

SIEMENS

Low-Voltage Motors

Catalog M 11 · 2000



SOURBEL-CAGE MOTORS

Important:

The technical specifications contained in this catalog are provided as general information.
The Operating Instructions and the information specified on the actual products are binding for installation, operation and maintenance.

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- Technical data, selection and ordering data (order numbers), accessories and availability are subject to change.
- All dimensions in this catalog are stated in millimeters.

Catalogs of the Automation and Drives Group (A&D)

Further information can be obtained from our branch offices listed in the appendix of this catalog

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Drive Systems			
<u>Variable-Speed Drives</u>			
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DC Drives Preferred Series 215 kW to 1500 kW	DA 12.2		
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SIMOVERT MASTERDRIVES Motion Control	DA 65.11		
SIMADYN D Control System	DA 99		
<u>Automation Systems for Machine Tools SIMODRIVE</u>	NC 60.1		
• AC Main Spindle Motors 1PH2, 1PH3, 1PH4, 1PH7			
• AC Servomotors 1FK6, 1FN1, 1FS5, 1FT5, 1FT6			
• Converter System SIMODRIVE 611			
See under catalog heading „SINUMERIK & SIMODRIVE“			
<u>Low-Voltage Three-Phase-Motors</u>			
• Project Manual	M 10		
• Squirrel-Cage Motors, Totally Enclosed, Fan-Cooled	M 11		
Drive and Control Components for Hoisting Equipment	HE 1		
Automation Systems for Machine Tools SINUMERIK & SIMODRIVE			
• Ordering Catalog	NC 60.1		
• Cables, Connectors and System Components	NC Z		
Human Machine Interface Products/Systems SIMATIC HMI	ST 80		
SIMATIC Industrial Automation Systems			
SIMATIC PCS Process Control System	ST 45		
SIMATIC S5/PC/505 Automation Systems	ST 50		
Components for Totally Integrated Automation	ST 70		
Supplementary Components	ST 71		
SIMATIC PCS 7 Process Control System	ST PCS 7		
Electrical Installation Technology			
Protective Switching and Fuse Systems	I 2.1		
Building Management Systems with <i>instabus EIB</i>			
Program Overview Modular Devices	I 2.11		
STAB Wall-Mounting Distribution Boards	I 2.31		
SIKUS Floor-Mounting Distribution Boards	I 2.32		
8PU Busway System	I 2.36		
Systems Engineering	<i>Catalog</i>		
Power supplies SITOP power	KT 10.1		
System cables SIMATIC TOP connect	KT 10.2		
MOBY Identification Systems	KT 21		
Industrial Microcomputers SICOMP	KT 51		
Printers and Monitors for Automation and Drives	KT 61		
Cabinet Packaging System for SIMATIC PCS 7	KT 71		
Industrial Communication and Field Devices	IK PI		
Low-Voltage Controls and Distribution			
<u>Low-Voltage Controlgear, Switchgear and Systems</u>	NS K		
Communication-Capable SIRIUS NET Controlgear, Controlgear, SIGUARD Safety Systems, Control and Signalling Devices, Switchgear, Transformers and DC Power Supplies, Main- and EMERGENCY-STOP Switches, Control Switches, Terminal Blocks			
SIGNUM Metallic 3SB3			
Products and Systems for Low-Voltage Power Distribution	NS PS		
TELEPERM M Process Control System			
SIMATIC PCS 7 Process Control System	ST PCS 7		
AS 235, AS 235H and AS 235K automation systems	PLT 111		
AS 388/TM and AS 488/TM automation systems	PLT 112		
OS 525 operating and monitoring system	PLT 122		
Operating and monitoring with WinCC/TM	PLT 123		
CS 275 bus system	PLT 130		
Process Engineering			
Field Instruments for Process Automation	FI 01		
Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters			
SITRANS LR	FI 01		
SIWAREX Weighing Systems	KT 30		
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Process Recorders, Spare Parts, Accessories and Consumable Material for Older Designs of Recorders	MP 20.1		
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Vacuum Pumps/Compressors			
Oil-Free Vacuum Pumps, Compressors (Blowers), Radial Blowers, Liquid Pumps	PV		
Pumps			
Vacuum Pumps and Compressors, System ELMO-F	Cat. Sheets PF		
Vacuum Pumps and Compressors, System ELMO-G	Cat. Sheets PG		
System Solutions			
Applications, Products and Services for Industry	SL 01		
Automation Solutions in the Plastic Industry			
• with SIMATIC S7	SL 10		
• with SIMATIC S5	ST 58		

Only quality has a future

The technical sophistication and the market success of the low-voltage three-phase motors are inseparably linked to their product quality. In order to guarantee the high quality standard, a reliable quality assurance system continuously monitors all phases from development to delivery.

This quality assurance system satisfies international demands, complies with all relevant standards and specifications and meets the requirements of DIN EN ISO 9001.

The benefits to our customers are as follows:

- Maximum operational safety;
- A high, consistent level of supply reliability;
- Compliance with the requirements of the European market;
- Participation in national and international bid solicitation processes.



Noise level testing and final electrical inspection of a three-phase motor.



Final mechanical inspection of a three-phase motor.



Electronic monitoring of the finished dimensions of a motor end shield.

SIEMENS

Squirrel-Cage Motors

Low-Voltage Motors

Catalog M 11 · 2000

Low-Voltage Motors

Squirrel-Cage Motors
Totally Enclosed,
Fan-Cooled

Catalog M 11 · 2000

Supersedes: Catalog M 11 · 1999

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Aluminum enclosure
Cast-iron enclosure
for converter-fed operation

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Squirrel-Cage Motors

Introduction

Technology which proves our know-how

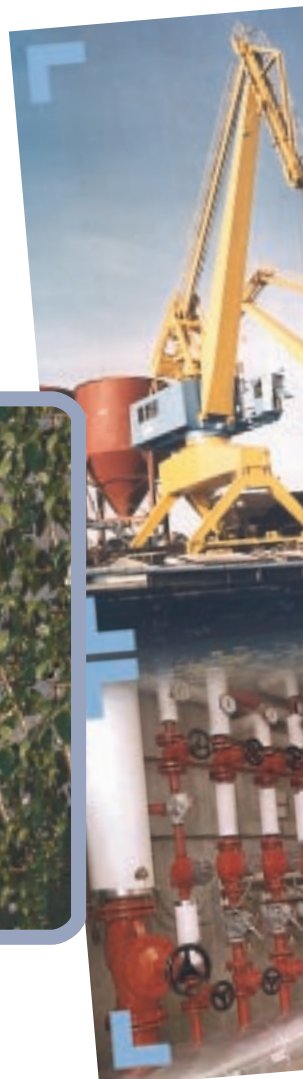
No matter what needs to be moved, Siemens motors are the right fit for every drive concept!

And no matter how great or small your drive problem, we will do our utmost to elaborate the optimum solution jointly with you.

The advantages of our motors:

- Optimum drive solutions for almost all branches of industry
- High-end technology with a worldwide reputation
- Simple, robust components with a guaranteed long life time
- Certified quality to "DIN EN ISO 9001"
- Compliance with German (DIN/VDE) and international (IEC/EN) standards
- Development and production with materials according to the Siemens standard SN 36 350 for environmentally compatible products
- Production technologies that are kind to the environment
- Highly qualified engineering consultancy close at hand thanks to a global distribution network
- Worldwide service
- High-speed logistics system
- 50,000 standard motors permanently in stock

Highly qualified engineers and competent sales staff develop pioneering solutions for all branches of industry jointly with our customers



Squirrel-Cage Motors Introduction

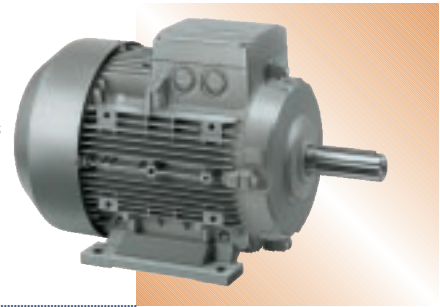
Low-voltage motors
Totally enclosed, fan-cooled, degree of protection IP 55

- The “built-on accessories” concept, with the pulse generator, separately driven fan and brake, does away with special versions. This patented mounting technique allows the 1LA standard motors to be installed quickly, easily and economically for all applications. The “built-on accessories” concept cuts the costs for installation, commissioning and stocks of spare parts (see page 2/36 ff. for further details).
- Single-phase motors are available on request.

Basic design

Energy-saving motors
eff1, eff2, EPACT
pole-changing
for converter-fed
operation

See Part 3 for 1LA



COMBIMASTER

Motor with converter

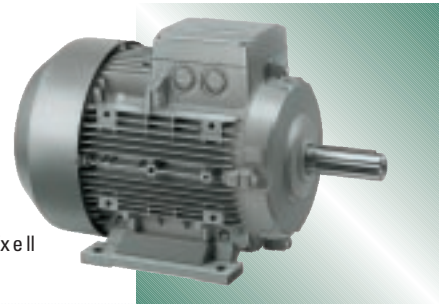
See Part 4 for 1UA



Increased Safety

Type of protection EEx e II

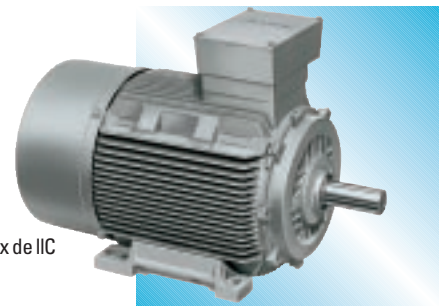
See Part 5 for 1MA



Explosion-Proof Enclosure

Type of protection EEx de IIC

See Part 6 for 1MJ



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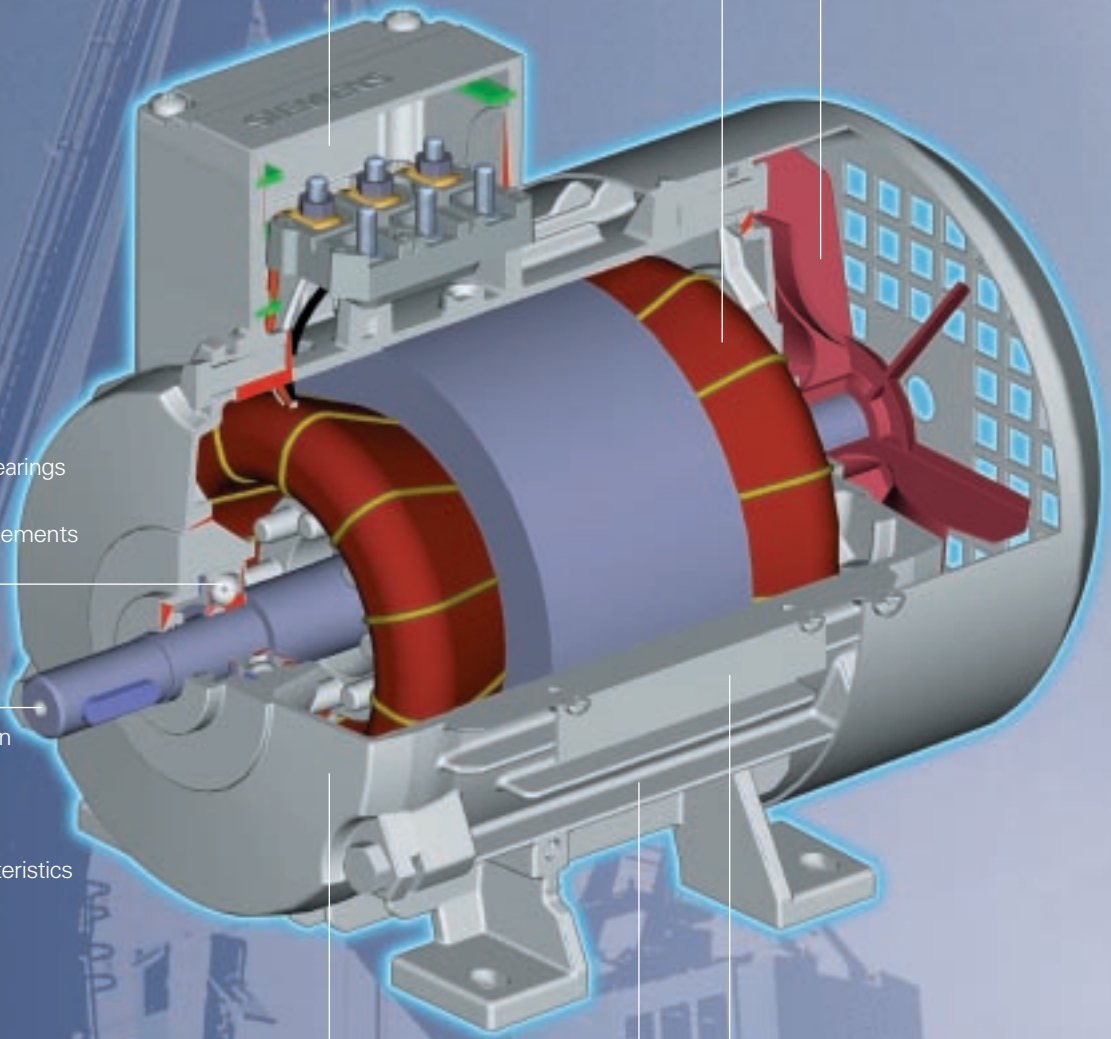
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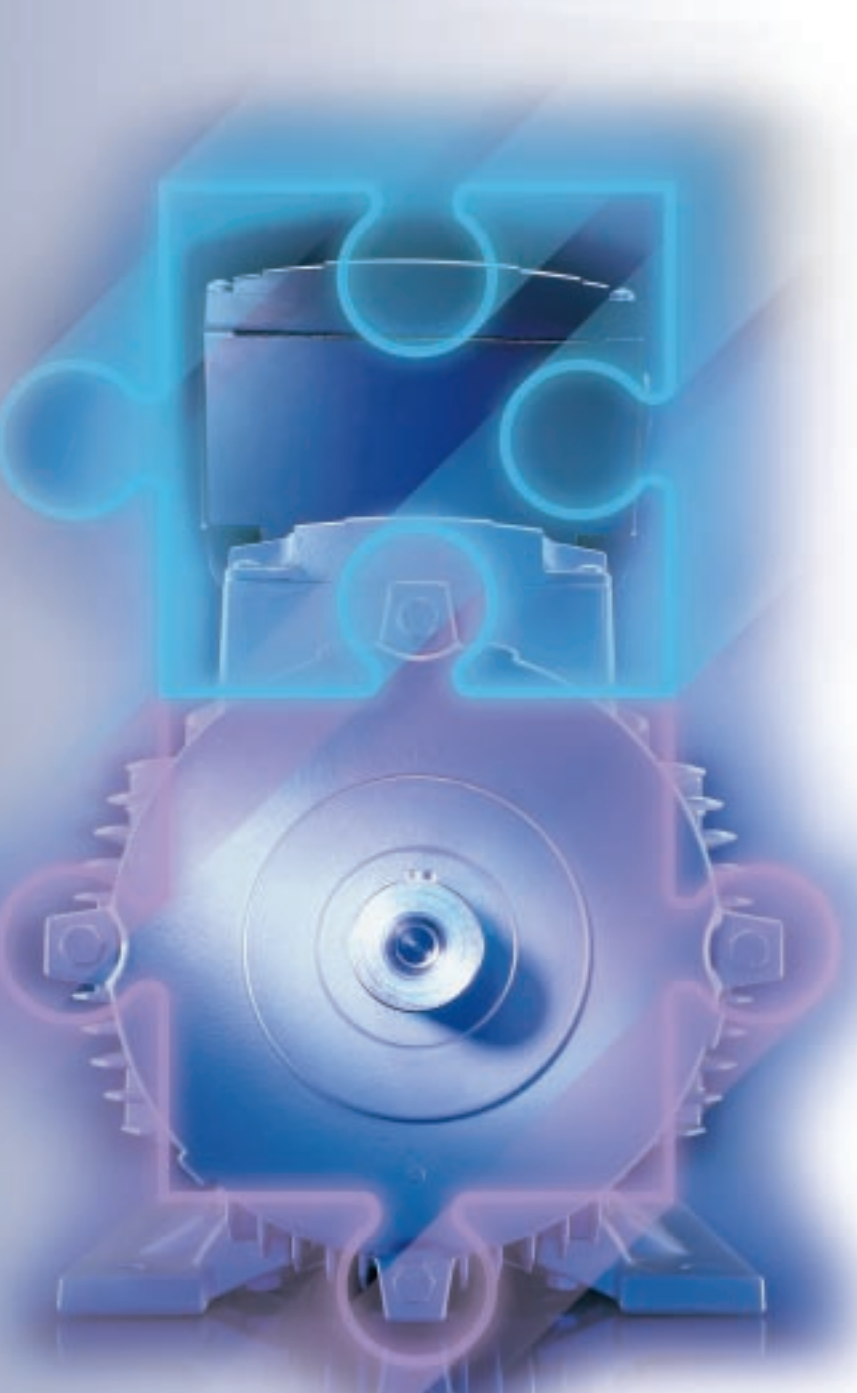
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Squirrel-Cage Motors

Technical Information



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Restarting against residual field and opposite phase, insulation, motor protection
Anti-condensation heaters, degrees of protection, frame design
Cooling and ventilation
Noise
Terminal boxes
Types of construction
Bearings
Selection of bearings
Bearing arrangements
Maximum cantilever forces
Mechanical balance quality, shaft extensions
Maximum axial loading
Paint finish
Modular technology

2

Squirrel-Cage Motors

Technical Information

Order number structure

Order number	1	2	3	4	5	6	7	8	9	10	11	12	-	Z
1st to 3rd position (number, letter, letter)														
Squirrel-cage motors Totally enclosed, fan-cooled IP 55 degree of protection	1	L	A											
Single-speed, pole changing, Aluminum and gray-cast design Improved efficiency eff 2 High efficiency eff 1 increased power rating, converter-fed operation	1	L	G											
COMBIMASTER® Motor with converter	1	U	A											
Increased safety EEx e II type of protection	1	M	A											
Explosion-proof enclosure EEx de IIC type of protection	1	M	J											
4th position (number)														
Series														
5th to 7th position (numbers)														
Motor frame size, coded from 56 to 450														
8th position (number)														
Number of poles														
9th and 10th positions (letters)														
Design														
11th position (number)														
Voltage, connections and frequency														
12th position (number)														
Type of construction														
Special designs														
Please state in plain text or Order code														

Ordering example

Three-phase motor IP 55

4-pole, 50 Hz, 45 kW,
230 VΔ/400 VY,
Type of construction IM V 5
with canopy:

- 3 PTC thermistors
- Separately mounted fan

Order No.	1 LA 5 2 2 3 - 4 A A . .
Voltage code	- 1
Type of construction code	- 9
Special designs	- Z
■ Type of construction IM V 5 with canopy	M1F
■ 3 PTC thermistors	A11
■ Separately mounted fan	G17
Please state in order:	1LA5223-4AA19-Z M1F+A11+G17

Squirrel-Cage Motors

Technical Information

Standards and specifications, tolerances

Title	DIN/EN	IEC
General requirements for rotating electrical machines	DIN EN 60 034-1	IEC 60 034-1, IEC 60 085
Three-phase induction motors for general use with standardized dimensions and outputs	pr EN 50 347	IEC 60 072 fixing dimensions only
Starting performance of rotating electrical machines	DIN EN 60 034-12	IEC 60 034-12
Terminal designations and direction of rotation, rotating electrical machines	DIN VDE 0530 Part 8	IEC 60 034-8
Types of construction and installation	DIN EN 60 034-7	IEC 60 034-7
Entry into the terminal box	DIN 42 925	–
Built-in thermal protection	–	IEC 60 034-11
Noise emission limits for rotating electrical machines	DIN EN 60 034-9	IEC 60 034-9
IEC standard voltages	DIN IEC 60 038	IEC 60 038
Methods of cooling rotating electrical machines	DIN EN 60 034-6	IEC 60 034-6
Vibration severity of rotating electrical machines	DIN EN 60 034-14	IEC 60 034-14
Degrees of protection of rotating electrical machines	DIN EN 60 034-5	IEC 60 034-5
⚡ Additional for EEx motors:		
General requirements	DIN EN 50 014	IEC 79-0
Explosion-proof enclosure "d"	DIN EN 50 018	IEC 79-1
Increased safety "e"	DIN EN 50 019	IEC 79-7

National standards

The motors comply with various national standards. The following have been harmonized with IEC publication 60 034-1 or replaced by DIN EN 60 034-1, so that the motors can be operated at normal rated outputs.

⚡ For explosion-proof motors:

■ Since these motors comply with the European standards EN 50 014, EN 50 018 and EN 50 019, all member states of the EU recognize the test certificates issued by the "Physikalisch-Technische Bundesanstalt" (PTB). The remaining members of CENELEC also accept the certificates, except for Switzerland (several motors have SEV approvals for Switzerland).

AS 1359	Australia (higher rated-output assignment than stated in DIN 42 673 for frame size 250 M or larger)
BS 5000 BS 4999	United Kingdom
CEI 2-3	Italy
CSA C22.2, No. 100	Canada
IS 325 IS 4722	India
NBNC 51-101	Belgium
NEK – IEC 60 034-1	Norway
NEN 3173	Netherlands
NF C 51	France
SS 426 01 01	Sweden superseded by EN 60 034-1
SEV 3009	Switzerland superseded by EN 60 034-1

2

Electrical tolerances

The following tolerances are permitted according to DIN EN 60 034:

Efficiency at
 $P_N \leq 50 \text{ kW}$ $-0.15 (1 - \eta)$
 $P_N > 50 \text{ kW}$ $-0.1 (1 - \eta)$
 with η being a decimal number.

Power factor $\frac{1 - \cos \varphi}{6}$
 Minimum 0.02
 Maximum 0.07

Slip $\pm 20 \% ^1)$
 Locked-rotor curr. $+20 \%$
 Locked-rotor torque -15% to $+25 \%$
 Breakdown torque -10%
 Moment of inertia $\pm 10 \%$

⚡ For type 1MA motors:

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

Motors for the U.S. market

In 1997, an act was passed in the USA to define minimum efficiencies for low-voltage three-phase motors (EPACT). In Canada there is an act which is largely identical, although it is based on different verification methods. Hence, most of the low-voltage three-phase motors exported to the U.S. or Canada must comply with legal requirements on efficiency.

USA

The act requires minimum efficiencies for 2, 4 and 6-pole 60 Hz motors in the power range of 1 to 200 hp (0.75 to 160 kW). The efficiency of these motors is verified using IEEE 112-1992, test method B. The act lays down that the efficiency at full load must be included on the rating plate. The required proof of an accredited testing laboratory is produced with each unit.

NEMA

The motors with increased efficiency according to EPACT are designed to meet the NEMA MG1 electrical standard, and marked accordingly. The mechanical design of all motors is compliant only to IEC, not to NEMA. For all motors, Design D (torque characteristic according to NEMA) means special design. For 1LA8 motors, Design A, B, C and D (torque characteristic according to NEMA) means special design (request necessary). All 1LA motors that match Division 2 can be implemented according to NEC-ANSI-C1, Division 2, Class I and II, Group A, B, D.

Canada

The motors with increased efficiency according to EPACT must fulfill the efficiency regulations on the basis of the CSA standard. The motors must carry a CSA-E energy verification mark.

CSA

All 1LA motors are certified according to the Canadian CSA standard (except when with separate ventilation or brake). The motors must be ordered with the code **D40**, voltage code "9" and the code for voltage and frequency (extra charge). The motors are stamped with the CSA rating plate with the rated voltage and the permitted voltage tolerance of $\pm 10 \%$. The motors must have increased efficiency according to EPACT. The rating plates are marked with the CSA-E sign.

1) $\pm 30 \%$ permitted for motors < 1 kW

Squirrel-Cage Motors

Technical Information

Standards and specifications

Use of 1LA motors in hazardous areas

Zone 2 to DIN VDE 0165

- L84** System operation
- L87** for converter-fed oper. Pump and fan drives
- M03** for converter-fed oper. Constant-torque drive

The 1LA motors are suitable for use in hazardous areas of Zone 2 for temperature rises T1 to T3. The maximum surface temperature during service must be less than the temperature limit for the particular temperature rise. The ventilation system must comply with DIN EN 50 014.

Use in accordance with class F on request.

Vertical mounted motors with the shaft extension pointing downwards must be provided with a canopy.

The 1LA motors are fitted with PTC thermistors when operated with converters (standard design for 1LA8 motors). 1LA6 motors have an additional PTC thermistor in the terminal box. With some motors the limit speed has to be reduced or a metal fan fitted.

Zone 2 to IEC 60 079-15

- L85** System operation
- L88** for converter-fed oper. Pump and fan drives
- M04** for converter-fed oper. Constant-torque drive

IEC 60 079-15 states the type of protection Ex nA II T3.

The same requirements must be met as with DIN VDE 0165. The motors are fitted with a metal terminal box.

A PTB certificate is available.

The rating plate or the supplementary rating plate is stamped with: Ex nA II T3 acc. to IEC 60 079-15.

Zone 2 to BS 5000, Part 16

- L86** System operation
- L89** for converter-fed oper. Pump and fan drives
- M05** for converter-fed oper. Constant-torque drive

The 1LA5 and 1LA7 motors are fitted with an external earthing terminal in addition to DIN VDE 0165.

Please enquire for further details about 1LA8 motors.

The rating plate or supplementary rating plate is stamped with: ExN II T3 in accordance with BS 5000/16.

Zone 21 to IEC 61 241, EN 50 281, ATEX 118a

- M34** System operation
- M38** for converter-fed op.

Zone 22 to IEC 61 241, EN 50 281, ATEX 118a

- M35** System operation
- M39** for converter-fed op.

The 1LA/1LG motors are suitable for use in areas with danger of dust explosions if various precautions are taken. Surface temperatures may not exceed 125 °C during normal operation.

The motor version for non-conductive dust, degree of protection IP 55, is designed for Zone 22. The motors obtain an outer ground terminal.

An ATEX certification is required for Zone 21, and a declaration of EC conformity for Zone 22.

VIK design

K30

Motors up to frame size 355 can be supplied in accordance with the "Technical Requirements" of VIK (Verband der Industriellen Energie- und Kraftwirtschaft).

Not possible for 1LA5 motors, 1LA6 motors are delivered.

A low-noise design is additionally required for 2-pole 1LA6 and 1LA6 motors, frame sizes 315 S and 315 L, as well as for all 2-pole 1MJ8 motors (Order Code **K37** or **K38**).

Take account of the rated-output assignment and the dimensions of 1LA8 motors. The terminal box of 1LA8 357 (2 and 4-pole) cannot be rotated 4 x 90°.

Vertically mounted motors with the shaft extension pointing downwards must be provided with a canopy.

Frame sizes 400 and 450 are not available with the VIK design.

Converter-fed operation available on request.

Design and certification of explosion-proof motors

Type of protection EEx de IIC explosion-proof enclosure "d"

- All 1MJ motors are certified for the EEx de IIC type of protection.

The frames are designed to withstand internal explosion and transmission. An igniting flame to the outside is impossible. The frame temperature is less than the ignition temperature of the gases for temperature class T4.

Temperature class T6 and an explosion-proof terminal box are available to order.

- The PTB certificate of conformity, which is valid up to temperature class T4, covers the following deviations: different coolant temperature (–20 °C to +60 °C), site altitude, frequency and rated duty type, pole-changing motors, fitting of temperature sensors and converter-fed operation with fitting of temperature sensors.

If 1MJ motors are used with converters, they may have to be fitted with special terminal boxes (please inquire).

EEx e II type of protection increased safety "e"

- The 1MA motors are certified for the EEx e II type of protection for temperature class T1 to T4 up to frame size 90 L, and for temperature classes T1 to T3 for frame size 100 L or larger. Higher temperature classes are available to order.

With the exception of the 2-pole motors with frame size 225 M or larger, all the motors are simultaneously suitable for T1/T2 or T3 and the corresponding rated outputs (standard design). A new or supplementary certificate may be needed for non-standard designs (different frequency, output, coolant temperature, site altitude etc.). It is essential for the temperature class to be specified because if not, the standard design for T1/T2 and T3 will be certified (double certification fee).

Energy-saving motors with efficiency classification according to CEMEP

Low-voltage motors in the output range between 1.1 to 90 kW, 2- and 4-pole, are marked according to the CEMEP Agreement with efficiency class **EFF2** (Improved efficiency) or **EFF1** (High Efficiency). The active motor parts

were optimised to fulfil the requirements for the efficiency classes **EFF2** and **EFF1**. The procedure to determine the efficiency is based on the loss-summation method according to IEC 60 034-2.

Squirrel-Cage Motors

Technical Information

Voltage and frequency

Voltages	Rated voltage range	The tolerance laid down by DIN EN 60 034-1 applies to all converter-fed 1LA8 motors, i.e. no rated voltage range is specified.	The maximum current is specified in the rated voltage range.
1LA, 1LG and 1MJ motors			
230 VΔ/400 VY, 50 Hz 400 VΔ/690 VY, 50 Hz	220 – 240 VΔ/380 – 420 VY, 50 Hz 380 – 420 VΔ/660 – 725 VY, 50 Hz		
1LA and 1LG motors with second rating plate, frame sizes 56 to 315 M			
460 V, 60 Hz	440 – 480 V, 60 Hz		
1MA motors		No rated voltage range is specified for 1MA8 motors.	
230 VΔ/400 VY, 50 Hz 400 VΔ/690 VY, 50 Hz	218 – 242 VΔ/380 – 420 VY, 50 Hz 380 – 420 VΔ/655 – 725 VY, 50 Hz		

Standard voltages

DIN EN 60 034-1 Part 1 lays down a voltage tolerance of ±5 % for motors (Zone A).

The tolerance for the rated voltage range is ±5 % in accordance with DIN EN 60 034, and the permissible limit temperature for the temperature rise in question can be exceeded by 10 K taking advantage of this voltage tolerance.

See page 2/8 for details of the rating plate inscriptions and examples.

The selection and ordering data states the rated current at 400 V. The rated currents at 380 V and 420 V are listed in the table on page 2/6.

DIN IEC 60 038 specifies a tolerance of ±10 % for system voltages of 230 V, 400 V and 690 V.

⚠ For 1MA motors:

For non-standard frequencies the t_c output values may differ from those stated in the selection tables; in this case, a new or supplementary certificate is needed.

The AUSTER software provides details of designs already approved at 60 Hz.

Overload protection with phase failure tripping must be provided for a Δ connection.

2

Other voltages and/or frequencies

The tolerance specified by DIN EN 60 034-1 applies to all non-standard voltages.

Order Codes have been allocated for a number of non-standard voltages

(11th position of Order No. = 9).

Plain texts for voltage, connection and frequency

L1X ■ Standard winding

L1Y ■ Non-standard winding

■ This Order Code only determines the price.

When ordering, please also state:
the voltage, frequency, connection and rated output in kW.

■ With 1LA9 and 1LA6, eff 1/EPACT, or increased output: only **L1Y** wiring.

Voltage at	Required output at	Order Code for	Frame sizes for motors			
			1LA5/1LA7 1LG8	1LA6, 1LA8	1MA6, 1MA8 1MA7	1MJ6, 1MJ8
50 Hz	50 Hz	50 Hz				
220 VΔ/380 VY	–	L1R	56 – 225	180 – 315	63 – 315	71 – 315
380 VΔ/660 VY	–	L1L	56 – 225	180 – 450	63 – 355	71 – 450
415 VY	–	L1C	56 – 225	180 – 450	63 – 355	71 – 450
415 VΔ	–	L1D	56 – 225	180 – 450	63 – 355	71 – 450
60 Hz	60 Hz	60 Hz				
220 VΔ/380 VY	50-Hz output	L2A	56 – 225	180 – 315 M	63 – 315 M	71 – 315 M
220 VΔ/380 VY	60-Hz output	L2B	56 – 225	180 – 315 M	–	71 – 315 M
380 VΔ/660 VY	50-Hz output	L2C	56 – 225	180 – 450	63 – 355	71 – 450
380 VΔ/660 VY	60-Hz output	L2D	56 – 225	180 – 450	–	71 – 450
440 VY	50-Hz output	L2Q	56 – 225	180 – 315 M	63 – 315 M	71 – 315 M
440 VY	60-Hz output	L2W	56 – 225	180 – 315 M	–	71 – 315 M
440 VΔ	50-Hz output	L2R	56 – 225	180 – 450	63 – 355	71 – 450
440 VΔ	60-Hz output	L2X	56 – 225	180 – 450	–	71 – 450
460 VY	50-Hz output	L2S	56 – 225	180 – 315 M	63 – 315 M	71 – 315 M
460 VY	60-Hz output	L2E	–	–	–	71 – 315 M
460 VΔ	50-Hz output	L2T	56 – 225	180 – 450	63 – 355	71 – 450
460 VΔ	60-Hz output	L2F	–	315 L – 450	–	71 – 450
575 VY	50-Hz output	L2U	56 – 225	180 – 315 M	63 – 315 M	71 – 315 M
575 VY	60-Hz output	L2L	56 – 225	180 – 315 M	–	71 – 315 M
575 VΔ	50-Hz output	L2V	56 – 225	180 – 450	63 – 355	71 – 450
575 VΔ	60-Hz output	L2M	56 – 225	180 – 450	–	71 – 450
60 Hz	60 Hz	Pole-changing motors				
220 V	50-Hz output	L4A	56 – 225	–	–	–
220 V	60-Hz output	L4B	56 – 225	–	–	–
380 V	50-Hz output	L4C	56 – 225	180 – 315	–	–
380 V	60-Hz output	L4D	56 – 225	180 – 315	–	–
440 V	50-Hz output	L4G	56 – 225	180 – 315	–	–
440 V	60-Hz output	L4E	56 – 225	180 – 315	–	–
460 V	50-Hz output	L4J	56 – 225 M	180 – 315	–	–
460 V	60-Hz output	L4H	56 – 225 M	180 – 315	–	–
575 V	50-Hz output	L4N	56 – 225 M	180 – 315	–	–
575 V	60-Hz output	L4M	56 – 225 M	180 – 315	–	–

Squirrel-Cage Motors

Technical Information

Voltage and frequency

Rated currents for the rated voltage range from 380 V to 420 V

	Currents in A at voltage							
	380 V 2-pole	420 V	380 V 4-pole	420 V	380 V 6-pole	420 V	380 V 8-pole	420 V
1LA7, 1LA5 motors								
1LA7 050	0.27	0.26	0.21	0.21	–	–	–	–
1LA7 053	0.33	0.32	0.30	0.31	–	–	–	–
1LA7 060	0.52	0.53	0.42	0.44	–	–	–	–
1LA7 063	0.68	0.70	0.56	0.57	0.48	0.5	–	–
1LA7 070	1.05	1.02	0.80	0.77	0.66	0.64	0.36	0.36
1LA7 073	1.38	1.41	1.07	1.06	0.80	0.80	0.51	0.52
1LA7 080	1.75	1.79	1.50	1.50	1.18	1.25	0.73	0.80
1LA7 083	2.45	2.50	1.90	1.92	1.62	1.66	1.01	1.10
1LA7 090	3.40	3.35	2.60	2.60	2.10	2.15	1.15	1.18
1LA7 096	4.70	4.65	3.50	3.50	3.0	2.95	1.63	1.60
1LA7 106	6.25	6.15	4.8	4.8	4.0	4.1	2.25	2.2
1LA7 107	–	–	6.5	6.8	–	–	3.0	3.0
1LA7 113	8.2	7.7	8.4	8.3	5.4	5.3	4.1	4.2
1LA7 130	10.6	10.4	11.4	11.9	7.3	7.5	5.9	6.0
1LA7 131	14.1	13.8	–	–	–	–	–	–
1LA7 133	–	–	15.4	15.5	9.5	9.7	7.9	7.9
1LA7 134	–	–	–	–	13.0	13.1	–	–
1LA7 163	21.0	20.5	22.3	21.5	17.5	17.3	9.9	10.6
1LA7 164	28.0	26.0	–	–	–	–	13.1	13.4
1LA7 166	34.0	32.0	29.5	28.5	24.8	24.7	17.6	18.4
1LA5 183	40	38	36	35	–	–	–	–
1LA5 186	–	–	42	41	31	29.5	26.5	23.5
1LA5 206	55	52	–	–	37	24.5	–	–
1LA5 207	67	64	57	54	44.5	41	34	31
1LA5 220	–	–	69	64	–	–	40	37
1LA5 223	81	76	84	78	59	54	47	43
1LG8, 1LA6, 1LA8 motors								
1LG8 090	3.1	3.3	2.7	2.75	2.1	2.25	1.34	1.5
1LG8 096	4.5	4.7	3.4	3.5	3.3	3.5	2.0	1.9
1LG8 106	6.0	6.1	4.75	4.9	3.8	4.3	2.3	2.45
1LG8 107	–	–	6.4	6.7	–	–	3.1	3.4
1LG8 113	7.7	7.5	8.3	8.3	5.2	5.4	4.3	5.2
1LG8 130	10.9	10.5	11.0	11.0	6.6	6.3	5.7	5.7
1LG8 131	14.6	14.2	–	–	–	–	–	–
1LG8 133	–	–	15.0	15.0	8.8	9.1	7.5	7.5
1LG8 134	–	–	–	–	12.2	11.6	–	–
1LG8 163	22.0	20.0	21.5	21.0	16.3	16.0	9.4	9.0
1LG8 164	29.0	27.0	–	–	–	–	12.6	13.0
1LG8 166	34.5	32.0	30.0	28.0	23.0	22.0	17.2	17.0
1LA6 183	40	38	36	35	–	–	–	–
1LA6 186	–	–	42	41	31	29.5	26.5	23.5
1LA6 206	55	52	–	–	37	24.5	–	–
1LA6 207	67	64	57	54	44.5	41	34	31
1LA6 220	–	–	70	67	–	–	40	37
1LA6 223	81	74	83	79	59	54	47	43
1LA6 253	98	90	102	95	72	66	61	56
1LA6 280	134	124	138	129	86	78	72	69
1LA6 283	158	145	169	157	104	95	88	81
1LA6 310	195	180	205	190	140	133	106	102
1LA6 313	236	220	240	230	168	156	143	136
1LA6 316	280	255	290	265	203	190	172	162
1LA6 317	345	310	365	335	245	225	210	198
1LA6 318	–	–	–	–	295	275	255	240
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 5 % higher than the rated current.

1) Current at 660 V
2) Current at 725 V

Squirrel-Cage Motors

Technical Information

Rated outputs at 60 Hz

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

Motor type	Maximum output at 60 Hz for voltages between 220 V or 380 V and 725 V			
	2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LA7, 1LA5, 1MJ6 motors				
1LA7 050	–	0.105	0.07	–
1LA7 053	–	0.14	0.105	–
1LA7 060	–	0.21	0.14	–
1LA7 063	–	0.29	0.21	0.1
1LA7 070	1MJ6 070	0.43	0.29	0.21
1LA7 073	1MJ6 073	0.63	0.43	0.29
1LA7 080	1MJ6 080	0.86	0.63	0.43
1LA7 083	1MJ6 083	1.3	0.86	0.63
1LA7 090	1MJ6 096	1.75	1.3	0.86
1LA7 096	1MJ6 097	2.55	1.75	1.3
1LA7 106	1MJ6 106	3.45	2.55	1.75
1LA7 107	1MJ6 107	–	3.45	–
1LA7 113	1MJ6 113	4.6	4.6	2.55
1LA7 130	1MJ6 130	6.3	6.3	3.45
1LA7 131	1MJ6 131	8.6	–	–
1LA7 133	1MJ6 133	–	8.6	4.6
1LA7 134	1MJ6 134	–	–	6.3
1LA7 163	1MJ6 163	12.6	12.6	8.6
1LA7 164	1MJ6 164	17.3	–	6.3
1LA7 166	1MJ6 166	21.3	17.3	12.6
1LA5 183	1MJ6 183	24.5	21.3	–
1LA5 186	1MJ6 186	–	25.3	18
1LA5 206	1MJ6 206	33.5	–	22
1LA5 207	1MJ6 207	41.5	34.5	26.5
1LA5 220	–	–	42.5	–
1LA5 223	–	51	52	36

Motor type	Maximum output at 60 Hz for voltages between 220 V or 380 V and 725 V			
	2-pole kW	4-pole kW	6-pole kW	8-pole kW
1LG8, 1LA6, 1MJ6, 1LA8, 1MJ8 motors				
1LG8 090	–	1.75	1.3	0.86
1LG8 096	–	2.55	1.75	1.3
1LG8 106	–	3.45	2.55	1.75
1LG8 107	–	–	3.45	–
1LG8 113	–	4.6	4.6	2.55
1LG8 130	–	6.3	6.3	3.45
1LG8 131	–	8.6	–	–
1LG8 133	–	–	8.6	4.6
1LG8 134	–	–	–	6.3
1LG8 163	–	12.6	12.6	8.6
1LG8 164	–	17.3	–	6.3
1LG8 166	–	21.3	17.3	12.6
1LA6 183	–	24.5	21.3	–
1LA6 186	–	–	25.3	18
1LA6 206	–	33.5	–	22
1LA6 207	–	41.5	34.5	26.5
1LA6 220	1MJ6 220	–	42.5	–
1LA6 223	1MJ6 223	51	52	36
1LA6 253	1MJ6 253	62	63	44.5
1LA6 280	1MJ6 280	84	86	54
1LA6 283	1MJ6 283	101	104	66
1LA6 310	1MJ6 310	123	127	90
1LA6 313	1MJ6 313	148	152	108
1LA6 316	–	180	184	127
1LA6 317	–	224	230	152
1LA6 318	–	–	–	184
1LA8 315	–	280	288	230
1LA8 317	–	353	362	288
1LA8 353	–	398	408	–
1LA8 355	–	448	460	362
1LA8 357	–	560	575	460
1LA8 403	–	616	644	518
1LA8 405	–	693	725	575
1LA8 407	–	781	817	644
1LA8 453	–	–	920	725
1LA8 455	–	–	1040	817
1LA8 457	–	–	1150	920
–	1MJ8 313	190	180	132
–	1MJ8 314	–	–	145
–	1MJ8 316	240	220	175
–	1MJ8 353	280	250	225
–	1MJ8 354	–	280	–
–	1MJ8 356	350	315	280
–	1MJ8 357	–	355	–
–	1MJ8 400	400	400	315
–	1MJ8 403	450	450	355
–	1MJ8 406	–	500	400
–	1MJ8 453	500	560	450
–	1MJ8 456	560	630	500
–	1MJ8 457	630	710	560

Speed increases to approx. 120 % in relation to 50 Hz motors.

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

Frame size	No. of poles	Correction factor for 60 Hz output for voltages between 220 V or 380 V and 725 V
56 to 160 180 to 315	2 to 8	1.15
	2	1.12
	4	1.15
	6 and 8	1.2

For 60 Hz, the rated output values can be increased using the correction factors in the table above.

The output is increased separately for each number of poles, i.e. for 6-/4-pole motors, frame sizes 180 to 315 and 60 Hz the 6-pole rating can be increased by 20 % and the 4-pole rating by 15%.

Possible combinations of 2-pole motors

Frame size	Horizontal motor				Vertical motor	
	50 Hz with foot	60 Hz with foot	50 Hz with flange	60 Hz with flange	50 Hz	60 Hz
56 to 315 M	x	x	x	x	x	x
315 L	x	x	–	–	x	on request
315	x	x	–	–	x	x
355 and 400	x	x	–	–	x	–
450	x	–	–	–	x	–

Squirrel-Cage Motors

Technical Information

Output · Rating plate

■ The rated output refers to continuous duty according to DIN EN 60 034-1 at a frequency of 50 Hz, a coolant temperature (CT) of 40 °C and a site altitude of up to 1000 m above sea level (ASL).

The motors are designed for class F and used in class B. If the actual operating conditions deviate from this class, the maximum output should be adjusted according to the following tables.

Altitude above sea level in m	Coolant temperature in °C		
	<30	30-40	45
1000	1.07	1.00	0.96
1500	1.04	0.97	0.93
2000	1.00	0.94	0.90
2500	0.96	0.90	0.86
3000	0.92	0.86	0.82
3500	0.88	0.82	0.79
4000	0.82	0.77	0.74

Altitude above sea level in m	Coolant temperature in °C		
	50	55	60
1000	0.92	0.87	0.82
1500	0.89	0.84	0.79
2000	0.86	0.82	0.77
2500	0.83	0.78	0.74
3000	0.79	0.75	0.70
3500	0.75	0.71	0.67
4000	0.71	0.67	0.63

The coolant temperature and the altitude are rounded up to the nearest 5 °C or 500 m.

If utilised according to temperature class B, motors intended for coolant temperatures other than 40 °C or altitudes greater than 1000 m above sea level must always be ordered with the suffix “-Z” added to the Order No. and the requirement stated in plain text.

Additional derating of the output will result in a deterioration in performance due to the lower utilization factor of the motors.

For Order Codes for class F utilization, see “DURIGNIT IR 2000 insulation” on page 2/14.

For all motors:

The motors are intended to withstand 1.5 times the rated current for up to 2 minutes at rated voltage and frequency (DIN EN 60 034).

■ Effective values, which must be stated when ordering, have been calculated for the following output ratings and coolant temperatures (CT) of 45 °C and 50 °C.

DIN-output rating kW	Maximum output at 50 Hz	
	at CT 45 °C kW	at CT 50 °C 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	653
800	768	736
900	864	828
1000	960	920

■ For changes in the output rating with class F utilization, see “DURIGNIT IR 2000 insulation” on page 2/14.

Ambient temperature

All motors with the standard design can be used at ambient temperatures between -20 °C and +40 °C. 1LA7 and 1LG8 motors can be operated at temperatures from -30 °C to +60 °C, at 40 °C with pulse duty factor 1.1, utilization of heat class F from 40 °C with reduction in power. For use up to +60 °C, there is a reduction in power.

Special design measures are necessary for other ambient temperatures.

Inquiry is necessary if brakes are needed for sub-zero temperatures.

Rating plate

Motor type	Frame size	Rating plate							50/60 data for	
		inter-national	de	de/en	fr/es	it	pt	ru	230/400 V and 460 V double rating plate	400/690 V and 460 V
1LA7	all	■							■	■
1LA5	all	■							■	■
1LA9	all	■							■	■
1LG8	all	■							■	■
1LA6	180 and 200	■							■	■
1LA6	225 to 315	■			●	●	●	◆		■ except BG 315L
1LA8	all	■								■
1MA7	all	■								■
1MA6	all	■								■
1MA8	all	■								■
1MJ6	71 to 160	■								■
1MJ6	180 to 315	■								■
1MJ8	all	■								■

- Standard design
- no extra charge
- ◆ extra charge

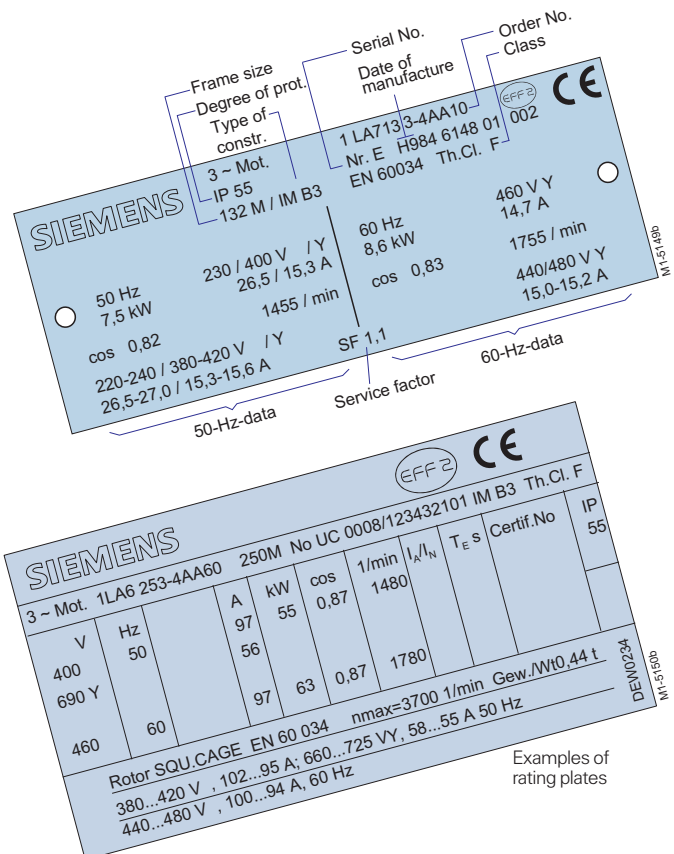
For all motors from 30 kg on the weight is indicated on the rating plate.

A second rating plate can be supplied loose for all the motors (Order Code **K31**, extra charge).

In addition, a supplementary plate with the order specifications is available (Order Code **Y82**, extra charge).

⊗ For type 1MA and 1ME motors:

With the exception of the 2-pole motors with frame size 225 M or larger, all the motors are simultaneously suitable for T1/T2 and T3 and the corresponding rated outputs (standard design). If the rated output for T1/T2 differs from that for T3, the data for both outputs is stated on separate rating plates.



Examples of rating plates

Squirrel-Cage Motors

Technical Information

Efficiency and power factor, rated torque

Efficiency and power factor

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

For eff1 and eff2 motors, also the $\frac{3}{4}$ load efficiency is indicated in the selection tables.

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

Rated torque

The rated torque in Nm delivered at the motor shaft is

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

P Rated output in kW
 n Speed in rpm

- If the voltage deviates from its nominal 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, while the locked-rotor current varies approximately linearly.

In the case of squirrel-cage motors, the locked-rotor torque and the 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 –5% undervoltage – it is possible to start up the motor against a load torque of up to

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

of the rated torque.

The diagrams show only typical characteristics.

- Please ask for advice if the torque characteristic of the driven machine is very close to the scatter band of the motor torque characteristic.

⊗ For type 1MA and 1ME motors

In the case of the standard design for T1/T2 and T3 and different rated outputs, the torque class specified for the higher output applies.

Part-load efficiency % at					Part-load power factor at				
1/4 of full load	1/2	3/4	4/4	5/4	1/4 of full load	1/2	3/4	4/4	5/4
93	96	97	97	96.5	0.70	0.86	0.90	0.92	0.92
92	95	96	96	95.5	0.65	0.85	0.89	0.91	0.91
90	93.5	95	95	94.5	0.63	0.83	0.88	0.90	0.90
89	92.5	94	94	93.5	0.61	0.80	0.86	0.89	0.89
88	91.5	93	93	92.5	0.57	0.78	0.85	0.88	0.88
87	91	92	92	91.5	0.53	0.76	0.84	0.87	0.87
86	90	91	91	90	0.51	0.75	0.83	0.86	0.86
85	89	90	90	89	0.49	0.73	0.81	0.85	0.86
84	88	89	89	88	0.47	0.71	0.80	0.84	0.85
80	87	88	88	87	0.45	0.69	0.79	0.83	0.84
79	86	87	87	86	0.43	0.67	0.77	0.82	0.83
78	85	86	86	85	0.41	0.66	0.76	0.81	0.82
76	84	85	85	83.5	0.40	0.65	0.75	0.80	0.81
74	83	84	84	82.5	0.38	0.63	0.74	0.79	0.80
72	82	83	83	81.5	0.36	0.61	0.72	0.78	0.80
70	81	82	82	80.5	0.34	0.59	0.71	0.77	0.79
68	80	81	81	79.5	0.32	0.58	0.70	0.76	0.78
66	79	80	80	78.5	0.30	0.56	0.69	0.75	0.78
64	77	79.5	79	77.5	0.29	0.55	0.68	0.74	0.77
62	75.5	78.5	78	76.5	0.28	0.54	0.67	0.73	0.77
60	74	77.5	77	75	0.27	0.52	0.63	0.72	0.76
58	73	76	76	74	0.26	0.50	0.62	0.71	0.76
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					

Squirrel-Cage Motors

Technical Information

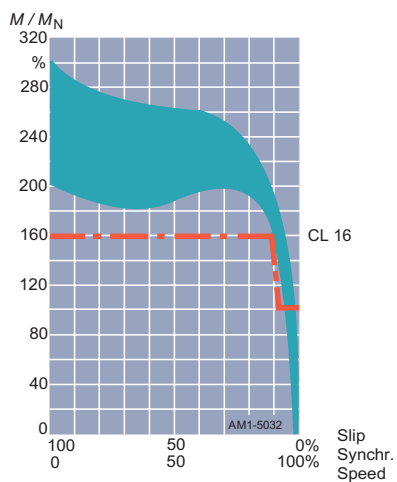
Torque characteristics

In the following torque characteristics

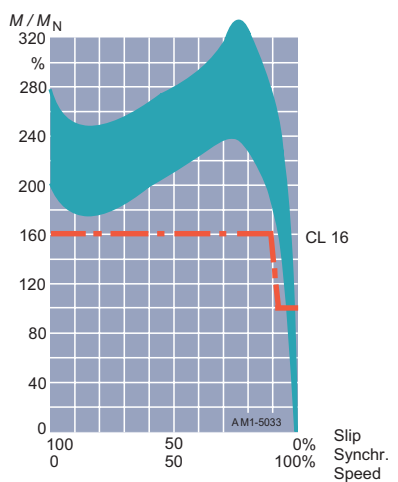
- the torque is plotted as % of the rated value,
- the speed is plotted as % of the synchronous speed.

CL Torque class

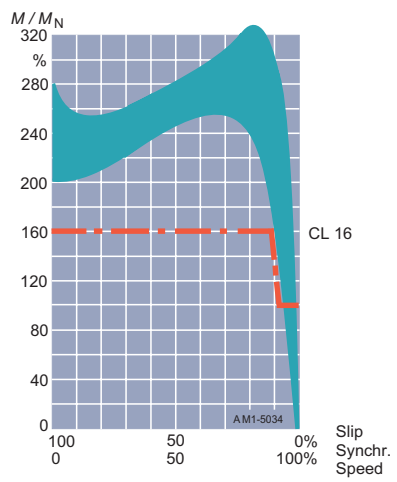
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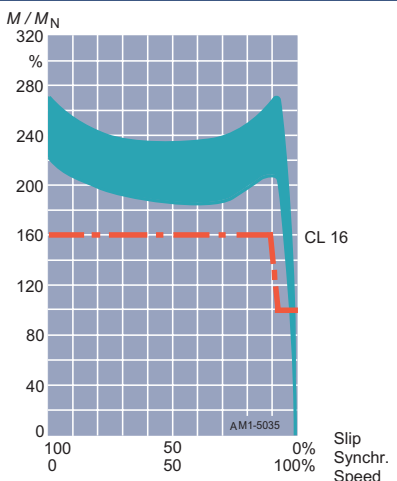
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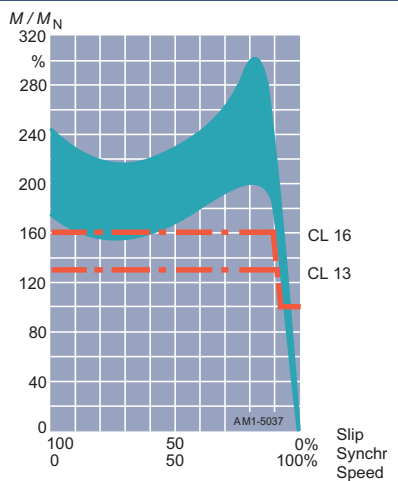
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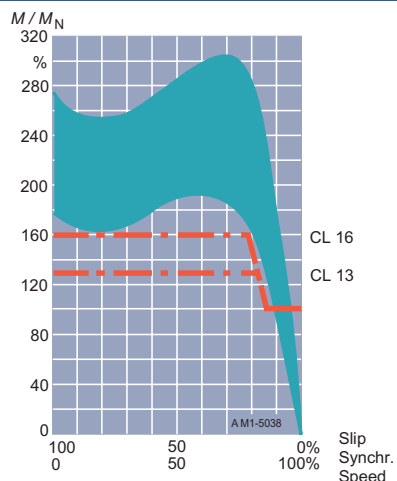
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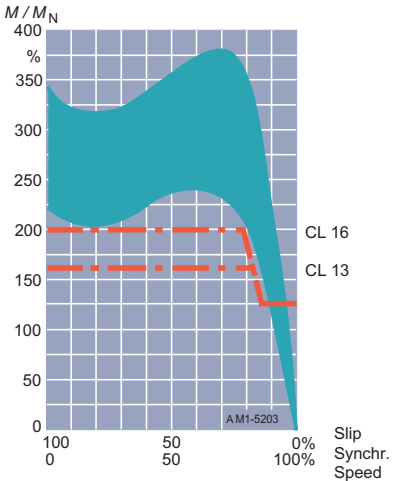
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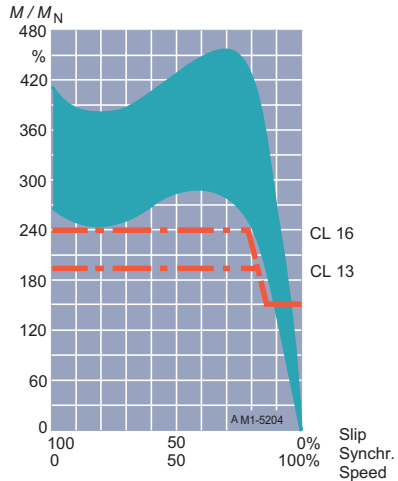
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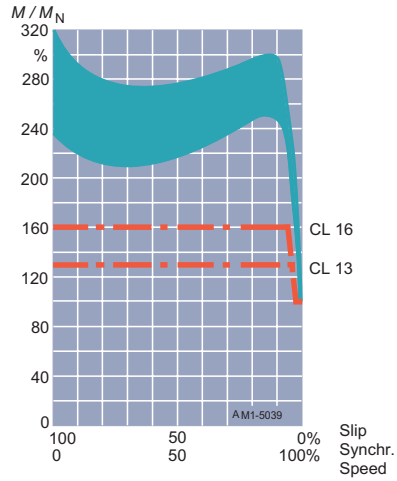
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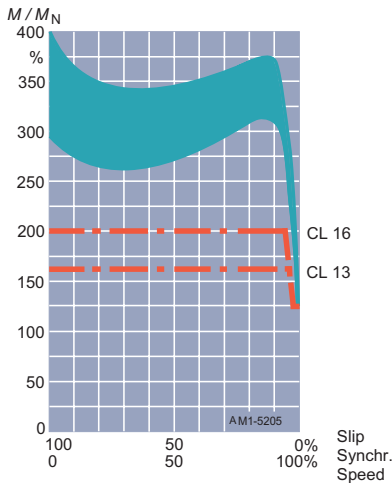


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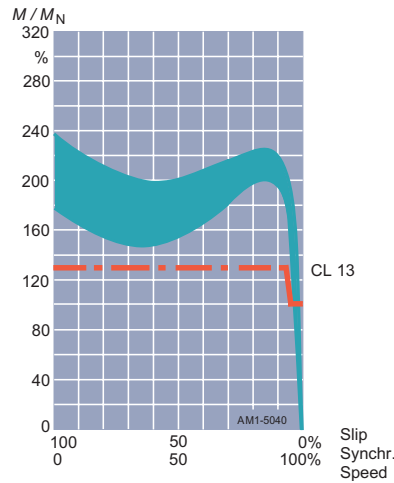


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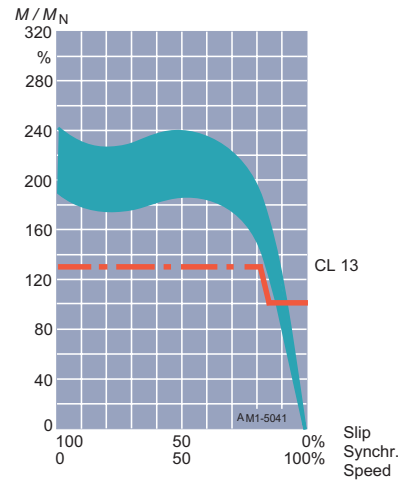
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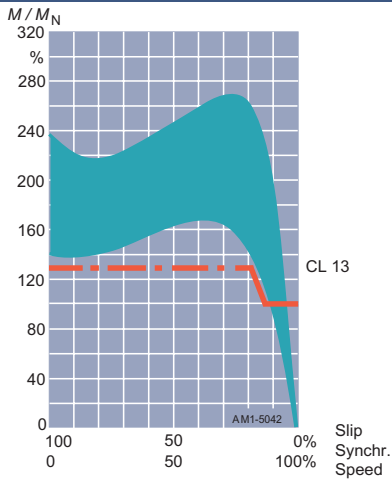
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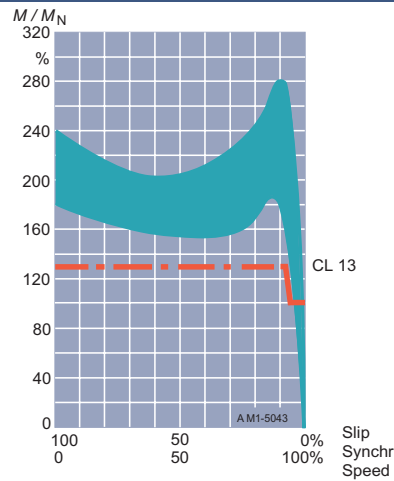
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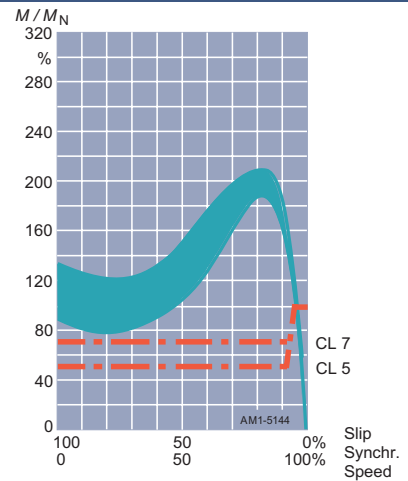
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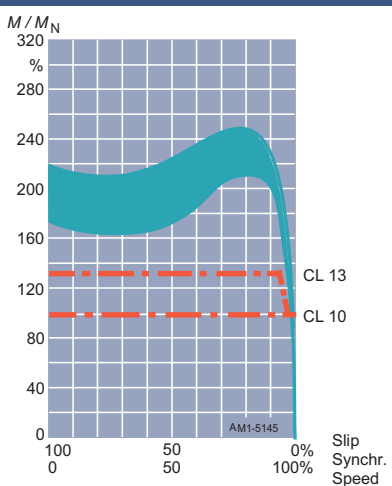
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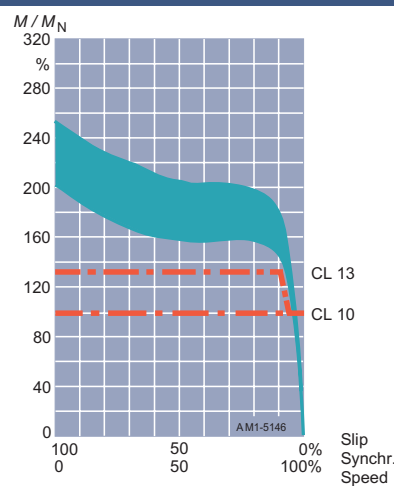
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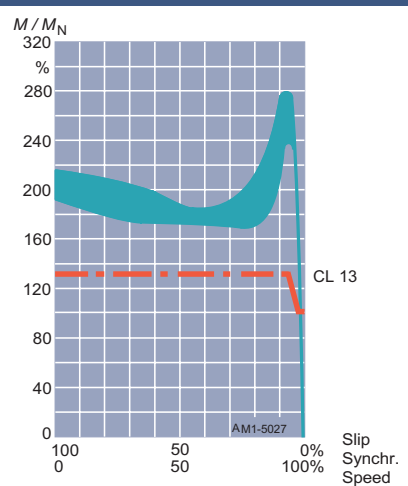
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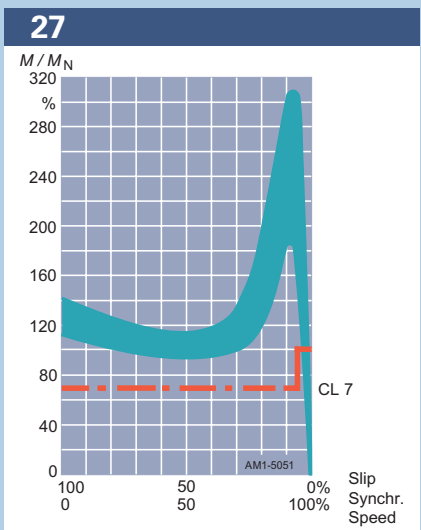
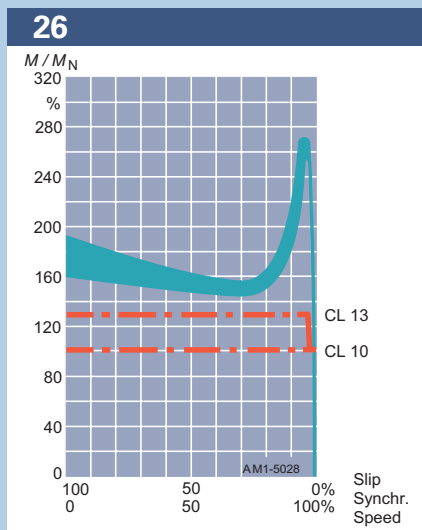
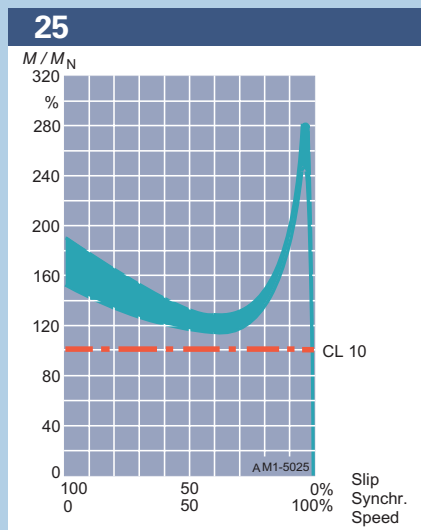
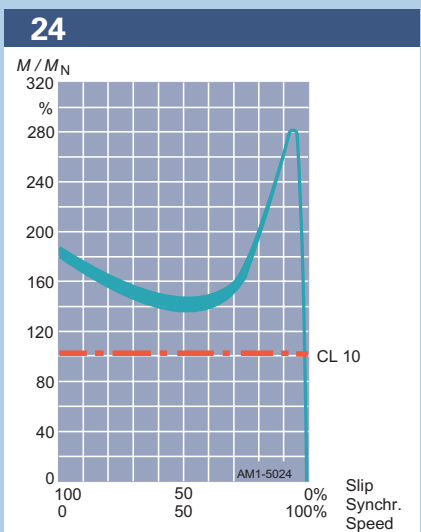
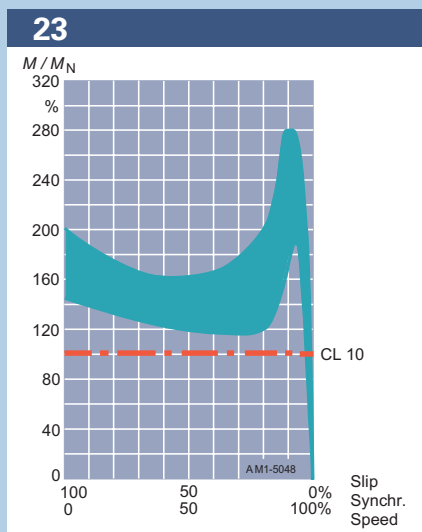
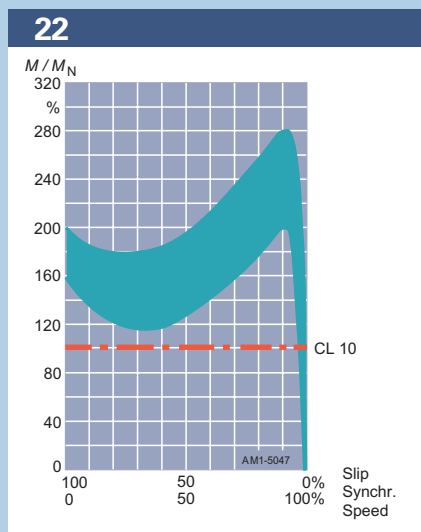
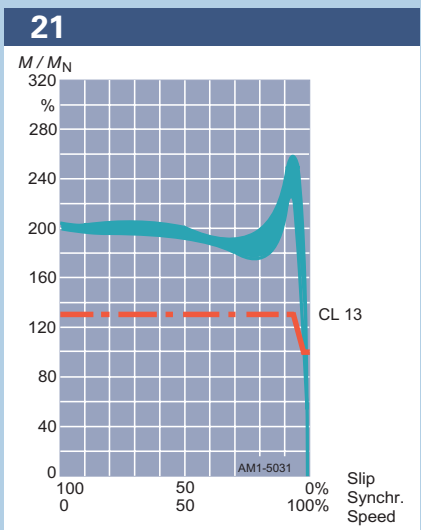
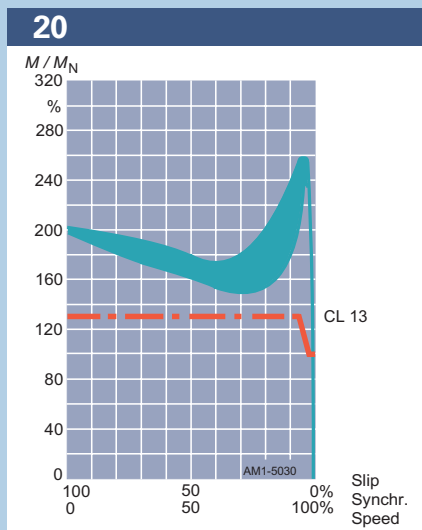
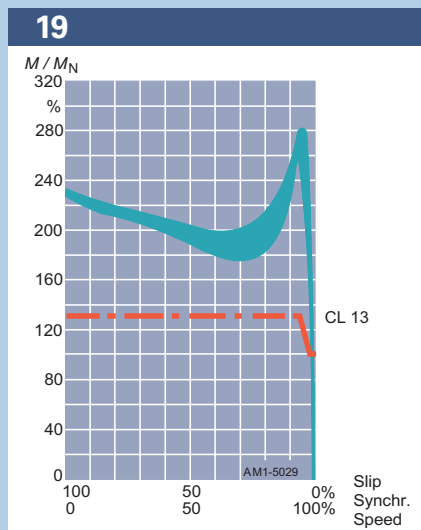


Squirrel-Cage Motors

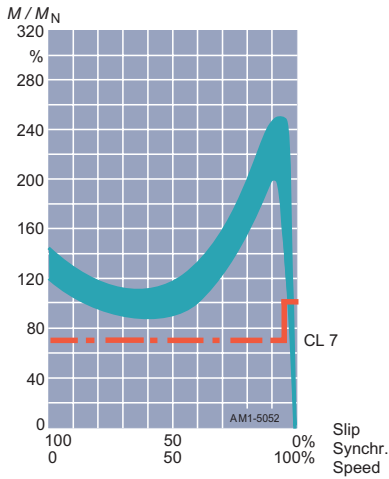
Technical Information

Torque characteristics

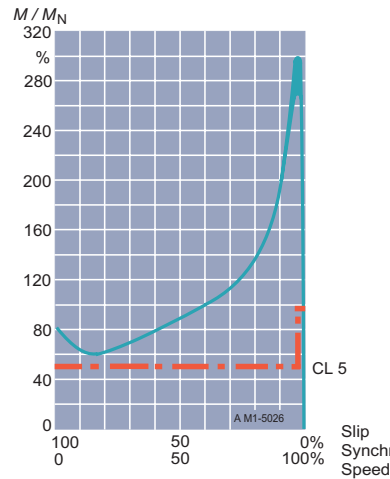
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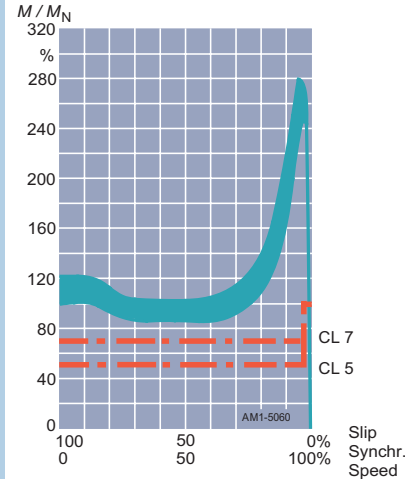
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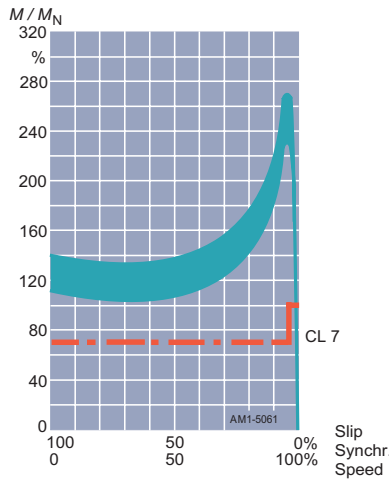
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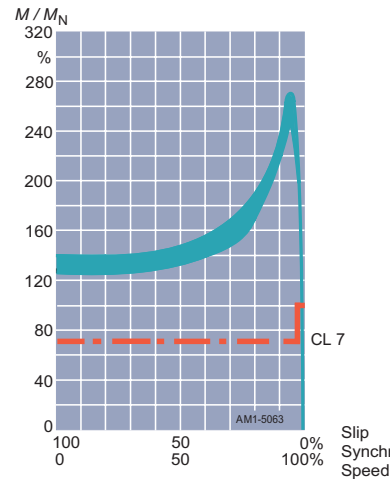
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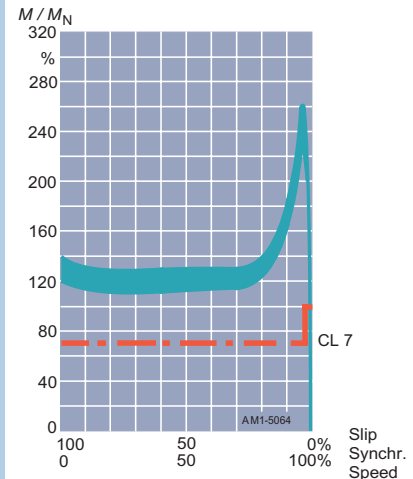
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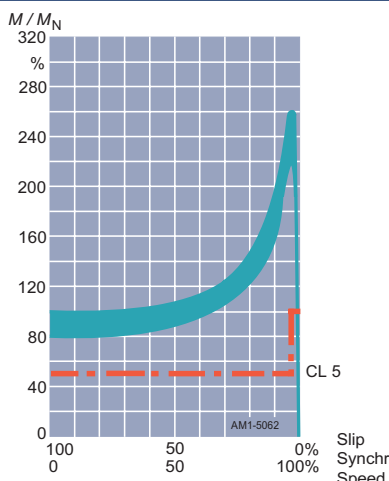
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Squirrel-Cage Motors

Technical Information

Restarting against residual field and opposite phase · Insulation, motor protection

Restarting against residual field and opposite phase

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

DURIGNIT® IR 2000 Insulation

- The DURIGNIT IR 2000 insulation system comprises high-grade enamelled 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 offers excellent protection for the windings against corrosive gases, vapours, dust, oil and humidity, and resists the normal stresses of vibration.

The motors have tropicalized insulation.

- The windings of the 1LA8 and 1MA8 motors are VPI-treated (vacuum pressure impregnation).

Please inquire about extreme applications.

All motors are manufactured with class F insulation. The utilization of the motor corresponds to class B at rated output and with mains operation.

All 1LA motors can be stamped with the ratings in accordance with the selection tables and rated voltage range as well as with a service factor (SF) of 1.1 for frame sizes 56 to 355 or 1.05 for frame sizes 400 and 450. Order Code **C11**.

The service factor is already stamped on the rating plate of standard ex-stock motors and 1LA8 motors.

If the motor is used for class F, the rated output specified in the selection and ordering data can be increased by 10 % (or by 5 % for frame sizes 400 and 450). Order Code **C12**.

If the catalog ratings are used, it is permissible to increase the temperature of the coolant to 55 °C (or to 50 °C for frame sizes 400 and 450). Order Code **C13**.

The service factor is not stamped on the rating plate for Order Codes **C12** und **C13**.

Motor protection

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

This type of protection is current-sensitive and is particularly effective under locked-rotor conditions.

The motors can also be protected by means of semiconductor temperature sensors (thermistors) embedded in the winding and operating in conjunction with a tripping unit (Order Code **A11** or **A12**).

This type of protection is temperature-sensitive and prevents the motor windings from overheating, e.g. due to sharply fluctuating loads or frequent switching.

- All 1LA8 and 1MA8 motors with the standard design are fitted with 6 PTC thermistors for alarm and tripping.
- The response temperature of the PTC thermistors for the 1LA, 1MJ and 1LG motors corresponds to class F.

In order to achieve full thermal protection it is necessary to combine a thermally delayed overcurrent release and a PTC thermistor. Full motor protection on request.

⊗ For type 1MJ motors:

Always use PTC thermistors if the duty type is anything other than S1.

- PTC thermistors are absolutely essential for these motors used for converter-fed operation. In this case, an additional thermistor is fitted in the terminal box for 1MJ6. Order Code **A15** or **A16**.

No additional anti-condensation heater can be integrated in designs with temperature sensors and frame sizes up to 200 L.

Thermistor protection takes the form of three PTC thermistors connected in series and embedded in the stator winding of the motor. The type **3RN1** tripping unit which completes the system must be ordered separately. Further details about its mode of operation, circuitry and price can be found in Catalog NS K, Order No. E20002-K1002-A101-B1-7600.

Pole-changing motors with two separate windings need twice the number of temperature sensors.

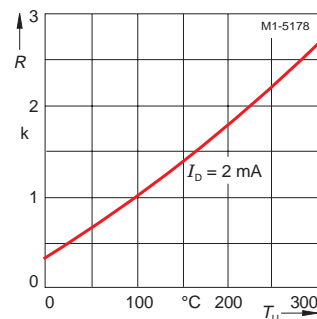
If an alarm signal is to be output prior to the motor being shut down, two groups of three temperature sensors will be needed. The alarm is usually output at 10 K below shutdown temperature.

Motor temperature detection for converter-fed operation

Order Code **A23**.

KTY 84-130 temperature sensor

This sensor is a PTC thermistor. Its resistance varies as a function of the temperature in accordance with a defined curve.



Siemens converters calculate the motor temperature according to the resistance of the temperature sensor. They can be set to a user-definable temperature for alarms and tripping.

The temperature sensor is embedded in the motor winding overhang in the same way as a PTC thermistor.

The evaluation is effected by the converter, for example.

The 1LA8 motors are supplied without the standard PTC thermistor if Order Code **A23** is specified.

Squirrel-Cage Motors

Technical Information

Anti-condensation heaters, degrees of protection · frame design

Anti-condensation heating

Order Code **K45**
Supply voltage 230 V

Order Code **K46**
Supply voltage 115 V

Anti-condensation heaters can be fitted to motors whose windings are exposed to a risk of condensation due to the ambient climate, e.g. stationary motors in a damp environment or motors subjected to considerable fluctuations in temperature.

An additional M16 x 1.5 or M20 x 1.5 cable entry fitting is provided in the terminal box for the power supply cable.

The anti-condensation heater must not be switched on while the motor is running.

An alternative to anti-condensation heaters (involving no extra cost) is to connect a voltage of around 4 to 10 % of the motor rated voltage to stator terminals U1 and V1; 20 to 30 % of the motor rated current provide an adequate heating effect.

⊗ For 1MJ6 motors:

No built-in anti-condensation heater is available for 1MJ6 motors up to frame size 200 L when equipped with PTC thermistors.

Degrees of protection to DIN EN 60 034-5

All motors and COMBIMASTER are designed for IP 55.

They are suitable for use in dusty or damp surroundings.

The 1LA6 and 1MA6 from BG 225 M as well as 1LA8 and 1MA8 motors have condensation drain holes sealed with plastic plugs.

■ All motors which have a shaft extension pointing upwards must have a means (provided by the user) of preventing the ingress of water along the shaft.

In the case of flange-mounting motors with IM V 3 type of construction, the liquid level in the flange recess can be prevented from rising by means of drain holes (to order). These are

Frame design

Some foot-mounting motors have two fixing holes at the non-drive end (see Dimensions Part 7).

There is a cast inscription near these holes to differentiate between frame sizes.

Eyebolts

The 1LA7, 1MA7 and 1LA5 motors from frame size 100 L up have two cast eyebolts with the terminal box design.

The 1LA5 motors can optionally be fitted with two additional eyebolts for the types of construction IM V 1 and IM V 3. Order Code **K32**.

The 1LG8 motors from frame size 100 L on have two bolted eyebolts.

■ The 1LA6 motors and the 1MA6 and 1MJ6 motors with frame size 180 M or larger have one eyebolt with the standard IM B 3 type of construction and two eyebolts with the IM B 5 type of construction. If the motors are used with the IM V 1 type of construction, one of the eyebolts must be repositioned, whereby care must be taken to avoid stress perpendicular to the eyebolt.

The 1LA8 motors have one eyebolt for the IM B 3 type of construction and two eyebolts for the IM V 1 type of construction.

1MJ6 motors, frame size 100 L to 132 M have to eyebolts, frame sizes 160 M to 160 L one eyebolt.

For motors	Frame size	Heat output (W) for Order Code	
		K45 (230 V)	K46 (115 V)
1LA5, 1LA6, 1LA7, 1MA6, 1MJ6	56 to 80 90 to 112 132 to 200 225 to 250 280 to 315	25 50 100 78 98	25 50 100 78 98
1LG8	90 and 100 112 and 132 160	12.5 25 50	12.5 25 50
1LA8 1MA8	all all	200 140	183 129
1MJ8	315 355 400 450	100 200 200 280	100 200 200 280

standard for 1LA6, 1MA6 and 1MJ6 motors with frame size 225 or larger.

No additional protection against the effects of the weather is necessary for the motors, providing they are stored correctly or mounted outdoors in a suitable manner.

They must, however, be protected against direct sunlight, e.g. with a canopy.

Type series	Frame size	Frame material	Frame feet
1LA5, 1LA7, 1LA9	56 to 100 ¹⁾ 112 to 225	Aluminium alloy Aluminium alloy	cast bolted
1MA7	63 to 100 ¹⁾ 112 to 160	Aluminium alloy Aluminium alloy	cast bolted
1LG8	90 to 160	Cast iron	cast
1LA6, 1MA6	180 to 200 225 to 315 M 315 L	Cast iron Cast iron Cast iron	bolted cast bolted
1MJ6	71 and 80 90 to 160 180 to 315	Cast iron Cast iron Cast iron	cast bolted bolted
1LA8 1MA8	315 to 450 315 and 355	Cast iron Cast iron	cast cast
1MJ8	315 to 450	Welded steel	welded

1) Frame size 100 with side-mounted terminal box has bolted feet.

Squirrel-Cage Motors

Technical Information

Cooling and ventilation

Coupling to gearboxes

The motors can be fitted with a radial seal for coupling to gearboxes. Order Code **K17**.

There must be adequate lubrication with grease, oil spray or oil mist (pressure oil is not allowed).

It is advisable to check the permitted bearing loads.

Please enquire about 1LA8 motors.

Speed and direction of rotation

The rated speed values apply to operation under rated conditions. The synchronous speed varies in direct proportion to the frequency of the power supply system.

The motors are suitable for operating in either direction of rotation (exceptions: 1LA8, 1MA8 and 1MJ8 motors, 2-pole).

Connecting terminals U1, V1 and W1 to phases L1, L2 and L3 will result in clockwise rotation looking towards the drive end of the shaft. Anticlockwise rotation can be achieved by interchanging two of the phases (see also "Cooling and ventilation").

Cooling and ventilation

Standard motors with frame sizes 63 to 450 (exception: 1LA8 and 1MA8 motors, 2-pole) are fitted with a radial-flow fan which functions independently of the direction of rotation (cooling method IC 411 to DIN EN 60 034-6).

Motors with frame size 56 have no fan (IC 410).

■ Standard, 2-pole 1LA8 and 1MA8 motors have an axial-flow fan for clockwise rotation (exception: 1LA831). It is possible to convert the fan subsequently for anticlockwise rotation.

If the motor is installed in an area with a limited air supply, it is essential to ensure a minimum clearance between the fan cowl and the wall, equal to the distance between the canopy and the cowl (dimension $k_2 - k$).

Materials

Type series	Frame size	Fan material	Fan cowl material
1LA5, 1LA7, 1LA9	63 to 225	Plastic	Corrosion-protected steel plate
1LA6	63 to 200		
1MA7	180 to 200		
1MA6	63 to 160		
1MJ6	180 to 200		
1LG8	71 to 200		
1LA6	90 to 160		
1MA6	225 to 315	Plastic	Glass-reinforced plastic
1MJ6	225 to 315		
1LA8	225 to 315		
1MA8	all		
1MJ8	all		
		Welded steel plate	Corrosion-protected steel plate

2

Squirrel-Cage Motors

Technical Information

Noise (direct on-line operation)

The noise levels are measured in accordance with EN 21 680-1 in a dead room with rated power.

\bar{L}_{pFA} is specified in dB as the A-weighted measuring-surface sound pressure level.

This value is the spatial main value of the sound pressure levels measured on the test hemisphere. This hemisphere is a cuboid at a distance of 1 m from the machine surface. The sound power level L_{WA} is specified in dB.

The values are applicable at 50 Hz with a tolerance of +3 dB. They are approximately 4 dB higher at 60 Hz.

Please enquire about the noise levels for pole-changing motors, motors with an increased power output or motors for converter-fed operation.

A-weighted measuring-surface sound pressure level and soundpower

Standard design

Type series	Frame size	Measuring-surface sound pressure level (\bar{L}_{pFA}) Sound power level (L_{WA})							
		2-pole		4-pole		6-pole		8-pole	
		\bar{L}_{pFA}	L_{WA}	\bar{L}_{pFA}	L_{WA}	\bar{L}_{pFA}	L_{WA}	\bar{L}_{pFA}	L_{WA}
		dB	dB	dB	dB	dB	dB	dB	dB
1LA5, 1LA6, 1LA7, 1LA9, 1MA7, 1MA6, 1MJ6	56	41	52	42	53	38	49	–	–
	63	49	60	42	53	39	50	–	–
	71	52	63	44	55	39	50	36	47
	80	56	67	47	58	40	51	41	52
	90	60	72	48	60	43	55	41	53
	100	62	74	53	65	47	59	45	57
	112	63	75	53	65	52	64	49	61
	132	68	80	62	74	63	75	53	65
	160	70	82	66	78	66	78	63	75
	180	70	83	63	76	66	78	60	73
200	71	84	65	78	66	78	58	71	
225	71	84	65	78	59	72	58	71	
250	75	89	65	79	60	74	57	71	
280	77	91	67	81	60	74	58	72	
315	79	93	69	83	63	77	62	76	
1LG8	90	60	72	49	60	47	58	46	57
	100	64	76	54	66	50	62	49	61
	112	64	76	54	66	54	66	53	65
	132	63	75	59	71	60	72	55	67
	160	68	80	64	76	63	75	61	73
1LA8, 1MA8	315	82 ¹⁾	97	73	87	68	82	65	79
	355	77 ¹⁾	92	75	90	71	86	67	82
	400	79 ¹⁾	94	78	93	73	88	69	84
	450	81 ¹⁾	96	81	96	75	90	71	86
1MJ8	315	80	94	70	84	70	84	69	83
	355	82	97	73	88	75	90	73	88
	400	82	97	79	94	80	95	74	89
	450	84	99	80	95	83	88	78	93

In order to reduce noise levels, 2-pole motors with frame sizes 132 S or larger can be fitted with an axial-flow fan that is suitable for one direction of rotation only.

Clockwise rotation
Order Code **K37**

Anticlockwise rotation
Order Code **K38**

Low-noise design

Type series	Frame size	2-pole motors	
		\bar{L}_{pFA}	L_{WA}
		dB	dB
1LA5, 1LA6, 1LA7, 1MA7, 1MA6, 1MJ6	132	64	76
	160	64	76
	180	63	76
	200	63	76
	225	68	80
	250	70	82
1LG8	280	72	84
	315	74	86
	132	56	68
1LA8	160	57	69
	315	75	90
1MJ8	315	68	82
	355	69	84
	400	o. r.	o. r.

1) The standard 1LA8 and 1MA8 design, 2-pole have an axial-flow fan for clockwise rotation (exception: 1LA8 315). Order Code **K37** is not needed.
For anticlockwise rotation please state Order Code **K38**.

The motors up to frame size 315 L are 80 mm longer than normal. A second shaft extension and/or pulse generator mounting is not possible.

Squirrel-Cage Motors

Technical Information

Terminal boxes

Terminal boxes

The position of the terminal box is always described looking towards the drive end of the motor.

There are marked terminals for connecting the protective earth conductor.

The earthing terminal is on the outside of the motor frame (non-standard design for 1LA5 motors, Order Code **L13**).

⊗ For type 1MJ motors:

The terminal box has degree of protection EEx e. The winding ends of motors with frame sizes up to 160 enter the terminal box through a common explosion-proof gland; individual glands are used on motors with frame size 180 or larger.

Motor connection

Mains conductors

The mains conductors must be dimensioned in accordance with DIN VDE 0298. The number of required – possibly parallel – feeders is determined by

- the maximum connectable conductor cross-section (300 mm²),
- the cable type,
- the laying arrangement,
- the ambient temperature and
- the permissible current in accordance with DIN VDE 0298.

Parallel feeders

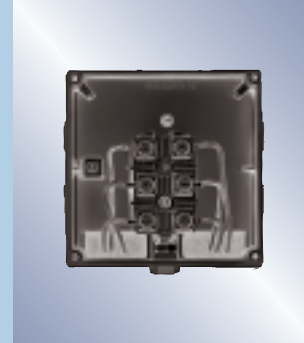
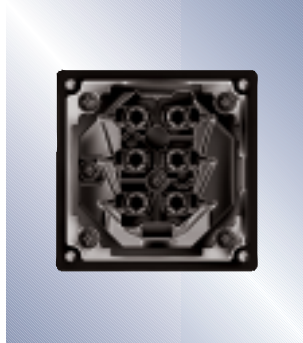
Some motors must be fitted with parallel feeders due to the maximum permissible current per terminal. These motors are marked in the selection tables. Two parallel feeders are used with motors having the terminal box 1XB7, with the terminal box 1XB1 631 four feeders are possible.

1LA7, 1LA9 and 1MA7, frame sizes 100 L to 160 L

The terminal box is integrated into the frame. On each side there are two knock-out openings for boltings.

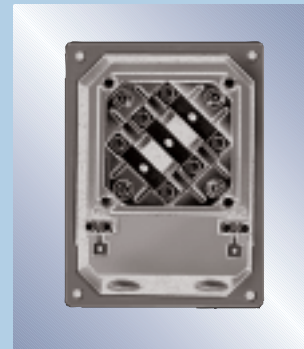
The bolting nuts are included with the terminal box.

Type gk 030



Type gk 130
230
330

Type gk 430



Type 1XB7 222
1XB7 322
gk 431

Type 1XB7 422
to 1XB7 622



Type 1XB1 631

Terminal boxes for 1LA5, 1LA6, 1LA7, 1LA8, 1LA9 and 1LG8 motors							
Motors	Frame size	Terminal box position	Degree of protection	Rotation of terminal box	No. of cable entries	Feeder connection	Terminal box material
1LA5, 1LA7, 1LA9	56 to 71	Top	IP 55	90° and 180°	2 holes, with plugs, sealed	Without cable lug	Aluminum alloy
	80 to 90	Top, right-hand side or left-hand side possible.		180° (2 holes 180° apart)	4 knockout holes in cast-iron skin, sealed (2 left, 2 right) Terminal box is moulded		
	100 to 160			90° and 180°	2 holes with plugs		
1LA6	180 to 225 250 to 315	Retrofitting not possible.				With cable lug	Cast iron
1LA8	315 and 355 ¹⁾ 400 and 450	Right-hand side (45° from vertical) or left-hand side possible. Retrofitting not possible.		90° and 180° (retrofitting not possible). State position of cable entry.	4 holes, sealed		
1LG8	90 and 100 112 to 160	Top, right-hand side or left-hand side possible.		90° and 180°	1 } Plugs, sealed 2 }	Without cable lug	

Terminal boxes for 1LA5, 1LA7 and 1LA9 motors							
Frame size	Type	No. of terminals	Terminal screw thread	Max. conductor size	Sealing range	Cable entry	Split plate ²⁾
				mm ²	mm	Size	Max. outer cable diameter mm
56 63 71 80 90	gk 030	6	M 4	2.5	9 – 17 4.5 – 10	M 25 x 1.5 M 16 x 1.5	–
100 112	gk 130	6	M 4	4	11 – 21	M 32 x 1.5	–
132	gk 230	6	M 4	6	11 – 21	M 32 x 1.5	–
160 180	gk 330	6	M 5	16	19 – 28	M 40 x 1.5	–
200	gk 430	6	M 6	25	27 – 35	M 50 x 1.5	–
225	gk 431	6	M 8	35	27 – 35	M 50 x 1.5	–

Terminal boxes for 1LG8 and 1LA6 motors							
90	without designation	6	M 4	2.5	9 – 17	M 25 x 1.5	–
100		6	M 4	2.5	11 – 21	M 32 x 1.5	–
112		6	M 5	4	11 – 21	M 32 x 1.5	–
132		6	M 6	16	11 – 21	M 32 x 1.5	–
160		6	M 6	16	19 – 28	M 40 x 1.5	–
180	1XB7 222	6	M 6	16	19 – 28	M 40 x 1.5	–
200	1XB7 322	6	M 8	25 ●	24 – 35	M 50 x 1.5	–
225							
250 280	1XB7 422	6	M 10	120	32 – 42	M 63 x 1.5	40 – 50
315	1XB7 522	6	M 12	240	40 – 48	M 63 x 1.5	40 – 60

Terminal boxes for 1LA8 motors							
315 355	1XB7 622 ¹⁾	6	M 16	240	41 – 56.5	M 72 x 2	40 – 70
400 450	1XB1 631	12	M 16	300	–	–	40 – 75

● 35 mm² with cable lug

■ The terminal box list does not apply to pole-changing motors with three speeds.

The 1LA7/1LA9 motors, frame sizes 100 L to 160 L, come with 2 bolting nuts in the terminal box.

- 1) The requirements specified for frame sizes 400 and 450 are valid for type 1LA8 357, 2- and 4-pole (1XB1 631 terminal box).
- 2) Split plate available at extra charge. Order Code **K06**. For 1XB1 631 terminal box, standard design. With strain relief for frame size 250 M or larger.

Squirrel-Cage Motors

Technical Information

Terminal boxes

Terminal boxes for 1MA7, 1MA6 and 1MA8 motors

Motors	Frame size	Terminal box position	Degree of protection	Rotation of terminal box	No. of cable entries	Feeder connection	Terminal box material
1MA7	63 to 71	Top	IP 55	90° and 180°	2 holes, 1 gland with sealing ring, 1 plug	Without cable lug ¹⁾	Aluminum alloy
	80 to 90 100 to 160	Top, right-hand side or left-hand side possible.		180° (2 holes 180° apart)	4 knockout holes in cast-iron skin, sealed (2 left, 2 right) Terminal box is moulded		
1MA6	180 to 225 250 to 315	Retrofitting not possible.		90° and 180°	2 boltings with sealing ring		Cast iron
1MA8	315 and 355 355 ²⁾	Right-hand side (45° from vertical), left-hand side possible. Retrofitting not possible.		90° and 180° (retrofitting not possible). State position of cable entry.	4 holes, sealed		

Terminal boxes for 1MA7, 1MA6 and 1MA8 motors

Frame size	Type	No. of terminals	Terminal screw thread	Max. conductor size	Sealing range	Cable entry	Split plate ²⁾
				mm ²	mm	Size	Max. outer cable diameter mm
63	gk 130	6	M 4	4	11 – 16	M 25 x 1.5	–
71						M 16 x 1.5	
80							
90							
100							
112					14 – 21	M 32 x 1.5	–
132	gk 230	6	M 4	6			
160	gk 330	6	M 5	16	19 – 27	M 40 x 1.5	–
180	1XB7 222	6	M 6	10	19 – 27	M 40 x 1.5	–
200	1XB7 322	6	M 8	50	24 – 35	M 50 x 1.5	–
225							
250	1XB7 422	6	M 10	120	32 – 42	M 63 x 1.5	40 – 50
280							
315	1XB7 522	6	M 12	240	40 – 48	M 63 x 1.5	40 – 60

Terminal boxes for 1MA8 motors

315	1XB7 622	6	M 16	240	41 – 56.5	M 72 x 2	–
355							
355²⁾	1XB1 631	12	M 16	240	–	–	40 – 75

■ Unused holes for 1MA and 1ME motors must be sealed in accordance with EN 50 014.

The 1MA7 motors, frame sizes 100 L to 160 L, come with 1 bolting with sealing ring and two bolting nuts in the terminal box.

- 1) The parts required for the connection without cable lugs are supplied in an accessories pack with the terminal box for all motors with frame size 225 or larger.
- 2) Requirements only valid for 1MA8 357, 2- and 4-pole.

Terminal boxes for 1MJ6 and 1MJ8 motors							
Motors	Frame size	Terminal box position	Degree of protection	Rotation of terminal box	No. of cable entries	Feeder connection	Terminal box material
1MJ6	71 and 80	Top	IP 55	90° and 180°	2 holes 1 gland with sealing ring, 1 plug	Without cable lug ¹⁾	Aluminum alloy BG 160 L Cast iron
	90 to 160	Top, right-hand side or left-hand side possible. Retrofitting not possible.		90° and 180°				2 holes 2 glands with sealing	Aluminum alloy Cast iron
	180 to 225						
	250 to 315						
1MJ8	315 S/M		Top, right-hand side or left-hand side on request.		90° and 180°	2 holes 2 glands	
	315 L to 450				1 or 2 holes ²⁾		

Terminal boxes for 1MJ6 and 1MJ8 motors							
Frame size	Type	No. of terminals	Terminal screw thread	Max. conductor size	Sealing range	Cable entry	
				mm ²	mm	Size	
71 80	gk 330	6	M 4	4	11 – 16	M 25 x 1.5	
90	gk 420	6	M 4	6	11 – 16	M 25 x 1.5	
100					14 – 21	M 32 x 1.5	
112	gk 420	6	M 4	6	14 – 21	M 32 x 1.5	
132 160	gk 465 •		M 5 •	16 •	19 – 27 •	M 40 x 1.5 •	
180	1XC1 270	6	M 6	25	19 – 27	M 40 x 1.5	
200 225	1XC1 380	6	M 8	50	24 – 35	M 50 x 1.5	
250 280	1XC1 480	6	M 10	120	32 – 42	M 63 x 1.5	
315	1XC1 580	6	M 12	240	40 – 48	M 63 x 1.5	
Terminal box for 1MJ8 motors							
315 355 400 450	without designation	6	M 12 M 16	120 to 300	56 – 68	M 63 x 1.5 ²⁾	

■ Explosion-proof terminal boxes can be fitted (to order). • For frame size 160 L

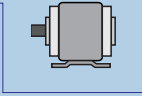
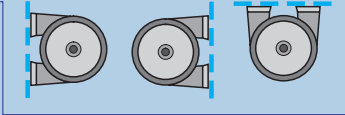
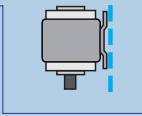
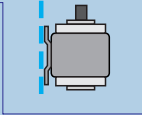
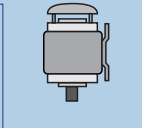
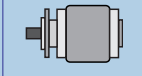

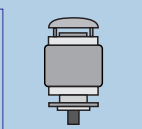
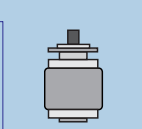
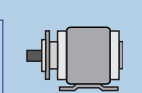
■ Unused holes for 1MJ motors must be sealed in accordance with EN 50 014.

- 1) The parts required for the connection without cable lugs are supplied in an accessories pack with the terminal box for all 1MJ6 motors with frame size 225 M or larger.
- 2) Standard design from BG 315 L with cable entry gland split lengthwise for 35 – 75 mm and strain relief.

Squirrel-Cage Motors

Technical Information

Types of construction

Type of construction to DIN EN 60 034-7	Frame size	Code 12th position	Order Code
IM B 3 	56 M to 450	0 ⁴⁾	-
IM B 6, IM B 7, IM B 8 	56 M to 315 L	0	-
IM V 5 without canopy 	56 M to 315 M 315 L	0 9 ¹⁾	- M1D
IM V 6 	56 M to 315 M 315 L	0 9 ¹⁾	- M1E
IM V 5 with canopy 	63 M to 315 L	9 ¹⁾	M1F
Flange			
IM B 5 	56 M to 315 M	1 ²⁾	-
IM V 1 without canopy 	56 M to 315 M 315 L to 450	1 ²⁾³⁾ 8 ⁴⁾⁵⁾	- -
IM V 1 with canopy 	63 M to 450	4 ¹⁾²⁾³⁾⁵⁾	-
IM V 3 	56 M to 160 L 180 M to 315 M	1 9 ²⁾³⁾	- M1G
IM B 35 ⁶⁾ 	56 M to 450	6 ⁴⁾	-

The flanges are assigned to the frame sizes as FF with through-holes in DIN EN 50 347. A-flanges acc. to DIN 42 948 are still valid.

1) 60 Hz is available for 2-pole motors with frame size 315 L on request.

2) Motors with frame sizes between 225 S and 315 M are delivered with two eyebolts according to IM B 5, one of which may be repositioned acc. to IM V 1 or IM V 3; then, care must be taken to avoid stress perpendicular to the eyebolt.

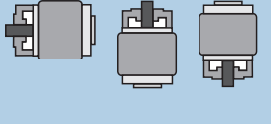
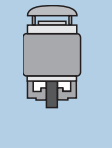
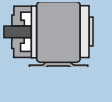
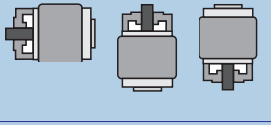
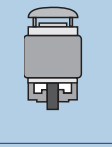
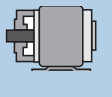
3) With frame sizes between 180 M and 225 M, the motors are available

with two additional eyebolts; please state order suffix **"Z"** and Order Code **K32**.

4) Frame size 450, 2-pole, 60 Hz not available.

5) 60 Hz design is not available for 2-pole 1LA8 motors with frame size 355 or larger.

6) With 1LA8, the related flange diameter is greater than double the shaft height.

Type of construction to DIN EN 60 034-7	Frame size	Code 12th position	Order Code
Standard flange			
IM B 14, IM V 19, IM V 18 without canopy	 56 M to 160 L	2	-
IM V 18 with canopy	 63 M to 160 L	9	M2A
IM B 34	 56 M to 160 L	7	-
Custom flange			
IM B 14, IM V 19, IM V 18 without canopy	 56 M to 160 L	3	-
IM V 18 with canopy	 63 M to 160 L	9	M2B
IM B 34	 56 M to 160 L	9	M2C

The standard flanges are assigned to the frame sizes as FT with threaded holes in DIN 50 347.
C-flanges acc. to DIN 42 948 are still valid.
The custom flange was assigned as large flange in the previous DIN 42 677.

All types of construction within the following series have equal dimensions:
IM B 3, IM B 6, IM B 7, IM B 8, IM V 5 and IM V 6
IM B 5, IM V 1 and IM V 3
IM B 14, IM V 18 and IM V 19

The motors in the standard power range are available in the standard types of construction IM B 3, IM B 5 or IM B 14, and can be operated in the mounting positions IM B 6, IM B 7, IM B 8, IM V 5, IM V 6, IM V 1, IM V 3 (up to frame size 160 L) or IM V 18 and IM V 19 (universal type of construction).

- On the normal rating plate, therefore, they are marked with only the basic type of construction.
- If foot-type motors larger than frame size 180 M are mounted to the wall, it is recommended that especially the motor feet are supported.

For all motors with the shaft end pointing down, the version "with canopy" is recommended; see chapter "degrees of protection", page 2/15.

⊗ For explosion-proof motors:

For types of construction with shaft end pointing down, the version "with canopy" is mandatory. Types of construction with shaft end pointing up must be suitably covered in order to avoid that small parts fall into the fan cowl.

(See also section 17 DIN EN 50 014.)

The cooling may not be impaired by the cover.

Squirrel-Cage Motors

Technical Information

Bearings

Bearings

The nominal bearing life of motors with horizontal type of construction is at least 40,000 hours if there is no additional axial loading at the output coupling; with the maximum permitted loads listed on pages 2/29 to 2/35 it is at least 20,000 hours, provided the motor is operated at 50 Hz.

The bearings of motors with frame sizes up to 250 M are pre-lubricated. Frame size 280 S and larger sizes are regreasable with a flat-type grease nipple M 10 x 1 in accordance with DIN 3404.

Regreasable bearings can be fitted in motors with frame sizes 100 L to 250 M. Order Code **K40** (extra charge)

The bearings must be regreased at regular intervals according to the pot life of the grease, in order to ensure that they achieve their nominal service life.

The stated grease pot life applies to the standard bearing design. Please enquire if the bearing is subjected to increased cantilever forces.

The 1LA7 motors up to frame size 132 M do not have a locating bearing.

The bearings at the drive end are preloaded.

Frame sizes 160 M to 315 L, all 1MJ6 motors, and 1LG8 motors with frame size 112 M or larger have a locating bearing at the non-drive end and a floating bearing at the drive end; the latter is a preloaded, deep-groove ball bearing. Motors equipped with parallel roller bearings are an exception to this rule (see pages 2/25 to 2/28 for selection of bearings).

The standard 1LA8 motors have the fixed bearing at the drive end. Vertically mounted motors and motors for high cantilever forces have this bearing at the non-drive end.

If high cantilever forces are exerted at the drive end, e.g. owing to a belt transmission, the motors can be fitted with other bearings on request at an extra charge (please inquire about 1LG8, 1MJ6 with frame sizes between 280 and 315, and 1MJ8 motors; not available for 1MJ6 up to frame size 160 L. Order Code **K20** (see page 2/30 for selection of bearings.)

If bearings for high cantilever forces are fitted, the following must be noted: the minimum permitted cantilever force is equal to the maximum permitted force for the standard bearings (vibration severity grades R and S are not possible).

With various motors, a locating bearing with a retaining ring can be fitted at the non-drive end on request (Order Code **L04**, Fig. 2, Page 2/27).

Alternatively, a locating bearing with a stationary outer race held by an inner bearing cover can be fitted at the drive end (Order Code **K94**, Fig. 3, Page 2/27).

Mechanical limit speeds for converter-fed 1LA8 motors see page 3/21.

Type of lubrication	Frame size	No. of poles	Grease life and/or relubrication interval	
			at KT 40 °C	at KT 25 °C
Prelubricated	Up to 250	2	10 000 h	20 000 h
		4 to 8	20 000 h	40 000 h
Regreasable	280 and 315	2	2 000 h	4 000 h
		4 to 8	4 000 h	8 000 h
	355 to 450	2 and 4	2 000 h	4 000 h
		6 and 8	4 000 h	8 000 h

Selection of bearings for 1LA, 1MA and 1LG motors, basic design							
For motors Frame size	Type 1LA5... 1LA6... 1LA7... 1LA9... 1MA6... 1MA7...	No. of poles	Drive-end bearing		Non-drive end bearing		Fig. No. on pages 2/27 and 2/28
			Horizontal motors	Vertical motors	Horizontal motors	Vertical motors	
56	1LA7 05.	all	6201 2ZC3		6201 2ZC3		Fig. 1
63	... 06.	all	6201 2ZC3		6201 2ZC3		
71	... 07.	all	6202 2ZC3		6202 2ZC3		
80	... 08.	all	6004 2ZC3		6004 2ZC3		
90	... 09.	all	6205 2ZC3		6004 2ZC3		
100	... 10.	all	6206 2ZC3 ¹⁾		6205 2ZC3 ¹⁾		
112	... 113	all	6206 2ZC3 ¹⁾		6205 2ZC3 ¹⁾		
132	... 13.	all	6208 2ZC3 ¹⁾		6208 2ZC3 ¹⁾		
160	... 16.	all	6209 2ZC3 ¹⁾		6209 2ZC3 ¹⁾	Fig. 2 Fig. 4	
180	... 18.	all	6210 ZC3 ¹⁾		6210 ZC3 ¹⁾		
200	... 20.	all	6212 ZC3 ¹⁾		6212 ZC3 ¹⁾		
225	... 22.	all	6213 ZC3 ¹⁾		6212 ZC3 ¹⁾		
250	... 253	all	6215 ZC3 ¹⁾		6215 ZC3 ¹⁾		
280	... 28.	2	6216 C3		6216 C3	Fig. 5	
280		4 to 8	6317 C3		6317 C3		
315 S	... 310	2 4 to 8	6217 C3		6217 C3		
315 M	... 313		6319 C3		6319 C3		
315 L	... 316	2 4 to 8	6217 C3	6217 C3 ²⁾	6217 C3	7217 B ²⁾	
	... 317		6319 C3	6319 C3	6319 C3	6319 C3	
	... 318						
	1LG8... 1LA6...						
90	1LG8 09.	all	6205 2Z C3		6205 2Z C3	Fig. 6	
100	1LG8 10.	all	6206 2Z C3		6205 2Z C3		
112	1LG8 11.	all	6306 2Z C3		6206 2Z C3		
132	1LG8 13.	all	6308 2Z C3		6208 2Z C3		
160	1LG8 16.	all	6309 2Z C3		6210 2Z C3		
180	1LA6 18.		6210 Z C3		6210 Z C3		Fig. 4
200	1LA6 20.		6212 Z C3		6212 Z C3		
225	1LA6 22.		6213 Z C3		6213 Z C3		
	1LA8... 1MA8...						
315	... 31.	2 4 to 8	NU 215 E + 6215 C3 NU 218 E + 6218 C3	6215 C3 6218 C3	NU 215 E NU 218 E	7215 B 7218 B	Fig. 7a and Fig. 7b
355	... 35.	2 4 to 8	NU 217 E + 6217 C3 NU 220 E + 6220 C3	6217 C3 ²⁾ 6220 C3	NU 217 E NU 220 E	7217 B ²⁾ 7220 B	
400	1LA8 40.	2 4 to 8	NU 217 E + 6217 C3 NU 224 E + 6224 C3	6217 C3 ²⁾ 6224 C3	NU 217 E NU 224 E	7217 B ²⁾ 7224 B	
450	1LA8 45.	2 4 to 8	NU 219 E + 6219 C3 ²⁾ NU 226 E + 6226 C3	6219 C3 ²⁾ 6226 C3	NU 219 E ²⁾ NU 226 E	7218 B ²⁾ 7226 B	

- 1) Bearings without sideplates are used when a regreasing device is fitted.
- 2) For 50 Hz only.

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 from the factory by quoting the serial number or read off on the lubrication instruction plate of 1LA8 motors.

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

Fig. 3 (page 2/27) shows the non-standard design with a locating bearing at the drive end for 1LA7, 1LA9 and 1MA7 motors.

Squirrel-Cage Motors

Technical Information

Selection of bearings

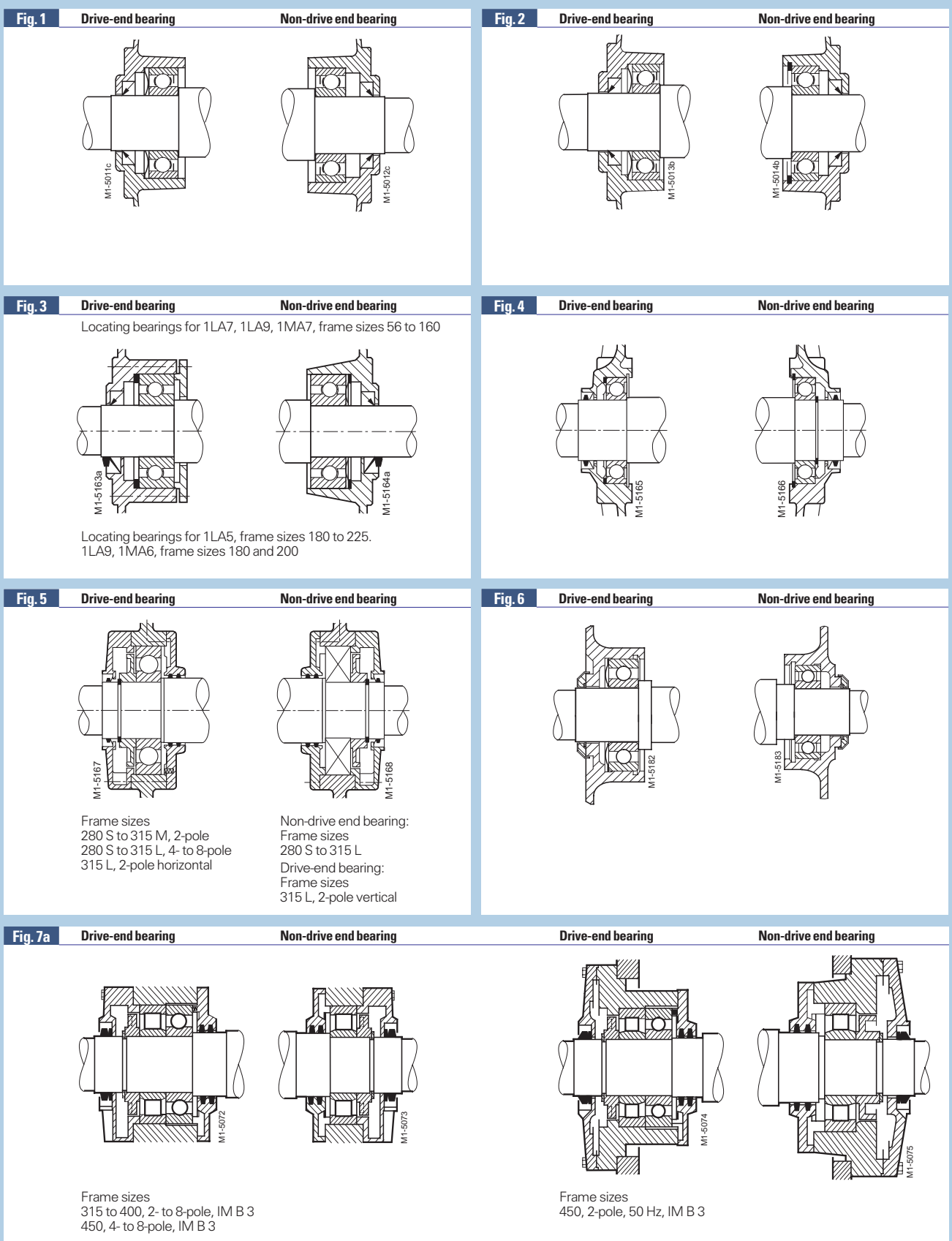
Selection of bearings for 1MJ motors, basic design

For motors Frame size	Type	No. of poles	Drive-end bearing		Non-drive end bearing		Fig. No. on page 2/31
			Horizontal motors and vertical motors		Horizontal motor	Vertical motor	
71	1MJ6 07 .	all	6202 ZC3		6202 ZC3		Fig. 8
80	1MJ6 08 .	all	6004 ZC3		6004 ZC3		
90 L	1MJ6 09 .	all	6205 C3		6205 C3		Fig. 9
100 L	1MJ6 10 .	all	6206 C3		6206 C3		
112 M	1MJ6 11 .	all	6306 C3		6306 C3		
132 S 132 M	1MJ6 13 .	all	6308 C3		6308 C3		Fig. 10
160 M 160 L	1MJ6 16 .	all	6309 C3		6309 C3		
180 M 180 L	1MJ6 18 .	all	6210 C3		6210 C3		Fig. 11
200 L	1MJ 6 20 .	all	6212 C3		6212 C3		
225 S 225 M	1MJ6 22 .	all	6213 C3		6213 C3		
250 M	1MJ6 253	all	6215 C3		6215 C3		
280 S 280 M	1MJ6 28 .	all	NU 216		6216 C3		Fig. 12
315 S 315 M	1MJ6 31 .	2 4 to 8	NU 217 NU 218		6217 C3 6218 C3		
315	1MJ8 31 .	2 4 to 8	6316 C3 6320 C3		6316 C3 6320 C3		Fig. 13
355	1MJ8 35 .	2 4 to 8	6316 C3 6320 C3		6316 C3 6320 C3		
400	1MJ8 40 .	2 4 to 8	6317 C4 6322 C4		6317 C4 7317 BM 6322 C4 7322 BMP		
450	1MJ8 45 .	2 4 to 8	6317 C4 6322 C4		6317 C4 71317 BM 6322 C4 7322 BMP		

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 from the factory by quoting the serial number.

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

1MJ8 motors for 60 Hz on request.

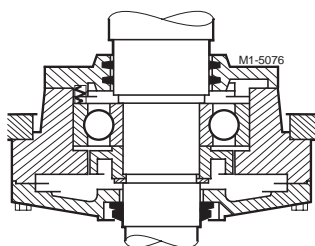


Squirrel-Cage Motors

Technical Information

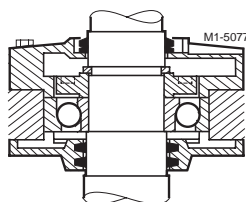
Bearing arrangements

Fig. 7b Drive-end bearing



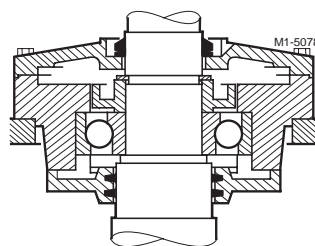
Frame sizes
315, 2- to 8-pole, IM V 1
355 and 450, 2- to 8-pole, 50 Hz, IM V 1

Non-drive end bearing



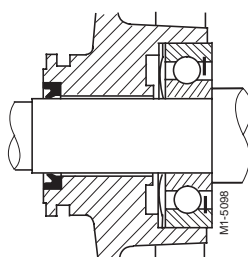
Frame sizes
315, 2- to 8-pole, IM V 1
355 and 400, 2- to 8-pole, 50 Hz, IM V 1
450, 4- to 8-pole, 50 Hz, IM V 1

Non-drive end bearing



Frame size
450, 2-pole, 50 Hz, IM V 1

Fig. 8 Drive-end bearing



Non-drive end bearing

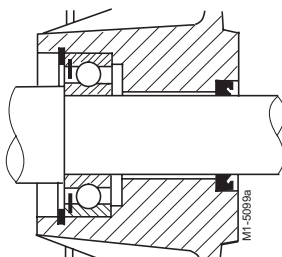
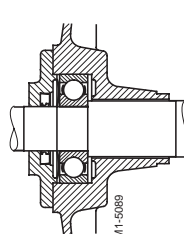


Fig. 9 Drive-end bearing



Non-drive end bearing

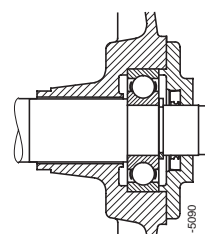
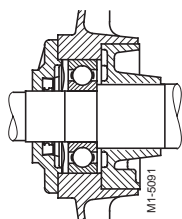


Fig. 10 Drive-end bearing



Non-drive end bearing

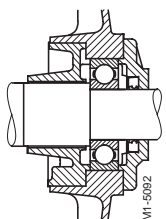
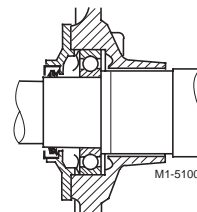


Fig. 11 Drive-end bearing



Non-drive end bearing

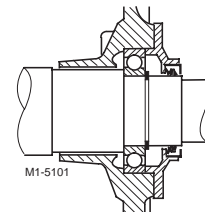
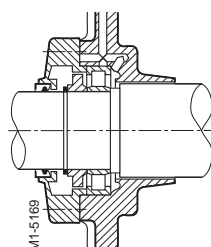


Fig. 12 Drive-end bearing



Non-drive end bearing

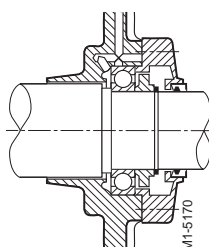
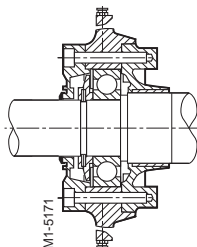
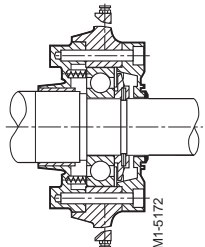


Fig. 13 Drive-end bearing

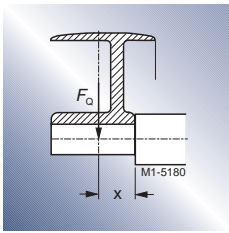


Non-drive end bearing



Drive and non-drive end bearing:
Frame size 315 or larger
Outer bearing seal
Frame sizes 400 and 450
with labyrinth gland

Maximum cantilever forces, basic design



The values for the maximum permitted cantilever force F_Q (N) with a radial load are based on the assumption that the line of force (i.e. the centreline of the pulley) is still within the free shaft extension (dimension x).

Dimension x (mm) is the distance from the shoulder of the shaft to the line of action of the force F_Q . The dimension x_{max} is thus the length of the shaft extension.

Total cantilever force $F_Q = c \cdot F_u$

The pretensioning factor c is an empirical value determined by the belt manufacturer. It can be approximated as follows:

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 peripheral force F_u (N) can be calculated from the following equation

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

F_u Peripheral force in N
 P Motor rated output (transmitted power) in kW
 n Motor rated speed in rpm
 D belt pulley diameter in mm

Standard belt pulleys conforming to DIN 2211, Sheet 3, are used.

Reduced values for 60 Hz on request.

Maximum cantilever forces for 50 Hz basic version

x_0 values refer to $x = 0$ and x_{max} values to $x = l$

For motors	No. of poles	Max. cantilever force at x_0			Max. cantilever force at x_{max}		
		Type 1LA5 1LA7 1LA9 1MA6 1MA7 N	Type 1LG8 1LA6 N	Type 1MJ6 N	Type 1LA5 1LA7 1LA9 1MA6 1MA7 N	Type 1LG8 1ME8 N	Type 1MJ6 1LA6 N
56	2	270	–	–	240	–	–
	4	350	–	–	305	–	–
	6	415	–	–	360	–	–
63	2	270	–	–	240	–	–
	4	350	–	–	305	–	–
	6	415	–	–	360	–	–
71	2	415	–	415	355	–	355
	4	530	–	530	450	–	450
	6	630	–	630	535	–	535
	8	690	–	–	585	–	–
80	2	485	–	485	400	–	400
	4	625	–	625	515	–	515
	6	735	–	735	605	–	605
	8	815	–	–	675	–	675
90 S	2	725	770	725	605	620	605
90 L	4	920	970	920	775	780	775
	6	1090	1120	1090	910	900	910
	8	1230	1240	1230	1030	990	1030
100 L	2	1030	1100	1030	840	950	840
	4	1310	1450	1310	1060	800	1060
	6	1550	1650	1550	1250	800	1250
	8	1720	1820	1720	1400	800	1400
112 M	2	1010	1600	1680	830	1350	1490
	4	1270	2100	1960	1040	1500	1580
	6	1520	2400	2140	1240	1520	1720
	8	1690	2650	2450	1380	1540	1950
132 S	2	1490	2350	2250	1180	1900	1820
132 M	4	1940	3000	2720	1530	2500	2170
	6	2260	3500	3100	1780	2850	2420
	8	2500	3800	3400	1980	2850	2700
160 M	2	1540	2900	2800	1210	2300	2250
160 L	4	2040	3700	3330	1590	2700	2600
	6	2330	4250	3750	1820	2700	2900
	8	2660	4700	3750	2080	3000	2900
180 M	2	2000	2000	2000	1550	1550	1550
180 L	4	2350	2350	2350	1950	1950	1950
	6	2800	2800	2800	2250	2250	2250
	8	3050	3050	3050	2500	2500	2500
200 L	2	2550	2550	2550	2100	2100	2100
	4	3350	3350	3350	2750	2750	2750
	6	3900	3900	3900	3200	3200	3200
	8	4150	4150	4150	3450	3450	3450
225 S	2	3050	3050	3050	2550	2550	2550
225 M	4	3750	3750	3750	2950	2950	2950
	6	4550	4550	4550	3600	3600	3600
	8	4850	4850	4850	3900	3900	3900

Maximum cantilever forces for 50 Hz basic version

x_0 values refer to $x = 0$ and x_{max} values to $x = l$

For motors	Frame size	No. of poles	Max. cantilever force at x_0		Max. cantilever force at x_{max}	
			Type 1LA6 1MA6 N	Type 1MJ6 1MA6 N	Type 1LA6 1MA6 N	Type 1MJ6 1MA6 N
250 M	2	2	3650	3650	2950	2950
	4	4	4400	4400	3600	3600
	6	6	5350	5350	4350	4350
	8	8	5700	5700	4700	4700
280 S	2	2	3350	8100	2800	6700
280 M	4	4	8400	7200	7200	8050
	6	6	10000	8500	8900	9700
	8	8	11000	9500	9850	10600
315 S	2	2	3950	9000	3350	7600
315 M	4	4	9900	13100	8100	10800
	6	6	12100	15600	9900	12800
	8	8	13300	16900	10900	13900
315 L	2	2	3100	18400	2700	15600
	4	4	8800	22500	7450	18600
	6	6	11400	25200	9600	21100
	8	8	12500	27700	10500	23100
			1LA8 1MA8	1MJ8	1LA8 1MA8	1MJ8
315	2	2	8650	see diagrams page 2/31	7600	see diagrams page 2/31
	4	4	15400	see diagrams page 2/31	13200	see diagrams page 2/31
	6	6	17200	see diagrams page 2/31	14700	see diagrams page 2/31
	8	8	19000	see diagrams page 2/31	14300	see diagrams page 2/31
355	2	2	10600	see diagrams page 2/31	9500	see diagrams page 2/31
	4	4	21200	see diagrams page 2/31	18600	see diagrams page 2/31
	6	6	23400	see diagrams page 2/31	18400	see diagrams page 2/31
	8	8	25700	see diagrams page 2/31	16300	see diagrams page 2/31
400	2	2	9800	see diagrams page 2/31	8700	see diagrams page 2/31
	4	4	28400	see diagrams page 2/31	24300	see diagrams page 2/31
	6	6	31200	see diagrams page 2/31	27000	see diagrams page 2/31
	8	8	34500	see diagrams page 2/31	27600	see diagrams page 2/31
450	2	2	13500	see diagrams page 2/31	12100	see diagrams page 2/31
	4	4	29200	see diagrams page 2/31	25500	see diagrams page 2/31
	6	6	32500	see diagrams page 2/31	31300	see diagrams page 2/31
	8	8	36100	see diagrams page 2/31	31300	see diagrams page 2/31

Please note that in the case of the IM B 6, IM B 7, IM B 8, IM V 5 and IM V 6 types of construction, the belt tension is only allowed to act parallel to or towards the mounting plane and that the feet must be braced.

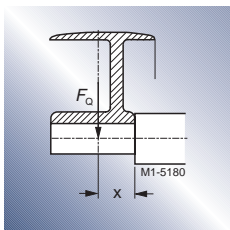
Refer to pages 2/30 and 2/31 if the cantilever forces are higher than those listed above.

Squirrel-Cage Motors

Technical Information

Maximum cantilever forces

Maximum cantilever forces, bearings for high cantilever forces



Selection of bearings for 1LA, 1MA and 1MJ motors Bearings for high cantilever forces · Order Code K20

For type 1LG8, 1MJ6 motors, frame sizes 280 to 315 and for type 1MJ8 motors on request, not available for 1MJ6 up to frame size 160

For motor Frame size	Type 1LA5 ... 1LA6 ... 1LA7 ... 1LA9 ... 1MA6 ... 1MA7 ... 1MJ6 ...	No. of poles	Drive-end bearing	
			Horizontal motors	Vertical motors
100	... 10.	all	6306 ZC3	
112	... 11.	all	6306 ZC3	
132	... 13.	all	6308 ZC3	
160	... 16.	all	6309 ZC3	
180	... 18.	all	6310 Z C3 (NU 210) ²⁾	
200	... 20.	all	6312 ZC3 (NU 212) ²⁾	
225	... 22.	all	NU 213 E ³⁾	
250	... 253	all	NU 215 E ³⁾	
280	... 28.	2 4 to 8	NU 216 E ³⁾ NU 317 E ³⁾	
315 S	... 310	2	NU 217 E ³⁾	
315 M	... 313	4 to 8	NU 319 E ³⁾	
315 L	... 316 ... 317 ... 318	2 4 to 8	NU 217 E ³⁾ NU 319 E ³⁾	– NU 319 E ¹⁾
	1LA8 ... 1MA8 ...			
315	... 31.	4 to 8	NU 320 E	on request
355	... 35.	4 to 8	NU 322 E	on request

The non-drive end bearing equals the basic design.

- 1) For 50 Hz only.
- 2) Bracketed data for 1MJ6 motors
- 3) Also deep-groove bearings of the dimension series 03 are possible (Order Code **K36**)

Noise and vibration data available on request.

Minimum cantilever force required

Maximum cantilever forces for 50 Hz for type 1LA, 1MA and 1MJ motors Bearings for high cantilever forces

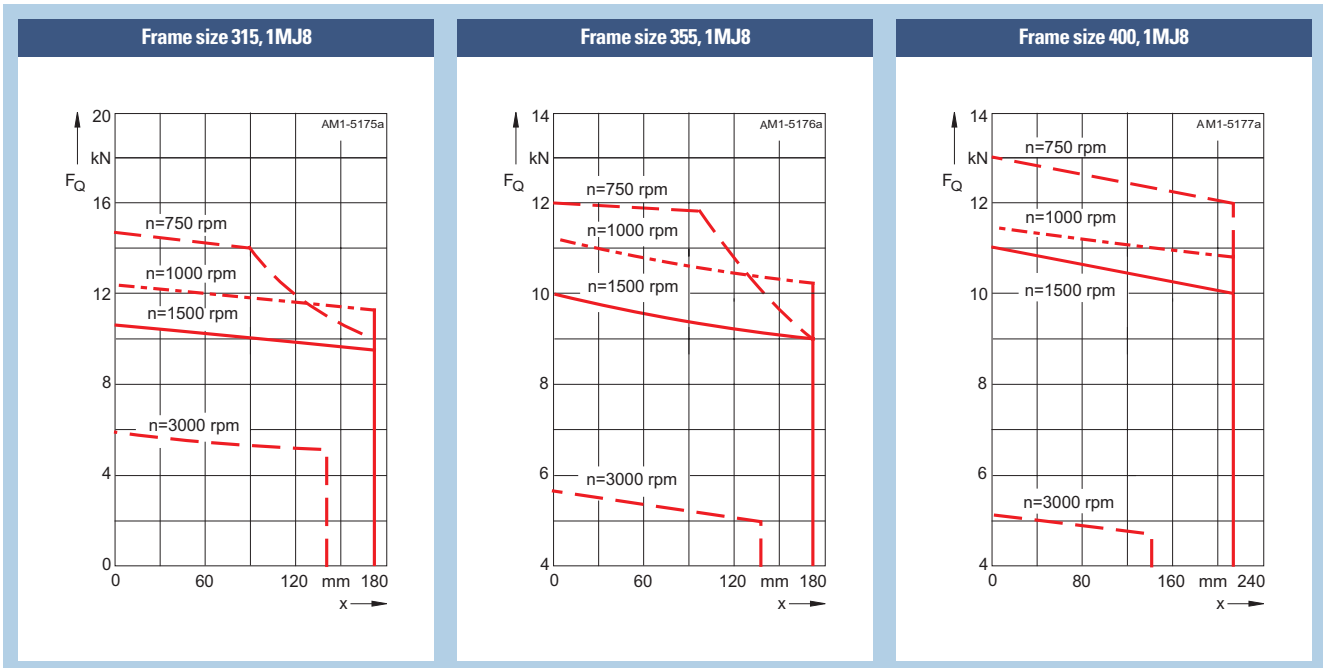
For motors Frame size	Type 1LA5 ... 1LA6 ... 1LA7 ... 1LA9 ... 1MA6 ... 1MA7 ... 1MJ6 ...	No. of poles	Max. cantilever force at F_Q	
			at x_0	at x_{max}
			N	N
100	... 10.	2	1680	1490
		4	1960	1580
		6	2140	1720
		8	2450	1950
112	... 113	2	1680	1490
		4	1960	1580
		6	2140	1720
		8	2450	1950
132	... 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

Maximum cantilever forces for 50 Hz for type 1LA, 1MA and 1MJ motors Bearings for high cantilever forces

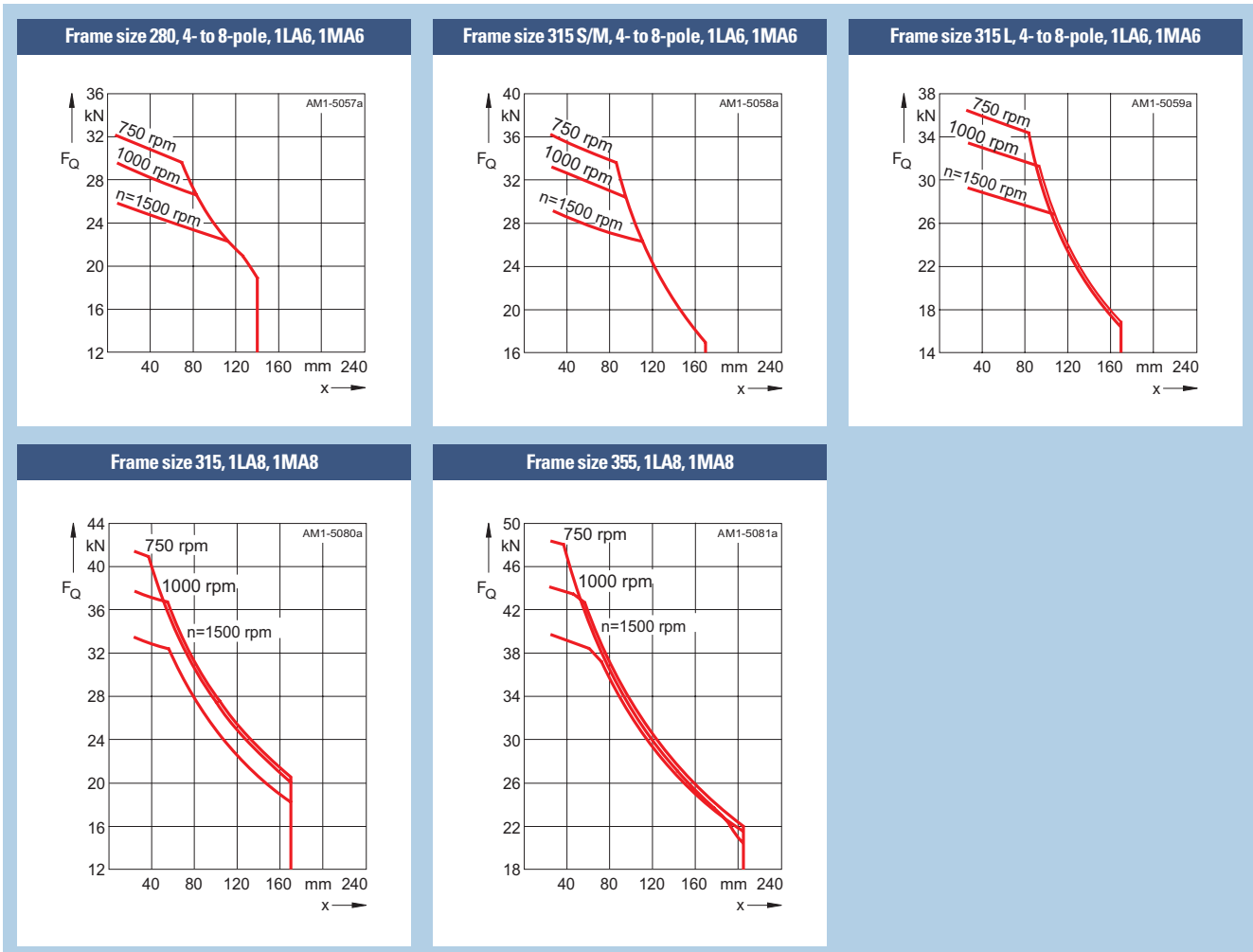
For motors Frame size	Type 1LA5 ... 1LA6 ... 1MA6 ... 1MJ6 ...	No. of poles	Max. cantilever force at F_Q	
			at x_0	at x_{max}
			N	N
225	... 22.	2	8100	6800
		4	9800	7800
		6	11200	8800
		8	12200	9700
250	... 25.	2	9600	7900
		4	11600	9600
		6	13200	10800
		8	14400	11800
280	... 28.	2	10000	8400
315 S	... 310	2	12000	10200
315 M	... 313			
315 L	... 316 ... 317	2	11800 (horizontal motors)	10200

Please note that in the case of IM B 6, IM B 7, IM B 8, IM V 5 and IM V 6 types of construction, the belt extension is only allowed to act parallel to or towards the mounting plane and that the feet must be braced.

Maximum cantilever forces at 50 Hz for type 1MJ8 motors, basic design



Maximum cantilever forces at 50 Hz for 1LA and 1MA motors, bearings for high cantilever forces



Squirrel-Cage Motors

Technical Information

Mechanical balance quality · shaft extensions

Mechanical balance quality

■ All the rotors are dynamically balanced with half keys to vibration severity grade N (standard). DIN EN 60 034-14 controls the vibration severity of the motors. This standard stipulates the "half key" type of balancing, in line with DIN ISO 8821.

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

The type of balancing is marked on the drive-end shaft extension of the motor as follows:

F = Balancing with full key

H = Balancing with half key

N = Balancing without key

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

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

Precision-balanced motors can be supplied for meeting stricter specifications regarding the mechanical balance quality (extra charge).

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

Vibration severity grade S (special) to order. (Not available with parallel roller bearing.)

The values quoted here are applicable to freely suspended motors running uncoupled and at no load, as well as to rigidly installed 1LA8 motors, frame size 450.

For further details see Catalog M 10.

■ Precision-balanced designs of pole-changing motors are available in accordance with DIN EN 60 034-14.

Remember that the measured values may deviate from the actual values by ±10 %.

Shaft extensions

60° centre hole to DIN 332, Part 2.

Drive-end shaft extension diameter mm	Thread mm
7 to 10	DR M 3
Over 10 to 13	DR M 4
Over 13 to 16	DR M 5
Over 16 to 21	DR M 6
Over 21 to 24	DR M 8
Over 24 to 30	DR M 10
Over 30 to 38	DR M 12
Over 38 to 50	DR M 16
Over 50 to 85	DR M 20
Over 85 to 130	DS M 24

Second standard shaft extension Order Code **K16** (extra charge).

The second shaft extension can transmit the full rated output via a coupling drive output up to frame size 315 M (please enquire about reduced transmitted power for frame sizes larger than 315 L). The full rated output does not apply to 1LA motors, frame sizes 90 S to 112 M. These motors can only transmit the rated output of the next lower size.

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

A second shaft extension is not available if a pulse generator and/or a separately driven fan is mounted. Please enquire if a brake is mounted.

■ The keyway and the featherkeys conform to DIN 6885. The motors are always supplied with a featherkey fitted in the shaft.

The shaft extension at the non-drive end of frame sizes 100 L to 315 M has a M8 center hole, DR form, for mounting of the pulse generator 1XP8 001 or for fitting and extraction tools.

Squirrel-Cage Motors

Technical Information

Maximum axial load

Maximum axial load on vertical type 1LA, 1MA and 1MJ motors

Frame size	With shaft extension															
	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
56	80	245	230	95	80	330	310	95	80	410	390	95	-	-	-	-
63	80	245	230	95	80	330	310	95	80	410	390	95	-	-	-	-
71	105	365	335	130	90	380	440	130	90	590	550	130	90	700	660	130
80	110	425	360	160	100	540	480	165	100	650	590	165	100	760	700	165
90	110	440	360	180	100	680	580	190	100	920	820	190	100	1150	1050	190
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140	710	550	300	130	1000	820	310	130	1290	1110	310	130	1570	1390	310
	(140)*	(1050)*	(800)*	(300)*	(130)*	(1350)*	(1100)*	(300)*	(130)*	(1720)*	(1500)*	(310)*	(130)*	(2000)*	(1850)*	(310)*
132	200	1200	950	470	180	1680	1200	470	180	1900	1600	470	190	2200	1900	440
	(1500)*	(1550)*	(1300)*	(470)*	(1500)*	(2100)*	(1600)*	(470)*	(280)*	(2400)*	(2100)*	(470)*	(290)*	(2800)*	(2400)*	(440)*
160	1500	1400	950	1900	1900	1800	1300	2200	2200	2200	1600	2700	2700	2700	1950	2900
	(2000)*	(1720)*	(1300)*	(2500)*	(2500)*	(2400)*	(1720)*	(2800)*	(2800)*	(2800)*	(2130)*	(3600)*	(3600)*	(3600)*	(2600)*	(3700)*

For 1LG8 motors

90	650	720	650	720	880	960	880	960	1100	1150	1100	1150	1200	1300	1200	1300
100	620	750	620	750	840	1000	840	1000	1100	1150	1100	1150	1150	1300	1150	1300
112	850	990	850	990	1100	1350	1100	1350	1350	1550	1350	1550	1550	1750	1550	1750
132	1200	1450	1200	1450	1650	1900	1650	1900	1900	2300	1900	2300	2200	2600	2200	2600
160	1400	1900	1400	1900	1900	2500	1900	2500	2200	3000	2200	3000	2600	3300	2600	3300

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

Maximum axial load on horizontal type 1LA, 1MA and 1MJ motors

Frame size	3000 rpm						1500 rpm						1000 rpm						750 rpm					
	Tensile load			Thrust load (N) with radial load at			Tensile load			Thrust load (N) with radial load at			Tensile load			Thrust load (N) with radial load at			Tensile load			Thrust load (N) with radial load at		
	N	X ₀	X _{max.}	without radial load	N	X ₀	X _{max.}	without radial load	N	X ₀	X _{max.}	without radial load	N	X ₀	X _{max.}	without radial load								
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	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480								
	(220)*	(850)*	(700)*	(1050)*	(220)*	(1150)*	(1000)*	(1350)*	(220)*	(1300)*	(1150)*	(1720)*	(220)*	(1450)*	(1300)*	(2000)*								
132	350	650	520	1200	350	850	700	1600	350	1020	890	1900	350	1150	1020	2200								
	(350)*	(1000)*	(900)*	(1550)*	(350)*	(1250)*	(1150)*	(2100)*	(350)*	(1500)*	(1400)*	(2400)*	(350)*	(1750)*	(1650)*	(2800)*								
160	1500	850	720	1500	1500	1050	920	1800	1500	1250	1120	2200	1500	1350	1220	2600								
	(2100)*	(1280)*	(1100)*	(2100)*	(2100)*	(1680)*	(1700)*	(2350)*	(2100)*	(2050)*	(1920)*	(2900)*	(2100)*	(2400)*	(2200)*	(3300)*								

For 1LG8 motors

90	330	560	680	910	750	910	1100	900	1100	1250	1000	1250
100	300	500	670	910	700	910	1100	850	1100	1200	1000	1200
112	670	670	900	1200	900	1200	1400	1100	1400	1600	1300	1600
132	970	970	1300	1750	1200	1750	2100	1500	2100	2400	1700	2400
160	1200	1200	1600	2100	1500	2100	2500	1800	2500	2900	2200	2900

* Bracketed values with frame sizes 112 to 160 apply to 1MJ6 motors

■ The maximum loads refer to 50 Hz operation; Please inquire about 60 Hz operation.

The figures for the maximum axial loads have been calculated assuming the maximum permitted cantilever force.

Please ask for advice if the loading direction alternates (i.e. if the side from which the load is applied changes).

Squirrel-Cage Motors

Technical Information

Maximum axial load

Maximum axial load on vertical type 1LA, 1MA and 1MJ motors

(without assuming a cantilever force on the shaft end)

For motors		With 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	
Frame size	Type	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...	1LA5... 1LA6... 1MA6... 1MJ6...	1MJ6... 1LA6... 1MA6... 1MJ6...
		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
180 M	... 183	1150	1150	1900	1900	1400	1400	2350	2350	-	-	-	-	-	-	-	-
180 L	... 186	-	-	-	-	1400	1400	2400	2400	1700	1700	2850	2850	2000	2000	3150	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	4500
225 S	... 220	-	-	-	-	2300	2300	3020	3020	-	-	-	-	3200	3200	4080	4080
225 M	... 223	1890	1890	2190	2190	2180	2180	3060	3060	2700	2700	3500	3500	3040	3040	4120	4120
250 M	... 253	1750	1750	2790	2790	2160	2160	3760	3760	2740	2740	4340	4340	2990	2990	4890	4890
280 S	... 280	380	1150	4480	3850	3830	1350	8790	4950	5340	2350	10000	5650	6280	2850	11000	6250
280 M	... 283	180	900	4580	3900	3550	1000	8910	5000	5000	2000	10100	5700	5930	2450	11100	6300
315 S	... 310	210	900	5270	4500	3700	1700	10200	6400	5150	2300	11700	7050	6520	3400	13000	7950
315 M	... 313	100	650	5350	4550	3330	1600	10400	6900	4740	2050	11700	7500	5801	2800	13000	8400
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	-
	1LA8... 1MA8...	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
315	... 315	4300	1550	11100	2210	12500	2880	14300	3000								
	... 317	3790	1830	10600	2550	11800	3360	13600	3440								
355	... 353	5320	1850	13100	3050	-	-	-	-								
	... 355	5000	2030	12700	3260	14100	4530	16300	4660								
	... 357	4240	2480	11800	3760	12900	5410	15100	5530								
400	... 403	3460	3130	15700	4140	17500	6140	20200	6380								
	... 405	2950	3430	15000	4580	16600	6720	16600	6960								
	... 407	2500	3710	14300	5070	15700	7320	18500	7570								
450	... 453	3560	3560	14400	6010	16300	8230	19300	8530								
	... 455	2900	3980	13600	6520	15400	8920	18300	9230								
	... 457	2240	4440	12800	7110	14200	9790	17200	10100								

■ The maximum loads refer to 50 Hz operation; Please inquire about 60 Hz operation.

The figures for the maximum axial loads have been calculated assuming that standard coupling types are used for the drive. See Part 8 for sources.

Please inquire about 1MJ8 motors.

Please ask for advice if the loading direction alternates.

Squirrel-Cage Motors

Technical Information

Maximum axial load · paint finish

Maximum axial load on horizontal type 1LA, 1MA and 1MJ motors										
For motors Frame size	Type 1LA5... 1LA6... 1MA6... 1MJ6...	3000 rpm		1500 rpm		1000 rpm		750 rpm		
		Loading direction		Loading direction		Loading direction		Loading direction		
		Tension	Thrust	Tension	Thrust	Tension	Thrust	Tension	Thrust	
		N	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	
	1LA8... 1MA8...	N	N	N	N	N	N	N	N	
315	... 315	2640	2640	5190	5190	6190	6190	7030	7030	
	... 317	2640	2640	5190	5190	6190	6190	7030	7030	
355	... 353	3320	3320	6590	6590	–	–	–	–	
	... 355	3320	3320	6590	6590	7870	7870	8930	8930	
	... 357	3320	3320	6590	6590	7870	7870	8930	8930	
400	... 403	3320	3320	7810	7810	9340	9340	10600	10600	
	... 405	3320	3320	7810	7810	9340	9340	10600	10600	
	... 407	3320	3320	7810	7810	9340	9340	10600	10600	
450	... 453	4310	4310	8460	8460	10100	10100	11500	11500	
	... 455	4310	4310	8460	8460	10100	10100	11500	11500	
	... 457	4310	4310	8460	8460	10100	10100	11500	11500	

* The values in brackets refer to 1MJ6 motors with frame sizes 280 S to 315 M for 1MJ6 motors.

■ The maximum loads refer to 50 Hz operation; Please inquire about 60 Hz operation.

The figures for the maximum axial loads have been calculated assuming that standard coupling types are used for the drive. See Part 9 for sources.

Please inquire about 1MJ8 motors.

Please ask for advice if the loading direction alternates.

Paint finish

■ The 1LA7, 1MA7, 1LA5 and 1MA6/1MJ6 motors up to frame size 200 L are supplied with the special paint finish as standard.

They can be painted over with any normal type of paint.

When no color is specified the motor is painted in the color RAL 7030.

Paintwork	Suitability for climate groups to DIN IEC 60 721, Part 2 – 1	
Standard finish	Moderate (extended) for indoors and outdoors	Short per.: up to 120 °C Contin.: up to 100 °C
Special finish	Worldwide (global) for outdoors	Short per.: 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

Squirrel-Cage Motors

Technical Information

Modular technology

Modular Technology for 1LA motors

Description

The range of potential applications can be broadened considerably in combination with the following built-on accessories (e.g. the motors can be used as brake motors).

- with pulse generator 1XP8 001, frame sizes 100 L to 315 L
- with separately driven fan 2CW2, frame sizes 100 L to 225 M
- with brake 2LM8, frame sizes 63 to 225 M

The brake must always be mounted in the factory for safety reasons.

The pulse generator and/or the separately driven fan can also be retrofitted.

The degree of protection for motors with built-on accessories is IP 55.

Pulse generator 1XP8 001

The pulse generator can be supplied already mounted in an HTL version as 1XP8 001-1 (Order Code **H57**) or in a TTL version as 1XP8 001-2 (Order Code **H58**).

It can also be ordered and fitted separately (Order No. **1XP8 001-1** or **1XP8 001-2**, part 8). All 1LA5 and 1LA7 motors with frame sizes from 100 L to 315 L that are listed in this catalog are prepared for fitting a pulse generator on the non-drive end.

The pulse generator can only be fitted on a standard non-drive end, i.e. a second shaft extension or a canopy can no longer be supplied.

Technical data of pulse generators

Supply voltage U_B	1XP8 001-1 (HTL version) +10 V to +30 V	1XP8 001-2 (TTL version) 5 V \pm 10 %
Current input without load	200 mA	150 mA
Maximum load current per output	max. 100 mA	
Pulses per revolution	1024	
Outputs	2 square-wave pulses A, B - 2 inverted square-wave pulses \bar{A} , \bar{B} Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	90° \pm 20 %	
Output amplitude	$U_{\text{high}} > U_B - 3.5 \text{ V}$ $U_{\text{low}} < 3 \text{ V}$	$U_{\text{high}} \geq 2.5 \text{ V}$ $U_{\text{low}} \leq 0.5 \text{ V}$
Minimum edge interval	0.8 μs at 160 kHz	0.45 μs at 300 kHz
Edge steepness (without load or cable)	$t_r, t_f \leq 200 \text{ ns}$	$t_r, t_f \leq 100 \text{ ns}$
Maximum frequency	160 kHz	300 kHz
Maximum speed	9000 rpm	12000 rpm
Temperature range	-20 °C to +100 °C	
Degree of protection	IP 66	
Maximum radial cantilever force	60 N	
Maximum axial force	40 N	
Termination system	12-way plug (socket supplied)	

Separately driven fan 2CW2

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. In both cases, this refers to converter-fed operation only. Please enquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted. Order Code **G17**.

It can also be ordered and fitted separately (see Accessories, part 8, for selection information and order numbers).

The separately driven fan has a rating plate with all important data. Please note the fan's direction of rotating when connecting up.

Technical data of the separately driven fan

Frame size	Rated voltage range	Frequency	Rated speed	Rated output	Rated current
	V	Hz	rpm	kW	A
100 L	200 to 290 Δ	50	2680	0.062	0.24
	346 to 500 Υ	50	2680	0.062	0.14
	200 to 290 Δ	60	3000	0.052	0.16
	346 to 500 Υ	60	3000	0.052	0.09
112 M	200 to 290 Δ	50	2760	0.097	0.43
	346 to 500 Υ	50	2760	0.097	0.25
	200 to 290 Δ	60	3120	0.098	0.29
	346 to 500 Υ	60	3120	0.098	0.17
132 S/M	200 to 290 Δ	50	2690	0.164	0.59
	346 to 500 Υ	50	2690	0.164	0.34
	200 to 290 Δ	60	2960	0.212	0.52
	346 to 500 Υ	60	2960	0.212	0.30
160 M to 225 M	200 to 290 Δ	50	2690	0.269	0.95
	346 to 500 Υ	50	2690	0.269	0.55
	200 to 290 Δ	60	2980	0.354	0.84
	346 to 500 Υ	60	2980	0.354	0.48

Further mounting parts for 1LA motors (not in combination with modular technology)

Other pulse generators for frame sizes 100 to 450¹⁾

HOG9 D 1024 I pulse generator

- The HOG9 D 1024 I pulse generator can be supplied already fitted. Order Code **H72**.
- The HOG9 pulse generator can be provided by the customer and fitted by Siemens. Order Code **H74**.
- The HOG9 pulse generator can also be fitted separately. The motor must be prepared for this purpose. Order Code **H79** must be specified in the order. The pulse generator is not part of the scope of supply.

HOG10 D 1024 I pulse generator

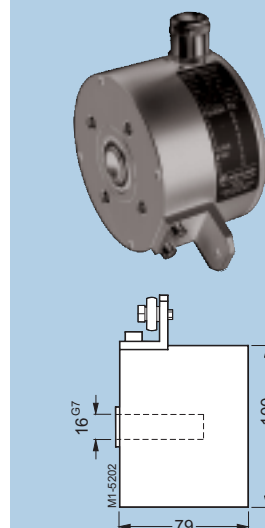
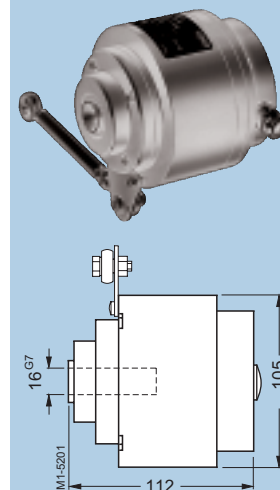
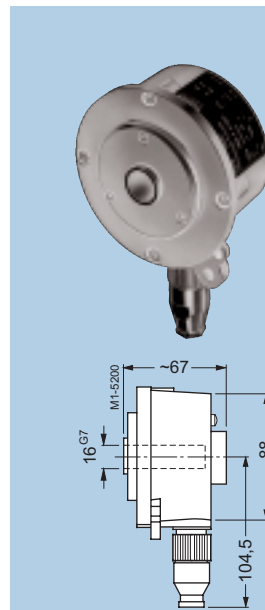
This generator is very robust and therefore suitable for service in harsh environments.

- The HOG10 D 1024 pulse generator can be supplied already fitted. Order Code **H73**.
- The HOG10 pulse generator can be supplied by the customer and fitted by Siemens. Order Code **H75**.
- The HOG10 pulse generator can also be fitted separately. The motor must be prepared for this purpose. Order Code **H80** must be specified in the order. The pulse generator is not part of the scope of supply.

XH 860 900 220 rotary pulse generator

This generator is very robust and therefore suitable for service in harsh environments. It is shock-free and vibration-proof.

- The XH 860 900 220 rotary pulse generator can be supplied already fitted. Order code **H70**.
- The XH 860 900 220 pulse generator can be provided by the customer and installed by Siemens. Order code **H71**.
- The XH 860 900 220 pulse generator can also be fitted separately. The motor must be prepared for this purpose. Order Code **H78** must be specified. The pulse generator is not part of the scope of supply.



Technical data

Supply voltage U_B	+9 V to +30 V
Current input without load	50 to 100 mA
Maximum load current per output	60 mA
Pulses per revolution	1024
Outputs	4 short-circuit-proof squ.-wave pulses A, B and A, B
Pulse offset between the two outputs	90° ± 20 %
Output amplitude	$U_{high} \geq U_B - 3.5 V$ $U_{low} \leq 1.5 V$
Pulse duty factor	1 : 1 ± 20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 °C to +100 °C
Degree of protection	IP 55
Maximum radial cantilever force	150 N
Maximum axial force	100 N
Termination system	Radial right-angle connector
Mech. design acc. to Ident. No.	73 522 B

Supply voltage U_B	+9 V to +26 V
Current input without load	Approx. 90 mA
Maximum load current per output	60 mA
Pulses per revolution	1024
Outputs	4 short-circuit-proof squ.-wave pulses A, B and A, B
Pulse offset between the two outputs	90° ± 20 %
Output amplitude	$U_{high} \geq U_B - 3.5 V$ $U_{low} \leq 1.5 V$
Pulse duty factor	1 : 1 ± 20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	4000 rpm
Temperature range	-20 °C to +85 °C
Degree of protection	IP 66
Maximum radial cantilever force	50 N
Maximum axial force	80 N
Termination system	Terminals, Pg 9 cable connection
Mech. design acc. to Ident. No.	74 055 B

Supply voltage U_B	+9 V to +30V
Current input without load	90 mA
Maximum load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit-proof squ.-wave pulses A, A', B, B', 0, 0'
Pulse offset between the two outputs	90° ± 25° el.
Output amplitude	$U_{high} > 20 V$ $U_{low} < 2.5 V$
Pulse duty factor	1 : 1 ± 10 %
Edge steepness	50 V/μs (without load)
Maximum frequency	100 kHz with 350 m cable
Maximum speed	3500 rpm
Temperature range	-20 °C to +80 °C
Degree of protection	IP 65
Maximum permissible radial cantilever force	300 N
Maximum permissible axial force	100 N
Termination system	Terminals in generator Pg 9 radial cable connection

1) Please inquire for 1LA9 motors.

Squirrel-Cage Motors

Technical Information

Modular technology

Modular technology for 1LA motors, frame sizes 63 to 225 M

2LM8 spring-operated disk brake

Design and mode of operation

The brake takes the form of a single-disk brake with two friction faces.

The braking torque is generated by friction when pressure is applied by one or more compression springs to the de-energized brake. 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 opp. frictional surfaces by means of the springs. When the brake is applied, there is an air gap S_{Lu} between the armature disk and the solenoid comp. The solenoid coil is energized with DC voltage in order to release the brake. The resulting mag. force pulls the armature disk towards the solenoid comp. against the spring force. The spring force is then no longer applied to the rotor, so that the latter is able to rotate freely.

Voltage and frequency

The solenoid coils and rectifier of the 2LM8 brake 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 %.

- 1 Armature disk
- 2 Compression springs
- 3 Axially sliding rotor
- 4 Hub
- 5 Shaft
- 6 Opposing frictional surface
- 7 Solenoid component

Connection

The motors are connected in the same way as the 1LA motors.

The terminal boxes contain six terminals. The terminals of the rectifier or those on the terminal strip (24 V version) can be used for the brake.

The AC voltage for the excitation winding of the brake is connected to the two free terminals of the rectifier block (~).

The brake can be released when the motor is stationary by separately energizing the solenoid. In this case, AC voltage must be connected to the terminals of the rectifier block. The brake remains released as long as this voltage is present.

The rectifiers are protected against overvoltages by means of varistors at the input and output.

The terminals of the brakes for 24 V DC voltage are connected to the DC voltage source directly.

Fast brake application

The brake is applied when it is isolated from the supply. The application time of the brake disk is delayed by the solenoid coil inductance (disconnected on the AC side). This involves a significant delay. For short brake application times, the brake must be disconnected on the DC side. A spark suppressor must be connected in parallel to the coil and contacts to protect them when they are disconnected on the DC side.

Mechanical manual release

The brakes can be supplied with a mechanical manual release using an actuator lever. Order Code **K82**.

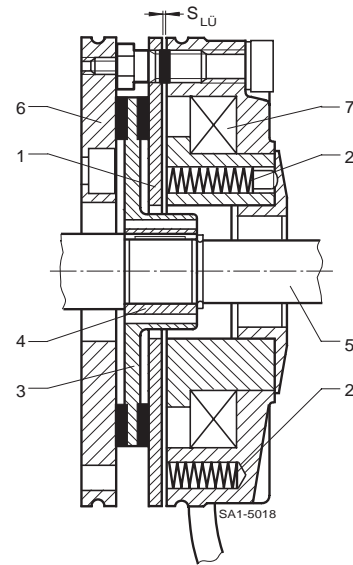
The brake can also be supplied for 24 V DC excitation. Order Code **C00**.

Rating plate

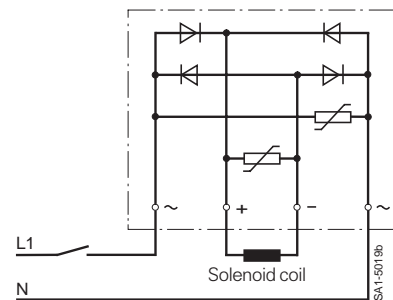
The motors have a second rating plate with the brake data on the opposite side of the motor.

Inquiry is necessary if brake motors are operated with ambient temperatures below zero.

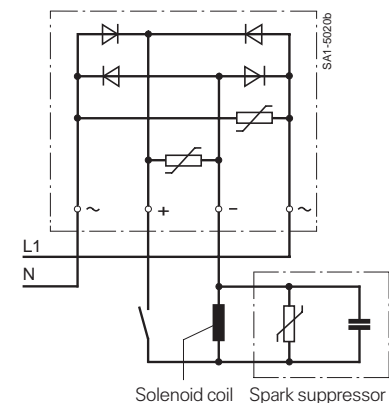
Design of the brake



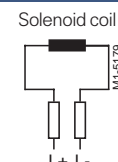
AC side switch (230 V AC)



DC side switch (230 V DC)



Brake connection with 24 V DC voltage



It is not permissible to increase the brake voltage!

Modular technology for 1LA motors, frame sizes 63 to 225 M (continued)

Explanations											
For motors Frame size	Performance of spring-operated brakes with standard excitation Brake type	Rated brake torque at 100 rpm	Power input		Brake application time ¹⁾	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Brake rating		
			A	W					Lifetime of brake lining L	Air gap adjustment required after braking energy L_N	
		Nm			ms	ms	kg m ²	dB (A)	Nm x 10 ⁶	Nm x 10 ⁶	
63	2LM8 005-1NA10	5	0.1	20	17	35	0.000013	77	105	16	
71	2LM8 005-2NA10	5	0.1	20	17	35	0.000013	77	105	16	
80	2LM8 010-3NA10	10	0.12	25	20	50	0.000045	74	270	29	
90	2LM8 020-4NA10	20	0.15	30	30	90	0.00016	75	740	79	
100	2LM8 040-5NA10	40	0.2	40	40	120	0.00036	80	1350	115	
112	2LM8 060-6NA10	60	0.25	50	65	150	0.00063	77	1600	215	
132	2LM8 100-7NA10	100	0.27	55	90	180	0.0015	75	2450	325	
160	2LM8 240-8NA10	240	0.5	100	200	400	0.0073	79	7300	935	
180	2LM8 300-0NA10	300	0.5	100	200	400	0.0073	79	5500	470	
200, 225	2LM8 400-0NA10	400	0.55	110	270	500	0.0200	93	9450	1260	

1) The specified switching times are valid for switching on the DC side with a nom. release travel and with the coil already warm. They are average values which may vary among other things according to the rectifier type and the release travel. The brake application time for switching on the AC side, for example, is approx. 6 times longer than for switching on the DC side.

2

Lifetime of the brake lining

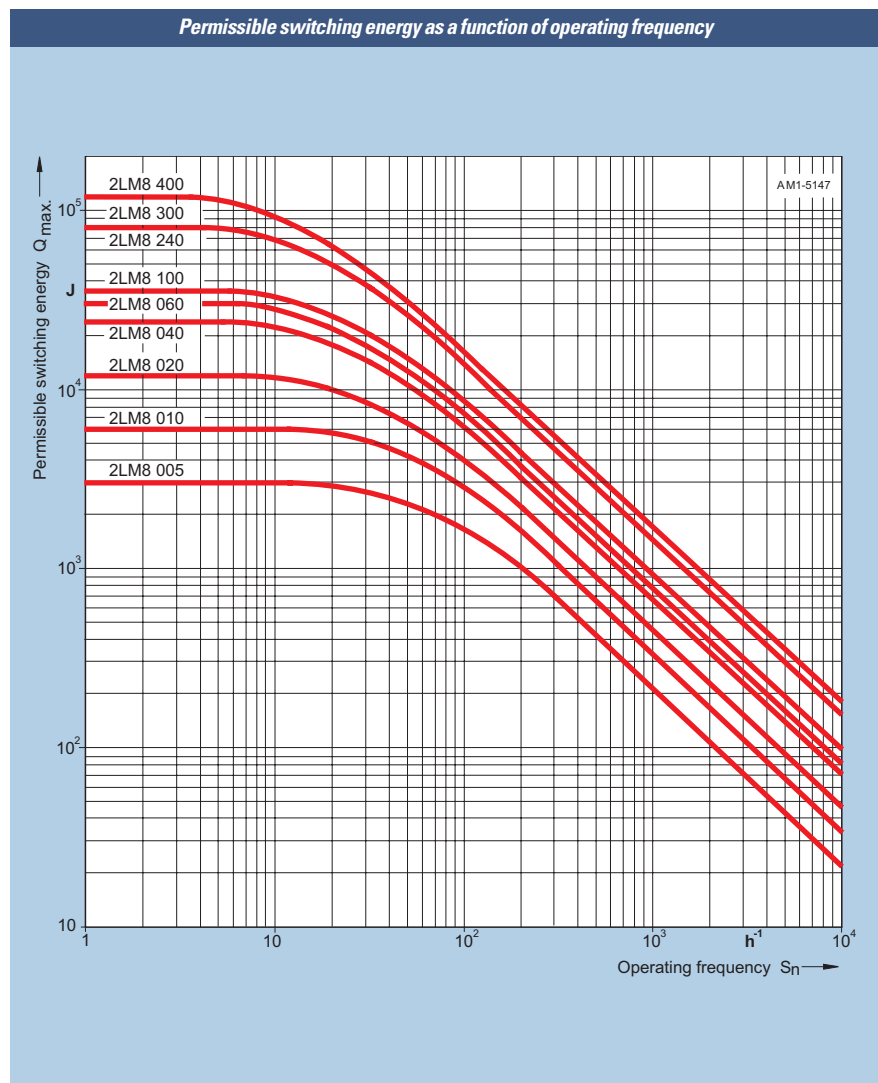
The braking energy L_N until the brake needs to be adjusted depends on various factors, and particularly on the masses that are braked, the operating speed, the operating frequency and thus the temperature on the friction faces. It is therefore not possible to specify a value for the friction energy until readjustment that is valid for all operating conditions.

The specific wear on the friction faces (volume of wear per unit of friction energy) is approximately 0.05 to 2 cm³/kWh when the brake is used as a service brake.

Maximum speeds

Please refer to the table on page 2/40 for the maximum speeds at which an emergency stop is permissible. These speeds should be considered as recommended values and confirmed by testing under actual operating conditions.

The maximum permitted braking energy depends on the operating frequency and is shown for the various brakes on the graph opposite ("Permissible switching energy as a function of operating frequency"). Greater wear occurs during emergency braking.



Squirrel-Cage Motors

Technical Information

Modular technology

Modular technology for 1LA motors, frame sizes 63 to 225 M (continued)

Explanations										
For motors Frame size	Brake type	Max. rpm Max. operating rpm if max. switching energy utilized	Max. no-load rpm with emergency stop function		Change in braking torque			Readjustment of air gap		
			Horizontal mounting rpm	Vertical mounting rpm	Reduction per notch Nm	Dim. "o ₁ " mm	Min. braking torque Nm	Rated air gap s _{LüNenn} mm	Max. air gap s _{Lümax.} mm	Min. rotor thickness h _{min.} mm
63	2LM8 005-1NA10	3000	6000	6000	0.19	4.5	4.4	0.2	0.4	4.3
71	2LM8 005-2NA10	3000	6000	6000	0.19	4.5	4.4	0.2	0.4	4.3
80	2LM8 010-3NA10	3000	6000	6000	0.36	4.5	8.5	0.2	0.4	5.3
90	2LM8 020-4NA10	3000	6000	6000	0.6	7.5	19	0.2	0.5	7.3
100	2LM8 040-5NA10	3000	6000	6000	1.2	9.5	22	0.3	0.5	6.0
112	2LM8 060-6NA10	3000	6000	6000	1.5	11.0	40	0.3	0.8	6.0
132	2LM8 100-7NA10	3000	5300	5000	2.1	10.0	40	0.3	0.8	7.0
160	2LM8 240-8NA10	1500	4400	3200	3.0	15.0	150	0.4	1.2	9.6
180	2LM8 300-0NA10	1500	4400	3200	3.0	17.0	184	0.4	0.8	9.6
200, 225	2LM8 400-0NA10	1500	3000	3000	4.7	19.5	290	0.5	1.4	12.5

2

Changing the braking torque

The brake is supplied with a preset torque. It is possible to reduce this torque to the dimension o_1 by unscrewing the adjusting ring with a hook spanner.

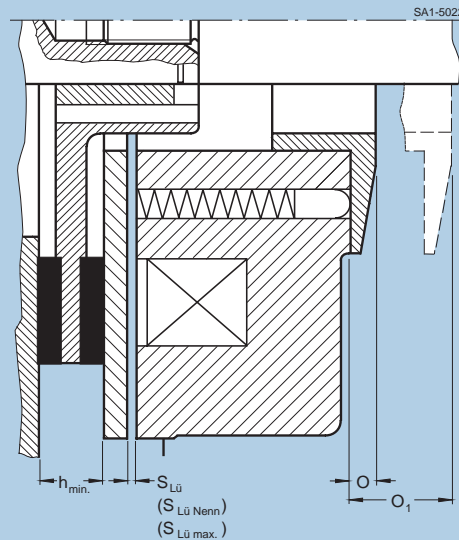
The braking torque changes by the values shown in the above table for each notch of the adjusting ring.

Readjusting the air gap

Under normal operating conditions, the brake is practically maintenance-free.

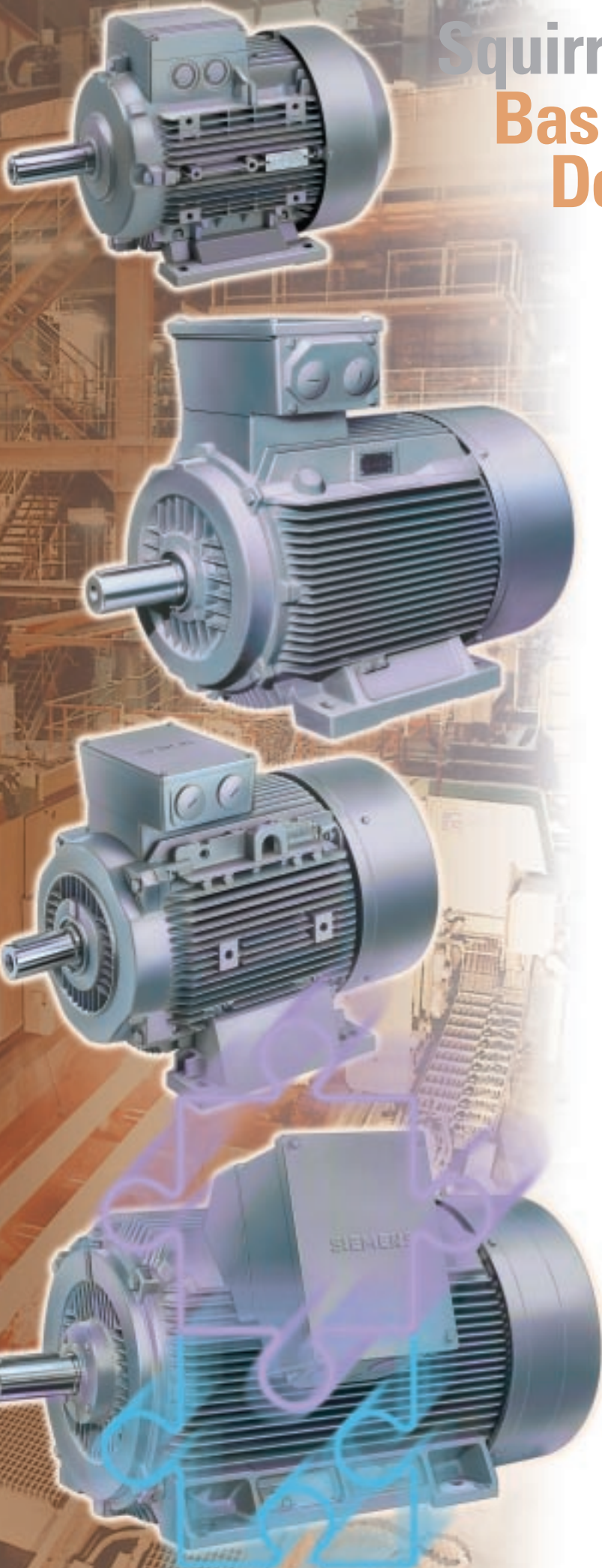
The air gap $s_{Lü}$ must be checked at regular intervals if the application requires a very large amount of friction energy, and readjusted to the rated gap $s_{LüNenn}$ at the latest when the maximum air gap $s_{Lümax.}$ is reached.

Readjusting the air gap



Squirrel-Cage Motors

Basic Design



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Aluminum enclosure

Energy-saving motor to CEMEP
"Improved Efficiency" eff2
"High Efficiency" eff1
Energy-saving motor to EPACT
With increased output
Pole-changing

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3/16
3/17
3/18

Cast-iron enclosure

Energy-saving motor to CEMEP
"Improved Efficiency" eff2
"High Efficiency" eff1
Energy-saving motor to EPACT
Pole-changing

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Motors for converter-fed operation

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Motors for duty at

SIMOVERT® MASTERDRIVES

with standard insulation for ≤ 500 V
with special insulation for 690 V

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Special designs

1LA5 to 1LA8 motors

Frame sizes	56 to 450
Output range	0.06 to 1000 kW
Class F	Utilization acc. to B
Suitable for con- verter-fed operation	Voltage front times $t_s > 0.1 \mu s$ at $U \leq 500$ V

Ex-stock designs permanently available.
See M 11 Price List for selection information.

Energy saving motors to CEMEP

Number of poles: 2 and 4
Output range 1.1 to 90 kW
Eff1 High Efficiency
Eff2 Improved Efficiency
Efficiency acc. to IEC 60 034-2

The motors are stamped on the rating plate and on the packing. Efficiency at $\frac{3}{4}$ and $\frac{4}{4}$ loads is recorded. Only licensed manufacturers are allowed to stamp. Considerable savings in energy have become reality with the optimized motor series.

Energy-saving motors to EPACT

Number of poles 2, 4 and 6
Output range 1 to 200 HP
Minimum efficiencies laid down by U.S. laws.
Efficiency according to IEEE 112b

The nominal efficiency and NEMA MG-1 is stamped on the rating plate.

Squirrel-Cage Motors

Basic design · Cast-iron enclosure

Energy-saving motor to CEMEP "Improved Efficiency,"
degree of protection IP 55, temperature class F, 2-pole, 50 Hz



Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Efficiency class	Performance at rated output					Lo.-rotor torque	Lo.-rotor current	Breakdown torque	Torque class	Moment of inertia J	Weight		
				Rated speed rpm	Efficiency η at 4/4- 3/4-load	Power factor p.f.	Rated current at 400 V A	Rated torque Nm							Type of constr. IM B 3 approx. kg	
3000 rpm, 2-pole, 50 Hz																
1.5	90 S	1LG8 090-2AA ..	2	2830	78.5	77	0.87	3.4	5.1	2.4	5.4	2.6	16	9	0.0015	20
2.2	90 L	1LG8 096-2AA ..	2	2850	82	80	0.86	4.7	7.4	2.6	5.6	2.7	16	9	0.0019	22
3	100 L	1LG8 106-2AA ..	2	2880	84.2	83	0.88	6	10	2.6	6.9	3.0	16	9	0.004	35
4	112 M	1LG8 113-2AA ..	2	2880	85.5	84	0.91	7.5	13	2.8	7.2	3.4	16	9	0.006	38
5.5	132 S	1LG8 130-2AA ..	2	2900	86.5	85	0.87	11	18	3.0	6.6	3.2	16	9	0.012	53
7.5	132 S	1LG8 131-2AA ..	2	2910	88	87	0.87	14.5	25	3.2	7.5	3.3	16	9	0.014	56
11	160 M	1LG8 163-2AA ..	2	2920	88.5	88.2	0.87	21	36	2.6	6.2	2.9	16	9	0.036	104
15	160 M	1LG8 164-2AA ..	2	2920	90	89.5	0.88	28	49	2.6	6.0	2.9	16	9	0.042	106
18.5	160 L	1LG8 166-2AA ..	2	2920	91	90	0.89	34	61	2.9	6.4	3.2	16	9	0.057	130
22	180 M	1LA6 183-2AA ..	2	2940	91.7	91.7	0.88	39 ¹⁾	71	2.5	6.9	2.8	16	3	0.077	165
30	200 L	1LA6 206-2AA ..	2	2945	92.3	92.3	0.89	53	97	2.4	7.2	2.8	16	3	0.14	230
37	200 L	1LA6 207-2AA ..	2	2945	92.8	92.8	0.89	65 ¹⁾	120	2.4	7.7	2.8	16	3	0.16	250
45	225 M	1LA6 223-2AB ..	2	2955	93.4	93.4	0.90	77 ¹⁾	145	2.3	6.9	2.7	13	14	0.24	310
55	250 M	1LA6 253-2AB ..	2	2965	93.5	93.5	0.91	93	177	2.1	6.9	2.8	13	14	0.45	415
75	280 S	1LA6 280-2AC ..	2	2975	94.3	94.2	0.90	128	241	1.9	7.0	2.7	10	23	0.79	570
90	280 M	1LA6 283-2AC ..	2	2975	94.7	94.4	0.91	150	289	2.0	7.0	2.7	10	23	0.92	610
110	315 S	1LA6 310-2AC ..	2	2980	94.8	94.4	0.90	186	353	1.8	7.0	2.8	10	23	1.3	790
132	315 M	1LA6 313-2AC ..	2	2980	95.1	94.8	0.90	225	423	1.9	7.0	2.8	10	23	1.5	850
160	315 L	1LA6 316-2AC ..	2	2980	95.5	95.1	0.91	265	513	1.8	7.0	2.8	10	23	1.8	990
200	315 L	1LA6 317-2AC ..	2	2980	96.0	95.7	0.92	325	641	1.9	7.0	2.8	10	23	2.3	1100
250	315	1LA8 315-2AC ..	2	2979	96.2	96.2	0.90	415	801	1.8	7.0	2.8	10	24	2.7	1300
315	315	1LA8 317-2AC ..	2	2979	96.6	96.6	0.91	520	1010	1.8	7.0	2.8	10	24	3.3	1500
355	355	1LA8 353-2AC ..	2	2980	96.6	96.6	0.90	590	1140	1.7	6.5	2.5	10	25	4.8	1900
400	355	1LA8 355-2AC ..	2	2980	96.7	96.7	0.91	660	1280	1.7	6.5	2.5	10	25	5.3	2000
500	355	1LA8 357-2AC ..	2	2982	97.1	97.1	0.91	820	1600	1.8	6.5	2.6	10	25	6.4	2200
560	400	1LA8 403-2AC ..	2	2985	97.1	97.1	0.91	910	1790	1.6	7.0	2.8	10	25	8.6	2800
630	400	1LA8 405-2AC ..	2	2985	97.1	97.1	0.91	1020	2020	1.6	7.0	2.8	10	25	9.6	3000
710	400	1LA8 407-2AC ..	2	2985	97.3	97.3	0.91	670	2270	1.7	7.0	2.8	10	25	11	3200
800	450	1LA8 453-2AE ..	2	2986	97.2	97.2	0.91	760	2560	0.9	7.0	3.0	5	29	19	4000
900	450	1LA8 455-2AE ..	2	2986	97.3	97.3	0.92	840	2880	0.9	7.0	2.8	5	29	21	4200
1000	450	1LA8 457-2AE ..	2	2986	97.4	97.4	0.93	920	3200	0.9	7.0	2.7	5	29	23	4400

• With axial-driven fan for clockwise rotation. ◆ Rated current at 690 V.

Order No. suffixes

Motor type	Penultimate position: Voltage code								Last position: Type of construction code						
	50 Hz				60 Hz				IM B 3 (extra charge)						
	230 VΔ / 400 VΔ / 500 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ	690 VΔ	460 VΥ	460 VΔ		IM B 3	IM B 5	IM V 1 without canopy	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1LG8 090 to 1LG8 096	1	6	3	-	-	1	6	0	1	1	4	2	3	6	
1LG8 106 to 1LG8 166	1	6	3	5	-	1	6	0	1	1	4	2	3	6	
1LA6 183 to 1LA6 207	1	6	3	5	-	1	6	0	1	1	4	-	-	6	
1LA6 223 to 1LA6 313	1	6	3	5	-	-	6	0	1	1	4	-	-	6	
1LA6 316 and 1LA6 317	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6	
1LA8 315 to 1LA8 405	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6	
1LA8 407 to 1LA8 457	-	-	-	5	0	-	on request	0	-	8	4	-	-	6	

Voltage code „9“ for other voltages and frequencies.

Order numbers must be specified in this case (see page 2/5).

Please refer to pages 2/22 and 2/23 for types of construction.

Possible 2-pole motors see page 2/7.

Voltage	1LA6										1LA8												
	183	206	207	223	253	280	283	310	313	316	317	315	317	353	355	357	403	405	407	453	455	457	
230 V	■			■	■																		
400 V														■	■	■	■	■	■				
500 V																				■	■	■	■
690 V																						■	■



Squirrel-Cage Motors

Basic design · Cast-iron enclosure

Energy-saving motor to CEMEP "Improved Efficiency" eff2, degree of protection IP 55, temperature class F, 4-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Efficiency class	Performance at rated output					Lo.-rotor torque	Lo.-rotor current	Breakdown torque	Torque class	Torque characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight	
				Rated speed rpm	Efficiency η at 4/4-load	Power factor p.f.	Rated current at 400 V A	Rated torque Nm								Type of constr. IM B 3 approx. kg
1500 rpm, 4-pole, 50 Hz																
1.1	90 S	1LG8 090-4AB ..	2	1410	77	77	0.82	2.6	7.5	2.0	5.0	2.2	13	12	0.0024	20
1.5	90 L	1LG8 096-4AB ..	2	1415	79	80	0.82	3.5	10	2.3	5.0	2.5	13		0.003	22
2.2	100 L	1LG8 106-4AA ..	2	1400	81	81	0.83	5	15	2.4	5.3	2.7	16	9	0.0045	35
3		1LG8 107-4AA ..	2	1410	82.5	82.5	0.80	7	20	2.5	5.5	2.8	16		0.0055	38
4	112 M	1LG8 113-4AA ..	2	1415	84	84	0.85	8.3	27	2.2	5.9	2.6	16	9	0.012	41
5.5	132 S	1LG8 130-4AA ..	2	1440	87	87.5	0.84	11	37	2.3	6.4	2.7	16	9	0.021	59
7.5	132 M	1LG8 133-4AA ..	2	1445	88	88	0.84	15	50	2.6	7.0	3.1	16		0.028	69
11	160 M	1LG8 163-4AA ..	2	1460	90	90	0.86	21.5	73	2.5	6.1	2.4	16	9	0.065	108
15	160 L	1LG8 166-4AB ..	2	1450	90.5	90.8	0.83	29	99	2.4	6.0	2.2	13	12	0.09	130
18.5	180 M	1LA6 183-4AA ..	2	1460	90.5	90.5	0.84	35	121	2.3	7.5	3.0	16	3	0.13	165
22	180 L	1LA6 186-4AA ..	2	1460	91.2	91.2	0.86	41	144	2.3	7.5	3.0	16		0.15	180
30	200 L	1LA6 207-4AA ..	2	1465	91.8	91.8	0.86	55	196	2.6	7.0	3.2	16	3	0.24	240
37	225 S	1LA6 220-4AA ..	2	1475	92.9	93.1	0.86	67	240	2.5	7.0	3.1	16	3	0.44	300
45	225 M	1LA6 223-4AA ..	2	1475	93.4	93.6	0.87	80	292	2.6	7.0	3.2	16		0.52	330
55	250 M	1LA6 253-4AA ..	2	1480	93.8	94.0	0.87	97	355	2.6	6.7	2.5	16	4	0.79	435
75	280 S	1LA6 280-4AA ..	2	1485	94.3	94.3	0.86	134	482	2.5	6.7	2.7	16	4	1.4	610
90	280 M	1LA6 283-4AA ..	2	1485	94.6	94.7	0.86	160	579	2.5	6.8	2.8	16		1.6	660
110	315 S	1LA6 310-4AA ..		1486	94.8	94.7	0.86	194	707	2.5	6.7	2.7	16	4	2.2	830
132	315 M	1LA6 313-4AA ..		1486	95.5	95.4	0.86	232	848	2.7	7.2	3.0	16		2.7	910
160	315 L	1LA6 316-4AA ..		1486	95.6	95.6	0.87	275	1030	2.6	7.0	2.6	16		3.2	1060
200	315 L	1LA6 317-4AA ..		1488	96.2	96.1	0.87	345	1280	2.7	7.0	2.7	16		4.2	1200
250	315	1LA8 315-4AB ..		1488	96.0	96.0	0.88	425	1600	1.9	6.5	2.8	13	18	3.6	1300
315		1LA8 317-4AB ..		1488	96.3	96.3	0.88	540	2020	2.0	6.8	2.8	13		4.4	1500
355	355	1LA8 353-4AB ..		1488	96.3	96.3	0.87	610	2280	2.1	6.5	2.6	13	18	6.1	1900
400		1LA8 355-4AB ..		1488	96.4	96.4	0.87	690	2570	2.1	6.5	2.6	13		6.8	2000
500		1LA8 357-4AB ..		1488	96.8	96.8	0.88	850	3210	2.1	6.5	2.4	13		8.5	2200
560	400	1LA8 403-4AB ..		1492	96.8	96.8	0.88	950	3580	1.9	6.5	2.7	13	26	13	2800
630		1LA8 405-4AB ..		1492	97.0	97.0	0.88	1060	4030	1.9	6.8	2.7	13		14	3000
710		1LA8 407-4AB ..		1492	97.0	97.0	0.89	690	4540	1.9	6.8	2.7	13		16	3200
800	450	1LA8 453-4AC ..		1492	97.0	97.0	0.88	780	5120	1.6	7.0	2.6	10	26	23	4000
900		1LA8 455-4AC ..		1492	97.1	97.1	0.88	880	5760	1.6	7.0	2.6	10		26	4200
1000		1LA8 457-4AC ..		1492	97.1	97.1	0.89	970	6400	1.7	7.0	2.6	10		28	4400

◆ Rated current at 690 V.

Order No. suffixes

Motor type	Penultimate position: Voltage code								Last position: Type of construction code					
	50 Hz				60 Hz				IM B 3 (extra charge)					
	230 VΔ / 400 VY	400 VΔ / 690 VY	500 VY	500 VΔ	690 VΔ	460 VY	460 VΔ	IM B 3	IM B 5	IM V 1 without canopy	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1LG8 090 to 1LG8 096	1	6	3	-	-	1	6	0	1	1	4	2	3	6
1LG8 106 to 1LG8 166	1	6	3	5	-	1	6	0	1	1	4	2	3	6
1LA6 183 to 1LA6 207	1	6	3	5	-	1	6	0	1	1	4	-	-	6
1LA6 220 to 1LA6 313	1	6	3	5	-	-	6	0	1	1	4	-	-	6
1LA6 316 and 1LA6 317	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6
1LA8 315 to 1LA8 405	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6
1LA8 407 to 1LA8 457	-	-	-	5	0	-	on request	0	-	8	4	-	-	6

Voltage code „9“ for other voltages and frequencies.

Order numbers must be specified in this case (see page 2/5).

Please refer to pages 2/22 and 2/23 for types of construction.

Voltage	1LA6										1LA8													
	183	186	207	220	223	253	280	283	310	313	316	317	315	317	353	355	357	403	405	407	453	455	457	
230 V	■	■		■	■			■		■														
400 V													■	■	■	■	■	■	■					
500 V															■	■			■	■	■	■	■	■
690 V																							■	■

Squirrel-Cage Motors

Basic design · Cast-iron enclosure

Degree of protection IP 55, temperature class F, 6-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.-rotor current	Breakdown torque	Torque class CL	Moment of inertia J kg m ²	Weight kg	
			Rated speed rpm	Efficiency η %	Power factor p.f.	Rated current at 400 V A	Rated torque Nm							
1000 rpm, 6-pole, 50 Hz														
0.75	90 S	1LG8 090-6AD ..	890	68.3	0.75	2.2	8	1.6	3.1	1.9	7	15	0.0025	20
1.1	90 L	1LG8 096-6AB ..	910	69.8	0.72	3.2	12	2.0	3.5	2.3	13	12	0.0036	22
1.5	100 L	1LG8 106-6AB ..	940	76.4	0.70	4.3	15	2.2	4.1	2.5	13	12	0.0086	35
2.2	112 M	1LG8 113-6AD ..	945	80	0.75	5.5	22	1.8	4.5	2.0	7	15	0.014	38
3	132 S	1LG8 130-6AA ..	960	85.3	0.80	6.5	30	2.6	5.8	2.6	16	9	0.03	59
4	132 M	1LG8 133-6AB ..	955	85	0.80	8.8	40	2.2	5.5	2.6	13	12	0.03	67
5.5	132 M	1LG8 134-6AA ..	955	85	0.80	11.8	55	2.5	6.0	2.6	16	9	0.04	72
7.5	160 M	1LG8 163-6AA ..	965	87.9	0.82	15.3	74	2.5	6.5	2.8	16	9	0.10	108
11	160 L	1LG8 166-6AB ..	965	89	0.82	22.5	109	2.3	6.5	2.6	13	12	0.13	130
15	180 L	1LA6 186-6AA ..	970	89	0.83	29.5	148	2.6	5.7	2.4	16	4	0.2	180
18.5	200 S	1LA6 206-6AA ..	975	90.2	0.83	35.5	181	2.6	5.7	2.3	16	4	0.29	240
22	200 L	1LA6 207-6AA ..	975	90.8	0.83	42.5	215	2.5	5.7	2.3	16	4	0.33	255
30	225 M	1LA6 223-6AA ..	978	92.0	0.84	56	293	2.6	5.7	2.2	16	4	0.57	305
37	250 M	1LA6 253-6AA ..	980	92.4	0.84	69	361	2.6	6.0	2.1	16	4	0.89	410
45	280 S	1LA6 280-6AA ..	982	93.0	0.86	81	438	2.4	6.0	2.3	16	4	1.3	540
55	280 M	1LA6 283-6AA ..	984	93.0	0.86	99	534	2.5	6.2	2.4	16	4	1.5	580
75	315 S	1LA6 310-6AA ..	988	93.8	0.85	136	725	2.4	6.2	2.5	16	4	2.4	770
90	315 M	1LA6 313-6AA ..	988	94.2	0.85	162	870	2.4	6.2	2.5	16	4	2.9	830
110	315 L	1LA6 316-6AA ..	988	94.7	0.85	198	1060	2.6	6.6	2.5	16	4	3.5	970
132	315 L	1LA6 317-6AA ..	986	94.7	0.86	235	1280	2.3	6.6	2.2	16	4	4.3	1060
160	315 L	1LA6 318-6AA ..	988	95.0	0.87	280	1550	2.4	6.6	2.3	16	4	4.9	1100
200	315	1LA8 315-6AB ..	989	95.7	0.87	345	1930	2.0	6.3	2.5	13	19	6.0	1300
250	315	1LA8 317-6AB ..	989	95.9	0.87	430	2410	2.0	6.3	2.5	13	19	7.3	1500
315	355	1LA8 355-6AB ..	993	96.2	0.87	540	3030	2.2	6.5	2.8	13	19	13	2000
400	355	1LA8 357-6AB ..	993	96.5	0.87	690	3850	2.2	6.5	2.8	13	19	16	2200
450	400	1LA8 403-6AB ..	992	96.5	0.86	780	4330	2.2	6.5	2.8	13	19	21	2800
500	400	1LA8 405-6AB ..	992	96.5	0.87	860	4810	2.3	6.5	2.8	13	19	24	3000
560	400	1LA8 407-6AB ..	992	96.7	0.87	960	5390	2.3	6.5	2.8	13	19	27	3200
630	450	1LA8 453-6AB ..	993	96.8	0.86	1100	6060	2.0	6.5	2.6	13	20	35	4000
710	450	1LA8 455-6AB ..	993	96.8	0.87	710	6830	2.0	6.5	2.5	13	20	39	4200
800	450	1LA8 457-6AB ..	993	97.0	0.87	790	7690	2.0	6.5	2.5	13	20	44	4500

◆ Rated current at 690 V.

Order No. suffixes

Motor type	Penultimate position: Voltage code						Last position: Type of construction code							
	50 Hz			60 Hz			IM B 3 (extra charge)							
	230 VΔ / 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ	690 VΔ	460 VΥ	460 VΔ	IM B 5	IM V 1 without canopy	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35	
1LG8 090 to 1LG8 096	1	6	3	-	-	1	6	0	1	1	4	2	3	6
1LG8 106 to 1LG8 166	1	6	3	5	-	1	6	0	1	1	4	2	3	6
1LA6 186 to 1LA6 207	1	6	3	5	-	1	6	0	1	1	4	-	-	6
1LA6 223 to 1LA6 313	1	6	3	5	-	-	6	0	1	1	4	-	-	6
1LA6 316 to 1LA6 318	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6
1LA8 315 to 1LA8 453	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6
1LA8 455 and 1LA8 457	-	-	-	5	0	-	on request	0	-	8	4	-	-	6

Voltage code "9" for other voltages and/or frequencies.

Order numbers must be specified in this case (see page 2/5).

Please refer to pages 2/22 and 2/23 for types of construction.

Spannung	1LA6										1LA8												
	186	206	207	223	253	280	283	310	313	316	317	318	315	317	355	357	403	405	407	453	455	457	
230 V				■																			
400 V															■	■		■	■	■			
500 V																■					■	■	■

Squirrel-Cage Motors

Basic design · Cast-iron enclosure

Degree of protection IP 55, temperature class F, 8-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.-rotor current	Breakdown torque	Torque class	Moment of inertia J	Weight	
			Rated speed rpm	Efficiency η %	Power factor p.f.	Rated current at 400 V A	Rated torque Nm							Type of constr. IM B 3 approx. kg
750 rpm, 8-pole, 50 Hz														
0.37	90 S	1LG8 090-8AD ..	690	62	0.58	1.56	5.1	1.8	2.7	1.9	7	15	0.0026	20
0.55	90 L	1LG8 096-8AD ..	690	67	0.64	1.82	7.6	1.7	2.7	1.9	7	15	0.0036	22
0.75	100 L	1LG8 106-8AB ..	700	69	0.70	2.30	10	2.0	3.8	2.1	13	12	0.0086	35
1.1		1LG8 107-8AB ..	700	69	0.70	3.28	15	2.0	3.7	2.1	13	13	0.01	38
1.5	112 M	1LG8 113-8AB ..	700	74	0.72	4.20	21	1.9	3.7	2.1	13	12	0.014	40
2.2	132 S	1LG8 130-8AB ..	715	81.5	0.70	5.60	29	2.0	4.4	2.3	13	12	0.032	59
3	132 M	1LG8 133-8AB ..	715	83	0.70	7.50	40	2.1	4.5	2.3	13	13	0.045	72
4	160 M	1LG8 163-8AD ..	715	83.5	0.76	9.25	53	1.6	4.3	2.5	7	15	0.09	104
5.5	160 M	1LG8 164-8AD ..	725	84	0.74	13	73	1.8	4.8	2.5	7	15	0.12	108
7.5	160 L	1LG8 166-8AB ..	720	86	0.74	17.2	100	2.1	5.4	2.6	13	12	0.16	130
11	180 L	1LA6 186-8AB ..	725	87	0.70	24	145	2.0	5.0	2.2	13	14	0.21	175
15	200 L	1LA6 207-8AB ..	725	87.5	0.78	32	198	2.1	5.0	2.2	13	14	0.37	245
18.5	225 S	1LA6 220-8AB ..	725	88.6	0.80	37.5	244	2.1	5.0	2.2	13	14	0.58	300
22	225 M	1LA6 223-8AB ..	725	90.1	0.81	43.5	290	2.1	5.0	2.2	13	13	0.66	325
30	250 M	1LA6 253-8AB ..	730	91.6	0.81	58	392	2.1	5.0	2.1	13	14	1.1	435
37	280 S	1LA6 280-8AB ..	732	92.7	0.82	70	483	2.2	5.5	2.2	13	14	1.4	550
45	280 M	1LA6 283-8AB ..	734	92.8	0.83	84	585	2.2	5.5	2.2	13	13	1.6	600
55	315 S	1LA6 310-8AB ..	738	93.1	0.82	104	712	2.2	6.0	2.4	13	14	2.3	740
75	315 M	1LA6 313-8AB ..	738	93.6	0.82	140	970	2.3	6.2	2.5	13	13	3.0	850
90	315 L	1LA6 316-8AB ..	738	93.8	0.83	166	1170	2.3	6.6	2.5	13	13	3.6	990
110	315 L	1LA6 317-8AB ..	738	94.0	0.83	205	1420	2.3	6.6	2.5	13	13	4.4	1100
132	315 L	1LA6 318-8AB ..	738	94.0	0.83	245	1710	2.3	6.6	2.5	13	13	4.8	1200
160	315	1LA8 315-8AB ..	739	94.9	0.82	295	2070	2.1	6.0	2.3	13	21	6.0	1300
200		1LA8 317-8AB ..	739	95.2	0.82	370	2580	2.1	6.0	2.3	13	13	7.3	1500
250	355	1LA8 355-8AB ..	741	95.7	0.82	460	3220	2.1	6.1	2.4	13	21	13	2000
315		1LA8 357-8AB ..	741	96.0	0.82	580	4060	2.1	6.1	2.4	13	13	16	2200
355	400	1LA8 403-8AB ..	742	96.1	0.82	650	4570	2.0	6.5	2.6	13	21	21	2800
400		1LA8 405-8AB ..	742	96.2	0.82	730	5150	2.1	6.5	2.6	13	13	24	3000
450		1LA8 407-8AB ..	742	96.3	0.82	820	5790	2.1	6.5	2.6	13	13	27	3200
500	450	1LA8 453-8AB ..	744	96.4	0.81	920	6420	2.0	6.6	2.4	13	21	35	4000
560		1LA8 455-8AB ..	744	96.5	0.81	1040	7190	2.0	6.6	2.4	13	13	39	4200
630		1LA8 457-8AB ..	744	96.6	0.81	1160	8090	2.0	6.6	2.4	13	13	44	4500

3

Order No. suffixes

Motor type	Penultimate position: Voltage code							Last position: Type of construction code						
	50 Hz				60 Hz			IM B 3 (extra charge)						
	230 V Δ / 400 V Υ	400 V Δ / 690 V Υ	500 V Υ	500 V Δ	690 V Δ	460 V Υ	460 V Δ	IM B 5	IM V 1 without canopy	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35	
1LG8 090 to 1LG8 096	1	6	3	-	-	1	6	0	1	1	4	2	3	6
1LG8 106 to 1LG8 166	1	6	3	5	-	1	6	0	1	1	4	2	3	6
1LA6 186 to 1LA6 207	1	6	3	5	-	1	6	0	1	1	4	-	-	6
1LA6 220 to 1LA6 313	1	6	3	5	-	-	6	0	1	1	4	-	-	6
1LA6 316 to 1LA6 318	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6
1LA8 315 to 1LA8 457	-	6	-	5	-	-	9 L2F	0	-	8	4	-	-	6

Voltage code "9" for other voltages and/or frequencies.
Order numbers must be specified in this case (see page 2/5).
Please refer to pages 2/22 and 2/23 for types of construction.

■ Parallel feeders required (see pages 2/18 and 2/19)											
Voltage	1LA8										
	315	317	355	357	403	405	407	453	455	457	
400 V				■			■	■	■	■	
500 V									■	■	

Squirrel-Cage Motors for converter-fed operation

SIMOVERT MASTERDRIVES

In general, all motors are suitable for converter-fed operation. Some motors require special measures, which are described in the following text.

The planning notes for drives with a constant or square-law counter-torque are contained in the following catalogs:

SIMOVERT A: Catalog DA 62

MICROMASTER: Catalog DA 64

SIMOVERT MASTERDRIVES: Catalog series DA 65.

These catalogs also contain tables showing which squirrel-cage motors should be assigned to which SIMOVERT converter, depending on the load characteristic of the driven machine.

- All data specified in Catalog M11 applies to 50 Hz supply systems.

Attention should be paid to the reduction factors for constant-torque drives, pump drives and compressor drives.

For motor protection and motor temperature detection, see page 2/14.

Bearings

To avoid damage from bearing currents, insulated BS bearings are recommended for frame sizes between 280 and 315 (Order Code **L27**). These insulated bearings are standard in 1LA8 motors for converter-fed operation on SIMOVERT MASTERDRIVES.

Insulation

The insulation of 1LA motors is such that they can operate unrestrictedly in converter-fed mode up to voltages of 500 V. The same applies to operation with pulse-controlled AC converters with voltage front times $t_v > 0.1 \mu s$ at the motor terminals.

Providing these conditions are met, all motors with voltage codes 1, 3, 5 and 6 can be operated in converter-fed mode, except for those with voltage ratings of $>500 V$ to 690 V, which are supplied with special insulation for operation with a pulse-controlled AC converter (SIMOVERT MASTERDRIVES) but without a converter circuit (du/dt filter or sine filter) (10th position of the Order No. = "M").

For operating with a converter at the outputs specified in the catalog, the motors are utilized according to temperature class F. Order codes C11, C12 and C13 are not possible.

Rated voltage

The tolerance laid down by DIN VDE 60034-1 applies to all converter-fed 1LA8 motors, i.e. no rated voltage range is specified (voltage codes 4, 7 and 8).

1LA8 motors

The following points must be noted in connection with these motors:

The motors are designed with a standard rotor and are suitable for both mains operation and converter-fed operation. They are fitted with an insulated bearing at the non-drive end as standard.

The motors with a rated output of 900 kW or more can be fed on request by two parallel inverters without an interphase transformer.

3

Mechanical notes

Noise

Increased fan noise may occur in self-ventilated motors at speeds higher than the rated speed. Under certain circumstances, it is advisable to use separately ventilated motors (1LA5/1LA7 with Order code **G17** or 1PQ6/1PQ8).

Mechanical stress, grease life

At speeds above the rated speed there is greater vibration and the bearings are subjected to more mechanical stress. This reduces the life of both the bearings and the grease (if in doubt, please inquire).

Connection of the motors

In addition to the restrictions applying to mains-connected machines, the maximum permissible conductor cross-sections for the converter must also be kept in mind when the motors are connected.

Mechanical limit speeds								
Motor	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
1LA7 10 .	6000	100	4200	140	3600	180	3000	200
1LA7 113 .	6000	100	4200	140	3600	180	3000	200
1LA7 13 .	5600	90	4200	140	3600	180	3000	200
1LA7 16 .	4800	80	4200	140	3600	180	3000	200
1LA5 18 .	4600	76	4200 (3800)	140 (126)	3600	180	3000	200
1LA5 20 .	4500	75	4200 (3800)	140 (126)	3600	180	3000	200
1LA5 22 .	4500	75	4500 (3800)	150 (126)	4400 (3400)	220 (170)	4400 (3400)	293 (226)
1LA6 253 .	3900	65	3700	123	3700 (3400)	185 (170)	3700 (3400)	247 (226)
1LA6 28 .	3600	60	3000	100	3000	150	3000	200
1LA6 310 .	3600	60	2600	87	2600	130	2600	173
1LA6 313 .	3600	60	2600	87	2600	130	2600	173
1LA6 316 .	3600/	60/	2600	87	2600	130	2600	173
1LA6 317 .	3000 ¹⁾	50 ¹⁾						
1LA6 318 .								
1LA8 31 .	3600	60	3000 (2650)	100 (88)	2950 (2350)	147 (117)	2950 (2350)	196 (156)
1LA8 35 .	3600/	60/	2500 (2350)	83 (78)	2500 (2100)	126 (105)	2500 (2100)	166 (140)
	3100 ¹⁾	52 ¹⁾						
1LA8 40 .	3600/	60	2200/(2100)	73/(70)	2200/(1900)	110/(95)	2200/(1900)	146/(126)
	3100 ¹⁾	52 ¹⁾	2100 ¹⁾	70 ¹⁾	2100 ¹⁾	105 ¹⁾	2100 ¹⁾	140 ¹⁾
1LA8 45 .	3000	50	2100/(1900)	70/(63)	2100/(1700)	105/(85)	2100/(1700)	140/
			1800 ¹⁾	60 ¹⁾	1800 ¹⁾	90 ¹⁾	1800 ¹⁾	120 ¹⁾

The values in brackets apply to motors used in hazardous areas of Zone 2 (see page 2/4).

Up to frame size 90L the values are identical to those for the 1LA7 10 .. motor.

1) For vertical mounting.

Squirrel-Cage Motors for duty at SIMOVERT MASTERDRIVES

with standard insulation for ≤ 500 V

Degree of protection IP 55,
temperature class F, 2-, 4-, 6-, 8-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Locked-rotor torque	Locked-rotor current	Break-down torque	Torque class	Moment of inertia J	Weight
			Rated speed	Efficiency η	Power factor p.f.	Rated current at 400 V	Rated torque							Type of constr. IM B 3
			rpm	%		A	Nm	For direct-online starting in multiples of rated torque			kg m ²	approx. kg	
3000 rpm, 2-pole, 50 Hz													
250	315	1LA8 315-2PC ..	2979	96.3	0.90	415	801	1.8	7.0	2.8	10	2.7	1300
315		1LA8 317-2PC ..	2979	96.7	0.91	520	1010	1.8	7.0	2.8	10	3.3	1500
355	355	1LA8 353-2PC ..	2980	96.6	0.90	590	1140	1.7	6.5	2.5	10	4.8	1900
400		1LA8 355-2PC ..	2980	96.7	0.91	660	1280	1.7	6.5	2.5	10	5.3	2000
500		1LA8 357-2PC ..	2982	97.1	0.91	820	1600	1.8	6.5	2.6	10	6.4	2200
560	400	1LA8 403-2PC ..	2985	97.1	0.91	910	1790	1.6	7.0	2.8	10	8.6	2800
630		1LA8 405-2PC ..	2985	97.1	0.91	1020	2020	1.6	7.0	2.8	10	9.6	3000
710		1LA8 407-2PC ..	2985	97.3	0.91	670 ◆	2270	1.7	7.0	2.8	10	11	3200
800	450	1LA8 453-2PE ..	2986	97.2	0.91	760 ◆	2560	0.9	7.0	3.0	5	19	4000
900		1LA8 455-2PE ..	2986	97.3	0.92	840 ◆	2880	0.9	7.0	2.8	5	21	4200
1000		1LA8 457-2PE ..	2986	97.4	0.93	920 ◆	3200	0.9	7.0	2.7	5	23	4400
1500 rpm, 4-pole, 50 Hz													
250	315	1LA8 315-4PB ..	1486	96.0	0.88	425	1600	1.9	6.5	2.8	13	3.6	1300
315		1LA8 317-4PB ..	1488	96.3	0.88	540	2020	2.0	6.8	2.8	13	4.4	1500
355	355	1LA8 353-4PB ..	1488	96.3	0.87	610	2280	2.1	6.5	2.6	13	6.1	1900
400		1LA8 355-4PB ..	1488	96.3	0.87	690	2570	2.1	6.5	2.6	13	6.8	2000
500		1LA8 357-4PB ..	1488	96.8	0.88	850	3210	2.1	6.5	2.4	13	8.5	2200
560	400	1LA8 403-4PB ..	1492	96.8	0.88	950	3580	1.9	6.5	2.7	13	13	2800
630		1LA8 405-4PB ..	1492	97.0	0.88	1060	4030	1.9	6.8	2.7	13	14	3000
710		1LA8 407-4PB ..	1492	97.0	0.89	690 ◆	4540	1.9	6.8	2.7	13	16	3200
800	450	1LA8 453-4PC ..	1492	97.0	0.88	780 ◆	5120	1.6	7.0	2.6	10	23	4000
900		1LA8 455-4PC ..	1492	97.1	0.88	880 ◆	5760	1.6	7.0	2.6	10	26	4200
1000		1LA8 457-4PC ..	1492	97.1	0.89	970 ◆	6400	1.7	7.0	2.6	10	28	4400
1000 rpm, 6-pole, 50 Hz													
200	315	1LA8 315-6PB ..	989	95.7	0.87	345	1930	2.0	6.3	2.5	13	6.0	1300
250		1LA8 317-6PB ..	989	95.9	0.87	430	2410	2.0	6.3	2.5	13	7.3	1500
315	355	1LA8 355-6PB ..	993	96.2	0.87	540	3040	2.2	6.5	2.8	13	13	2000
400		1LA8 357-6PB ..	993	96.5	0.87	690	3850	2.2	6.5	2.8	13	16	2200
450	400	1LA8 403-6PB ..	992	96.5	0.86	780	4330	2.2	6.5	2.8	13	21	2800
500		1LA8 405-6PB ..	992	96.5	0.87	860	4810	2.3	6.5	2.8	13	24	3000
560		1LA8 407-6PB ..	992	96.7	0.87	960	5390	2.3	6.5	2.8	13	27	3200
630	450	1LA8 453-6PB ..	993	96.8	0.86	1100	6060	2.0	6.5	2.6	13	35	4000
710		1LA8 455-6PB ..	993	96.8	0.87	710 ◆	6830	2.0	6.5	2.5	13	39	4200
800		1LA8 457-6PB ..	993	97.0	0.87	790 ◆	7690	2.0	6.5	2.5	13	44	4500
750 rpm, 8-pole, 50 Hz													
160	315	1LA8 315-8PB ..	739	94.9	0.82	295	2070	2.1	6.0	2.3	13	6.0	1300
200		1LA8 317-8PB ..	739	95.2	0.82	370	2580	2.1	6.0	2.3	13	7.3	1500
250	355	1LA8 355-8PB ..	741	95.7	0.82	460	3220	2.1	6.1	2.4	13	13	2000
315		1LA8 357-8PB ..	741	96.0	0.82	580	4060	2.1	6.1	2.4	13	16	2200
355	400	1LA8 403-8PB ..	742	96.1	0.82	650	4570	2.0	6.5	2.6	13	21	2800
400		1LA8 405-8PB ..	742	96.2	0.82	730	5150	2.1	6.5	2.6	13	24	3000
450		1LA8 407-8PB ..	742	96.3	0.82	820	5790	2.1	6.5	2.6	13	27	3200
500	450	1LA8 453-8PB ..	744	96.4	0.81	920	6420	2.0	6.6	2.4	13	35	4000
560		1LA8 455-8PB ..	744	96.5	0.81	1040	7190	2.0	6.6	2.4	13	39	4200
630		1LA8 457-8PB ..	744	96.6	0.81	1160	8090	2.0	6.6	2.4	13	44	4500

◆ Rated current at 690 V.

Order No. suffixes

Motor type	Penultimate position: Voltage code				Last position: Type of construction code			
	50 Hz (No rated voltage range)				IM B 3 (extra charge)			
	400 VΔ	400 VΔ / 690 VΥ ³⁾	500 VΔ	690 VΔ ³⁾	IM V 1 without canopy	IM V 1 with canopy	IM B 35	
1LA8 315 to 1LA8 405	4	8	5	–	0	8	4	6
1LA8 407 to 1LA8 457	4 ¹⁾	8 ¹⁾	5	7 ²⁾	0	8	4	6

Please refer to pages 2/22 and 2/23 for types of construction.

1) Not possible for 2 and 4-pole motors upwards of type 1LA8 407 or for 6-pole motors upwards of type 1LA8 455.

2) Only available for 2 and 4-pole motors upwards of type 1LA8 407 and for 6-pole motors upwards of type 1LA8 455.

3) The motors with standard insulation can only be operated with a converter circuit (du/dt or sine filter).

Squirrel-Cage Motors for duty at SIMOVERT MASTERDRIVES

with special insulation for 690 V

Degree of protection IP 55, temperature class F, 2-, 4-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Locked-rotor torque For direct-online starting in multiples of rated torque	Locked-rotor current	Break-down torque	Torque class CL	Moment of inertia J kg m ²	Weight Type of constr. IM B 3 approx. kg
			Rated speed rpm	Efficiency η %	Power factor p.f.	Rated current at 690 V A	Rated torque Nm						
3000 rpm, 2-pole, 50 Hz													
45	225 M	1LA6 223-2PM6 .	2955	93.9	0.90	44.5	145	2.3	6.9	2.7	13	0.24	310
55	250 M	1LA6 253-2PM6 .	2965	93.7	0.91	54	177	2.1	6.9	2.8	13	0.45	415
75	280 S	1LA6 280-2PM6 .	2975	94.7	0.90	73	241	1.9	7.0	2.7	10	0.79	570
90	280 M	1LA6 283-2PM6 .	2975	95.1	0.91	87	289	2.0	7.0	2.7	10	0.92	610
110	315 S	1LA6 310-2PM6 .	2980	94.8	0.90	108	353	1.8	7.0	2.8	10	1.3	790
132	315 M	1LA6 313-2PM6 .	2980	95.1	0.90	130	423	1.9	7.0	2.8	10	1.5	850
150	315 L	1LA6 316-2PM6 .	2980	95.4	0.91	144	481	1.9	7.2	2.9	10	1.8	990
180		1LA6 317-2PM6 .	2984	95.9	0.92	170	576	2.1	7.5	3.0	10	2.3	1100
240	315	1LA8 315-2PM8 .	2978	96.1	0.90	230	770	1.8	7.0	3.0	10	2.7	1300
300		1LA8 317-2PM8 .	2978	96.5	0.91	285	962	1.9	7.0	3.0	10	3.3	1500
345	355	1LA8 353-2PM8 .	2981	96.4	0.90	335	1105	1.7	7.0	2.6	10	4.8	1900
390		1LA8 355-2PM8 .	2981	96.6	0.91	370	1249	1.7	6.7	2.6	10	5.3	2000
485		1LA8 357-2PM8 .	2982	97.0	0.91	460	1553	1.8	7.0	2.6	10	6.4	2200
545	400	1LA8 403-2PM8 .	2986	97.1	0.91	520	1743	1.5	7.0	3.0	10	8.6	2800
610		1LA8 405-2PM8 .	2986	97.1	0.92	570	1951	1.6	7.0	2.9	10	9.6	3000
680		1LA8 407-2PM7 .	2986	97.2	0.92	640	2175	1.7	7.0	3.0	10	11	3200
775	450	1LA8 453-2PM7 .	2987	97.2	0.92	730	2478	0.9	7.0	2.8	5	19	4000
875		1LA8 455-2PM7 .	2987	97.3	0.92	820	2798	0.9	7.0	2.8	5	21	4200
970		1LA8 457-2PM7 .	2987	97.4	0.93	900	3101	0.9	7.0	2.8	5	23	4400
1500 rpm, 4-pole, 50 Hz													
37	225 S	1LA6 220-4PM6 .	1475	92.7	0.86	38.5	240	2.5	7.0	3.1	16	0.44	300
45	225 M	1LA6 223-4PM6 .	1475	93.1	0.87	46	291	2.6	7.0	3.2	16	0.52	330
55	250 M	1LA6 253-4PM6 .	1480	94.0	0.87	56	355	2.6	6.7	2.5	16	0.79	435
75	280 S	1LA6 280-4PM6 .	1485	94.7	0.86	77	482	2.5	6.7	2.7	16	1.4	610
84	280 M	1LA6 283-4PM6 .	1485	94.9	0.86	86	540	2.6	7.3	3.0	16	1.6	660
110	315 S	1LA6 310-4PM6 .	1486	94.8	0.86	112	707	2.5	6.7	2.7	16	2.2	830
132	315 M	1LA6 313-4PM6 .	1486	95.3	0.86	134	848	2.7	7.2	3.0	16	2.7	910
150	315 L	1LA6 316-4PM6 .	1488	95.7	0.87	150	963	2.7	7.4	2.7	16	3.2	1060
190		1LA6 317-4PM6 .	1490	96.0	0.86	192	1218	2.8	7.4	2.8	16	4.2	1200
235	315	1LA8 315-4PM8 .	1485	95.8	0.87	235	1511	1.8	7.0	2.8	13	3.6	1300
290		1LA8 317-4PM8 .	1485	96.0	0.88	285	1865	1.8	7.0	2.8	13	4.4	1500
340	355	1LA8 353-4PM8 .	1488	96.0	0.87	340	2182	1.9	7.0	2.6	13	6.1	1900
385		1LA8 355-4PM8 .	1488	96.2	0.87	385	2471	2.0	7.0	2.6	13	6.8	2000
480		1LA8 357-4PM8 .	1488	96.5	0.87	480	3081	2.1	7.0	2.5	13	8.5	2200
545	400	1LA8 403-4PM8 .	1491	96.6	0.88	540	3491	1.9	7.0	2.6	13	13	2800
615		1LA8 405-4PM8 .	1491	96.8	0.88	600	3939	1.9	7.0	2.7	13	14	3000
690		1LA8 407-4PM7 .	1491	96.9	0.89	670	4420	1.9	7.0	2.6	13	16	3200
785	450	1LA8 453-4PM7 .	1492	96.8	0.88	770	5025	1.5	6.9	2.5	10	23	4000
880		1LA8 455-4PM7 .	1492	97.0	0.87	870	5633	1.6	7.0	2.6	10	26	4200
980		1LA8 457-4PM7 .	1492	97.1	0.89	950	6273	1.7	7.0	2.6	10	28	4400

Order No. suffixes

Motor type	Last position: Type of construction code					
	IM B 3	IM B 5	(extra charge)	IM V 1 without canopy	IM V 1 with canopy	IM B 35
1LA6 220 to 1LA6 313	0	1	1	4	6	
1LA6 316 to 1LA8 457	0	-	8	4	6	

Please refer to pages 2/22 and 2/23 for types of construction.

Squirrel-Cage Motors for duty at SIMOVERT MASTERDRIVES with special insulation for 690 V

Degree of protection IP 55, temperature class F, 6-8-pole, 50 Hz

Selection and ordering data

Rated output kW	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Locked-rotor torque For direct-online starting in multiples of rated torque	Locked-rotor current in multiples of rated current	Break-down torque	Torque class CL	Moment of inertia J kg m ²	Weight approx. kg
			Rated speed rpm	Efficiency η %	Power factor p.f.	Rated current at 690 V A	Rated torque Nm						
1000 rpm, 6-pole, 50 Hz													
30	225 M	1LA6 223-6PM6 .	978	92.3	0.84	32.5	293	2.6	5.7	2.2	16	0.57	305
37	250 M	1LA6 253-6PM6 .	980	92.4	0.84	40	361	2.6	6.0	2.1	16	0.89	410
45	280 S	1LA6 280-6PM6 .	982	93.0	0.86	47	438	2.4	6.0	2.3	16	1.3	540
55	280 M	1LA6 283-6PM6 .	984	93.6	0.86	57	534	2.5	6.2	2.4	16	1.5	580
75	315 S	1LA6 310-6PM6 .	988	93.8	0.85	79	725	2.4	6.2	2.5	16	2.4	770
90	315 M	1LA6 313-6PM6 .	988	94.2	0.85	94	870	2.4	6.2	2.5	16	2.9	830
110	315 L	1LA6 316-6PM6 .	988	94.7	0.85	114	1060	2.6	6.6	2.5	16	3.5	970
125		1LA6 317-6PM6 .	986	94.6	0.86	128	1210	2.4	6.9	2.3	16	4.3	1060
150		1LA6 318-6PM6 .	988	95.0	0.86	154	1450	2.4	7.2	2.4	16	4.9	1100
190	315	1LA8 315-6PM8 .	990	95.5	0.85	196	1833	2.1	7.0	2.7	13	6.0	1300
235		1LA8 317-6PM8 .	990	95.7	0.86	240	2267	2.2	7.0	2.7	13	7.3	1500
300	355	1LA8 355-6PM8 .	992	96.2	0.86	305	2888	2.2	7.0	2.8	13	13	2000
380		1LA8 357-6PM8 .	992	96.4	0.86	385	3658	2.3	7.0	2.9	13	16	2200
435	400	1LA8 403-6PM8 .	993	96.4	0.85	445	4184	2.1	7.0	2.8	13	21	2800
485		1LA8 405-6PM8 .	993	96.5	0.86	490	4664	2.1	7.0	2.8	13	24	3000
545		1LA8 407-6PM8 .	993	96.6	0.86	550	5241	2.1	7.0	2.7	13	27	3200
615	450	1LA8 453-6PM8 .	993	96.8	0.84	630	5915	2.0	7.0	2.7	13	35	4000
690		1LA8 455-6PM7 .	993	96.8	0.85	700	6636	1.9	7.0	2.5	13	39	4200
780		1LA8 457-6PM7 .	993	96.9	0.85	790	7502	2.0	7.0	2.6	13	44	4500
750 rpm, 8-pole, 50 Hz													
18.5	225 S	1LA6 220-8PM6 .	725	88.6	0.80	23	244	2.1	5.0	2.2	13	0.58	300
22	225 M	1LA6 223-8PM6 .	725	90.1	0.81	25	290	2.1	5.0	2.2	13	0.66	325
30	250 M	1LA6 253-8PM6 .	730	91.6	0.81	34	392	2.1	5.0	2.1	13	1.1	435
37	280 S	1LA6 280-8PM6 .	732	92.7	0.82	41	483	2.2	5.5	2.2	13	1.4	550
45	280 M	1LA6 283-8PM6 .	734	92.8	0.83	49	585	2.2	5.5	2.2	13	1.6	600
55	315 S	1LA6 310-8PM6 .	738	93.1	0.82	60	712	2.2	6.0	2.4	13	2.3	740
75	315 M	1LA6 313-8PM6 .	738	93.8	0.82	82	971	2.3	6.2	2.5	13	3.0	850
90	315 L	1LA6 316-8PM6 .	738	93.7	0.82	98	1160	2.3	6.6	2.5	13	3.6	990
100		1LA6 317-8PM6 .	738	94.0	0.82	108	1290	2.5	7.2	2.7	13	4.4	1100
120		1LA6 318-8PM6 .	738	94.0	0.82	130	1550	2.5	7.2	2.7	13	4.8	1200
145	315	1LA8 315-8PM8 .	740	94.6	0.79	162	1871	2.2	6.4	2.5	13	6.0	1300
180		1LA8 317-8PM8 .	740	94.9	0.80	198	2323	2.2	6.4	2.5	13	7.3	1500
230	355	1LA8 355-8PM8 .	743	95.5	0.80	250	2956	2.1	6.8	2.4	13	13	2000
290		1LA8 357-8PM8 .	743	95.7	0.81	315	3727	2.1	6.8	2.4	13	16	2200
335	400	1LA8 403-8PM8 .	743	96.0	0.80	365	4306	1.9	6.6	2.6	13	21	2800
375		1LA8 405-8PM8 .	743	96.1	0.80	410	4820	1.9	6.9	2.7	13	24	3000
425		1LA8 407-8PM8 .	743	96.2	0.79	470	5463	1.9	6.8	2.7	13	27	3200
485	450	1LA8 453-8PM8 .	745	96.5	0.78	540	6217	1.9	6.8	2.5	13	35	4000
545		1LA8 455-8PM8 .	745	96.6	0.78	610	6986	2.0	6.8	2.5	13	39	4200
600		1LA8 457-8PM8 .	745	96.7	0.79	660	7691	2.0	6.8	2.5	13	44	4500

Order No. suffixes

Motor type	Last position: Type of construction code (extra charge)				
	IM B 3	IM B 5	IM V 1 without canopy	IM V 1 with canopy	IM B 35
1LA6 220 to 1LA6 313	0	1	1	4	6
1LA6 316 to 1LA8 457	0	-	8	4	6

Please refer to pages 2/22 and 2/23 for types of construction.

Squirrel-Cage Motors

1LA. and 1LG. motors

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame size					
		Aluminum			Cast iron		
		1LA7	1LA5	1LA9	1LG8	1LA6	1LA8

Windings and motor protection

C11	Used as class F with service factor	56 – 160	180 – 225	56 – 200 ³⁾	90 – 160	180 – 315	315 – 450
		Service factor 1.1; from frame size 400 SF 1.05					
C12	Used as class F with increased power rating ¹⁾	56 – 160	180 – 225	56 – 200 ³⁾	90 – 160	180 – 315	315 – 450 Not possible with converter-fed operation
		Increased output 10 %, from frame size 400 5 %					
C13	Used as class F with increased coolant temperature	56 – 160	180 – 225	56 – 200 ³⁾	90 – 160	180 – 315	315 – 450
		Coolant temperature 55 °C, from frame size 400 50 °C					
Y52 •	Used as class F – other requirements and req. rating CT... °C and/or altitude m above sea level	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450 Not possible with converter-fed operation
A11	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ²⁾	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	–
A12	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	Standard design
A23	Motor temperature detection with embedded temperature sensor KTY 84-130	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450

Paint finish

K26	Special paintwork in RAL 7030 stone grey	Standard design			90 – 160	225 – 315 180 + 200 Standard design	315 – 450			
M16	Special paintwork in RAL 1002 sand yellow									
M17	Special paintwork in RAL 1013 pearl white									
M18	Special paintwork in RAL 3000 flame red									
K27	Special paintwork in RAL 6011 mignonette green									
M19	Special paintwork in RAL 6021 pale green									
M20	Special paintwork in RAL 7001 silver grey	56 – 160	180 – 225	56 – 200	90 – 160 with Order code Y54 and special paintwork RAL	180 – 315 with Order code Y54 and special paintwork RAL	315 – 450 with Order code Y54 and special paintwork RAL			
K28	Special paintwork in RAL 7031 bluish grey									
L42	Special paintwork in RAL 7032 pebble grey									
M21	Special paintwork in RAL 7035 light grey									
M22	Special paintwork in RAL 9001 cream									
M23	Special paintwork in RAL 9002 grey white									
L43	Special paintwork in RAL 9005 jet black									
Y54 •	Special paintwork in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	56 – 160	180 – 225	56 – 200						
Y53 •	Standard paintwork in other colors and standard paintwork RAL	–	–	–				90 – 160	225 – 315	315 – 450
K23	Unpainted (only cast iron parts primed)	56 – 160	180 – 225	56 – 200				90 – 160	180 – 315	315 – 450
K24	Unpainted, only primed	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	–			

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

- Additional plain text is required.

- 1) Only the 50 Hz data is stamped on the rating plate.
- 2) For 3UN1 tripping unit see catalog NS K. Twice the number of temperature sensors is required for pole-changing motors with separate windings.
- 3) Not possible for motors with increased output.

Squirrel-Cage Motors

1LA. and 1LG. motors

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame size						
		Aluminum 1LA7	1LA5	1LA9	Cast iron 1LG8	1LA6	1LA8	
Versions for zones¹⁾								
L84	T3 to DIN VDE 0165	Design for Zone 2 direct on-line operation	56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	315 – 450
L85	Ex nA II T3 acc. to IEC 60 079-15		56 – 160	–	56 – 160 ⁴⁾	90 – 160	180 – 315	315 – 450
L86	ExN II T3 acc. to BS 5000, Part 16		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
L87	T3 acc. to DIN VDE 0165	Design for Zone 2 converter-fed operation turbomachine drive	56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	315 – 450
L88	²⁾ Ex nA II T3 acc. to IEC 60 079-15		56 – 160	–	56 – 160 ⁴⁾	90 – 160	180 – 315	315 – 450
L89	²⁾ ExN II T3 acc. to BS 5000, Part 16		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
M03	³⁾ T3 acc. to DIN VDE 0165	Design for Zone 2 converter-fed operation constant torque drive	56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	315 – 450
M04	^{2) 3)} Ex nA II T3 acc. to IEC 60 079-15		56 – 160	–	56 – 160 ⁴⁾	90 – 160	180 – 315	315 – 450
M05	²⁾ ExN II T3 acc. to BS 5000, Part 16		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
M34	Design for zone 21 for direct on-line operation		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
M35	⁷⁾ Design for zone 22 for direct on-line operation		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
M38	²⁾ Design for zone 21 for converter-fed operation		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–
M39	^{2) 7)} Design for zone 22 for converter-fed operation		56 – 160	180 – 225	56 – 200 ⁴⁾	90 – 160	180 – 315	–

Modular technology/mounting⁵⁾

H57	⁶⁾ Mounting of 1XP8 001-1 (HTL) pulse generator	100 – 160	180 – 225	–	–	180 – 315	–
H58	⁶⁾ Mounting of 1XP8 001-2 (TTL) pulse generator	100 – 160	180 – 225	–	–	–	–
G17	⁶⁾ Mounting of separately driven fan 2CW2	100 – 160	180 – 225	–	–	–	–
H61	⁶⁾ Mounting of separately driven fan 2CW2 and pulse generator 1XP8 001-1	100 – 160	180 – 225	–	–	–	–
G26	⁶⁾ Mounting of 2LM8 brake	63 – 160	180 – 225	–	–	–	–
H62	⁶⁾ Mounting of 2LM8 brake and pulse generator 1XP8 001-1	100 – 160	180 – 225	–	–	–	–
H63	⁶⁾ Mounting of 2LM8 brake and separately driven fan 2CW2	100 – 160	180 – 225	–	–	–	–
H64	⁶⁾ Mounting of 2LM8 brake, separately driven fan 2CW2 and pulse generator 1XP8 001-1	100 – 160	180 – 225	–	–	–	–
K82	Manual brake release with lever	63 – 160	180 – 225	–	–	–	–
C00	Brake excitation DC 24 V	63 – 160	180 – 225	–	–	–	–

Further mountings⁵⁾

H70	Mounting of the XH860 900 220 pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H71	Mounting of the enclosed XH860 900 220 pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H78	Designed for retrofitting XH860900220 pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H72	Mounting of the HOG 9 D 1024 I pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H74	Mounting of the enclosed HOG 9 pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H79	Designed for retrofitting with the HOG 9 D 1024 KR I pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H73	Mounting of the HOG 10 D 1024 I pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H75	Mounting of the enclosed HOG 10 pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450
H80	Designed for retrofitting with the HOG 10 D 1024 I pulse generator	100 – 160	180 – 225	–	–	180 – 315	315 – 450

Converter mounting

H15	⁸⁾ Designed for retrofitting with the MMI pulse generator	56 – 132	–	–	–	–	–
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1) Modular technology and other mountings not possible; space heater up to size 200 L not possible.
2) This option includes thermistors for heat class B.

3) For 1LA8 motors a 10 % reduction in power is necessary.
4) Not available for motors with increased output.

5) Second shaft extension not possible. The other mountings are not available in conjunction with the modular technology.
6) Order codes cannot be combined with one another.

7) Design for non-conductive dust, degree of protection IP 55.
8) The converter mounting is available in acc. with the COMBIMASTER range in Part 4 for motors with 230 VΔ/400 VY.

Squirrel-Cage Motors

1LA. and 1LG. motors

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame size					
		Aluminum			Cast iron		
		1LA7	1LA5	1LA9	1LG8	1LA6	1LA8

Mechanical features

K06	Two-part board of the terminal box	–	–	–	–	225 – 315	315 – 355 for BG 400 & 450 standard design
K09	Side-mounted terminal box, right (when viewed in the drive end side)	80 – 160	180 – 225	80 – 200	90 – 160	180 – 315	Standard design
K10	Side-mounted terminal box, left (when viewed in the drive end side)	80 – 160	180 – 225	80 – 200	90 – 160	180 – 315	315 – 450
K83	Terminal box rotated 90°, entry from drive-end	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
K84	Terminal box rotated 90°, entry from non-drive end	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
K85	Terminal box rotated 180°	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
D40	Canadian standards (CSA) ¹⁾	56 – 160	180 – 200	56 – 200	90 – 160	180 – 315	315 – 450
		with voltage code 9 and Order code for voltage and frequency					
K01	Vibration severity grade R	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 400
		for pole-changing on request					
K16	Second standard shaft-end ²⁾	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
K17	Drive-end seal for flange-mounting motors ³⁾	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	–
K20	Bearings for increased cantilever forces ⁴⁾	100 – 160	180 – 225	100 – 200	–	180 – 315	315 – 355
K40	Regreasing device	100 – 160	180 – 225	100 – 200*	160	180 – 250, from BG 280 standard design	–
L04	Locating bearing at non-drive end	56 – 132	–	56 – 132	90 – 100	–	–
K94	Locating bearing at drive end	56 – 160	180 – 225	56 – 200	90 – 160	180 – 225	–
L27	Insulated bearing cartridge	–	–	–	–	225 – 315	Standard for duty at SIMOVERT MASTER-DRIVES
L13	External earthing	56 – 160	180 – 225	56 – 200	90 – 160	Standard design	
K30	VIK design ⁵⁾	56 – 160	–	56 – 160	90 – 160	180 – 225	315 – 355
K31	Extra rating plate, loose	56 – 160	180 – 225	56 – 200	90 – 160	180 – 225	315 – 450
Y82 • for purchasers' data	Extra rating plate	56 – 160	180 – 225	56 – 200	90 – 160	180 – 225	315 – 450
K37	Low-noise design for 2-pole motors with clockwise direction of rotation ⁶⁾	132 – 160	180 – 225	180 – 200	132 – 160	180 – 315	315, for 355 – 450 standard design
K38	Low-noise design for 2-pole motors with anticlockwise direction of rotation ⁶⁾	132 – 160	180 – 225	180 – 200	132 – 160	180 – 315	315 – 450
K45	Anti-condensation heater for 230 V	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
K46	Anti-condensation heater for 115 V	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	315 – 450
L99	Wire-lattice pallet	56 – 160	180	56 – 180	–	180	–

Safety and commissioning notes/certification

B00	Without S&C note Customer's declaration of renouncement required	56 – 160	180 – 225	56 – 200	–	180 – 200	–
B01	With one S&C note per grid crate	56 – 160	180	56 – 180	–	180	–
B02	Factory test in accordance with EN 10 204 2.3	56 – 160	180 – 225	56 – 200	90 – 160	180 – 315	Standard design

- Additional plain text is required.
- 1) The rated voltage is included on the rating plate. Separately driven fan and brake are not CSA certified.
- 2) Vertically mounted for 1LA6 on request, low-noise design not available.
- 3) Not available for type of construction IM V 3, 1LA6 motors only 4 to 8-pole.

- 4) Not available for: 2-pole 1LA6 motors, frame size 315 L, vertically mounted; 2-pole 1LA8 motors, frame sizes 315 to 355; 1LA8 motors, vertically mounted. Vibration severity grade R on request for 1LA6 motors, frame sizes BG 225 M or larger.

- 5) Low-noise design is additionally required for motors with frame sizes 315 S to 315 L. Please note the rated-output assignment and the dimensions of 1LA8 motors. The terminal box of 2- and 4-pole 1LA8 357 motors can't be rotated by 4 x 90°.

- 6) 1LA6 motors are up to 80 mm longer than the standard design. A second shaft extension cannot be mounted.
- * From October 2000. Not possible for 1LA9 134-6.

Squirrel-Cage Motors

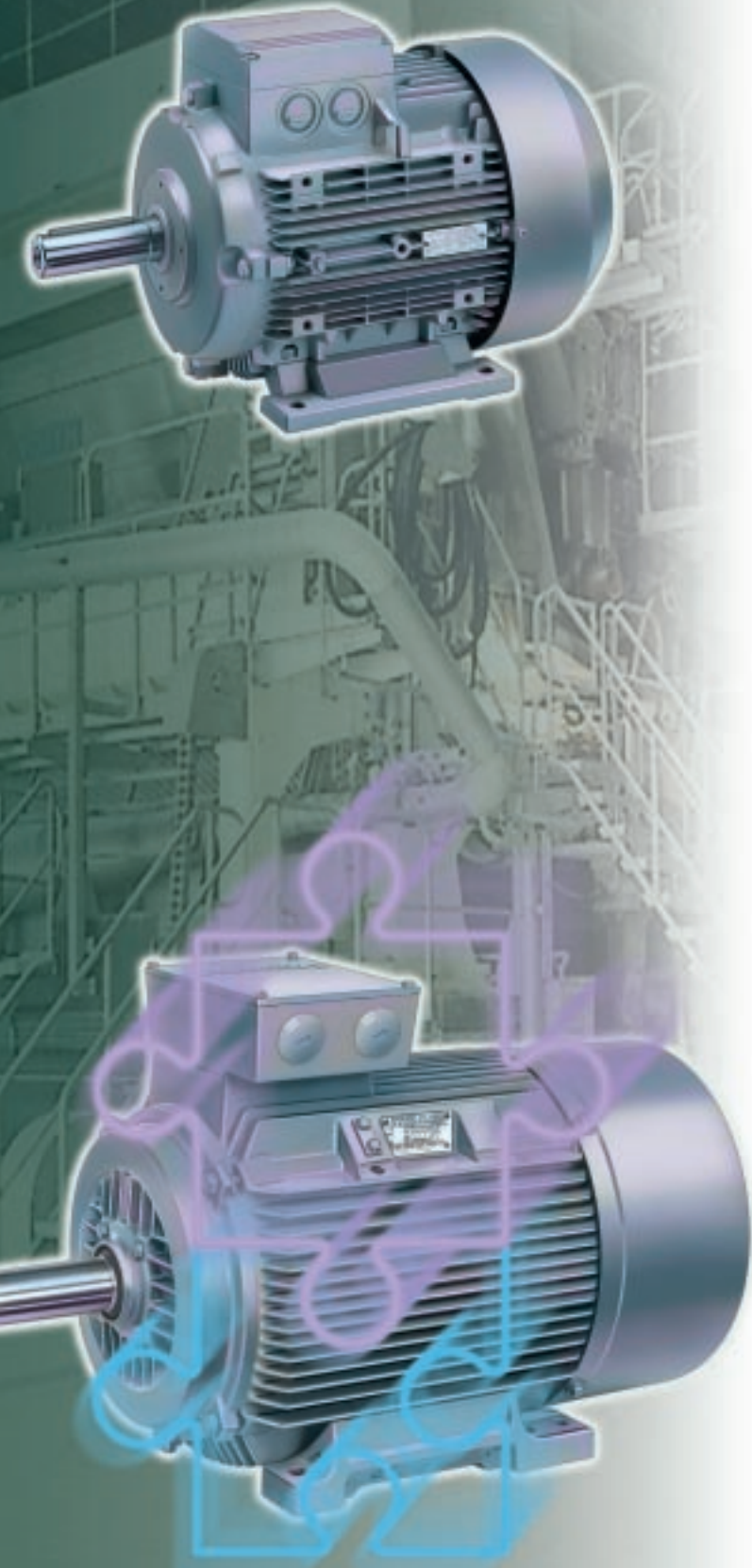
Notes

3

Squirrel-Cage Motors

Increased Safety

Ex e II Type of Protection



5/2
5/3
5/4

Selection and ordering data

2-pole, 50 Hz, temperature classes T1 to T3

4-pole, 50 Hz, temperature classes T1 to T3

6-pole, 50 Hz, temperature classes T1 to T3

5/5

Special designs

5

1MA motors Increased Safety

Frame sizes	63 to 355
Output range	0.12 to 400 kW
Temperature class	T1 to T3
Class F	Utilization according to class B

Squirrel-Cage Motors

Increased Safety · EEx e II Type of Protection

Temperature rises T1 to T3,
Degree of protection IP 55, temperature class F

Selection and ordering data

Rated output kW	Temperature classes	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table on page 5/2	Performance at rated output				Locked rotor torque For direct-online starting in multiples of rated torque	Locked rotor current For direct-online starting in multiples of rated current	Break-down torque	t _e -time for temperature rises		Torque class CL	Characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight approx. kg	
				Rated speed rpm	Efficiency η ¹⁾ %	Power factor p.f.	Rated current at 400 V A				Rated torque Nm	T1 s					T3 s
1500 rpm, 4-pole, 50 Hz																	
0.12	T1-T3	63	1MA7 060-4BB ..	1375	55	0.66	0.52	0.83	1.9	2.6	1.9	35	30	13	12	0.0003	3.5
0.18	T1-T3		1MA7 063-4BB ..	1330	57	0.75	0.62	1.3	1.9	2.7	1.9	30	25	13		0.0004	4.0
0.25	T1-T3	71	1MA7 070-4BB ..	1310	60	0.77	0.80	1.8	1.9	3.1	1.9	50	40	13	12	0.0006	5.2
0.37	T3		1MA7 073-4BB ..	1355	67	0.74	1.10	2.6	1.9	3.7	2.1	35	29	13		0.00083	6.4
0.55	T1-T3	80	1MA7 080-4BA ..	1390	73	0.73	1.59	3.8	2.4	4.6	2.5	24	21	16	3	0.0015	8.4
0.75	T1-T3		1MA7 083-4BA ..	1395	73	0.75	2.05	5.1	2.6	4.8	2.6	19	16	16		0.0018	9.8
1	T1-T3	90 S	1MA7 090-4BA ..	1420	77	0.78	2.5	6.7	2.2	5.5	2.5	16	14	16	3	0.0028	12.7
1.35	T1-T3	90 L	1MA7 096-4BA ..	1415	78	0.81	3.1	9.1	2.3	5.9	2.5	15	13	16		0.0035	16
2	T1-T3	100 L	1MA7 106-4BA ..	1420	80	0.81	4.5	14	2.5	6.4	2.7	13	11	16	3	0.0048	22
2.5	T1-T3		1MA7 107-4BA ..	1415	81	0.83	5.5	17	2.6	6.4	2.7	12	10	16		0.0058	24
3.6	T1-T3	112 M	1MA7 113-4BA ..	1435	85	0.83	7.5	24	2.6	7.2	2.9	10	9	16	3	0.011	29
5	T1-T3	132 S	1MA7 130-4BA ..	1445	86	0.82	10.4	33	2.7	6.6	3.2	10	9	16	9	0.021	39
6.8	T1-T3	132 M	1MA7 133-4BA ..	1465	87	0.82	14.0	44	3.0	7.6	3.6	11	9	16		0.027	53
10	T1-T3	160 M	1MA7 163-4BB ..	1455	88	0.87	19.7	66	2.3	6.5	2.7	17	10	13	9	0.052	73
13.5	T1-T3	160 L	1MA7 166-4BB ..	1465	89	0.84	27	88	2.4	6.8	3.0	18	9	13		0.057	90
15	T3	180 M	1MA6 183-4BC ..	1470	91.3	0.81	29.5	97	1.8	6.6	2.9	15	15	10	22	0.13	165
17	T1, T2	180 M		1465	91	0.82	33	111	1.6	5.8	2.4	13	10	10			
17.5	T3	180 L	1MA6 186-4BC ..	1470	91.7	0.82	33.5	114	1.8	6.9	3.0	17	15	10		0.15	180
20	T1, T2	180 L		1465	91.6	0.83	38 ³⁾	130	1.6	6,	2.6	14	10	10			
24	T3	200 L	1MA6 207-4BC ..	1475	92.2	0.83	45	155	2.1	7.0	3.0	16	8	10	22	0.24	240
27	T1, T2			1470	92.0	0.84	50	175	1.8	6.2	2.6	14	10	10			
30	T3	225 S	1MA6 220-4BC ..	1481	93.3	0.83	59	193	1.6	6.7	2.7	13	13	10	22	0.44	300
33	T1, T2	225 S		1480	93.1	0.84	64 ³⁾	213	1.4	6.2	2.5	11	10	10			
36	T3	225 M	1MA6 223-4BC ..	1484	93.8	0.84	70 ³⁾	232	1.7	6.9	2.8	12	12	10		0.52	330
40	T1, T2	225 M		1480	93.6	0.85	77 ³⁾	258	1.5	6.2	2.5	10	10	10			
44	T3	250 M	1MA6 253-4BC ..	1485	94	0.85	83	283	1.7	7.3	2.5	18	11	10	22	0.79	435
50	T1, T2			1485	93.8	0.86	94	322	1.5	6.4	2.1	15	10	10			
58	T3	280 S	1MA6 280-4BC ..	1488	94.6	0.84	111	372	1.7	6.3	2.5	30	7	10	22	1.4	610
68	T1, T2	280 S		1485	94.5	0.85	131	437	1.5	5.3	2.1	23	10	10			
70	T3	280 M	1MA6 283-4BC ..	1488	94.8	0.85	130	449	1.7	7.0	2.5	26	6	10		1.6	660
80	T1, T2	280 M		1485	94.8	0.87	150 ³⁾	514	1.5	6.0	2.2	20	10	10			
84	T3	315 S	1MA6 310-4BD ..	1492	95.4	0.84	158	538	1.7	7.7	2.8	28	8	7	28	2.2	830
100	T1, T2	315 S		1490	95.3	0.85	188	641	1.4	6.5	2.4	24	7	7			
100	T3	315 M	1MA6 313-4BD ..	1492	95.8	0.85	185	640	1.6	7.2	2.5	29	7	7		2.7	910
120	T1, T2	315 M		1488	95.7	0.86	222 ³⁾	770	1.3	6.0	2.1	24	7	7			
115	T3	315 L	1MA6 316-4BD ..	1490	95.6	0.86	214	740	1.7	7.5	2.5	28	5	7	28	3.2	1060
135	T1, T2			1488	95.5	0.87	248	868	1.4	6.4	2.1	21	7	7			
135	T3		1MA6 317-4BD ..	1492	95.8	0.86	245	868	1.7	7.8	2.8	26	7	7		4.2	1200
165	T1, T2			1485	95.8	0.87	305	1061	1.5	6.3	2.3	17	7	7			
170	T3	315	1MA8 315-4BD ..	1490	96.2	0.86	310	1090	1.3	6.6	2.7	9	7	7	31	3.6	1300
200	T1, T2			1486	96.1	0.87	365	1290	1.1	5.6	2.3	23	7	7			
215	T3		1MA8 317-4BD ..	1490	96.5	0.87	390	1380	1.4	6.6	2.7	9	7	7		4.4	1500
245	T1, T2			1486	96.4	0.88	440	1570	1.2	5.8	2.4	24	7	7			
240	T3	355	1MA8 353-4BE ..	1490	96.5	0.88	430	1540	0.9	6.3	2.5	11	5	5	34	6.1	1900
275	T1, T2			1488	96.4	0.89	485 ⁴⁾	1760	0.8	5.5	2.2	27	5	5			
275	T3		1MA8 355-4BE ..	1490	96.7	0.88	490 ⁴⁾	1760	0.9	6.4	2.6	12	5	5		6.8	2000
315	T1, T2			1488	96.6	0.88	560 ⁴⁾	2020	0.8	5.6	2.3	28	5	5			
350	T3		1MA8 357-4BE ..	1490	96.9	0.88	620	2240	1.0	6.5	2.6	11	5	5		8.5	2200
400	T1, T2			1488	96.8	0.89	710	2570	0.9	5.7	2.3	26	5	5			

■ VIK not possible.

- Referring to 75 °C.
- Separate designs for T1, T2 and T3 with voltage code "9".
- Parallel feeders required for 230 V supply.

- Parallel feeders required for 400 V supply.
- Parallel feeders required for 500 V supply.

- Please enquire about the rated voltage range for 1MA8.
- Please enquire about 2-pole motors.

- Not available for 1MA7 06.
- 500 VY design not available for 1MA7 060-4.

Squirrel-Cage Motors

Increased Safety · EEx e II Type of Protection

Temperature rises T1 to T3,
Degree of protection IP 55, temperature class F

Selection and ordering data

Rated output kW	Temperature classes	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Locked rotor torque For direct-online starting in multiples of rated torque	Locked rotor current For direct-online starting in multiples of rated current	Break-down torque	t _e -time		Torque class	Characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight
				Rated speed rpm	Efficiency η ¹⁾ %	Power factor p.f.	Rated current at 400 V A	Rated torque Nm				for temperature rises T1 T3 s s	CL					Type of constr. IM B 3 approx. kg
1000 rpm, 6-pole, 50 Hz																	
0.25	T1-T3	71	1MA7 073-6BA ..	850	63	0.72	0.81	2.8	2.2	3.0	2.1	130	70	16	6	0.0009	6.7
0.37	T1-T3	80	1MA7 080-6BA ..	920	68	0.70	1.14	3.6	2.3	3.6	2.4	60	55	16	6	0.0015	8.3
0.55	T1-T3		1MA7 083-6BA ..	930	69	0.67	1.75	5.6	2.4	4.0	2.4	34	27	16		0.0025	12.5
0.65	T1-T3	90 S	1MA7 090-6BA ..	915	70	0.75	1.8	6.8	2.3	3.9	2.4	35	30	16	6	0.0028	12.5
0.95	T1-T3	90 L	1MA7 096-6BA ..	915	72	0.75	2.6	9.9	2.3	4.1	2.4	22	19	16		0.0038	15.7
1.3	T1-T3	100 L	1MA7 106-6BA ..	935	77	0.73	3.35	13	2.4	4.8	2.5	26	26	16	6	0.0063	22
1.9	T1-T3	112 M	1MA7 113-6BB ..	940	79	0.76	4.7	19	2.3	5.0	2.5	19	16	13	6	0.011	25
2.6	T1-T3	132 S	1MA7 130-6BB ..	945	79	0.75	6.5	26	1.8	4.4	2.4	21	18	13	6	0.015	38
3.5	T1-T3	132 M	1MA7 133-6BB ..	955	81	0.72	8.9	35	2.3	5.1	2.8	16	13	13		0.019	43
4.8	T1-T3	132 M	1MA7 134-6BB ..	950	83	0.76	11.4	48	2.4	5.6	2.8	13	11	13		0.025	51
6.6	T1-T3	160 M	1MA7 163-6BB ..	960	85	0.76	14.9	65	2.7	6.5	3.1	18	9	13	6	0.041	73
9.7	T1-T3	160 L	1MA7 166-6BB ..	965	88	0.76	21.0	96	2.8	7.7	2.2	15	8	13		0.055	99
13.2	T1-T3	180 L	1MA6 186-6BC ..	976	89.8	0.79	27.5	129	1.6	5.4	2.5	27	27	10	22	0.20	170
16.5	T1-T3	200 L	1MA6 206-6BC ..	980	90.8	0.82	32.5	161	1.7	5.8	2.6	24	24	10	22	0.29	220
20	T1-T3		1MA6 207-6BC ..	980	91.3	0.82	39	195	1.7	5.9	2.6	17	15	10		0.33	235
27	T1-T3	225 M	1MA6 223-6BC ..	980	92.5	0.82	54	263	1.6	5.6	2.5	15	15	10	22	0.57	305
33	T1-T3	250 M	1MA6 253-6BC ..	985	93	0.83	66	320	1.6	5.3	2.4	16	16	10	22	0.89	410
40	T1-T3	280 S	1MA6 280-6BC ..	990	93.3	0.85	77	386	1.5	6.2	2.6	13	13	10	22	1.3	540
46	T3	280 M	1MA6 283-6BC ..	988	93.5	0.86	86	445	1.6	6.5	2.5	12	10			1.5	580
50	T1, T2	280 M		987	93.3	0.86	96	484	1.5	5.8	2.3	14	10				
64	T3	315 S	1MA6 310-6BC ..	991	94.3	0.84	124	617	1.7	6.2	2.5	14	10	22	2.4	770	
68	T1, T2	315 S		990	94.2	0.85	131	656	1.6	5.9	2.3	22	10				
76	T3	315 M	1MA6 313-6BC ..	991	94.6	0.84	146	732	1.7	6.4	2.5	8	10			2.9	830
82	T1, T2	315 M		990	94.5	0.84	158	791	1.6	5.9	2.3	18	10				
92	T3	315 L	1MA6 316-6BC ..	991	95	0.85	172	887	1.7	6.5	2.5	9	10	22	3.5	970	
98	T1, T2			990	94.8	0.85	185	945	1.6	6.1	2.3	20	10				
110	T3		1MA6 317-6BC ..	991	95.2	0.84	210	1060	1.7	6.8	2.5	6	10			4.3	1060
120	T1, T2			990	95	0.85	230	1160	1.6	6.2	2.3	16	10				
125	T3		1MA6 318-6BC ..	991	95.2	0.86	220	1210	1.6	7.0	2.5	6	10			4.9	1100
135	T1, T2			990	95.0	0.86	240	1300	1.5	6.5	2.3	17	10				
160	T3	315	1MA8 315-6BD ..	991	95.9	0.86	290	1540	1.3	6.6	2.6	16	7	32	6.0	1300	
175	T1, T2			990	95.8	0.87	315	1690	1.2	6.1	2.4	20	7				
200	T3		1MA8 317-6BD ..	991	96.1	0.87	360	1930	1.4	6.4	2.7	15	7			7.3	1500
215	T1, T2			990	96.0	0.88	380	2070	1.3	6.0	2.5	20	7				
250	T3	355	1MA8 355-6BD ..	994	96.4	0.86	455	2400	1.3	6.5	2.5	14	7	33	13	1900	
275	T1, T2			993	96.3	0.87	495 ²⁾	2640	1.2	6.0	2.3	22	7				
315	T3		1MA8 357-6BD ..	995	96.7	0.86	570 ²⁾	3020	1.4	6.9	2.6	14	7			16	2200
340	T1, T2			994	96.6	0.86	610 ²⁾	3270	1.3	6.5	2.4	23	7				

• Certified for rated voltage of 400 V only. ■ VIK not possible.

Order No. suffixes

Motor type	Penultimate position: Voltage code				Last position: Type of construction code					
	50 Hz	230 VΔ 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ	IM B 3	extra charge IM B 5	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1MA7 073 to 1MA7 096	1	6	3	-	0	1	4	2	3	6
1MA7 106 to 1MA7 166	1	6	3	5	0	1	4	2	3	6
1MA6 186 to 1MA6 313	1	6	3	5	0	1	4	-	-	6
1MA6 316 to 1MA6 318	-	6	3	5	0	-	4	-	-	6
1MA8 315 to 1MA8 357	-	6 ³⁾	3	on request	0	-	4	-	-	6

Voltage code „9“ for other voltages and/or frequencies.
Order codes must be specified in this case (see page 2/10).
Certification costs may be incurred.

There may be changes to the motor types which have not yet been approved by the PTB (Physikalisch-Technische Bundesanstalt).

1) Referring to 75 °C.

2) Parallel feeders required for 400 V supply.

3) Please inquire about the rated voltage range 1MA8.

Squirrel-Cage Motors

Increased Safety · EEx e II Type of Protection

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame sizes		
		1MA7	1MA6	1MA8

Windings and motor protection

Y52 •	Used as class F – and req. rating CT.. °C and/or altitude ... m above sea level	63 – 160 Request necessary. Certification costs may be incurred.	180 – 315 Request necessary. Certification costs may be incurred.	–
A11	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	63 – 160	180 – 315	–
A12	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping	63 – 160	180 – 315	Standard design

Paint finish

K26	Special paintwork in RAL 7030 stone grey	Standard design	180 – 315	315 – 355
M16	Special paintwork in RAL 1002 sand yellow	63 – 160	180 + 200	225 – 315 with Order code Y54 and special paintwork RAL
M17	Special paintwork in RAL 1013 pearl white			
M18	Special paintwork in RAL 3000 flame red			
K27	Special paintwork in RAL 6011 mignonette green			
M19	Special paintwork in RAL 6021 pale green			
M20	Special paintwork in RAL 7001 silver grey			
K28	Special paintwork in RAL 7031 bluish grey			
L42	Special paintwork in RAL 7032 pebble grey			
M21	Special paintwork in RAL 7035 light grey			
M22	Special paintwork in RAL 9001 cream			
M23	Special paintwork in RAL 9002 grey white	63 – 160	180 – 315	315 – 355
L43	Special paintwork in RAL 9005 jet black			
Y54 •	Special paintwork in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	–	180 – 315	315 – 355
Y53 •	Standard paintwork in other colors and special paintwork RAL	–	180 – 315	315 – 355
K23	Unpainted (only cast iron parts primed)	63 – 160	180 – 315	315 – 355
K24	Unpainted, only primed	63 – 160	180 + 200	–

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

• Additional plain text required.

1) For 3RN1 tripping unit see Catalog NS K.

Squirrel-Cage Motors

Increased Safety · EEx e II Type of Protection

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame sizes		
		1MA7	1MA6	1MA8
Mechanical features				
K06	Two-part board of the terminal box	–	225 – 315	– for 1MA8 357, 2- and 4-pole Standard design
K09	Side-mounted terminal box, right (when viewed in the drive end side)	80 – 160	180 – 315	Standard design
K10	Side-mounted terminal box, left (when viewed in the drive end side)	80 – 160	180 – 315	315 – 355
K83	Terminal box rotated 90°, entry from drive-end	63 – 160	180 – 315	315 – 355
K84	Terminal box rotated 90°, entry from non-drive end	63 – 160	180 – 315	315 – 355
K85	Terminal box rotated 180°	63 – 160	180 – 315	315 – 355
K01	Vibration severity grade R	63 – 160	180 – 315	315 – 355
K16	Second standard shaft-end ¹⁾	63 – 160	180 – 315	315 – 355
K17	Drive-end seal for flange-mounting motors ²⁾	63 – 160	180 – 315	–
K20	Bearings for increased cantilever forces ³⁾	100 – 160	180 – 315	315 – 355
K40	Regreasing device	100 – 160	180 – 250, from BG 280 standard design	–
L04	Locating bearing at non-drive end	63 – 132	–	–
K94	Locating bearing at drive end	63 – 160	180 + 200	–
K30	VIK design ⁴⁾	63 – 160	180 – 315	315 – 355
K31	Extra rating plate, loose	63 – 160	180 – 315	315 – 355
Y82 • for purchasers' data	Extra rating plate	63 – 160	180 – 315	315 – 355
K37	Low-noise design for 2-pole motors with clockwise direction of rotation ⁵⁾	132 – 160	180 – 315	Standard design
K38	Low-noise design for 2-pole motors with anticlockwise direction of rotation ⁵⁾	132 – 160	180 – 315	315 – 355
K45	Anti-condensation heater for 230 V	–	225 – 315	315 – 355
K46	Anti-condensation heater for 115 V	–	225 – 315	315 – 355
L99	Wire-lattice pallet	63 – 160	180	–
Certification				
B02	Factory test in accordance with EN 10 204 2.3	63 – 160	180 – 315	–

- Additional plain text is required.
- Vertically mounted motors for 1MA6 on request, low-noise design not available.
 - Not available for IM V 3 type of construction, 1MA6 motors only 4- to 8-pole.

- Not available for:
2-pole 1MA6 motors, frame size 315 L, vertically mounted;
2-pole 1MA8 motors and 1MA8 motors, vertically mounted.
Vibration severity grade R for 1MA6 motors with frame size 225 M or larger on request.

- Low-noise design is additionally required for frame sizes 315 S to 315 L. Please note the rated-output assignment and the dimensions of 1MA8 motors. The terminal box of 2- and 4-pole 1MA8 357 motors can't be rotated 4 x 90°.

- 1MA6 motors are up to 80 mm longer than the standard design. A second shaft extension cannot be mounted.

Squirrel-Cage Motors

Explosion-Proof Enclosure

Ex de IIC Type of Protection

6/2
6/3
6/4
6/5

Selection and ordering data

2-pole, 50 Hz, temperature classes T1 to T4
4-pole, 50 Hz, temperature classes T1 to T4
6-pole, 50 Hz, temperature classes T1 to T4
8-pole, 50 Hz, temperature classes T1 to T4

6/6

Special designs

6

1MJ motors Explosion-proof enclosure

Frame sizes	71 to 450
Output range	0.25 to 630 kW
Temperature class	T1 to T4
Class F	utilization according to class B
Suitable for con- verter-fed operation	$t_s > 0.1 \mu\text{s}$ at $U \leq 500 \text{ V}$

The motors are certified for the highest explosion class IIC.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Temperature classes T1 to T4,
degree of protection IP 55, class F

Selection and ordering data

Rated output HP	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.rotor current of rated current	Breakdown torque	Torque class	Torque characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight
			Rated speed rpm	Efficiency η	Power factor p.f.	Rated current at 400 V A	Rated torque Nm								Type of constr. IM B 3	approx. kg
3000 rpm, 2-pole, 50 Hz														
0.37	71 M	1MJ6 070-2CA ..	2750	67	0.81	0.98	1.3	2.3	4.3	2.3	16	1	0.00035	18.8
0.55		1MJ6 073-2CA ..	2790	71	0.81	1.38	1.9	2.3	5.3	2.3	16		0.00045	19.8
0.75	80 M	1MJ6 080-2CA ..	2840	72	0.86	1.75	2.5	2.4	6.3	2.3	16	1	0.00085	24
1.1		1MJ6 083-2CA ..	2835	74	0.87	2.45	3.7	2.6	6.3	2.3	16		0.0011	25.6
1.5	90 L	1MJ6 096-2CA ..	2850	78	0.84	3.3	5.0	2.5	6.7	2.5	16	2	0.0015	32.3
2.2		1MJ6 097-2CA ..	2860	80	0.86	4.6	7.4	2.8	7.1	2.8	16		0.0020	35
3	100 L	1MJ6 106-2CA ..	2885	82	0.85	6.2	9.9	2.8	7.7	3.0	16	2	0.0038	44.4
4	112 M	1MJ6 113-2CA ..	2895	84	0.88	7.8	13	2.4	7.6	2.8	16	2	0.0055	56.3
5.5	132 S	1MJ6 130-2CA ..	2910	83	0.86	11.1	18	2.0	6.3	2.6	16	2	0.016	80
7.5		1MJ6 131-2CA ..	2905	84	0.89	14.5	25	2.2	6.9	2.6	16		0.021	85.5
11	160 M	1MJ6 163-2CA ..	2915	85	0.89	21	36	2.0	6.3	2.6	16	2	0.034	125
15	160 M	1MJ6 164-2CA ..	2925	87	0.89	28	49	2.3	7.2	3.1	16		0.040	135
18.5	160 L	1MJ6 166-2CA ..	2925	89	0.89	33.5	60	2.4	7.7	3.3	16		0.052	160
22	180 M	1MJ6 183-2CA ..	2940	92	0.88	39	71	2.5	6.9	3.2	16	3	0.077	175
30	200 L	1MJ6 206-2CA ..	2940	92.3	0.89	53	97	2.4	6.5	2.8	16	3	0.14	250
37		1MJ6 207-2CA ..	2945	92.8	0.90	64	120	2.4	7.7	2.8	16		0.16	270
45	225 M	1MJ6 223-2CB ..	2955	93.9	0.90	77 ¹⁾	145	2.3	6.9	2.7	13	14	0.24	335
55	250 M	1MJ6 253-2CB ..	2965	94.0	0.91	93	177	2.1	6.9	2.8	13	14	0.45	445
75	280 S	1MJ6 280-2CC ..	2975	94.7	0.90	128	241	1.9	7.0	2.7	10	23	0.79	600
90	280 M	1MJ6 283-2CC ..	2975	95.1	0.91	150 ¹⁾	289	2.0	7.0	2.7	10		0.92	640
110	315 S	1MJ6 310-2CC ..	2980	94.8	0.90	186	353	1.8	7.0	2.8	10	23	1.3	840
132	315 M	1MJ6 313-2CC ..	2980	95.1	0.90	225 ¹⁾	423	1.9	7.0	2.8	10		1.5	900
160	315 M	1MJ8 313-2AB ..	2980	95.7	0.88	280	513	2.2	6.9	2.5	10	17	2.3	1100
200	315 L	1MJ8 316-2AB ..	2980	96.2	0.89	335	641	2.3	6.9	2.6	10		2.8	1200
250	355 M	1MJ8 353-2AC ..	2980	96.2	0.89	423 ²⁾	801	2.1	6.7	2.6	13	17	3.5	1700
315	355 L	1MJ8 356-2AC ..	2980	96.6	0.89	530 ²⁾	1009	2.1	6.7	2.6	13		4.2	2000
355	400 S	1MJ8 400-2AD ..	2986	96.6	0.91	585 ²⁾	1135	0.9	6.5	2.8	7	15	5.2	2500
400	400 M	1MJ8 403-2AE ..	2986	96.7	0.91	655 ²⁾	1279	0.85	6.6	2.9	5		6.0	2800
450	450 M	1MJ8 453-2AE ..	2990	96.7	0.91	740 ²⁾	1437	0.8	6.6	2.9	5	15	9	3300
500	450 L	1MJ8 456-2AE ..	2990	96.8	0.91	820 ¹⁾²⁾	1597	0.8	6.5	2.8	5		10	3700
560	450 L	1MJ8 457-2AE ..	2990	96.9	0.91	920 ¹⁾²⁾	1789	0.8	6.5	2.8	5		11	3700

• EEx de IIB type of protection.

Order No. suffixes

Motor type	Penultimate position: Voltage code					Last position: Type of construction code					
	50 Hz	230 V Δ / 400 V Υ	400 V Υ	400 V Δ / 690 V Υ	500 V Υ	500 V Δ	IM B 3	(extra charge) IM B 5	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1MJ6 070 to 1MJ6 097	1	-	6	3	-	0	1	4	2	3 ³⁾	6
1MJ6 106 to 1MJ6 166	1	-	6	3	5	0	1	4	-	-	6
1MJ6 183 to 1MJ6 207	1	-	6	3	5	0	1	4	-	-	6
1MJ6 223 to 1MJ6 313	-	4	6	3	-	0	1	4	-	-	6
1MJ8 313 to 1MJ8 316	-	-	6	3	5	0	1	4	-	-	6
1MJ8 353 to 1MJ8 457	-	-	6	3	5	0	-	4	-	-	6

Voltage code "9" for other voltages and/or frequencies.
Order codes must be specified in this case.

1) Parallel feeders required for 400 V supply.

2) The motors have 2 terminal boxes, see Part 7.

3) Only up to 1MJ6 083.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Temperature classes T1 to T4,
degree of protection IP 55, class F

Selection and ordering data

Rated output HP	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.rotor current of rated current	Breakdown torque	Torque class	Torque characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight
			Rated speed rpm	Efficiency η	Power factor p.f.	Rated current at 400 V A	Rated torque Nm								Type of constr. IM B 3 approx. kg
1500 rpm, 4-pole, 50 Hz														
0.25	71 M	1MJ6 070-4CB ..	1325	60	0.77	0.78	1.8	1.8	3.2	1.8	13	12	0.0006	19.4
0.37		1MJ6 073-4CB ..	1375	64	0.74	1.13	2.5	2.0	3.6	2.0	13		0.0008	20.3
0.55	80 M	1MJ6 080-4CA ..	1395	71	0.79	1.42	3.7	2.3	4.7	2.4	16	3	0.0015	24
0.75		1MJ6 083-4CA ..	1395	73	0.79	1.88	5.1	2.5	5.0	2.6	16		0.0018	25
1.1	90 L	1MJ6 096-4CA ..	1410	73	0.81	2.7	7.5	2.1	4.9	2.5	16	2	0.0028	32
1.5		1MJ6 097-4CA ..	1420	77	0.80	3.5	10	2.2	5.8	2.6	16	3	0.0035	35
2.2	100 L	1MJ6 106-4CA ..	1420	78	0.80	5.1	15	2.2	6.0	2.6	16	3	0.0048	44.1
3		1MJ6 107-4CA ..	1415	80	0.82	6.6	20	2.7	6.4	3.0	16		0.0058	46.3
4	112 M	1MJ6 113-4CA ..	1435	83	0.82	8.5	27	2.8	7.2	3.0	16	2	0.011	57.8
5.5	132 S	1MJ6 130-4CA ..	1450	86	0.83	11.1	36	2.4	6.9	3.3	16	3	0.018	81.5
7.5	132 M	1MJ6 133-4CA ..	1450	86	0.84	15	49	2.7	7.7	3.3	16		0.024	107
11	160 M	1MJ6 163-4CA ..	1455	87	0.85	21.5	72	2.4	6.6	2.9	16	3	0.040	127
15	160 L	1MJ6 166-4CA ..	1465	89	0.85	28.5	98	2.8	7.4	3.2	16		0.052	148
18.5	180 M	1MJ6 183-4CA ..	1460	90.5	0.84	35	121	2.3	7.1	3.0	16	3	0.13	175
22	180 L	1MJ6 186-4CA ..	1460	91.2	0.85	41	144	2.3	7.5	3.0	16		0.15	190
30	200 L	1MJ6 207-4CA ..	1465	91.8	0.86	55	196	2.6	7.4	3.2	16	3	0.24	260
37	225 S	1MJ6 220-4CA ..	1475	93.0	0.86	67 ¹⁾	240	2.5	7.0	3.1	16	3	0.44	325
45	225 M	1MJ6 223-4CA ..	1475	93.4	0.87	80 ¹⁾	292	2.6	7.0	3.2	16		0.52	355
55	250 M	1MJ6 253-4CA ..	1480	94.0	0.87	97	355	2.6	6.7	2.5	16	4	0.79	465
75	280 S	1MJ6 280-4CA ..	1485	94.7	0.86	132	482	2.5	6.7	2.7	16	4	1.4	630
90	280 M	1MJ6 283-4CA ..	1485	95	0.86	160 ¹⁾	579	2.5	6.8	2.8	16		1.6	680
110	315 S	1MJ6 310-4CA ..	1486	94.8	0.86	194	707	2.5	6.7	2.7	16	4	2.2	870
132	315 M	1MJ6 313-4CA ..	1486	95.5	0.86	232 ¹⁾	848	2.7	7.2	3.0	16		2.7	950
160	315 M	1MJ8 313-4AC ..	1485	95.6	0.86	285	1029	2.4	6.8	2.5	13	16	3.3	1120
200	315 L	1MJ8 316-4AB ..	1485	95.7	0.85	355	1286	2.5	6.9	2.4	10		4.0	1200
225	355 M	1MJ8 353-4AC ..	1485	96.2	0.85	400	1447	2.1	6.6	2.3	13	17	5.5	1800
250	355 M	1MJ8 354-4AD ..	1490	96.5	0.86	435 ²⁾	1602	1.2	6.5	2.4	7	15	6	1800
280	355 L	1MJ8 356-4AC ..	1485	96.3	0.85	495 ²⁾	1801	2.1	6.6	2.3	13	17	6.5	2100
315	355 L	1MJ8 357-4AD ..	1490	96.6	0.87	540 ²⁾	2019	1.2	6.5	2.4	7	15	7	2100
355	400 S	1MJ8 400-4AD ..	1493	96.6	0.86	620 ²⁾	2271	1.05	6.2	2.6	7	15	10	2650
400	400 M	1MJ8 403-4AD ..	1493	96.7	0.86	695 ²⁾	2559	1.05	6.2	2.6	7		11	2900
450	400 L	1MJ8 406-4AD ..	1493	96.8	0.86	780 ²⁾	2878	1.0	6.0	2.5	7		12	3050
500	450 M	1MJ8 453-4AD ..	1493	96.9	0.89	840 ¹⁾²⁾	3198	0.95	6.2	2.6	7	15	22	3500
560	450 L	1MJ8 456-4AD ..	1493	97.0	0.89	940 ¹⁾²⁾	3582	0.95	6.2	2.6	7		24	3800
630	450 L	1MJ8 457-4AD ..	1494	97.0	0.89	1055 ¹⁾²⁾⁴⁾	4027	1.0	6.4	2.6	7		27	4050

• EEx de IIB type of protection.

Order No. suffixes

Motor type	Penultimate position: Voltage code					Last position: Type of construction code					
	50 Hz 230 VΔ/ 400 VY	400 VY	400 VΔ/ 690 VY	500 VY	500 VΔ	IM B 3	(extra charge) IM B 5	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1MJ6 070 to 1MJ6 097	1	-	6	3	-	0	1	4	2	3 ³⁾	6
1MJ6 106 to 1MJ6 166	1	-	6	3	5	0	1	4	-	-	6
1MJ6 183 to 1MJ6 207	1	-	6	3	5	0	1	4	-	-	6
1MJ6 220 to 1MJ6 313	-	4	6	3	-	0	1	4	-	-	6
1MJ8 313 to 1MJ8 316	-	-	6	3	5	0	1	4	-	-	6
1MJ8 353 to 1MJ8 457	-	-	6	3	5	0	-	4	-	-	6

Voltage code "9" for other voltages and/or frequencies.
Order codes must be specified in this case.

1) Parallel feeders required for 400 V supply.

2) The motors have 2 terminal boxes, see Part 7.

3) Only up to 1MJ6 083.

4) Parallel feeders required for 500 V supply.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Temperature classes T1 to T4,
degree of protection IP 55, class F

Selection and ordering data

Rated output HP	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.rotor current of rated current	Breakdown torque	Torque class	Torque characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight
			Rated speed rpm	Efficiency η	Power factor p.f.	Rated current at 400 V A	Rated torque Nm								Type of constr. IM B 3	approx. kg
			1000 rpm, 6-pole, 50 Hz											
0.25	71 M	1MJ6 073-6CA ..	870	63	0.70	0.82	2.7	2.2	3.1	2.2	16	6	0.0009	16
0.37	80 M	1MJ6 080-6CA ..	910	64	0.71	1.18	3.9	1.9	3.3	2.0	16	6	0.0015	34.6
0.55		1MJ6 083-6CA ..	900	64	0.74	1.67	5.8	2.0	3.5	2.1	16		0.0018	22.5
0.75	90 L	1MJ6 096-6CA ..	910	69	0.76	2.1	8.0	2.2	3.9	2.3	16	6	0.0028	31.8
1.1		1MJ6 097-6CA ..	905	72	0.75	2.95	12	2.4	4.3	2.4	16		0.0035	32
1.5	100 L	1MJ6 106-6CA ..	930	72	0.75	4.0	15	2.0	4.5	2.1	16	6	0.0063	39
2.2	112 M	1MJ6 113-6CA ..	945	76	0.76	5.5	22	2.2	4.8	2.5	16	6	0.011	52.5
3	132 S	1MJ6 130-6CA ..	945	78	0.75	7.4	30	2.0	4.8	2.2	16	6	0.015	78
4	132 M	1MJ6 133-6CA ..	945	79	0.76	9.6	40	2.0	5.0	2.4	16		0.019	86
5.5	132 M	1MJ6 134-6CA ..	950	83	0.76	12.6	55	2.2	5.4	2.5	16		0.025	110
7.5	160 M	1MJ6 163-6CA ..	960	86	0.72	17.5	75	2.1	5.1	2.5	16	6	0.041	134
11	160 L	1MJ6 166-6CA ..	960	87	0.74	24.5	109	2.3	5.5	2.5	16		0.049	167
15	180 L	1MJ6 186-6CA ..	970	89	0.83	29.5	148	2.6	6.3	2.4	16	4	0.20	180
18.5	200 L	1MJ6 206-6CA ..	975	90.2	0.82	36	181	2.6	6.3	2.3	16	4	0.29	240
22		1MJ6 215-6CA ..	975	90.8	0.83	42.5	215	2.5	5.7	2.3	16		0.33	255
30	225 M	1MJ6 223-6CA ..	978	92.0	0.84	56 ¹⁾	293	2.6	5.7	2.2	16	4	0.57	330
37	250 M	1MJ6 253-6CA ..	980	92.4	0.84	69	361	2.6	6.0	2.1	16	4	0.89	440
45	280 S	1MJ6 280-6CA ..	982	93.0	0.86	81	438	2.4	6.0	2.3	16	4	1.3	560
55	280 M	1MJ6 283-6CA ..	984	93.6	0.86	99	534	2.5	6.2	2.4	16		1.5	600
75	315 S	1MJ6 310-6CA ..	988	93.8	0.85	136	725	2.4	6.2	2.5	16	4	2.4	810
90	315 M	1MJ6 313-6CA ..	988	94.2	0.85	162	870	2.4	6.2	2.5	16		2.9	870
110	315 M	1MJ8 313-6AC ..	990	95.3	0.86	195	1061	2.1	6.8	2.3	13	17	4.8	1150
132	315 M	1MJ8 314-6AC ..	990	95.4	0.87	228	1273	2.1	6.6	2.3	13		4.8	1150
160	315 L	1MJ8 316-6AC ..	990	95.5	0.87	275	1543	2.1	6.6	2.3	13		6.0	1250
200	355 M	1MJ8 353-6AD ..	990	95.6	0.86	350	1929	1.1	6.5	2.2	7	17	8	1900
250	355 L	1MJ8 356-6AD ..	990	95.8	0.85	440 ²⁾	2412	1.1	6.5	2.2	7		9	2200
280	400 S	1MJ8 400-6AD ..	994	96.2	0.85	495 ²⁾	2690	1.0	5.8	2.35	7	15	16	2800
315	400 M	1MJ8 403-6AD ..	994	96.3	0.85	560 ²⁾	3026	1.0	6.0	2.4	7		17.5	3000
355	400 L	1MJ8 406-6AD ..	994	96.4	0.85	625 ²⁾	3411	1.0	5.8	2.35	7		19	3200
400	450 M	1MJ8 453-6AD ..	995	96.5	0.85	705 ²⁾	3839	0.9	5.8	2.45	7	15	28	3700
450	450 L	1MJ8 456-6AD ..	995	96.6	0.85	790 ²⁾	4319	0.9	5.8	2.4	7		31	4000
500	450 L	1MJ8 457-6AD ..	995	96.7	0.85	880 ¹⁾²⁾	4799	0.9	5.9	2.45	7		34	4300

• EEx de IIB type of protection.

Order No. suffixes

Motor type	Penultimate position: Voltage code					Last position: Type of construction code						
	50 Hz	230 V Δ / 400 V Υ	400 V Υ	400 V Δ / 690 V Υ	500 V Υ	500 V Δ	IM B 3	(extra charge)	IM B 5	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1MJ6 073 to 1MJ6 097	1	-	6	3	-	0	1	4	2	3 ³⁾	6	
1MJ6 106 to 1MJ6 166	1	-	6	3	5	0	1	4	-	-	6	
1MJ6 186 to 1MJ6 207	1	-	6	3	5	0	1	4	-	-	6	
1MJ6 223 to 1MJ6 313	-	4	6	3	-	0	1	4	-	-	6	
1MJ8 313 to 1MJ8 316	-	-	6	3	5	0	1	4	-	-	6	
1MJ8 353 to 1MJ8 457	-	-	6	3	5	0	-	4	-	-	6	

Voltage code "9" for other voltages and/or frequencies.
Order codes must be specified in this case.

1) Parallel feeders required for 400 V supply.

2) The motors have 2 terminal boxes, see Part 7.

3) Only up to 1MJ6 083.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Temperature classes T1 to T4,
degree of protection IP 55, class F

Selection and ordering data

Rated output HP	Frame size	Order No. For Order No. suffixes for voltage and type of constr. see table below	Performance at rated output					Lo.-rotor torque For direct-online starting in multiples of rated torque	Lo.rotor current of rated current	Breakdown torque	Torque class	Torque characteristic acc. to pages 2/10 to 2/13	Moment of inertia J	Weight
			Rated speed rpm	Efficiency η %	Power factor p.f.	Rated current at 400 V A	Rated torque Nm								Type of constr. IM B 3 approx. kg
750 rpm, 8-pole, 50 Hz														
0.37	90 L	1MJ6 096-8CB ..	655	61	0.76	1.16	5.3	1.4	2.8	1.7	13	13	0.0025	27.5
0.55		1MJ6 097-8CB ..	655	65	0.76	1.62	7.9	1.5	2.9	1.7	13	13	0.0035	29.5
0.75	100 L	1MJ6 106-8CB ..	665	65	0.77	2.15	11	1.6	3.5	1.8	13	13	0.0053	34.5
1.1		1MJ6 107-8CB ..	685	74	0.74	2.9	16	1.8	3.9	2.0	13	13	0.0070	48
1.5	112 M	1MJ6 113-8CB ..	700	74	0.73	4.0	21	1.8	4.4	2.0	13	13	0.013	52
2.2	132 S	1MJ6 130-8CB ..	695	74	0.72	6.0	30	1.7	4.2	2.1	13	13	0.014	78
3	132 M	1MJ6 133-8CB ..	700	76	0.72	7.9	40	1.9	4.4	2.2	13	13	0.019	86
4	160 M	1MJ6 163-8CB ..	715	81	0.72	9.9	54	2.1	4.8	2.3	13	13	0.035	121
5.5	160 M	1MJ6 164-8CB ..	710	83	0.72	13.3	74	2.3	5.1	2.5	13	6	0.043	134
7.5	160 L	1MJ6 166-8CB ..	715	84	0.72	17.9	100	2.6	5.8	2.8	13	6	0.062	159
11	180 L	1MJ6 186-8CB ..	725	87	0.70	26	145	2.0	5.0	2.2	13	14	0.21	185
15	200 L	1MJ6 207-8CB ..	725	87.5	0.78	32	198	2.1	5.0	2.2	13	14	0.37	265
18.5	225 S	1MJ6 220-8CB ..	725	88.6	0.80	37.5	244	2.1	5.0	2.2	13	14	0.58	325
22	225 M	1MJ6 223-8CB ..	725	90.1	0.81	43.5	290	2.1	5.0	2.2	13	13	0.66	350
30	250 M	1MJ6 253-8CB ..	730	91.6	0.81	58	392	2.1	5.0	2.1	13	14	1.1	465
37	280 S	1MJ6 280-8CB ..	732	92.7	0.82	70	483	2.2	5.5	2.2	13	14	1.4	570
45	280 M	1MJ6 283-8CB ..	734	92.8	0.83	84	585	2.2	5.5	2.2	13	13	1.6	620
55	315 S	1MJ6 310-8CB ..	738	93.1	0.82	104	712	2.2	6.0	2.4	13	14	2.3	780
75	315 M	1MJ6 313-8CB ..	738	93.6	0.82	140	970	2.3	6.2	2.5	13	13	3.0	890
90	315 M	1MJ8 313-8AB ..	740	94.4	0.79	175	1161	1.7	6.1	2.0	10	17	4.8	1150
110	315 M	1MJ8 314-8AB ..	740	94.4	0.79	210	1420	1.7	6.1	2.0	10	17	4.8	1150
132	315 L	1MJ8 316-8AB ..	740	94.4	0.80	255	1704	1.8	6.1	2.0	10	17	6.0	1250
160	355 M	1MJ8 353-8AD ..	740	95.1	0.83	292	2065	1.3	5.3	2.2	7	17	12	1900
200	355 L	1MJ8 356-8AD ..	740	95.4	0.83	365	2581	1.3	5.3	2.2	7	17	14.7	2250
250	400 S	1MJ8 400-8AD ..	743	95.8	0.84	450 ¹⁾	3213	1.1	5.5	2.4	7	15	16	2800
280	400 M	1MJ8 403-8AD ..	743	95.9	0.84	500 ¹⁾	3599	1.1	5.4	2.3	7	15	17.5	3000
315	400 L	1MJ8 406-8AD ..	743	96.0	0.84	565 ¹⁾	4049	1.1	5.5	2.35	7	15	19	3200
355	450 M	1MJ8 453-8AD ..	745	96.2	0.84	635 ¹⁾	4551	1.0	5.6	2.35	7	15	27	3700
400	450 L	1MJ8 456-8AD ..	745	96.3	0.84	715 ¹⁾	5128	1.0	5.6	2.4	7	15	30	4000
450	450 L	1MJ8 457-8AD ..	745	96.4	0.84	800 ¹⁾	5768	1.0	5.5	2.35	7	15	33	4300

• EEx de IIB type of protection.

Order No. suffixes

Motor type	Penultimate position: Voltage code					Last position: Type of construction code					
	50 Hz 230 V Δ / 400 V Υ	400 V Υ	400 V Δ / 690 V Υ	500 V Υ	500 V Δ	IM B 3	(extra charge) IM B 5	IM V 1 with canopy	IM B 14 with standard flange	IM B 14 with custom flange	IM B 35
1MJ6 096 and 1MJ6 097	1	-	6	3	-	0	1	4	2	3 ²⁾	6
1MJ6 106 to 1MJ6 166	1	-	6	3	5	0	1	4	-	-	6
1MJ6 186 to 1MJ6 207	1	-	6	3	5	0	1	4	-	-	6
1MJ6 220 to 1MJ6 313	-	4	6	3	-	0	1	4	-	-	6
1MJ8 313 to 1MJ8 316	-	-	6	3	5	0	1	4	-	-	6
1MJ8 353 to 1MJ8 457	-	-	6	3	5	0	-	4	-	-	6

Voltage code "9" for other voltages and/or frequencies.
Order codes must be specified in this case.

1) The motors have 2 terminal boxes, see Part 7.

2) Only up to 1MJ6 083.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame size		
		1MJ6	1MJ6	1MJ8
Motor protection				
A11	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	71 – 200 •	225 – 315	315 – 450
A12	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	71 – 200 •	225 – 315	315 – 450
A15	Motor protection with PTC thermistors for converter-fed operation with 3 embedded temperature sensors for tripping ¹⁾	71 – 200 •	225 – 315	315 – 450
A16	Motor protection with PTC thermistors for converter-fed operation with 6 embedded temperature sensors for alarm and tripping ¹⁾	71 – 200 •	225 – 315	315 – 450

• Additional anti-condensation heater not available.

Paint finish

K26	Special paintwork in RAL 7030 stone grey	Standard design	225 – 315	315 – 450
M16	Special paintwork in RAL 1002 sand yellow	71 – 200	225 – 315 with Order code Y54 and special paintwork RAL	315 – 450 with Order code Y54 and special paintwork RAL
M17	Special paintwork in RAL 1013 pearl white			
M18	Special paintwork in RAL 3000 flame red			
K27	Special paintwork in RAL 6011 mignonette green			
M19	Special paintwork in RAL 6021 pale green			
M20	Special paintwork in RAL 7001 silver grey			
K28	Special paintwork in RAL 7031 bluish grey			
L42	Special paintwork in RAL 7032 pebble grey			
M21	Special paintwork in RAL 7035 light grey			
M22	Special paintwork in RAL 9001 cream			
M23	Special paintwork in RAL 9002 grey white			
L43	Special paintwork in RAL 9005 jet black			
Y54 •	Special paintwork in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	71 – 200	225 – 315	315 – 450
Y53 •	Standard paintwork in other colors	–	225 – 315	315 – 450
K23	Unpainted (only cast iron parts primed)	71 – 200	225 – 315	315 – 450
K24	Unpainted, only primed	71 – 200	–	–

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

• Additional plain text required.

1) For 3RN1 tripping unit see Catalog NS K.

Squirrel-Cage Motors

Explosion-Proof Enclosure · EEx de IIC Type of Protection

Order codes for special designs

Additional Order No. suffix -Z with Order code	Special designs	Motor type – frame size		
		1MJ6	1MJ6	1MJ8
Mechanical features				
K09	Side-mounted terminal box, right (when viewed in the drive end side)	90 – 200	225 – 315	315 – 450
K10	Side-mounted terminal box, left (when viewed in the drive end side)	90 – 200	225 – 315	315 – 450
K83	Terminal box rotated 90°, entry from drive-end on AS	71 – 200	225 – 315	315 – 450
K84	Terminal box rotated 90°, entry from non-drive end on BS	71 – 200	225 – 315	315 – 450
K85	Terminal box rotated 180°	71 – 200	225 – 315	315 – 450
K01	Vibration severity grade R	71 – 200	225 – 315	315 – 450
K16	Second started shaft-end ¹⁾	71 – 200	225 – 315	315 – 450
K17	Drive-end seal for flange-mounting motors ²⁾	71 – 200	225 – 315	315 – 450
K20	Bearings for increased cantilever forces	180 – 200 not available with vibration severity grade R	225 – 250	–
K40	Regreasing device	180 – 200	225 – 250, standard design from	
K30	VIK design ³⁾	71 – 200	225 – 315	315 – 355
K31	Extra rating plate, loose	71 – 200	225 – 315	315 – 450
Y82 • for purchasers' data	Extra rating plate	71 – 200	225 – 315	315 – 450
K37	Low-noise design for 2-pole motors with clockwise direction of rotation ⁴⁾	132 – 200	225 – 315	315 – 400
K38	Low-noise design for 2-pole motors with anticlockwise direction of rotation ⁴⁾	132 – 200	225 – 315	315 – 400
K45	Anti-condensation heater for 230 V	71 – 200 Additional PTC thermistor not available	225 – 315	315 – 400
K46	Anti-condensation heater for 115 V	71 – 200 Additional PTC thermistor not available	225 – 315	315 – 400
Certification				
B02	Factory test in accordance with EN 10 204 2.3	71 – 200	–	–

• Additional plain text required.
1) Vertically mounted motors from frame size BG 180 M with 1MJ6 on request, low-noise design not available.

2) Not available for IM V 3 type of construction, only 4- to 8-pole motors from frame size 180 M.

3) Additional low-noise design is required for frame size 315 S or larger.

4) The motors are up to 80 mm longer than the standard design. A second shaft extension cannot be mounted.

Squirrel-Cage Motors

Notes

6

Короткозамкнутые электродвигатели

SIEMENS

Размеры

Примечание

- Размеры на чертежах в соответствии с DIN EN 50 347 и IEC 60 072.
- Вал (DIN 748) и центрирующие выступы (DIN 42 948) указанные в таблицах, удовлетворяют следующему:

Размеры символ	ISO в соотв с DIN ISO 286-2	
D, DA	< 30	j6
	> 30 to 50	k6
	> 50	m6
N	< 250	j6
	> 250	h6
F, FA		h9

- Допуски на размер:

Отклонения, указанные ниже допускаются для размеров, выделенных в таблицах:

Размеры символ	Размеры	Допустимое отклонение
A, B	< 250	± 0.75
	> 250 to 500	± 1.0
	> 500 to 750	± 1.5
	> 750 to 1000	± 2.0
	> 1000	± 2.5
M	< 200	± 0.25
	> 200 to 500	± 0.5
	> 500	± 1.0
H	< 250	- 0.5
	> 250	- 1.0

E, EA - 0.5

Шпоночные пазы (размеры GA, GC, F и FA соответствуют DIN 6885 Часть 1).

Фланцы

В DIN EN 50 347, плоские фланцы FF с отверстиями для сквозного болта и выступами FT с отверстиями под винт соответствуют определенному типоразмеру. Фланцы A и C в соответствие с DIN 42 948. См. таблицу справа.

- Все заявленные размеры в мм.

Замечание

Siemens сохраняет за собой право изменять техническую информацию без уведомления. Размеры в каталоге могут отличаться от действительных. Уточнение при заказе.

7/2	1LA5, 1LA7 и 1MA7
7/4	1LA9
7/6	1LG8
7/8	1LA6 и 1MA6
7/10	1LA8 и 1MA8
7/12	1UA7
7/14	1MJ6
7/16	1MJ6 и 1MJ8

Монтажное исполнение IM B 3

7/18	1LA5, 1LA7 и 1MA7
7/20	1LA9
7/22	1LG8
7/24	1LA6 и 1MA6
7/26	1LA8 и 1MA8
7/28	1UA7
7/30	1MJ6
7/32	1MJ6 и 1MJ8

Монтажное исполнение IM B 5 и IM V 1

7/34	1LA5, 1LA7 и 1MA7
7/36	1LA9
7/38	1LG8
7/40	1LA6 и 1MA6
7/42	1LA8 и 1MA8
7/44	1UA7
7/46	1MJ6
7/48	1MJ6

Монтажное исполнение IM B 35

7/50	1LA7 и 1MA7
7/52	1LA9
7/54	1LG8
7/56	1MJ6

Монтажное исполнение IM B 14

7/58	1LA5 и 1LA7
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Модульная технология

Типоразмер двигателя	Соответствие фланцев типоразмеру электродвигателя			
	Фланцы под сквозной болт		под винт	
	DIN EN 50 347	DIN 42 948	DIN EN 50 347	DIN 42 948
56	FF 100	A 120	FT 65	C 80
63	FF 115	A 140	FT 75	C 90
71	FF 130	A 160	FT 85	C 105
80	FF 165	A 200	FT 100	C 120
90	FF 165	A 200	FT 115	C 140
100	FF 215	A 250	FT 130	C 160
112	FF 215	A 250	FT 130	C 160
132	FF 265	A 300	FT 165	C 200
160	FF 300	A 350	FT 215	C 250
180	FF 300	A 350		
200	FF 350	A 400		
225	FF 400	A 450		
250	FF 500	A 550		
280	FF 500	A 550		
315	FF 600	A 660		

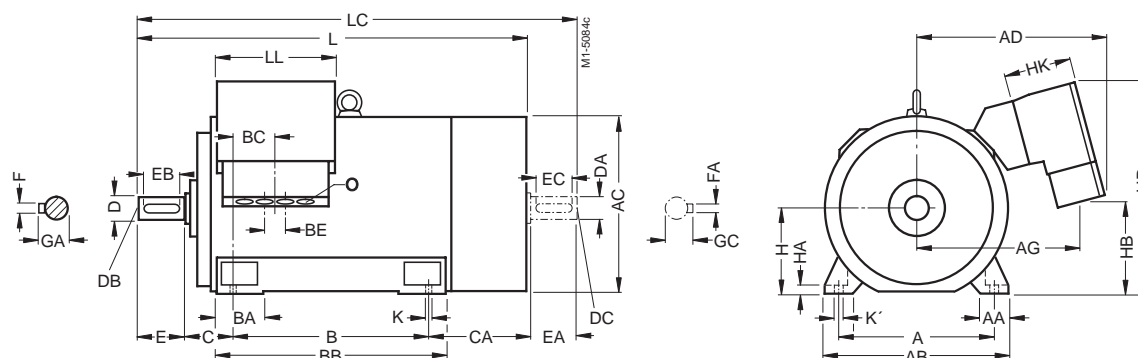
Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 3

1LA8 · Типоразмер от 315 до 450

1MA8 · Типоразмер от 315 до 355



Для двигателя		Символы размеров																			
Высота вала	Тип 1LA8... 1MA8...	К-во пол.	по IEC по DIN	A b	AA n	AB f	AC ¹⁾ g	AD p ₁	AG r	B a	BA m	BB e	BC x ₃	BE x	C w ₁	CA w ₂	H h	HA c	HB v		
315	... 315	2	4 to 8	560	120	680	710	680	560	630	180	780	195	135	180	435	315	28	330		
	... 317														180						
	... 31...														200						
355	... 353	2	4 to 8	630	150	780	790	710	585	800	220	980	185	135	200	470	355	35	400		
	... 355														200						
	... 357														(840) (740)					(100)	(360)
	... 35...														224						
400	1LA8 403	2	4 to 8	710	150	860	880	875	775	900	220	1080	186	100	224	506	400	35	440		
	1LA8 405														224						
	1LA8 407														224						
450	1LA8 453	2 ³⁾	4 to 8	800	180	980	970	910	810	1000	260	1220	170	100	250	540	450	42	525		
	1LA8 455														250						
	1LA8 457														250						

■ Размеры в скобках относятся к 1LA8 357 с 2-мя и 4-мя полюсами.

- 1) Измеренный поперек головок болтов (не на скосах кожуха вентилятора).
- 2) С подшипником для нагруженной консоли (привод через шкив и т.д.).
- 3) Только для 50 Гц.

Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 3

HD p	HK x ₄	K s	K' s ₁	L k	LC k ₁	LL x ₁	O s ₃	Длина вала со стороны привода					GA t	Длина вала с полевого конца					
								D d	DB d ₆	E l	EB	F u		DA d ₁	DC d ₇	EA l ₁	EC	FA u ₁	GC t ₁
835	229	26	33	1370	1495	330	M 72 x 2	65	M 20	140	125	18	69	50	M 16	110	100	14	53.5
				1400	1555			85	M 20	170	140	22	90	70	M 20	140	125	20	74.5
				1420	1575			95	M 24	170	140	25	100	70	M 20	140	125	20	74.5
905 (945)	229 (320)	33	40	1595	1750	330	M 72 x 2	75	M 20	140	125	20	79.5	60	M 20	140	125	18	64
				1625	1810			95	M 24	170	140	25	100	80		170	140	22	85
				1690	1874			100	M 24	210	180	28	106	80	M 20	170	140	22	85
1025	320	33	40	1785	1940	550	φ 80	80	M 20	170	140	22	85	70	M 20	140	125	20	74.5
				1825	2010			110	M 24	210	180	28	116	90	M 24	170	140	25	95
1110	320	39	47	1945	2100	550	φ 80	90	M 24	170	140	25	95	75	M 20	140	125	20	79.5
				1985	2210			120		210	180	32	127	100	M 24	210	180	28	106

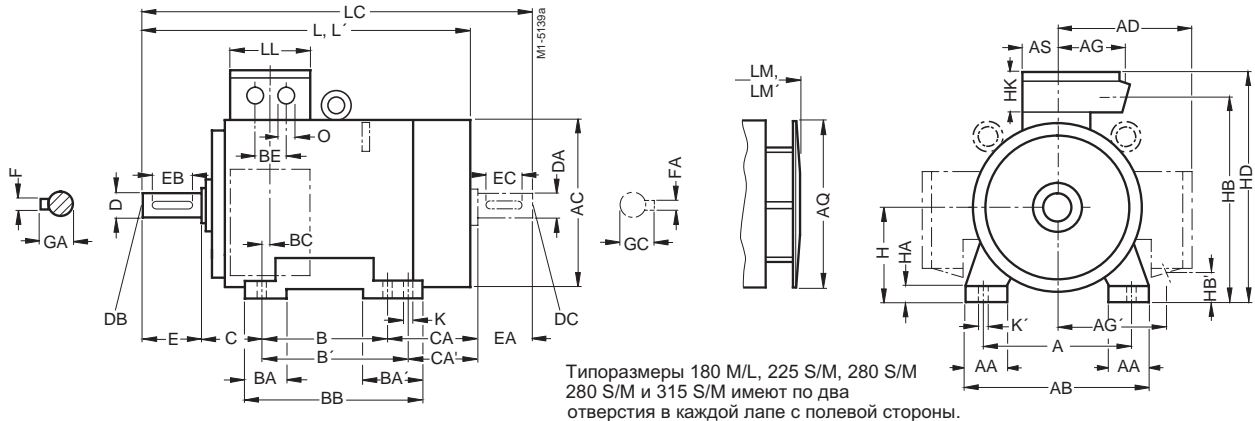
Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 3

1MJ6 · Типоразмер от 180 M до 315 M

1MJ8 · Типоразмер от 315 M до 450 L



Для двигателя		Символы размеров																					
Высота вала	Тип	по IEC по DIN	A b	AA n	AB f	AC ¹⁾ g	AD p ₁	AD' r ₃	AG r	AG' y	AQ j	AS r ₂	B a	B' a'	BA m	BA' m ₁	BB e	BC x ₃	BE x	C w ₁	CA w ₂	CA' w ₂	H h
180 M	1MJ6 183	2 and 4	279	65	344	375	310	-	138	270	340	82	241*	279	70	108	319	35	75	121	259	-	180
180 L	1MJ6 186	4 to 8	279	65	344	375	310	-	138	270	340	82	241	279*	70	108	319	35	75	121	-	221	180
200 L	1MJ6 206	2 6	318	80	398	415	360	-	164	295	340	98.5	305	-	85	85	355	42	85	133	239	-	200
	1MJ6 207	2 4 to 8	318	80	398	415	360	-	164	295	340	98.5	305	-	85	85	355	42	85	133	239	-	200
225 S	1MJ6 220	4 and 8	356	80	436	470	375	-	155	320	425	100	286*	311	85	110	361	25	90	149	269	-	225
225 M	1MJ6 223	2 4 to 8	356	80	436	470	375	-	155	320	425	100	286	311*	85	110	361	25	90	149	-	244	225
250 M	1MJ6 253	2 4 to 8	406	100	506	520	465	-	200	385	470	120	349	-	100	100	409	39	105	168	283	-	250
280 S	1MJ6 280	2 4 to 8	457	100	557	575	490	-	200	410	525	120	368*	419	100	151	479	30	105	190	317	-	280
280 M	1MJ6 283	2 4 to 8	457	100	557	575	490	-	200	410	525	120	368	419*	100	151	479	30	105	190	-	266	280
315 S	1MJ6 310	2 4 to 8	508	120	628	645	555	-	250	475	590	135	406*	457	125	171	527	32	90	216	358	-	315
315 M	1MJ6 313	2 4 to 8	508	120	628	645	555	-	250	475	590	135	406	457*	125	171	527	32	90	216	-	307	315
315 M	1MJ8 313	2 4 to 8	508	120	630	622	-	-	494	-	-	-	457	-	130	130	570	-	-	216	-	-	315
	1MJ8 314	4 and 6	508	120	630	622	-	-	494	-	-	-	457	-	130	130	570	-	-	216	-	-	315
315 L	1MJ8 316	2 4 to 8	508	120	630	622	-	-	494	-	-	-	508	-	130	130	621	-	-	216	-	-	315
355 M	1MJ8 353	2 4 to 8	610	120	700	698	-	740	480	-	-	-	560	-	150	150	650	-	-	254	-	-	355
	1MJ8 354	4	610	120	700	698	-	740	480	-	-	-	560	-	150	150	650	-	-	254	-	-	355
355 L	1MJ8 356	2 4 to 8	610	120	700	698	-	740	480	-	-	-	630	-	150	150	720	-	-	254	-	-	355
	1MJ8 357	4	610	120	700	698	-	740	480	-	-	-	630	-	150	150	720	-	-	254	-	-	355
400 S	1MJ8 400	2 4 to 8	686	120	780	792	-	750	480	-	-	-	560	-	200	200	650	-	-	280	-	-	400
400 M	1MJ8 403	2 4 to 8	686	120	780	792	-	750	480	-	-	-	630	-	200	200	720	-	-	280	-	-	400
400 L	1MJ8 406	2 4 to 8	686	120	780	792	-	750	480	-	-	-	710	-	200	200	800	-	-	280	-	-	400
450 M	1MJ8 453	2 4 to 8	750	150	900	900	-	810	480	-	-	-	710	-	200	200	870	-	-	280	-	-	450
450 L	1MJ8 456	2 4 to 8	750	150	900	900	-	810	480	-	-	-	800	-	200	200	960	-	-	280	-	-	450
450 L	1MJ8 457	2 4 to 8	750	150	900	900	-	810	480	-	-	-	900	-	200	200	1060	-	-	280	-	-	450

* Это размер предписан указанному типоразмеру стандартом DIN EN 50 347.

1) Измеренный поперек головок болтов.
2) Конструкция с маломощным вентилятором.

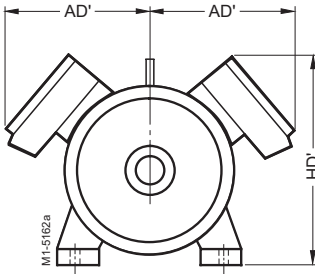
3) Второй конец вала невозможен в маломощной конструкции.

Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 3

Конструкция для 1MJ8 с номинальным током > 400А (две клеммных коробки).



HA с	HB v	HB' v'	HD p	HD' p ₂	HK x ₄	K s	K' s ₁	L k	L' ²⁾ k'	LC ³⁾ k ₁	LL x ₁	LM k ₂	LM' ²⁾ k ₂ '	O s ₃	Длина вала со стороны привода					Длина вала с полевого конца ³⁾						
															D d	DB d ₆	E l	EB l	F u	GA t	DA d ₁	DC d ₇	EA l ₁	EC	FA u ₁	GC t ₁
26	450	42	490	-	123	15	20	716	770	841	164	800	885	M40 x 1.5	48	M 16	110	100	14	51.5	48	M 16	110	100	14	51.5
26	450	42	490	-	123	15	20	716	-	841	164	800	-	M40 x 1.5	48	M 16	110	100	14	51.5	48	M 16	110	100	14	51.5
34	500	36	560	-	148	19	25	772	825	897	197	856	910	M50 x 1.5	55	M 20	110	100	16	59	48	M 16	110	100	14	51.5
34	500	36	560	-	148	19	25	772	-	897	197	856	910	M50 x 1.5	55	M 20	110	100	16	59	55	M 20	110	100	14	51.5
34	500	36	560	-	148	19	25	772	825	897	197	856	910	M50 x 1.5	55	M 20	110	100	16	59	48	M 16	110	100	14	51.5
34	540	70	600	-	148	19	25	835	-	954	197	935	-	M50 x 1.5	60	M 20	140	125	18	64	55	M 20	110	100	16	59
34	540	70	600	-	148	19	25	805	855	924	197	905	955	M50 x 1.5	55	M 20	110	100	16	59	48	M 16	110	100	14	51.5
34	540	70	600	-	148	19	25	835	-	954	197	935	-	M50 x 1.5	60	M 20	140	125	18	64	55	M 20	110	100	14	51.5
42	620	50	715	-	193	24	30	930	1010	1050	234	1030	1110	M63 x 1.5	60	M 20	140	125	18	64	55	M 20	110	100	16	59
42	620	50	715	-	193	24	30	930	-	1080	234	1030	1110	M63 x 1.5	65	M 20	140	125	18	69	60	M 20	140	125	18	64
42	675	80	770	-	193	24	30	1005	1080	1155	234	1115	1230	M63 x 1.5	75	M 20	140	125	18	79.5	65	M 20	140	125	18	64
42	675	80	770	-	193	24	30	1005	-	1155	234	1115	1230	M63 x 1.5	75	M 20	140	125	18	79.5	65	M 20	140	125	18	64
56	750	65	870	-	225	28	35	1110	1185	1260	266	1220	1295	M63 x 1.5	65	M 20	140	125	18	69	60	M 20	140	125	18	64
56	750	65	870	-	225	28	35	1140	-	1290	266	1250	-	M63 x 1.5	80	M 20	170	140	22	85	70	M 20	140	125	18	74.5
56	750	65	870	-	225	28	35	1110	1185	1260	266	1220	1295	M63 x 1.5	65	M 20	140	125	18	69	60	M 20	140	125	18	64
56	750	65	870	-	225	28	35	1140	-	1290	266	1250	-	M63 x 1.5	80	M 20	170	140	22	85	70	M 20	140	125	18	74.5
30	-	-	922	-	-	28	28	1241	-	1440	-	1404	-	M63 x 1.5	65	M 20	140	125	18	69	65	M 20	140	125	18	69
30	-	-	922	-	-	28	28	1343	-	1563	-	1455	-	M63 x 1.5	80	M 20	170	140	22	85	80	M 20	170	140	22	85
30	-	-	922	-	-	28	28	1343	-	1563	-	1455	-	M63 x 1.5	80	M 20	170	140	22	85	80	M 20	170	140	22	85
30	-	-	974	-	-	28	28	1351	-	1550	-	1514	-	35-75	65	M 20	140	125	18	69	65	M 20	140	125	18	69
30	-	-	974	-	-	28	28	1453	-	1673	-	1565	-	35-75	80	M 20	170	140	22	85	80	M 20	170	140	22	85
30	-	-	1063	875	-	28	28	1650	-	1850	-	-	-	35-75	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
30	-	-	1063	875	-	28	28	1680	-	1910	-	-	-	35-75	90	M 24	170	140	25	95	90	M 24	170	140	25	95
30	-	-	1063	875	-	28	28	1680	-	1910	-	-	-	35-75	90	M 24	170	140	25	95	90	M 24	170	140	25	95
30	-	-	1063	875	-	28	28	1780	-	1980	-	-	-	35-75	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
30	-	-	1063	875	-	28	28	1810	-	2040	-	-	-	35-75	90	M 24	170	140	25	95	90	M 24	170	140	25	95
30	-	-	1063	875	-	28	28	1810	-	2040	-	-	-	35-75	90	M 24	170	140	25	95	90	M 24	170	140	25	95
37	-	-	1141	860	-	35	35	1650	-	-	-	-	-	35-75	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
37	-	-	1141	860	-	35	35	1720	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106
37	-	-	1141	860	-	35	35	1770	-	-	-	-	-	35-75	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
37	-	-	1141	860	-	35	35	1840	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106
37	-	-	1141	860	-	35	35	1900	-	-	-	-	-	35-75	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
37	-	-	1141	860	-	35	35	1970	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106
37	-	-	1239	1150	-	35	35	1790	-	-	-	-	-	35-75	80	M 20	170	140	22	85	80	M 20	170	140	22	85
37	-	-	1239	1150	-	35	35	1830	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106
37	-	-	1239	1150	-	35	35	1890	-	-	-	-	-	35-75	80	M 20	170	140	22	85	80	M 20	170	140	22	85
37	-	-	1239	1150	-	35	35	1930	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106
37	-	-	1239	1150	-	35	35	1990	-	-	-	-	-	35-75	80	M 20	170	140	22	85	80	M 20	170	140	22	85
37	-	-	1239	1150	-	35	35	2030	-	-	-	-	-	35-75	100	M 24	210	180	28	106	100	M 24	210	180	28	106

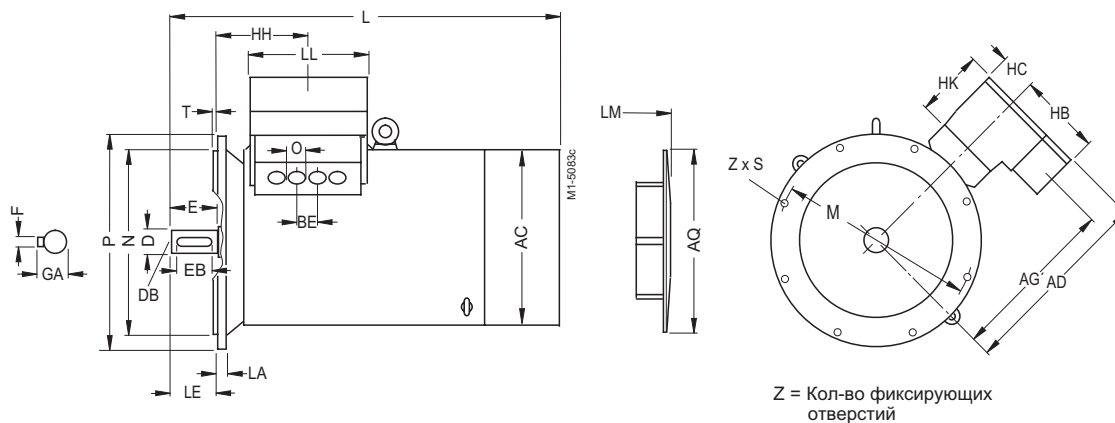
Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM V 1

1LA8 · Типоразмер от 315 до 450

1MA8 · Типоразмер от 315 до 355



Z = Кол-во фиксирующих отверстий

Для двигателя		Символы размеров													
Высота вала	Тип 1LA8... 1MA8...	К-во пол.	по IEC по DIN	AC ²⁾ g	AD p ₁	AG' y	AQ j	BE x	HB r	HC r ₂	HH o ₁	HK x ₄	L k	LA c ₁	LE i ₂
315	... 315	2	4 to 8	710	690	560	670	135	285	165	375	229	1370	25	140
	... 317												1400		170
355	... 353	2 ¹⁾	4 to 8	790	730 (880)	600 (745)	750	135 (100)	285 (400)	165 (175)	385	229 (320)	1595	25	140
	... 355												1625		170
	... 357														
400	1LA8 403	2 ¹⁾	4 to 8	880	930	795	850	100	400	175	410	320	1785	28	170
	1LA8 405												1825		210
	1LA8 407														
450	1LA8 453	2 ¹⁾	4 to 8	970	980	845	950	100	400	175	420	320	1945	30	170
	1LA8 455												1985		210
	1LA8 457														

■ Размеры в скобках относятся к 1LA8 357, с 2-мя и 4-мя полюсами.

- 1) Только для 50 Гц.
- 2) Измеренный поперек головок болтов (не на скобах кожуха вентилятора)

Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM V1

LL x ₁	LM k ₂	M e ₁	N b ₁	O S ₃	P a ₁	S s ₂	T f ₁	Z z ₁	Длина вала со стороны привода					
									D d	DB d ₆	E l	EB	F u	GA t
330	1500 1530	740	680	M 72 x 2	800	22	6	8	65 85	M 20	140 170	125 140	18 22	69 90
330 (550)	1735 1765	840	780	M 72 x 2 (ϕ 80)	900	22	6	8	75 95	M 20 M 24	140 170	125 140	20 25	79.5 100
550	1935 1975	940	880	ϕ 80	1000	22	6	8	80 110	M 20 M 24	170 210	140 180	22 28	85 116
550	2105 2145	1080	1000	ϕ 80	1150	26	6	8	90 120	M 24	170 210	140 180	25 32	95 127

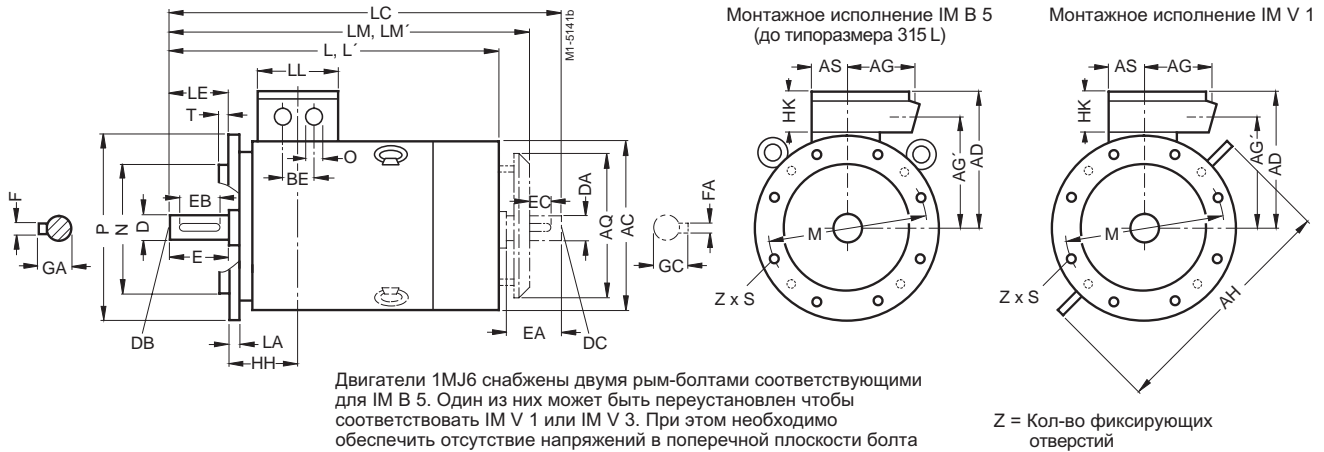
Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 5 и IM V 1

1MJ6 · Типоразмер от 180 M до 315 M

1MJ8 · Типоразмер от 315 M до 450 L



Двигатели 1MJ6 снабжены двумя рым-болтами соответствующими для IM B 5. Один из них может быть переустановлен чтобы соответствовать IM V 1 или IM V 3. При этом необходимо обеспечить отсутствие напряжений в поперечной плоскости болта

Z = Кол-во фиксирующих отверстий

Для двигателя	Символы размеров																				
Высота вала	Тип	К-во пол.	по IEC по DIN	Фланец размер	AC ¹⁾ g	AD p ₁	AD' r ₃	AG r	AG' y	AH p ₃	AQ j	AS r ₂	BE x	HD' p ₂	HH o ₁	HK x ₄	L k	L ⁽²⁾ k'	LA c ₁	LC ⁽³⁾ k ₁	
180 M	1MJ6 183	2 and 4		A 350	375	310	-	138	270	470	340	82	75	-	156	123	716	770	13	841	
180 L	1MJ6 186	4 to 8		A 350	375	310	-	138	270	470	340	82	75	-	156	123	716	-	13	841	
200 L	1MJ6 206	2		A 400	415	360	-	164	290	530	340	98.5	85	-	175	148	772	825	15	897	
	1MJ6 207	4 to 8		A 400	415	360	-	164	290	530	340	98.5	85	-	175	148	772	825	15	897	
225 S	1MJ6 220	4 and 8		A 450	470	375	-	155	315	580	425	100	90	-	174	148	835	-	16	954	
225 M	1MJ6 223	2		A 450	470	375	-	155	315	580	425	100	90	-	174	148	805	855	16	924	
		4 to 8															835	-		954	
250 M	1MJ6 253	2		A 550	520	480	-	200	385	645	470	120	105	-	207	193	930	1010	18	1050	
		4 to 8																		1080	
280 S	1MJ6 280	2		A 550	575	490	-	200	395	700	525	120	105	-	220	193	1005	1080	18	1155	
		4 to 8																			
280 M	1MJ6 283	2		A 550	575	490	-	200	395	700	525	120	105	-	220	193	1005	1080	18	1155	
		4 to 8																			
315 S	1MJ6 310	2		A 660	645	555	-	250	435	805	590	135	90	-	248	225	1110	1185	22	1260	
		4 to 8															1140	-		1290	
315 M	1MJ6 313	2		A 660	645	555	-	250	435	805	590	135	90	-	248	225	1110	1185	22	1260	
		4 to 8															1140	-		1290	
315 M	1MJ8 313	2		A 660	622	607	-	-	-	-	-	-	-	-	-	-	1241	-	22	1440	
		4 to 8															1343	-		1563	
	1MJ8 314	4 and 6		A 660	622	659	-	-	-	-	-	-	-	-	-	-	1343	-	22	1563	
315 L	1MJ8 316	2		A 660	622	659	-	-	-	-	-	-	-	-	-	-	1351	-	22	1550	
		4 to 8															1453	-		1673	
355 M	1MJ8 353	2		A 800	698	706	710	-	-	-	-	-	-	-	520	-	-	-	-	-	1850
		4 to 8																			1910
	1MJ8 354	4		A 800	698	706	710	-	-	-	-	-	-	520	-	-	-	-	-	-	1910
355 L	1MJ8 356	2		A 800	698	706	710	-	-	-	-	-	-	520	-	-	-	-	-	-	1980
		4 to 8																			2040
	1MJ8 357	4		A 800	698	706	710	-	-	-	-	-	-	520	-	-	-	-	-	-	2040
400 S	1MJ8 400	2		A 1000	792	741	760	-	-	-	-	-	-	460	-	-	-	-	-	-	-
		4 to 8																			
400 M	1MJ8 403	2		A 1000	792	741	760	-	-	-	-	-	-	460	-	-	-	-	-	-	-
		4 to 8																			
400 L	1MJ8 406	2		A 1000	792	741	760	-	-	-	-	-	-	460	-	-	-	-	-	-	-
		4 to 8																			
450 M	1MJ8 453	2		A 1000	900	789	700	-	-	-	-	-	-	700	-	-	-	-	-	-	-
		4 to 8																			
450 L	1MJ8 456	2		A 1000	900	789	700	-	-	-	-	-	-	700	-	-	-	-	-	-	-
		4 to 8																			
450 L	1MJ8 457	2		A 1000	900	789	700	-	-	-	-	-	-	700	-	-	-	-	-	-	-
		4 to 8																			

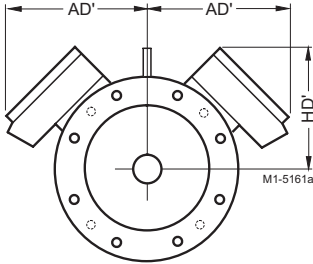
- 1) Измеренный поперек головок болтов.
- 2) Конструкция с малошумным вентилятором.
- 3) Второй конец вала невозможен в малошумной конструкции.

Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 5 и IM V 1

Монтажное исполнение IM V 1
Конструкция для 1MJ8 с номинальным током > 400 А



LE i ₂	LL x ₁	LM k ₂	LM ⁽²⁾ k' ₂	M e ₁	N b ₁	O s ₃	P a ₁	S s ₂	T f ₁	Z z ₁	Длина вала со стороны привода					Длина вала с полевого конца ³⁾						
											D d	DB d ₆	E l	EB e	F u	GA t	DA d ₁	DC d ₇	EA l ₁	EC	FA u ₁	GC t ₁
110	164	800	885	300	250	M 40 x 1.5	350	17.5	5	4	48	M 16	110	100	14	51.5	48	M 16	110	100	14	51.5
110	164	800	-	300	250	M 40 x 1.5	350	17.5	5	4	48	M 16	110	100	14	51.5	48	M 16	110	100	14	51.5
110	197	856	910	350	300	M 50 x 1.5	400	17.5	5	4	55	M 20	110	100	16	59	48 55	M 16 M 20	110	100	14 16	51.5 59
110	197	856	910	350	300	M 50 x 1.5	400	17.5	5	4	55	M 20	110	100	16	59	48 55	M 16 M 20	110	100	14 16	51.5 59
140	197	935	-	400	350	M 50 x 1.5	450	17.5	5	8	60	M 20	140	125	18	64	55	M 20	110	100	16	59
110	197	905	955	400	350	M 50 x 1.5	450	17.5	5	8	55	M 20	110	100	16	59	48	M 16	110	100	14	51.5
140	197	935	-	400	350	M 50 x 1.5	450	17.5	5	8	60	M 20	140	125	18	64	55	M 20	110	100	16	59
140	234	1030	1110	500	450	M 63 x 1.5	550	17.5	5	8	60 65	M 20	140	125	18	64 69	55 60	M 20	110 140	100 125	16 18	59 64
140	234	1115	1230	500	450	M 63 x 1.5	550	17.5	5	8	65 75	M 20	140	125	18 20	69 79.5	60 65	M 20	140	125	18	64 69
140	234	1115	1230	500	450	M 63 x 1.5	550	17.5	5	8	65 75	M 20	140	125	18 20	69 79.5	60 65	M 20	140	125	18	64 69
140	266	1220	1295	600	550	M 63 x 1.5	660	22	6	8	65 80	M 20	140 170	125 140	18 22	69 85	60 70	M 20	140	125	18 20	64 74.5
140	266	1220	1295	600	550	M 63 x 1.5	660	22	6	8	65 80	M 20	140 170	125 140	18 22	69 85	60 70	M 20	140	125	18 20	64 74.5
140	-	1404	-	600	550	M 63 x 1.5	660	24	6	6	65	M 20	140	125	18	69	65	M 20	140	125	18	69
170	-	1455	-	600	550	M 63 x 1.5	660	24	6	6	80	M 20	170	140	22	85	80	M 20	170	140	22	85
170	-	1455	-	600	550	M 63 x 1.5	660	24	6	6	80	M 20	170	140	22	85	80	M 20	170	140	22	85
140	-	1514	-	600	550	35-75	660	24	6	6	65	M 20	140	125	18	69	65	M 20	140	125	18	69
170	-	1565	-	600	550	35-75	660	24	6	6	80	M 20	170	140	22	85	80	M 20	170	140	22	85
140	-	1810	-	740	680	35-75	800	24	6	8	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
170	-	1840	-	740	680	35-75	800	24	6	8	90	M 24	170	140	25	95	90	M 24	170	140	25	95
170	-	1840	-	740	680	35-75	800	24	6	8	90	M 24	170	140	25	95	90	M 24	170	140	25	95
140	-	1940	-	740	680	35-75	800	24	6	8	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
170	-	1970	-	740	680	35-75	800	24	6	8	90	M 24	170	140	25	95	90	M 24	170	140	25	95
170	-	1970	-	740	680	35-75	800	24	6	8	90	M 24	170	140	25	95	90	M 24	170	140	25	95
140	-	1810	-	940	880	35-75	1000	28	6	8	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
210	-	1880	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106
140	-	1930	-	940	880	35-75	1000	28	6	8	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
210	-	2000	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106
140	-	2060	-	940	880	35-75	1000	28	6	8	75	M 20	140	125	20	79.5	75	M 20	140	125	20	79.5
210	-	2130	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106
170	-	1950	-	940	880	35-75	1000	28	6	8	80	M 20	170	140	22	85	80	M 20	170	140	22	85
210	-	1990	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106
170	-	2050	-	940	880	35-75	1000	28	6	8	80	M 20	170	140	22	85	80	M 20	170	140	22	85
210	-	2090	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106
170	-	2150	-	940	880	35-75	1000	28	6	8	80	M 20	170	140	22	85	80	M 20	170	140	22	85
210	-	2190	-	940	880	35-75	1000	28	6	8	100	M 24	210	180	28	106	100	M 24	210	180	28	106

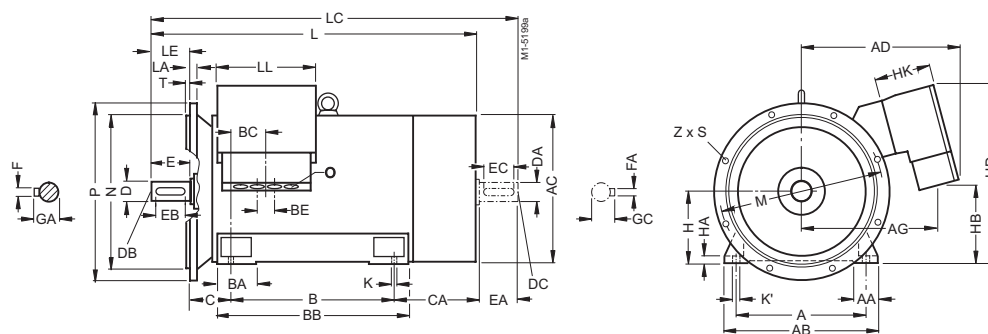
Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 35

1LA8 · Типоразмер от 315 до 450

1MA8 · Типоразмер от 315 до 355



Для двигателя		Символы размеров																							
Высота вала	Тип 1LA8... 1MA8...	К-во пол.	по IEC по DIN	A b	AA n	AB f	AC ¹⁾ g	AD p ₁	AG r	B a	BA m	BB e	BC x ₃	BE x	C w ₁	CA w ₂	H h	HA c	HB v	HD p	HK x ₄	K s			
315	... 315	2 4 to 8 4 to 8 ²⁾		560	120	680	710	680	560	630	180	780	195	135	180	435	315	28	330	835	229	26			
	... 317														180										
	... 31...														200										
355	... 353	2 4 to 8 4 to 8 ²⁾		630	150	780	790	710	585 (840)	800	220	980	185	135	200	470	355	35	400	905	229	33			
	... 355														200										
	... 357														(100)								(360)	(945)	(320)
	... 35..														224										
400	1LA8 403	2 4 to 8		710	150	860	880	875	775	900	220	1080	186	100	224	506	400	35	440	1025	320	33			
	1LA8 405																								
	1LA8 407																								
450	1LA8 453	2 ³⁾ 4 to 8		800	180	980	970	910	810	1000	260	1220	170	100	250	540	450	42	525	1110	320	39			
	1LA8 455																								
	1LA8 457																								

■ Размеры в скобках относятся к 1LA8 357, с 2-мя и 4-мя полюсами.

- 1) Измеренный поперек головок болтов (не на скозах кожуха вентилятора).
- 2) С подшипником для нагруженной консоли (привод через шкив и т.д.).
- 3) Только для 50 Гц

Короткозамкнутые электродвигатели

Размеры

Монтажное исполнение IM B 35

K' s ₁	L k	LA c ₁	LC k ₁	LE i ₂	LL x ₁	M e ₁	N b ₁	O s ₃	P a ₁	S s ₂	T f ₁	Z z ₁	Длина вала со стороны привода						Длина вала с полевого конца					
													D d	DB d ₆	E l	EB	F u	GA t	DA d ₁	DC d ₇	EA l ₁	EC	FA u ₁	GC t ₁
33	1370	25	1495	140	330	740	680	M 72x2	800	22	6	8	65	M 20	140	125	18	69	50	M 16	110	100	14	53.5
	1400		1555	170									85	M 20	170	140	22	90	70	M 20	140	125	20	74.5
	1420		1575	170									95	M 24	170	140	25	100	70	M 20	140	125	20	74.5
40	1595	25	1750	140	330	840	780	M 72x2	900	22	6	8	75	M 20	140	125	20	79.5	60	M 20	140	125	18	64
	1625		1810	170									95	M 24	170	140	25	100	80		170	140	22	85
				210																				
	1690		1874	210	(550)		(φ 80)						100	M 24	210	180	28	106	80	M 20	170	140	22	85
40	1785	28	1940	170	550	940	880	φ 80	1000	22	6	8	80	M 20	170	140	22	85	70	M 20	140	125	20	74.5
	1825		2010	210									110	M 24	210	180	28	116	90	M 24	170	140	25	95
47	1945	30	2100	170	550	1080	1000	φ 80	1150	26	6	8	90	M 24	170	140	25	95	75	M 20	140	125	20	79.5
	1985		2210	210									120		210	180	32	127	100	M 24	210	180	28	106

Squirrel-Cage Motors Accessories and Spare Parts

Spare parts

■ Siemens supply commitment for replacement motors and spare parts for the following periods after delivery of the motor:

Up to 3 yrs a fully compatible motor – in terms of mounting dimensions and functions – if the original motor fails completely (changes in series reserved).

Up to 5 yrs Spare parts.

Up to 10 yrs Technical advice about the complete motor and components; fabrication drawings for spare parts supplied if required.

■ The following information should be specified in all orders for spare parts:

- Part designation and number
- Order No. and Serial No. of the motor

Ordering example for a 1LA7 fan cowl, frame size 160 M, 4-pole:

Fan cowl No. 740,
1LA7 163-4AA60, Serial No. J783298901018

■ See Part 2 for bearing selection tables.

■ The 1UA7 COMBIMASTER comprises a standard 1 LA7 motor and a top-mounted frequency converter. Spare parts for the motor should be selected from the 1LA7 tables. The frequency converter can only be ordered as a complete unit (please inquire).

■ Spare parts for 1MJ6 motors, frame size 180 or larger, and 1MJ8, 1ME8, 1ML8 and 1LG8 motors to order (please inquire).

No obligation exists to supply spares of standard parts.

8/2

Accessories

Spare parts

8/3

1LA5 and 1MA5 · Frame sizes 56 M to 90 L

8/4

1LA5 · Frame sizes 180 M to 225 M

8/5

1LA7 and 1MA7 · Frame sizes 56 M to 90 L

8/6

1LA7 and 1MA7 · Frame sizes 100 L to 160 L

8/7

1LA6 and 1MA6 · Frame sizes 180 M to 200 L

8/8

1LA6 and 1MA6 · Frame sizes 225 M to 315 L

8/10

1LA8 and 1MA8 · Frame sizes 315 to 450

8/12

1MJ6 · Frame sizes 71 M to 160 L

Squirrel-Cage Motors

Accessories

Modular technology, slide rails, foundation blocks, taper pins and couplings

Modular technology

Various modular components can be supplied as built-on accessories. The brake – a safety-relevant assembly – is not allowed to be retrofitted.

Cables for pulse generators can be ordered using Catalog DA 65.11.

Design	For motor Frame size	Order No.	Weight kg
Pulse generator HTL version	100 to 225	1XP8 001-1	0.3
	TTL version	1XP8 001-2	0.3
Separately driven fan Mounting parts included	100	2CW2 185-8RF14-1AA0	3.9
	112	2CW2 210-8RF14-1AA1	4.4
	132	2CW2 250-8RF14-1AA2	5.7
	160	2CW2 300-8RF14-1AA3	7.2
	180	2CW2 300-8RF14-1AA4	9.6
	200	2CW2 300-8RF14-1AA5	10.7
	225	2CW2 300-8RF14-1AA6	10.7
Separately driven fan and pulse generator 1XP8 001-1 Mounting parts included	100	2CW2 185-8RF14-2AA0	4.2
	112	2CW2 210-8RF14-2AA1	4.7
	132	2CW2 250-8RF14-2AA2	6.0
	160	2CW2 300-8RF14-2AA3	7.5
	180	2CW2 300-8RF14-2AA4	9.9
	200	2CW2 300-8RF14-2AA5	11.0
	225	2CW2 300-8RF14-2AA6	11.0

Slide rails with fixing bolts and tensioning screws to DIN 42 923

Slide rails are an easy and convenient means of adjusting the belt tension of a machine when there is no idler pulley. They are secured to the foundation with rag bolts or foundation blocks.

The assignment of slide rails to motor frame sizes is stated in DIN 42 923. No standard slide rails are available for motors with frame sizes 355 to 450 (please inquire).

Sources include:
Lütgert & Co.
Postfach 41 07
D-33276 Gütersloh
Tel. +49-52 41-74 07-0
Fax +49-52 41-74 07-90
Internet:
<http://www.luetgert-antriebe.de>
e-mail:
info@luetgert-antriebe.de

Foundation blocks to DIN 799

Foundation blocks are recessed into concrete foundations and grouted with cement. They have a number of uses, e.g. for fixing medium-sized machines, slide rails, pedestal bearings, base-frames, etc. After the fixing bolts have been removed, a machine can be shifted as required without having to lift it.

At the time of the initial installation procedure, the foundation blocks - which are pinned and bolted to the machine (without shims) - are not grouted until the latter has been properly aligned. The machine is first set down 2 to 3 mm lower than its first final position. The difference between the shaft heights is compensated by means of shims during the final assembly. The taper pins enable the machine to be repositioned accurately without having to realign it, whenever it is removed and replaced.

Sources include:
Lütgert & Co.
Postfach 41 07
D-33276 Gütersloh
Tel. +49-52 41-74 07-0
Fax +49-52 41-74 07-90
Internet:
<http://www.luetgert-antriebe.de>
e-mail:
info@luetgert-antriebe.de

Taper pins to DIN 258 with threaded ends and constant taper lengths

The purpose of taper pins is to ensure that parts which are frequently disassembled are aligned accurately. The hole for the taper pin is reamed so that, when the pin is inserted by hand, there is still about 3 to 4 mm of the taper projecting above the hole rim.

The pin is driven in fully with a hammer.

The pin is extracted by tightening a nut down on its threaded end.

Standard taper pins are available from normal commercial sources.

Sources include:
Otto Roth
Bäumleinsberg 54
91233 Neunkirchen am Sand
Tel. +49-91 23-94 00 17
Fax +49-91 23-94 00 15

Couplings

In the majority of applications the motor is connected to the driven machine by means of a flexible coupling.

Sources include:
KTR Kupplungstechnik GmbH
Postfach 17 63
48407 Rheine
Tel. +49-59 71-7 98-0
Fax +49-59 71-7 98-440
Internet: <http://www.ktr.de>

Squirrel-Cage Motors Spare Parts

Squirrel-cage motors 1LA5 and 1MA5
Frame sizes 56 to 90 L

Selection and ordering data

For motor Frame size	Type 1LA5..., 1MA5...
56	....050....053
63	....060....063
71	....070....073
80	....080....083
90 S 90 L	....090....096

Motor (Operating Instructions 610.42057/21)

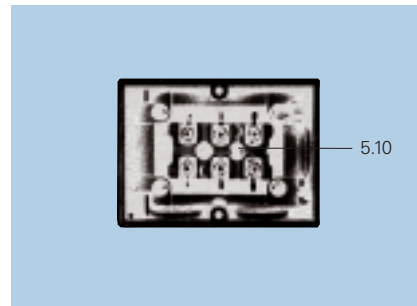
Part No.	Designation
1.40	End shield, drive end (supplied with spring band if required)
1.61	Spring band (for end shield hub at drive end, bearing size specified 6205/6 or 8)
5.00	Terminal box, complete with terminal board
5.10	Terminal board
6.20	End shield, non- drive end
7.04	External fan
7.40	Fan cowl

5.10 Terminal board

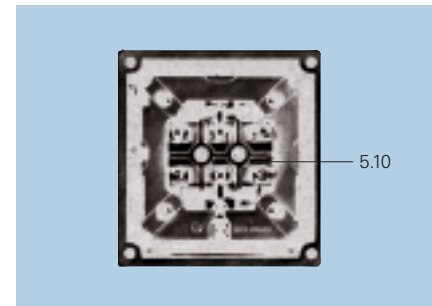
For motor Type	Order No.
1LA5 05 . to 1LA5 09 .	1LY7 113
1MA5 06 . to 1MA5 09 .	1LY7 116

7.04 External fan

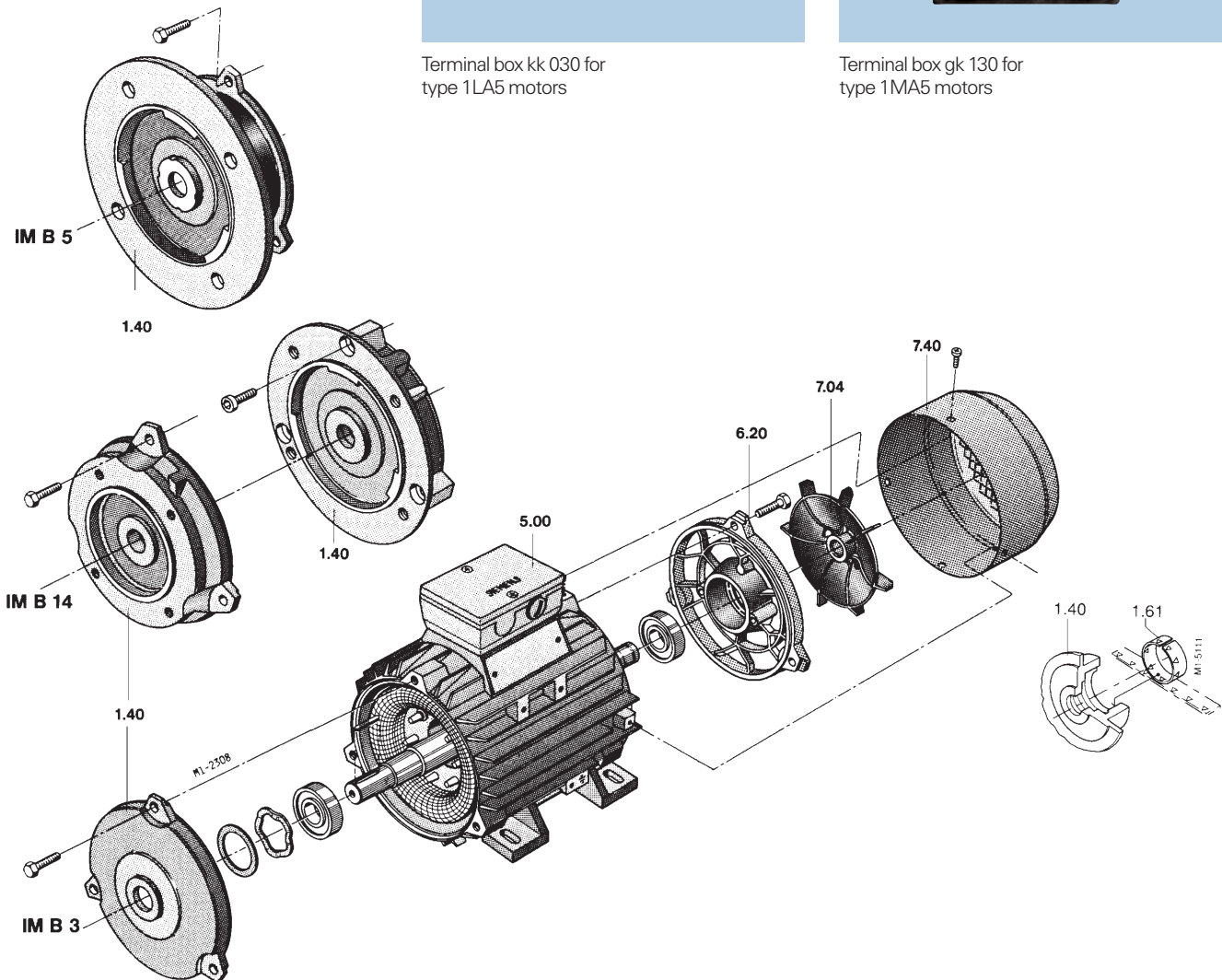
For motor Frame size	Type 1LA5..., 1MA5...	Order No. Thermo- plastic	Metal
63	....06 .	1LY7 001	1LY7 201
71	....07 .	1LY7 002	1LY7 202
80	....08 .	1LY7 003	1LY7 203
90	....09 .	1LY7 025	1LY7 225



Terminal box kk 030 for
type 1LA5 motors



Terminal box gk 130 for
type 1MA5 motors



Squirrel-Cage Motors

Spare Parts

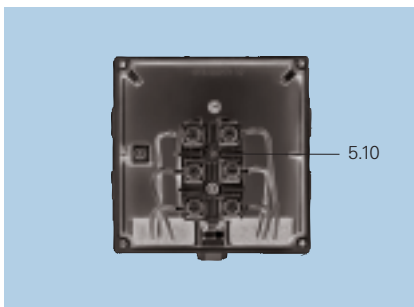
Squirrel-cage motors 1LA5 · Frame sizes 180 M to 225 M

Selection and ordering data

For motor Frame size	Type
180 M	1LA5 183
180 L	1LA5 186
200 L	1LA5 206
	1LA5 207
225 M	1LA5 220
	1LA5 223

Motor (Operating Instructions 610.42348/21)

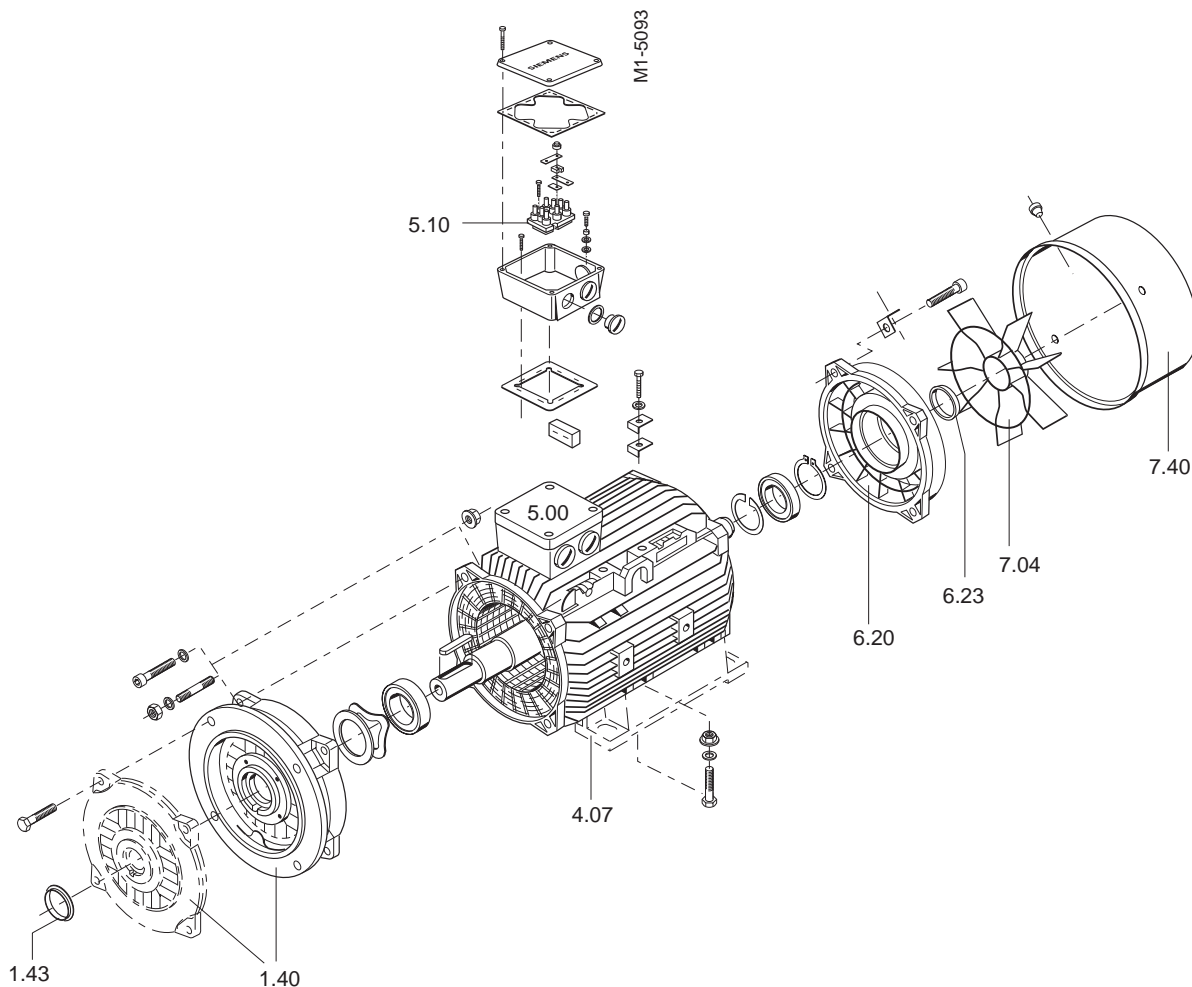
Part No.	Designation
1.40	End shield, drive end
1.43/6.23	V-ring
4.07	Frame feet (1 pair)
5.00	Terminal box, complete with terminal board
5.10	Terminal board
6.20	End shield, non drive end
7.04	External fan
7.40	Fan cowl



Terminal box gk 330



Terminal box gk 430



Squirrel-Cage Motors Spare Parts

Squirrel-cage motors 1LA7 · Frame sizes 56 to 90

Selection and ordering data

For motor Frame size	Type 1LA7 , 1MA7
56 M	. . . . 050 053
63 M	. . . . 060 063
71 M	. . . . 070 073
80 M	. . . . 080 083
90 S 90 L	. . . . 090 096

Motor (Betriebsanleitung 610.43428/21)

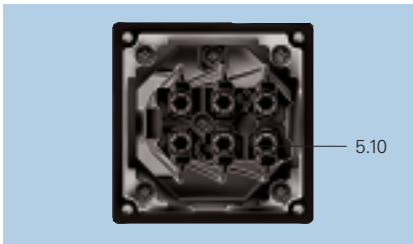
Part No.	Designation
1.40	End shield, drive end
1.43/6.23	V-ring
4.07	Frame feet (1 pair)
5.00	Terminal box, complete with terminal board
5.10	Terminal board
6.20	End shield, non drive end
7.04	External fan
7.40	Fan cowl

5.10 Terminal board

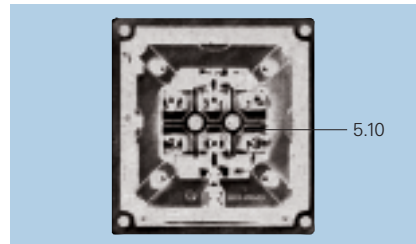
For motor Type	Order No.
1LA7 05 . . to 1LA7 09 .	1LY7 113
1MA7 06 . . to 1MA7 09 .	1LY7 116

7.04 External fan

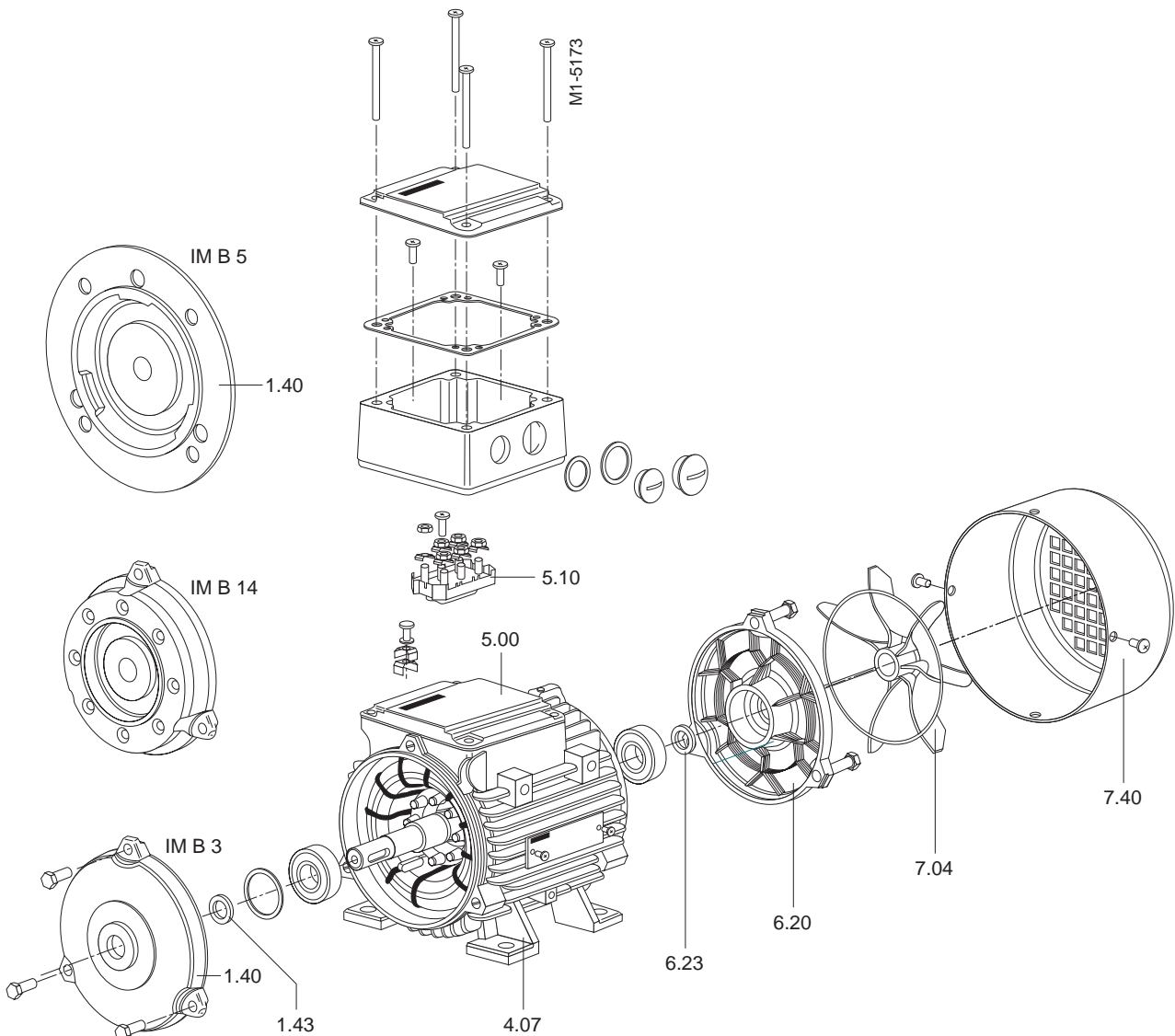
For motor Frame size	Type 1LA7 , 1MA7	Order No. Thermo- plastic	Metal
63	. . . . 06 .	1LY7 001	1LY7 201
71	. . . . 07 .	1LY7 002	1LY7 202
80	. . . . 08 .	1LY7 003	1LY7 203
90	. . . . 09 .	1LY7 025	1LY7 225



Terminal box gk 030 for type 1LA7 motors



Terminal box gk 130 for type 1MA7 motors



Squirrel-Cage Motors

Spare Parts

Squirrel-cage motors 1LA7/1MA7
Frame sizes 100 L to 160 L

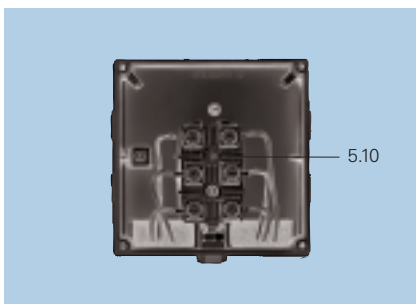
Selection and ordering data

For motor Frame size	Type 1LA7 ..., 1MA7 ...
100 L	.... 106
112 M	.... 113
132 S	.... 130
	.... 131
160 M	.... 163
	.... 164
160 L	.... 166

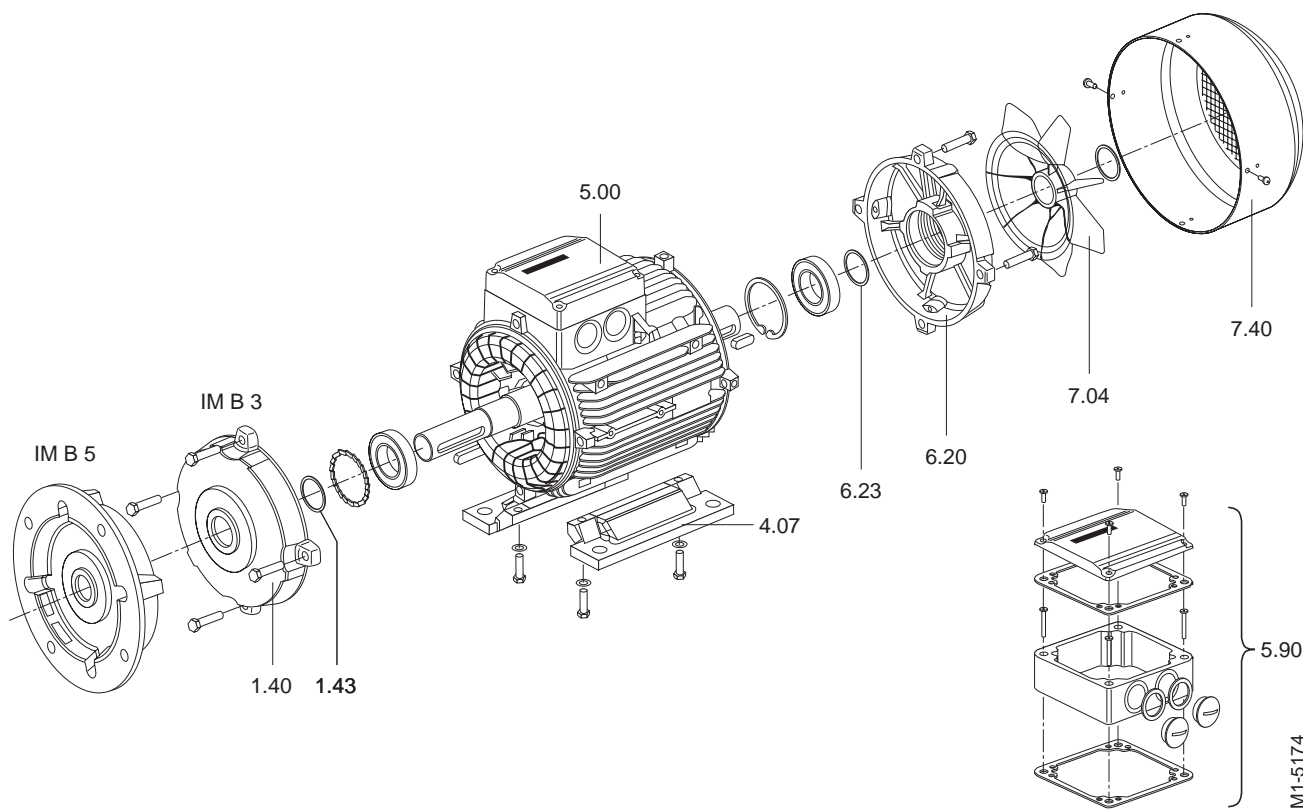
Motor (Operating Instructions 610.43428/21)

Part No.	Designation
1.40	End shield, drive end
1.43/6.23	V-ring
4.07	Frame feet (1 pair)
5.00	Terminal box cover*, complete with terminal board
5.10	Terminal board
5.90	Side-mounted terminal box, left or right (Order Code K09 or K10 respectively)
6.20	End shield, non drive end
7.04	External fan
7.40	Fan cowl

* Terminal box is cast



Terminal box gk 130



Squirrel-Cage Motors Spare Parts

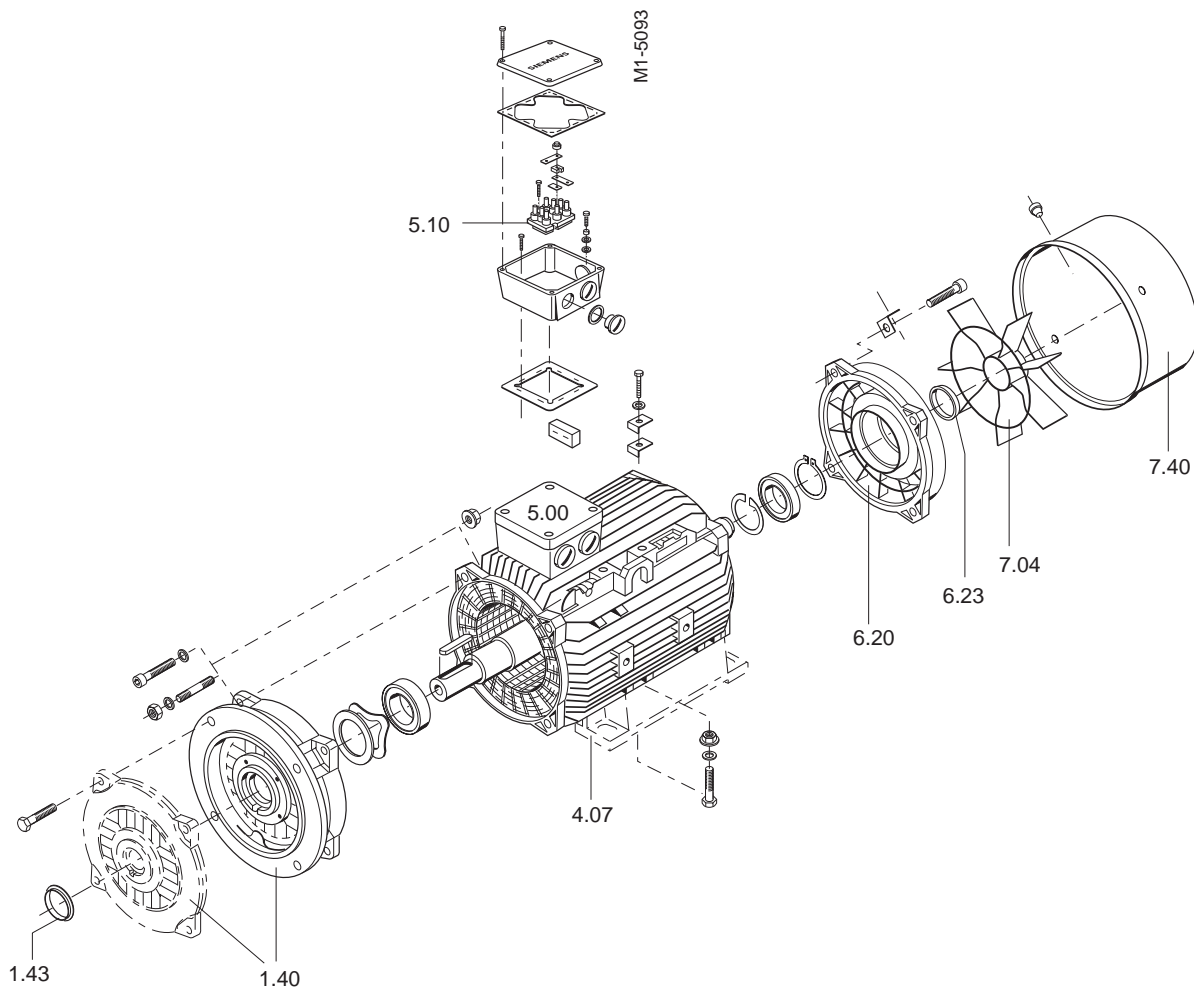
Squirrel-cage motors 1LA6 and 1MA6
Frame sizes 180 M to 200 L

Selection and ordering data

For motor Frame size	Type 1LA6..., 1MA6...
180 M	.... 183
180 L	.... 186
200 L	.... 206 207

Motor (Operating Instructions 610.43106/21)

Part No.	Designation
1.40	End shield, drive end
1.43/6.23	V-ring
4.07	Frame feet (1 pair)
5.00	Terminal box, complete with terminal board
5.10	Terminal board
6.20	End shield, non drive end
7.04	External fan
7.40	Fan cowl



Squirrel-Cage Motors

Spare Parts

Squirrel-cage motors 1LA6 and 1MA6
Frame sizes 225 M to 315 L

Selection and ordering data

For motor Frame size	Type 1LA6..., 1MA6...
225 S	....220
225 M	....223
250 M	....253
280 S	....280
280 M	....283
315 S	....310
315 M	....313
315 L	....316....317....318

Motor (Operating Instructions NMA 2748 DE)

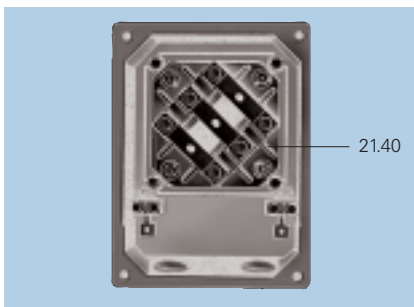
Part No.	Designation
5.00	End shield, drive end
5.10	Flanged end shield
6.00	End shield, non drive end
8.00	Rotor, complete with external fan and roller bearing
10.10	Frame feet (1 pair)
11.00	External fan
12.01	Fan cowl
12.70	Canopy
20.00	Terminal box, complete with terminals

Bearings (Operating Instructions NMA 2924 DE)

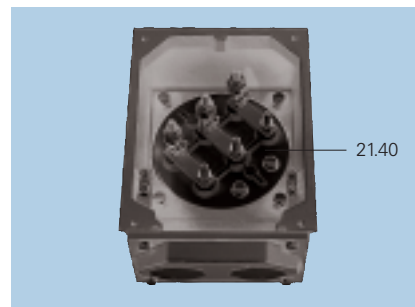
Part No.	Designation
4.20	Outer bearing cap, drive end
4.60	Inner bearing cap, drive end
3.20	Outer bearing cap, non-drive end
3.60	Inner bearing cap, non-drive end
3.10/4.10	V-ring

Terminal box 1XB7 for frame sizes 225 M to 400 L (Operating Instructions NMA 2923 DE)

Part No.	Designation
20.30	Terminal box cover
21.40	Insulating plate (terminal plate) without terminals



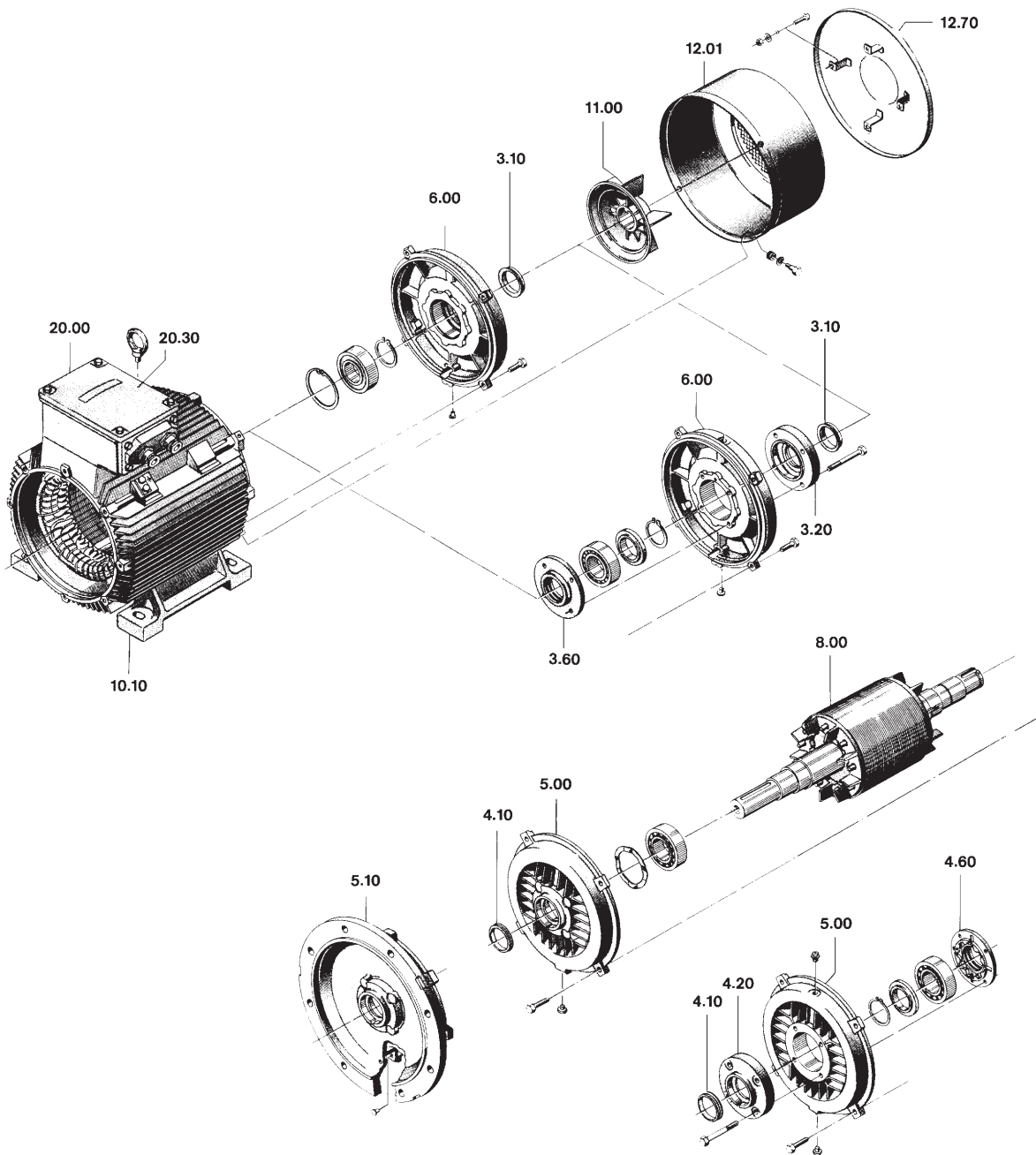
Terminal box 1XB7 222 and 1XB7 322



Terminal box 1XB7 422 to 1XB7 622

Squirrel-Cage Motors Spare Parts

Squirrel-cage motors 1LA6 and 1MA6
Frame sizes 225 M to 315 L



Squirrel-Cage Motors

Spare Parts

Squirrel-cage motors 1LA8 and 1MA8
Frame sizes 315 to 450

Selection and ordering data

For motor	
Frame size	Type 1LA8..., 1MA8...
315	...315
	...317
	...353
355	...355
	...357
	...403
400	...405
	...407
	450	...453
...455	
...457	
...457	

Motor
(Operating Instructions NMA 3420 DE)

Part No.	Designation
5.00	End shield, drive end
5.10	Flanged end shield
6.00	End shield, non-drive end
7.07	Internal fan
8.00	Rotor, complete with external fan and roller bearing
11.04	External fan, unidirectional
11.05	External fan, bidirectional
12.01	Fan cowl
12.70	Canopy
20.00	Terminal box, complete with terminals

Bearings (Operating Instructions
NMA 2934, 2935, 2936 DE)

Part No.	Designation
3.20	Outer bearing cap, drive end
3.60	Inner bearing cap, drive end
4.20	Outer bearing cap, non-drive end
4.60	Inner bearing cap, non-drive end
3.10/4.10	V-ring

Terminal box 1XB7 for frame sizes 315 and 355
(Operating Instructions NMA 2923 DE)

Part No.	Designation
20.30	Terminal box cover
21.40	Insulating plate (terminal plate) without terminals

Terminal box 1XB1 for frame sizes 400 and 450
(Operating Instructions NMA 2937 DE)

Part No.	Designation
20.00	Terminal box, complete
20.30	Terminal box cover
	Terminal post insulator

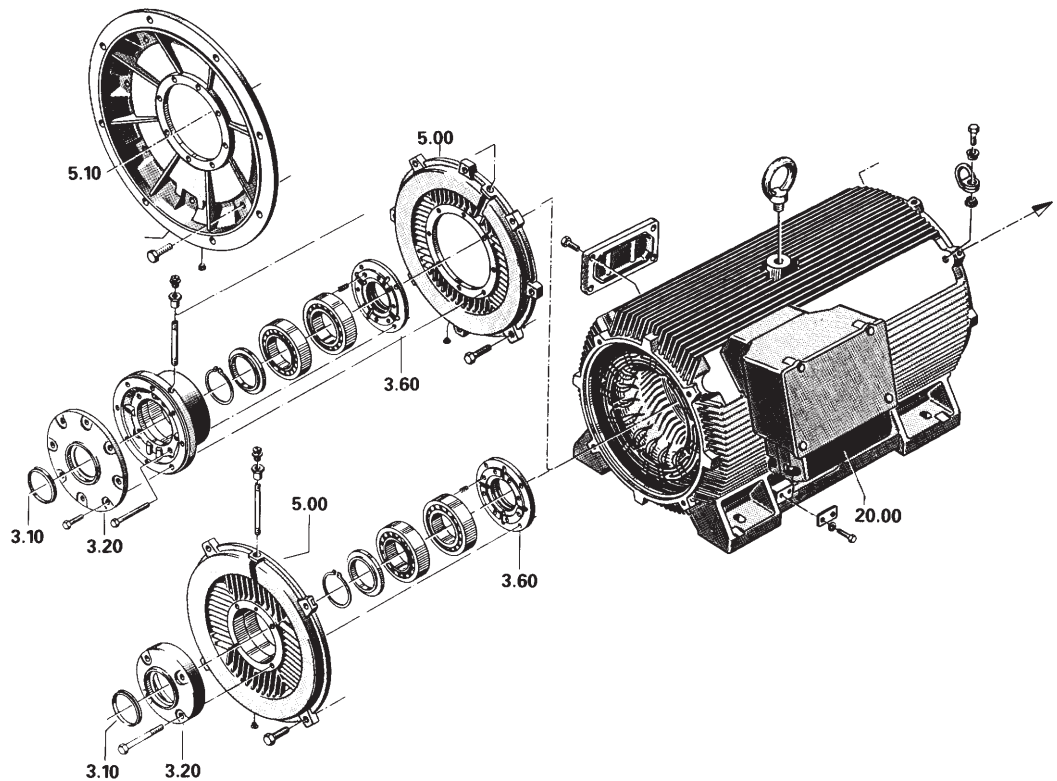


21.40

Terminal box 1XB7 622

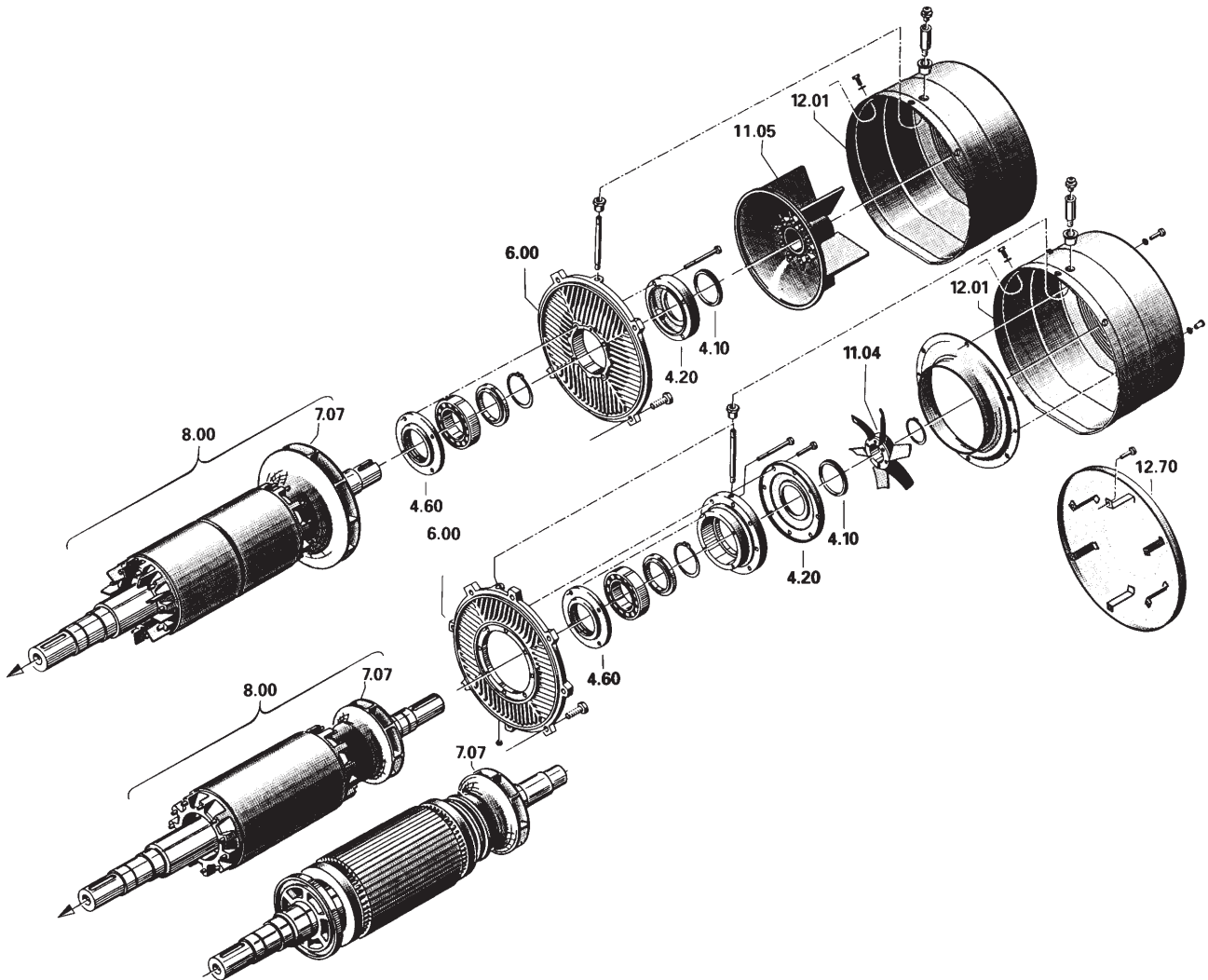


Terminal box 1XB1 631



Squirrel-Cage Motors Spare Parts

Squirrel-cage motors 1LA8 and 1MA8
Frame sizes 315 to 450



Squirrel-Cage Motors

Spare Parts

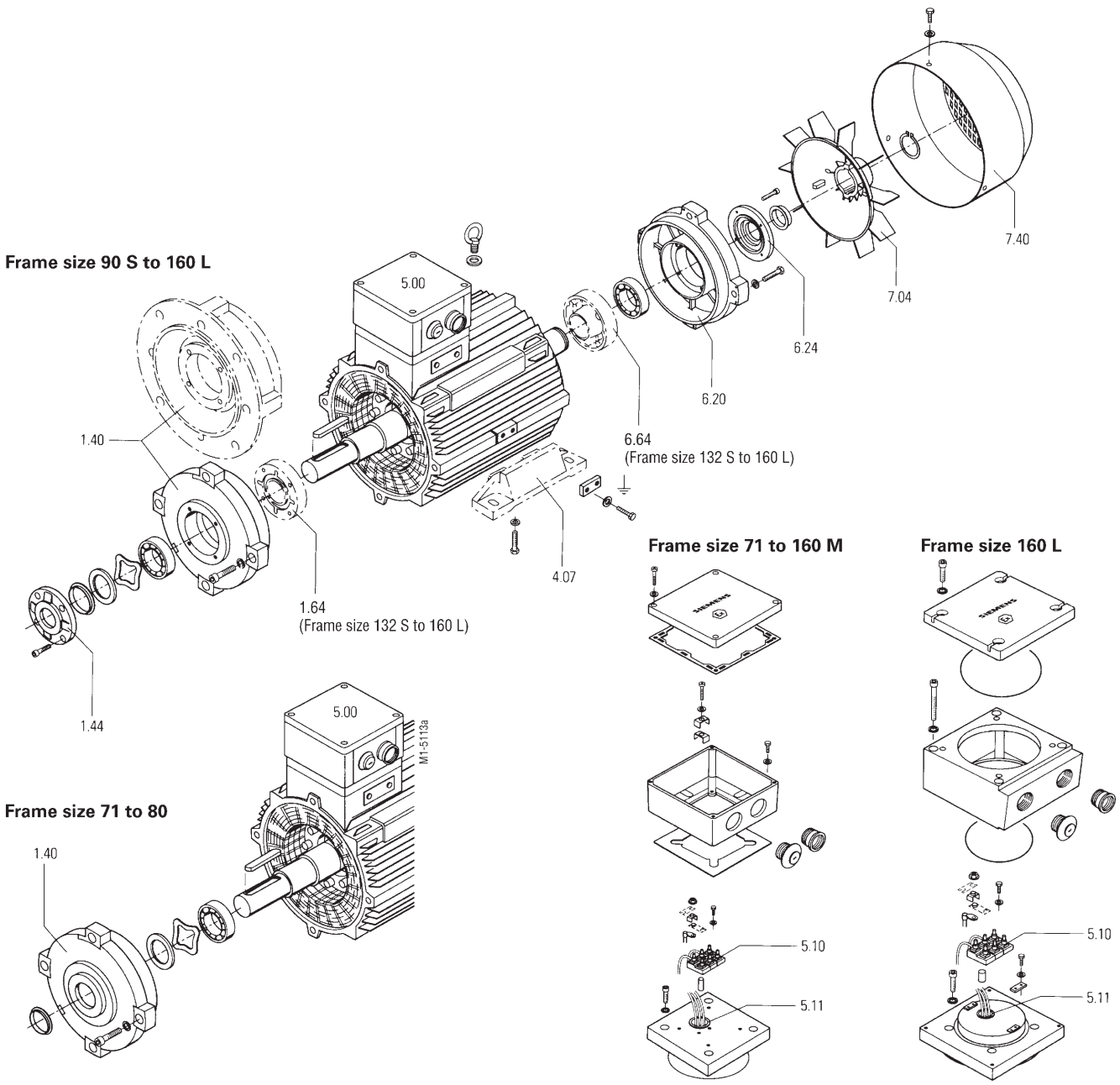
Squirrel-cage motors 1MJ6 · Frame sizes 71 to 160 L

Selection and ordering data

For motor Frame size	Type
71	1MJ6 070
	1MJ6 073
80	1MJ6 080
	1MJ6 083
90 L	1MJ6 096
	1MJ6 097
100 L	1MJ6 106
	1MJ6 107
112 M	1MJ6 113
132 S	1MJ6 130
	1MJ6 131
132 M	1MJ6 133
	1MJ6 134
160 M	1MJ6 163
	1MJ6 164
160 L	1MJ6 166

Motor (Operating Instructions 610.43413/21)	
Part No.	Designation
1.40	End shield, drive end
1.44	Outer bearing cap, drive end ¹⁾
1.64	Inner bearing cap, drive end
4.07	Frame feet (1 pair)
5.00	Terminal box, complete with explosion-proof gland and terminal board
5.10	Terminal board
5.11	Explosion-proof gland
6.20	End shield, non-drive end
6.24	Outer bearing cap, non-drive end ¹⁾
6.64	Inner bearing cap, non-drive end
7.04	External fan
7.40	Fan cowl

1) In order to achieve compliance with the IP 55 degree of protection, the bearing cap must always be fitted with a matching shaft seal.



Squirrel-Cage Motors

Appendix

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9/2	Certificates
9/3	Packing Weights and Dimensions
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Squirrel-Cage Motors

Appendix

Environment, Resources and Recycling, Certificates

Siemens AG feels a responsibility to play a role in protecting our environment and saving our valuable natural resources. This is true for both our production and our products.

Even during development, we consider any possible environmental impact of future products/systems. Our aim is to prevent harmful environmental effects, or at least to reduce them to an absolute minimum – beyond present regulations and legislation.

The most important activities for protecting our environment are as follows:

- We are constantly endeavoring to reduce the environmental impact of our products, as well as their consumption of energy and resources, over and above the statutory environmental protection regulations.
- We take every possible step to prevent damage to the environment.
- Environmental impact is assessed and considered at the earliest possible stage of product and process planning.

- Our optimized environmental management strategy ensures that our environment policy is put into practice effectively. The necessary technical and organizational procedures are reviewed at regular intervals and continuously updated.
- An awareness for environmental problems is expected of all our employees. Establishing and furthering a sense of responsibility for the environment on all levels represents a permanent challenge for the corporate management.

- We urge our business partners to act according to the same environmental principles as ourselves. We cooperate with the responsible public authorities.
- We inform interested members of the public about the consequences of our corporate policies for the environment as well as our achievements to the benefit of the environment.
- Our complete documentation is printed on chlorine-free bleached paper.



Packing weights for type 1LA, 1MA and 1MJ motors

For motors		For land transport			Types of construction IM B 5, IM V 1		
Frame size	Type 1LA5.../1LA7... 1LA6.../1LA9... 1MA6.../1MA7... 1MJ6...	Type of construction IM B 3					
		in cartons tare kg	on battens tare kg	in crates tare kg	in cartons tare kg	on battens tare kg	in crates tare kg
56	... 050/053	0.65	–	–	0.65	–	–
63	... 060/063	0.65	–	–	0.65	–	–
71	... 070 ... 073	0.65	–	–	0.65	–	–
80	... 080 ... 083	0.65	–	–	0.65	–	–
90 S	... 090	0.65	–	–	0.65	–	–
90 L	... 096/097						
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						
160 M	... 163/164	4.8	–	–	5.7	–	–
160 L	... 166						
180 M	... 183	13.0	–	–	13.4	–	–
180 L	... 186						
200 L	... 206/207	13.5	–	–	13.5	–	–
225 S	... 220	13.7	7	20	13.7	10	20
225 M	... 223						
250 M	... 253	–	20	36	–	20	40
280 S	... 280	–	20	36	–	20	40
280 M	... 283						
315 S	... 310	–	20	38	–	20	45
315 M	... 313						
315 L	... 316/317/318		22	40		22	
For 1LG8 motors							
90 S/L		2	–	–	2	–	–
100 L		2	–	–	3	–	–
112 M		3	–	–	4	–	–
132 S/M		4	–	–	6	–	–
160 M/L		–	8	–	–	8	–

Values for type 1MJ8 motors on request.

The figures stated in this table apply to individual packing. Frame sizes 56 to 180 L can also be packed on grid crates. Order Code **L99**.

Packing weights and dimensions for 1LA8 and 1MA8 motors

For motors		Packing weights			
Frame size	Type 1LA8... 1MA8...	Land transport on battens		Sea transport in wooden cases	
		Type IM B 3 tare kg	Type IM V 1 tare kg	Type IM B 3 tare kg	Type IM V 1 tare 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 IM B 3	Type IM V 1	Type IM B 3	Type IM V 1
		approx.	approx.	approx.	approx.
		mm	mm	mm	mm
Length		+250	+250	+250	+250
Width		+200	+300	+200	+200
Height		+200	+250	+500	+500

Squirrel-Cage Motors

Appendix

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A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

<http://www.ad.siemens.de>

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Information on the interactive catalogs can be found in the Internet under

<http://www.ad.siemens.de/ca01>

or on CD-ROM:

Automation and Drives, CA 01
Order No.:
E86060-D4001-A110-B3-7600

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E86060-D8200-A107-A1

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<http://mall.siemens.de>

Squirrel-Cage Motors

Appendix

Notes

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Appendix

Conditions of Sale and Delivery

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Subject to the General Conditions of Sale and Delivery for Products and Services of the Electrical and Electronic Industry and to any other conditions agreed upon with the recipients of catalogs.

■ The technical data, dimensions and weights are subject to change unless stated otherwise on individual pages of this catalog.

The illustrations are for reference only.

We reserve the right to adjust the prices and shall charge the prices applying of delivery.

Important:

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The Operating Instructions and the information specified on the actual products are binding for installation, operation and maintenance.

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