		0.74	3.8	1PC1002-1DD2Q-00000		60
2.2		160 M	730	29		85		0.74	5.1	1PC1002-1DD3Q-00000		72
3		160 L	730	39		86		0.74	6.8	1PC1002-1DD4Q-00000		91

Order No. supplements, see from Page 1/48.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breaddown torque	Torque class	Moment of inertia	Noise at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1PC1002-1AA4Q-QQQQ	3	6	3	16	0.0034	67	79
1PC1002-1BA2Q-QQQQ	2.3	7.2	3	13	0.0067	69	81
1PC1002-1CA0Q-QQQQ	1.7	5.3	2.3	10	0.0127	62	74
1PC1002-1CA1Q-QQQQ	2	6.3	2.8	13	0.0160	62	74
1PC1002-1DA2Q-QQQQ	2.1	6.3	2.9	13	0.0297	60	72
1PC1002-1DA3Q-QQQQ	2.5	7	3.1	16	0.0362	60	72
1PC1002-1DA4Q-QQQQ	2.5	7	3.1	16	0.0439	60	72
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1PC1002-1AB4Q-QQQQ	2	5.1	2.2	13	0.0059	60	72
1PC1002-1AB5Q-QQQQ	2.2	5.4	2.4	13	0.0078	60	72
1PC1002-1BB2Q-QQQQ	1.9	5.4	2.2	13	0.0102	58	70
1PC1002-1CB0Q-QQQQ	2.2	5.7	2.6	13	0.0186	64	76
1PC1002-1CB2Q-QQQQ	2.4	6.4	2.7	16	0.0237	64	76
1PC1002-1DB2Q-QQQQ	2.1	7	2.8	13	0.0439	64	76
1PC1002-1DB4Q-QQQQ	2.4	7.5	3	16	0.0562	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1PC1002-1AC4Q-QQQQ	1.8	4.1	2	10	0.0065	59	71
1PC1002-1BC2Q-QQQQ	2.1	4.2	2.2	13	0.0092	55	67
1PC1002-1CC0Q-QQQQ	1.7	4.5	2.2	10	0.0167	63	75
1PC1002-1CC2Q-QQQQ	1.9	4.6	2.2	13	0.0212	63	75
1PC1002-1CC3Q-QQQQ	2.2	5	2.5	13	0.0274	63	75
1PC1002-1DC2Q-QQQQ	2.1	6	2.7	13	0.0563	67	79
1PC1002-1DC4Q-QQQQ	2.1	6.4	2.8	13	0.0780	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1PC1002-1AD4Q-QQQQ	1.8	3.3	2.2	10	0.0056	60	72
1PC1002-1AD5Q-QQQQ	1.8	3.4	2.2	10	0.0078	60	72
1PC1002-1BD2Q-QQQQ	1.7	3.3	1.9	10	0.0094	63	75
1PC1002-1CD0Q-QQQQ	1.6	4.2	2.3	10	0.0186	63	75
1PC1002-1CD2Q-QQQQ	1.7	4.2	2.3	10	0.0237	63	75
1PC1002-1DD2Q-QQQQ	1.7	4.9	2.3	10	0.0439	63	75
1PC1002-1DD3Q-QQQQ	1.5	5	2.3	10	0.0562	63	75
1PC1002-1DD4Q-QQQQ	1.8	5.4	2.5	10	0.0772	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1PC1002-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1PC1002-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1PC1002-1C...Q-Q...	132 S/M	○	○	○	○	✓	✓	✓	✓
1PC1002-1D...Q-Q...	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)										
		With flange						With flange (acc. to DIN EN 50347)				
		IM B3 2)3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protec- tive cover 3)	Flange size	IM B5 3)4)	IM V1 without protec- tive cover 3)	IM V3 3)	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1PC1002-1A...-Q..	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1002-1B...-Q..	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1002-1C...-Q..	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1PC1002-1D...-Q..	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)					With standard flange (next larger standard flange acc. to DIN EN 50347)				
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protec- tive cover 3)	IM B34	Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protec- tive cover 3)	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-	-	-	-		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1PC1002-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1002-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1002-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1PC1002-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.

⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with improved efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1PC1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1PC1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1PC1002-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1PC1002-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

□ Standard version

✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1PC1002-1A...-...□	100 L	□	✓	✓	✓
1PC1002-1B...-...□	112 M	□	✓	✓	✓
1PC1002-1C...-...□	132 S/M	□	✓	✓	✓
1PC1002-1D...-...□	160 M/L	□	✓	✓	✓

□ Standard version

✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering datal

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 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	For Order No. supplements for voltage, type of construction, motor protection and connection box, see from Page 1/52	IM B3 type of construction	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
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
1.4		100 L	2920	4.6		87.5		0.88	2.6	1PC1001-1AA4Q-0000Q		21
1.6		112 M	2955	5.2		82		0.9	3.15	1PC1001-1BA2Q-0000Q		27
3.1		132 S	2955	10		91		0.89	5.5	1PC1001-1CA0Q-0000Q		39
4.3		132 S	2955	14		91.5		0.9	7.5	1PC1001-1CA1Q-0000Q		43
6.3		160 M	2955	20		94.5		0.89	10.8	1PC1001-1DA2Q-0000Q		67
6.5		160 M	2960	21		91.5		0.9	11.4	1PC1001-1DA3Q-0000Q		75
9		160 L	2960	29		93.5		0.91	15.2	1PC1001-1DA4Q-0000Q		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
1.1		100 L	1460	7.2		86		0.83	2.2	1PC1001-1AB4Q-0000Q		21
1.5		100 L	1460	9.8		86		0.84	3	1PC1001-1AB5Q-0000Q		25
2		112 M	1460	13		88.5		0.83	3.95	1PC1001-1BB2Q-0000Q		29
2.6		132 S	1465	17		89.5		0.83	5.1	1PC1001-1CB0Q-0000Q		42
4		132 M	1465	26		89.5		0.84	7.7	1PC1001-1CB2Q-0000Q		49
6		160 M	1470	39		91		0.87	11	1PC1001-1DB2Q-0000Q		71
6.2		160 L	1480	40		91.5		0.86	11.4	1PC1001-1DB4Q-0000Q		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
0.85		100 L	960	8.5		85		0.75	1.92	1PC1001-1AC4Q-0000Q		25
1.2		112 M	960	12		83.5		0.75	2.75	1PC1001-1BC2Q-0000Q		29
1.5		132 S	970	15		86.5		0.77	3.25	1PC1001-1CC0Q-0000Q		38
2.5		132 M	970	25		87		0.79	5.3	1PC1001-1CC2Q-0000Q		43
2.7		132 M	975	26		88		0.77	5.8	1PC1001-1CC3Q-0000Q		52
5		160 M	975	49		89		0.77	10.6	1PC1001-1DC2Q-0000Q		77
6.5		160 L	975	64		89.5		0.8	13.2	1PC1001-1DC4Q-0000Q		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.37		100 L	730	4.8		72.5		0.58	1.28	1PC1001-1AD4Q-0000Q		21
0.55		100 L	720	7.3		73		0.62	1.76	1PC1001-1AD5Q-0000Q		25
0.75		112 M	720	9.9		77.5		0.66	2.1	1PC1001-1BD2Q-0000Q		29
1.1		132 S	730	14		82.5		0.65	2.95	1PC1001-1CD0Q-0000Q		41
1.5		132 M	730	20		84		0.68	3.8	1PC1001-1CD2Q-0000Q		49
2.4		160 M	730	31		88.5		0.7	5.6	1PC1001-1DD2Q-0000Q		69
3.3		160 M	730	43		88		0.7	7.7	1PC1001-1DD3Q-0000Q		82
4.6		160 L	730	60		88		0.7	10.8	1PC1001-1DD4Q-0000Q		94

Order No. supplements, see from Page 1/52.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breaddown torque torque	Torque class	Moment of inertia	Noise at rated output	
	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)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1PC1001-1AA4Q-QQQQ	2.1	8.3	3.6	13	0.0044	67	79
1PC1001-1BA2Q-QQQQ	2.5	9.5	3.5	16	0.0092	69	81
1PC1001-1CA0Q-QQQQ	1.9	7.1	2.9	13	0.0201	62	74
1PC1001-1CA1Q-QQQQ	1.9	7.6	2.9	13	0.0235	62	74
1PC1001-1DA2Q-QQQQ	1.8	7.1	3	10	0.0447	60	72
1PC1001-1DA3Q-QQQQ	2.3	8.7	3.3	13	0.0528	60	72
1PC1001-1DA4Q-QQQQ	2.4	8.7	3.2	16	0.0608	60	72
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1PC1001-1AB4Q-QQQQ	2.1	7.6	3.3	13	0.0086	60	72
1PC1001-1AB5Q-QQQQ	2.2	7.8	3.5	13	0.0109	60	72
1PC1001-1BB2Q-QQQQ	2.3	7.4	3.1	13	0.0140	58	70
1PC1001-1CB0Q-QQQQ	2.2	7.5	2.8	13	0.0270	64	76
1PC1001-1CB2Q-QQQQ	2.1	7.3	2.9	13	0.0335	64	76
1PC1001-1DB2Q-QQQQ	1.8	6	2.5	10	0.0649	64	76
1PC1001-1DB4Q-QQQQ	2.6	8.6	3.5	16	0.0828	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1PC1001-1AC4Q-QQQQ	1.7	5.5	2.6	10	0.0113	59	71
1PC1001-1BC2Q-QQQQ	1.7	5.7	2.7	10	0.0139	55	67
1PC1001-1CC0Q-QQQQ	1.4	5.5	2.4	7	0.0237	63	75
1PC1001-1CC2Q-QQQQ	1.4	5.4	2.3	7	0.0292	63	75
1PC1001-1CC3Q-QQQQ	1.9	6.8	3	13	0.0367	63	75
1PC1001-1DC2Q-QQQQ	1.6	6	2.6	10	0.0754	67	79
1PC1001-1DC4Q-QQQQ	1.6	6	2.6	10	0.0975	67	79
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1PC1001-1AD4Q-QQQQ	1.5	4.5	2.7	10	0.0086	60	72
1PC1001-1AD5Q-QQQQ	1.6	4.4	2.5	10	0.0109	60	72
1PC1001-1BD2Q-QQQQ	1.3	4.4	2.4	7	0.0140	63	75
1PC1001-1CD0Q-QQQQ	1.2	4.5	2.1	7	0.0270	63	75
1PC1001-1CD2Q-QQQQ	1.2	4.7	2.3	7	0.0346	63	75
1PC1001-1DD2Q-QQQQ	1.6	4.4	1.8	10	0.0649	63	75
1PC1001-1DD3Q-QQQQ	1.6	4.6	1.8	10	0.0828	63	75
1PC1001-1DD4Q-QQQQ	1.5	4.5	1.8	10	0.0982	63	75

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1PC1001-1A...Q-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1PC1001-1B...Q-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1PC1001-1C...Q-Q...	132 S/M	○	○	○	○	✓	✓	✓	✓
1PC1001-1D...Q-Q...	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/54).

Motor type	Frame size	Position 14: Type of construction (type letter)										
		With flange						With flange (acc. to DIN EN 50347)				
		IM B3 2)3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	Flange size	IM B5 3)4)	IM V1 without protective cover 3)	IM V3 3)	IM B35
		A	T	U	V	D	C	F	G	H	J	
		Order No. supplement -Z with order code										
1PC1001-1A...-Q...	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1001-1B...-Q...	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1PC1001-1C...-Q...	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1PC1001-1D...-Q...	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Type of construction (type letter)									
		With standard flange (acc. to DIN EN 50347)				With standard flange (next larger standard flange acc. to DIN EN 50347)					
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34	Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover 3)	IM B34
			K	L	M	N		K	L	M	N
		Order No. supplement -Z with order code									
			-Z	-Z	-Z	-Z		-Z	-Z	-Z	-Z
			P01	P01	P01	P01		P01	P01	P01	P01
1PC1001-1A...-Q...	100 L	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1001-1B...-Q...	112 M	FT 130	✓	✓	✓	✓	FT 165	✓	✓	✓	✓
1PC1001-1C...-Q...	132 S/M	FT 165	✓	✓	✓	✓	FT 215	✓	✓	✓	✓
1PC1001-1D...-Q...	160 M/L	FT 215	✓	✓	✓	✓	-	-	-	-	-

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.

⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Self-cooled motors without external fan and fan cover with high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1PC1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1PC1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1PC1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1PC1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

□ Standard version

✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1PC1001-1A...-...□	100 L	□	✓	✓	✓
1PC1001-1B...-...□	112 M	□	✓	✓	✓
1PC1001-1C...-...□	132 S/M	□	✓	✓	✓
1PC1001-1D...-...□	160 M/L	□	✓	✓	✓

□ Standard version

✓ With additional charge

¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes
(without **-Z** supplement)

Not possible for General Line motors with shorter delivery time.

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 12th position and **0** in the 13th position of the Order No. and the appropriate order code.

Special versions	Voltage code 12th / 13th position of the Order No.	Additional identi- fication code with order code and plain text if required	Motor type frame size								
			56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency Forced-air cooled motors without external fan and fan cover with improved efficiency Forced-air cooled motors without external fan and fan cover with high efficiency Self-cooled motors without external fan and fan cover with improved efficiency Self-cooled motors without external fan and fan cover with high efficiency											
			1LE1/1PC1 (Aluminum)								
Voltage at 60 Hz											
220 VΔ/380 VY; 50 Hz output	9	0	M2A					✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	0	M1A					✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	0	M2B					✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	0	M1B					✓	✓	✓	✓
440 VY; 50 Hz output	9	0	M2C					✓	✓	✓	✓
440 VY; 60 Hz output	9	0	M1C					✓	✓	✓	✓
440 VΔ; 50 Hz output	9	0	M2D					✓	✓	✓	✓
440 VΔ; 60 Hz output	9	0	M1D					✓	✓	✓	✓
460 VY; 50 Hz output	9	0	M2E					✓	✓	✓	✓
460 VY; 60 Hz output	9	0	M1E					○	○	○	○
460 VΔ; 50 Hz output	9	0	M2F					✓	✓	✓	✓
460 VΔ; 60 Hz output	9	0	M1F					○	○	○	○
575 VY; 50 Hz output	9	0	M2G					✓	✓	✓	✓
575 VY; 60 Hz output	9	0	M1G					✓	✓	✓	✓
575 VΔ; 50 Hz output	9	0	M2H					✓	✓	✓	✓
575 VΔ; 60 Hz output	9	0	M1H					✓	✓	✓	✓
Non-standard voltages and / or frequencies											
Non-standard winding for voltages between 200 V and 690 V (voltages outside this range are available on request) ¹⁾	9	0	M1Y					✓	✓	✓	✓

- Without additional charge
✓ With additional charge

¹⁾ Plain text must be specified in the order: voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Options

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

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
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Motor connection and connection box										
One cable gland, metal	R15						✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	R10						○	○	○	○
Rotation of the connection box through 90°, entry from NDE	R11						○	○	○	○
Rotation of the connection box through 180°	R12						○	○	○	○
Larger connection box	R50						✓	✓	✓	✓
Reduction piece for M cable gland in accordance with British standard, both cable entries mounted ¹⁾	R30						✓	✓	✓	✓
External earthing	H04						✓	✓	✓	✓
3 cables protruding, 0.5 m long ²⁾³⁾	R20						✓	✓	✓	✓
3 cables protruding, 1.5 m long ²⁾³⁾	R21						✓	✓	✓	✓
6 cables protruding, 0.5 m long ²⁾	R22						✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	R23						✓	✓	✓	✓
6 cables protruding, 3 m long ²⁾	R24						✓	✓	✓	✓
Connection box on NDE ⁴⁾	H08						✓	✓	✓	✓
Windings and insulation										
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03						✓	✓	✓	✓
Temperature class 180 (H) at rated power and max. CT 60 °C ⁵⁾	N11						✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m³ of air	N20						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	N05						✓	✓	✓	✓

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

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
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Windings and insulation (continued)										
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	N06						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	N07						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	N08						✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	N21						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code						✓	✓	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							□	□	□	□
Special finish in other standard RAL colors : 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 0/101	Y54 • and special finish RAL.....						✓	✓	✓	✓
Special finish in special RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 0/101	Y51 • and special finish RAL.....						✓	✓	✓	✓
Special finish sea air resistant	S03						O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	S00						O	O	O	O
Unpainted, only primed	S01						✓	✓	✓	✓
Modular technology – Basic versions ⁶⁾										
Mounting of separately driven fan	F70						✓	✓	✓	✓
Mounting of brake ⁷⁾	F01						✓	✓	✓	✓
Mounting of 1XP8012-10 (HTL) rotary pulse encoder ⁸⁾	G01						✓	✓	✓	✓
Mounting of 1XP8012-20 (TTL) rotary pulse encoder ⁸⁾	G02						✓	✓	✓	✓
Modular technology – Additional versions										
Brake supply voltage 24 V DC	F10						✓	✓	✓	✓
Brake supply voltage 230 V AC, 50/60 Hz	F11						O	O	O	O
Brake supply voltage 400 V AC, 50/60 Hz	F12						✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	F50						✓	✓	✓	✓

For legend and footnotes, see Page 1/59.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

1

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
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
							1LE1 (Aluminum)			
Special technology ⁶⁾										
Mounting of LL 861 900 220 rotary pulse encoder ⁸⁾	G04						✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder ⁸⁾	G05						✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder ⁸⁾	G06						✓	✓	✓	✓
Mechanical design and degrees of protection										
Protective cover for types of construction ⁸⁾	H00						✓	✓	✓	✓
Screwed-on feet (instead of cast)	H01						✓	✓	✓	✓
Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar ⁹⁾	H23						✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation	F77						–	–	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation	F78						–	–	✓	✓
IP65 degree of protection ¹⁰⁾	H20						✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹¹⁾	H22						✓	✓	✓	✓
Vibration-proof version	H02						✓	✓	✓	✓
Condensation drainage holes ¹²⁾	H03						✓	✓	✓	✓
Non-rusting screws (externally)	H07						✓	✓	✓	✓
Prepared for mountings, only center hole ¹³⁾	G40						✓	✓	✓	✓
Prepared for mountings with D12 shaft ¹³⁾	G41						✓	✓	✓	✓
Prepared for mountings with D16 shaft ¹³⁾	G42						✓	✓	✓	✓
Protective cover for encoder (loosely enclosed – only for mountings acc. to order codes G40, G41 and G42)	G43						✓	✓	✓	✓
Coolant temperature and site altitude										
Coolant temperature –40 °C to +40 °C ¹⁴⁾	D03						✓	✓	✓	✓
Coolant temperature –30 °C to +40 °C ¹⁴⁾	D04						✓	✓	✓	✓
Designs in accordance with standards and specifications										
Electrical according to NEMA MG1-12 ¹⁵⁾	D30						✓	✓	✓	✓
Design according to UL with “Recognition Mark” ¹⁶⁾	D31						✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40						✓	✓	✓	✓
PSE Mark Japan ¹⁸⁾	D46						✓	✓	✓	–

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

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
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection ¹⁹⁾	Q01						✓	✓	✓	✓
Bearing design for increased cantilever forces	L22						✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	L25						✓	✓	✓	✓
Regreasing device ¹⁹⁾	L23						✓	✓	✓	✓
Located bearing at DE	L20						✓	✓	✓	✓
Located bearing at NDE	L21						✓	✓	✓	□
Balance and vibration quantity										
Vibration quantity A							□	□	□	□
Vibration quantity B	L00						✓	✓	✓	✓
Half-key balancing (standard)							□	□	□	□
Full-key balancing	L02						✓	✓	✓	✓
Balancing without key	L01						✓	✓	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08						✓	✓	✓	✓
Second standard shaft extension	L05						✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	L04						✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07						✓	✓	✓	✓
Standard shaft made of non-rusting steel	L06						✓	✓	✓	✓
Non-standard cylindrical shaft extension ²⁰⁾	Y55 • and identification code						✓	✓	✓	✓
Heating and ventilation										
Fan cover for textile industry	F75						✓	✓	✓	✓
Metal external fan ²¹⁾	F76						✓	✓	✓	✓
Anti-condensation heaters for 230 V	Q02						✓	✓	✓	✓
Anti-condensation heaters for 115 V	Q03						✓	✓	✓	✓
Sheet metal fan cover	F74						✓	✓	✓	✓
Rating plate and extra rating plates										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
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 (max. of 20 characters)	Y84 • and identification code						✓	✓	✓	✓

For legend and footnotes, see Page 1/59.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

1

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
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
							1LE1 (Aluminum)			
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○
With one safety and start-up guide per box pallet	B01						○	○	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	B02						✓	✓	✓	✓
Printed operating instructions English/German enclosed	B04						✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	B83						✓	✓	✓	✓
Wire-lattice pallet	B99						○	○	○	○
Connected in star for dispatch	M01						✓	✓	✓	✓
Connected in delta for dispatch	M02						✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Available on request
- ✓ With additional charge

- 1) Not possible in combination with order code **R15** "One cable gland, metal".
- 2) In combination with motor protection (position 15 of the Order No.) or with option anti-condensation heater request required.
- 3) Not possible in combination with voltage code **22** or **34**.
- 4) Not possible in combination with the following order codes: **N01, N02, N03, N05, N06, N07, N08, N11**.
Use according to temperature class 155 (F) possible only.
- 5) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant 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.
- 7) When quoting or ordering, it is necessary to provide the brake supply voltage for order codes **F10, F11** and **F12**.
- 8) All encoders are supplied with a protective cover as standard. The protective cover is not supplied with the combination rotary pulse encoder with separately driven fan, as, in this case, the rotary pulse encoder is installed under the fan cover.
- 9) Not possible for type of construction IM V3.
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code **G05**) and/or brake 2LM8 (order code **F01**).
- 11) Not possible in combination with brake 2LM8 – order code **F01**.
- 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 for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.

- 13) Motors that are prepared for additional mountings (order codes **G40, G41, G42**) are supplied without protective cover as standard. If a protective cover is requested as cover or as mechanical protection for mounting provided by the customer, it can be ordered with order code **G43**.
Not possible in combination with order code **L00**, vibration quantity level B.
- 14) In connection with mountings, the respective technical data must be observed; request required.
- 15) 1LE1 motors in EFF1 version without additional charge (standard version).
- 16) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 17) The rated voltage is indicated on the rating plate without voltage range.
- 18) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 19) Not possible when brake is mounted.
- 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. For order codes **Y55** and **L05**:
- 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 catalog part 0 "Introduction".
- 21) For 1LE1 motors with metal external fan, converter-fed operation is permitted. The metal external fan is not possible in combination with the low-noise version – order code **F77** or **F78**.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

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
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
							1LE1/1PC1 (Aluminum)			
Motor connection and connection box										
One cable gland, metal	R15						✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	R10						○	○	○	○
Rotation of the connection box through 90°, entry from NDE	R11						○	○	○	○
Rotation of the connection box through 180°	R12						○	○	○	○
Larger connection box	R50						✓	✓	✓	✓
Reduction piece for M cable gland in accordance with British standard, both cable entries mounted ¹⁾	R30						✓	✓	✓	✓
External earthing	H04						✓	✓	✓	✓
3 cables protruding, 0.5 m long ²⁾³⁾	R20						✓	✓	✓	✓
3 cables protruding, 1.5 m long ²⁾³⁾	R21						✓	✓	✓	✓
6 cables protruding, 0.5 m long ²⁾	R22						✓	✓	✓	✓
6 cables protruding, 1.5 m long ²⁾	R23						✓	✓	✓	✓
6 cables protruding, 3 m long ²⁾	R24						✓	✓	✓	✓
Connection box on NDE ⁴⁾	H08						✓	✓	✓	✓
Windings and insulation										
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03						✓	✓	✓	✓
Temperature class 180 (H) at rated power and max. CT 60 °C ⁵⁾	N11						✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	N20						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	N05						✓	✓	✓	✓

For legend and footnotes, see Page 1/63.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

1

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
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
		1LE1/1PC1 (Aluminum)								
Windings and insulation (continued)										
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	N06						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	N07						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	N08						✓	✓	✓	✓
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	N21						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code						✓	✓	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							□	□	□	□
Special finish in other standard RAL colors : 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 0/101	Y54 • and special finish RAL....						✓	✓	✓	✓
Special finish in special-RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 0/101	Y51 • and special finish RAL....						✓	✓	✓	✓
Special finish sea air resistant	S03						O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	S00						O	O	O	O
Unpainted, only primed	S01						✓	✓	✓	✓
Mechanical design and degree of protection										
Screwed-on feet (instead of cast)	H01						✓	✓	✓	✓
Radial seal on DE for flange-mounting motors with oil resistance to 0.1 bar ⁶⁾	H23						✓	✓	✓	✓
IP65 degree of protection	H20						✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	H22						✓	✓	✓	✓
Vibration-proof version	H02						✓	✓	✓	✓
Condensation drainage holes ⁷⁾	H03						✓	✓	✓	✓
Non-rusting screws (externally)	H07						✓	✓	✓	✓
Coolant temperature and site altitude										
Coolant temperature -40 °C to +40 °C	D03						✓	✓	✓	✓
Coolant temperature -30 °C to +40 °C	D04						✓	✓	✓	✓

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

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
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
							1LE1/1PC1 (Aluminum)			
Designs in accordance with standards and specifications										
Electrical according to NEMA MG1-12 ⁸⁾	D30						✓	✓	✓	✓
Design according to UL with "Recognition Mark" ⁹⁾	D31						✓	✓	✓	✓
Canadian regulations (CSA) ¹⁰⁾	D40						✓	✓	✓	✓
PSE Mark Japan ¹¹⁾	D46						✓	✓	✓	–
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	Q01						✓	✓	✓	✓
Bearing design for increased canteliver forces	L22						✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	L25						✓	✓	✓	✓
Regreasing device	L23						✓	✓	✓	✓
Located bearing at DE	L20						✓	✓	✓	✓
Located bearing at NDE	L21						✓	✓	✓	□
Balance and vibration quantity										
Vibration quantity A							□	□	□	□
Vibration quantity B	L00						✓	✓	✓	✓
Half-key balancing (standard)							□	□	□	□
Full-key balancing	L02						✓	✓	✓	✓
Balancing without key	L01						✓	✓	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08						✓	✓	✓	✓
Shaft extension with standard dimensions, without featherkey way	L04						✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07						✓	✓	✓	✓
Standard shaft made of non-rusting steel	L06						✓	✓	✓	✓
Non-standard cylindrical shaft extension ¹²⁾	Y55 • and identification code						✓	✓	✓	✓
Heating and ventilation										
Anti-condensation heaters for 230 V	Q02						✓	✓	✓	✓
Anti-condensation heaters for 115 V	Q03						✓	✓	✓	✓

For legend and footnotes, see Page 1/63.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Special versions

1

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
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
Self-cooled motors without external fan and fan cover with improved efficiency										
Self-cooled motors without external fan and fan cover with high efficiency										
							1LE1/1PC1 (Aluminum)			
Rating plate and extra rating plates										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
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 (max. of 20 characters)	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 start-up guide per box pallet	B01						○	○	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	B02						✓	✓	✓	✓
Printed operating instructions English/German enclosed	B04						✓	✓	✓	✓
Type test with heat run for horizontal motors, with acceptance	B83						✓	✓	✓	✓
Wire-lattice pallet	B99						○	○	○	○
Connected in star for dispatch	M01						✓	✓	✓	✓
Connected in delta for dispatch	M02						✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Available on request
- ✓ With additional charge

- 1) Not possible in combination with order code **R15** "One cable gland, metal".
- 2) In combination with motor protection (position 15 of the Order No.) or with option anti-condensation heater request required.
- 3) Not possible in combination with voltage code **22** or **34**.
- 4) Not possible in combination with the following order codes: **N01, N02, N03, N05, N06, N07, N08, N11**. Use according to temperature class 155 (F) possible only.
- 5) Cannot be used for motors in UL version (order code **D31**). The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) Not possible for type of construction IM V3.
- 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 for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.

- 8) 1LE1 motors in EFF1 version without additional charge (standard version).
- 9) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 10) The rated voltage is indicated on the rating plate without voltage range.
- 11) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 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. For order code **Y55**:
 - 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 catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Accessories

Overview

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.

Source of supply:
Siemens contact partner – ordering from Catalog Siemens MD 10.1 “FLENDER Standard Couplings”

or

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

Mounting of encoder

In the case of mounting by the customer.

Baumer Hübner GmbH
Planufer 92b
10967 Berlin, Germany
Tel. +49 (0) 30-690 03-0
Fax +49 (0) 30-690 03-104

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com

Leine & Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen, Germany
Tel. +49 (0) 7361-78 093-0
Fax +49 (0) 7361-78 093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se

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
- For bearing types, see the „Orientation”, “Technical data”, Page 0/124.
- 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

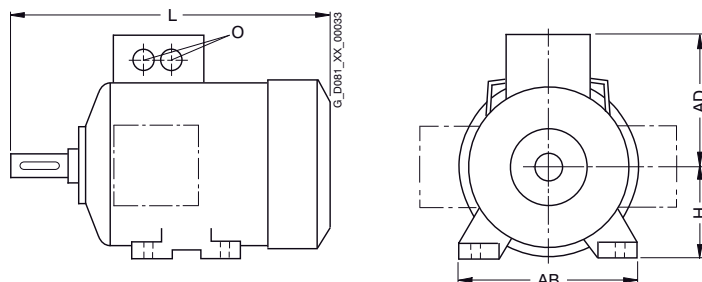
New Generation 1LE1/1PC1

Dimensions

1

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
100 L	General Line motors with shorter delivery time		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		430.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		321.5	166	100	196	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		321.5	166	100	196	2 x M32 x 1.5
112 M	General Line motors with shorter delivery time		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		414 ¹⁾	177	112	226	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		311	177	112	226	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		311	177	112	226	2 x M32 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
132 S/ 132 M	General Line motors with shorter delivery time		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		515 ¹⁾	202	132	256	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		380.5	202	132	256	2 x M32 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		380.5	202	132	256	2 x M32 x 1.5
160 M/ 160 L	General Line motors with shorter delivery time		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		664 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		510	236.5	160	300	2 x M40 x 1.5
	Self-cooled motors without external fan and fan cover with improved/high efficiency		510	236.5	160	300	2 x M40 x 1.5

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

Overview (continued)

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	up to 30	j6
	over 30 to 50	k6
	over 50	m6
N	up to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimensions	Admissible deviation
H	up 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

New Generation 1LE1/1PC1

Dimensions

1

More information

SD configurator

SD configurator (on DVD of the interactive catalog CA01 “Products for Automation and Drives”)



The interactive Catalog CA 01 contains over 100 000 products with approximately 5 million potential drive system product variants.

The **SD configurator** has been developed to facilitate selection of the correct motor and/or converter from the wide spectrum of A&D SD products. It is integrated as a “selection aid” in this catalog.

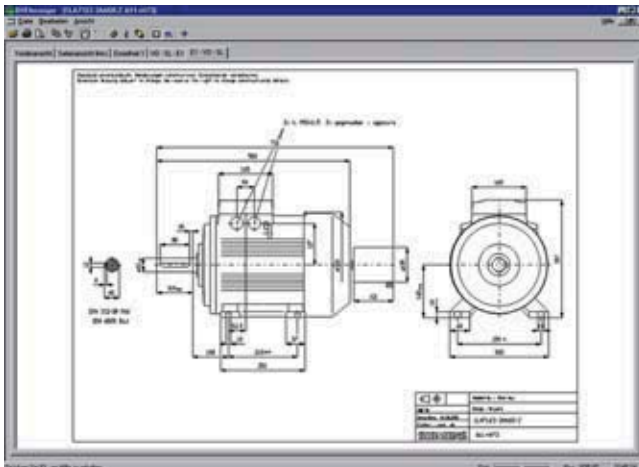
The **SD configurator** makes it easier to find the right drive solution. It supplies the correct order number as well as the corresponding documentation.

It can display operating instructions, factory test certificate, terminal box documentation, etc. and generates data sheets, dimension drawings and a start-up calculation for the relevant products.

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.



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

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

SD configurator product range:

Low-voltage motors (energy-saving motors) with corresponding documentation and dimension drawings, low-voltage converters of the MICROMASTER 4 product series, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters, and SIMATIC ET 200S FC and SIMATIC ET 200pro FC frequency converters for distributed I/O.

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

Links to tips, tricks and downloads for functional or content updates can be found at this address.

Order No. for CA 01, English International:
DVD: **E86060-D4001-A510-C7-7600**

Note: The SD configurator offline tool within CA 01 can be updated for the new 1LE1 motor series online over the Internet.

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 CA 01 electronic catalog as a selection aid (for further information, see above).

The interactive CA 01 catalog 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, English International
DVD: **E86060-D4001-A510-C7-7600**

Note:

The SD configurator offline tool within CA01 can be updated for the new 1LE1 motor series online over the Internet.

IEC Squirrel-Cage Motors

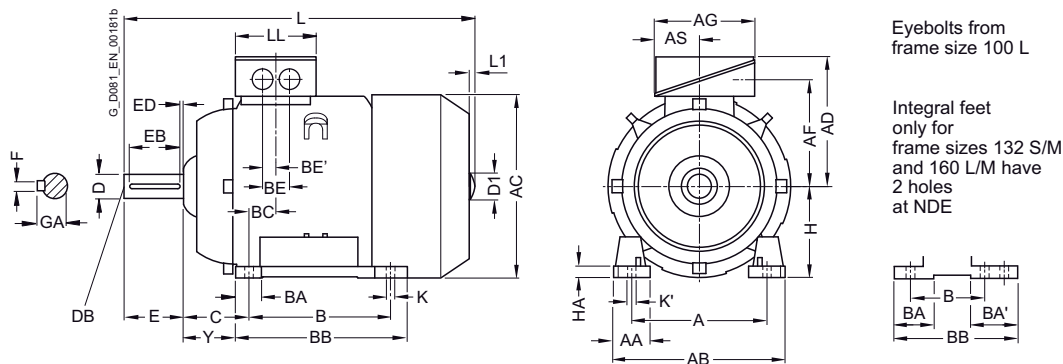
New Generation 1LE1/1PC1

Dimensions

Dimensional drawings

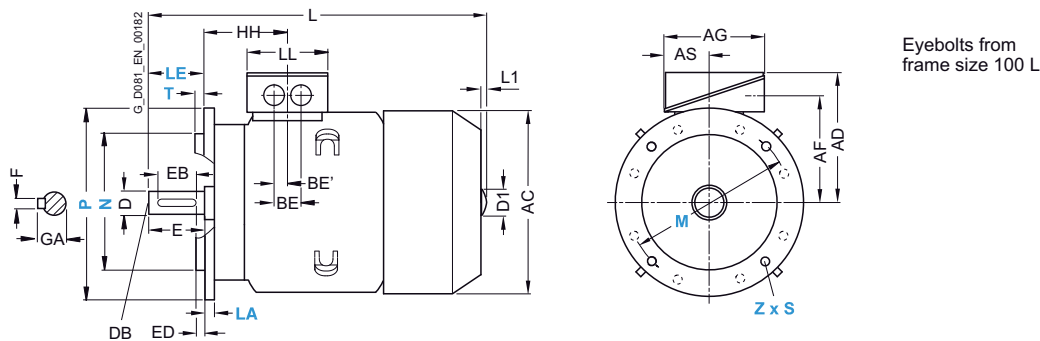
Aluminum series 1LE1, frame sizes 100 to 160 – General Line motors with shorter delivery time

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																		
Frame size	Number of poles	A	AA	AB	AC	AD	AF	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	125.5	135	63.5	140	37.5	–	176	33.5	50	25	63	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	136.5	135	63.5	140	35.4	–	176	26	50	25	70	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	140	38	76	218	26.5	48	24	89	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	178	38	76	218	26.5	48	24	89	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	210	44	89	300	47	57	28.5	108	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	254	44	89	300	47	57	28.5	108	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

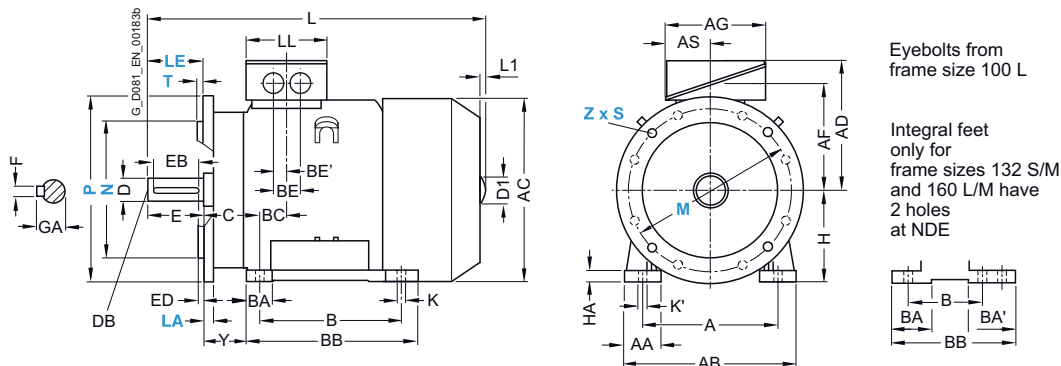
¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – General Line motors with shorter delivery time

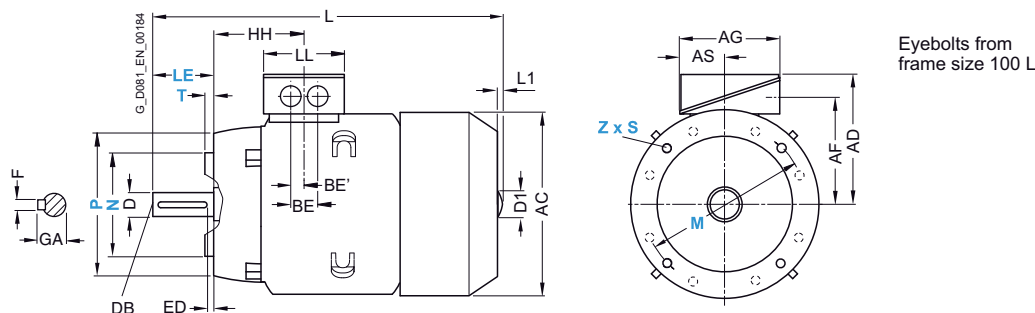
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC							DE shaft extension						
Frame size	Number of poles	HH	K	K'	L ¹⁾	L1	D1	LL	D	DB	E	EB	ED	F	GA
100 L	2, 4, 6, 8	96.5	12	16	395.5	7	32	112	28	M10	60	50	5	8	31
112 M	2, 4, 6, 8	96	12	16	389	7	32	112	28	M10	60	50	5	8	31
132 S	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41
132 M	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41
160 M	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45
160 L	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

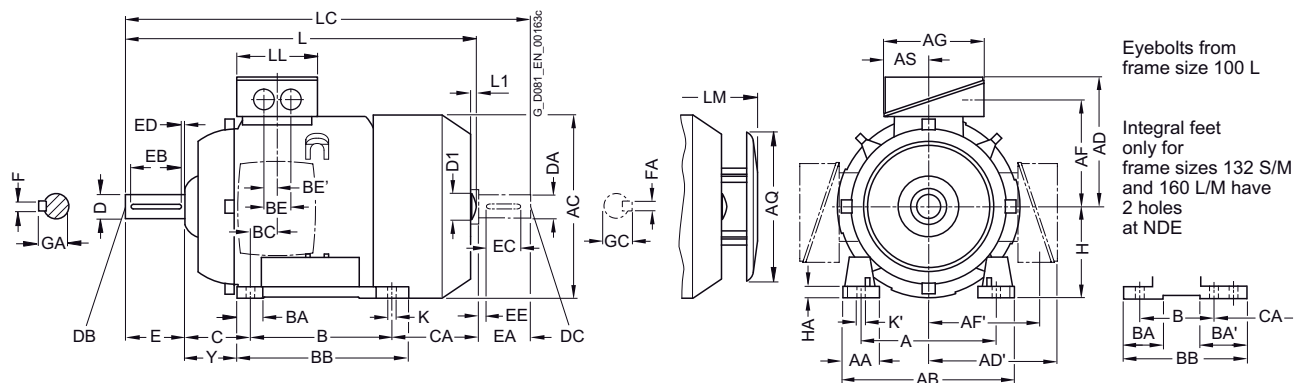
New Generation 1LE1/1PC1

Dimensions

Dimensional drawings (continued)

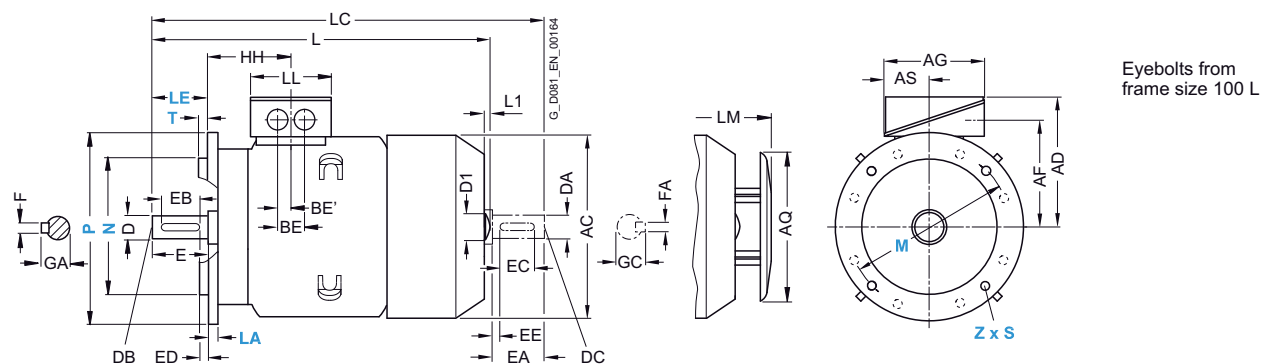
Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with improved/high efficiency

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	166	125.5	125.5	135	195	63.5	140	37.5	–	176	33.5	50	25	63	141	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	177	136.5	136.5	135	195	63.5	140	35.4	–	176	26	50	25	70	129.7	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	140	38	76 ²⁾	218 ³⁾	26.5	48	24	89	128.5 ⁴⁾	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	178	38	76	218	26.5	48	24	89	128.5 ⁴⁾	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	210	44	89 ⁵⁾	300 ⁶⁾	47	57	28.5	108	148 ⁷⁾	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	254	44	89	300	47	57	28.5	108	148 ⁷⁾	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

2) With screwed-on feet, dimension BA' is 38 mm.

3) With screwed-on feet, dimension BB is 180 mm.

4) With screwed-on feet, dimension CA is 166.5 mm.

5) With screwed-on feet, dimension BA' is 44 mm.

6) With screwed-on feet, dimension BB is 256 mm.

7) With screwed-on feet, dimension CA is 192 mm.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

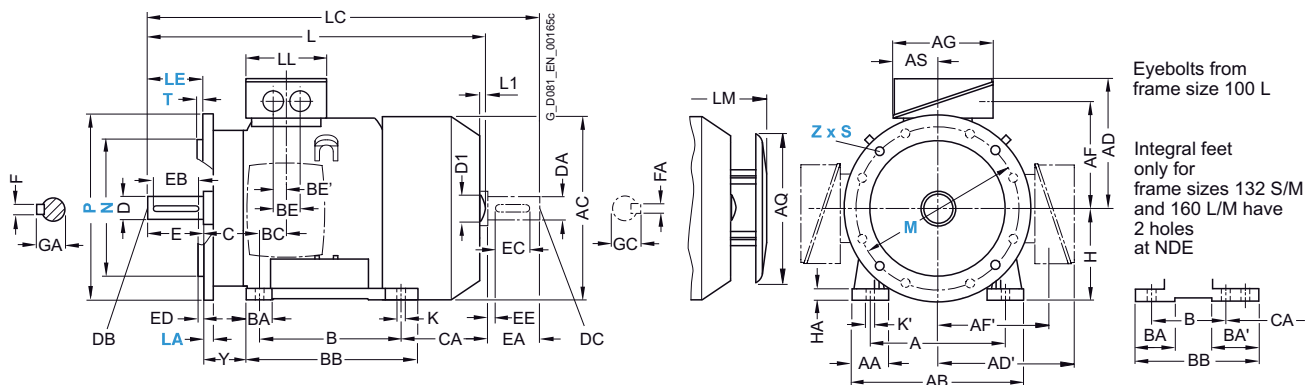
1

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with improved/high efficiency

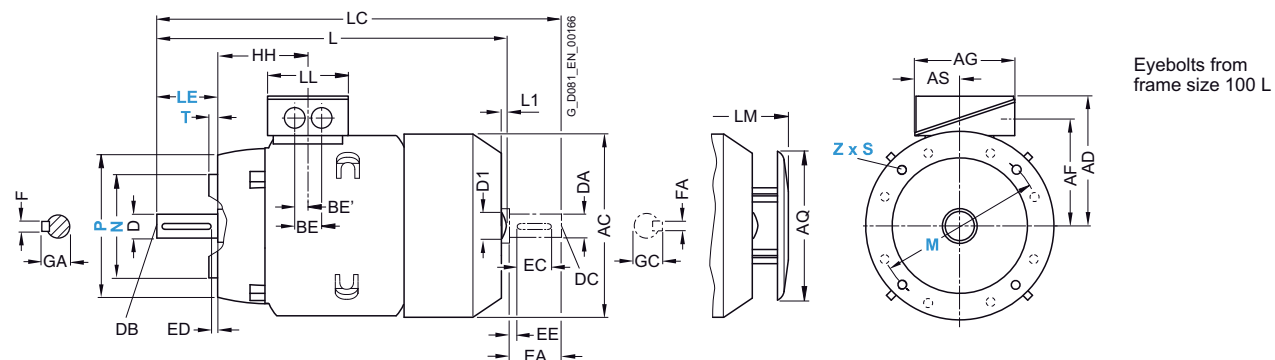
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC									DE shaft extension							NDE shaft extension							
Frame size	Number of poles	HH	K	K'	L ¹⁾	L1	D1	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC	
100 L	2, 4, 6, 8	96.5	12	16	395.5	7	32	454	112	428.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
112 M	2, 4, 6, 8	96	12	16	389	7	32	450	112	422	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27	
132 S	2, 4, 6, 8	115.5	12	16	465	8.5	39	535.5	130	500.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31	
132 M	2, 4, 6, 8	115.5	12	16	465	8.5	39	535.5	130	500.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31	
160 M	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	
160 L	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45	

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

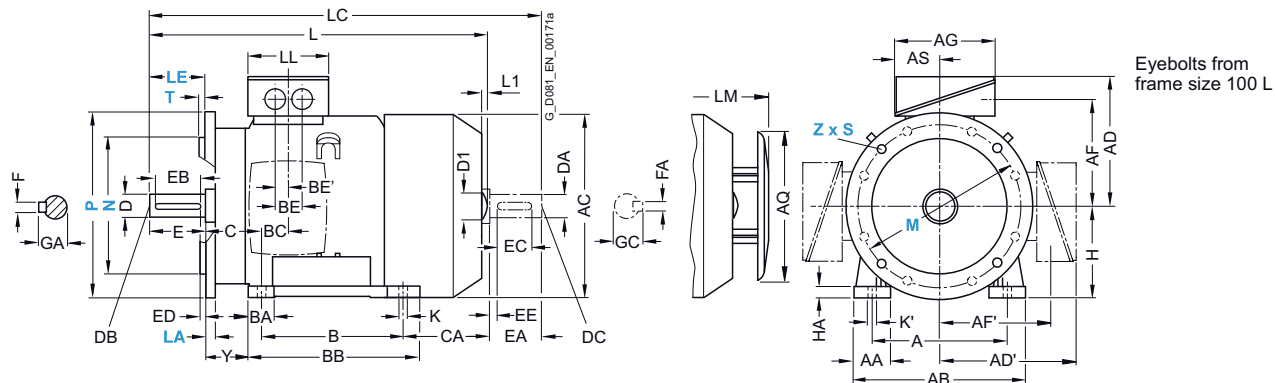
1

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – self-ventilated motors with increased output and improved/high efficiency

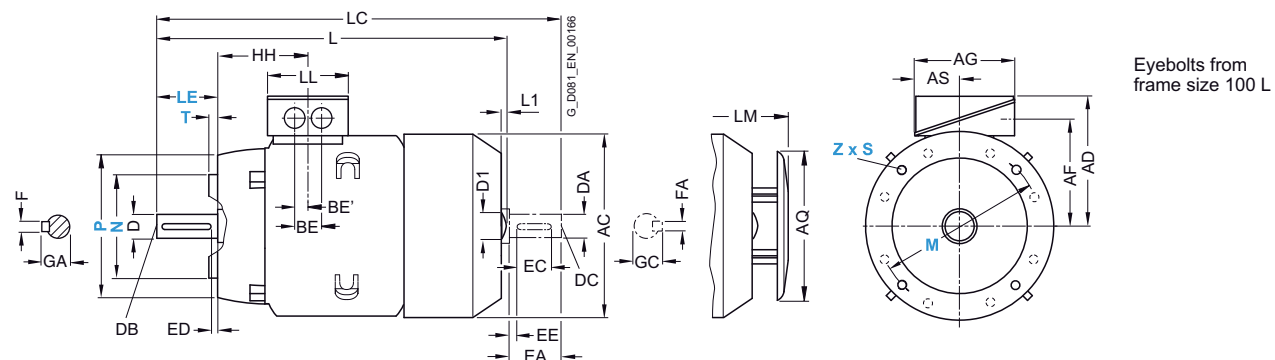
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC										DE shaft extension							NDE shaft extension							
Frame size	Number of poles	HH	K	K' L ¹⁾	L1	D1	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC			
100 L	2, 4, 6, 8	96.5	12	16	430.5	7	32	489	112	463.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
112 M	2, 4, 6, 8	96	12	16	414	7	32	475	112	447	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27		
132 M	2, 4, 6, 8	115.5	12	16	515	8.5	39	585.5	130	550.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31		
160 L	2, 4, 6, 8	155	15	19	664	10	45	790	145	698	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45		

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

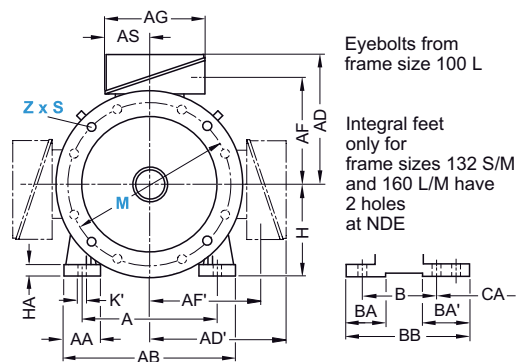
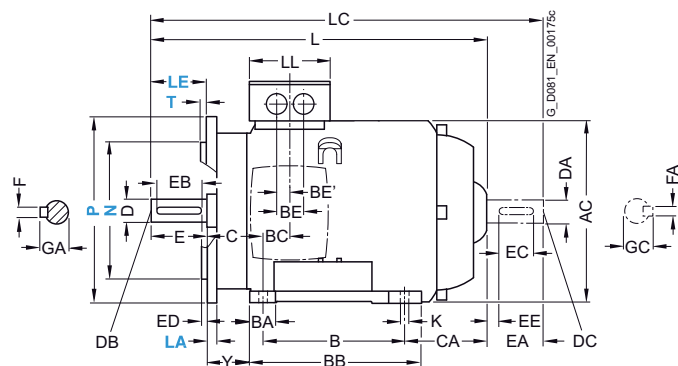
1

Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 – forced-air cooled motors with improved/high efficiency
Aluminum series 1PC1, frame sizes 100 to 160 – self-cooled motors with improved/high efficiency

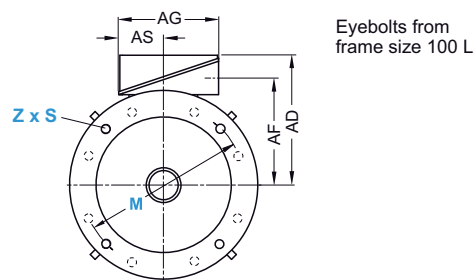
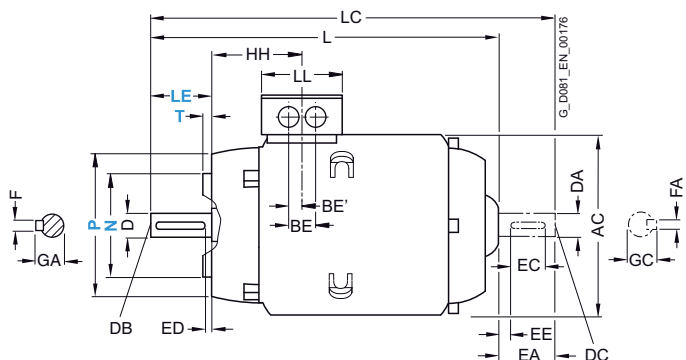
Type of construction IM B35

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/76 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC						DE shaft extension						NDE shaft extension							
Frame size	Number of poles	HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	2, 4, 6, 8	96.5	12	16	321.5	–	112	28	M10	60	50	5	8	31	–	–	–	–	–	–	–
112 M	2, 4, 6, 8	96	12	16	311	–	112	28	M10	60	50	5	8	31	–	–	–	–	–	–	–
132 S	2, 4, 6, 8	115.5	12	16	380.5	–	130	38	M12	80	70	5	10	41	–	–	–	–	–	–	–
132 M	2, 4, 6, 8	115.5	12	16	380.5	–	130	38	M12	80	70	5	10	41	–	–	–	–	–	–	–
160 M	2, 4, 6, 8	155	15	19	510	–	145	42	M16	110	90	10	12	45	–	–	–	–	–	–	–
160 L	2, 4, 6, 8	155	15	19	510	–	145	42	M16	110	90	10	12	45	–	–	–	–	–	–	–

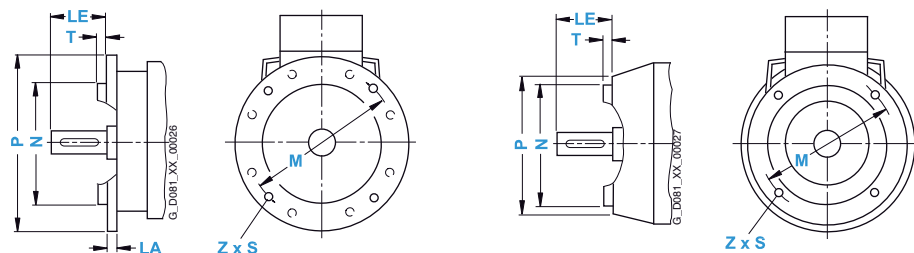
IEC Squirrel-Cage Motors

New Generation 1LE1/1PC1

Dimensions

Dimensional drawings (continued)

Flange dimensions



In DIN EN 50347, flanges FF with through holes and flanges FT with tapped holes are assigned to frame sizes. 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	
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 (next larger standard 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 (next larger standard 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 (next larger standard flange)	FT 215	C 250	–	80	215	180	250	M12	4	4	
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flansch	FF 300	A 350	13	110	300	250	350	18.5	5	4	
	IM B14, IM B34, IM V18, IM V19	Normflansch	FT 215	C 250	–	110	215	180	250	M12	4	4	

Standard motors up to frame size 315 L



2/2 Orientation

2/2 Overview
2/4 Benefits
2/4 Application
2/5 Integration
2/7 Technical specifications
2/8 Selection and ordering data
2/9 More information

2/10 Self-ventilated energy-saving motors with improved efficiency, Aluminum series 1LA7 and 1LA5

2/10 Selection and ordering data

2/22 Self-ventilated energy-saving motors with high efficiency, Aluminum series 1LA9

2/22 Selection and ordering data

2/34 Self-ventilated motors with increased output, Aluminum series 1LA9

2/34 Selection and ordering data

2/38 Self-ventilated energy-saving motors with improved 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

2/48 Selection and ordering data

2/58

Self-cooled motors without external fan, Aluminum series 1LP7 and 1LP5

2/58 Selection and ordering data

2/62

Self-cooled motors without external fan, Cast-iron series 1LP4

2/62 Selection and ordering data

2/66

Special versions

2/66 Overview
2/67 Selection and ordering data
2/67 • Voltages
2/76 • Types of construction
2/78 • Options

2/120

Accessories

2/120 Overview
2/121 More information

2/122

Dimensions

2/122 Overview
2/123 More information
2/124 Dimensional drawings

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

Overview

2



Standard motors from Siemens are characterised by their flexibility, ruggedness and energy efficiency. In general, all motors are suitable for converter-fed operation with mains voltages of up to 460 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>

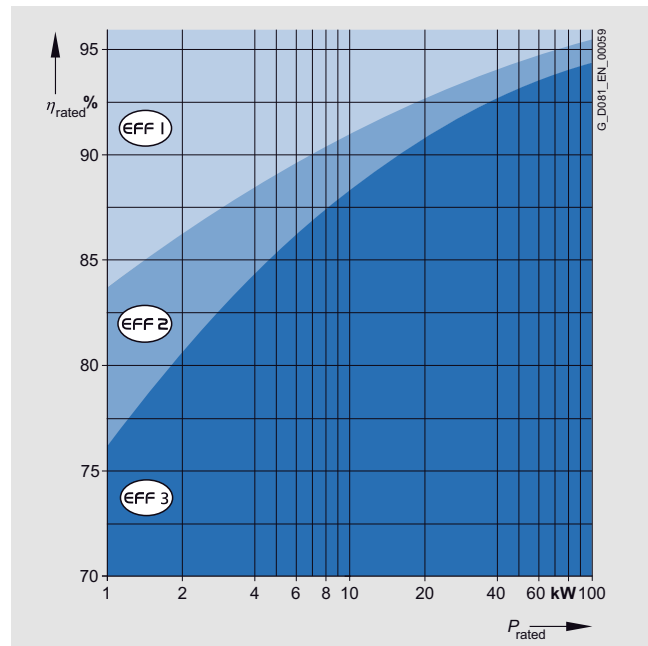
Classified energy-saving motors for an efficient energy balance

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 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

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

2

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 150 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.

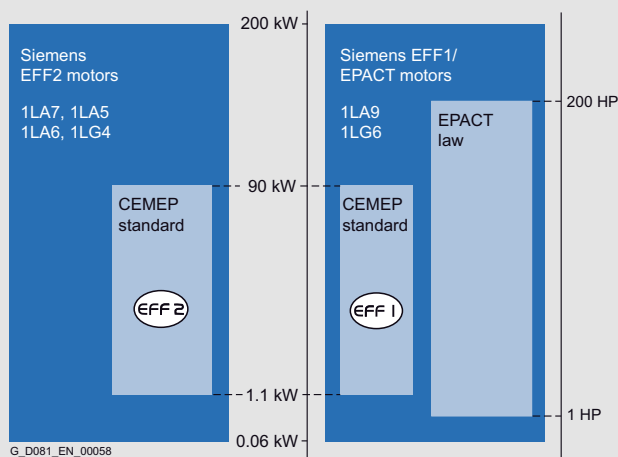
At a glance: Energy-saving motors from Siemens according to CEMEP EFF1/EFF2, EPACT and CSA

SIEMENS 3-Mot. 1LA9166-2KA60-Z	
D-91056 Erlangen	E0107/471101 01 002 IEC/EN 60034
120 kg IM B3 160L IP55 Th.Cl.155(F) AMB 40°C	EFF1 (H) CE
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
180 kg IM B3 180L IP55 Th.Cl.155(F) AMB 40 °C	EFF1 CE
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

Improved efficiency

High efficiency



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.

2

Benefits

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

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 mains 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

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

2

Integration

MICROMASTER 411/ COMBIMASTER 411 distributed drive solutions

The MICROMASTER 411/COMBIMASTER 411 series is included in Catalog 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.

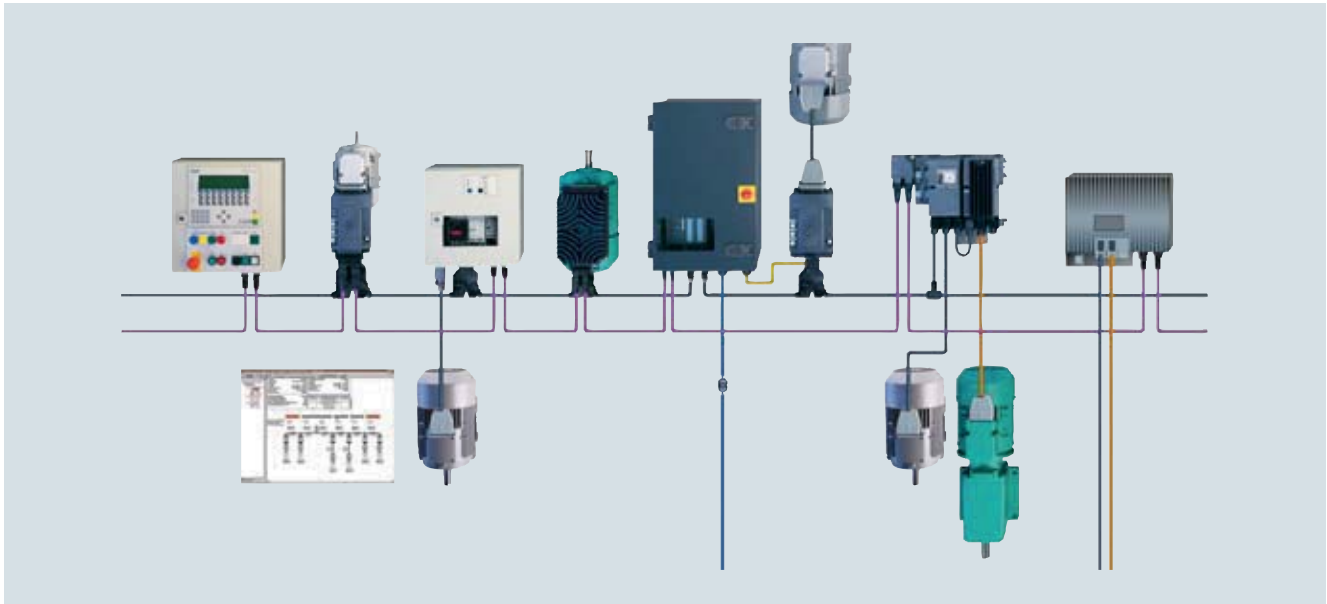
Main features:

- 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

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 x 90°. 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.

Only one sensor (temperature sensor or PTC thermistor) can be connected.

Maximum admissible mains 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 VΔ/400 VY, 50 Hz
- Star-delta starting: Voltage code **9** with order code **L1U** 400 VΔ, 50 Hz

More information

Further information is available in the Catalogs 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>

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

2

Technical specifications

The following table lists the most important technical specifications. For further information and details, see catalog part 0 "Introduction".

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 catalog part 7 "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 155 (F), used acc. to temperature class 130 (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-ventilated (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)
Admissible coolant temperature and site altitude	-20 °C ... +40 °C as standard, site altitude 1000 mm above sea level. See "Coolant temperature and site altitude" in catalog part 0 "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 catalog part 0 "Introduction".
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (standard – without special vibration requirements) Level B (with special vibration requirements) See "Balance and vibration quantity" in catalog part 0 "Introduction".
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing See "Balance and vibration quantity" in catalog part 0 "Introduction".
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 catalog part 0 "Introduction".
Rating plates	Fixed to the motor See "Rating plate" in catalog part 0 "Introduction".
Connection and connection boxes	See "Connection, circuit and connection box" in catalog part 0 "Introduction".
Bearing design	See "Bearings" in catalog part 0 "Introduction".
Cantilever forces	See "Admissible cantilever forces" in catalog part 0 "Introduction".
Options	See the selection and ordering data for "Special versions"

General note

All the data listed in the catalog 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 utilization at low speeds it is recommended that forced-ventilated 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 improved efficiency

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum 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 Page
rpm		kW/HP	rpm	Nm	A	
Aluminum series 1LA9 (motors with external fan)						
For use 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 use 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 use 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 use 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 Page
rpm		kW	rpm	Nm	A	
Aluminum 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

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Orientation

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
Aluminum 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 improved efficiency – Aluminum series 1LA7/1LA5

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.
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					
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos \phi_{rated}$	I_{rated} A		► Phase-out model		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
0.09	0.11	56 M	2830	0.3		63	62	0.81	0.26		1LA7 050-2AAQQ		3
0.12	0.14	56 M	2800	0.41		65	64	0.83	0.32		1LA7 053-2AAQQ		3
0.18	0.21	63 M	2820	0.61		64	63	0.79	0.51		1LA7 060-2AAQQ		3.5
0.25	0.29	63 M	2830	0.84		65	65	0.80	0.69		1LA7 063-2AAQQ		4.1
0.37	0.43	71 M	2740	1.3		66	65	0.82	1		1LA7 070-2AAQQ		5
0.55	0.63	71 M	2800	1.9		71	70	0.82	1.36		1LA7 073-2AAQQ		6
0.75	0.86	80 M	2855	2.5		73	72	0.86	1.73		1LA7 080-2AAQQ		9
1.1	1.3	80 M	2845	3.7	EFF2	77	77	0.87	2.4		1LA7 083-2AAQQ		11
1.5	1.75	90 S	2860	5	EFF2	79	80	0.85	3.25		1LA7 090-2AAQQ		12.9
2.2	2.55	90 L	2880	7.3	EFF2	82	82	0.85	4.55		1LA7 096-2AAQQ		15.7
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1		► 1LA7 106-2AAQQ		22
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8		► 1LA7 113-2AAQQ		29
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4		► 1LA7 130-2AAQQ		39
7.5	8.6	132 S	2930	24	EFF2	88	88	0.89	13.8		► 1LA7 131-2AAQQ		48
11	12.6	160 M	2930	36	EFF2	89.5	89.5	0.88	20		► 1LA7 163-2AAQQ		68
15	17.3	160 M	2930	49	EFF2	90	90.2	0.9	26.5		► 1LA7 164-2AAQQ		77
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32		► 1LA7 166-2AAQQ		86
22	24.5	180 M	2940	71	EFF2	91.7	91.7	0.88	39.5 ¹⁾		1LA5 183-2AAQQ		113
30	33.5	200 L	2945	97	EFF2	92.3	92.3	0.89	53		1LA5 206-2AAQQ		159
37	41.5	200 L	2945	120	EFF2	92.8	92.8	0.89	65 ¹⁾		1LA5 207-2AAQQ		179
45	51	225 M	2960	145	EFF2	93.6	93.6	0.89	78 ¹⁾		1LA5 223-2AAQQ		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 (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 V3	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
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "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 improved efficiency – Aluminum series 1LA7/1LA5

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	Torque class	Moment of inertia	Noise at rated output	
	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)
► Phase-out model							
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-2AAQQ	2	3.7	2.3	16	0.00015	41	52
1LA7 053-2AAQQ	2.1	3.7	2.4	16	0.00015	41	52
1LA7 060-2AAQQ	2	3.7	2.2	16	0.00018	49	60
1LA7 063-2AAQQ	2	4	2.2	16	0.00022	49	60
1LA7 070-2AAQQ	2.3	3.5	2.3	16	0.00029	52	63
1LA7 073-2AAQQ	2.5	4.3	2.6	16	0.00041	52	63
1LA7 080-2AAQQ	2.3	5.6	2.4	16	0.00079	56	67
1LA7 083-2AAQQ	2.6	6.1	2.7	16	0.001	56	67
1LA7 090-2AAQQ	2.4	5.5	2.7	16	0.0014	62	74
1LA7 096-2AAQQ	2.8	6.3	3.1	16	0.0018	62	74
► 1LA7 106-2AAQQ	2.8	6.8	3	16	0.0035	62	74
► 1LA7 113-2AAQQ	2.6	7.2	2.9	16	0.0059	63	75
► 1LA7 130-2AAQQ	2	5.9	2.8	16	0.015	68	80
► 1LA7 131-2AAQQ	2.3	6.9	3	16	0.019	68	80
► 1LA7 163-2AAQQ	2.1	6.5	2.9	16	0.034	70	82
► 1LA7 164-2AAQQ	2.2	6.6	3	16	0.043	70	82
► 1LA7 166-2AAQQ	2.4	7	3.1	16	0.051	70	82
1LA5 183-2AAQQ	2.5	6.9	3.2	16	0.077	70	83
1LA5 206-2AAQQ	2.4	7.2	2.8	16	0.14	71	84
1LA5 207-2AAQQ	2.4	7.7	2.8	16	0.16	71	84
1LA5 223-2AAQQ	2.8	7.7	3.4	16	0.2	71	84

- The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		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
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						
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A		► Phase-out model		
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
0.06	0.07	56 M	1350	0.42		56	55	0.77	0.2		1LA7 050-4ABQQ		3
0.09	0.11	56 M	1350	0.64		58	57	0.77	0.29		1LA7 053-4ABQQ		3
0.12	0.14	63 M	1350	0.85		55	54	0.75	0.42		1LA7 060-4ABQQ		3.5
0.18	0.21	63 M	1350	1.3		59	60	0.76	0.58		1LA7 063-4ABQQ		4.1
0.25	0.29	71 M	1350	1.8		60	60	0.78	0.77		1LA7 070-4ABQQ		4.8
0.37	0.43	71 M	1370	2.6		65	65	0.78	1.06		1LA7 073-4ABQQ		6
0.55	0.63	80 M	1395	3.8		67	67	0.81	1.46		1LA7 080-4AAQQ		9
0.75	0.86	80 M	1395	5.1		72	72	0.8	1.91		1LA7 083-4AAQQ		10
1.1	1.3	90 S	1415	7.4		77	77	0.81	2.55		1LA7 090-4AAQQ		13
1.5	1.75	90 L	1420	10	EFF2	79	79	0.81	3.4		1LA7 096-4AAQQ		15.6
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7	►	1LA7 106-4AAQQ		21
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4	►	1LA7 107-4AAQQ		24
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2	►	1LA7 113-4AAQQ		31
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4	►	1LA7 130-4AAQQ		41
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2	►	1LA7 133-4AAQQ		49
11	12.6	160 M	1460	72	EFF2	88.5	89	0.84	21.5	►	1LA7 163-4AAQQ		73
15	17.3	160 L	1460	98	EFF2	90	90.2	0.84	28.5	►	1LA7 166-4AAQQ		85
18.5	21.3	180 M	1460	121	EFF2	90.5	90.5	0.83	35.5 ¹⁾		1LA5 183-4AAQQ		113
22	25.3	180 L	1460	144	EFF2	91.2	91.2	0.84	41.5 ¹⁾		1LA5 186-4AAQQ		123
30	34.5	200 L	1465	196	EFF2	91.8	91.8	0.86	55		1LA5 207-4AAQQ		157
37	42.5	225 NO	1470	240	EFF2	92.9	92.9	0.87	66 ¹⁾		1LA5 220-4AAQQ		206
45	52	225 M	1470	292	EFF2	93.4	93.4	0.87	80 ¹⁾		1LA5 223-4AAQQ		232

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 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
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "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 improved efficiency – Aluminum series 1LA7/1LA5

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 at rated output	
	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)
► Phase-out model							
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 050-4ABQQ	1.9	2.6	1.9	13	0.00027	42	53
1LA7 053-4ABQQ	1.9	2.6	1.9	13	0.00027	42	53
1LA7 060-4ABQQ	1.9	2.8	2	13	0.00029	42	53
1LA7 063-4ABQQ	1.9	3	1.9	13	0.00037	42	53
1LA7 070-4ABQQ	1.9	3	1.9	13	0.00052	44	55
1LA7 073-4ABQQ	1.9	3.3	2.1	13	0.00077	44	55
1LA7 080-4AAQQ	2.2	3.9	2.2	16	0.0014	47	58
1LA7 083-4AAQQ	2.3	4.2	2.3	16	0.0017	47	58
1LA7 090-4AAQQ	2.3	4.6	2.4	16	0.0024	50	62
1LA7 096-4AAQQ	2.4	5.3	2.6	16	0.0033	50	62
► 1LA7 106-4AAQQ	2.5	5.6	2.8	16	0.0047	56	68
► 1LA7 107-4AAQQ	2.7	5.6	3	16	0.0055	56	68
► 1LA7 113-4AAQQ	2.7	6	3	16	0.012	53	65
► 1LA7 130-4AAQQ	2.5	6.3	3.1	16	0.018	62	74
► 1LA7 133-4AAQQ	2.7	6.7	3.2	16	0.023	62	74
► 1LA7 163-4AAQQ	2.2	6.2	2.7	16	0.043	66	78
► 1LA7 166-4AAQQ	2.6	6.5	3	16	0.055	66	78
1LA5 183-4AAQQ	2.3	7.5	3	16	0.13	63	76
1LA5 186-4AAQQ	2.3	7.5	3	16	0.15	63	76
1LA5 207-4AAQQ	2.6	7	3.2	16	0.24	65	78
1LA5 220-4AAQQ	2.8	7	3.2	16	0.32	65	78
1LA5 223-4AAQQ	2.8	7.7	3.3	16	0.36	65	78

- The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		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
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				
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		IM B3 type of construction approx.
									► Phase-out model		m kg
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection											
0.09	0.1	63 M	850	1		45	41.5	0.66	0.44	1LA7 063-6ABQQ	4.1
0.18	0.21	71 M	850	2		53	54.5	0.68	0.72	1LA7 070-6AAQQ	5
0.25	0.29	71 M	830	2.8		60	58.5	0.76	0.79	1LA7 073-6AAQQ	6.3
0.37	0.43	80 M	920	3.8		62	60.5	0.72	1.2	1LA7 080-6AAQQ	9
0.55	0.63	80 M	910	5.8		67	66.5	0.74	1.6	1LA7 083-6AAQQ	10
0.75	0.86	90 S	915	7.8		69	69	0.76	2.05	1LA7 090-6AAQQ	12.5
1.1	1.3	90 L	915	11		72	72	0.77	2.85	1LA7 096-6AAQQ	15.7
1.5	1.75	100 L	925	15		74	74	0.75	3.9	► 1LA7 106-6AAQQ	21
2.2	2.55	112 M	940	22		78	78.5	0.78	5.2	► 1LA7 113-6AAQQ	26
3	3.45	132 S	950	30		79	79.5	0.76	7.2	► 1LA7 130-6AAQQ	38
4	4.6	132 M	950	40		80.5	80.5	0.76	9.4	► 1LA7 133-6AAQQ	44
5.5	6.3	132 M	950	55		83	83	0.76	12.6	► 1LA7 134-6AAQQ	52
7.5	8.6	160 M	960	75		86	86	0.74	17	► 1LA7 163-6AAQQ	74
11	12.6	160 L	960	109		87.5	87.5	0.74	24.5	► 1LA7 166-6AAQQ	95
15	18	180 L	970	148		89.5	89.5	0.77	31.5	1LA5 186-6AAQQ	126
18.5	22	200 L	975	181		90.2	90.2	0.77	38.5	1LA5 206-6AAQQ	161
22	26.5	200 L	975	215		90.8	90.8	0.77	45.5	1LA5 207-6AAQQ	183
30	36	225 M	978	293		91.8	91.8	0.77	61 ¹⁾	1LA5 223-6AAQQ	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 ²⁾ IM V3	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 QQ	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓
1LA7 06 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 07 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 08 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 09 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 10 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 11 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 13 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA7 16 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓
1LA5 18 QQ	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 20 QQ	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–
1LA5 22 QQ	○	○	○	○	○	○	□	✓ ⁴⁾	✓	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "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 improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated 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 at rated output Measuring surface sound pressure level at 50 Hz L_{pFA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
▶ Phase-out model							
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (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

- ▶ The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21 or under "General Line motors with shorter delivery time" (defined versions - voltages, types of construction, motor protection and location of the connection boxes) Pages 1/8 to 1/17.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at		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
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				
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		IM B3 type of construction approx.
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection										► Phase-out model	m kg
0.09	0.1	71 M	630	1.4	53	54.5	0.68	0.36	1LA7 070-8ABQQ		6.3
0.12	0.14	71 M	645	1.8	53	49.5	0.64	0.51	1LA7 073-8ABQQ		6.3
0.18	0.21	80 M	675	2.5	51	49.5	0.68	0.75	1LA7 080-8ABQQ		9
0.25	0.29	80 M	685	3.5	55	50.5	0.64	1.02	1LA7 083-8ABQQ		10
0.37	0.43	90 S	675	5.2	63	62	0.75	1.14	1LA7 090-8ABQQ		10.5
0.55	0.63	90 L	675	7.8	66	65	0.76	1.58	1LA7 096-8ABQQ		13.2
0.75	0.86	100 L	680	11	66	65	0.76	2.15	► 1LA7 106-8ABQQ		19
1.1	1.3	100 L	680	15	72	72	0.76	2.9	► 1LA7 107-8ABQQ		22
1.5	1.75	112 M	705	20	74	74	0.76	3.85	► 1LA7 113-8ABQQ		24
2.2	2.55	132 S	700	30	75	75	0.74	5.7	► 1LA7 130-8ABQQ		38
3	3.45	132 M	700	41	77	77.5	0.74	7.6	► 1LA7 133-8ABQQ		44
4	4.6	160 M	715	53	80	80	0.72	10	► 1LA7 163-8ABQQ		64
5.5	6.3	160 M	710	74	83.5	83.5	0.73	13	► 1LA7 164-8ABQQ		74
7.5	8.6	160 L	715	100	85.5	85.5	0.72	17.6	► 1LA7 166-8ABQQ		94
11	13.2	180 L	725	145	87	87	0.75	24.5	1LA5 186-8ABQQ		128
15	18	200 L	725	198	87.5	87.5	0.78	31.5	1LA5 207-8ABQQ		176
18.5	22	225 NO	725	244	89.2	89.2	0.79	38	1LA5 220-8ABQQ		184
22	26.5	225 M	725	290	90.6	90.6	0.79	44.5	1LA5 223-8ABQQ		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 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	3	5	1	6	0	1	4	6	2	7	3	
1LA7 05 QQ	○	○	○	–	○	○	□	✓	–	✓	✓	✓	✓	
1LA7 06 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 07 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 08 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 09 QQ	○	○	○	–	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 10 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 11 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 13 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA7 16 QQ	○	○	○	○	○	○	□	✓	✓	✓	✓	✓	✓	
1LA5 18 QQ	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA5 20 QQ	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	
1LA5 22 QQ	○	○	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	

- Standard version
 ○ Without additional charge
 ✓ With additional 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 improved efficiency – Aluminum series 1LA7/1LA5

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 at rated output 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	$L_{p(A)}$ dB(A)	L_{WA} dB(A)
► Phase-out model							
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA7 070-8ABQQ	1.9	2.2	1.7	13	0.0008	36	47
1LA7 073-8ABQQ	2.2	2.2	2	13	0.0008	36	47
1LA7 080-8ABQQ	1.7	2.3	1.9	13	0.0014	41	52
1LA7 083-8ABQQ	2	2.6	2.2	13	0.0017	41	52
1LA7 090-8ABQQ	1.6	2.9	1.8	13	0.0023	41	53
1LA7 096-8ABQQ	1.7	3	1.9	13	0.0031	41	53
► 1LA7 106-8ABQQ	1.6	3	1.9	13	0.0051	45	57
► 1LA7 107-8ABQQ	1.8	3.3	2.1	13	0.0063	45	57
► 1LA7 113-8ABQQ	1.8	3.7	2.1	13	0.013	49	61
► 1LA7 130-8ABQQ	1.9	3.9	2.3	13	0.014	53	65
► 1LA7 133-8ABQQ	2.1	4.1	2.4	13	0.019	53	65
► 1LA7 163-8ABQQ	2.2	4.5	2.6	13	0.036	63	75
► 1LA7 164-8ABQQ	2.3	4.7	2.7	13	0.046	63	75
► 1LA7 166-8ABQQ	2.7	5.3	3	13	0.064	63	75
1LA5 186-8ABQQ	2	5	2.2	13	0.21	60	73
1LA5 207-8ABQQ	2.1	5	2.2	13	0.37	58	71
1LA5 220-8ABQQ	2.1	4.5	2.2	13	0.37	58	71
1LA5 223-8ABQQ	2.2	4.8	2.3	13	0.45	58	71

- The Order No. for 1LA7 motors marked with this symbol are phase-out models.
1LE1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-ventilated energy-saving motors with improved efficiency" Pages 1/18 to 1/21.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7/1LA5

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	Power factor 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		FS	n_{rated} rpm		T_{rated} Nm		η_{rated} %		$\cos\phi_{\text{rated}}$		I_{rated} A				m kg
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit															
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											
	230 V	400 V	500 V	690 V	Without flange	With flange			With standard flange			With special flange
					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
 ○ Without additional charge
 ✓ With additional 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 improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting 1500 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of torque 3000 rpm T_{LR}/T_{rated}	Locked-rotor 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
4/2-pole, 1500/3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 060-0AA00	1.8	1.8	2.7	2.9	1.8	1.8	10	0.00029
1LA7 063-0AA00	2	2	3	3.3	2	2	10	0.0004
1LA7 070-0AA00	1.6	1.6	3	3.1	1.8	1.8	10	0.00052
1LA7 073-0AA00	1.8	1.8	3.7	3.8	2	2	10	0.00076
1LA7 080-0AA00	1.7	1.7	3.9	4	2	2	10	0.0014
1LA7 083-0AA00	1.8	1.8	4.3	4.3	2.1	2.1	10	0.0017
1LA7 090-0AA00	1.6	1.8	4.2	4.3	1.9	2	13	0.0024
1LA7 096-0AA00	1.9	1.9	4.9	5.3	2	2.1	13	0.0033
1LA7 106-0AA00	1.8	1.8	5	5.5	2	2.1	13	0.0048
1LA7 107-0AA00	2.3	2.4	5.6	5.6	2.4	2.4	13	0.0055
1LA7 113-0AA00	2	2.2	5.6	5.8	2.2	2.3	13	0.011
1LA7 130-0AA00	1.7	1.6	6.3	6.5	2.2	2.2	10	0.018
1LA7 133-0AA00	2	2.1	6.9	7.5	2.5	2.6	10	0.023
1LA7 163-0AA00	2	1.8	6.7	7.4	2.6	2.4	10	0.043
1LA7 166-0AA00	2.5	2.8	7.6	8.5	3	3	10	0.06
1LA5 183-0AA00	2.1	2.2	6.7	7.5	2.7	3.2	13	0.13
1LA5 186-0AA00	2	2.2	6.4	7.3	2.6	3.1	13	0.15
1LA5 207-0AA00	2.6	2.6	6.7	7.5	2.8	3.3	13	0.24

See catalog part "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 improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Rated output at 50 Hz, 750 rpm	1500 rpm	Frame size	Rated speed at 50 Hz, 750 rpm	1500 rpm	Rated torque at 50 Hz, 750 rpm	1500 rpm	Efficiency at 50 Hz 4/4-load 750 rpm	1500 rpm	Power factor at 50 Hz 4/4-load 750 rpm	1500 rpm	Rated current at 400 V, 50 Hz 750 rpm	1500 rpm	Order No.	Price	Weight motor
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 155 (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	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
 ○ Without additional charge
 ✓ With additional 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 improved efficiency – Aluminum series 1LA7/1LA5

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque 750 rpm T_{LR}/T_{rated}	Locked-rotor torque as multiple of current 1500 rpm T_{LR}/T_{rated}	Locked-rotor current torque 750 rpm I_{LR}/I_{rated}	Locked-rotor current torque 1500 rpm I_{LR}/I_{rated}	Breakdown torque 750 rpm T_B/T_{rated}	Breakdown torque 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 155 (F), IP55 degree of protection, double pole-changing for constant load torque with one winding connected in Dahlander circuit								
1LA7 090-0ABQQ	1.3	1.3	2.5	3.2	1.6	1.6	10	0.0023
1LA7 096-0ABQQ	1.4	1.5	3	3.5	1.7	1.8	10	0.0031
1LA7 106-0ABQQ	1.7	1.6	3.3	3.5	2	1.9	10	0.0051
1LA7 107-0ABQQ	1.8	1.6	3.5	3.6	2	1.9	10	0.0063
1LA7 113-0ABQQ	1.4	1.5	3.6	4.4	1.7	1.8	10	0.013
1LA7 130-0ABQQ	2	1.3	4.3	5.4	2.3	1.8	10	0.018
1LA7 133-0ABQQ	2	1.3	4.3	5.4	2.3	1.8	10	0.023
1LA7 163-0ABQQ	2	1.4	4	5.4	2.3	1.8	10	0.043
1LA7 166-0ABQQ	2.2	1.7	4.2	5.9	2.4	2	10	0.06
1LA5 186-0ABQQ	1.9	2	5.2	6.2	2.2	2.2	13	0.21
1LA5 207-0ABQQ	2.4	2.3	5.4	6.6	2.5	2.5	13	0.37

See catalog part “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 – Aluminum 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
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF1	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	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 155 (F), IP55 degree of protection, for use according to CEMEP												
0.09	56 M	2830	0.3		70	70	0.76	0.24	1LA9 050-2KAQQ			3
0.12	56 M	2830	0.4		70	70	0.81	0.31	1LA9 053-2KAQQ			3.8
0.18	63 M	2840	0.61		70	70	0.78	0.48	1LA9 060-2KAQQ			4.1
0.25	63 M	2840	0.84		72	72	0.8	0.63	1LA9 063-2KAQQ			5.1
0.37	71 M	2840	1.2		74	74	0.77	0.94	1LA9 070-2KAQQ			6
0.55	71 M	2835	1.9		75	75	0.75	1.42	1LA9 073-2KAQQ			7.2
0.75	80 M	2870	2.5		80	80	0.82	1.66	1LA9 080-2KAQQ			9.8
1.1	80 M	2860	3.7	EFF1	84	84	0.89	2.1	1LA9 083-2KAQQ			12.3
1.5	90 S	2890	5	EFF1	85	85	0.87	2.95	1LA9 090-2KAQQ			15
2.2	90 L	2890	7.3	EFF1	86.5	86.5	0.87	4.2	1LA9 096-2KAQQ			18.6
3	100 L	2890	9.9	EFF1	87	87	0.88	5.7	1LA9 106-2KAQQ			24
4	112 M	2905	13	EFF1	88.5	88.5	0.89	7.3	1LA9 113-2KAQQ			35
5.5	132 S	2930	18	EFF1	89.5	89.5	0.9	9.9	1LA9 130-2KAQQ			43
7.5	132 S	2930	24	EFF1	90.5	90.5	0.92	13	1LA9 131-2KAQQ			56
11	160 M	2945	36	EFF1	91	91	0.9	19.4	1LA9 163-2KAQQ			73
15	160 M	2945	49	EFF1	91.5	91.5	0.9	26.5	1LA9 164-2KAQQ			82
18.5	160 L	2940	60	EFF1	92.3	92.5	0.92	31.5	1LA9 166-2KAQQ			102
22	180 M	2945	71	EFF1	93	93.2	0.89	38.5 ¹⁾	1LA9 183-2WAQQ			131
30	200 L	2950	97	EFF1	93.5	93.5	0.89	52	1LA9 206-2WAQQ			185
37	200 L	2950	120	EFF1	94	94.1	0.89	64 ¹⁾	1LA9 207-2WAQQ			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 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 QQ	○	○	○	–	□	✓	–	–	✓	✓	✓	✓
1LA9 06 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 07 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 08 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 09 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 18 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–
1LA9 20 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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)
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 050-2KAQQ	3.6	4.5	3	16	0.00015	41	52
1LA9 053-2KAQQ	3.2	4.3	2.8	16	0.0002	41	52
1LA9 060-2KAQQ	2.8	4.8	3.1	16	0.00022	49	60
1LA9 063-2KAQQ	2.5	4.9	2.5	16	0.00026	49	60
1LA9 070-2KAQQ	3.3	6.5	3.1	16	0.00041	52	63
1LA9 073-2KAQQ	3.6	6.3	2.9	16	0.0005	52	63
1LA9 080-2KAQQ	4.4	8.3	3.2	16	0.001	56	67
1LA9 083-2KAQQ	3.8	7	3.2	16	0.0013	56	67
1LA9 090-2KAQQ	4.1	7	3.5	16	0.0018	60	72
1LA9 096-2KAQQ	4.1	7	3.5	16	0.0022	60	72
1LA9 106-2KAQQ	3.4	7	3.2	16	0.0044	62	74
1LA9 113-2KAQQ	2.8	7	3.2	16	0.0077	63	75
1LA9 130-2KAQQ	2.7	7	3.2	16	0.019	68	80
1LA9 131-2KAQQ	2.8	7	3.1	16	0.024	68	80
1LA9 163-2KAQQ	2.5	7	3.1	16	0.044	70	82
1LA9 164-2KAQQ	2.5	7	3.1	16	0.051	70	82
1LA9 166-2KAQQ	2.4	7	3.1	16	0.065	70	82
1LA9 183-2WAQQ	2.6	7.2	3.3	16	0.09	70	83
1LA9 206-2WAQQ	2.5	7	3.2	16	0.16	71	84
1LA9 207-2WAQQ	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 – Aluminum series 1LA9

Selection and ordering data (continued)

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
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF I	η_{rated} %	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	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 155 (F), IP55 degree of protection, for use according to CEMEP											
0.06	56 M	1380	0.42		61	61	0.66	0.22	1LA9 050-4KAQQ		3
0.09	56 M	1390	0.62		62	62	0.68	0.31	1LA9 053-4KAQQ		3.8
0.12	63 M	1395	0.82		66	66	0.65	0.41	1LA9 060-4KAQQ		4.1
0.18	63 M	1395	1.3		65	65	0.68	0.59	1LA9 063-4KAQQ		5.1
0.25	71 M	1410	1.7		70	70	0.64	0.81	1LA9 070-4KAQQ		6
0.37	71 M	1385	2.6		71	71	0.73	1.04	1LA9 073-4KAQQ		7.2
0.55	80 M	1410	3.7		77	77	0.78	1.32	1LA9 080-4KAQQ		9.8
0.75	80 M	1400	5.1		81	81	0.75	1.78	1LA9 083-4KAQQ		12.3
1.1	90 S	1440	7.3	EFF1	84	84	0.77	2.45	1LA9 090-4KAQQ		15
1.5	90 L	1440	9.9	EFF1	85	85	0.77	3.3	1LA9 096-4KAQQ		18
2.2	100 L	1435	15	EFF1	86.5	86.5	0.82	4.5	1LA9 106-4KAQQ		25
3	100 L	1435	20	EFF1	87.5	87.7	0.81	6.1	1LA9 107-4KAQQ		30
4	112 M	1440	27	EFF1	88.5	89	0.81	8.1	1LA9 113-4KAQQ		37
5.5	132 S	1455	36	EFF1	89.5	89.5	0.84	10.6	1LA9 130-4KAQQ		45
7.5	132 M	1455	49	EFF1	90.3	90.5	0.84	14.2	1LA9 133-4KAQQ		60
11	160 M	1460	72	EFF1	91.5	92	0.85	20.5	1LA9 163-4KAQQ		81
15	160 L	1460	98	EFF1	92	92.3	0.86	27.5	1LA9 166-4KAQQ		107
18.5	180 M	1465	121	EFF1	92.5	93	0.84	34.5 ¹⁾	1LA9 183-4WAQQ		126
22	180 L	1465	143	EFF1	93	93.4	0.84	40.5 ¹⁾	1LA9 186-4WAQQ		146
30	200 L	1465	196	EFF1	93.5	94	0.87	53	1LA9 207-4WAQQ		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 QQ	○	○	○	–	□	✓	–	–	✓	✓	✓	✓
1LA9 06 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 07 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 08 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 09 QQ	○	○	○	–	□	✓	✓	✓	✓	✓	✓	✓
1LA9 10 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 11 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 13 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 16 QQ	○	○	○	○	□	✓	✓	✓	✓	✓	✓	✓
1LA9 18 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–
1LA9 20 QQ	○	○	○	○	□	✓ ³⁾	✓	✓	–	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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)
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 050-4KAQQ	2.7	3.1	2.8	16	0.00027	42	53
1LA9 053-4KAQQ	2.8	3.2	2.8	16	0.00035	42	53
1LA9 060-4KAQQ	2.7	3.5	2.6	16	0.00037	42	53
1LA9 063-4KAQQ	3	3.6	2.5	16	0.00045	42	53
1LA9 070-4KAQQ	3.6	4.3	3.1	16	0.00076	44	55
1LA9 073-4KAQQ	3.3	4.2	3	16	0.00095	44	55
1LA9 080-4KAQQ	3.4	5.6	2.9	16	0.0017	47	58
1LA9 083-4KAQQ	4	5.8	3.5	16	0.0024	47	58
1LA9 090-4KAQQ	3.1	6.4	3.2	16	0.0033	48	60
1LA9 096-4KAQQ	3.6	6.7	3.4	16	0.004	48	60
1LA9 106-4KAQQ	3.4	7	3.6	16	0.0062	53	65
1LA9 107-4KAQQ	3.8	7	3.9	16	0.0077	53	65
1LA9 113-4KAQQ	3.2	6.9	3.2	16	0.014	53	65
1LA9 130-4KAQQ	3.2	7	3.6	16	0.023	62	74
1LA9 133-4KAQQ	3.4	7	3.6	16	0.029	62	74
1LA9 163-4KAQQ	2.6	6.9	3.2	16	0.055	66	78
1LA9 166-4KAQQ	2.8	7	3.3	16	0.072	66	78
1LA9 183-4WAQQ	2.8	7	3.2	16	0.15	63	76
1LA9 186-4WAQQ	3.1	7.3	3.4	16	0.19	63	76
1LA9 207-4WAQQ	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 – Aluminum series 1LA9

Selection and ordering data (continued)

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
P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	Efficiency Class according to CEMEP	η_{rated} %	η_{rated} %	$\cos \phi_{\text{rated}}$	I_{rated} A	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 155 (F), IP55 degree of protection, for use according to CEMEP											
0.75	90 S	925	7.7		75.5	75.5	0.72	2	1LA9 090-6KAQQ		15.7
1.1	90 L	940	11		82	82	0.7	2.75	1LA9 096-6KAQQ		19
1.5	100 L	935	15		85	85	0.73	3.6	1LA9 106-6KAQQ		25
2.2	112 M	955	22		84	84	0.7	5.4	1LA9 113-6KAQQ		37
4	132 M	950	40		84	84	0.81	8.5	1LA9 133-6KAQQ		49
5.5	132 M	960	55		86	86	0.77	12	1LA9 134-6KAQQ		64
7.5	160 M	965	74		88	88	0.72	17	1LA9 163-6KAQQ		98
11	160 L	960	109		88.5	88.5	0.78	23	1LA9 166-6KAQQ		105
15	180 L	970	148		91	91	0.75	31.5	1LA9 186-6WAQQ		144
18.5	200 L	975	181		91	91	0.77	38	1LA9 206-6WAQQ		186
22	200 L	975	215		91.5	91.5	0.77	45	1LA9 207-6WAQQ		217

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, 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
 ○ Without additional charge
 ✓ With additional 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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP							
1LA9 090-6KAQQ	3	4.4	2.5	16	0.0033	43	55
1LA9 096-6KAQQ	3.7	5.7	3.2	16	0.005	43	55
1LA9 106-6KAQQ	3.5	6.2	3.4	16	0.0065	47	59
1LA9 113-6KAQQ	2.9	6.2	3	16	0.014	52	64
1LA9 133-6KAQQ	3	6.3	2.7	16	0.025	63	75
1LA9 134-6KAQQ	3.7	7.3	3.6	16	0.03	63	75
1LA9 163-6KAQQ	2.4	5.5	2.5	16	0.063	66	78
1LA9 166-6KAQQ	3.1	6.9	3.2	16	0.072	66	78
1LA9 186-6WAQQ	2.2	6.5	2.5	16	0.19	66	78
1LA9 206-6WAQQ	2.8	6.2	2.5	16	0.28	66	78
1LA9 207-6WAQQ	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 – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 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 IM B3 type of construction 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 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
0.12	56 M	3440	0.25	No	70	0.74	0.23	1LA9 050-2KAQQ		3
0.16	56 M	3440	0.33	No	71	0.76	0.28	1LA9 053-2KAQQ		3.8
0.25	63 M	3440	0.53	No	71	0.79	0.4	1LA9 060-2KAQQ		4.1
0.33	63 M	3460	0.69	No	72	0.76	0.56	1LA9 063-2KAQQ		5.1
0.5	71 M	3445	1	No	72	0.75	0.86	1LA9 070-2KAQQ		6
0.75	71 M	3445	1.6	No	73	0.73	1.3	1LA9 073-2KAQQ		7.2
1	80 M	3485	2	Yes	75.5	0.82	1.52	1LA9 080-2KAQQ		9.8
1.5	80 M	3480	3.1	Yes	82.5	0.88	1.9	1LA9 083-2KAQQ		12.3
2	90 S	3510	4.1	Yes	84	0.86	2.6	1LA9 090-2KAQQ		15
3	90 L	3510	6.1	Yes	85.5	0.85	3.8	1LA9 096-2KAQQ		18.6
4	100 L	3510	8.1	No	86.5	0.87	5	1LA9 106-2KAQQ		24
5	112 M	3540	10	Yes	87.5	0.88	6	1LA9 113-2KAQQ		35
7.5	132 S	3540	15	Yes	88.5	0.9	8.7	1LA9 130-2KAQQ		43
10	132 S	3540	20	Yes	89.5	0.92	11.4	1LA9 131-2KAQQ		56
15	160 M	3555	30	Yes	90.2	0.9	17	1LA9 163-2KAQQ		73
20	160 M	3555	40	Yes	90.2	0.9	23.2	1LA9 164-2KAQQ		82
25	160 L	3550	50	Yes	91	0.92	27.7	1LA9 166-2KAQQ		102
30	180 M	3545	60	Yes	91	0.86	36	1LA9 183-2WAQQ		131
40	200 L	3555	80	Yes	91.7	0.88	46.5	1LA9 206-2WAQQ		185
50	200 L	3555	100	Yes	92.4	0.88	57	1LA9 207-2WAQQ		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	With special flange	
	460 VY (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 B34	IM B14, IM V19, IM V18 without protective cover
	1	6	0	1	4	6	2	7	3
1LA9 05 QQ	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-2KAQQ	3.6	5.5	3.8	16	0.00015	45	56
1LA9 053-2KAQQ	3.2	5.4	3.4	16	0.0002	45	56
1LA9 060-2KAQQ	2.8	4.9	3.3	16	0.00022	53	64
1LA9 063-2KAQQ	2.5	5	2.7	16	0.00026	53	64
1LA9 070-2KAQQ	3.3	7.5	3.4	16	0.00041	56	67
1LA9 073-2KAQQ	3.4	7.2	3.7	16	0.0005	56	67
1LA9 080-2KAQQ	4.4	9.6	4.4	16	0.001	60	71
1LA9 083-2KAQQ	3.8	8.6	3.2	16	0.0013	60	71
1LA9 090-2KAQQ	4.1	8.6	4.1	16	0.0018	64	76
1LA9 096-2KAQQ	4.1	8.5	5.1	16	0.0022	64	76
1LA9 106-2KAQQ	3.4	8.6	3.7	16	0.0044	66	78
1LA9 113-2KAQQ	2.8	9.2	4	16	0.0077	67	79
1LA9 130-2KAQQ	2.7	8.5	3.8	16	0.019	72	84
1LA9 131-2KAQQ	2.8	8.3	3.7	16	0.024	72	84
1LA9 163-2KAQQ	2.5	8.5	3.7	16	0.044	74	86
1LA9 164-2KAQQ	2.5	8.5	3.7	16	0.051	74	86
1LA9 166-2KAQQ	2.4	8.5	3.5	16	0.065	74	86
1LA9 183-2WAQQ	2.6	8.6	3.5	16	0.09	74	87
1LA9 206-2WAQQ	2.5	8.4	3.6	16	0.16	75	88
1LA9 207-2WAQQ	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 – Aluminum series 1LA9

Selection and ordering data (continued)

Rated output at 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 IM B3 type of construction approx. m 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			
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
0.08	56 M	1715	0.33	No	63	0.65	0.18	1LA9 050-4KAQQ		3
0.12	56 M	1725	0.5	No	64	0.6	0.29	1LA9 053-4KAQQ		3.8
0.16	63 M	1710	0.66	No	68	0.6	0.37	1LA9 060-4KAQQ		4.1
0.25	63 M	1705	1.1	No	66	0.63	0.54	1LA9 063-4KAQQ		5.1
0.33	71 M	1730	1.4	No	69	0.6	0.76	1LA9 070-4KAQQ		6
0.5	71 M	1725	2.1	No	70	0.68	0.98	1LA9 073-4KAQQ		7.2
0.75	80 M	1725	3.1	No	75.5	0.74	1.24	1LA9 080-4KAQQ		9.8
1	80 M	1720	4.1	Yes	82.5	0.75	1.59	1LA9 083-4KAQQ		12.3
1.5	90 S	1755	6.1	Yes	84	0.76	2.15	1LA9 090-4KAQQ		15
2	90 L	1755	8.1	Yes	84	0.76	2.95	1LA9 096-4KAQQ		18
3	100 L	1750	12	No	87.5	0.79	4	1LA9 106-4KAQQ		25
4	100 L	1750	16	No	87.5	0.79	5.5	1LA9 107-4KAQQ		30
5	112 M	1755	20	Yes	87.5	0.79	6.7	1LA9 113-4KAQQ		37
7.5	132 S	1760	30	Yes	89.5	0.81	9.5	1LA9 130-4KAQQ		45
10	132 M	1760	40	Yes	89.5	0.82	12.8	1LA9 133-4KAQQ		60
15	160 M	1765	61	Yes	91	0.85	17.9	1LA9 163-4KAQQ		81
20	160 L	1765	81	Yes	91	0.85	24.5	1LA9 166-4KAQQ		107
25	180 M	1770	101	Yes	92.4	0.83	30.5	1LA9 183-4WAQQ		126
30	180 L	1770	121	Yes	92.4	0.83	36	1LA9 186-4WAQQ		146
40	200 L	1770	161	Yes	93	0.86	47	1LA9 207-4WAQQ		199

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ (see "Introduction" for outputs at 60 Hz)	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 QQ	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 050-4KAQQ	2.7	3.4	3	16	0.00027	46	57
1LA9 053-4KAQQ	2.8	3.5	3	16	0.00035	46	57
1LA9 060-4KAQQ	2.7	3.9	2.8	16	0.00037	46	57
1LA9 063-4KAQQ	3	3.6	3.1	16	0.00045	46	57
1LA9 070-4KAQQ	3.6	4.9	3.4	16	0.00076	48	59
1LA9 073-4KAQQ	3.3	4.9	3.4	16	0.00095	48	59
1LA9 080-4KAQQ	3.4	6.8	3.6	16	0.0017	51	62
1LA9 083-4KAQQ	4	7.3	3.9	16	0.0024	51	62
1LA9 090-4KAQQ	3.1	7.7	3.9	16	0.0033	52	64
1LA9 096-4KAQQ	3.6	8.1	4.2	16	0.004	52	64
1LA9 106-4KAQQ	3.4	8.4	4.3	16	0.0062	57	69
1LA9 107-4KAQQ	3.8	8.7	4.6	16	0.0077	57	69
1LA9 113-4KAQQ	3.2	8.6	3.9	16	0.014	57	69
1LA9 130-4KAQQ	3.2	8.7	4.1	16	0.023	66	78
1LA9 133-4KAQQ	3.4	8.7	4.1	16	0.029	66	78
1LA9 163-4KAQQ	2.6	8.1	3.2	16	0.055	70	82
1LA9 166-4KAQQ	2.8	8.5	3.5	16	0.072	70	82
1LA9 183-4WAQQ	2.8	8.4	3.6	16	0.15	67	80
1LA9 186-4WAQQ	3.1	8.8	3.9	16	0.19	67	80
1LA9 207-4WAQQ	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 – Aluminum series 1LA9

Selection and ordering data (continued)

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
		Rated speed at 60 Hz	Rated torque at 60 Hz	EPACT with CC No. CC 032A				For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A			m kg
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
1	90 S	1140	6.2	Yes	80	0.66	1.78	1LA9 090-6KAQQ		15.7
1.5	90 L	1150	9.3	Yes	85.5	0.64	2.55	1LA9 096-6KAQQ		19
2	100 L	1150	12	No	86.5	0.70	3.1	1LA9 106-6KAQQ		25
3	112 M	1160	18	Yes	87.5	0.66	4.8	1LA9 113-6KAQQ		37
5	132 M	1160	31	Yes	87.5	0.77	6.9	1LA9 133-6KAQQ		49
7.5	132 M	1160	46	Yes	89.5	0.73	10.6	1LA9 134-6KAQQ		64
10	160 M	1165	61	Yes	89.5	0.7	15	1LA9 163-6KAQQ		98
15	160 L	1165	92	Yes	90.2	0.77	19	1LA9 166-6KAQQ		105
20	180 L	1175	121	Yes	90.2	0.75	28	1LA9 186-6WAQQ		144
25	200 L	1175	152	Yes	91.7	0.75	34	1LA9 206-6WAQQ		186
30	200 L	1175	182	Yes	91.7	0.75	40	1LA9 207-6WAQQ		217

Order No. supplements

Motor type	Penultimate position: Voltage code		Final position: Type of construction code						
	60 Hz	460 VΔ (see "Introduction" for outputs at 60 Hz)	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 QQ	○	○	□	✓	–	–	✓	✓	✓
1LA9 06 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 07 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 08 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 09 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 10 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 11 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 13 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 16 QQ	○	○	□	✓	✓	✓	✓	✓	✓
1LA9 18 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–
1LA9 20 QQ	○	○	□	✓ ²⁾	✓	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 – Aluminum series 1LA9

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring surface sound pressure level at 60 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT							
1LA9 090-6KAQQ	3	5.6	3	16	0.0033	47	59
1LA9 096-6KAQQ	3.7	6.4	3.7	16	0.005	47	59
1LA9 106-6KAQQ	3.5	7.2	3.8	16	0.0065	51	63
1LA9 113-6KAQQ	2.9	7.5	3.7	16	0.014	56	68
1LA9 133-6KAQQ	3	7.9	3.6	16	0.025	67	79
1LA9 134-6KAQQ	3.7	8.4	4.3	16	0.03	67	79
1LA9 163-6KAQQ	2.4	6.4	2.8	16	0.063	70	82
1LA9 166-6KAQQ	3.1	8.3	3.8	16	0.072	70	82
1LA9 186-6WAQQ	2.8	7.1	2.8	16	0.19	70	82
1LA9 206-6WAQQ	2.8	7.1	2.8	16	0.28	70	82
1LA9 207-6WAQQ	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 –
Aluminum series 1LA9

Selection and ordering data

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. <i>m</i> 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			
<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} %	cos <i>φ</i> _{rated}	<i>I</i> _{rated} A			
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)											
0.2	0.23	56 M	2830	0.67	69	69	0.82	0.51	1LA9 053-2LA00	3.8	
0.33	0.38	63 M	2775	1.1	68	67.5	0.8	0.88	1LA9 060-2LA00	4.1	
0.45	0.52	63 M	2720	1.6	68	67.5	0.84	1.14	1LA9 063-2LA00	5.1	
0.65	0.75	71 M	2720	2.3	72	72	0.83	1.56	1LA9 070-2LA00	6	
0.94	1.08	71 M	2735	3.3	73	73	0.82	2.25	1LA9 073-2LA00	7.2	
1.45	1.67	80 M	2820	4.9	76	76	0.83	3.3	1LA9 080-2LA00	9.8	
1.75	2.01	80 M	2840	5.9	77	77.5	0.82	4	1LA9 083-2LA00	12.3	
2.9	3.34	90 S	2825	9.8	81	81	0.82	6.3	1LA9 090-2LA00	15	
3.8	4.37	90 L	2810	13	81	81	0.85	8	1LA9 096-2LA00	18.6	
4.4	5.06	100 L	2880	15	82	82	0.83	9.3	1LA9 106-2LA00	24	
6.5	7.48	112 M	2900	21	85	85	0.83	13.2	1LA9 113-2LA00	35	
9	10.35	132 S	2895	29	87	87	0.9	16.6	1LA9 130-2LA00	43	
12	13.8	132 S	2905	39	87	87	0.89	22.5	1LA9 131-2LA00	56	
18	20.7	160 M	2910	59	89	89	0.87	33.5	1LA9 163-2LA00	73	
21	24.15	160 M	2910	68	90	90	0.91	37	1LA9 164-2LA00	82	
26	29.9	160 L	2920	85	91	91	0.91	45.5	1LA9 166-2LA00	102	
33	37.95	180 M	2940	107	92	92	0.86	60	1LA9 183-2AA00	131	
44	50.6	200 L	2945	143	92	92	0.86	80	1LA9 206-2AA00	182	
53	60.95	200 L	2945	172	92.5	92.5	0.87	95	1LA9 207-2AA00	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	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
○ Without additional charge
✓ With additional 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 –
Aluminum 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 at rated output	
	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)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)							
1LA9 053-2LAQQ	2.1	4.5	2.3	16	0.0002	41	52
1LA9 060-2LAQQ	2.3	4.4	2.2	16	0.00022	49	60
1LA9 063-2LAQQ	2.2	4.2	2.3	16	0.00026	49	60
1LA9 070-2LAQQ	2.4	4.5	2.5	16	0.00041	52	63
1LA9 073-2LAQQ	2.5	4.8	2.4	16	0.0005	52	63
1LA9 080-2LAQQ	3.1	6.7	3.1	16	0.001	56	67
1LA9 083-2LAQQ	3.7	7.4	3.5	16	0.0013	56	67
1LA9 090-2LAQQ	3.2	6.5	3	16	0.0018	60	72
1LA9 096-2LAQQ	3.1	6.5	2.7	16	0.0022	60	72
1LA9 106-2LAQQ	3	7.8	3.2	16	0.0044	62	74
1LA9 113-2LAQQ	3	8.6	3.8	16	0.0077	63	75
1LA9 130-2LAQQ	2	6.4	2.6	16	0.019	68	80
1LA9 131-2LAQQ	3	7.4	3.2	16	0.024	68	80
1LA9 163-2LAQQ	2.2	7	3.1	16	0.044	70	82
1LA9 164-2LAQQ	2	6.9	2.7	16	0.051	70	82
1LA9 166-2LAQQ	2.2	7.7	3.2	16	0.065	70	82
1LA9 183-2AAQQ	2.5	7.4	3.3	16	0.09	70	83
1LA9 206-2AAQQ	2.4	7.8	3.2	16	0.16	71	84
1LA9 207-2AAQQ	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 –
Aluminum series 1LA9

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.
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} %	$\cos\varphi_{\text{rated}}$	I_{rated} A		m kg	
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)											
0.14	0.16	56 M	1385	0.97	62	60.5	0.74	0.44	1LA9 053-4LA00	3.8	
0.21	0.24	63 M	1335	1.5	60	58.5	0.77	0.66	1LA9 060-4LA00	4.1	
0.29	0.33	63 M	1330	2.1	60	58.5	0.71	0.98	1LA9 063-4LA00	5.1	
0.45	0.52	71 M	1340	3.2	64	63	0.71	1.42	1LA9 070-4LA00	6	
0.6	0.69	71 M	1340	4.3	70	70	0.75	1.64	1LA9 073-4LA00	7.2	
0.9	1.04	80 M	1340	6.4	70	70	0.81	2.3	1LA9 080-4LA00	9.8	
1.25	1.44	80 M	1340	8.9	70	70	0.83	3.1	1LA9 083-4LA00	12.3	
1.8	2.07	90 S	1380	12	77	77.5	0.83	4.05	1LA9 090-4LA00	15	
2.5	2.88	90 L	1390	17	76	76	0.81	5.9	1LA9 096-4LA00	18	
4	4.6	100 L	1410	27	77	77.5	0.81	9.3	1LA9 107-4LA00	25	
5.5	6.33	112 M	1440	36	82	82	0.8	12.2	1LA9 113-4LA00	37	
8.6	9.89	132 S	1440	57	84	84	0.83	17.8	1LA9 130-4LA00	45	
11	12.65	132 M	1450	72	86	86	0.82	22.5	1LA9 133-4LA00	60	
17	19.55	160 M	1455	112	88	88	0.84	33	1LA9 163-4LA00	81	
22	25.3	160 L	1455	144	88	88	0.82	44	1LA9 166-4LA00	107	
26	30	180 M	1460	170	90.5	90.5	0.83	50	1LA9 183-4AA00	126	
32	38	180 L	1465	209	91.3	91.3	0.84	60	1LA9 186-4AA00	146	
43	49.6	200 L	1465	280	91.7	91.7	0.85	80	1LA9 207-4AA00	196	

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
 ○ Without additional charge
 ✓ With additional 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 –
Aluminum 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 at rated output	
	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)
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used as temperature class 155 (F)							
1LA9 053-4LAQQ	2.3	3.5	2.2	16	0.00035	42	53
1LA9 060-4LAQQ	2.1	2.9	2.1	16	0.00037	42	53
1LA9 063-4LAQQ	2.3	2.9	2.3	16	0.00045	42	53
1LA9 070-4LAQQ	2.3	3.4	2.3	16	0.00076	44	55
1LA9 073-4LAQQ	2.3	3.6	2.3	16	0.00095	44	55
1LA9 080-4LAQQ	2.3	4.1	2.4	16	0.0017	47	58
1LA9 083-4LAQQ	2.7	4.5	2.4	16	0.0024	47	58
1LA9 090-4LAQQ	2.4	5.1	2.4	16	0.0033	48	60
1LA9 096-4LAQQ	2.5	5.1	2.3	16	0.004	48	60
1LA9 107-4LAQQ	2.7	6	3	16	0.0062	53	65
1LA9 113-4LAQQ	3	6.8	3	16	0.014	53	65
1LA9 130-4LAQQ	2.3	6.8	2.7	16	0.023	62	74
1LA9 133-4LAQQ	2.8	7.4	3.1	16	0.029	62	74
1LA9 163-4LAQQ	2.9	7.5	2.8	16	0.055	66	78
1LA9 166-4LAQQ	3.1	8.3	3.4	16	0.072	66	78
1LA9 183-4AAQQ	2.4	7.5	3.2	16	0.15	63	76
1LA9 186-4AAQQ	2.5	7.9	3.4	16	0.19	63	76
1LA9 207-4AAQQ	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 improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data

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 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		IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
3	3.45	100 L	2890	9.9	EFF2	84	84	0.85	6.1	1LA6 106-2AAQQ		34
4	4.6	112 M	2905	13	EFF2	86	86	0.86	7.8	1LA6 113-2AAQQ		43
5.5	6.3	132 S	2925	18	EFF2	86.5	86.5	0.89	10.4	1LA6 130-2AAQQ		53
7.5	8.6	132 S	2930	24	EFF2	88	88	0.89	13.8	1LA6 131-2AAQQ		58
11	12.6	160 M	2940	36	EFF2	89.5	89.5	0.88	20	1LA6 163-2AAQQ		96
15	17.3	160 M	2940	49	EFF2	90	90.2	0.9	26.5	1LA6 164-2AAQQ		105
18.5	21.3	160 L	2940	60	EFF2	91	91.2	0.91	32	1LA6 166-2AAQQ		115
22	24.5	180 M	2945	71	EFF 2	91.6	91.6	0.86	40.5 ¹⁾	1LG4 183-2AAQQ		145
30	33.5	200 L	2950	97	EFF 2	91.8	91.9	0.88	54 ¹⁾	1LG4 206-2AAQQ		205
37	41.5	200 L	2955	120	EFF 2	92.9	93.2	0.89	65 ¹⁾	1LG4 207-2AAQQ		225
45	51	225 M	2960	145	EFF 2	93.6	93.9	0.88	79 ¹⁾	1LG4 223-2AAQQ		285
55	62	250 M	2970	177	EFF 2	93.6	93.8	0.88	96	1LG4 253-2ABQQ		375
75	84	280 S	2975	241	EFF 2	94.5	94.3	0.88	130 ¹⁾	1LG4 280-2ABQQ		500
90	101	280 M	2975	289	EFF 2	95.1	95.2	0.89	154 ¹⁾	1LG4 283-2ABQQ		540
110	123	315 S	2982	352		94.6	93.8	0.88	190 ¹⁾	1LG4 310-2ABQQ		720
132	148	315 M	2982	423		95.1	94.8	0.9	225 ¹⁾	1LG4 313-2ABQQ		775
160	180	315 L	2982	512		95.5	95.3	0.91	265 ²⁾	1LG4 316-2ABQQ		900
200	224	315 L	2982	641		95.9	95.8	0.92	325 ²⁾	1LG4 317-2ABQQ		1015

Order No. supplements

Motor type	Penultimate position: Voltage code						Final position: Type of construction code							
	50 Hz		60 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 - ... QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 - ... QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 - ... QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 - ... QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 - ... QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 - ... QQ	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–
1LG4 317 - ... QQ	–	○	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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 improved efficiency – 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	Torque class	Moment of inertia	Noise at rated output	
	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)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-2AAQQ	2.8	6.8	3	16	0.0035	62	74
1LA6 113-2AAQQ	2.6	7.2	2.9	16	0.0059	63	75
1LA6 130-2AAQQ	2	5.9	2.8	16	0.015	68	80
1LA6 131-2AAQQ	2.3	6.9	3	16	0.019	68	80
1LA6 163-2AAQQ	2.1	6.5	2.9	16	0.034	70	82
1LA6 164-2AAQQ	2.2	6.6	3	16	0.043	70	82
1LA6 166-2AAQQ	2.4	7	3.1	16	0.051	70	82
1LG4 183-2AAQQ	2.5	6.4	3.4	16	0.068	67	80
1LG4 206-2AAQQ	2.3	6.5	3	16	0.13	73	86
1LG4 207-2AAQQ	2.5	7.2	3.3	16	0.15	73	86
1LG4 223-2AAQQ	2.4	6.7	3.1	16	0.22	73	86
1LG4 253-2ABQQ	2.1	6.7	3.1	13	0.4	75	88
1LG4 280-2ABQQ	2.5	7.5	3.1	13	0.72	74	87
1LG4 283-2ABQQ	2.6	7.2	3.1	13	0.83	74	87
1LG4 310-2ABQQ	2.4	7.2	3.1	13	1.2	80	94
1LG4 313-2ABQQ	2.4	6.9	3	13	1.4	80	94
1LG4 316-2ABQQ	2.4	7	3	13	1.6	80	94
1LG4 317-2ABQQ	2.3	6.7	2.9	13	2.1	80	94

2

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 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**.
- 8) 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 improved efficiency – Cast-iron series 1LA6/1LG4

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 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		IM B3 type of construction approx. m kg
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection												
2.2	2.55	100 L	1420	15	EFF2	82	82.5	0.82	4.7	1LA6 106-4AAQQ		33
3	3.45	100 L	1420	20	EFF2	83	83.5	0.82	6.4	1LA6 107-4AAQQ		36
4	4.6	112 M	1440	27	EFF2	85	85.5	0.83	8.2	1LA6 113-4AAQQ		45
5.5	6.3	132 S	1455	36	EFF2	86	86	0.81	11.4	1LA6 130-4AAQQ		55
7.5	8.6	132 M	1455	49	EFF2	87	87.5	0.82	15.2	1LA6 133-4AAQQ		62
11	12.6	160 M	1460	72	EFF2	88.5	89	0.84	21.5	1LA6 163-4AAQQ		100
15	17.3	160 L	1460	98	EFF2	90	90.2	0.84	28.5	1LA6 166-4AAQQ		114
18.5	21.3	180 M	1465	121	EFF 2	90.4	90.8	0.84	35 ¹⁾	1LG4 183-4AAQQ		140
22	25.3	180 L	1465	143	EFF 2	91	91.5	0.84	41.5 ¹⁾	1LG4 186-4AAQQ		155
30	34.5	200 L	1465	196	EFF 2	91.6	92	0.85	56 ¹⁾	1LG4 207-4AAQQ		205
37	42.5	225 S	1475	240	EFF 2	92.2	92.6	0.85	68 ¹⁾	1LG4 220-4AAQQ		265
45	52	225 M	1475	291	EFF 2	93.1	93.6	0.86	81 ¹⁾	1LG4 223-4AAQQ		300
55	63	250 M	1480	355	EFF 2	93.5	93.8	0.85	100	1LG4 253-4AAQQ		390
75	86	280 S	1485	482	EFF 2	94.2	94.1	0.85	136 ¹⁾	1LG4 280-4AAQQ		535
90	104	280 M	1485	579	EFF 2	94.6	94.6	0.86	160 ¹⁾	1LG4 283-4AAQQ		580
110	127	315 S	1488	706		94.6	94.6	0.85	198 ¹⁾	1LG4 310-4AAQQ		730
132	152	315 M	1488	847		95.2	95.2	0.85	235 ¹⁾	1LG4 313-4AAQQ		810
160	184	315 L	1486	1028		95.7	95.8	0.86	280 ²⁾	1LG4 316-4AAQQ		955
200	230	315 L	1486	1285		95.9	96.2	0.88	340 ²⁾	1LG4 317-4AAQQ		1060

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 ³⁾	IM B5, IM V1 without protective cover 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 □□	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional 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 improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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 155 (F), IP55 degree of protection							
1LA6 106-4AAQQ	2.5	5.6	2.8	16	0.0047	53	65
1LA6 107-4AAQQ	2.7	5.6	3	16	0.0055	53	65
1LA6 113-4AAQQ	2.7	6	3	16	0.012	53	65
1LA6 130-4AAQQ	2.5	6.3	3.1	16	0.018	62	74
1LA6 133-4AAQQ	2.7	6.7	3.2	16	0.023	62	74
1LA6 163-4AAQQ	2.2	6.2	2.7	16	0.043	66	78
1LA6 166-4AAQQ	2.6	6.5	3	16	0.055	66	78
1LG4 183-4AAQQ	2.4	6.7	3.1	16	0.099	65	78
1LG4 186-4AAQQ	2.5	6.9	3.2	16	0.12	65	78
1LG4 207-4AAQQ	2.5	6.7	3.4	16	0.19	66	79
1LG4 220-4AAQQ	2.3	6.7	3.1	16	0.37	66	79
1LG4 223-4AAQQ	2.6	7.2	3.2	16	0.45	66	79
1LG4 253-4AAQQ	2.4	6.1	2.8	16	0.69	65	78
1LG4 280-4AAQQ	2.5	7.1	3	16	1.2	70	84
1LG4 283-4AAQQ	2.5	7.4	3	16	1.4	70	84
1LG4 310-4AAQQ	2.5	6.4	2.8	16	1.9	70	84
1LG4 313-4AAQQ	2.7	6.8	2.9	16	2.3	71	85
1LG4 316-4AAQQ	2.7	6.8	2.8	16	2.9	71	85
1LG4 317-4AAQQ	2.6	6.5	2.8	16	3.5	71	85

2

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 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 improved efficiency – Cast-iron series 1LA6/1LG4

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.
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		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 155 (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	950	30		79	79.5	0.76	7.2	1LA6 130-6AA□□	50	
4	4.6	132 M	950	40		80.5	80.5	0.76	9.4	1LA6 133-6AA□□	57	
5.5	6.3	132 M	950	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		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 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 QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 11 QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 13 QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LA6 16 QQ	○	○	○	○	○	○	□	✓	–	✓	✓	✓	✓	✓
1LG4 18 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 20 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 22 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 25 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 28 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 310 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 313 QQ	○	○	○	○	○	○	□	✓ ⁶⁾	–	✓	✓	–	–	–
1LG4 316 QQ	–	○	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG4 317 QQ														
1LG4 318 QQ														

- Standard version
- Without additional charge
- ✓ With additional 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 improved efficiency – 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	Torque class	Moment of inertia	Noise at rated output	
	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, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-6AAQQ	2.3	4	2.3	16	0.0047	47	59
1LA6 113-6AAQQ	2.2	4.6	2.5	16	0.0091	52	64
1LA6 130-6AAQQ	1.9	4.2	2.2	16	0.015	63	75
1LA6 133-6AAQQ	2.1	4.5	2.4	16	0.019	63	75
1LA6 134-6AAQQ	2.3	5	2.6	16	0.025	63	75
1LA6 163-6AAQQ	2.1	4.6	2.5	16	0.044	66	78
1LA6 166-6AAQQ	2.3	4.8	2.6	16	0.063	66	78
1LG4 186-6AAQQ	2.3	5.3	2.5	16	0.18	57	73
1LG4 206-6AAQQ	2.5	5.6	2.5	16	0.24	58	73
1LG4 207-6AAQQ	2.6	5.7	2.5	16	0.29	58	73
1LG4 223-6AAQQ	2.7	5.6	2.5	16	0.49	59	73
1LG4 253-6AAQQ	2.7	6	2.3	16	0.76	60	75
1LG4 280-6AAQQ	2.4	6.1	2.4	16	1.1	61	75
1LG4 283-6AAQQ	2.5	6.3	2.5	16	1.4	61	75
1LG4 310-6AAQQ	2.5	6.5	2.8	16	2.1	63	77
1LG4 313-6AAQQ	2.6	6.8	2.9	16	2.5	63	77
1LG4 316-6AAQQ	2.5	6.8	2.9	16	3.2	64	78
1LG4 317-6AAQQ	3.1	7.3	3	16	4	64	78
1LG4 318-6AAQQ	3	7.5	3	16	4.7	65	79

2

- 1) For connection to 230 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 2) For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 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 improved efficiency – Cast-iron series 1LA6/1LG4

Selection and ordering data (continued)

Rated output at		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 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						
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
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection													
0.75	0.86	100 L	680	11		66	65	0.76	2.15		1LA6 106-8ABQQ		29
1.1	1.3	100 L	680	15		72	72	0.76	2.9		1LA6 107-8ABQQ		32
1.5	1.75	112 M	705	20		74	74	0.76	3.85		1LA6 113-8ABQQ		39
2.2	2.55	132 S	700	30		75	75	0.74	5.7		1LA6 130-8ABQQ		50
3	3.45	132 M	700	41		77	77.5	0.74	7.6		1LA6 133-8ABQQ		57
4	4.6	160 M	715	53		80	80	0.72	10		1LA6 163-8ABQQ		91
5.5	6.3	160 M	710	74		83.5	83.5	0.73	13		1LA6 164-8ABQQ		102
7.5	8.6	160 L	715	100		85.5	85.5	0.72	17.6		1LA6 166-8ABQQ		122
11	13.2	180 L	725	145		87.5	88.3	0.73	25		1LG4 186-8ABQQ		150
15	18	200 L	725	198		87.7	88.4	0.76	32.5		1LG4 207-8ABQQ		205
18.5	22	225 S	730	242		89.4	90.4	0.78	38.5		1LG4 220-8ABQQ		270
22	26.5	225 M	730	288		89.7	90.7	0.79	45		1LG4 223-8ABQQ		290
30	36	250 M	730	392		91.4	92.2	0.81	58		1LG4 253-8ABQQ		385
37	44.5	280 S	735	481		92	92.8	0.81	72		1LG4 280-8ABQQ		475
45	54	280 M	735	585		92.4	93.3	0.81	87		1LG4 283-8ABQQ		515
55	66	315 S	740	710		93	93.4	0.81	106		1LG4 310-8ABQQ		680
75	90	315 M	738	971		93.3	94	0.83	140		1LG4 313-8ABQQ		745
90	108	315 L	738	1165		93.4	94	0.83	168		1LG4 316-8ABQQ		865
110	132	315 L	738	1423		94	94.4	0.83	205		1LG4 317-8ABQQ		1020
132	158	315 L	738	1708		94.2	94.6	0.83	245		1LG4 318-8ABQQ		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 (see “Introduction” for outputs at 60 Hz)	IM B3/6/ 7/8, IM V6, IM V5 without protec- tive cover ¹⁾	IM B5, IM V1 without protec- tive cover IM V3 ²⁾	IM V1 without protec- tive 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 protec- tive 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
- Without additional charge
- ✓ With additional 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 improved efficiency – 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 at rated output	
	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)
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection							
1LA6 106-8ABQQ	1.6	3	1.9	13	0.0051	45	57
1LA6 107-8ABQQ	1.8	3.3	2.1	13	0.0063	45	57
1LA6 113-8ABQQ	1.8	3.7	2.1	13	0.013	49	61
1LA6 130-8ABQQ	1.9	3.9	2.3	13	0.014	53	65
1LA6 133-8ABQQ	2.1	4.1	2.4	13	0.019	53	65
1LA6 163-8ABQQ	2.2	4.5	2.6	13	0.036	63	75
1LA6 164-8ABQQ	2.3	4.7	2.7	13	0.046	63	75
1LA6 166-8ABQQ	2.7	5.3	3	13	0.064	63	75
1LG4 186-8ABQQ	1.7	4.2	2.1	13	0.17	66	79
1LG4 207-8ABQQ	2.2	4.9	2.6	13	0.29	67	70
1LG4 220-8ABQQ	2.3	5.5	2.7	13	0.48	57	70
1LG4 223-8ABQQ	2.3	5.6	2.8	13	0.55	54	73
1LG4 253-8ABQQ	2.3	5.5	2.6	13	0.84	55	73
1LG4 280-8ABQQ	2.2	5	2.1	13	1.1	56	74
1LG4 283-8ABQQ	2.2	5.1	2.1	13	1.4	58	74
1LG4 310-8ABQQ	2.2	5.8	2.6	13	2.1	64	78
1LG4 313-8ABQQ	2.2	5.7	2.6	13	2.5	64	78
1LG4 316-8ABQQ	2.2	5.8	2.7	13	3.1	64	78
1LG4 317-8ABQQ	2.4	6.1	2.8	13	3.9	64	78
1LG4 318-8ABQQ	2.5	6.5	2.9	13	4.5	64	78

2

- 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
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		IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
30	33.5	180 L	2950	97	92.8	92.9	0.86	54 ¹⁾	1LG4 188-2AAQQ		175
45	51	200 L	2955	145	93.6	93.7	0.89	78 ¹⁾	1LG4 208-2AAQQ		255
55	62	225 M	2960	177	94.8	95	0.89	94 ¹⁾	1LG4 228-2AAQQ		335
75	84	250 M	2970	241	94.5	94.5	0.88	130 ¹⁾	1LG4 258-2AAQQ		420
110	123	280 M	2975	353	95.5	95.6	0.9	184 ¹⁾	1LG4 288-2ABQQ		630
4-pole, 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
30	34.5	180 L	1465	196	91.7	91.9	0.8	59 ¹⁾	1LG4 188-4AAQQ		180
37	42.5	200 L	1465	241	92.5	92.8	0.83	70 ¹⁾	1LG4 208-4AAQQ		230
55	63	225 M	1475	356	93.4	93.9	0.86	99 ¹⁾	1LG4 228-4AAQQ		330
75	86	250 M	1482	483	94.3	94.4	0.85	136 ¹⁾	1LG4 258-4AAQQ		460
110	127	280 M	1488	706	95.2	94.9	0.84	198 ¹⁾	1LG4 288-4AAQQ		680
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
18.5	22	180 L	970	182	89.6	90.3	0.8	37.5 ¹⁾	1LG4 188-6AAQQ		175
30	36	200 L	975	294	90.9	91.3	0.8	60 ¹⁾	1LG4 208-6AAQQ		245
37	44.5	225 M	978	361	92.2	93	0.83	70 ¹⁾	1LG4 228-6AAQQ		325
45	54	250 M	982	438	93.3	93.8	0.83	84	1LG4 258-6AAQQ		405
75	90	280 M	985	727	93.8	94.3	0.85	136 ¹⁾	1LG4 288-6AAQQ		570
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)											
15	18	180 L	720	199	87.8	88.5	0.73	34 ¹⁾	1LG4 188-8ABQQ		165
18.5	22	200 L	725	244	88.3	89.2	0.78	39	1LG4 208-8ABQQ		230
30	36	225 M	730	392	90.4	91.2	0.79	61 ¹⁾	1LG4 228-8ABQQ		340
37	44.5	250 M	730	484	91.9	92.8	0.82	71	1LG4 258-8ABQQ		430
55	66	280 M	735	715	92.9	93.7	0.81	106	1LG4 288-8ABQQ		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 IM V3 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	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
 ○ Without additional charge
 ✓ With additional 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 catalog part 0 "Introduction", "Connection, circuit and connection box").
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

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 at rated output	
	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)
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
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	73	86
1LG4 258-2AA□□	2.4	7.1	3.1	16	0.48	74	87
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 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
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	68	81
1LG4 288-4AA□□	2.8	7.9	3.3	16	1.71	70	84
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-6AA□□	2.3	4.9	2.4	16	0.2	60	73
1LG4 208-6AA□□	2.6	5.8	2.6	16	0.36	61	74
1LG4 228-6AA□□	2.5	5.9	2.8	16	0.62	61	74
1LG4 258-6AA□□	2.7	6.3	2.3	16	0.93	61	74
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 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
1LG4 188-8AB□□	2	4.5	2.4	13	0.21	69	82
1LG4 208-8AB□□	2.4	5.2	2.6	13	0.37	58	71
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	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	Order No.	Price	Weight
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			IM B3 type of construction approx. m kg
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP												
22	180 M	2955	71	EFF 1	94.1	94.5	0.88	38.5 ¹⁾	1LG6 183-2AAQQ			180
30	200 L	2960	97	EFF 1	93.5	93.4	0.88	53 ¹⁾	1LG6 206-2AAQQ			225
37	200 L	2960	119	EFF 1	94.1	94	0.89	64 ¹⁾	1LG6 207-2AAQQ			255
45	225 M	2965	145	EFF 1	94.9	95.1	0.89	77 ¹⁾	1LG6 223-2AAQQ			330
55	250 M	2975	177	EFF 1	95.3	95.3	0.9	93	1LG6 253-2AAQQ			420
75	280 S	2975	241	EFF 1	95.2	95.2	0.89	128 ¹⁾	1LG6 280-2ABQQ			530
90	280 M	2978	289	EFF 1	95.6	95.7	0.9	150 ¹⁾	1LG6 283-2ABQQ			615
110	315 S	2982	352		95.8	95.7	0.91	182 ¹⁾	1LG6 310-2ABQQ			790
132	315 M	2982	423		96	95.9	0.91	220 ¹⁾	1LG6 313-2ABQQ			915
160	315 L	2982	512		96.4	96.4	0.92	260	1LG6 316-2ABQQ			1055
200	315 L	2982	641		96.5	96.5	0.93	320	1LG6 317-2ABQQ			1245
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP												
18.5	180 M	1470	120	EFF 1	92.6	93.2	0.83	34.5 ¹⁾	1LG6 183-4AAQQ			155
22	180 L	1470	143	EFF 1	93.2	93.5	0.84	40.5 ¹⁾	1LG6 186-4AAQQ			180
30	200 L	1470	195	EFF 1	93.3	93.4	0.85	55 ¹⁾	1LG6 207-4AAQQ			225
37	225 S	1480	239	EFF 1	94	94.4	0.85	67 ¹⁾	1LG6 220-4AAQQ			290
45	225 M	1480	290	EFF 1	94.5	94.7	0.85	81 ¹⁾	1LG6 223-4AAQQ			330
55	250 M	1485	354	EFF 1	95.1	95.3	0.87	96	1LG6 253-4AAQQ			460
75	280 S	1485	482	EFF 1	95.1	95.2	0.87	130 ¹⁾	1LG6 280-4AAQQ			575
90	280 M	1486	578	EFF 1	95.4	95.5	0.86	158 ¹⁾	1LG6 283-4AAQQ			675
110	315 S	1488	706		95.9	96	0.87	190 ¹⁾	1LG6 310-4AAQQ			810
132	315 M	1488	847		96.1	96.2	0.88	225 ¹⁾	1LG6 313-4AAQQ			965
160	315 L	1490	1026		96.3	96.4	0.88	275 ²⁾	1LG6 316-4AAQQ			1105
200	315 L	1490	1282		96.4	96.5	0.88	340 ²⁾	1LG6 317-4AAQQ			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⁾	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	0	1	8	4	6	2	7	3	
1LG6 18 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 20 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 22 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 25 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 28 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 310 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 313 QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–	–
1LG6 316 QQ	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–	–
1LG6 317 QQ	–	○	–	○	□ ⁷⁾	–	✓ ⁸⁾	✓ ⁸⁾	✓	–	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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

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 at rated output	
	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, temperature class 155 (F), IP55 degree of protection, for use 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 155 (F), IP55 degree of protection, for use 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	65	78
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	68	82
1LG6 310-4AA□□	2.7	7.1	2.9	16	2.3	68	82
1LG6 313-4AA□□	2.7	7.3	2.9	16	2.9	69	83
1LG6 316-4AA□□	3	7.4	3	16	3.5	69	83
1LG6 317-4AA□□	3.2	7.6	3	16	4.2	69	83

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 catalog part 0 "Introduction", "Connection, circuit and connection box").
- For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 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

Selection and ordering data (continued)

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
		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	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, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
15	180 L	975	147		90.9	91.7	0.81	29.5	1LG6 186-6AAQQ		175
18.5	200 L	978	181		91.2	91.8	0.81	36	1LG6 206-6AAQQ		210
22	200 L	978	215		91.9	92.5	0.82	42	1LG6 207-6AAQQ		240
30	225 M	980	292		93.2	93.7	0.83	56 ¹⁾	1LG6 223-6AAQQ		325
37	250 M	985	359		93.7	94.1	0.83	69	1LG6 253-6AAQQ		405
45	280 S	988	435		94.4	94.6	0.85	81	1LG6 280-6AAQQ		520
55	280 M	988	532		94.6	94.8	0.85	99	1LG6 283-6AAQQ		570
75	315 S	990	723		95	95	0.83	138	1LG6 310-6AAQQ		760
90	315 M	990	868		95.3	95.4	0.85	160 ¹⁾	1LG6 313-6AAQQ		935
110	315 L	990	1061		95.6	95.7	0.85	196	1LG6 316-6AAQQ		1010
132	315 L	990	1273		95.8	95.8	0.85	235	1LG6 317-6AAQQ		1180
160	315 L	990	1543		95.8	95.9	0.86	280 ²⁾	1LG6 318-6AAQQ		1245
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), IP55 degree of protection, for use according to CEMEP											
11	180 L	725	145		88.7	89.6	0.76	23.5	1LG6 186-8ABQQ		165
15	200 L	725	198		89.3	89.8	0.8	30.5	1LG6 207-8ABQQ		235
18.5	225 S	730	242		91.1	91.8	0.81	36	1LG6 220-8ABQQ		295
22	225 M	730	288		91.6	92.1	0.81	43	1LG6 223-8ABQQ		335
30	250 M	735	390		92.8	93.3	0.82	57	1LG6 253-8ABQQ		435
37	280 S	738	479		93.1	93.3	0.81	71	1LG6 280-8ABQQ		510
45	280 M	738	582		93.7	94	0.81	86	1LG6 283-8ABQQ		560
55	315 S	740	710		94.3	94.4	0.82	102	1LG6 310-8ABQQ		750
75	315 M	740	968		94.5	94.7	0.83	138	1LG6 313-8ABQQ		840
90	315 L	740	1161		94.7	95.1	0.84	164	1LG6 316-8ABQQ		1005
110	315 L	740	1420		94.8	95.1	0.84	200	1LG6 317-8ABQQ		1100
132	315 L	740	1704		94.9	95.2	0.84	240	1LG6 318-8ABQQ		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 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - ... QQ	○	○	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - ... QQ	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 317 - ... QQ	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–
1LG6 318 - ... QQ	–	○	–	○	□ ⁷⁾	–	✓	✓	✓	–	–	–

- Standard version
- Without additional charge
- ✓ With additional 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

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 at rated output	
	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 155 (F), IP55 degree of protection, for use according to CEMEP							
1LG6 186-6AA□□	2.4	5.5	2.5	16	0.2	56	69
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	59	72
1LG6 223-6AA□□	2.8	6.5	2.9	16	0.63	59	72
1LG6 253-6AA□□	2.9	6.8	2.5	16	0.93	59	72
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 155 (F), IP55 degree of protection, for use 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	57	70
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	61	75
1LG6 313-8AB□□	2.5	6.7	2.9	13	3.1	60	74
1LG6 316-8AB□□	2.4	6.3	2.8	13	3.9	64	77
1LG6 317-8AB□□	2.4	6.4	2.6	13	4.5	64	77
1LG6 318-8AB□□	2.5	6.7	2.9	13	5.3	64	77

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 catalog part 0 "Introduction", "Connection, circuit and connection box").
- For connection to 400 V, parallel supply cables are necessary (see catalog part 0 "Introduction", "Connection, circuit and connection box").
- 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

Selection and ordering data (continued)

Rated output at 60 Hz	Frame size	Operating values at rated output						Order No.	Price	Weight
		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	For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction approx.
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A			m kg
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use in the North American market according to EPACT										
30	180 M	3560	60	Yes	93	0.88	34	1LG6 183-2AAQQ		180
40	200 L	3565	80	Yes	91.7	0.88	46	1LG6 206-2AAQQ		225
50	200 L	3565	100	Yes	92.4	0.89	57	1LG6 207-2AAQQ		255
60	225 M	3570	120	Yes	93.6	0.89	67	1LG6 223-2AAQQ		330
75	225 M	3570	150	Yes	94.5	0.9	83	1LG6 228-2AAQQ¹⁾		390
75	250 M	3578	149	No	93.6	0.89	84	1LG6 253-2AAQQ		420
100	250 M	3580	199	Yes	94.1	0.89	112	1LG6 258-2AAQQ¹⁾		470
100	280 S	3580	199	No	95	0.89	110	1LG6 280-2ABQQ		530
125	280 M	3580	249	Yes	95	0.9	136	1LG6 283-2ABQQ		615
150	280 M	3580	299	Yes	95	0.9	164	1LG6 288-2AAQQ¹⁾		660
150	315 S	3585	298	Yes	94.5	0.91	164	1LG6 310-2ABQQ		790
175	315 M	3586	348	Yes	95	0.91	190	1LG6 313-2ABQQ		915
200	315 L	3588	397	Yes	95.4	0.91	215	1LG6 316-2ABQQ		1055
250	315 L	3588	496	No	95.4	0.93	265	1LG6 317-2ABQQ		1245
300	315 L	3591	595	No	95.4	0.92	320	1LG6 318-2AAQQ¹⁾		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	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) 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 B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - ... QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–
1LG6 317 - ... QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–
1LG6 318 - ... QQ	–	○	□ ⁶⁾	–	✓ ⁷⁾	✓ ⁷⁾	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
2-pole, 3600 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use 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

Selection and ordering data (continued)

Rated output at 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 IM B3 type of construction approx.
		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			
P_{rated} HP	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use 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	460 VA (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 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
 ○ Without additional charge
 ✓ With additional 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

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 at rated output	
	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_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
4-pole, 1800 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use 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

Selection and ordering data (continued)

Rated output at 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 IM B3 type of construction approx.
		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			
		P_{rated} HP	FS	η_{rated} rpm	T_{rated} Nm	η_{rated} %	$\cos\phi_{rated}$				$I_{rated}$ A	$m$ kg
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use 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	94.5	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							
	60 Hz		Without flange	With flange					With standard flange	With special flange
	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) 4)} 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 B14, IM V19, IM V18 without protective cover
	1	6	0	1	8	4	6	2	7	3
1LG6 18 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 20 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 22 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 25 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 28 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 310 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 313 - ... QQ	○	○	□	✓	–	✓	✓	–	–	–
1LG6 316 - ... QQ	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 317 - ... QQ	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–
1LG6 318 - ... QQ	–	○	□ ⁶⁾	–	✓	✓	✓	–	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	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_{pFA} dB(A)	Sound pressure level at 60 Hz L_{WA} dB(A)
6-pole, 1200 rpm at 60 Hz, temperature class 155 (F), IP55 degree of protection, for use 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
Aluminum series 1LP7/1LP5

Selection and ordering data

Rated output with		Frame size	Order No. For Order No. supplements for voltage and type of construction, see table below	Price	Weight For IM B3 type of construction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	► Phase-out model		m kg
2-pole, 3000 rpm at 50 Hz, 3600 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), 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
0.35	0.40	80 M	1LP7 080-2AA□□		8.0
0.55	0.6	80 M	1LP7 083-2AA□□		9.6
0.82	0.95	90 S	1LP7 090-2AA□□		12.5
1.1	1.25	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
- Without additional charge
- ✓ With additional charge
- Not possible

▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models.
1PC1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

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
Aluminum series 1LP7/1LP5

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 155 (F), used acc. to temperature class 155 (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
0.22	0.25	80 M	1LP7 080-4AA□□		7.8
0.38	0.45	80 M	1LP7 083-4AA□□		9.1
0.55	0.63	90 S	1LP7 090-4AA□□		11.9
0.65	0.75	90 L	1LP7 096-4AA□□		15.1
0.88	1.00	100 L	▶ 1LP7 106-4AA□□		23.0
1.2	1.4	100 L	▶ 1LP7 107-4AA□□		25.0
1.6	1.85	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	IM B34	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 B14, IM V19, IM V18 without protective cover		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
- Without additional charge
- ✓ With additional charge
- Not possible

- ▶ The Order No. for 1LP7 motors marked with this symbol are phase-out models. 1PC1 motors are the successors. For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

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
Aluminum series 1LP7/1LP5

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
6-pole, 1000 rpm at 50 Hz, 1200 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, with reduced output					
0.045	0.05	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	0.57	90 L	1LP7 096-6AA□□		15.2
0.7	0.8	100 L	► 1LP7 106-6AA□□		23.3
1.0	1.15	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 207-6AA□□		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					
	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	Without flange	With flange	With standard flange	IM B14, IM V19, IM V18 without protective cover	With special flange
	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
- Without additional charge
- ✓ With additional charge
- Not possible

- The Order No. for 1LP7 motors marked with this symbol are phase-out models.
1PC1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

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 Aluminum series 1LP7/1LP5

Selection and ordering data (continued)

Rated output with		Frame size	Order No. For Order No. supple- ments for voltage and type of construction, see table below	Price	Weight For IM B3 type of con- struction approx.
50 Hz P_{rated} kW	60 Hz P_{rated} kW	FS	► Phase-out model		m kg
8-pole, 750 rpm at 50 Hz, 900 rpm at 60 Hz, temperature class 155 (F), used acc. to temperature class 155 (F), IP55 degree of protection, with reduced output					
0.045	0.05	71 M	1LP7 070-8ABQQ		6.1
0.06	0.07	71 M	1LP7 073-8ABQQ		6.1
0.09	0.105	80 M	1LP7 080-8ABQQ		7.3
0.13	0.15	80 M	1LP7 083-8ABQQ		9.1
0.25	0.29	90 S	1LP7 090-8ABQQ		10.2
0.35	0.4	90 L	1LP7 096-8ABQQ		12.8
0.45	0.5	100 L	► 1LP7 106-8ABQQ		19.4
0.65	0.75	100 L	► 1LP7 107-8ABQQ		21.3
0.8	0.9	112 M	► 1LP7 113-8ABQQ		23.3
1.2	1.4	132 S	► 1LP7 130-8ABQQ		40.0
1.45	1.7	132 M	► 1LP7 133-8ABQQ		48.0
1.8	2.1	160 M	► 1LP7 163-8ABQQ		59.0
2.4	2.8	160 L	► 1LP7 164-8ABQQ		68.0
3	3.45	160 L	► 1LP7 166-8ABQQ		88.0
5.5	6.5	180 L	1LP5 186-8ABQQ		122.0
7.5	9	200 L	1LP5 207-8ABQQ		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
- Without additional charge
- ✓ With additional charge
- Not possible

- The Order No. for 1LP7 motors marked with this symbol are phase-out models.
1PC1 motors are the successors.
For additional information see catalog part 1 "New Generation 1LE1/1PC1" under "Self-cooled motors without external fan and fan cover with improved efficiency" Pages 1/46 to 1/49.

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 with direct starting torque	Locked-rotor current	Break-down torque as multiple of rated torque	Torque class CL	Moment of inertia J kg m ²	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 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} %	$\cos\phi_{rated}$	I_{rated} A	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}						
2-pole, 3000 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), IP55 degree of protection, with reduced output															
7.3	180 M	2945	24	91.0	0.89	13	2.4	6.5	3.4	16	0.068		1LP4 183-2FAQQ		140
10	200 L	2950	32	90.9	0.89	17.8	2.3	6.4	2.9	16	0.129		1LP4 206-2FAQQ		195
12.5	200 L	2955	40	91.9	0.90	22	2.5	7.1	3.2	16	0.153		1LP4 207-2FAQQ		215
15	225 M	2960	48	93.2	0.90	26	2.3	6.7	3.0	16	0.217		1LP4 223-2FAQQ		275
18.5	250 M	2970	59	92.6	0.89	32.5	2.0	6.6	3.0	13	0.403		1LP4 253-2FBQQ		360
25	280 S	2975	80	93.8	0.90	42.5	2.5	7.6	3.0	13	0.715		1LP4 280-2FBQQ		480
30	280 M	2975	96	94.4	0.90	51	2.6	7.2	2.9	13	0.832		1LP4 283-2FBQQ		520
37	315 S	2984	118	94.5	0.90	63	2.3	7.3	3.0	13	1.19		1LP4 310-2FBQQ		700
44	315 M	2982	141	94.0	0.91	74	2.3	6.8	2.8	13	1.39		1LP4 313-2FBQQ		755
53	315 L	2982	170	94.6	0.91	89	2.3	6.9	2.9	13	1.62		1LP4 316-2FBQQ		880
67	315 L	2984	214	95.1	0.92	110	2.1	6.5	2.8	13	2.09		1LP4 317-2FBQQ		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 V3	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	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
 ○ Without additional charge
 ✓ With additional 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

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 starting torque	starting current	as multiple torque			For Order No. supplements for voltage and type of construction, see table below		IM B3 type of construction 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			
4-pole, 1500 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), 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 183-4FAQQ		135
7.3	180 L	1470	47	91.2	0.87	13.2	2.1	6.9	3.1	16	0.117	1LP4 186-4FAQQ		150
10	200 L	1465	65	90.5	0.88	18.2	2.3	6.6	3.2	16	0.191	1LP4 207-4FAQQ		195
12.5	225 S	1475	81	92.2	0.86	23	2.3	6.6	3.0	16	0.374	1LP4 220-4FAQQ		255
15	225 M	1475	97	93.1	0.87	26.5	2.4	7.1	3.1	16	0.447	1LP4 223-4FAQQ		290
18.5	250 M	1480	119	93.5	0.87	33	2.2	6.0	2.6	16	0.688	1LP4 253-4FAQQ		375
25	280 S	1485	161	93.9	0.87	44	2.4	7.0	2.9	16	1.19	1LP4 280-4FAQQ		515
30	280 M	1485	193	94.4	0.88	52	2.4	7.2	2.9	16	1.39	1LP4 283-4FAQQ		560
37	315 S	1488	237	94.4	0.87	65	2.2	6.2	2.6	16	1.94	1LP4 310-4FAQQ		710
44	315 M	1488	282	95.2	0.87	77	2.4	6.7	2.7	16	2.31	1LP4 313-4FAQQ		790
53	315 L	1488	340	95.5	0.87	92	2.5	6.7	2.7	16	2.88	1LP4 316-4FAQQ		935
67	315 L	1488	430	95.7	0.88	114	2.3	6.2	2.6	16	3.46	1LP4 317-4FAQQ		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 (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 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
○ Without additional charge
✓ With additional 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

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting torque	Locked-rotor current	Break-down torque as multiple of rated 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} %	$\cos\varphi_{\text{rated}}$	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	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 155 (F), used acc. to temperature class 130 (B), 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	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
 ○ Without additional charge
 ✓ With additional 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

Selection and ordering data (continued)

Rated output at 50 Hz	Frame size	Operating values at rated output					Locked-rotor torque with direct starting torque	Locked-rotor current starting 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 IM B3 type of construction approx. <i>m</i> 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								
<i>P</i> _{rated} kW	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	<i>T</i> _{LR} / <i>T</i> _{rated}	<i>I</i> _{LR} / <i>I</i> _{rated}	<i>T</i> _B / <i>T</i> _{rated}	CL	<i>J</i> kg m ²			
8-pole, 750 rpm at 50 Hz, temperature class 155 (F), used acc. to temperature class 130 (B), 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	1	8	6	2	7
1LP4 18 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 20 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 22 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 25 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 28 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 310 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 313 - ... □□	○	○	○	○	○	○	○		□	✓	–	✓	–	–
1LP4 316 - ... □□	–	○	–	○	–	○	○		□ ³⁾	–	✓	✓	–	–
1LP4 317 - ... □□	–	○	–	○	–	○	○		□ ³⁾	–	✓	✓	–	–

- Standard version
 ○ Without additional charge
 ✓ With additional 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

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 catalog part 0 "Introduction".
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 catalog part 0 "Introduction".
Motor protection	For an overview of the relevant order codes, see "Special versions", "Selection and ordering data".
Motor connection and connection box	For further information and details, see catalog part 0 "Introduction".
Windings and insulation	
Colors 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	
Coolant temperature and site altitude	
Designs in accordance with standards and specifications	
Bearings and lubrication	
Balance and vibration quantity	
Shaft and rotor	
Heating and ventilation	
Rating plate and extra rating plates	
Packaging, safety notes, documentation and test certificates	
Design for Zones 1, 2, 21 and 22 according to ATEX	See catalog part 4 "Explosion-proof motors"
Ship version	See catalog part 10 "Marine motors"

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

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 the Order No.	Additional identifica- tion 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 energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																		
			1LA7 (aluminum)										1LA5 (aluminum)					
Voltage at 50 Hz																		
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E		○	○	○	○	○	○	○	○	○	○	○				
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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 ³⁾	9	L3E		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–			
230 VYY/460 VY 60 Hz; 60 Hz output, 9 main terminals and electrical design to NEMA ³⁾	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 voltages and/or frequencies																		
Non-standard winding for vol- tages 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 identifica- tion 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 energy-saving motors with improved efficiency in pole-changing version – Aluminum series 1LA7 and 1LA5																		
			1LA7 (aluminum)										1LA5 (alu- minum)					
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																		
Non-standard winding for volt- ages 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 •		–	–	–	–	✓	✓	✓	✓	✓	✓	✓				

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ With order codes **L1A**, **L1B**, **L1C**, **L1D**, **L1E**, **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.

³⁾ When ordered with option brake (order code **G26**) only 6 motor connection terminals are possible for frame size 56 to 90.

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 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 – Aluminum series 1LA9																		
			1LA9 (aluminum)															
Voltage at 50 Hz																		
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E		○	○	○	○	○	○	○	○	○	○					
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																		
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					

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 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 – Aluminum series 1LA9																		
			1LA9 (aluminum)															
Voltage at 50 Hz																		
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E		○	○	○	○	○	○	○	○	○	○	○				
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																		
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

○ Without additional charge

✓ With additional charge

– Not possible

• This order code only determines the price of the version –
Additional plain text is required.

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, 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 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 improved efficiency – Cast-iron series 1LA6 and 1LG4																			
											1LA6 (cast-iron)				1LG4 (cast-iron)				
Voltage at 50 Hz																			
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R									✓	✓	✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E									○	○	○	○	○	○	○	○	–
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																			
Non-standard winding for vol- tages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •									✓	✓	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
- ✓ With additional charge
- Not possible
- This order code only determines the price of the version – Additional plain text is required.

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, 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 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 (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R														✓	✓	✓	✓	✓	
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E														○	○	○	○	○	
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																					
Non-standard winding for vol- tages between 200 and 690 V (other voltages are available on request) ²⁾	9	L1Y														✓	✓	✓	✓	✓	

- Without additional charge
 ✓ With additional charge
 – Not possible

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, 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 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 energy-saving motors with high efficiency – Cast-iron series 1LG6																									
																			1LG6 (cast-iron)						
Voltage at 50 Hz																									
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R																	✓	✓	✓	✓	✓	✓	–
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E																	○	○	○	○	○	○	–
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																									
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y																	✓	✓	✓	✓	✓	✓	✓

- Without additional charge
✓ With additional charge
– Not possible

¹⁾ With order codes **L1A, L1B, L1C, L1D, L1E, 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 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 – Aluminum series 1LP7 and 1LP5																			
			1LP7 (aluminum)										1LP5 (aluminum)						
Voltage at 50 Hz																			
220 VΔ/380 VY (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E		○	○	○	○	○	○	○	○	○	○	○	○				
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																			
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 2/75.

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 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 (440 VY at 60 Hz) (210 ... 230 VΔ/360 ... 400 VY); 50 Hz output ¹⁾	9	L1R	✓ ✓ ✓ ✓ ✓ ✓ ✓															
230 VΔ (220 ... 240 VΔ); 50 Hz output ¹⁾	9	L1E	○ ○ ○ ○ ○ ○ –															
380 VΔ/660 VY (440 VΔ at 60 Hz) (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 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																		
Non-standard winding for voltages between 200 and 690 V (voltages outside this range are available on request) ²⁾	9	L1Y •	✓ ✓ ✓ ✓ ✓ ✓ ✓															

○ Without additional charge

✓ With additional charge

– Not possible

- This order code only determines the price of the version – Additional plain text is required.

¹⁾ With order codes **L1A**, **L1B**, **L1C**, **L1D**, **L1E**, **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	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															
			56	63	71	80	90	100	112	132	160	180	200	225	250	280	315	
Self-ventilated energy-saving motors with improved efficiency – Aluminum series 1LA7 and 1LA5																		
			1LA7 (aluminum)										1LA5 (aluminum)					
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 – Aluminum series 1LA9																		
Self-ventilated motors with increased output – Aluminum series 1LA9																		
			1LA9 (aluminum)															
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 additional 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 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 improved 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 – Aluminum series 1LP7 and 1LP5																									
			1LP7 (aluminum)				1LP5 (aluminum)																		
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									✓								✓	✓	✓	✓	–	–	

- Without additional charge
✓ With additional 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 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 improved efficiency – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum)									1LA5 (aluminum)				
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Motor connection and connection box																
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		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
One cable gland, metal	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Cable gland, 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3 cables protruding, 0.5 m long ⁴⁾⁵⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
3 cables protruding, 1.5 m long ⁴⁾⁵⁾	L45		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
6 cables protruding, 0.5 m long ⁴⁾	L47		✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.	O. R.		
6 cables protruding, 1.5 m long ⁴⁾	L48		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6 cables protruding, 3 m long ¹⁾	L49		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
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

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 improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)										1LA5 (aluminum)				
Windings and insulation																
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 180 (H) at rated output and max. CT 60 °C ⁶⁾	C18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁷⁾	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁷⁾	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁷⁾	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 130 (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		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Colors and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□	□		
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special finish in special RAL colors: For RAL colors, see “Special finish in special RAL colors” on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.		

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 improved efficiency – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum)										1LA5 (aluminum)			
Colors and paint finish (continued)																
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○		
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Modular technology – Basic versions ⁸⁾																
Mounting of separately driven fan	G17		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of brake ⁹⁾	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 ⁹⁾	H62		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of brake and separately driven fan ⁹⁾	H63		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁹⁾	H64		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁹⁾	H98		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁹⁾	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 ¹⁰⁾	C02		–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–		
Mechanical manual brake release with lever (no locking)	K82		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special technology ⁸⁾																
Prepared for mounting MMI ¹¹⁾	H15		O. R.	O. R.	✓	✓	✓	✓	✓	✓	–	–	–	–		
Mounting of LL 861 900 220 rotary pulse encoder	H70		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
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, 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 improved efficiency – Aluminum series 1LA7 and 1LA5																
		1LA7 (aluminum)										1LA5 (aluminum)				
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors, oil resistant to 0.1 bar ¹²⁾	K17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
With two additional eyebolts for IM V1/IM V3	K32		–	–	–	–	–	–	–	–	–	✓	✓	✓		
Low-noise version for 2-pole motors with clockwise direction of rotation ¹⁰⁾	K37		–	–	–	–	–	–	–	✓	✓	✓	✓	✓		
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹⁰⁾	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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Mechanical protection for encoder ¹⁶⁾	M68		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Coolant temperature and site altitude																
Coolant temperature –40 to +40 °C	D03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Coolant temperature –30 to +40 °C	D04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Designs in accordance with standards and specifications																
CCC China Compulsory Certification ¹⁷⁾	D01		✓	✓	✓	✓	✓	–	–	–	–	–	–	–		
Electrical according to NEMA MG1-12	D30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Design according to UL with “Recognition Mark” ¹⁸⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Canadian regulations (CSA) ¹⁹⁾	D40		✓	✓	✓	✓	✓	○	○	○	○	○	○	○		
PSE Mark Japan ²⁰⁾	D46		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–		
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate) ²¹⁾	K30		–	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–		
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection ²²⁾	G50		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Bearing design for increased cantilever forces	K20		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Regreasing device ²²⁾	K40		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
Located bearing DE	K94		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Located bearing NDE	L04		✓	✓	✓	✓	✓	✓	✓	✓	□	□	□	□		
Balance and vibration quantity																
Vibration quantity A			□	□	□	□	□	□	□	□	□	□	□	□		
Vibration quantity B	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Balancing without key	M37		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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 improved efficiency – Aluminum series 1LA7 and 1LA5																
			1LA7 (aluminum)										1LA5 (aluminum)			
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²³⁾	K04		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Second standard shaft extension	K16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Shaft extension with standard dimensions without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
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 ²⁴⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Heating and ventilation																
Fan cover for textile industry	H17		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Metal external fan ²⁵⁾	K35		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heaters for 230 V	K45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heaters for 115 V	K46		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06		–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓		
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 (maximum of 20 characters)	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Packaging, safety notes 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Operating instructions German/English in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	–	–		
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

- Standard version
 ○ Without additional charge
 • This order code only determines the price of the version – Additional plain text is required.
 O. R. On request
 ✓ With additional charge
 – Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 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, G50, H15, H17, H62, H63, H64, 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, 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 inquire before ordering.
- 5) Not possible for pole-changing motors and/or for voltage codes **1** or **6**.
- 6) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor series 1LA5 frame size 180 to 225. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 7) No derating in combination with the following order codes: **L2A, L2C, L2Q, L2R, L2S, L2T, L2U, L2V, L3E and L3G**.
- 8) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 9) 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**.
- 10) Not possible in motors in a pole-changing version.
- 11) Converter mounting is possible, if the MICROMASTER DA 51.3 type is specified for 230 VΔ/400 VY.
- 12) Not possible for type of construction IM V3.
- 13) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72, H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 14) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 15) 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.
- 16) 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.
- 17) 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
 The order code **D01** for frame sizes 100 and 112 is only valid for pole-changing motors 1LA7.
- 18) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 19) The rated voltage is indicated on the rating plate without voltage range.
- 20) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 21) Not possible for pole-changing motors.
- 22) Not possible when brake is mounted.
- 23) 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.
- 24) 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. 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 catalog part 0 "Introduction".
- 25) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external 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 – Aluminum series 1LA9																	
		1LA9 (aluminum)															
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
Motor connection and connection box																	
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
ECOFAST motor plug EMC Han-Drive 10e for 230 VΔ/400VY ³⁾	G56		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓				
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓				
One cable gland, metal	K54		–	–	–	–	–	✓	✓	✓	✓	–	–				
Cable gland, 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
3 cables protruding, 0.5 m long ⁴⁾⁵⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.			
3 cables protruding, 1.5 m long ⁴⁾⁵⁾	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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
6 cables protruding, 3 m long ⁴⁾	L49		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Connection box on NDE	M64		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Windings and insulation																	
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	C11		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 30 to 60 g water per m³ of air	C19		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁶⁾	C22		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend and footnotes, see Page 2/87.

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 – Aluminum series 1LA9																	
			1LA9 (aluminum)														
Windings and insulation (continued)																	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁶⁾	C23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁶⁾	C24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (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 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Colors and paint finish																	
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□				
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.				
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors, oil-resistant to 0.1 bar 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 counter-clockwise direction of rotation	K38		–	–	–	–	–	–	–	–	–	–	✓	✓			
IP65 degree of protection	K50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
IP56 degree of protection (non-heavy-sea)	K52		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Vibration-proof version	L03		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Condensation drainage holes ⁷⁾	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 – Aluminum series 1LA9																	
		1LA9 (aluminum)															
Coolant temperature and site altitude																	
Coolant temperature –40 to +40 °C	D03	–	–	–	✓	✓	✓	✓	✓	✓	–	–					
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 ⁹⁾	D30	□	□	□	□	□	□	□	□	□	□	□					
Design according to UL with "Recognition Mark" ¹⁰⁾	D31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Certified for Korea according to KS C4202 ¹¹⁾	D33	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓					
Canadian regulations (CSA) ¹²⁾	D40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
PSE Mark Japan ¹³⁾	D46	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–					
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30	–	✓	✓	✓	✓	✓	✓	✓	✓	–	–					
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50	–	–	–	–	–	✓	✓	✓	✓	✓	✓					
Bearing design for increased cantilever forces	K20	–	–	–	–	–	✓	✓	✓	✓	✓	✓					
Regreasing device	K40	–	–	–	–	–	✓	✓	✓ ¹⁴⁾	✓	✓	✓					
Located bearing DE	K94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Located bearing NDE	L04	✓	✓	✓	✓	✓	✓	✓	✓	□	□	□					
Balance and vibration quantity																	
Vibration quantity A		□	□	□	□	□	□	□	□	□	□	□					
Vibration quantity B	K02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Full key balancing	L68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Balancing without key	M37	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Shaft extension with normal dimensions without featherkey way	K42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Non-standard cylindrical shaft extension ¹⁶⁾	Y55 • and identification code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Heating and ventilation																	
Fan cover for textile industry	H17	–	–	–	–	–	–	✓	✓	–	–	–					
Metal external fan ¹⁷⁾	K35	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Anti-condensation heaters for 230 V	K45	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Anti-condensation heaters for 115 V	K46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06	–	–	–	–	–	✓	✓	✓	✓	✓	✓					
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 (maximum of 20 characters)	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

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 – Aluminum series 1LA9																	
		1LA9 (aluminum)															
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Operating instructions German/English in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	–				
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 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, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- 3) 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 codes **G56**: **A12, A23, A31, D31, D40, G50, H17, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, L03, L44, L45, L47, L48, L49, L51, L52**.
- 4) In combination with the PTC thermistor option or anti-condensation heating option, please inquire before ordering.
- 5) Not possible for voltage code **1** or **6**.
- 6) No derating in combination with the following order codes: **L2A, L2C, L2Q, L2R, L2S, L2T, L2U, L2V, L3E** and **L3G**.
- 7) 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.
- 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. For EPACT version or UL standard version (no order code necessary). The rated voltage is indicated on the rating plate without voltage range.
- 10) Possible up to 600 V max. The rated voltage is indicated on the rating plate without voltage range.
- 11) For Korea are certified:
 - 2-pole motors ≤ 0.75 kW
 - 4-pole motors ≤ 0.75 kW
 - 6-pole motors ≤ 0.75 kW
- 12) The rated voltage is indicated on the rating plate without voltage range.
- 13) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 14) Not possible for 1LA9 134-6...□□.
- 15) 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.
- 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. 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 catalog part 0 "Introduction".
- 17) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external fan is already included (standard version) in combination with the low-noise version.

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 – Aluminum series 1LA9																
		1LA9 (aluminum)														
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	–	✓	✓	✓	✓	✓				
Motor connection and connection box																
ECOFAST motor plug Han-Drive 10e for 230 VΔ/400 VY ²⁾	G55		✓	✓	✓	✓	✓	✓	✓	–	–	–	–			
Connection box on RHS	K09		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓			
Connection box on LHS	K10		–	–	–	✓	✓	✓	✓	✓	✓	✓	✓			
One cable gland, metal	K54		–	–	–	–	–	✓	✓	✓	✓	–	–			
Cable gland, 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3 cables protruding, 0.5 m long ³⁾⁴⁾	L44		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O. R.	O. R.		
3 cables protruding, 1.5 m long ³⁾⁴⁾	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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6 cables protruding, 3 m long ³⁾	L49		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Connection box on NDE	M64		–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
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, see Page 2/90, for footnotes, see Page 2/91.

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 – Aluminum series 1LA9																	
		1LA9 (aluminum)															
Colors and paint finish																	
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□				
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.				
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○				
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar 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 counter-clockwise 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Coolant temperature and site altitude																	
Coolant temperature –40 to +40 °C	D03		–	–	–	✓	✓	✓	✓	✓	✓	–	–				
Coolant 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
PSE Mark Japan ⁹⁾	D46		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–				
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 quantity																	
Vibration quantity A			□	□	□	□	□	□	□	□	□	□	□				
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Balancing without key	M37		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

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 – Aluminum series 1LA9																	
		1LA9 (aluminum)															
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Shaft extension with normal dimensions without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Non-standard cylindrical shaft extension ¹¹⁾	Y55 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
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 lubricating plate, supplied loose	B06		–	–	–	–	–	✓	✓	✓	✓	✓	✓				
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 (maximum of 20 characters)	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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Operating instructions German/English in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	○	○	–			
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 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, 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 inquire before ordering.
- 4) Not possible for voltage codes **1** or **6**.
- 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. The rated voltage is indicated on the rating plate without voltage range.
- 8) The rated voltage is indicated on the rating plate without voltage range.
- 9) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 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) 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. 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 catalog part 0 "Introduction".
- 12) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external 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 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 improved 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						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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						–	–	–	–	✓	✓	✓	✓	✓	✓
Installation of 2 PT100 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 box																
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						□	□	□	□	✓	✓	✓	□	□	□
One cable gland, metal	K54						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cable gland, 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						✓	✓	✓	✓	□	□	□	□	□	□

For legend, see Page 2/97, for footnotes, see Page 2/98.

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 improved efficiency – Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
Motor connection and connection box (continued)																
Undrilled entry plate	L01						–	–	–	–	○	○	○	○	○	○
6 cables protruding, 1.5 m long ²⁾	L48						–	–	–	–	✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49						–	–	–	–	✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51						–	–	–	–	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾	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 155 (F), used acc. to 155 (F), with service factor (SF)	C11						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	C12						✓	✓	✓	✓	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 180 (H) at rated output and max. CT 60 °C ⁵⁾	C18						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased air humidity/temperature with 30 to 60 g water per m² of air	C19						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 %	C22						✓	✓	✓	✓	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 %	C23						✓	✓	✓	✓	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 %	C24						✓	✓	✓	✓	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 %	C25						✓	✓	✓	✓	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾	✓ ⁴⁾
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT... °C or SA m above sea level						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT... °C or SA m above sea level						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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 improved efficiency – Cast-iron series 1LA6 and 1LG4																
			1LA6 (cast-iron)				1LG4 (cast-iron)									
Colors and paint finish																
Standard finish in RAL 7030 stone gray			–	–	–	–	□	□	□	□	□	□	□	□	□	□
Standard finish in other standard RAL colors: 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 0/18	Y53 • and standard finish RAL		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in RAL 7030 stone gray ⁶⁾	K26		□	□	□	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: 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, 9002, 9005 Page 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91		O. R.	O. R.	O. R.	O. R.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94		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.	O. R.
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁷⁾																
Mounting of separately driven fan ⁸⁾	G17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake ^{8) 9)}	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 ⁷⁾																
Mounting of separately driven fan and 1XP8 001-1 rotary pulse encoder	H61		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-1 rotary pulse encoder ⁹⁾	H62		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and separately driven fan ^{8) 9)}	H63		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-1 rotary pulse encoder ⁹⁾	H64		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of separately driven fan and 1XP8 001-2 rotary pulse encoder	H97		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake and 1XP8 001-2 rotary pulse encoder ⁹⁾	H98		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of brake, separately driven fan and 1XP8 001-2 rotary pulse encoder ⁹⁾	H99		–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

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 improved efficiency – Cast-iron series 1LA6 and 1LG4																
							1LA6 (cast-iron)				1LG4 (cast-iron)					
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 ⁷⁾																
Mounting of LL 861 900 220 rotary pulse encoder	H70						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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						–	–	–	–	✓	✓	✓	✓	✓	✓
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						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm						–	–	–	–	✓	✓	✓	✓	✓	✓
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm						–	–	–	–	✓	✓	✓	✓	✓	✓
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ¹⁰⁾	K17						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with clockwise direction of rotation ¹¹⁾	K37						–	–	✓	✓	✓	✓	✓	✓	✓	✓
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ¹¹⁾	K38						–	–	✓	✓	✓	✓	✓	✓	✓	✓
IP65 degree of protection ¹²⁾	K50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea) ¹³⁾	K52						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vibration-proof version	L03						✓	✓	✓	✓	–	–	–	–	–	–
Condensation drainage holes ¹⁴⁾	L12						✓	✓	✓	✓	□	□	□	□	□	□
Non-rusting screws (externally)	M27						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Earth brushes for converter-fed operation	M44						–	–	–	–	–	–	–	–	O. R.	O. R.
Mechanical protection for encoder ¹⁵⁾	M68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

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 improved efficiency – Cast-iron series 1LA6 and 1LG4																
			1LA6 (cast-iron)				1LG4 (cast-iron)									
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" ¹⁶⁾	D31						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSE Mark Japan ¹⁸⁾	D46						✓	✓	✓	–	–	–	–	–	–	–
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearings and lubrication																
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁹⁾	K20						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36						–	–	–	–	✓	✓	✓	✓	✓ ²⁰⁾	✓ ²⁰⁾
Regreasing device	K40						✓	✓	✓	✓	✓	✓	✓	✓	□	□
Located bearing DE	K94						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Located bearing NDE	L04						✓	✓	✓	□	□	□	□	□	□	□
Insulated bearing cartridge	L27						–	–	–	–	–	–	✓	✓	✓	✓
Balance and vibration quantity																
Vibration quantity A							□	□	□	□	□	□	□	□	□	□
Vibration quantity B	K02						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full key balancing	L68						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balancing without key	M37						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft and rotor																
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²¹⁾	K04						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second standard shaft extension ²²⁾	K16						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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 ²³⁾	Y55 • and identification code						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heating and ventilation																
Fan cover for textile industry	H17						✓	✓	✓	✓	–	–	–	–	–	–
Metal external fan ²⁴⁾	K35						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36						–	–	–	–	✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code						–	–	–	–	–	–	✓	✓	✓	✓

For legend, see Page 2/97, for footnotes, see Page 2/98.

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 improved efficiency – Cast-iron series 1LA6 and 1LG4																
		1LA6 (cast-iron)								1LG4 (cast-iron)						
Rating plate and extra rating plates																
Second lubricating plate, supplied loose	B06						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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 (maximum of 20 characters)	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						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operating instructions German/English in print	B23						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire-lattice pallet	L99						○	○	○	○	–	–	–	–	–	–
Connected in star for dispatch	M32						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33						✓	✓	✓	✓	✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- . R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire 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) Cannot be used for motors in UL version (order code **D31**). Cannot be used for motors according to CSA approval (order code **D40**) for motor serie 1LG4. The grease lifetime specified in catalog part 0 "Introduction" refers to CT 40 °C. When the coolant temperature rises by 10 K, the grease lifetime or relubrication interval is halved.
- 6) For frame sizes 100 to 160, do not specify an order code. Order code is only necessary for frame sizes 180 to 315.
- 7) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 8) 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.
- 9) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 10) Not possible for motor series 1LG4 for 2-pole motors.
- 11) For 1LG4 motors in low-noise version a second shaft extension and/or mounting of an encoder are not possible.)
- 12) Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 13) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 14) 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.
- 15) 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.
- 16) 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.
- 17) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 18) "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 19) Not possible for 2-pole 1LG4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level A 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**.
- 20) Additional charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 21) 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.
- 22) 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.
- 23) 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. 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 catalog part 0 "Introduction".
- 24) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external 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 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											✓	✓	✓	✓	✓	
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											✓	✓	✓	✓	✓	
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 box																	
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											✓	✓	✓	□	□	
One cable gland, metal	K54											✓	✓	✓	✓	✓	
Cable gland, 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 ²⁾	L48											✓	✓	✓	O. R.	O. R.	
6 cables protruding, 3 m long ²⁾	L49											✓	✓	✓	O. R.	O. R.	
Protruding cable ends – right side ³⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	
Protruding cable ends – left side ³⁾	L52											O. R.	O. R.	O. R.	O. R.	O. R.	
Auxiliary connection box 1XB3 020	L97											✓	✓	✓	✓	✓	

2

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 – Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Motor connection and connection box (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 155 (F), used acc. to 155 (F), with service factor (SF)	C11											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁵⁾	C12											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13											✓	✓	✓	✓	✓	
Increased air humidity/temperature with 30 to 60 g water per m ³ of air	C19											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁴⁾	C22											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁴⁾	C23											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁴⁾	C24											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ⁴⁾	C25											✓	✓	✓	✓	✓	
Increased air humidity/temperature with 60 to 100 g water per m ³ of air	C26											✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level											✓	✓	✓	✓	✓	
Colors and paint finish																	
Standard finish in RAL 7030 stone gray												□	□	□	□	□	
Standard finish in other standard RAL colors: 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 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL											✓	✓	✓	✓	✓	

For legend, see Page 2/103, for footnotes, see Page 2/104.

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 – Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Colors and paint finish (continued)																	
Special finish in special RAL colors: For RAL colors, see “Special finish in special RAL colors” on Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓	
Offshore special finish	M91											✓	✓	✓	✓	✓	
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.	
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	
Unpainted, only primed	K24											✓	✓	✓	✓	✓	
Modular technology – Basic versions ⁵⁾																	
Mounting of separately driven fan ⁶⁾	G17											✓	✓	✓	✓	✓	
Mounting of brake ^{6) 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 ^{6) 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											✓	✓	✓	✓	✓	
Mechanical manual brake release with lever (no locking)	K82											✓	✓	✓	✓	✓	
Special technology ⁵⁾																	
Mounting of LL 861 900 220 rotary pulse encoder	H70											✓	✓	✓	✓	✓	
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72											✓	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73											✓	✓	✓	✓	✓	
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											✓	✓	✓	✓	✓	
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15											✓	✓	✓	✓	✓	
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16											✓	✓	✓	✓	✓	

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 – Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
Special technology ⁵⁾ (continued)																	
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm										✓	✓	✓	✓	✓		
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm										✓	✓	✓	✓	✓		
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm										✓	✓	✓	✓	✓		
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ⁸⁾	K17										✓	✓	✓	✓	✓		
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K37										✓	✓	✓	✓	✓		
Low-noise version for 2-pole motors with counter-clockwise direction of rotation ⁹⁾	K38										✓	✓	✓	✓	✓		
IP65 degree of protection ¹⁰⁾	K50										✓	✓	✓	✓	✓		
IP56 degree of protection (non-heavy-sea) ¹¹⁾	K52										✓	✓	✓	✓	✓		
Condensation drainage holes ¹²⁾	L12										□	□	□	□	□		
Non-rusting screws (externally)	M27										✓	✓	✓	✓	✓		
Earth brushes for converter-fed operation	M44										–	–	–	–	O. R.		
Mechanical protection for encoder ¹³⁾	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" 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 DE and NDE, bearing size	K36										✓	✓	✓	✓	✓ ¹⁷⁾		
Regreasing device	K40										✓	✓	✓	✓	□		
Located bearing DE	K94										✓	✓	✓	✓	✓		
Located bearing NDE	L04										□	□	□	□	□		
Insulated bearing cartridge	L27										–	–	✓	✓	✓		
Balance and vibration quantity																	
Vibration quantity A											□	□	□	□	□		
Vibration quantity B	K02										✓	✓	✓	✓	✓		
Full key balancing	L68										✓	✓	✓	✓	✓		
Balancing without key	M37										✓	✓	✓	✓	✓		

For legend, see Page 2/103, for footnotes, see Page 2/104.

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 – Cast-iron series 1LG4																	
												1LG4 (cast-iron)					
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											✓	✓	✓	✓	✓	
Shaft extension with normal dimensions without featherkey way	K42											✓	✓	✓	✓	✓	
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											✓	✓	✓	✓	✓	
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code											–	–	✓	✓	✓	
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06											✓	✓	✓	✓	✓	
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 (maximum of 20 characters)	Y84 • and identification code											✓	✓	✓	✓	✓	
Packaging, safety notes, documentation and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	
Operating instructions German/English enclosed in print	B23											✓	✓	✓	✓	✓	
Type test with heat run for horizontal motors, with acceptance	F83											✓	✓	✓	✓	✓	
Connected in star for dispatch	M32											✓	✓	✓	✓	✓	
Connected in delta for dispatch	M33											✓	✓	□	□	□	

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire 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) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same technology system. This applies for:
 - Modular technology
 - Basic versions of "Modular technology"
 - Combination of special versions "Special technology"
- 6) 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.
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 8) Not possible for motor series 1LG4 for 2-pole motors.
- 9) For 1LG4 motors in low-noise version a second shaft extension and/or mounting of an encoder are not possible.)
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 10241 (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 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 quantity level A 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. 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 catalog part 0 "Introduction".
- 21) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external 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 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)					
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											✓	✓	✓	✓	✓	✓
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											✓	✓	✓	✓	✓	✓
Installation of 2 PT100 screw-in resistance thermometers (3-wire circuit) for rolling-con- tact bearings ¹⁾	A78											✓	✓	✓	✓	✓	✓
Installation of 2 PT 100 double screw-in resistance thermome- ters (3-wire circuit) for rolling- contact bearings ¹⁾	A80											✓	✓	✓	✓	✓	✓
Motor connection and connection box																	
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											✓	✓	✓	□	□	□
One cable gland, metal	K54											✓	✓	✓	✓	✓	✓
Cable gland, 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											□	□	□	□	□	□

2

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)					
Motor connection and connection box (continued)																	
6 cables protruding, 1.5 m long ²⁾	L48											✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49											✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side ³⁾	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 155 (F), used acc. to 155 (F), with service factor (SF)	C11											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁴⁾	C12											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13											✓	✓	✓	✓	✓	✓
Increased air humidity/temperature, with 30 to 60 g water per m ³ of air	C19											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4 % ⁴⁾	C22											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8 % ⁴⁾	C23											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13 % ⁴⁾	C24											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18 % ⁴⁾	C25											✓	✓	✓	✓	✓	✓
Increased air humidity/temperature, with 60 to 100 g water per m ³ of air	C26											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level											✓	✓	✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level											✓	✓	✓	✓	✓	✓

For legend, see Page 2/110, for footnotes, see Page 2/111.

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)						
Colors and paint finish																		
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□	□
Standard finish in other standard RAL colors: 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 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓	✓
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓	
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓	✓
Offshore special finish	M91											✓	✓	✓	✓	✓	✓	✓
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Unpainted (only cast iron parts primed)	K23											O	O	O	O	O	O	O
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓	✓
Modular technology – Basic versions ⁵⁾																		
Mounting of separately driven fan ⁶⁾	G17											✓	✓	✓	✓	✓	✓	✓
Mounting of brake ^{6) 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 ⁵⁾																		
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 ^{6) 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											✓	✓	✓	✓	✓	✓	✓

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)															
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 ⁵⁾																	
Mounting of LL 861 900 220 rotary pulse encoder	H70										✓	✓	✓	✓	✓	✓	
Mounting of HOG 9 D 1024 I rotary pulse encoder	H72										✓	✓	✓	✓	✓	✓	
Mounting of HOG 10 D 1024 I rotary pulse encoder	H73										✓	✓	✓	✓	✓	✓	
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										✓	✓	✓	✓	✓	✓	
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against moisture	J15										✓	✓	✓	✓	✓	✓	
Mounting of explosion-proof rotary pulse encoder HOG 10 DN 1024 I, connection box protection against dust	J16										✓	✓	✓	✓	✓	✓	
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against moisture	Y74 • and specified speed rpm										✓	✓	✓	✓	✓	✓	
Mounting of rotary pulse encoder HOG 10 DN 1024 I + FSL, (speed rpm), connection box protection against dust	Y76 • and specified speed rpm										✓	✓	✓	✓	✓	✓	
Mounting of rotary pulse encoder HOG 10 DN 1024 I + ESL 93, (speed rpm), connection box protection against dust	Y79 • and specified speed (max. 3) rpm										✓	✓	✓	✓	✓	✓	
Mechanical design and degrees of protection																	
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction and 2-pole motors ⁸⁾	K17										✓	✓	✓	✓	✓	✓	
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K37										–	–	–	–	–	–	
Low-noise version for 2-pole motors with clockwise direction of rotation ⁹⁾	K38										–	–	–	–	–	–	
IP65 degree of protection ¹⁰⁾	K50										✓	✓	✓	✓	✓	✓	
IP56 degree of protection (non-heavy-sea) ¹¹⁾	K52										✓	✓	✓	✓	✓	✓	
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										✓	✓	✓	✓	✓	✓	

For legend, see Page 2/110, for 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-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																	
												1LG6 (cast-iron)					
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 ¹⁴⁾	D30											□	□	□	□	□	□
Design according to UL with “Recognition Mark” ¹⁵⁾	D31											✓	✓	✓	✓	✓	✓
Certified for Korea according to KS C4202 ¹⁶⁾	D33											✓	✓	✓	✓	✓	✓
Canadian regulations (CSA) ¹⁷⁾	D40											✓	✓	✓	✓	✓	✓
VIK version (includes Zone 2 for mains-fed operation, without Ex nA II on rating plate)	K30											✓	✓	✓	✓	✓	✓
Bearings and lubrication																	
Measuring nipple for SPM shock pulse measurement for bearing inspection	G50											✓	✓	✓	✓	✓	✓
Bearing design for increased cantilever forces ¹⁸⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	K36											✓	✓	✓	✓	✓ ¹⁹⁾	✓ ¹⁹⁾
Regreasing device	K40											✓	✓	✓	✓	□	□
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge	L27											–	–	✓	✓	✓	✓
Balance and vibration quantity																	
Vibration quantity A												□	□	□	□	□	□
Vibration quantity B	K02											✓	✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓	✓
Shaft and rotor																	
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors ²⁰⁾	K04											✓	✓	✓	✓	✓	✓
Second standard shaft extension ²¹⁾	K16											✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42											✓	✓	✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L39											✓	✓	✓	✓	✓	✓
Non-standard cylindrical shaft extension ²²⁾	Y55 • and identification code											✓	✓	✓	✓	✓	✓
Heating and ventilation																	
Metal external fan ²³⁾	K35											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	✓
Sheet metal fan cover	L36											✓	✓	✓	✓	✓	✓
Separately driven fan with non-standard voltage and/or frequency	Y81 • and identification code											–	–	✓	✓	✓	✓

For legend, see Page 2/110, for 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-ventilated energy-saving motors with high efficiency – Cast-iron series 1LG6																	
			1LG6 (cast-iron)														
Rating plate and extra rating plates																	
Second lubricating plate, supplied loose	B06											✓	✓	✓	✓	✓	✓
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 (maximum of 20 characters)	Y84 • and identification code											✓	✓	✓	✓	✓	✓
Packaging, safety notes and test certificates																	
Acceptance test certificate 3.1 according to EN 10204	B02											✓	✓	✓	✓	✓	✓
Operating instructions German/English enclosed in print	B23											✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83											✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32											✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33											✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions

2

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire 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) A second shaft extension is not possible. Please inquire for mounted brakes. The order codes listed cannot be combined within the various technologies nor with each other within the same 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.
- 6) 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.
- 7) The standard brake supply voltage is 230 V AC, 50/60 Hz. Other brake supply voltages are possible with order codes **C00** and **C01**.
- 8) Not possible for motor series 1LG6 for 2-pole motors.
- 9) Not necessary for 1LG6 motors because these motors are already noise optimized.
- 10) Not possible in combination with rotary pulse encoder HOG 9 D 1024I (order code **H72**, **H79**) and/or brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 11) Not possible in combination with brake 2LM8 (used for motors up to and including frame size 225, order code **G26**).
- 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) For the EPACT standard version (no order code required).
- 15) 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.
- 16) For Korea are certified:
 - 2-pole motors ≤ 0.75 kW
 - 4-pole motors ≤ 0.75 kW
 - 6-pole motors ≤ 0.75 kW
- 17) Order with voltage code **9** and order code for voltage and frequency. The rated voltage is indicated on the rating plate.
- 18) Not possible for 2-pole 1LG6 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B 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**.
- 19) Extra charge for 2-pole motors. With 4-pole to 8-pole motors, standard version.
- 20) 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.
- 21) 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.
- 22) 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. 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 $\leq 2 \times$ length E (normal) of the shaft extension
 For an explanation of the order codes, see catalog part 0 "Introduction".
- 23) For 1LA5/6/7/9 motors and 1LG with metal external fan, converter-fed operation is permitted. The metal external 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 – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)									1LP5 (aluminum)				
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Temperature detectors for tripping ¹⁾	A31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Installation of 3 PT 100 resistance thermometers ¹⁾	A60		–	–	–	–	✓	✓	✓	✓	✓	✓	✓			
Motor connection and connection box																
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		–	–	✓	✓	✓	✓	✓	✓	✓	✓				
One cable gland, metal	K54		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Cable gland, 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
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 m³ of air	C19		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Increased air humidity/temperature with 60 to 100 g water per m³ of air	C26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

For legend, see Page 2/114, for 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 – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)									1LP5 (aluminum)				
Colors and paint finish																
Special finish in RAL 7030 stone gray			□	□	□	□	□	□	□	□	□	□	□			
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Special finish in special RAL colors: For RAL colors, see “Special finish in special RAL colors” on Page 0/19	Y51 • and special finish RAL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Standard finish in other standard RAL colors: 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 0/18	Y53 • and standard finish RAL		–	–	–	–	–	–	–	–	–	–	–			
Sea air resistant special finish	M94		O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	O. R.			
Unpainted (only cast iron parts primed)	K23		○	○	○	○	○	○	○	○	○	○	○			
Unpainted, only primed	K24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Mechanical design and degrees of protection																
Drive-end seal for flange-mounting motors with an oil-tightness of up to 0.1 bar 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Coolant temperature and site altitude																
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” ⁷⁾	D31		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Canadian regulations (CSA) ⁸⁾	D40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
PSE Mark Japan ⁹⁾	D46		✓	✓	✓	✓	✓	✓	✓	✓	–	–	–			
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		✓	✓	✓	✓	✓	✓	✓	✓	□	□	□			

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 – Aluminum series 1LP7 and 1LP5																
			1LP7 (aluminum)									1LP5 (aluminum)				
Balance and vibration quantity																
Vibration quantity A			□	□	□	□	□	□	□	□	□	□	□			
Vibration quantity B	K02		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Full key balancing	L68		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Balancing without key	M37		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Shaft extension with normal dimensions without featherkey way	K42		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
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 • 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 lubricating plate, supplied loose	B06		–	–	–	–	✓	✓	✓	✓	✓	✓	✓			
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 (maximum of 20 characters)	Y84 • and identification code		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Packaging, safety notes 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		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Operating instructions German/English in print	B23		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Type test with heat run for vertical motors, with acceptance	F83		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Wire-lattice pallet	L99		○	○	○	○	○	○	○	○	○	–				
Connected in star for dispatch	M32		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Connected in delta for dispatch	M33		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- R. Possible on request
- ✓ With additional charge
- Not possible

For footnotes, see Page 2/115.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Special versions
2

- ¹⁾ Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 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, C18, D31, D40, G50, H15, H17, H62, H63, H64, H98, H99, K04, K15, K16, K34, K35, K40, K45, K46, K52, K54, K82, L03, L44, L45, L47, L48, L49, L51, L52**.
- ³⁾ 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 inquire 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. The rated voltage is indicated on the rating plate without voltage range.
- ⁸⁾ The rated voltage is indicated on the rating plate without voltage range.
- ⁹⁾ "Small power motors" with a rated output of up to 3 kW which are exported to Japan must bear the PSE marking.
- 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**).
- 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. 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 catalog part 0 "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											✓	✓	✓	✓	✓	✓
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											✓	✓	✓	✓	✓	✓
Installation of 2 PT100 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 box																	
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											✓	✓	✓	✓	✓	✓
One cable gland, metal	K54											✓	✓	✓	✓	✓	✓
Cable gland, 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 ²⁾	L48											✓	✓	✓	O. R.	O. R.	O. R.
6 cables protruding, 3 m long ²⁾	L49											✓	✓	✓	O. R.	O. R.	O. R.
Protruding cable ends – right side ³⁾	L51											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.
Protruding cable ends – left side 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 2/119.

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)						
Motor connection and connection box (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 155 (F), used acc. to 155 (F), with service factor (SF)	C11											✓	✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 155 (F), with increased output ⁴⁾	C12											✓	✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	C13											✓	✓	✓	✓	✓	✓	
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											✓	✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 130 (B), with increased coolant temperature and/or site altitude	Y50 • and specified output, CT .. °C or SA m above sea level											✓	✓	✓	✓	✓	✓	
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and specified output, CT .. °C or SA m above sea level											✓	✓	✓	✓	✓	✓	
Colors and paint finish																		
Standard finish in RAL 7030 stone gray												□	□	□	□	□	□	
Standard finish in other standard RAL colors: 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 0/18	Y53 • and standard finish RAL											✓	✓	✓	✓	✓	✓	
Special finish in RAL 7030 stone gray	K26											✓	✓	✓	✓	✓	✓	
Special finish in other standard RAL colors: 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 0/18	Y54 • and special finish RAL											✓	✓	✓	✓	✓	✓	
Special finish in special RAL colors: For RAL colors, see "Special finish in special RAL colors" on Page 0/19	Y51 • and special finish RAL											✓	✓	✓	✓	✓	✓	
Offshore special finish	M91											✓	✓	✓	✓	✓	✓	
Sea air resistant special finish	M94											O. R.	O. R.	O. R.	O. R.	O. R.	O. R.	
Unpainted (only cast iron parts primed)	K23											○	○	○	○	○	○	
Unpainted, only primed	K24											✓	✓	✓	✓	✓	✓	

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 with an oil-tightness of up to 0.1 bar Not possible for IM V3 type of construction ⁵⁾	K17											✓	✓	✓	✓	✓	✓
IP65 degree of protection	K50											✓	✓	✓	✓	✓	✓
IP56 degree of protection (non-heavy-sea)	K52											✓	✓	✓	✓	✓	✓
Condensation drainage holes ⁶⁾	L12											□	□	□	□	□	□
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" 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 ⁹⁾	K20											✓	✓	✓	✓	✓	✓
Special bearing for DE and NDE, bearing size	K36											✓	✓	✓	✓	✓ ¹⁰⁾	✓ ¹⁰⁾
Regreasing device	K40											✓	✓	✓	✓	□	□
Located bearing DE	K94											✓	✓	✓	✓	✓	✓
Located bearing NDE	L04											□	□	□	□	□	□
Insulated bearing cartridge	L27											–	–	✓	✓	✓	✓
Balance and vibration quantity																	
Vibration quantity A												□	□	□	□	□	□
Vibration quantity B	K02											✓	✓	✓	✓	✓	✓
Full key balancing	L68											✓	✓	✓	✓	✓	✓
Balancing without key	M37											✓	✓	✓	✓	✓	✓
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											✓	✓	✓	✓	✓	✓
Shaft extension with normal dimensions without featherkey way	K42											✓	✓	✓	✓	✓	✓
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																	
Anti-condensation heaters for 230 V	K45											✓	✓	✓	✓	✓	✓
Anti-condensation heaters for 115 V	K46											✓	✓	✓	✓	✓	✓

For legend and footnotes, see Page 2/119.

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												180	200	225	250	280	315
		56	63	71	80	90	100	112	132	160									
Self-cooled motors without external fan – Cast-iron series 1LP4																			
														1LP4 (cast-iron)					
Rating plate and extra rating plates																			
Second lubricating plate, supplied loose	B06													✓	✓	✓	✓	✓	✓
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 (maximum of 20 characters)	Y84 • and identification code													✓	✓	✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates																			
Acceptance test certificate 3.1 according to EN 10204	B02													✓	✓	✓	✓	✓	✓
Type test with heat run for vertical motors, with acceptance	F83													✓	✓	✓	✓	✓	✓
Connected in star for dispatch	M32													✓	✓	✓	✓	✓	✓
Connected in delta for dispatch	M33													✓	✓	□	□	□	□

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- O. R. Possible on request
- ✓ With additional charge
- Not possible

- 1) Evaluation with appropriate tripping unit (see Catalog LV 1) is recommended.
- 2) In combination with the PTC thermistor option or anti-condensation heating option, please inquire 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 possible for motor series 1LP4 for 2-pole motors.
- 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) Not possible for 2-pole 1LP4 motors, frame size 315 L in vertical types of construction; bearings for increased cantilever forces at vibration quantity level B 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**.

- 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 in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **K20**).
- 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 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. 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 catalog part 0 "Introduction".

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Accessories

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 Catalog 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⁾
	315	4 to 8	1PP9 063-2LA12-Z A11+K50 ⁴⁾
Separately driven fan and rotary pulse encoder 1XP8 001-1 incl. mounting parts ²⁾	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 inquire).

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.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

Accessories

2

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, Germany
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.

Source of supply:
Siemens contact partner – ordering from Catalog
Siemens MD 10.1 "FLENDER Standard Couplings"

or

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

Mounting of encoder

In the case of mounting by the customer.

Options H79, H80

Baumer Hübner GmbH
Planufer 92b
10967 Berlin, Germany
Tel. +49 (0)30-690 03-0
Fax +49 (0)30-690 03-104

<http://www.baumerhuebner.com>
e-mail: info@baumerhuebner.com

Options H78

Leine & Linde (Deutschland) GmbH
Bahnhofstraße 36
73430 Aalen, Germany
Tel. +49 (0)7361-78 093-0
Fax +49 (0)7361-78 093-11

<http://www.leinelinde.com>
e-mail: info@leinelinde.se

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>

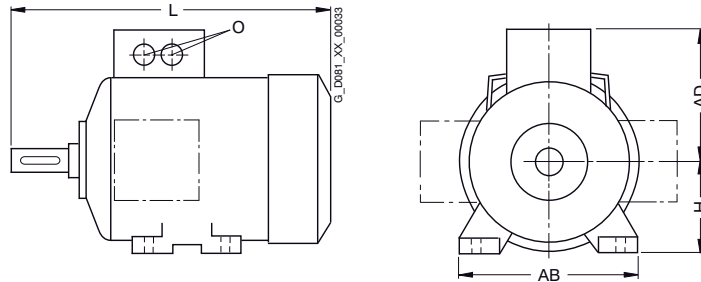
IEC Squirrel-Cage Motors

Standard motors frame size 315L and above

Dimensions

Overview

Overall dimensions



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 050		169	101	56	110	1 x M25 x 1.5
	1LA9 053		195	101	56	110	1 x M16 x 1.5
	1LA9 053		195	101	56	110	1 x M25 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 M25 x 1.5
	1LA9 061		228.5	101	63	120	1 x M16 x 1.5
	1LA9 061		228.5	101	63	120	1 x M25 x 1.5
71 M	1LA7		240	111	71	132	1 x M16 x 1.5
	1LA9		240	111	71	132	1 x M25 x 1.5
	1LP7		207	111	71	132	1 x M16 x 1.5
	1LP7		207	111	71	132	1 x M25 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 M25 x 1.5
	1LA9 083		308.5	120	80	150	1 x M16 x 1.5
	1LA9 083		308.5	120	80	150	1 x M25 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 M25 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 M25 x 1.5
	1LA9 096-4..		358	128	90	165	1 x M16 x 1.5
	1LA9 096-4..		358	128	90	165	1 x M25 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
	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		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

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
	1LP7		529	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
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
	1LA5		806	305	225	426	2 x M50 x 1.5
	1LA5	2	776	305	225	426	2 x M50 x 1.5
225 S/ 225 M	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
	1LG4		887	392	250	490	2 x M63 x 1.5
	1LG4 258	4	957	392	250	490	2 x M63 x 1.5
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
	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
	1LP4 253		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)

Frame 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

Frame 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	
K	
S	flange (FF)

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimension	Permitted deviation
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.

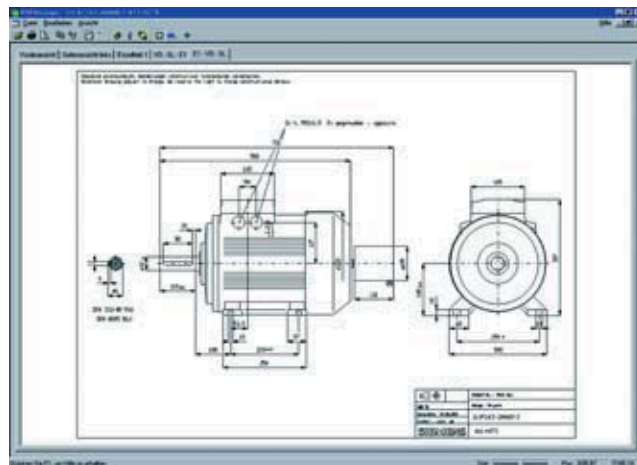
■ All dimensions are specified in mm.

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 Catalog CA 01 as a selection aid (for further information, catalog part 11 "Appendix", "SD configurator selection tool").

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 10/2008, English international:
DVD: E86060-D4001-A510-C7-7600

IEC Squirrel-Cage Motors

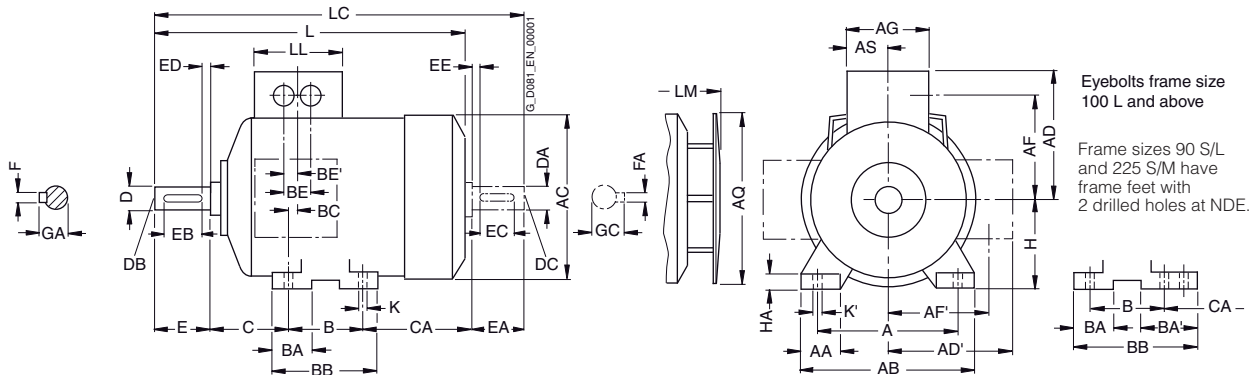
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

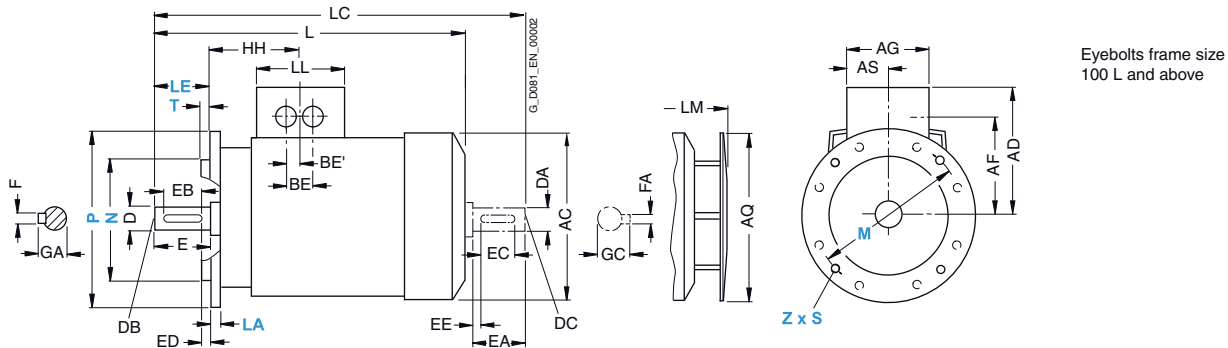
Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (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	75	–	37.5	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	75	124	37.5	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	75	124	37.5	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 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.

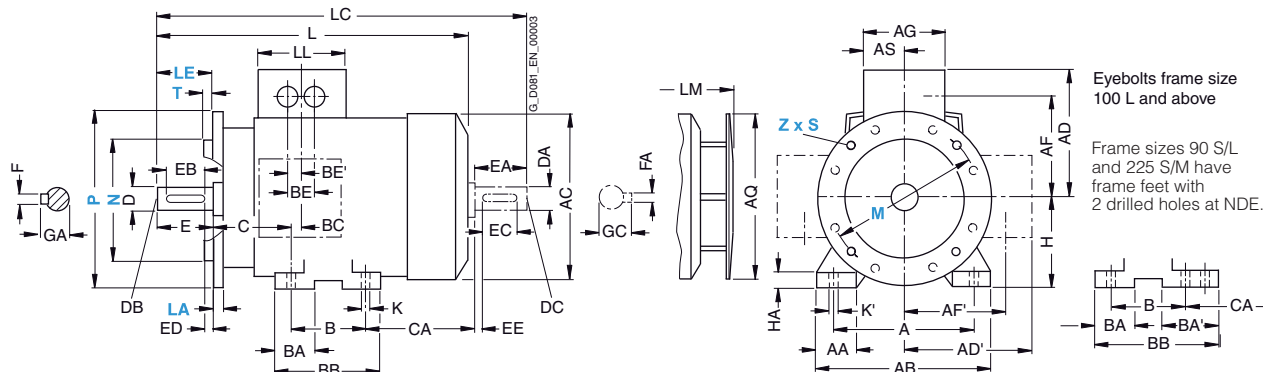
³⁾ The motors of frame size 56 M are not ventilated.

Dimensional drawings

Aluminum series 1LA7 and 1LA5, frame sizes 56 M to 225 M

Type of construction IM B35

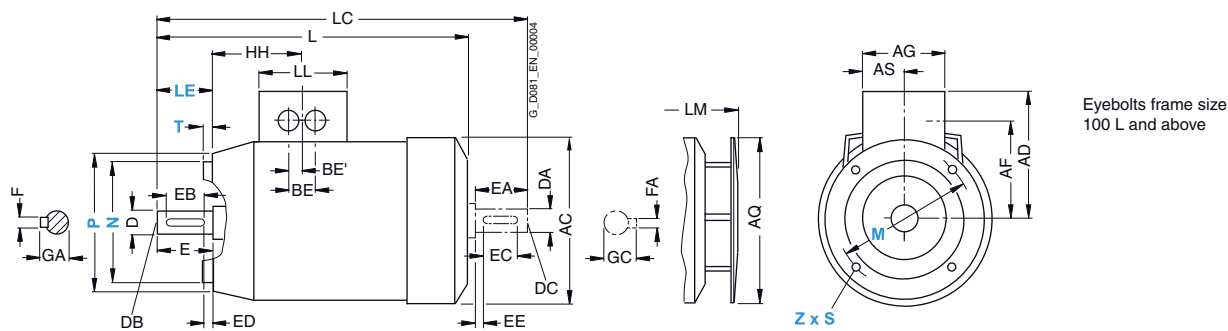
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



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 2/140 (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	75	–	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 ³⁾	232 ³⁾	75	231.5 ³⁾	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	75	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	2, 4, 6, 8	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, 8	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
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.

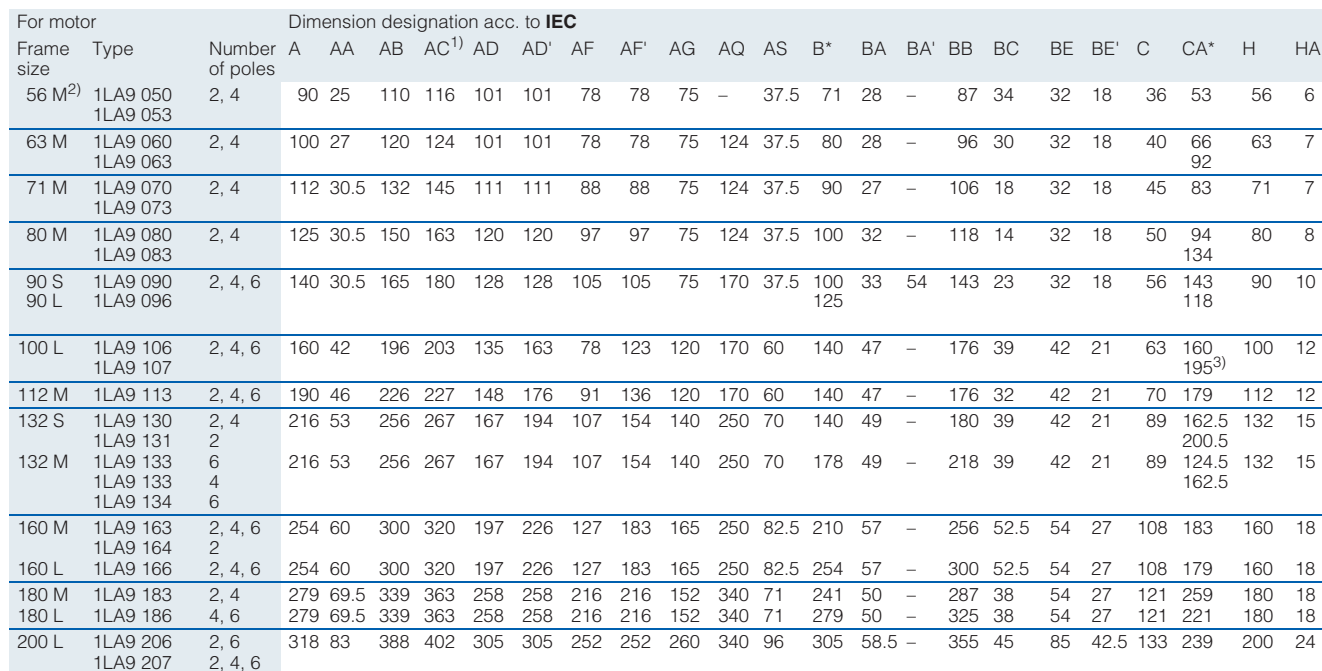
2) In a low-noise version, the dimension L is 8 mm greater and the dimension LM is 11.5 mm greater.

3) For 1LA7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

Type of construction IM B3



For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



3) For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

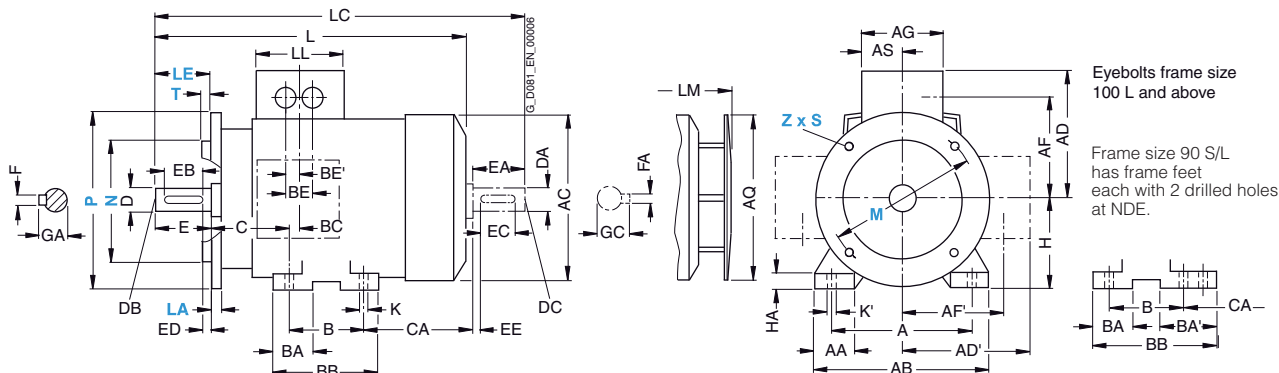
Dimensions

Dimensional drawings

Aluminum series 1LA9, frame sizes 56 M to 200 L

Type of construction IM B35

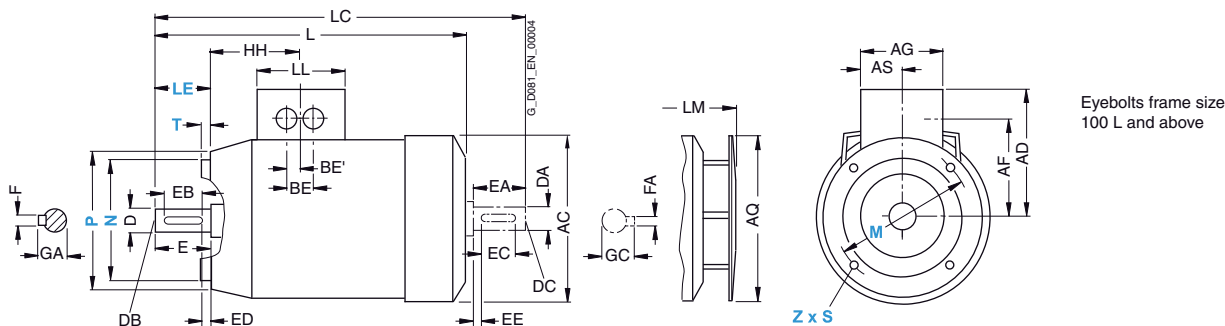
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



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 2/140 (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⁾	1LA9 050 1LA9 053	2, 4	69.5	5.8	9	169 ²⁾ 195	200 ²⁾ 226	75	–	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 ³⁾ 228.5	232 ³⁾ 258	75	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	75	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 ⁴⁾ 358 ⁵⁾	389 434 ⁴⁾ 414 ⁵⁾	75	382.5 427.5 ⁴⁾ 409.5 ⁵⁾	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 ⁶⁾	473 508 ⁶⁾	120	458.5 493 ⁶⁾	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 frame size 56 M with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L and LC are 26 mm longer.

³⁾ For 1LA9 060 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L, LC and LM are 26 mm longer.

⁴⁾ For 1LA9 096-6KA.

⁵⁾ For 1LA9 096-2 and 1LA9 096-4.

⁶⁾ For 1LA9 107-4KA.

IEC Squirrel-Cage Motors

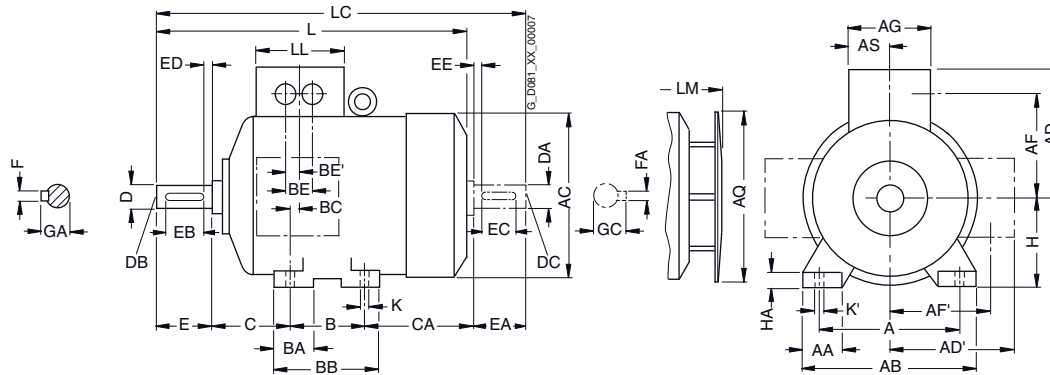
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

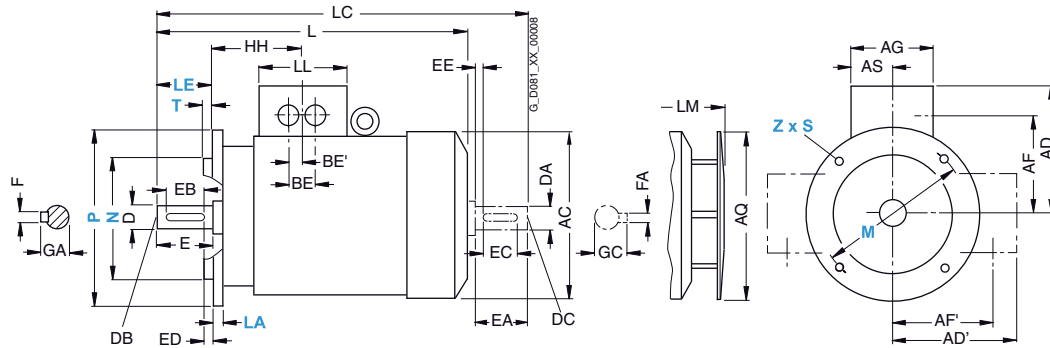
Cast-iron series 1LA6, frame sizes 100 L to 160 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (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.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

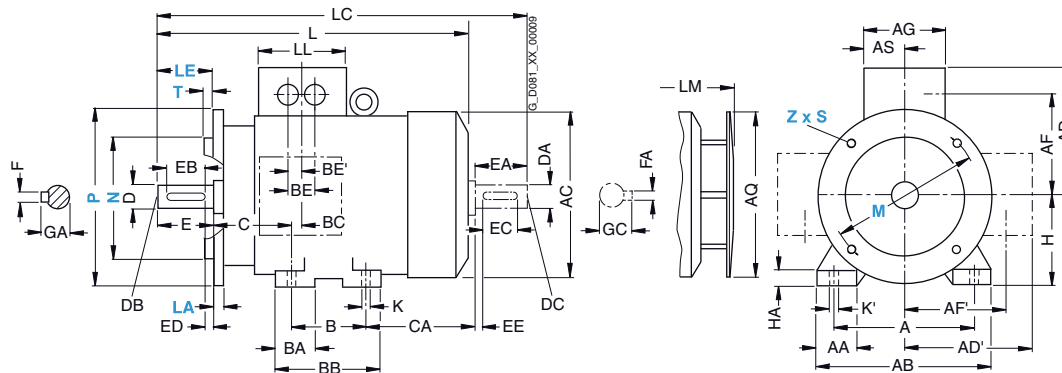
Dimensions

Dimensional drawings

Cast-iron series 1LA6, frame sizes 100 L to 160 L

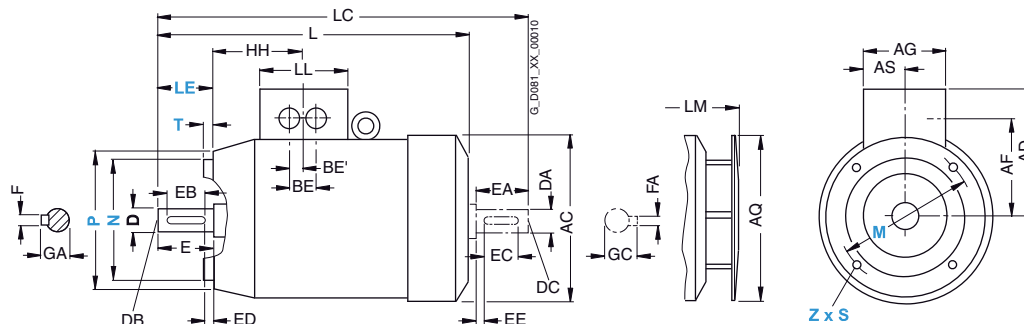
Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



Types of construction IM B14

For flange dimensions, see Page 2/140 (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	2, 4, 6, 8	104.5	12	16	372	438	121	423.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27
	1LA6 107	4, 8																					
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	2, 4, 6, 8	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA6 131	2																					
132 M	1LA6 133	4, 6, 8	130.5	12	16	453.5	551.5	141	506	38	M12	80	70	5	10	41	38	M12	80	70	5	10	41
	1LA6 134	6																					
160 M	1LA6 163	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
	1LA6 164	2, 8																					
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

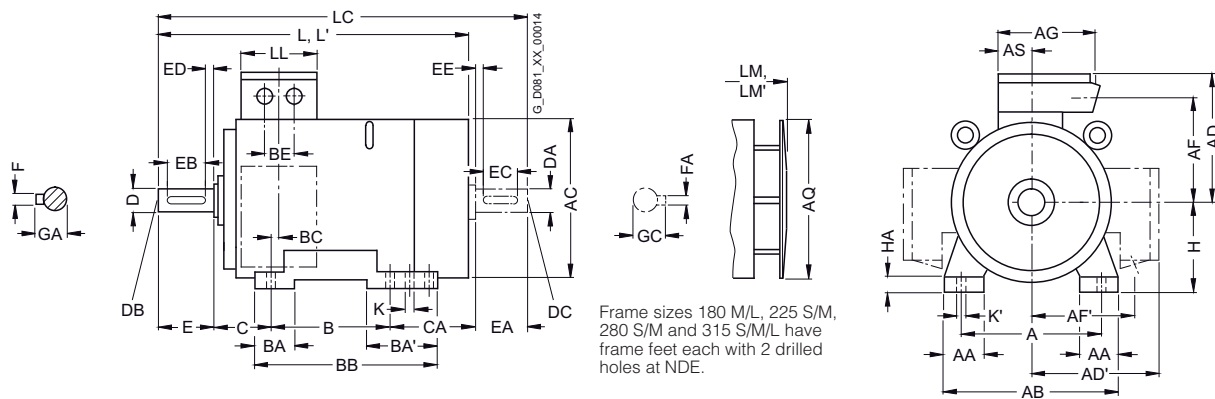
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

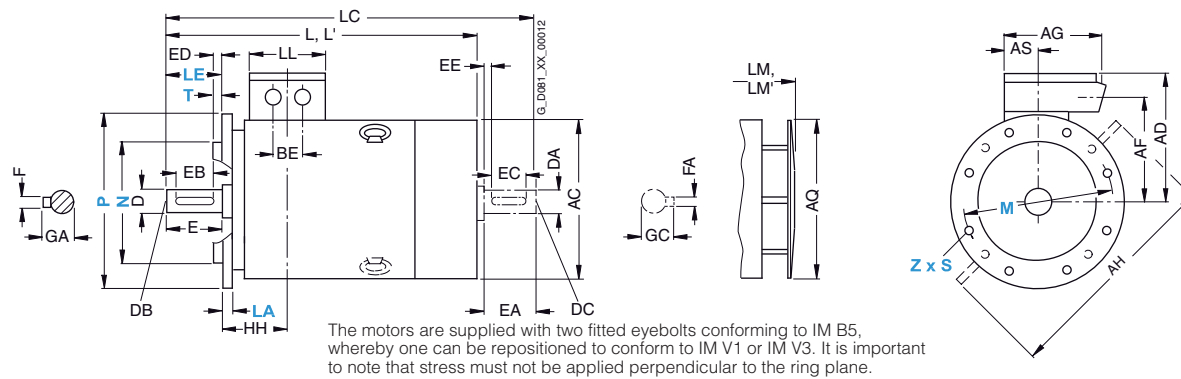
Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC		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	512	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	512	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	512	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
	1LG4 228	4, 6, 8		356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	225	34
		2																							
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
	1LG4 258	4, 6, 8		406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	235	250	40
		2																				305			
		4																				235			
		6, 8																							
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.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

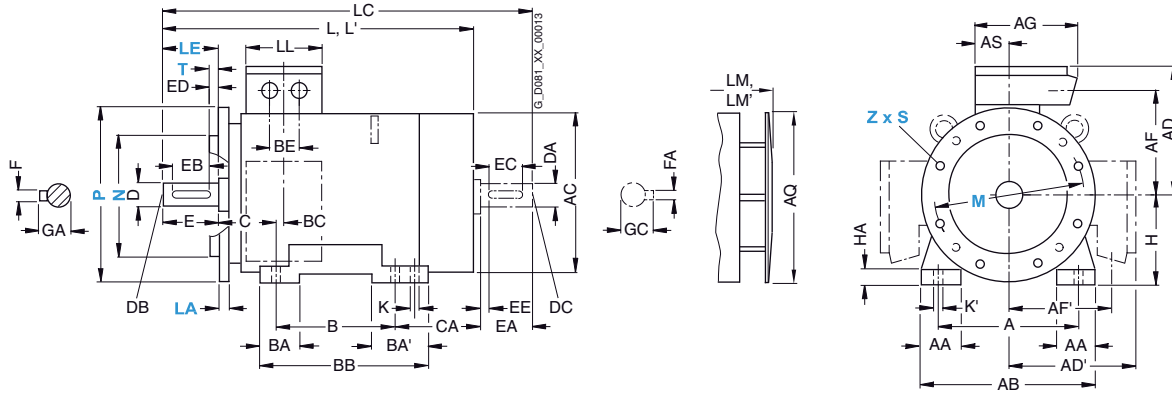
Dimensions

Dimensional drawings

Cast-iron series 1LG4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/140 (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	811	892	192	867	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	196	19	25	759	793	873	192	859	893	55	M20	110	100	5	16	59	48	M16	110	100	5	14	51.5
	1LG4 228	4, 6, 8	—	—	—	789	—	903	—	889	—	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59
		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
		—				—	1032	—		65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
	1LG4 258	2	887	924	1002	236	987	1024	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59			
		4	957	—	1102	—	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
280 M	1LG4 283	4, 6, 8	—	—	—	—	—	—	—	—	—	75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		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
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

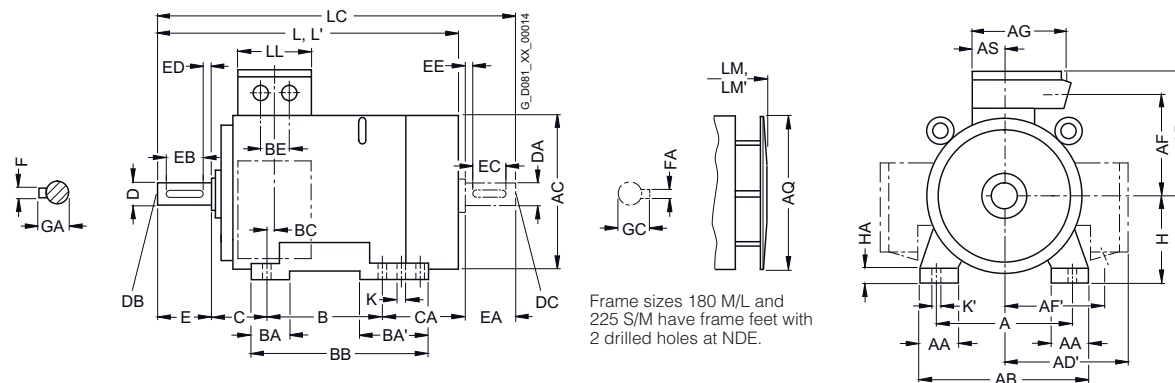
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

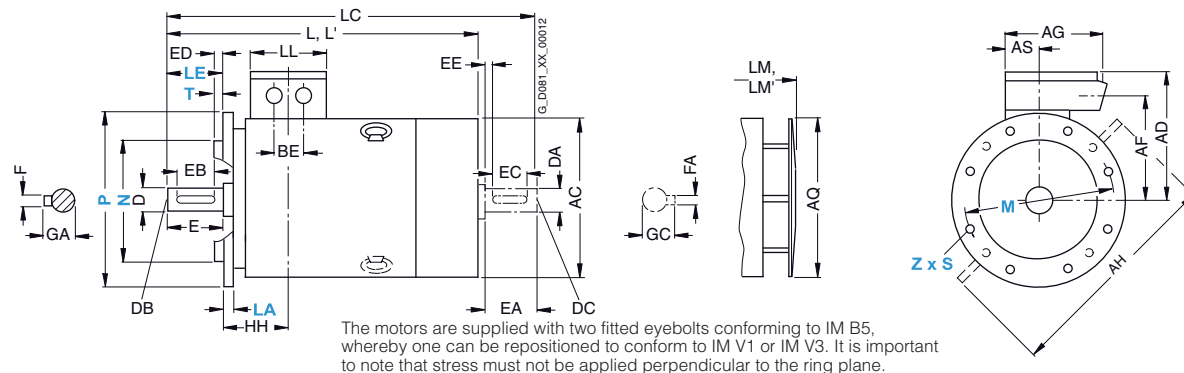
Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (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	2, 6	279	65	339	363	262	262	220	220	152	452	340	71	279	70	111	328	36	54	121	215	180	20		
	1LG6 207	4, 6, 8	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	177	200	25		
225 S	1LG6 220	2, 6	318	70	378	402	300	300	247	247	260	512	340	96	305	80	80	355	63	85	133	234	200	25		
	1LG6 207	4, 8																			177					
225 M	1LG6 223	2	356	80	436	442	325	325	272	272	260	556	425	96	286	85	110	361	47	85	149	218	225	34		
	1LG6 228	4, 6, 8	356	80	436	442	325	325	272	272	260	556	425	96	311	85	110	361	47	85	149	253	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		
	1LG6 258	4, 6, 8	406	100	490	495	392	392	308	308	300	620	470	118	349	100	100	409	69	110	168	305	250	40		
		2																			235					
		4, 6																			305					

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Measured across the bolt heads.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

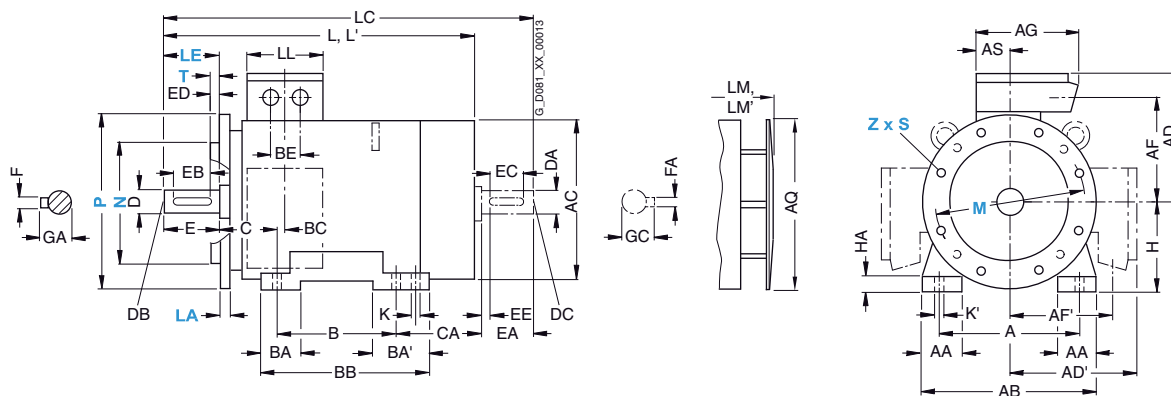
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 180 M to 250 M

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



2

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		
180 M	1LG6 183	2	157	15	19	720	835	132	810	48	M16	110	100	5	14	51.5	48	M16	110	100	5	14	51.5		
180 L	1LG6 186	4				669	784		759																
		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	835	192	810	55	M20	110	100	5	16	59	55	M20	110	100	5	16	59		
	1LG6 207	2, 6	196	19	25	777	892	192	867	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	933	192	919	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	983	192	969	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	1002	236	987	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	1102	236	1057	60	M20	140	125	10	18	64	55	M20	110	100	5	16	59		
		2								65	M20	140	125	10	18	69	60	M20	140	125	10	18	64		
		4, 6																							

IEC Squirrel-Cage Motors

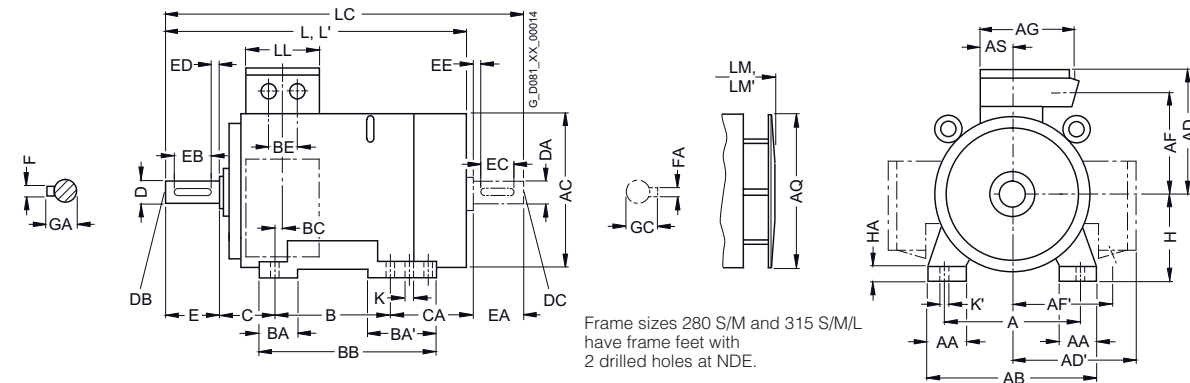
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

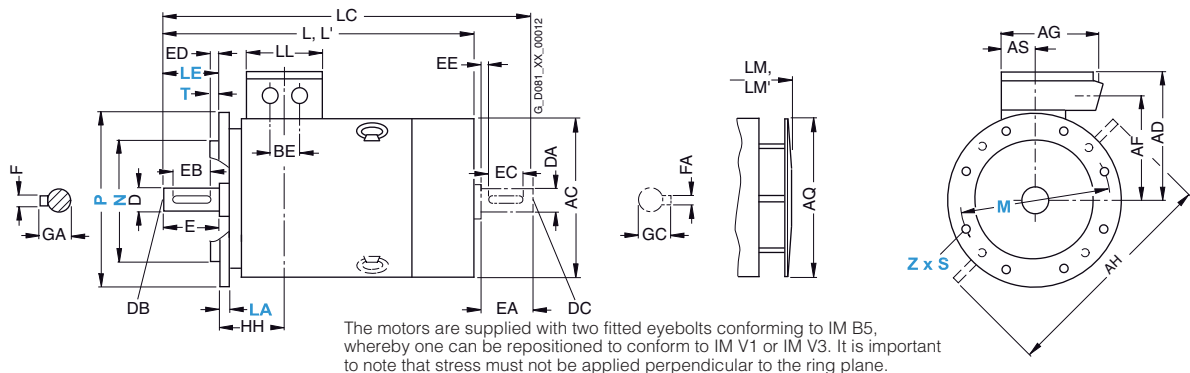
Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 2/140 (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	216	326	280	40
		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	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	
315 L ²⁾	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	
	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	508	120	610	610	651	651	524	524	470	780	590	165	508	155	206	648	69	135	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.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

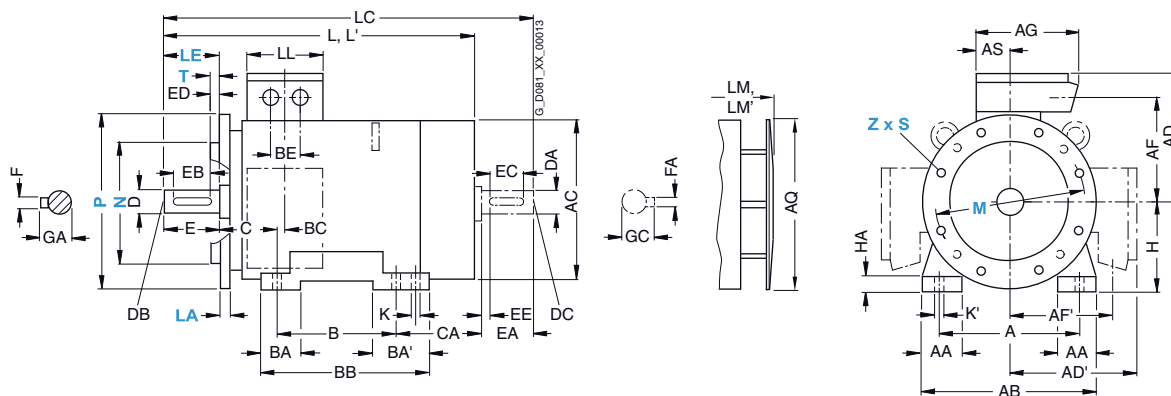
Dimensions

Dimensional drawings

Cast-iron series 1LG6, frame sizes 280 S to 315 L

Type of construction IM B35

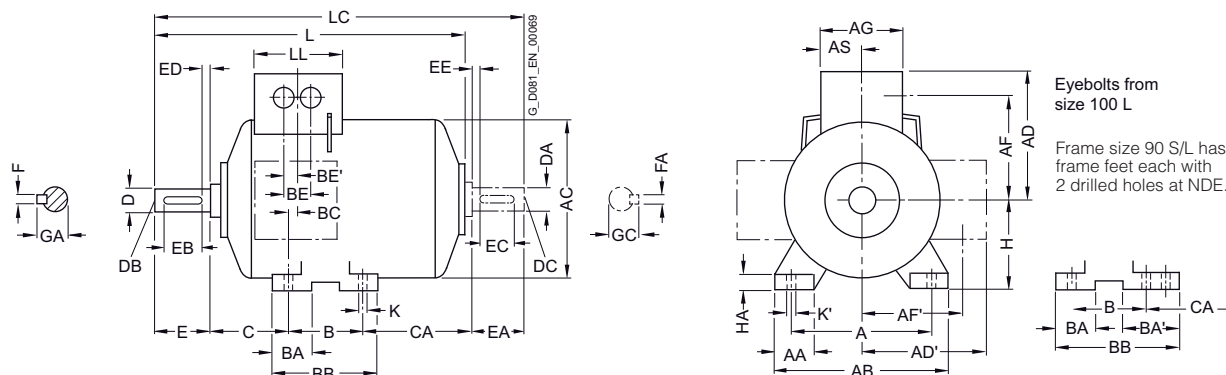
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



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
280 S	1LG6 280	2	252	24	30	960	1105	236	1070	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	1215	236	1180	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	1215	236	1180	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	1217	307	1182	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 M	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	1377	307	1342	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 L	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	1377	307	1342	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	1517	307	1482	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	1517	330	1482	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
	1LG6 318	4				1402	1547		1512	80 ¹⁾	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⁾ Diameters up to 90 mm are possible.

Type of construction IM B3



* This dimension is assigned in DIN EN 50347 to the frame size listed.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

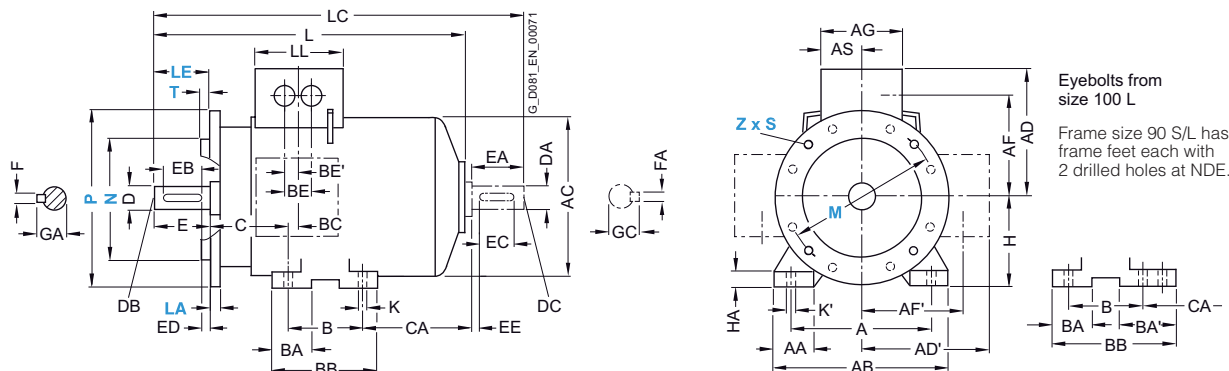
Dimensions

Dimensional drawings

Aluminum series 1LP7 and 1LP5, frame sizes 63 M to 200 L

Types of construction IM B35

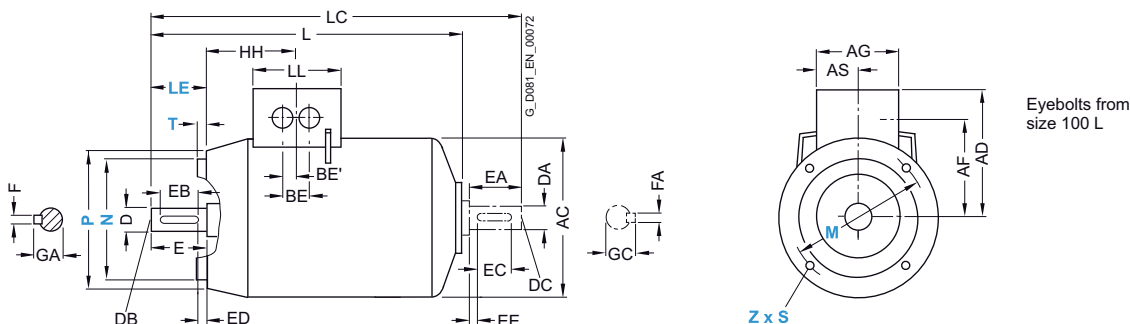
For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



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 2/140 (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	1LP7 060 1LP7 063	2, 4, 6	69.5	7	10	172 ¹⁾	206 ¹⁾	75	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	75	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 ²⁾	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 ³⁾	403 ⁴⁾	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 1LP7 063 with type of construction code 1 (B5, IM V1 without protective cover, IM V3) the dimensions L and LC are 26 mm longer.

²⁾ For IM B14, 381 mm.

³⁾ For IM B5, 345 mm.

⁴⁾ For IM B5, 399 mm.

IEC Squirrel-Cage Motors

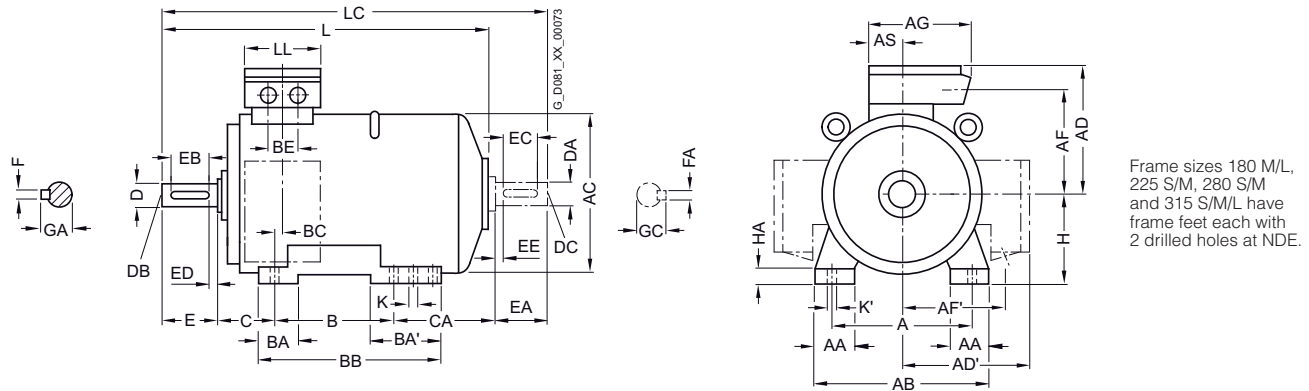
Standard motors up to frame size 315 L

Dimensions

Dimensional drawings

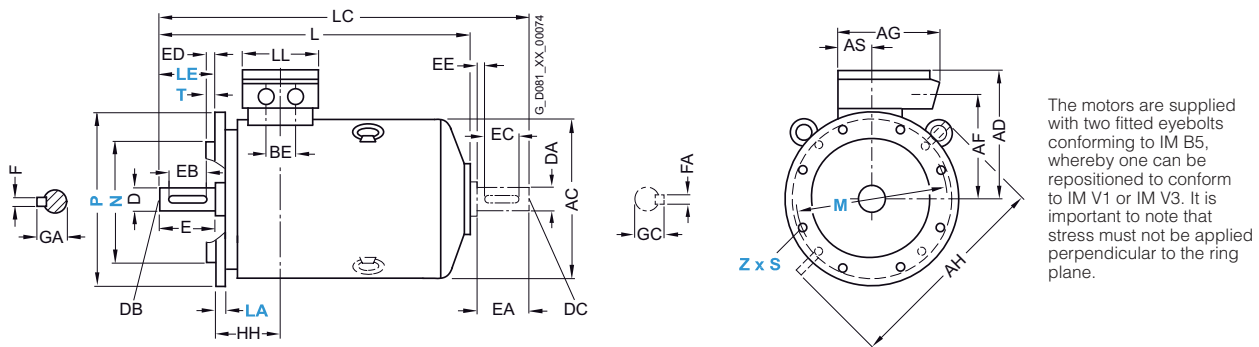
Cast-iron series 1LP4, frame sizes 180 M to 315 L

Type of construction IM B3



Types of construction IM B5 and IM V1 (IM B5 only up to frame size 315 M)

For flange dimensions, see Page 2/140 (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	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	512	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	512	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.

IEC Squirrel-Cage Motors

Standard motors up to frame size 315 L

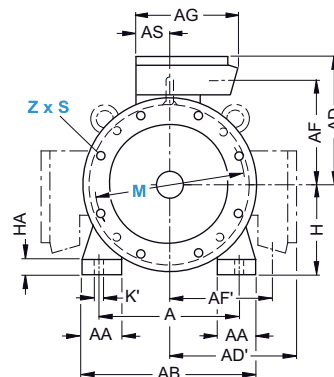
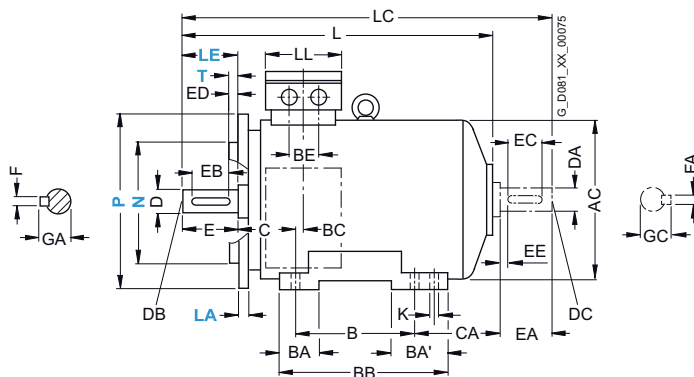
Dimensions

Dimensional drawings

Cast-iron series 1LP4, frame sizes 180 M to 315 L

Type of construction IM B35

For flange dimensions, see Page 2/140 (Z = the number of retaining holes)



2

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
280 M	1LP4 283	4, 6, 8							75	M20	140	125	10	20	79.5	65	M20	140	125	10	18	69
		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
315 M ¹⁾	1LP4 310	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	1LP4 313	2	285	28	35	925	1070	307	65	M20	140	125	10	18	69	60	M20	140	125	10	18	64
315 L ¹⁾	1LP4 313	4, 6, 8				955	1100		80	M20	170	140	25	22	85	70	M20	140	125	10	20	74.5
	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.

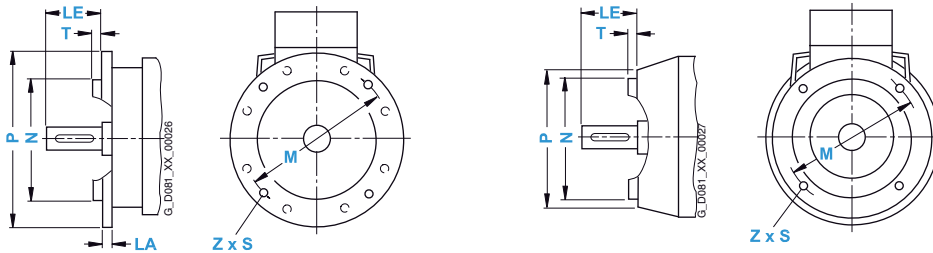
IEC Squirrel-Cage Motors

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								
					LA	LE	M	N	P	S	T	Z
56 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 100	Acc. to DIN EN 50347 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 115	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	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	IM B5, IM V1, IM V3	Flange	FF 600	A 660	22	140	600	550	660	24	6	8

Non-standard motors frame size 315 and above



3/2 Orientation

- 3/2 Overview
- 3/2 Benefits
- 3/3 Application
- 3/3 Design
- 3/4 Technical specifications
- 3/11 Selection and ordering data
- 3/13 More information

3/14 Self-ventilated motors for mains-fed operation Cast-iron series 1LA8

- 3/14 Selection and ordering data

3/18 Self-ventilated motors for converter-fed operation Cast-iron series 1LA8

- 3/18 Selection and ordering data

3/26 Forced-air cooled motors with separately driven fan for converter-fed operation Cast-iron series 1PQ8

- 3/26 Selection and ordering data

3/34 Self-ventilated motors with through ventilation for mains-fed operation Cast-iron series 1LL8

- 3/34 Selection and ordering data

3/38 Self-ventilated motors with through ventilation for converter-fed operation Cast-iron series 1LL8

- 3/38 Selection and ordering data

3/46 Special versions

- 3/46 Overview
- 3/47 Selection and ordering data
- 3/47 • Voltages
- 3/50 • Options

3/62 Accessories

- 3/62 Overview
- 3/62 More information

3/63 Dimensions

- 3/63 Overview
- 3/64 Dimensional drawings