

Low-Voltage MOTORS 1LE1

IEC Squirrel-Cage Motors
New Generation 1LE1
Frame sizes 100 to 160
Power range 0.75 kW to 22 kW

SIEMENS

Related catalogs

Low-Voltage Motors D 81.1
IEC Squirrel-Cage Motors
Frame sizes 56 to 450

Order No.:
E86060-K5581-A111-A2-7600



MOTOX Geared Motors D 87.1
Catalog available soon

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MICROMASTER DA 51.2
MICROMASTER 420/430/440
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**Industrial Communication
for Automation and Drives** IK PI
Part 6: ET 200 Distributed I/O
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E86060-K6710-A101-B5-7600



AC NEMA & IEC Motors D 81.2
Further details available on the
Internet at: U.S./
Canada

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



Catalog CA 01 CA 01
The Offline Mall of Automation
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Order No.:
CD: E86060-D4001-A110-C5-7600
DVD: E86060-D4001-A510-C5-7600



A&D Mall

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



Additional documentation

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

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

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

Catalog CA 01 – Selection tool SD configurator

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



On CD 2 for the selection and configuring tools, you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters and SIMATIC ET 200S FC frequency converters for distributed I/O, complete with:

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

Hardware and software requirements

- PC with 500 MHz CPU or faster
- Operating systems
 - Windows 98/ME
 - Windows 2000
 - Windows XP
 - Windows NT (Service Pack 6 or higher)
- 256 MB work memory (minimum)
- Screen resolution 1024 x 768, graphic with more than 256 colors, small fonts
- 150 MB spare hard disk space (after installation)
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

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

Low-Voltage Motors

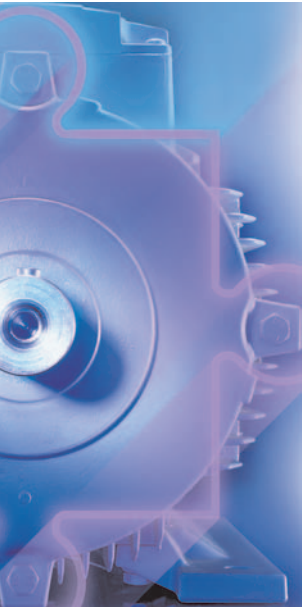
IEC Squirrel-Cage Motors

New Generation 1LE1

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SIEMENS

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Siemens Automation and Drives. Welcome

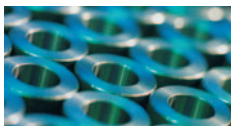
More than 70,000 people aiming for the same goal: increasing your competitiveness. That's Siemens Automation and Drives.

We offer you a comprehensive portfolio for sustained success in your sector, whether you're talking automation engineering, drives or electrical installation systems. Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) form the core of our offering. TIA and TIP are the basis of our integrated range of products and systems for the manufacturing and process industries as well as building automation. This portfolio is rounded off by innovative services over the entire life cycle of your plants.

Learn for yourself the potential our products and systems offer. And discover how you can permanently increase your productivity with us.

Your regional Siemens contact can provide more information. He or she will be glad to help.

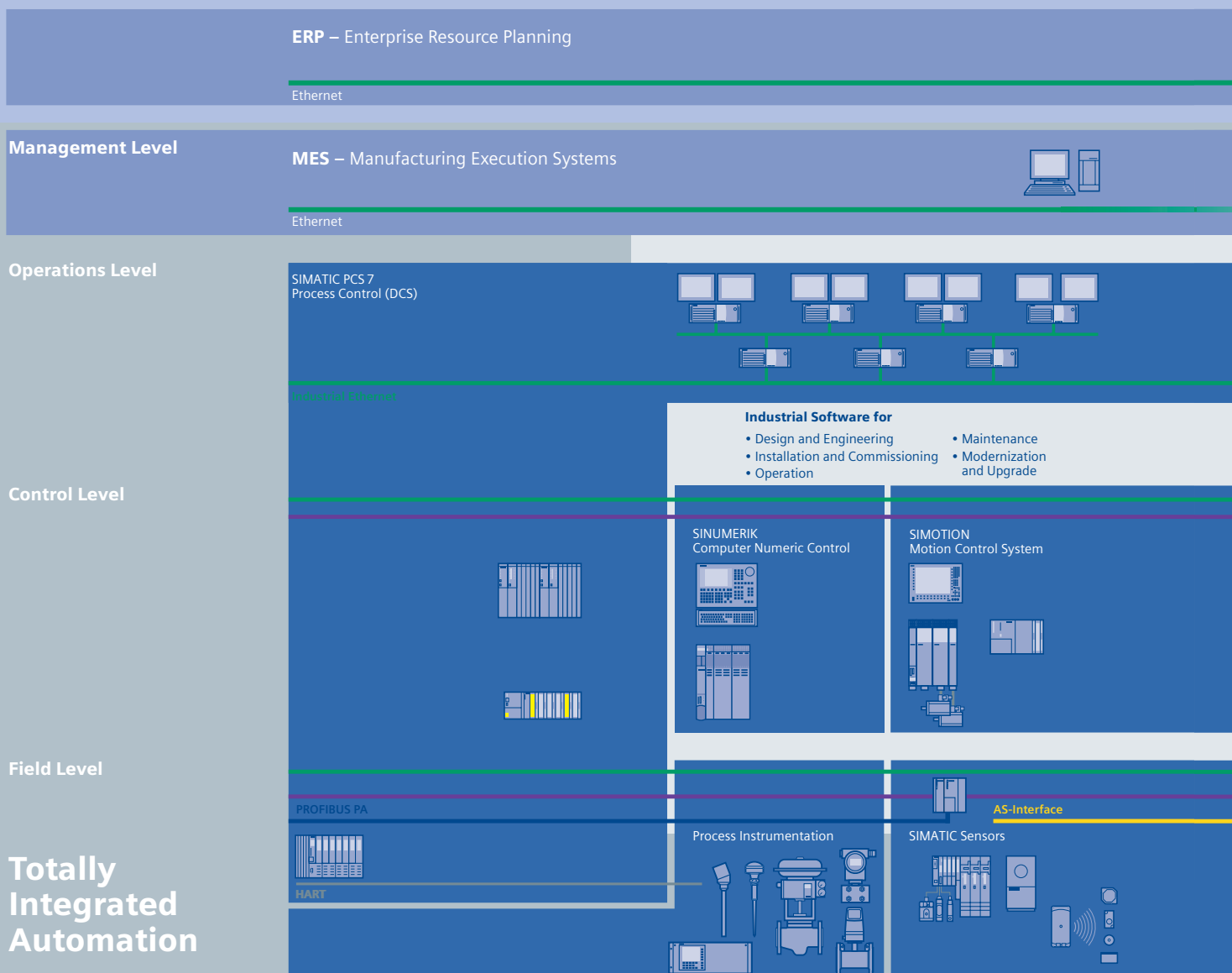




Sharpen your competitive edge. Totally Integrated Automation

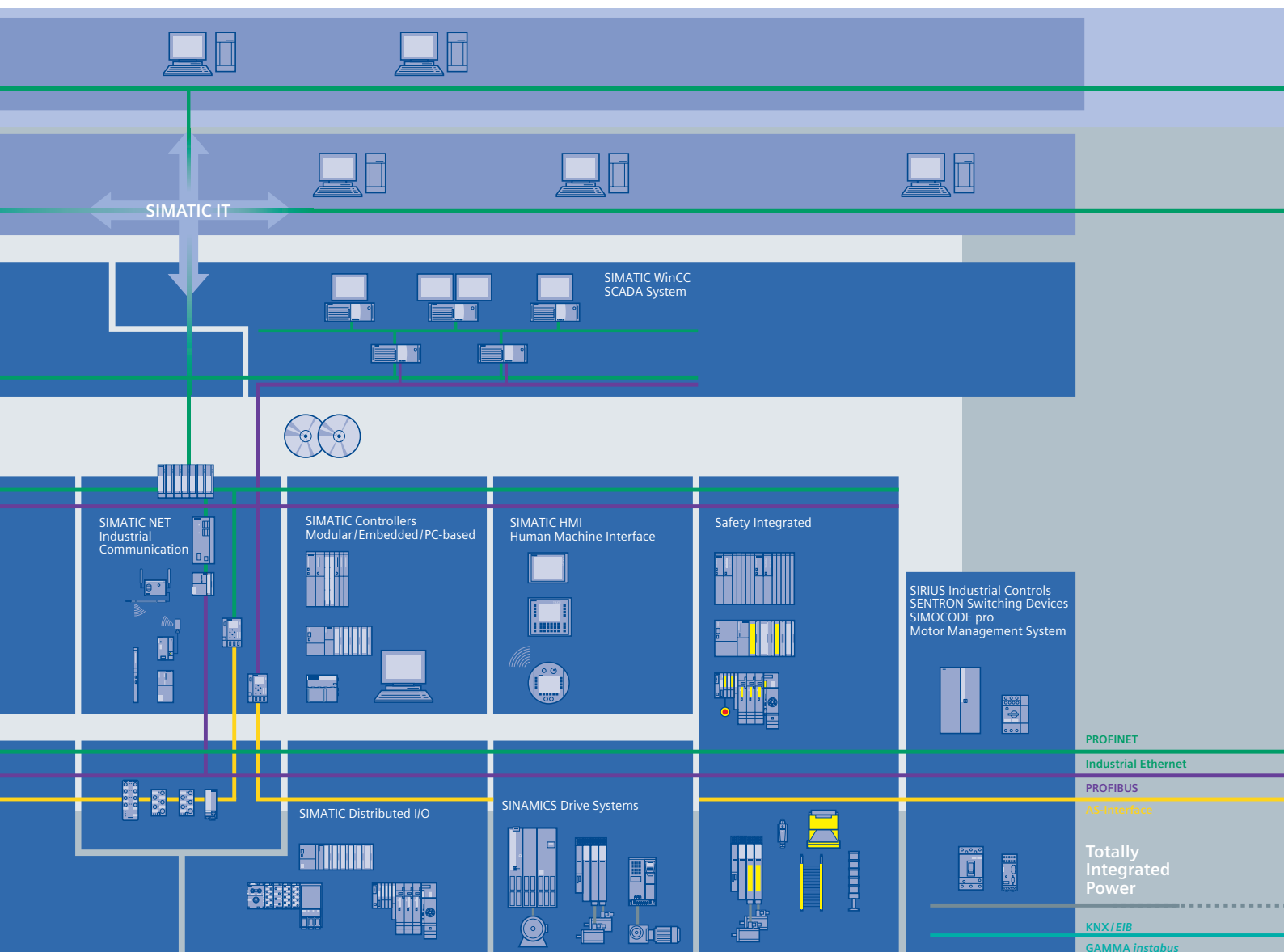
With Totally Integrated Automation (TIA), Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all sectors - from incoming goods to outgoing goods, from the field level through the production control level to connection with the corporate management level.

On the basis of TIA, we implement solutions that are perfectly tailored to your specific requirements and are characterized by a unique level of integration. This integration not only ensures significant reductions in interface costs but also guarantees the highest level of transparency across all levels.



It goes without saying that you profit from Totally Integrated Automation during the entire life cycle of your plants - from the first planning steps, through operation, right up to modernization. Consistent integration in the further development of our products and systems guarantees a high degree of investment security here.

Totally Integrated Automation makes a crucial contribution towards optimizing everything that happens in the plant and thus creates the conditions for a significant increase in productivity.



Protecting the environment and resources. Environmental sustainability

Environmental protection will continue to grow in importance as a result of progressive urbanization and global population growth. These global mega-trends make the careful and sustainable handling of natural resources a central challenge.

We are convinced that every individual - and especially every company - has an ecological responsibility. At Siemens Automation and Drives, we stand by this conviction. Our high environmental protection goals are part of our strict environmental management. We investigate the possible effects of our products and systems on the environment right back at the development stage. We concern ourselves, for example, with the question of how to reduce power consumption in plant operation - and we offer appropriate solutions, such as our energy-saving motors that cut power consumption in industrial manufacturing by up to 40% thanks to their high efficiency levels.

Many of our products and systems comply with the EC Directive RoHS (Restriction of Hazardous Substances). All the relevant Siemens AG sites are, of course, certified in accordance with DIN EN ISO 14001.

Our commitment goes well beyond compliance with the relevant directives and legislation: we are an active driving force behind environmental protection, through further development of environmental management systems, for example, and we are involved in professional associations such as the German Electrical and Electronic Manufacturers Association (ZVEI).



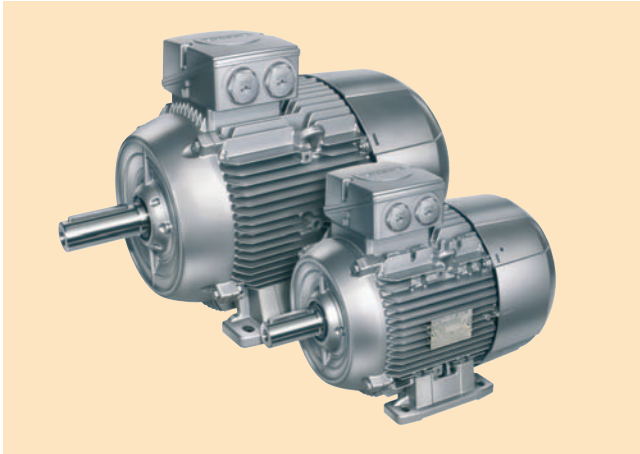
IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

1

Overview



Increasing energy costs have resulted in greater emphasis on the power consumption of drive systems. It is extremely important to utilize the full potential for minimization here to secure competitiveness today and in the future. The environment will also profit from reduced energy consumption.

With this in mind, we have already developed a new generation of low-voltage motors that you can use in drives to move even more than before. Innovative copper rotors that we develop and manufacture entirely in-house create the perfect conditions for motors with a high degree of efficiency (EFF2 and EFF1 motors are located in the same housing). The new motors for EFF1 (High Efficiency) offer considerable energy savings and protect our environment.

The modular mounting concept also provides total flexibility: Each motor is based on a uniform concept for all markets worldwide. Our motors are manufactured in accordance with modern ecological principles and give machines and plants more drive. Worldwide and for every application. Efficiency over the complete life cycle is a clear benefit of our motors especially for the use of 1LE1 designed to EFF1. All machine manufacturers and plant operators can profit from this – not to mention the environment. We will be launching our new 1LE1 motors onto the market step by step.

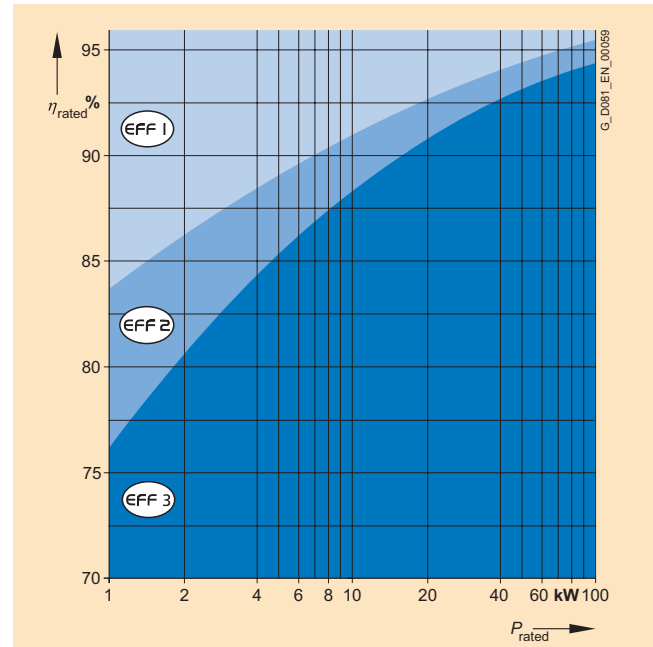
Classified energy-saving motors for an efficient energy balance

Depending on requirements, energy-saving motors are available for an efficient energy balance for the EU in accordance with CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics) and will be available soon for the North American market in accordance with EPACT (US Energy Policy Act).

Efficiency requirements according to CEMEP

CEMEP classifies efficiency levels for 2-pole and 4-pole motors with outputs of 1.1 to 90 kW. Three efficiency classes are defined:

- **EFF1** (High Efficiency motors – referred to below as “Motors with high efficiency”)
- **EFF2** (Improved Efficiency motors – referred to below as “Motors with improved efficiency”)
- **EFF3** (Conventional Efficiency motors)



At a glance: EU/CEMEP for Europe

- **Status**
Voluntary compliance with efficiency classification
- **Covers**
2-pole, 4-pole 50 Hz squirrel-cage motors from 1.1 to 90 kW (at 400 V and 50 Hz)
- **Required marking**
Efficiency class on the motor rating plate
 η_{rated} , $\eta_{3/4}$ load and efficiency class in the documentation

Efficiency requirements according to EPACT (motor version available soon)

In 1997, an act was passed in the US to define minimum efficiencies for low-voltage three-phase motors (EPACT).

An act is in force in Canada that is largely identical, although it is based on different verification methods. The efficiency is verified for these motors for the USA using IEEE 112, Test Method B and for Canada using CSA-C390. Apart from a few exceptions, all three-phase low-voltage motors imported into the USA or Canada must comply with the legal efficiency requirements. The law demands minimum efficiency levels for motors with a voltage of 230 and 460 V at 60 Hz, in the output range of 1 to 200 HP (0.75 to 150 kW) with 2, 4 and 6 poles. Explosion-proof motors must also be included.

The EPACT efficiency requirements exclude, for example:

- Motors whose frame size-output classification does not correspond with the standard series according to NEMA MG1-12.
- Flange-mounting motors
- Brake motors
- Converter-fed motors
- Motors with design letter C and higher

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

Overview (continued)

EPACT lays down that the nominal efficiency at full load and a "CC" number (Compliance Certification) must be included on the rating plate. The "CC" number is issued by the US Department of Energy (DOE). The following information is stamped on the rating plate of EPACT motors which must be marked by law:

- Nominal efficiency
- Design letter
- Code letter
- CONT
- CC No. CC 032A (Siemens) and NEMA MG1-12.

At a glance: EPACT/CSA for North America
(motor version available soon)

- Status
Minimum efficiencies required by law
- Covers
2-, 4- and 6-pole 60 Hz squirrel-cage motors from 1 to 200 HP (0.75 to 150 kW) for 230 V and/or 460 V 60 Hz
- Required marking
Efficiency η_{rated} on the motor rating plate

Motors with increased output and compact construction

Motors with increased output and compact construction can be used to advantage in confined spaces. For a slightly longer overall length, the output is at least as high as that of the next larger shaft height. These compact motors are also optimized for efficiency and therefore reduce the operating costs.

Motors without fan cover and external fan

Forced-air cooled motors with surface cooling without fan cover and external fan are mainly used for driving fans.

Motors delivered ex-stock with shorter delivery time – General Line

The most popular basic versions of the 1LE1 motor series can be supplied ex-stock and are termed the "General Line".

A so-called "Sector version" will be available soon for some of the motors available from stock. These include a located bearing at the drive end (DE), PTC thermistor and screwed-on feet for the IM B35 type of construction.

The normal delivery time for General Line motors is 1 to 2 days from the time of clarification of the order at the factory until delivery from the factory. To determine the time of arrival at the customer site, the appropriate shipping time must be added.

Benefits

There is considerable potential in our new 1LE1 series of low-voltage motors. As a consistent further development of our existing motors, the 1LE1 motors offer numerous advantages:

Greater efficiency

Instead of cast-aluminum rotors, the new copper technology is used in the EFF1 motors. The motors are therefore considerably more compact. EFF2 and EFF1 motors are based on the same housing. For changeover to the higher efficiency class – from EFF2 to EFF1 – reconstruction of the machine is no longer necessary. Savings are achieved in time and costs. And what is more: You can save a considerable amount of energy with EFF1 motors because they have power losses of up to 40 % less than EFF2 motors. The energy saving potential and life cycle costs of the new motors can be calculated with our SinaSave™ software. You can download the SinaSave program in the Internet using the following link: <http://www.siemens.com/energysaving>. Our 1LE1 motors also impress customers with their extremely long life and their weight-optimized design has a positive effect on the stability of the equipment unit.

Improved design

The new, optimized housing in modern EMC design has an attractive appearance and enhances functionality. The rotatable, accessible connection boxes, integral eyebolts, screwed-on feet and reinforced bearing plates ensure this.

Greater output

For the same shaft height, our high-performance motors offer an additional complete rated output level. The best is: We are also consistently implementing energy efficiency improvements here, too. The motors are offered – based on the categories of CEMEP – in high efficiency and improved efficiency versions.

More flexibility

The optimized architecture of the motors makes installation easier in general. Encoders, brakes and separately driven fans can be retrofitted easily. Connection boxes and feet for flexible mounting can be selected. Smaller inventories make stockkeeping easier and motor suppliers can respond to customer requirements more quickly. Optimized manufacturing processes support fast availability. All motors up to 460 V can be operated either directly on line or converter-fed – without the need for any additional measures.

Application

As soon as the range of motors and options is complete, it will be possible to use the 1LE1 motors from Siemens in all areas and sectors of industry due to their numerous options. They are suitable both for special environmental conditions such as those that predominate in the chemical or petrochemical industries as well as for most climatic requirements such as those of offshore applications. Their large range of line voltages enables them to be used all over the world.

The wide field of implementation includes the following applications:

- Pumps
- Fans
- Compressors
- Conveyor systems such as cranes, belts and lifting gear
- High-bay warehouses
- Packaging machines
- Automation and Drives

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Technical specifications

Technical data at a glance

The following table lists the most important technical data.

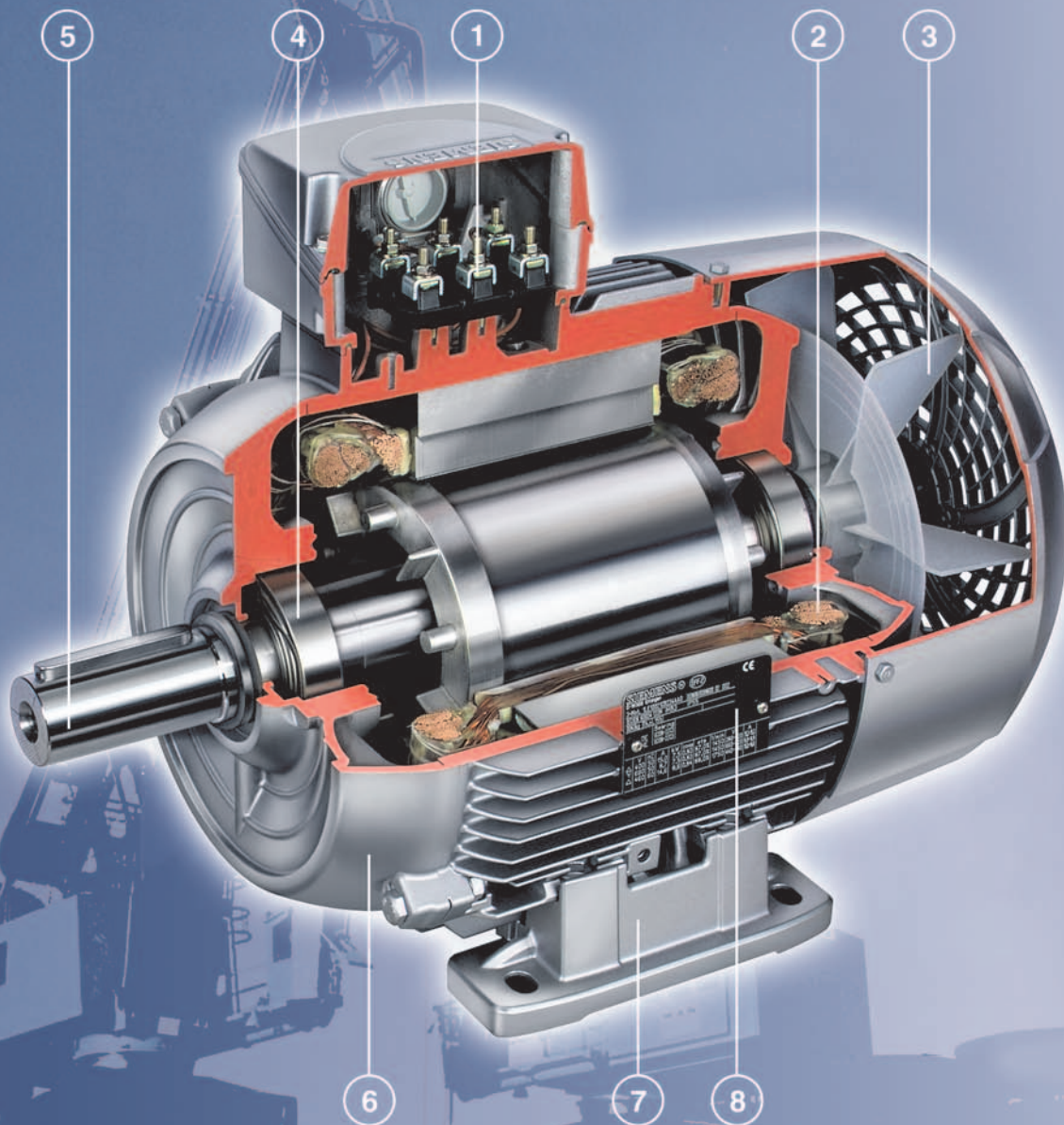
Type of motor	IEC Squirrel-Cage Motors 1LE1
Connection types	Star connection/delta connection You can establish the connection type used from the Order No. supplements in the selection and ordering data for the required motor.
Number of poles	2, 4, 6, 8
Frame sizes	100 L to 160 L
Rated output	0.75 ... 22 kW
Frequencies	50 Hz and 60 Hz
Versions	Self-ventilated energy-saving motors with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Self-ventilated motors with increased output and: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1) Forced-air-cooled motors without external fan and fan cover with: <ul style="list-style-type: none"> • Improved efficiency (EFF2) • High efficiency (EFF1)
Marking	EU/CEMEP efficiency classification, EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPACKT: 2-, 4-, 6-pole (motor version available soon)
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated torque	9.9 ... 150 Nm
Insulation of the stator winding according to EN 60034-1 (IEC 60034-1)	Temperature class 155 (F), used acc. to temperature class 130 (B) (also for motors with increased output) DURIGNIT IR 2000 insulation system
Degree of protection according to EN 60034-5 (IEC 60034-5)	IP55 as standard
Cooling according to EN 60034-6 (IEC 60034-6)	Self-ventilated frame sizes 100 L to 160 L (IC 411), forced-air-cooled frame sizes 100 L to 160 L (IC 416)
Admissible coolant temperature and site altitude	–20 °C ... +40 °C as standard, site altitude up to 1000 m above sea level.
Standard voltages according to EN 60038 (IEC 60038)	50 Hz: 230 V, 400 V, 500 V, 690 V The voltage to be used can be found in the selection and ordering data for the required motor.
Type of construction according to EN 60034-7 (IEC 60034-7)	Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover With flange: IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 With standard flange: IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Paint finish Suitability of paint finish for climate group according to IEC 60721, Part 2-1	Standard: Color RAL 7030 stone gray
Vibration quantity level according to EN 60034-14 (IEC 60034-14)	Level A (normal – without special vibration requirements) Optionally: Level B (with special vibration requirements)
Shaft extension according to DIN 748 (IEC 60072)	Balance type: Half-key balancing as standard
Sound pressure level according to DIN EN ISO 1680 (tolerance +3 dB)	The sound pressure level is listed in the selection and ordering data for the required motor.
Weights	The weight is listed in the selection and ordering data for the required motor.
Modular mounting concept	Rotary pulse encoder, brake, separately driven fan or prepared for mountings
Consistent series concept	<ul style="list-style-type: none"> • Cast housing feet, screw-mounted feet available as an option and retrofittable • Connection box obliquely partitioned and rotatable through 4 x 90° • Bearings at DE and NDE are of identical design, reinforced bearings available as an option
Options	See the selection and ordering data for "Special versions"

IEC Squirrel-Cage Motors

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Cut-away diagram of a low-voltage motor



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| ② Windings and insulation Page 1/12
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Designs in accordance with standards and specifications

Applicable standards and specifications

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

Title	IEC/EN	DIN EN
General specifications for rotating electrical machines	IEC 60034-1, IEC 60085	DIN EN 60034-1
Specification of the losses and efficiency of rotating electrical machines	IEC 60034-2	DIN EN 60034-2
Asynchronous AC motors for general use with standardized dimensions and outputs	IEC 60072 mounting dimensions only	DIN EN 50347
Restart characteristics for rotating electrical machines	IEC 60034-12	DIN EN 60034-12
Terminal designations and direction of rotation for electrical machines	IEC 60034-8	DIN EN 60034-8
Designation for type of construction, installation and connection box position	IEC 60034-7	DIN EN 60034-7
Entry to connection box	–	DIN 42925
Built-in thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values for rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods for rotating electrical machines	IEC 60034-6	DIN EN 60034-6
Vibration severity of rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection of rotating electrical machines	IEC 60034-5	DIN EN 60034-5

National standards

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

Colors and paint finish

Type	Suitability of paint finish for climate group in accordance with DIN IEC 60721, Part 2-1	
Special finish	Worldwide (global) for outdoor use in direct sunlight and/or weather conditions. Suitable for use in the tropics for <60% relative humidity at 40 °C	Briefly: Up to 140 °C Contin.: Up to 120 °C Also: for aggressive atmospheres up to 1% acid and alkali concentrations or permanent dampness in sheltered rooms

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

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

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

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

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

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

Title	Country
IS 325 IS 4722	India
NEK – IEC 60034-1	Norway

Tolerances for electrical data

According to DIN EN 60034, the following tolerances are permitted:

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

A tolerance of $\pm 5\%$ also applies to the rated voltage range in accordance with DIN EN 60034-1. For rated voltage and rated voltage range, see Page 1/7.

Efficiency η at

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

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

With η being a decimal number.

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

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

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

Locked-rotor current +20%

Locked-rotor torque –15% to +25%

Breakdown torque –10%

Moment of inertia $\pm 10\%$

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Orientation

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

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

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

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

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Packaging, safety notes, documentation and test certificates

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

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

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

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

Packing weights

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

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

Safety notes

If the motors are to be delivered without safety and commissioning notes, a customer's declaration of renouncement is required.

Without safety and commissioning note – Order code **B00**

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

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

Documentation

The following documents are optionally available:

- Operating instructions on CD enclosed – Order code **B03**
- Printed operating instructions English/German enclosed – Order code **B04**

Test certificates

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

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

Voltagess, currents and frequencies

Standard voltages

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

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

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

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

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

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Non-standard voltages and/or frequencies

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

Order codes have been allocated for a number of non-standard voltages at 50 or 60 Hz. They are ordered by specifying the code digit 9 for voltage in the 12th position of the Order No. as well as the code digit 0 in the 13th position of the Order No. and the appropriate order code.

M1Y Non-standard winding for voltages between 200 V and 690 V and rated output up to the possible rated output of the basic version.

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

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

Motor type	Frame size	Currents for voltage and number of poles							
		380 V	420 V	380 V	420 V	380 V	420 V	380 V	420 V
		2-pole		4-pole		6-pole		8-pole	
		/	/	/	/	/	/	/	/
		A	A	A	A	A	A	A	A

General Line motors with shorter delivery time

Self-ventilated energy-saving motors with improved efficiency - Aluminum series 1LE1

Forced-air cooled motors without external fan and fan cover with improved efficiency - Aluminum series 1LE1

1LE1002-1A.4	100 L	6.2	5.9	5.0	4.9	3.9	4.1	2.49	2.71
1LE1002-1A.5	100 L	–	–	6.4	6.1	–	–	3.55	3.81
1LE1002-1B.2	112 M	8.1	8.1	8.4	8.1	5.4	5.5	4.45	4.6
1LE1002-1C.0	132 S	10.9	10.3	11.5	11.4	7.3	7.7	6.2	6.5
1LE1002-1C.1	132 S	14.5	13.9	–	–	–	–	–	–
1LE1002-1C.2	132 M	–	–	15.2	15.2	9.3	9.4	8.4	8.8
1LE1002-1C.3	132 M	–	–	–	–	13.7	12.9	–	–
1LE1002-1D.2	160 M	21.7	20.7	22.4	22.8	17.0	17.7	10.5	11.6
1LE1002-1D.3	160 M	29.6	28.9	–	–	–	–	13.8	14.6
1LE1002-1D.4	160 L	35.0	33.5	30.0	30.2	23.9	23.8	18.9	19.4

Self-ventilated energy-saving motors with high efficiency - Aluminum series 1LE1

Forced-air cooled motors without external fan and fan cover with high efficiency - Aluminum series 1LE1

1LE1001-1A.4	100 L	6.1	6.1	4.65	4.65	3.55	3.55	2.75	3.0
1LE1001-1A.5	100 L	–	–	6.2	6.1	–	–	3.95	4.45
1LE1001-1B.2	112 M	7.8	7.6	8.3	8.2	5.1	5.0	4.5	4.55
1LE1001-1C.0	132 S	10.1	10.5	11.4	11.4	7.0	7.1	6.6	6.6
1LE1001-1C.1	132 S	14.2	13.7	–	–	–	–	–	–
1LE1001-1C.2	132 M	–	–	14.8	14.4	8.6	8.9	8.5	8.6
1LE1001-1C.3	132 M	–	–	–	–	12	11.9	–	–
1LE1001-1D.2	160 M	20.0	21.0	21.5	20.5	16.1	15.8	9.8	9.6
1LE1001-1D.3	160 M	28.0	27.0	–	–	–	–	13.4	13.3
1LE1001-1D.4	160 L	34.0	33.0	28.5	27.5	22.5	21.5	17.5	16.8

Self-ventilated motors with increased output with improved efficiency - Aluminum series 1LE1

1LE1002-1A.6	100 L	8.1	7.9	8.5	8.5	5.4	5.3	–	–
1LE1002-1B.6	112 M	10.9	10.9	11.4	11.3	7.5	8.0	–	–
1LE1002-1C.6	132 M	20.3	18.9	21.8	21.3	17.0	17.6	–	–
1LE1002-1D.6	160 L	40.2	37.9	36.1	35.5	33.5	34.0	–	–

Self-ventilated motors with increased output and high efficiency - Aluminum series 1LE1

1LE1001-1A.6	100 L	7.8	7.6	8.3	8.4	5.0	4.95	–	–
1LE1001-1B.6	112 M	10.4	9.8	11.2	11.1	6.6	6.5	–	–
1LE1001-1C.6	132 M	16.5	16.5	21.5	21	16.5	16.5	–	–
1LE1001-1D.6	160 L	40.0	37.5	35.5	34.5	30.5	29.0	–	–

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

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

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Outputs

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

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

Efficiency and power factor

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

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

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

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

Part-load power factor at

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

Rated speed and direction of rotation

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

If U1, V1, W1 are connected to L1, L2, L3, clockwise rotation results as viewed onto the drive-end shaft extension. Counter-clockwise rotation is achieved by swapping two phases (see also "Heating and ventilation", Page 1/14).

Rated torque

The rated torque in Nm delivered at the motor shaft is

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

P Rated output in kW
 n Speed in rpm

Note:

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

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

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

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

of the rated torque.

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Rating plate and extra rating plates

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

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

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

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

Overview of the languages on the rating plate

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

☐ Standard version

☐ Without additional charge

Example of a rating plate

The rating plate is a rectangular plate with the following fields and callouts:

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

The rating plate also includes the Siemens logo, CE mark, and various technical specifications such as 3-Mot. 1LE1 002-1DB43-4AA0, IEC/EN 60034 160L IMB3, IP55, 73 kg, Th.Cl. 155(F), DE, NE, Bearing 6209-2ZC3, and a table of performance data for 400V, 690V, and 460V.

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

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

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

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Coolant temperature and site altitude

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

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

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

This results in an admissible output of the motor of:

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

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

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

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

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

Power kW	Admissible output at 50 Hz	
	for CT 45 °C kW	for 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

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

Motors for coolant temperatures other than 40 °C or site altitudes higher than 1000 m above sea level for use in temperature class 130 (B) must always be ordered with the supplementary order code "**-Z**" and plain text. In the case of extreme derating, the operating data for the motors will also be less favorable due to partial utilization.

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

The following applies to all motors:

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

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

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

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

Ambient temperature:

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

Motors can be used in temperature class 155 (F)

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

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

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

For other temperatures, special measures are necessary.

When brakes are to be mounted on at temperatures below freezing, please inquire.

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Windings and insulation

DURIGNIT IR 2000 insulation system

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

The system ensures a high level of mechanical and electrical strength as well as good serviceability and a long motor life. The insulation system protects the winding against aggressive gases, vapors, dust, oil and increased air humidity. It can withstand the usual vibration stressing.

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

Please inquire about extreme applications.

Restarting against residual field and opposite phase

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

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

All motors are designed for temperature class 155 (F). At rated output with line-fed operation, the motors can be used in temperature class 130 (B).

Temperature class 155 (F), used in accordance with 155 (F), with service factor (SF)

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

Order code **N01**

Temperature class 155 (F), used in accordance with 155 (F), for increased output

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

Order code **N02**

Temperature class 155 (F), used in accordance with 155 (F), with increased coolant temperature

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

Order code **N03**

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

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

Temperature class 155 (F), used in accordance with 155 (F), other requirements

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

Order code **Y52**

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

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

Order code **N05**

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

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

Order code **N06**

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

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

Order code **N07**

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

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

Order code **N08**

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Motor protection

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

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

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

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

Current-dependent protection devices

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

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

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

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

Motor-temperature-dependent protection devices

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

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

Temperature detectors for tripping

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

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

Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping. In the connection box, 2 auxiliary terminals are required.

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

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

Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping. In the connection box, 4 auxiliary terminals are required.

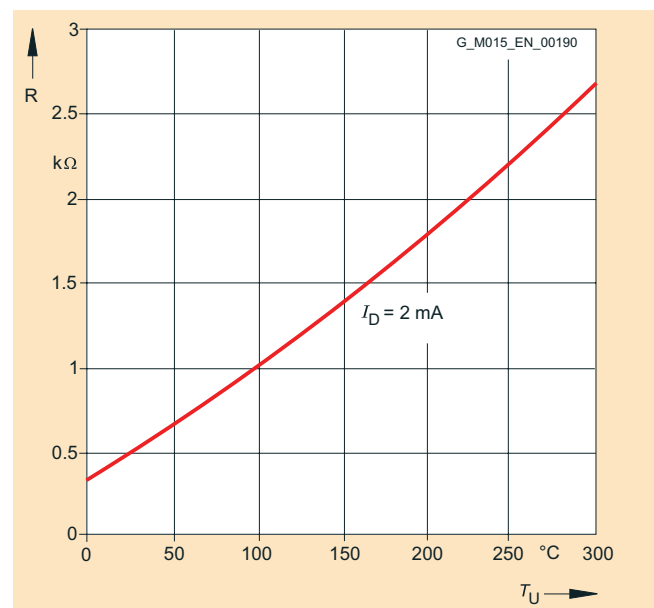
15th position of Order No. letter **C**

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

Motor temperature detection with converter-fed operation

KTY 84-130 temperature sensor

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



KTY 84-130 temperature sensor characteristic

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

Motor temperature detection with embedded temperature sensor KTY 84-130. Two auxiliary terminals are required in the connection box.

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

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

For line-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV 1, Order No.: E86060-K1002-A101-A6-7600.

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

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

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Heating and ventilation

Anti-condensation heaters

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

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

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

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

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

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

Instead of an anti-condensation heater, another possibility (at no extra cost) is connection of a voltage that is approximately 4 to 10% of the rated motor voltage to stator terminals U1 and V1; 20 to 30% of the rated motor current are sufficient to heat the motor.

Fans/Separately driven fans

Motors of frame sizes 100 ... 160 have radial-flow fans in the standard version that cool regardless of the direction of rotation of the motor (cooling method IC 411 acc. to DIN EN 60034-6). The air flow is forced from the non-drive-end (NDE) to the drive end (DE).

For details of separately driven fans for frame sizes 100 ... 160, see Page 1/27.

Line voltage of separately driven fan for 1LE1 motors:

The line voltage tolerance of the separately driven fan is $\pm 5\%$; for voltage ranges, Page 1/27.

When the motor is mounted and the air intake is restricted, it must be ensured that a minimum clearance is maintained between the fan cover and the wall. This clearance is calculated from the difference between the protective cover and the fan cover (differential dimension LM - L) or is specified in the detailed dimension drawing (see also Dimensional drawings from Page 1/90).

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

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

Sheet metal fan cover

For 1LE1 motor series, the fan cover can be supplied in sheet metal instead of plastic.

Order code **F74**

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

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

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

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

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

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

²⁾ Value: EFF1/EFF2

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Orientation

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Motor connection and connection boxes

Connection, circuit and connection boxes

Location of the connection box

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

The connection box of the motor can be mounted in four different locations or positions. The position of the connection box must always be viewed from the drive end (DE).

The standard position of the connection box for *General Line motors* is on top 16th position of Order No. digit **0**.

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

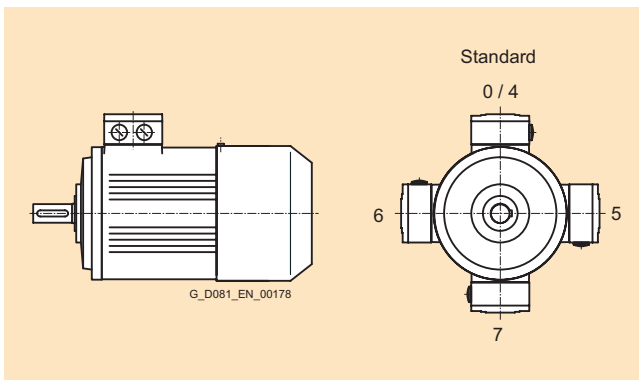
For all motors with feet (apart from motors with increased output), cast feet are standard. If rotation of the connection box in the future has to be provided for, it is recommended that the option "Screwed-on feet" (instead of cast feet), order code **H01**, is ordered.

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

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

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

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



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

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

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

Labeled terminals are provided to connect the protective conductor.

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

Order code **H04**.

If a brake control system or thermal protection is installed, the connections will also be in the connection box. The motors are suitable for direct connection to the line supply.

Design of the connection box

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

Motor connection

Line feeder cables

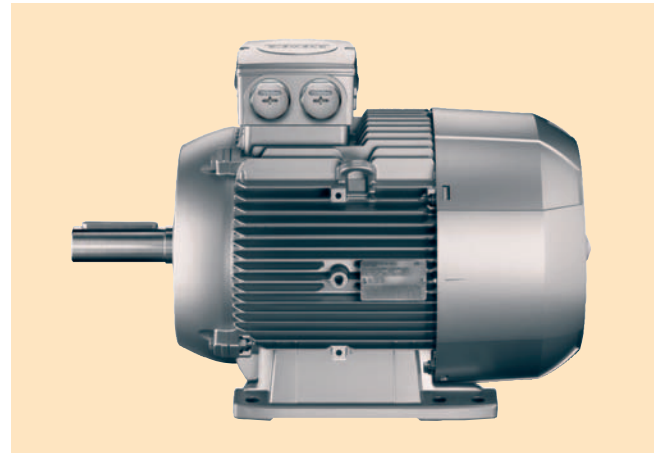
The line feeder cables must be dimensioned acc. to DIN VDE 0298. The number of required feeder cables, if necessary in parallel, is defined by:

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

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

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

The connection box is located on the housing and bolted in place. The connection box can be turned 4 x 90° on the terminal base of the machine's housing in the case of a terminal board with 6 terminal studs (standard design). There are 2 entry holes at the standard position complete with sealing plugs and locknuts (see figure).



Connection box in standard position

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Cable entry on connection box

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

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

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

The dimensions of the connection box are listed in part "Dimensions", see Pages 1/87 to 1/97 in accordance with the frame size and the "Dimension drawings".

If the position of the connection box (connection box RHS, LHS or above) is changed, the position of the cable entry must be checked and, if necessary, it can be ordered with the corresponding order codes (**R10**, **R11** and **R12**).

Ordering example:

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

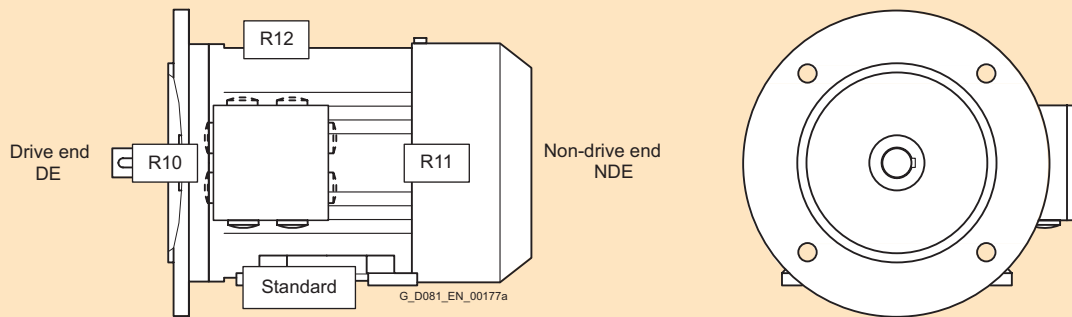
With additional order code **R10**:
Cable entry from drive end (DE)



Connection box in standard position, detailed view

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

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



Locations of the cable entries with corresponding order codes

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Connection, circuit and connection boxes

Type TB1 F00, TB1 H00, TB1 J00



Connections boxes for 1LE1 motors – basic data

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

Possible positions of the connection boxes for 1LE1 motors

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

○ Available version

Connection boxes for 1LE1 motors in standard version

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

– Not available

Terminal connection

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

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

²⁾ Designed for cable glands with O-ring.








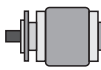

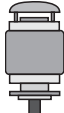

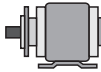
IEC Squirrel-Cage Motors

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Types of construction

Standard types of construction and special types of construction

Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
Without flange				
IM B3		100 L to 160 L	A	–
IM B6/IM 1051		100 L to 160 L	T	–
IM B7/IM 1061		100 L to 160 L	U	–
IM B8/IM 1071		100 L to 160 L	V	–
IM V5/IM 1011 without protective cover		100 L to 160 L	C	–
IM V6/IM 1031		100 L to 160 L	D	–
IM V5/IM 1011 with protective cover		100 L to 160 L	C	+ H00¹⁾
With flange				
IM B5/IM 3001		100 L to 160 L	F	–
IM V1/IM 3011 without protective cover		100 L to 160 L	G	–
IM V1/IM 3011 with protective cover		100 L to 160 L	G	+ H00¹⁾
IM V3/IM 3031		100 L to 160 L	H	–
IM B35/IM 2001		100 L to 160 L	J	–

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






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

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Type of construction acc. to DIN EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement -Z with order code
With standard flange				
IM B14/IM 3601		100 L to 160 L	K	–
IM V19/IM 3631		100 L to 160 L	L	–
IM V18/IM 3611 without protective cover		100 L to 160 L	M	–
IM V 18/IM 3611 with protective cover		100 L to 160 L	M¹⁾	+ H00¹⁾
IM B34/IM 2101		100 L to 160 L	N	–

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

The dimensions of the following types of construction are identical:

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

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

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

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

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

In the case of all types of construction with shaft end down, the version “with protective cover” is urgently recommended, see the section “Degrees of protection”, Page 1/20.

Frame design

Motors in the types of construction with feet have, in some cases, two fixing holes at the feet at the non-drive end (NDE), see dimension tables, Pages 1/90 to 1/97. A code is cast into the motor close to the fixing retaining holes to identify the frame size.

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

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Mechanical design and degrees of protection

Eyebolts and transport

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

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

Preparation for mountings

The encoders of the “modular and special technology” can be fitted at a later time. The motor must be prepared for this.

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

Order code **G40**

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

For the encoders

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

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

Order code **G41**

By using option **G41**, the motor length increases by dimension Δl. For explanations of additional dimensions and weights, see “Special technology”, “Dimensions and weights” from Page 1/35.

For the encoders

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

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

Order code **G42**

By using option **G42**, the motor length increases by dimension Δl. For explanations of additional dimensions and weights, see “Special technology”, “Dimensions and weights” from Page 1/35.

Degrees of protection

All motors are designed to IP55 degree of protection. They can be installed in dusty or humid environments. The motors are suitable for operation in tropical climates. Guide value <60% relative air humidity at CT 40 °C. Other requirements are available on request.

Brief explanation of the degree of protection

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

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

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

For motors with shaft extension pointing downwards, the version “with protective cover”, order code **H00**, is urgently recommended, see also “Types of construction”, Page 1/18.

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

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

Order code **H03**

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

Noise levels for line-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-valued measuring-surface sound pressure level L_{pTA} in dB (A). This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level is also specified as L_{WA} in dB (A). The specified values are valid at 50 Hz at rated output (see the Selection and ordering data). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please inquire about the noise levels for motors with converter-fed operation.

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

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Balance and vibration quantity

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

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

F = Balancing with full key
(Full-key convention)
H = Balancing with half key
(Half-key convention) – standard
N = Balancing without key –
Plain text required (Convention without key)

This is indicated on the rating plate of motors up to frame size 112.

Full-key balancing (F) is possible on request with order code **L02** (additional charge).

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

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

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

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

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

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

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

Limits (rms values) for max. vibration quantity of vibration distance (s), vibration speed (v) and acceleration (a) for the shaft height H		Shaft height H in mm								
Vibration quantity level	Machine installation	56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
		s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²	s_{rms} μm	v_{rms} mm/s	a_{rms} mm/s ²
A	Free suspension	25	1.6	2.5	35	2.2	3.5	45	2.8	4.4
	Rigid clamping	21	1.3	2.0	29	1.8	2.8	37	2.3	3.6
B	Free suspension	11	0.7	1.1	18	1.1	1.7	29	1.8	2.8
	Rigid clamping	–	–	–	14	0.9	1.4	24	1.5	2.4

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

Shaft and rotor

Shaft extension

60° center hole to DIN 332, Part 2 with M3 to M24 tapped hole depending on the shaft diameter (see dimension tables, Pages 1/90 to 1/97.)

Second standard shaft extension.
Order code **L05**.

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

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

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

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

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

Standard shaft made of non-rusting steel

For motor series 1LE1, a standard shaft made of non-rusting steel can be ordered. This is only possible for shaft extensions of standard dimensions. For non-standard shaft dimensions, there will be an additional charge!

Order code **L06**

Please inquire about other non-rusting materials.

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

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

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

The concentricity of the shaft extension, coaxiality and linear movement according to DIN 42955 Tolerance R for flange-mounting motors can be ordered using order code **L08**. This order code can be combined for motors with deep-groove bearings of series 60..., 62... and 63... This cannot be supplied in combination with brake or encoder mounting.

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

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

Bearings and lubrication

Bearing lifetime (nominal lifetime)

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

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

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

Bearing system

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

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

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

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

The bearing system is axially preloaded with a spring element at the drive end (DE) to ensure smooth running of the motor without play. (see Figure 1 of the Diagrams of bearings, Page 1/23).

For frame size 160 and above, the located bearing is axially secured at the non-drive end (NDE). Up to frame size 132, an additional axially-secured located bearing can be supplied on the non-drive end (NDE) complete with a retaining ring (see Figure 2 of the Diagrams of bearings, Page 1/23).

Order code **L21**

On request, the located bearing can also be supplied at the drive end (DE) (see Figure 3 of the Diagrams of bearings, Page 1/23). Order code **L20**

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

Motors 1LE1 can be supplied with reinforced deep-groove bearings (size range 03).

Special bearings for DE and NDE, bearing size 63, the bearing plates are manufactured from cast-iron for this purpose.

Order code **L25**

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

Order code **Q01**

Bearing selection for increased cantilever forces (see the table "Bearing selection for 1LE1 motors – Bearing for increased cantilever forces", Page 1/23) – "Admissible axial load" from Page 1/25.

Permanent lubrication

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

In the basic version, the motors have permanent lubrication.

Regreasing

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

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

Order code **L23**

Mechanical stress and grease lifetime

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

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{\max} at maximum supply frequency f_{\max} is essential, see the following table "Mechanical limit speeds n_{\max} at maximum supply frequency f_{\max} ".

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

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

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

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

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

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

³⁾ 40000 h apply to horizontally installed motors with coupling output without additional axial loads.

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

1

Bearing selection table for 1LE1 motors – basic version

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

When deep-groove ball bearings with side plates are used, the side plate is on the inside. Located bearing at drive end (DE) for 1LE1 motors, see special version Figure 2 in the "Diagrams of bearings", Page 1/23.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, Page 1/23
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
112 M	2 to 8	6206 2ZC3	6206 2ZC3	6206 2ZC3	6206 2ZC3	Fig. 1
132 S/M	2 to 8	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

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

Please inquire about noise and vibration data. The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the

serial number or can be read from the rating plate.

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

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, Page 1/23
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	6206 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	6208 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	6209 2ZC3 ¹⁾	Fig. 2

Bearing selection table for 1LE1 motors – Deep-groove bearings reinforced at both ends – Order code **L25**

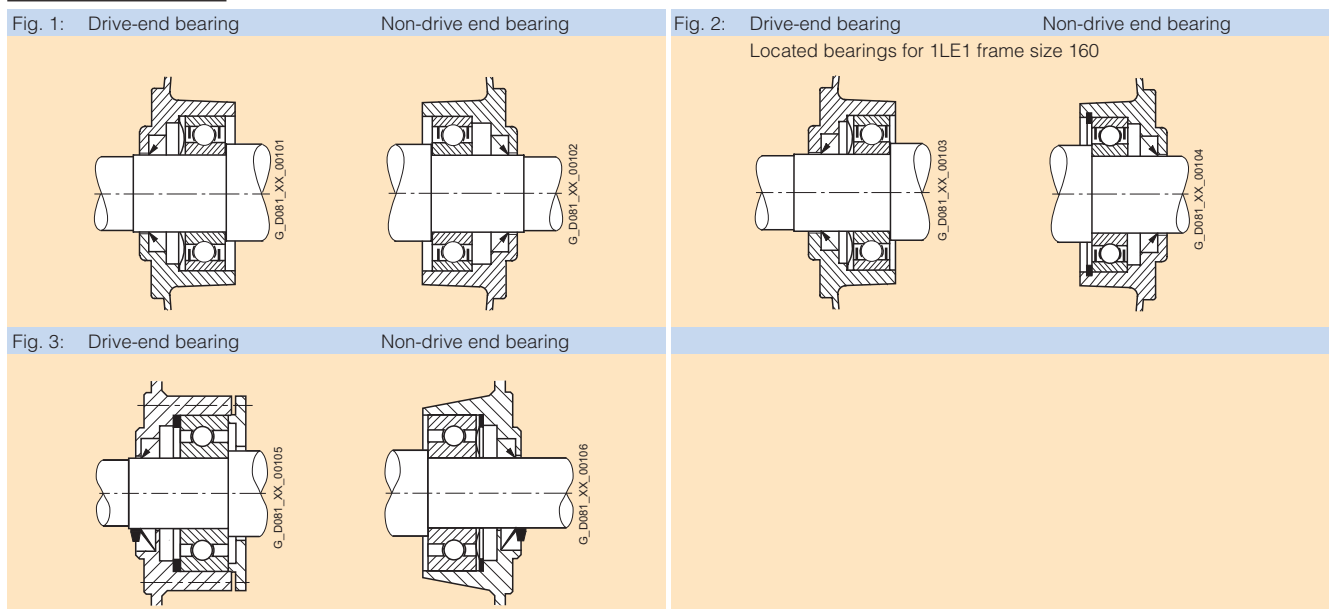
Please inquire about noise and vibration data. The bearing selection tables are only intended for planning purposes. Authoritative information on the actual type of bearings fitted in motors already supplied can be obtained by the factory by quoting the

serial number or can be read from the rating plate.

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

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end (NDE) bearing		Figure, Page 1/23
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
112 M	2 to 8	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	6306 2ZC3 ¹⁾	Fig. 1
132 S/M	2 to 8	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	6308 2ZC3 ¹⁾	Fig. 1
160 M/L	2 to 8	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	6309 2ZC3 ¹⁾	Fig. 2

Diagrams of bearings



¹⁾ Bearings with a side plate are used for regreasable versions (order code **L23**).

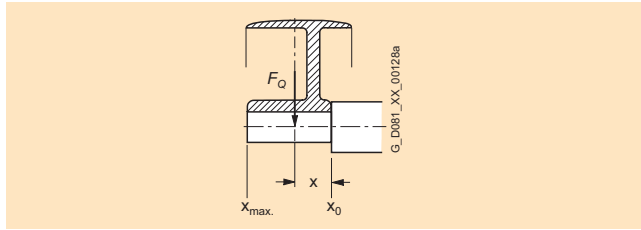
IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

Admissible cantilever forces

Admissible cantilever forces, basic version



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

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

Total cantilever force $F_Q = c \cdot F_u$

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

For normal flat leather belts with an idler pulley $c = 2$;

for V-belts $c = 2$ to 2.5;

for special synthetic belts (depending on the type of load and type of belt) $c = 2$ to 2.5.

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

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

F_u circumferential force in N

P rated motor output (transmitted power) in kW

n fan speed in rpm

D belt pulley diameter in mm

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

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

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

Refer to "Bearing design for increased cantilever forces", Page 1/25.

Admissible cantilever forces for the basic 50 Hz version

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

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{\max}
			Type	Type
			N	N

1LE1 motors, standard values for EFF1 motors¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency):

100	1LE1001-1AA	2	1020	815
	1LE1001-1AB	4	1250	1000
	1LE1001-1AC	6	1450	1155
	1LE1001-1AD	8	1615	1290
112	1LE1001-1BA	2	1000	790
	1LE1001-1BB	4	1250	990
	1LE1001-1BC	6	1450	1150
	1LE1001-1BD	8	1610	1275
132	1LE1001-1CA	2	1505	1170
	1LE1001-1CB	4	1880	1460
	1LE1001-1CC	6	2170	1680
	1LE1001-1CD	8	2420	1880
160	1LE1001-1DA	2	1560	1240
	1LE1001-1DB	4	2040	1590
	1LE1001-1DC	6	2350	1820
	1LE1001-1DD	8	2610	2030

Admissible cantilever forces for the basic 50 Hz version

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

Frame size	Order No.	Number of poles	Admissible cantilever force	
			at x_0	at x_{\max}
			Type	Type
			N	N

1LE1 motor values for EFF1 motors with increased output¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1010	825
	1LE1001-1AB	4	1230	1010
	1LE1001-1AC	6	1440	1180
112	1LE1001-1BA	2	970	785
	1LE1001-1BB	4	1235	1000
	1LE1001-1BC	6	1440	1165
132	1LE1001-1CA	2	1470	1180
	1LE1001-1CB	4	1830	1470
	1LE1001-1CC	6	2150	1730
160	1LE1001-1DA	2	1550	1270
	1LE1001-1DB	4	1910	1550
	1LE1001-1DC	6	2230	1810

¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5%.

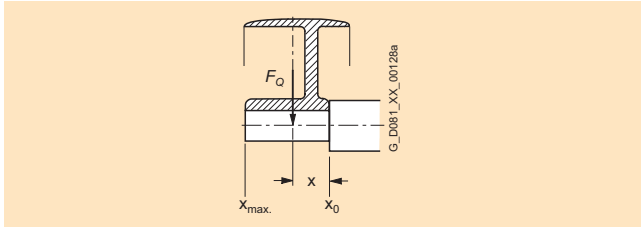
IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Bearing design for increased cantilever forces



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

Admissible cantilever forces for the basic 50 Hz version Deep-groove ball bearings at the drive end (DE) – Order code L22 Valid are: x_0 values for $x = 0$ and x_{max} values für $x = l$ (l = shaft extension)

For motors			Admissible cantilever force	
Frame size	Order No.	Number of poles	at x_0	at x_{max}
			Type	Type
			N	N

1LE1 motors standard values for EFF1 motors¹⁾ (Self-ventilated energy-saving motors with high efficiency/ Forced-air cooled motors without external fan and fan cover with high efficiency):

100	1LE1001-1AA	2	1590	1270
	1LE1001-1AB	4	1970	1575
	1LE1001-1AC	6	2270	1815
	1LE1001-1AD	8	2520	2015
112	1LE1001-1BA	2	1565	1240
	1LE1001-1BB	4	1965	1555
	1LE1001-1BC	6	2270	1800
	1LE1001-1BD	8	2510	1990
132	1LE1001-1CA	2	2310	1795
	1LE1001-1CB	4	2900	2250
	1LE1001-1CC	6	3330	2580
	1LE1001-1CD	8	3700	2870
160	1LE1001-1DA	2	2810	2170
	1LE1001-1DB	4	3540	2750
	1LE1001-1DC	6	4070	3160
	1LE1001-1DD	8	4510	3500

Admissible axial load

1LE1 motors in vertical type of construction – basic version (except motors with increased output)

Frame size	Shaft extension pointing															
	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	downwards		upwards		downwards		upwards		downwards		upwards		downwards		upwards	
	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up	Load down	Load up
100	140	700	550	280	130	990	820	285	130	1280	1110	285	130	1560	1390	285
112	140	710	550	300	130	1000	820	310	130	1290	1110	310	130	1570	1390	310
132	200	1200	950	470	180	1680	1200	470	180	1900	1600	470	190	2200	1900	440
160	1500	1400	950	1900	1900	1800	1300	2200	2200	2200	1600	2700	2700	2700	1950	2900

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

Admissible cantilever forces for the basic 50 Hz version

Deep-groove ball bearings at the drive end (DE) – Order code L22

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

For motors			Admissible cantilever force	
Frame size	Order No.	Number of poles	at x_0	at x_{max}
			Type	Type
			N	N

1LE1 motor values for EFF 1 motors with increased output¹⁾ (Self-ventilated motors with increased output and high efficiency):

100	1LE1001-1AA	2	1585	1300
	1LE1001-1AB	4	1960	1610
	1LE1001-1AC	6	2270	1865
112	1LE1001-1BA	2	1545	1250
	1LE1001-1BB	4	1960	1585
	1LE1001-1BC	6	2270	1835
132	1LE1001-1CA	2	2285	1840
	1LE1001-1CB	4	2860	2300
	1LE1001-1CC	6	3320	2670
160	1LE1001-1DA	2	2800	2240
	1LE1001-1DB	4	3450	2270
	1LE1001-1DC	6	4000	3200

¹⁾ The admissible cantilever force load of EFF2 motors can be increased by up to 5%.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog "Accessories and spare parts", Page 1/86.

Please inquire if the load direction alternates.

IEC Squirrel-Cage Motors

New Generation 1LE1

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1LE1 motors in horizontal type of construction – basic version (except motors with increased output)

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Tensile load	Thrust load (N)			Tensile load	Thrust load (N)			Tensile load	Thrust load (N)			Tensile load	Thrust load (N)		
		with radial load at x_0	$x_{max.}$	without radial load		with radial load at x_0	$x_{max.}$	without radial load		with radial load at x_0	$x_{max.}$	without radial load		with radial load at x_0	$x_{max.}$	without radial load
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
112	220	450	350	630	220	600	500	910	220	650	550	1200	220	750	650	1480
132	350	650	520	1200	350	850	700	1600	350	1020	890	1900	350	1150	1020	2200
160	1500	850	720	1500	1500	1050	920	1800	1500	1250	1120	2200	1500	1350	1220	2600

The values shown do not assume a cantilever force on the shaft extension.

The admissible loads are valid for operation at 50 Hz; for 60 Hz, please inquire.

The calculation of the admissible axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog "Accessories and spare parts", Page 1/86.

Please inquire if the load direction alternates.

Modular technology

Basic versions

The range of potential applications for the 1LE1 motors can be broadened considerably by mounting the following modules (e.g. as brake motors).

- **1XP8 012** rotary pulse encoder
- Separately driven fan
- Brake

The brake must always be mounted in the factory for safety reasons. The rotary pulse encoder and/or the separately driven fan can also be retrofitted.

The degree of protection of the motors with modular technology is IP55. Higher degrees of protection on request.

When a rotary pulse encoder, brake or separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Special technology", "Dimensions and weights" from Page 1/35.

1XP8 012 rotary pulse encoder

The rotary pulse encoder can be supplied already mounted in an HTL version as **1XP8 012-10** with order code **G01** or in a TTL version as **1XP8 012-20** with order code **G02**. The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension cannot be supplied.

The encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D12", order code **G41**, must be specified (see "Mechanical design and degrees of protection", Page 1/20).

The 1XP8 012 rotary pulse encoder is suitable for standard applications. For further encoders, see "Special technology", Page 1/32.

When the rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Special technology", "Dimensions and weights" from Page 1/35.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Technical data of rotary pulse encoders

Supply voltage U_B	1XP8 012-10 (HTL version) +10 V to +30 V	1XP8 012-20 (TTL version) 5V $\pm 10\%$
Current input without load	150 mA	120 mA
Admissible load current per output	max. 100 mA	max. 20 mA
Pulses per revolution	1024	1024
Outputs	2 square-wave pulses A, B – 2 inverted square-wave pulses A, B Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	90°	90°
Output amplitude	$U_{High} = U_B - 2.5 \text{ V}$ $U_{Low} = 1.6 \text{ V}$	$U_{High} > 2.5 \text{ V}$ $U_{Low} < 0.5 \text{ V}$
Edge interval	$\geq 0.43 \text{ } \mu\text{s}$	$\geq 0.43 \text{ } \mu\text{s}$
Sampling rate	$\leq 300 \text{ kHz}$	$\leq 300 \text{ kHz}$
Maximum speed	6000 rpm	6000 rpm
Temperature range	–40 to +100 °C	–40 to +100 °C
Degree of protection	IP66	IP66
Maximum admissible radial cantilever force	60 N	60 N
Maximum admissible axial force	40 N	40 N
Connection system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

1

Separately driven fan

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please inquire about traction and vibratory operation.

The separately driven fan can be supplied already fitted, order code **F70**.

It can also be ordered separately and retrofitted. For selection information and order numbers, see the section "Accessories and spare parts" (available soon). A rating plate listing all the important data is fitted to the separately driven fan. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Coolant temperature CT_{max} 50 °C, please inquire for higher coolant temperatures.

When the separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Special technology", "Dimensions and weights" from Page 1/35.

Technical data of the separately driven fan (acc. to DIN EN 60034-1 Tolerance)

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

IEC Squirrel-Cage Motors

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Orientation

Brakes

Spring-operated disk brakes are used for the brakes with order code **F01**. When the brake is ordered, the supply voltage must be specified. The supply voltage for brakes is explained under "Modular technology – Additional versions", Page 1/31.

For the design of each brake type, the braking time, run-on revolutions, braking energy per braking procedure as well as the service life of the brake linings, see "Configuration of motors with brakes", Page 1/30.

When a brake is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Special technology", "Dimensions and weights" from Page 1/35.

The brake can be retrofitted by authorized partners. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code G40, must be specified (see "Mechanical design and degrees of protection", Page 1/20).

2LM8 spring-operated disk brake

The 2LM8 brake has IP55 degree of protection.

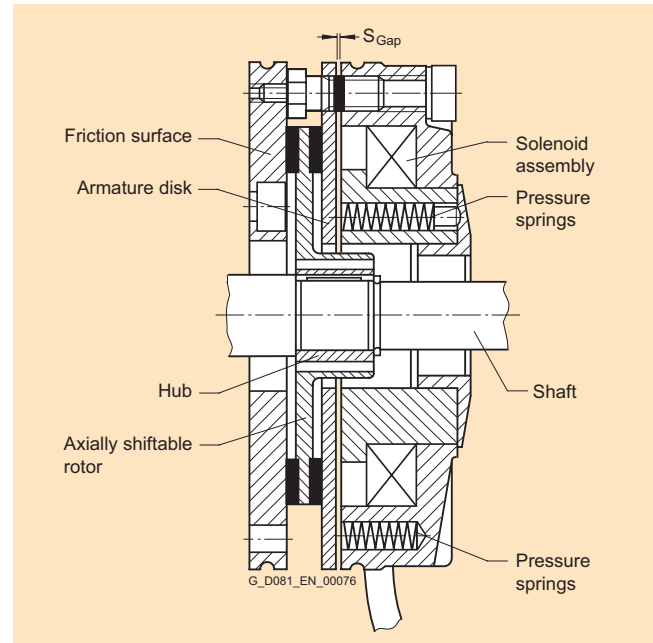
Please inquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times. Please inquire if the brake motors are used for converter-fed operation with low speeds.

Design and mode of operation

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

The braking torque is generated by friction when pressure is applied by one or more pressure springs in the de-energized state. The brake is released electromagnetically.

When the motor brakes, the rotor which can be axially shifted on the hub or the shaft is pressed via the armature disk against the friction surface by means of the springs. In the braked state, there is a gap S_{Gap} between the armature disk and the solenoid component. To release the brake, the solenoid is energized with DC voltage. The resulting magnetic force pulls the armature disk against the spring force on to the solenoid component. The spring force is then no longer applied to the rotor which can rotate freely.



Design of the 2LM8 spring-operated disk brake

Rating plate

The following brake data are specified on the motor rating plate.

Brake type, supply voltage, frequency, current, temperature class, braking torque

Operating values for spring-operated brakes with standard excitation

For motor Frame size	Brake type	Rated braking torque at 100 rpm	Rated braking torque at 100 rpm in % at the following speeds			Supply voltage	Current/power input		Brake applica- tion time $t_2^{(2)}$	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Service capabil- ity of the brake	
			1500 rpm	3000 rpm	Max. speed		A	W					Lifetime of brake lining L	Air gap adjust- ment required after braking energy L_N
100	2LM8 040-5NA10	40	81	74	66	AC 230	0.2	40	43	140	0.00036	80	1350	115
	2LM8 040-5NA60					AC 400	0.22							
	2LM8 040-5NA80					DC 24	1.67							
112	2LM8 060-6NA10	60	80	73	65	AC 230	0.25	53	60	210	0.00063	77	1600	215
	2LM8 060-6NA60					AC 400	0.28							
	2LM8 060-6NA80					DC 24	2.1							
132	2LM8 100-7NA10	100	79	72	65	AC 230	0.27	55	50	270	0.0015	77	2450	325
	2LM8 100-7NA60					AC 400	0.31							
	2LM8 100-7NA80					DC 24	2.3							
160	2LM8 260-8NA10	260	75	68	65	AC 230	0.5	100	165	340	0.0073	79	7300	935
	2LM8 260-8NA60					AC 400	0.47							
	2LM8 260-8NA80					DC 24	4.2							

¹⁾ For 400 V AC and for 24 V DC, the power can deviate by up to +10% as a result of the selected supply voltage.

²⁾ The specified switching times are valid for switching on the DC side with a rated release travel and with the coil already warm. They are average values which may vary depending on factors such as the rectifier type and the release travel. The brake application time for switching on the AC side, for example, is approximately 6 times longer than for switching on the DC side.

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

1

Lifetime of the brake lining

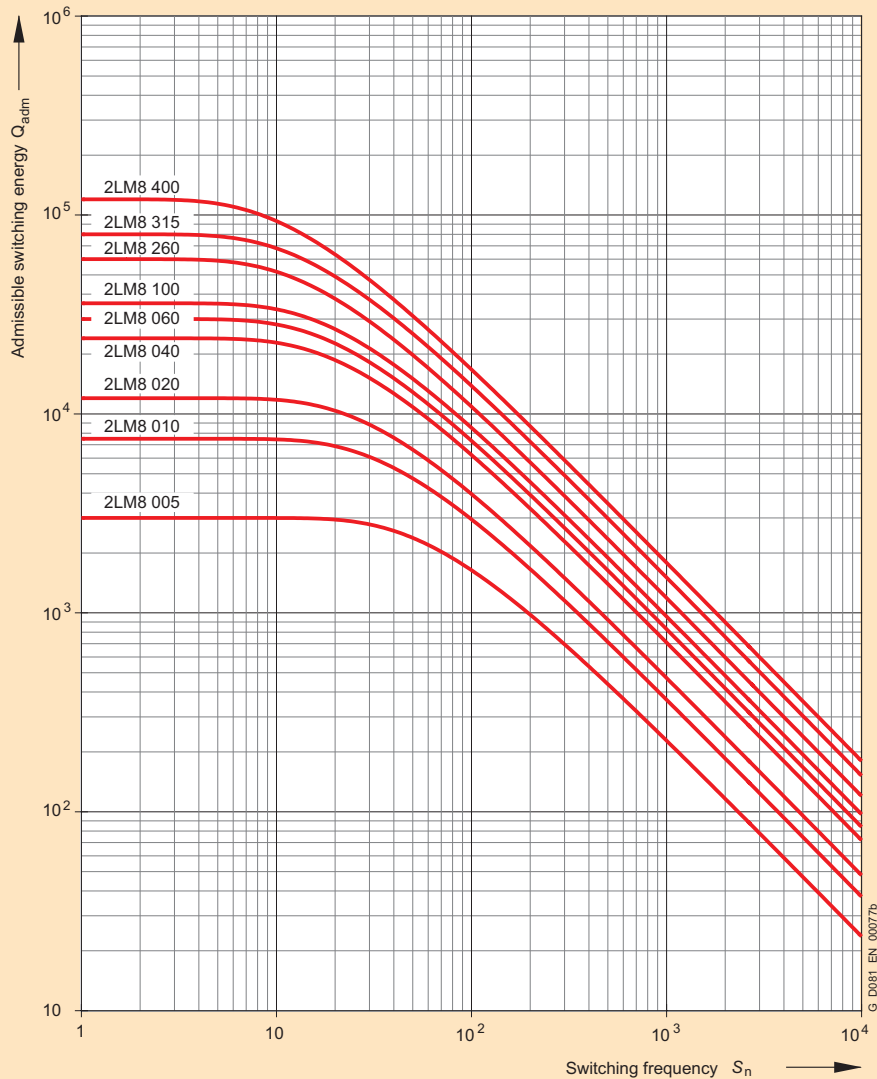
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the switching frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value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

When used as operating brake, the specific frictional surface wear (wear volume for the frictional work) is approximately 0.05 up to 2 cm³/kWh.

Maximum admissible speeds

The maximum admissible speeds from which emergency stops can be made, are listed in the next table. These speeds should be considered as recommended values and must be checked under actual operating conditions.

The maximum admissible friction energy depends on the switching frequency and is shown for the individual brakes in the following diagram. Increased wear can be expected when the brakes are used for emergency stops.



For motor Frame size	Brake type	Maximum admissible speeds			Changing the braking torque			Readjusting the air gap		
		Max. adm. operating speed if max. adm. operating energy utilized	Max. adm. no-load speed with emergency stop function		Reduction per notch	Dimension "O1"	Min. brak- ing torque	Rated air gap $S_{Gap \text{ Rated}}$	Maximum air gap $S_{Gap \text{ max.}}$	Min. rotor thickness $h_{min.}$
		rpm	rpm	rpm	Nm	mm	Nm	mm	mm	mm
100	2LM8 040-5NA . .	3000	6000	6000	1.29	12.5	21.3	0.3	0.65	8.0
112	2LM8 060-6NA . .	3000	6000	6000	1.66	11.0	32.8	0.3	0.75	7.5
132	2LM8 100-7NA . .	3000	5300	5000	1.55	13.0	61.1	0.3	0.75	8.0
160	2LM8 260-8NA . .	1500	4400	3200	5.6	17.0	157.5	0.4	1.2	12.0

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

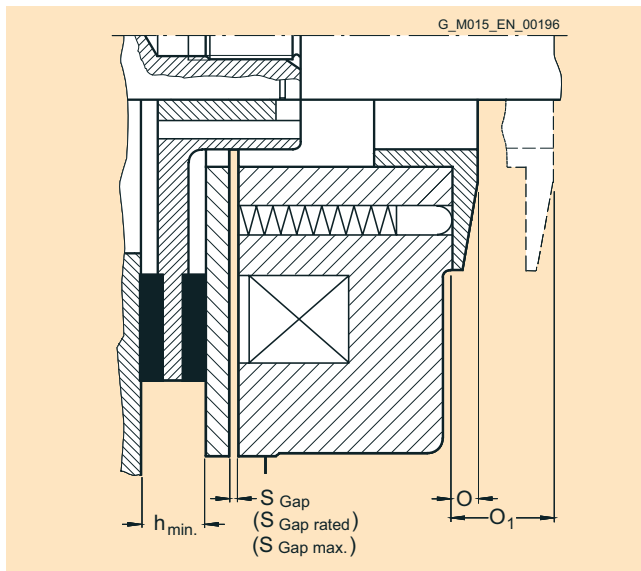
1

Changing the braking torque

The brake is supplied with the braking torque already set. For 2LM8 brakes, the torque can be reduced to the dimension O_1 by unscrewing the adjusting ring with a hook spanner. The braking torque changes by the values shown in the above table for each notch of the adjusting ring.

Readjusting the air gap

Under normal operating conditions, the brake is practically maintenance-free. The air gap S_{Gap} must only be checked at regular intervals if the application requires an extremely large amount of frictional energy and readjusted to the rated gap $S_{\text{Gap rated}}$ at the latest when the maximum air gap $S_{\text{Gap max.}}$ is reached.



Configuration of motors with brakes

Braking time

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

- The application time of the brake t_2
- The braking time t_{Br}

$$t_{Br} = \frac{J \cdot n_{\text{rated}}}{9.55 \cdot (T_B \pm T_L)}$$

t_{Br}	Braking time in s
J	Total moment of inertia in kgm^2
n_{rated}	Rated speed of the motor with brake in rpm
T_B	Rated braking torque in Nm
T_L	Average load torque in Nm (if T_L supports braking, T_L is positive)

Braking energy per braking operation Q_{adm}

The braking energy per braking operation in Nm comprises the energy of the moments of inertia to be braked Q_{Kin} and the energy Q_L , which must be applied in order to brake against a load torque:

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

- The energy of the moments of inertia in Nm

$$Q_{\text{Kin}} = \frac{J \cdot n_{\text{rated}}^2}{182.4}$$

n_{rated} Rated speed before braking in rpm
 J Total moment of inertia in kg m^2

- The braking energy in Nm against a load torque

$$Q_L = \frac{\pm T_L \cdot n_{\text{rated}} \cdot t_{Br}}{19.1}$$

T_L average load torque in Nm
 T_L is positive if it acts against the brake
 T_L is negative if it supports the brake

Run-on revolutions U

The number of run-on revolutions U of the motor with brake can be calculated as follows:

$$U = \frac{n_{\text{rated}}}{60} \left(t_2 + \frac{t_{Br}}{2} \right)$$

t_2 Brake application time in ms

Lifetime of the brake lining L and readjustment of the air gap

The brake lining wears due to friction which increases the air gap and the release time for the brake at standard excitation.

When the brake lining is worn out, it can be replaced easily.

In order to calculate the lifetime of the brake lining in terms of operations S_{max} , the lifetime of the brake lining L in Nm must be divided by the braking energy Q_{adm} :

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

The interval between adjustments N in switching frequencies can be calculated in terms of operations by dividing the braking energy L_N which the brake can output until it is necessary to re-adjust the working air gap by Q_{adm} :

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

IEC Squirrel-Cage Motors

New Generation 1LE1

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Additional versions

2LM8 spring-operated disk brake

Motor series

This brake is mounted on 1LE1 motors as standard.

Voltage and frequency

The solenoid coil and the brake rectifier can be connected to the following voltages or can be supplied for the following voltages:

- Brake supply voltage: 24 V DC
Order code **F10**
- Brake supply voltage: 230 V AC
Order code **F11**
- Brake supply voltage: 400 V AC
(directly at the terminal strip)
Order code **F12**

When 60 Hz is used, the voltage for the brake must not be increased!

Order codes **F10**, **F11** and **F12** may only be used in conjunction with order code **F01**.

Connections

Labeled terminals are provided in the main connection box of the motor to connect the brake.

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

The brake can be released when the motor is at a standstill by separately exciting the solenoid. In this case, an AC voltage must be connected at the rectifier block terminals. The brake remains released as long as this voltage is present.

The rectifier is protected against overvoltages by varistors in the input and output circuits.

For 24 V DC brakes, the brake terminals are directly connected to the DC voltage source.

See the circuit diagrams below.

Fast brake application

If the brake is disconnected from the line supply, the brake is applied. The application time for the brake disk is delayed as a result of the inductance of the solenoid (shutdown on the AC side). This results in a considerable delay before the brake is mechanically applied. In order to achieve short brake application times, the circuit must be interrupted on the DC side. To realize this, the wire jumpers, located between contacts 1+ and 2+ at the rectifier are removed and replaced by the contacts of an external switch (see circuit diagrams below).

Manual brake release with lever

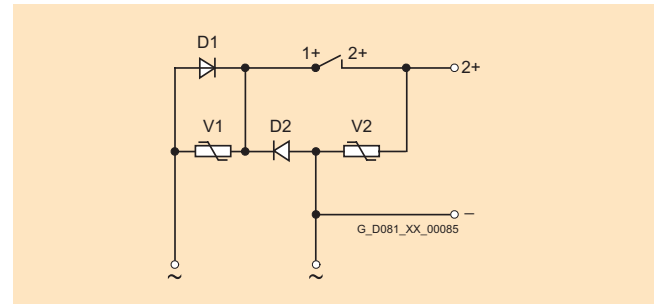
The brakes can be supplied with a mechanical manual release with lever.

Order code **F50**.

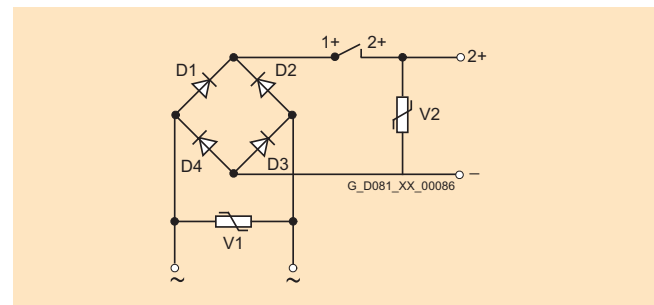
The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors.

Bridge rectifier / half-wave rectifier

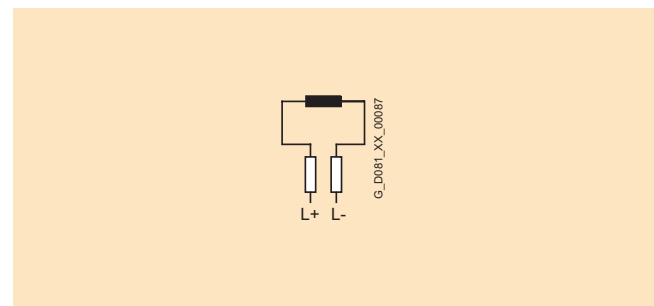
Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 brake. See the circuit diagrams below.



Half-wave rectifier, 400 V AC



Bridge rectifier, 230 V AC



Brake connection for 24 V DC

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

Special technology

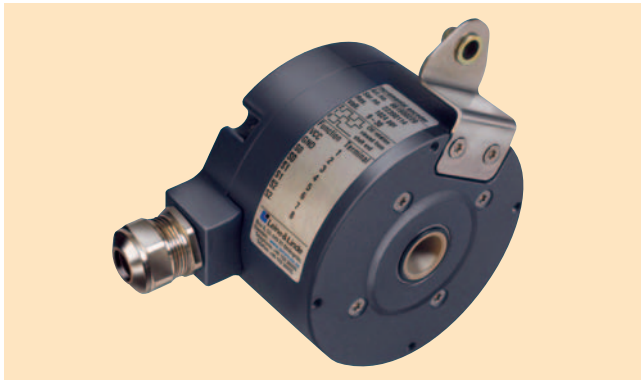
The range of "Special technology" comprises rotary pulse encoders for the 1LE1 motors.

The 1LE1 motors with the order codes **F70** (mounted separately driven fan), **F01** (mounted brake) and **F01 + F70** (mounted brake and separately driven fan) from the "Modular technology" range can be combined with the LL 861 900 200, HOG9 D 1024 I and HOG10 D 1024 I rotary pulse encoders from the "Special technology" range.

When a rotary pulse encoder is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see "Special technology", "Dimensions and weights" from Page 1/35.

The rotary pulse encoders of "Modular technology" and "Special technology" are fitted as standard with a protective cover made of non-corrosive sheet steel.

Rotary pulse encoder LL 861 900 220



With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration and has insulated bearings.

The LL 861 900 220 rotary pulse encoder can be supplied already mounted.

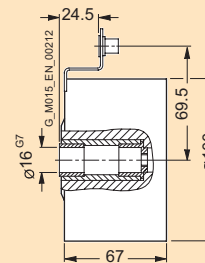
Order code **G04**.

*The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D 16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 1/20). The rotary pulse encoder is not part of the scope of supply in this case.*

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

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

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



Mounting dimensions of rotary pulse encoder LL 861 900 220

Technical data for LL 861 900 220 (HTL version)

Supply voltage U_B	+9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0'
Pulse offset between the two outputs	90° ±25° el.
Output amplitude	$U_{High} > 20$ V $U_{Low} < 2.5$ V
Mark space ratio	1:1 ±10%
Edge steepness	50 V/μs (without load)
Maximum frequency	100 kHz for 350 m cable
Maximum speed	4000 rpm
Temperature range	-20 to +80 °C
Degree of protection	IP65
Maximum adm. radial cantilever force	300 N
Maximum adm. axial force	100 N
Connection system	Terminal strips in encoder Cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

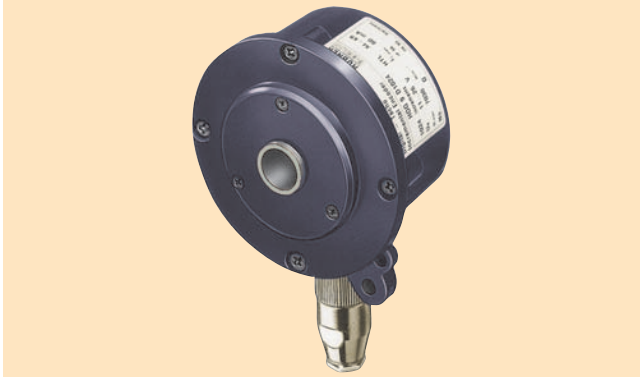
IEC Squirrel-Cage Motors

New Generation 1LE1

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HOG9 D 1024 rotary pulse encoder



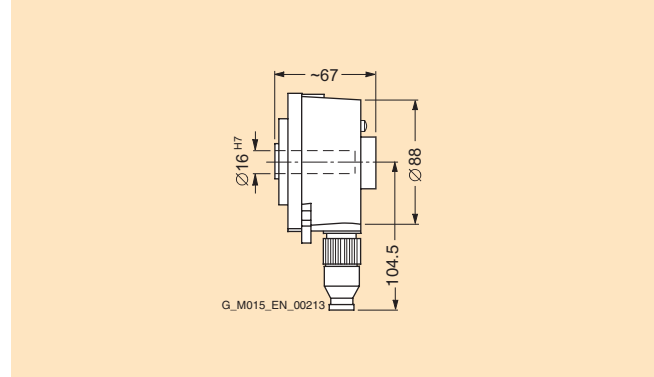
The encoder is fitted with insulated bearings.

The HOG9 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G05**.

*The HOG9 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 1/20). The rotary pulse encoder is not part of the scope of supply in this case.*

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

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



Mounting dimensions for HOG9 D 1024 I rotary pulse encoder

Technical data for HOG9 D 1024 (TTL version)

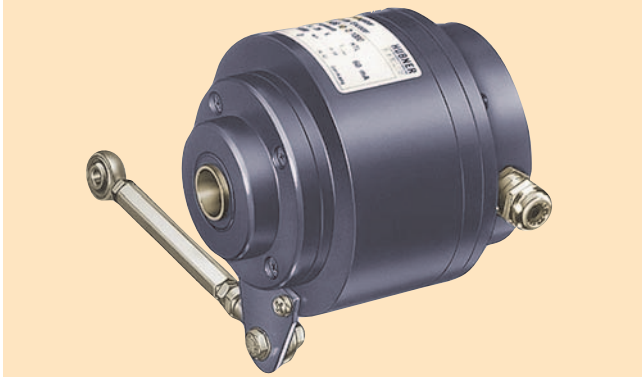
Supply voltage U_B	+9 V to +30 V
Current input without load	50 mA to 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq U_B - 3.5 \text{ V}$ $U_{Low} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20%
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to +100 °C
Degree of protection	IP56
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	100 N
Connection system	Radial right-angle plug (mating connector is part of the scope of supply)
Mech. design acc. to Hübner Ident. No.	73 522 B
Weight	Approx. 0.9 kg

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

HOG10 D 1024 I rotary pulse encoder



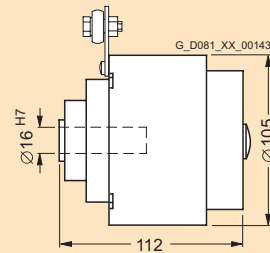
This encoder is extremely rugged and is therefore suitable for difficult operating conditions. It is fitted with insulated bearings.

The HOG10 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G06**.

*The HOG10 D 1024 I rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option "Prepared for mountings, center hole only", order code **G40**, or the option "Prepared for mountings with shaft D16", order code **G42**, must be specified (see "Mechanical design and degrees of protection", Page 1/20). The rotary pulse encoder is not part of the scope of supply in this case.*

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

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



Mounting dimensions for HOG10 D 1024 I rotary pulse encoder

Technical data for HOG10 D 1024 (HTL version)

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	90° ±20%
Output amplitude	$U_{High} \geq U_B - 3.5 \text{ V}$ $U_{Low} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20%
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to +100 °C
Degree of protection	IP66
Maximum adm. radial cantilever force	150 N
Maximum adm. axial force	80 N
Connection system	Terminals, cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 055 B
Weight	Approx. 1.6 kg

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Dimensions and weight

Fig. 1 Brake
Order code **F01**
[optionally with manual release, order code **F50**]

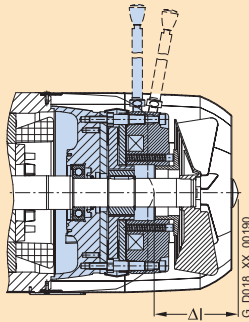


Fig. 2 Standard protective cover for types of construction
Order code **H00**

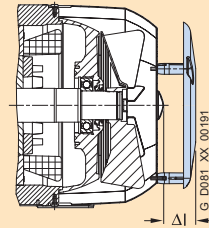


Fig. 3 Rotary pulse encoder (on cover)
Order code **G01/G02/G04/G05/G06**
[protective cover as standard]

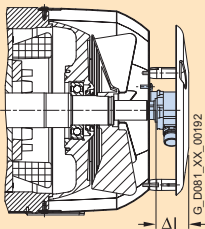


Fig. 4 Brake and rotary pulse encoder (on cover)
Order code **F01**
+ **G01/G02/G04/G05/G06**
[optionally with manual release, order code **F50**;
protective cover as standard]

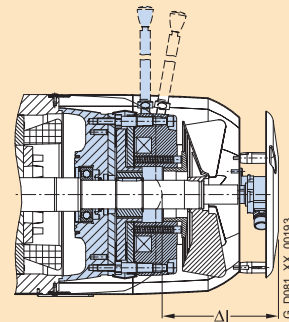


Fig. 5 Separately driven fan
Order code **F70**

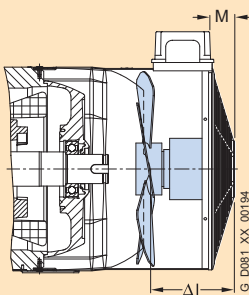
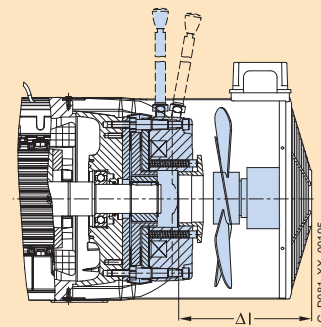


Fig. 6 Brake and separately driven fan
Order code **F01 + F70**
[optionally with manual release, order code **F50**]



IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Fig. 7 Rotary pulse encoder (under the cover) and separately driven fan
Order code **F70**
+ **G01/G02/G04/G05/G06**

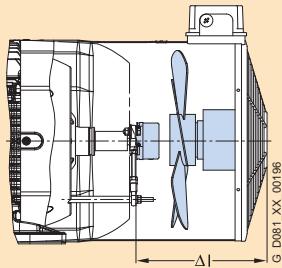


Fig. 8 Brake, rotary pulse encoder (under the cover) and separately driven fan
Order code **F01 + F70**
+ **G01/G02/G04/G05/G06**
[optionally with manual release, order code **F50**]

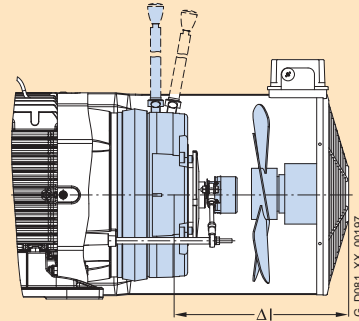


Fig. 9 Protective cover for separately driven fan
Order code **H00**

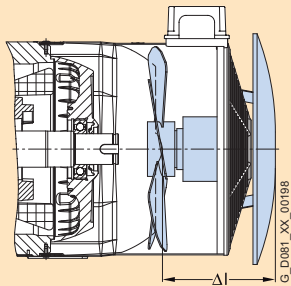


Fig. 10 Prepared for mountings – only center hole
(for brake order code **F01** and/or rotary pulse encoder
order codes **G01/G02/G04/G05/G06**)
Order code **G40**

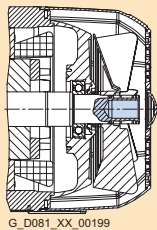
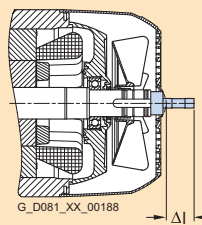


Fig. 11 Prepared for mountings with shaft D12/D16
Order codes **G41/G42**



Dimensions Δl and weights, see from Page 1/37.

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Relevant diagram												
1			2		3							
Frame size Brake			Protective cover		Rotary pulse encoder including protective cover							
Order code			Order code		1XP8 012		LL 861 900 220		HOG9 D 1024 I		HOG10 D 1024 I	
F01			H00		Order codes		Order code		Order code		Order code	
G01, G02			G04		G05		G06					
Δl			Δl		Δl		Δl		Δl		Δl	
Weight approx.			Weight approx.		Weight approx.		Weight approx.		Weight approx.		Weight approx.	
mm			mm		mm		mm		mm		mm	
kg			kg		kg		kg		kg		kg	
1LE1												
100	81	5.9	33	0.4	49	0.9	76	1.9	76	1.5	119	2.2
112	88	7.8	33	0.4	49	0.8	76	1.9	76	1.5	119	2.2
132	114	11.9	51.5	0.7	51.5	1.3	78.5	2.4	78.5	2	121.5	2.7
160	130	30.7	50	0.7	50	1.5	77	2.7	77	2.3	120	3

Relevant diagram											
4									5		
Frame size	Brake and rotary pulse encoder (on cover)								Separately driven fan		
	1XP8 012		LL 861 900 220		HOG9 D 1024 I		HOG10 D 1024 I				
	Order codes		Order codes		Order codes		Order codes		Order code		
	F01		F01		F01		F01		F70		
	+ G01/G02		+ G04		+ G05		+ G06				
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	M	Weight approx.
	mm	kg	mm	kg	mm	kg	mm	kg	mm	mm	kg
1LE1											
100	130	6.8	157	7.8	157	7.4	200	8.1	86.5	30	2.4
112	137	8.6	164	9.7	164	9.3	207	10	81.5	30	2.6
132	165.5	13.2	192.5	14.3	192.5	13.9	235.5	14.6	116	40	3.8
160	180	32.2	207	33.4	207	33	250	33.7	135.5	40	6.5

Relevant diagram												
6	7											
Frame size	Brake and separately driven fan				Separately driven fan and rotary pulse encoder (under cover)							
Order codes	Order codes				Order codes		Order codes		Order codes			
F01 + F70	F70 + G01/G02				F70 + G04		F70 + G05		F70 + G06			
Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	
mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	
1LE1												
100	161.5	8.3	161.5	3.3	161.5	4.3	161.5	3.9	196.5	4.6		
112	156.5	10.4	156.5	3.4	156.5	4.5	156.5	4.1	191.5	4.8		
132	186	15.7	186	5.1	186	6.2	186	5.8	241	6.5		
160	205.5	37.2	205.5	8	205.5	9.2	205.5	8.8	270.5	9.5		

	Relevant diagram 8								9		
Frame size	Brake, separately driven fan and rotary pulse encoder (under cover)								Protective cover for separately driven fan		
	Order codes		Order codes		Order codes		Order codes		Order code		
	F01 + F70 + G01/G02		F01 + F70 + G04		F01 + F70 + G05		F01 + F70 + G06		H00		
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Diameter of the fan cover
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm
1LE1											
100	196.5	9.2	196.5	10.2	196.5	9.8	246.5	10.5	30	1.4	210
112	191.5	11.2	191.5	12.3	191.5	11.9	241.5	12.6	33	1.8	249
132	241	17	241	18.1	241	17.7	291	18.4	24	2.4	300
160	270.5	38.7	270.5	39.9	270.5	39.5	320.5	40.2	31	3	338

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Frame size	Relevant diagram 10		11			
	Prepared for mountings – only center hole (for Brake order code F01 and/or rotary pulse encoder order codes G01/G02/G04/G05/G06) Order code G40		Prepared for mountings with shaft D12/D16 Order codes G41/G42			
	Order code G40		Order code G41		Order code G42	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.
	mm	kg	mm	kg	mm	kg
1LE1						
100	0	0	11.3	0.15	47.3	0.2
112	0	0	7.5	0.15	47.3	0.2
132	0	0.1	10.8	0.3	50.3	0.4
160	0	0.2	5.6	0.4	45.6	0.7

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Selection and ordering data

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

Step 1	Technical requirements for the motor		
Determine the required product profile, the following are required:	Rated frequency and rated voltage	3 AC 50/60 Hz, 400, 500 or 690 V	
	Duty	Standard duty (continuous duty S1 according to DIN EN 60034-1)	
	Degree of protection required	IP..	
	Rated speed (No. of poles)	$n = \dots\dots\dots$ rpm	
	Rated output	$P = \dots\dots\dots$ kW	
	Rated torque	$M = P \cdot 9550/n = \dots\dots\dots$ Nm	
	Type of construction	IM..	
Step 2	Environmental requirements for the motor		
Determine the installation conditions	Ambient temperature	≤40 °C	>40 °C
	Site altitude	≤1000 m	>1000 m
	Factors for derating	None	Determine the factor for derating (for derating factor, see “Technical information” – “Coolant temperature and site altitude”, Page 1/11)
Step 3	For preliminary selection of the motor ⇒ see subsequent pages and the corresponding “Preliminary selection of the motor” tables, Pages 1/41 to 1/42		
Determine the range of possible motors	Select the frame size and therefore the possible motors on the basis of the following parameters: cooling method, degree of protection, rated output, rated speed and rated torque range. Note: The standard temperature range of the motors is from 20 to +40 °C.		
Step 4	Detailed selection of the motor		
Determine the basic Order No. of the motor	Determine the motor Order No. according to the following parameters: rated output, rated speed, rated torque and rated current from the “Selection and ordering data” for the motors that have already been identified as possibilities.		
Step 5	Selection of the special versions (see under “Special versions”)		
Completing the motor Order No.	Determine special versions and the associated Order codes (e.g. special voltages and types of construction, motor protection and degrees of protection, windings and insulation, colors and paint finish, mountings and mounting technology, etc.).		
Step 6			
Select the frequency converter, if required	For Order No. of the converter as well as notes on selection, see Catalogs D 11, D 11.1, DA 51.2 and DA 51.3.		

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

Selection and ordering data (continued)

Order No. code

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

1LE1001-1DB20-1AA5-Z
H00

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

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

Ordering data:

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

Structure of the Order No.:		Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16									
IEC squirrel-cage motors, surface-cooled																													
Positions 1 to 4: Digit, letter, letter, digit		New generation Design or version (motor type) <ul style="list-style-type: none">• Standard: Self-ventilated by fan mounted on and driven by rotor• Expansion option (F90): Forced-air cooled by air flow from the fan to be driven					1	L	E	1																			
Positions 5 to 7: 3 digits		<ul style="list-style-type: none">• Motors with high efficiency (High Efficiency, EFF1), aluminum housing• Motors with improved efficiency (Improved Efficiency, EFF2), aluminum housing					0	0	1																				
Positions 8, 9 and 11: Digit, letter, digit		Motor frame size (frame size as a combination of shaft height and overall length, encoded)										1	A	0															
Position 10: Letter		Number of poles A ... D = 2-, 4-, 6-, 8-pole											D		6														
Positions 12 and 13: 2 digits		Voltage, circuit and frequency													0		0												
Position 14: Letter		Type of construction (A – V)															9		8										
Position 15: Letter		Motor protection (A – Z; special versions encoded)																		A									
Position 16: Digit		Mechanical design (motor version and connection box position) <ul style="list-style-type: none">• General Line motors with shorter delivery times, limited options (connection box on top, cast feet, only basic versions possible, non-drive-end (NDE) cannot be modified)• All options are possible or can be modified<ul style="list-style-type: none">- Connection box on top- Connection box on RHS (viewed from DE)- Connection box on LHS (viewed from DE)- Connection box below																											
		Special order versions: encoded – additional order code required not encoded – additional plain text required																											

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	New generation Standard motor with high efficiency EFF1, IP55 degree of protection, aluminum version	1LE1001-00000-0000
Motor frame size/No. of poles/speed	4-pole/1500 rpm	1LE1001-1DB20-0000
Rated output	11 kW	
Voltage and frequency	230 VΔ/400 VY, 50 Hz	1LE1001-1DB22-2000
Type of construction	IM V5 with protective cover ¹⁾	1LE1001-1DB22-2C00-Z H00
(Special versions)	3 PTC thermistors (motor protection with 3 embedded temperature sensors for tripping ²⁾)	1LE1001-1DB22-2CB0-Z H00
Mechanical design (motor version)	Connection box on RHS (viewed from DE)	1LE1001-1DB22-2CB5-Z H00
	Mounted separately driven fan	1LE1001-1DB22-2CB5-Z H00 F70

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

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

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Selection and ordering data (continued)

Determine the motor type according to cooling method, degree of protection and frame design

(for further selection according to speed or number of poles, rated output, rated torque, rated speed and rated current, see the relevant "Preselection of the motor" tables below)

Applications for surface-cooled motor types	Cooling method	Standard designation for degree of protection to DIN EN 60034 Part 5	Frame design	Rated output at 50 Hz								
				Motor frame sizes (shaft heights)					100	112	132	160
General Line motors with shorter delivery time	Self-ventilated	IP55	Aluminum	56	63	71	80	90	1.5 ... 18.5 kW			
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminum						0.75 ... 18.5 kW			
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminum						0.75 ... 18.5 kW			
Motors with increased output and improved efficiency	Self-ventilated	IP55	Aluminum						2.2 ... 22 kW			
Motors with increased output and high efficiency	Self-ventilated	IP55	Aluminum						2.2 ... 22 kW			
Motors without external fan and fan cover with improved efficiency	Forced-air-cooled	IP55	Aluminum						0.75 ... 18.5 kW			
Motors without external fan and fan cover with high efficiency	Forced-air-cooled	IP55	Aluminum						0.75 ... 18.5 kW			

Preliminary selection of the motor according to motor type/series, speed or number of poles, frame size, rated output, rated torque, rated speed and rated current

General Line motors with shorter delivery time

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/44 ... 1/47
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	6 ... 29.5	1/48 ... 1/51
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 109	3.8 ... 23.5	1/52 ... 1/53

Self-ventilated energy-saving motors with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/54 ... 1/55
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/54 ... 1/55
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.8 ... 23.5	1/54 ... 1/55
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	675 ... 720	10.4 ... 100	2.45 ... 18.6	1/54 ... 1/55

Self-ventilated energy-saving motors with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/58 ... 1/59
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/58 ... 1/59
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/58 ... 1/59
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	715 ... 735	9.9 ... 98	2.85 ... 17.4	1/58 ... 1/59

IEC Squirrel-Cage Motors

New Generation 1LE1

Orientation

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Selection and ordering data (continued)

Self-ventilated motors with increased output and improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2850 ... 2930	13.3 ... 72	7.9 ... 39.5	1/62 ... 1/63
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1430 ... 1460	26.8 ... 121	8.5 ... 35	1/62 ... 1/63
1000, 6-pole	100 L ... 160 L	2.2 ... 15	930 ... 965	22.5 ... 148	5.3 ... 33	1/62 ... 1/63

Self-ventilated motors with increased output and high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LE1 (motors with external fan)						
3000, 2-pole	100 L ... 160 L	4 ... 22	2905 ... 2955	13 ... 71	7.6 ... 38.5	1/66 ... 1/67
1500, 4-pole	100 L ... 160 L	4 ... 18.5	1460 ... 1475	26 ... 120	8.2 ... 34	1/66 ... 1/67
1000, 6-pole	100 L ... 160 L	2.2 ... 15	960 ... 975	22 ... 147	4.95 ... 29.5	1/66 ... 1/67

Forced-air cooled motors without external fan and fan cover with improved efficiency (Improved Efficiency EFF2)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2835 ... 2935	10 ... 60	6 ... 34	1/70 ... 1/71
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1425 ... 1460	14.8 ... 98	4.85 ... 29.5	1/70 ... 1/71
1000, 6-pole	100 L ... 160 L	1.5 ... 11	930 ... 970	15.3 ... 110	3.8 ... 23.5	1/70 ... 1/71
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	675 ... 720	10.4 ... 100	2.45 ... 18.6	1/70 ... 1/71

Forced-air cooled motors without external fan and fan cover with high efficiency (High Efficiency EFF1)

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data
rpm		kW	rpm	Nm	A	Page
Aluminum series 1LE1 (motors without external fan and fan cover)						
3000, 2-pole	100 L ... 160 L	3 ... 18.5	2905 ... 2955	9.9 ... 60	5.9 ... 33	1/74 ... 1/75
1500, 4-pole	100 L ... 160 L	2.2 ... 15	1455 ... 1475	14 ... 97	4.55 ... 27.5	1/74 ... 1/75
1000, 6-pole	100 L ... 160 L	1.5 ... 11	965 ... 975	15 ... 108	3.5 ... 22	1/74 ... 1/75
750, 8-pole	100 L ... 160 L	0.75 ... 7.5	715 ... 735	9.9 ... 98	2.85 ... 17.4	1/74 ... 1/75

More information

For further information, please get in touch with your local Siemens contact.

At

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

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- technical support
- spare parts/repairs
- service
- training
- sales or
- technical support/engineering

The selection procedure starts with:

- a country
- a product or
- a sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

Selection and ordering data

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA42-2AA0		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2AA0		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2AA0		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA12-2AA0		40
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA42-2FA0		21
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2FA0		26
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA02-2FA0		40
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA12-2FA0		45
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA42-2FB0		21
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA42-2KA0		22
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA22-2KA0		27

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise at rated output Measuring-surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA42-2AA0	3.2	6.2	3.3	16	0.0034	72	84	
1LE1002-1BA22-2AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA02-2AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA12-2AA0	2.2	6.4	3	16	0.01601	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA42-2FA0	3.2	6.2	3.3	16	0.0034	72	84	FF 215
1LE1002-1BA22-2FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA02-2FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA12-2FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA42-2FB0	3.2	6.2	3.3	16	0.0034	72	84	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AA42-2KA0	3.2	6.2	3.3	16	0.0034	72	84	FT 130
1LE1002-1BA22-2KA0	2.7	7.3	3.7	16	0.0067	69	81	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA43-4AA0		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AA0		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AA0		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA13-4AA0		40
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA23-4AA0		60
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA33-4AA0		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AA0		78
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA43-4AB0		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4AB0		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4AB0		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA13-4AB0		40
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA23-4AB0		60
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA33-4AB0		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4AB0		78
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA43-4FA0		21
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FA0		26
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FA0		40
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA13-4FA0		45
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA23-4FA0		69
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA33-4FA0		77
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FA0		87
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA23-4FB0		26
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA03-4FB0		40
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA13-4FB0		45
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA23-4FB0		69
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA33-4FB0		77
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA43-4FB0		87

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise at rated output Measuring-surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AA43-4AA0	3.2	6.2	3.3	16	0.0034	72	84	
1LE1002-1BA23-4AA0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AA0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AA0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AA0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AA0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AA0	2.5	7	3.2	16	0.04395	70	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AA43-4AB0	3.2	6.2	3.3	16	0.0034	72	84	
1LE1002-1BA23-4AB0	2.7	7.3	3.7	16	0.0067	69	81	
1LE1002-1CA03-4AB0	2	5.6	2.6	16	0.01267	68	80	
1LE1002-1CA13-4AB0	2.2	6.4	3	16	0.01601	68	80	
1LE1002-1DA23-4AB0	2.1	6.1	2.7	16	0.02971	70	82	
1LE1002-1DA33-4AB0	2.5	6.1	3.2	16	0.03619	70	82	
1LE1002-1DA43-4AB0	2.5	7	3.2	16	0.04395	70	82	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AA43-4FA0	3.2	6.2	3.3	16	0.0034	72	84	FF 215
1LE1002-1BA23-4FA0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FA0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FA0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FA0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FA0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FA0	2.5	7	3.2	16	0.04395	70	82	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BA23-4FB0	2.7	7.3	3.7	16	0.0067	69	81	FF 215
1LE1002-1CA03-4FB0	2	5.6	2.6	16	0.01267	68	80	FF 265
1LE1002-1CA13-4FB0	2.2	6.4	3	16	0.01601	68	80	FF 265
1LE1002-1DA23-4FB0	2.1	6.1	2.7	16	0.02971	70	82	FF 300
1LE1002-1DA33-4FB0	2.5	6.1	3.2	16	0.03619	70	82	FF 300
1LE1002-1DA43-4FB0	2.5	7	3.2	16	0.04395	70	82	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.


²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2AB0	18	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB02-2FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB22-2FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB22-2FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB42-2FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2FB0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2FB0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2FB0	28	
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB42-2KA0	20	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB52-2KA0	24	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB22-2KA0	29	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise at rated output Measuring-surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB42-2AA0	2.3	5.1	2.7	16	0.0059	63	75	
1LE1002-1AB52-2AA0	2.4	5.4	2.6	16	0.0078	63	75	
1LE1002-1BB22-2AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB02-2AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB22-2AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB22-2AA0	2.3	6.4	3.1	16	0.04395	64	76	
1LE1002-1DB42-2AA0	2.5	7	3.4	16	0.05616	64	76	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2AB0	2.3	5.1	2.7	16	0.0059	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB42-2FA0	2.3	5.1	2.7	16	0.0059	63	75	FF 215
1LE1002-1AB52-2FA0	2.4	5.4	2.6	16	0.0078	63	75	FF 215
1LE1002-1BB22-2FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB02-2FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB22-2FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB22-2FA0	2.3	6.4	3.1	16	0.04395	64	76	FF 300
1LE1002-1DB42-2FA0	2.5	7	3.4	16	0.05616	64	76	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB42-2FB0	2.3	5.1	2.7	16	0.0059	63	75	FF 215
1LE1002-1AB52-2FB0	2.4	5.4	2.6	16	0.0078	63	75	FF 215
1LE1002-1BB22-2FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AB42-2KA0	2.3	5.1	2.7	16	0.0059	63	75	FT 130
1LE1002-1AB52-2KA0	2.4	5.4	2.6	16	0.0078	63	75	FT 130
1LE1002-1BB22-2KA0	2.2	5.3	2.6	16	0.0102	58	70	FT 130

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.


³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AA0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AA0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AA0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AA0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AA0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AA0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AA0	73	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4AB0	18	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4AB0	22	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4AB0	27	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4AB0	38	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4AB0	44	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4AB0	62	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4AB0	73	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB43-4FA0	19	
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB53-4FA0	23	
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FA0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FA0	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB23-4FB0	28	
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4FB0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4FB0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4FB0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4FB0	82	
• With flange: IM B35												
- Without motor protection												
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB03-4JA0	43	
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB23-4JA0	49	
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB23-4JA0	71	
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB43-4JA0	82	

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

1

Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise at rated output Measuring-surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AB43-4AA0	2.3	5.1	2.7	16	0.0059	63	75	
1LE1002-1AB53-4AA0	2.4	5.4	2.6	16	0.0078	63	75	
1LE1002-1BB23-4AA0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AA0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AA0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AA0	2.3	6.4	3.1	16	0.04395	64	76	
1LE1002-1DB43-4AA0	2.5	7	3.4	16	0.05616	64	76	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AB43-4AB0	2.3	5.1	2.7	16	0.0059	63	75	
1LE1002-1AB53-4AB0	2.4	5.4	2.6	16	0.0078	63	75	
1LE1002-1BB23-4AB0	2.2	5.3	2.6	16	0.0102	58	70	
1LE1002-1CB03-4AB0	2.3	6.2	2.7	16	0.0186	64	76	
1LE1002-1CB23-4AB0	2.5	6.6	2.9	16	0.02371	64	76	
1LE1002-1DB23-4AB0	2.3	6.4	3.1	16	0.04395	64	76	
1LE1002-1DB43-4AB0	2.5	7	3.4	16	0.05616	64	76	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AB43-4FA0	2.3	5.1	2.7	16	0.0059	63	75	FF 215
1LE1002-1AB53-4FA0	2.4	5.4	2.6	16	0.0078	63	75	FF 215
1LE1002-1BB23-4FA0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FA0	2.3	6.4	3.1	16	0.04395	64	76	FF 300
1LE1002-1DB43-4FA0	2.5	7	3.4	16	0.05616	64	76	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1BB23-4FB0	2.2	5.3	2.6	16	0.0102	58	70	FF 215
1LE1002-1CB03-4FB0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4FB0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4FB0	2.3	6.4	3.1	16	0.04395	64	76	FF 300
1LE1002-1DB43-4FB0	2.5	7	3.4	16	0.05616	64	76	FF 300
• With flange: IM B35								
- Without motor protection								
1LE1002-1CB03-4JA0	2.3	6.2	2.7	16	0.0186	64	76	FF 265
1LE1002-1CB23-4JA0	2.5	6.6	2.9	16	0.02371	64	76	FF 265
1LE1002-1DB23-4JA0	2.3	6.4	3.1	16	0.04395	64	76	FF 300
1LE1002-1DB43-4JA0	2.5	7	3.4	16	0.05616	64	76	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.


²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\phi_{\text{rated}}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC42-2AA0		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2AA0		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2AA0		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2AA0		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC32-2AA0		48
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC42-2FA0		20
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FA0		26
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FA0		39
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC22-2FA0		44
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC42-2FB0		20
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2FB0		26
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC02-2FB0		39
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾												
- Without motor protection												
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC42-2KA0		21
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC22-2KA0		27
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz												
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AA0		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AA0		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AA0		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4AA0		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AA0		92
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4AB0		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4AB0		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4AB0		48
7.5	8.6	160 M	970	75		86	86.5	0.73	17.2	1LE1002-1DC23-4AB0		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4AB0		92
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾												
- Without motor protection												
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC03-4FA0		39
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FA0		44
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FA0		53
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FA0		81
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FA0		101
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC23-4FB0		44
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC33-4FB0		53
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC23-4FB0		81
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC43-4FB0		101

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.

³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

General Line motors with shorter delivery time

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current current I_{LR}/I_{rated}	Breakdown torque torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm ²	Noise at rated output Measuring-surface sound pressure level at 50 Hz $L_{p(A)}$ dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)								
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz								
230 VΔ/400 VY, 50 Hz; 460 VY, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1AC42-2AA0	2.1	4.1	2.4	16	0.0065	61	73	
1LE1002-1BC22-2AA0	2.1	4.1	2.4	16	0.0065	61	73	
1LE1002-1CC02-2AA0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC22-2AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC32-2AA0	2.5	5.2	2.8	16	0.02734	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1AC42-2FA0	2.1	4.1	2.4	16	0.0065	61	73	FF 215
1LE1002-1BC22-2FA0	2.3	4.1	2.5	16	0.0092	68	80	FF 215
1LE1002-1CC02-2FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC22-2FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1AC42-2FB0	2.1	4.1	2.4	16	0.0065	61	73	FF 215
1LE1002-1BC22-2FB0	2.3	4.1	2.5	16	0.0092	68	80	FF 215
1LE1002-1CC02-2FB0	2	4.6	2.6	16	0.0167	63	75	FF 265
• With standard flange: IM B14, IM V18 without protective cover, IM V19 ³⁾								
- Without motor protection								
1LE1002-1AC42-2KA0	2.1	4.1	2.4	16	0.0065	61	73	FT 130
1LE1002-1BC22-2KA0	2.3	4.1	2.5	16	0.0092	68	80	FT 130
400 VΔ/690 VY, 50 Hz; 460 VΔ, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6 ¹⁾								
- Without motor protection								
1LE1002-1CC03-4AA0	2	4.6	2.6	16	0.017	63	75	
1LE1002-1CC23-4AA0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AA0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AA0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AA0	2.2	5.4	2.8	16	0.0678	68	80	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC03-4AB0	2	4.6	2.6	16	0.0167	63	75	
1LE1002-1CC23-4AB0	2.1	4.7	2.5	16	0.02116	63	75	
1LE1002-1CC33-4AB0	2.5	5.2	2.8	16	0.02734	63	75	
1LE1002-1DC23-4AB0	2.1	5.5	2.9	16	0.04993	68	80	
1LE1002-1DC43-4AB0	2.2	5.4	2.8	16	0.0678	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3 ²⁾								
- Without motor protection								
1LE1002-1CC03-4FA0	2	4.6	2.6	16	0.0167	63	75	FF 265
1LE1002-1CC23-4FA0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FA0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FA0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FA0	2.2	5.4	2.8	16	0.0678	68	80	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC23-4FB0	2.1	4.7	2.5	16	0.02116	63	75	FF 265
1LE1002-1CC33-4FB0	2.5	5.2	2.8	16	0.02734	63	75	FF 265
1LE1002-1DC23-4FB0	2.1	5.5	2.9	16	0.04993	68	80	FF 300
1LE1002-1DC43-4FB0	2.2	5.4	2.8	16	0.0678	68	80	FF 300

These motors are standard painted with special finish color RAL 7030 (stone gray).

Additional options like protective cover and condensation drainage holes are not possible.

(Connection box on top, cast feet, only basic versions possible, non-drive end (NDE) cannot be modified)

¹⁾ Only the type of construction IM B3 will be stamped on the rating plate.

²⁾ Only the type of construction IM B5 will be stamped on the rating plate.


³⁾ Only the type of construction IM B14 will be stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated energy-saving motors
with improved efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight		
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/56.	IM B3 type of construction	IM B3 type of construction approx.		
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A				m kg	
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)														
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz														
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA4Q-QQQQ		20		
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-QQQQ		25		
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-QQQQ		35		
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA1Q-QQQQ		40		
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA2Q-QQQQ		60		
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA3Q-QQQQ		68		
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-QQQQ		78		
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz														
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-QQQQ		18		
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-QQQQ		22		
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-QQQQ		27		
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-QQQQ		38		
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-QQQQ		44		
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-QQQQ		62		
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-QQQQ		73		
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz														
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC4Q-QQQQ		19		
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-QQQQ		25		
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-QQQQ		34		
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-QQQQ		39		
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-QQQQ		48		
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-QQQQ		72		
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-QQQQ		92		
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz														
0.75	0.86	100 L	695	10.4		66	60.2	0.65	2.45	1LE1002-1AD4Q-QQQQ		17		
1.1	1.3	100 L	695	15.1		70.2	67.6	0.65	3.5	1LE1002-1AD5Q-QQQQ		22		
1.5	1.75	112 M	675	20		69.5	69.7	0.71	4.4	1LE1002-1BD2Q-QQQQ		25		
2.2	2.55	132 S	720	30		78.8	76.4	0.65	6.2	1LE1002-1CD0Q-QQQQ		37		
3	3.45	132 M	715	40		78.5	77.9	0.65	8.5	1LE1002-1CD2Q-QQQQ		44		
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-QQQQ		60		
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-QQQQ		72		
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-QQQQ		91		

Order No. supplements, see from Page 1/56.

IEC Squirrel-Cage Motors

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Self-ventilated energy-saving motors
with improved efficiency

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-QQQQ	3.2	6.2	3.3	16	0.0034	72	84
1LE1002-1BA2Q-QQQQ	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-QQQQ	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-QQQQ	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-QQQQ	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-QQQQ	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-QQQQ	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-QQQQ	2.3	5.1	2.7	16	0.0059	63	75
1LE1002-1AB5Q-QQQQ	2.4	5.4	2.6	16	0.0078	63	75
1LE1002-1BB2Q-QQQQ	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-QQQQ	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-QQQQ	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-QQQQ	2.3	6.4	3.1	16	0.04395	64	76
1LE1002-1DB4Q-QQQQ	2.5	7	3.4	16	0.05616	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-QQQQ	2.1	4.1	2.4	16	0.0065	61	73
1LE1002-1BC2Q-QQQQ	2.3	4.1	2.5	16	0.0092	68	80
1LE1002-1CC0Q-QQQQ	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-QQQQ	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-QQQQ	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-QQQQ	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-QQQQ	2.2	5.4	2.8	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-QQQQ	1.8	2.8	2	16	0.0056	66	78
1LE1002-1AD5Q-QQQQ	1.5	2.9	1.8	16	0.0078	66	78
1LE1002-1BD2Q-QQQQ	1.8	3.0	1.9	16	0.0094	66	78
1LE1002-1CD0Q-QQQQ	1.5	3.5	2.1	13	0.0186	53	65
1LE1002-1CD2Q-QQQQ	1.5	3.3	2	13	0.02372	53	65
1LE1002-1DD2Q-QQQQ	1.7	3.8	2.3	13	0.0439	68	80
1LE1002-1DD3Q-QQQQ	1.6	4	2.2	13	0.0562	68	80
1LE1002-1DD4Q-QQQQ	1.7	3.8	2.2	13	0.0772	68	80

IEC Squirrel-Cage Motors

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Self-ventilated energy-saving motors
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Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...-Q... 100 L	○	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...-Q... 112 M	○	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...-Q... 132 S/M	○	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...-Q... 160 M/L	○	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	–	–	–	–	–	–	-Z H00	–	–	-Z H00	–	–
1LE1002-1A...-Q..	100 L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1B...-Q..	112 M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1C...-Q..	132 S/M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓	FF 265	✓	✓	✓	✓	✓
1LE1002-1D...-Q..	160 M/L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)					
		With standard flange (acc. to DIN EN 50347)					
		Flange size	IM B14 _{3) 7)}	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover _{3) 4) 5)}	IM B34
			K	L	M	M	N
			–	–	–	–	–
		Order No. supplement -Z with order code					
		-Z H00					
1LE1002-1A...-Q... 100 L		FT 130	✓	✓	✓	✓	✓
1LE1002-1B...-Q... 112 M		FT 130	✓	✓	✓	✓	✓
1LE1002-1C...-Q... 132 S/M		FT 165	✓	✓	✓	✓	✓
1LE1002-1D...-Q... 160 M/L		FT 215	✓	✓	✓	✓	✓

□ Standard version
✓ With additional charge

- A rated voltage range is also specified on the rating plate.
- The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
- Option second shaft end (Order code) **L05** not possible.
- In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

- The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1002-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motortyp	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 S/M	□	✓	✓	✓
1LE1002-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

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Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF I	η_{rated} %	η_{rated} %	$\cos \varphi_{\text{rated}}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/60.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-QQQQ		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-QQQQ		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-QQQQ		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-QQQQ		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-QQQQ		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-QQQQ		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-QQQQ		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-QQQQ		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-QQQQ		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-QQQQ		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-QQQQ		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-QQQQ		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-QQQQ		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-QQQQ		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.6	0.73	3.5	1LE1001-1AC4Q-QQQQ		25
2.2	2.55	112 M	965	22		85	86.5	0.75	5	1LE1001-1BC2Q-QQQQ		29
3	3.45	132 S	970	30		86	85.6	0.74	6.9	1LE1001-1CC0Q-QQQQ		38
4	4.6	132 M	970	39		86	86.5	0.78	8.6	1LE1001-1CC2Q-QQQQ		43
5.5	6.3	132 M	970	54		88	89	0.77	11.8	1LE1001-1CC3Q-QQQQ		52
7.5	8.6	160 M	975	73		89	89.6	0.77	15.8	1LE1001-1DC2Q-QQQQ		77
11	12.6	160 L	975	108		89.5	90.5	0.80	22	1LE1001-1DC4Q-QQQQ		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		67	65	0.57	2.85	1LE1001-1AD4Q-QQQQ		21
1.1	1.3	100 L	725	14		67	64.5	0.57	4.15	1LE1001-1AD5Q-QQQQ		25
1.5	1.75	112 M	715	20		75	75.5	0.65	4.45	1LE1001-1BD2Q-QQQQ		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-QQQQ		41
3	3.45	132 M	720	40		81	82	0.64	8.4	1LE1001-1CD2Q-QQQQ		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-QQQQ		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-QQQQ		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-QQQQ		94

Order No. supplements, see from Page 1/60.

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ	2.3	7	3.3	16	0.0044	72	84
1LE1001-1BA2Q-QQQQ	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ	2.1	6.9	3.3	16	0.0086	63	75
1LE1001-1AB5Q-QQQQ	2	6.9	3.1	16	0.0109	63	75
1LE1001-1BB2Q-QQQQ	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ	2.2	6.7	2.8	16	0.06495	64	76
1LE1001-1DB4Q-QQQQ	2.5	7.3	3	16	0.08281	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ	2	6.2	2.9	16	0.0113	61	73
1LE1001-1BC2Q-QQQQ	2.1	6	3.1	16	0.0139	68	80
1LE1001-1CC0Q-QQQQ	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ	1.8	6.3	2.8	16	0.0754	68	80
1LE1001-1DC4Q-QQQQ	1.7	6.2	2.7	16	0.0975	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ	1.5	3.8	2.6	13	0.0086	66	78
1LE1001-1AD5Q-QQQQ	1.7	3.8	2.9	13	0.0109	66	78
1LE1001-1BD2Q-QQQQ	1.4	3.6	2	13	0.014	66	78
1LE1001-1CD0Q-QQQQ	1.4	3.6	1.8	10	0.02698	53	65
1LE1001-1CD2Q-QQQQ	1.6	3.9	2.1	10	0.03463	53	65
1LE1001-1DD2Q-QQQQ	1.8	4.3	2	13	0.0649	68	80
1LE1001-1DD3Q-QQQQ	2.1	4.4	2.1	13	0.0828	68	80
1LE1001-1DD4Q-QQQQ	1.9	4.5	2.1	13	0.0982	68	80

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Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY 400 VΔ/690 VY 500 VY 500 VΔ				220 VΔ/380 VY 380 VΔ/660 VY 415 VY 415 VΔ			
		60 Hz				Rated voltage range			
		460 VY 460 VΔ				(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾ (360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾ (395 ... 435 VY) ¹⁾ (395 ... 435 VΔ) ¹⁾			
see "Selection and ordering data" for outputs at 60 Hz									
		22	34	27	40	21	33	23	35
1LE1001-1A..□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B..□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C..□-□...	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D..□-□...	160 M/L	○	○	○	○	✓	✓	✓	✓

○

 Without additional charge

✓

 With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		-	-	-	-	-	-	-Z H00		-	-	-Z H00	-	-
Order No. supplement -Z with order code														
1LE1001-1A...-□..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-□..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-□..	132 S/M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-□..	160 M/L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)					
		With standard flange (acc. to DIN EN 50347)					
		Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34
			K	L	M	M	N
		Order No. supplement -Z with order code	—	—	—	-Z H00	—
1LE1001-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 S/M	FT 165	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 M/L	FT 215	✓	✓	✓	✓	✓

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft end (Order code) **L05** not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
	Order code						
1LE1001-1A...-...□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 S/M	□	✓	✓	✓
1LE1001-1D...-...□	160 M/L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

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Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/64.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
4	4.6	100 L	2850	13.3	EFF2	85.6	86.7	0.85	7.9	1LE1002-1AA6Q-QQQQ		25
5.5	6.3	112 M	2935	18	EFF2	87	86.8	0.86	10.6	1LE1002-1BA6Q-QQQQ		31
11	12.6	132 M	2920	36	EFF2	90	90.7	0.90	19.6	1LE1002-1CA6Q-QQQQ		53
22	24.5	160 L	2930	72	EFF2	91.6	91.4	0.88	39.5	1LE1002-1DA6Q-QQQQ		85
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
4	4.6	100 L	1430	26.8	EFF2	84.2	85.1	0.81	8.5	1LE1002-1AB6Q-QQQQ		27
5.5	6.3	112 M	1435	37	EFF2	85.7	86.5	0.84	11	1LE1002-1BB6Q-QQQQ		33
11	12.6	132 M	1450	72	EFF2	88.8	89.3	0.84	21.5	1LE1002-1CB6Q-QQQQ		58
18.5	21.3	160 L	1460	121	EFF2	90	90.2	0.85	35	1LE1002-1DB6Q-QQQQ		85
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
2.2	2.55	100 L	930	22.5		76	76.7	0.79	5.3	1LE1002-1AC6Q-QQQQ		24
3	3.45	112 M	945	30		79	78.2	0.72	7.6	1LE1002-1BC6Q-QQQQ		32
7.5	8.6	132 M	950	75		85.5	85.7	0.74	17.2	1LE1002-1CC6Q-QQQQ		54
15	17.3	160 L	965	148		88	88	0.75	33	1LE1002-1DC6Q-QQQQ		109

Order No. supplements, see from Page 1/64.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output
and improved efficiency

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA6Q-QQQQ	4.5	7	4.1	16	0.0044	72	84
1LE1002-1BA6Q-QQQQ	3.5	7.5	4.3	16	0.0085	69	81
1LE1002-1CA6Q-QQQQ	2.8	7.5	3.7	16	0.02233	68	80
1LE1002-1DA6Q-QQQQ	2.6	7.5	3.4	16	0.04913	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB6Q-QQQQ	2.9	5.8	3.1	16	0.01	63	75
1LE1002-1BB6Q-QQQQ	2.6	6.8	2.8	16	0.0124	58	70
1LE1002-1CB6Q-QQQQ	2.5	7.2	3	16	0.03259	64	76
1LE1002-1DB6Q-QQQQ	2.7	7.2	3.2	16	0.06843	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC6Q-QQQQ	2.2	4	2.3	16	0.0084	61	73
1LE1002-1BC6Q-QQQQ	2.9	4.6	3.0	16	0.0128	68	80
1LE1002-1CC6Q-QQQQ	2.4	5.3	3	16	0.032	63	75
1LE1002-1DC6Q-QQQQ	2.9	6	3.4	16	0.0936	68	80

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output and improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY 400 VΔ/690 VY 500 VY 500 VΔ				220 VΔ/380 VY 380 VΔ/660 VY 415 VY 415 VΔ			
		60 Hz				Rated voltage range			
		460 VY 460 VΔ				(210 ... 230 VΔ/ 360 ... 400 VY) ¹⁾ (360 ... 400 VΔ/ 625 ... 695 VY) ¹⁾ (395 ... 435 VY) ¹⁾ (395 ... 435 VΔ) ¹⁾			
see "Selection and ordering data" for outputs at 60 Hz									
		22	34	27	40	21	33	23	35
1LE1002-1A..□-□...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B..□-□...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C..□-□...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D..□-□...	160 L	○	○	○	○	✓	✓	✓	✓

○

 Without additional charge

✓

 With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C -Z H00	F	G	G -Z H00	H	J	
		Order No. supplement -Z with order code	-	-	-	-	-	-	-	-	-	-	-	-
1LE1002-1A...-Q..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1B...-Q..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1002-1C...-Q..	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1002-1D...-Q..	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)					
		With standard flange (acc. to DIN EN 50347)					
		Flange size	IM B14 3) 7)	IM V19 3)	IM V18 without protective cover 3)	IM V18 with protective cover 3) 4) 5)	IM B34
			K	L	M	M -Z H00	N
		Order No. supplement -Z with order code					
1LE1002-1A...-Q..	100 L	FT 130	✓	✓	✓	✓	✓
1LE1002-1B...-Q..	112 M	FT 130	✓	✓	✓	✓	✓
1LE1002-1C...-Q..	132 M	FT 165	✓	✓	✓	✓	✓
1LE1002-1D...-Q..	160 L	FT 215	✓	✓	✓	✓	✓

□ Standard version
✓ With additional charge

¹⁾ A rated voltage range is also specified on the rating plate.

²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

⁴⁾ Option second shaft end (Order code) **L05** not possible.

⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output
and improved efficiency

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
Order code		A	B	C	F	Z Q2A	Z Q3A
1LE1002-1A...-□	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-□	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-□	132 M	□	✓	✓	✓	✓	✓
1LE1002-1D...-□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1002-1A...-...□	100 L	□	✓	✓	✓
1LE1002-1B...-...□	112 M	□	✓	✓	✓
1LE1002-1C...-...□	132 M	□	✓	✓	✓
1LE1002-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.


²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight			
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/68.	IM B3 type of construction	IM B3 type of construction approx.			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{\text{rated}}$	I_{rated} A				m kg		
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)															
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz															
4	4.6	100 L	2905	13	EFF1	88	89	0.86	7.6	1LE1001-1AA6Q-QQQQ		26			
5.5	6.3	112 M	2950	18	EFF1	89	88.5	0.89	10	1LE1001-1BA6Q-QQQQ		34			
11	12.6	132 M	2955	36	EFF1	91.5	92.5	0.89	19.4	1LE1001-1CA6Q-QQQQ		57			
22	24.5	160 L	2955	71	EFF1	92.8	93.5	0.89	38.5	1LE1001-1DA6Q-QQQQ		94			
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz															
4	4.6	100 L	1460	26	EFF1	88.3	88.7	0.8	8.2	1LE1001-1AB6Q-QQQQ		30			
5.5	6.3	112 M	1460	36	EFF1	89.2	89.7	0.81	11	1LE1001-1BB6Q-QQQQ		34			
11	12.6	132 M	1465	72	EFF1	91	91.4	0.84	21	1LE1001-1CB6Q-QQQQ		64			
18.5	21.3	160 L	1475	120	EFF1	92.4	92.8	0.85	34	1LE1001-1DB6Q-QQQQ		100			
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz															
2.2	2.55	100 L	965	22		84.5	85.6	0.76	4.95	1LE1001-1AC6Q-QQQQ		30			
3	3.45	112 M	960	30		84.5	84.7	0.79	6.5	1LE1001-1BC6Q-QQQQ		34			
7.5	8.6	132 M	970	74		88.5	88.5	0.77	15.4	1LE1001-1CC6Q-QQQQ		64			
15	17.3	160 L	975	147		90.6	91	0.81	29.5	1LE1001-1DC6Q-QQQQ		115			

Order No. supplements, see from Page 1/68.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output
and high efficiency

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Selection and ordering data (continued)

Order No.	Locked-rotor torque with direct starting torque	Locked-rotor current as multiple of rated current	Breakdown torque torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring- surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, with increased output, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA6Q-QQQQ	2.5	7.6	3.5	16	0.0054	72	84
1LE1001-1BA6Q-QQQQ	2.2	7.7	3.3	16	0.0119	73	85
1LE1001-1CA6Q-QQQQ	2.5	7.9	3.2	16	0.03143	68	80
1LE1001-1DA6Q-QQQQ	3.1	8.4	3.7	16	0.06764	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB6Q-QQQQ	2.2	7.5	3.5	16	0.0137	63	75
1LE1001-1BB6Q-QQQQ	2.5	7.1	3.1	16	0.0166	58	70
1LE1001-1CB6Q-QQQQ	2.9	7.7	3.1	16	0.04571	64	76
1LE1001-1DB6Q-QQQQ	2.8	7.7	3.3	16	0.09854	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC6Q-QQQQ	1.9	5.7	2.9	16	0.0137	61	73
1LE1001-1BC6Q-QQQQ	2.1	6	3.1	16	0.0166	68	80
1LE1001-1CC6Q-QQQQ	2.1	6.5	3	16	0.04572	63	75
1LE1001-1DC6Q-QQQQ	1.9	6.5	2.9	16	0.01208	68	80

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output and high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...-Q...	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...-Q...	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...-Q...	132 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...-Q...	160 L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)												
		Without flange							With flange (acc. to DIN EN 50347)					
		IM B3 2) 3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover 3)	IM V5 with protective cover 3) 4) 5)	Flange size	IM B5 3) 6)	IM V1 without protective cover 3)	IM V1 with protective cover 3) 4) 5)	IM V3 3)	IM B35
		A	T	U	V	D	C	C		F	G	G	H	J
		Order No. supplement -Z with order code	-	-	-	-	-	-	-Z H00		-	-	-Z H00	-
1LE1001-1A...-Q..	100 L	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1B...-Q..	112 M	□	□	□	□	□	□	✓	FF 215	✓	✓	✓	✓	✓
1LE1001-1C...-Q..	132 M	□	□	□	□	□	□	✓	FF 265	✓	✓	✓	✓	✓
1LE1001-1D...-Q..	160 L	□	□	□	□	□	□	✓	FF 300	✓	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)					
		With standard flange (acc. to DIN EN 50347)					
		Flange size	IM B14 ₃₎₇₎	IM V19 ₃₎	IM V18 without protective cover ₃₎	IM V18 with protective cover ₃₎₄₎₅₎	IM B34
			K	L	M	M	N
			—	—	—	-Z H00	—
1LE1001-1A...-Q...	100 L	FT 130	✓	✓	✓	✓	✓
1LE1001-1B...-Q...	112 M	FT 130	✓	✓	✓	✓	✓
1LE1001-1C...-Q...	132 M	FT 165	✓	✓	✓	✓	✓
1LE1001-1D...-Q...	160 L	FT 215	✓	✓	✓	✓	✓

□ Standard version
✓ With additional charge

- ¹⁾ A rated voltage range is also specified on the rating plate.
- ²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate. With type of construction IM V5 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- ³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.
- ⁴⁾ Option second shaft end (Order code) **L05** not possible.
- ⁵⁾ In combination with an encoder, it is not necessary to order the protective cover (order code **H00**), as this is delivered as a protection for the encoder as standard. In this case, the protective cover is standard design (without additional charge).

- ⁶⁾ The types of construction IM V3 and IM V1 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate. With type of construction IM V1 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.
- ⁷⁾ The types of construction IM V19 and IM V18 without protective cover/with protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate. With type of construction IM V18 with protective cover, the protective cover has to be additionally ordered with order code **H00**. The protective cover is not stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

Self-ventilated motors with increased output
and high efficiency

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...-□	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-□	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-□	132 M	□	✓	✓	✓	✓	✓
1LE1001-1D...-□	160 L	□	✓	✓	✓	✓	✓

- Standard version
✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ²⁾	Connection box on LHS ²⁾	Connection box bottom ²⁾
		4	5	6	7
1LE1001-1A...-...□	100 L	□	✓	✓	✓
1LE1001-1B...-...□	112 M	□	✓	✓	✓
1LE1001-1C...-...□	132 M	□	✓	✓	✓
1LE1001-1D...-...□	160 L	□	✓	✓	✓

- Standard version
✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/72.	IM B3 type of construction	IM B3 type of construction approx.
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2835	10	EFF2	83.2	84.8	0.87	6	1LE1002-1AA4Q-0000Q-Z F90		20
4	4.6	112 M	2930	13	EFF2	84.8	84.4	0.86	7.9	1LE1002-1BA2Q-0000Q-Z F90		25
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	1LE1002-1CA0Q-0000Q-Z F90		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	1LE1002-1CA1Q-0000Q-Z F90		40
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	1LE1002-1DA2Q-0000Q-Z F90		60
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	1LE1002-1DA3Q-0000Q-Z F90		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	1LE1002-1DA4Q-0000Q-Z F90		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1425	14.8	EFF2	81	84	0.81	4.85	1LE1002-1AB4Q-0000Q-Z F90		18
3	3.45	100 L	1425	20.2	EFF2	82.8	83.6	0.85	6.2	1LE1002-1AB5Q-0000Q-Z F90		22
4	4.6	112 M	1435	27	EFF2	84.2	85.1	0.84	8.2	1LE1002-1BB2Q-0000Q-Z F90		27
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	1LE1002-1CB0Q-0000Q-Z F90		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	1LE1002-1CB2Q-0000Q-Z F90		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	1LE1002-1DB2Q-0000Q-Z F90		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	1LE1002-1DB4Q-0000Q-Z F90		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	940	15.3		74	72.6	0.77	3.8	1LE1002-1AC4Q-0000Q-Z F90		19
2.2	2.55	112 M	930	23		78	78.1	0.77	5.3	1LE1002-1BC2Q-0000Q-Z F90		25
3	3.45	132 S	955	30		80	79.4	0.74	7.3	1LE1002-1CC0Q-0000Q-Z F90		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	1LE1002-1CC2Q-0000Q-Z F90		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	1LE1002-1CC3Q-0000Q-Z F90		48
7.5	8.6	160 M	970	75		86	85.4	0.73	17.2	1LE1002-1DC2Q-0000Q-Z F90		72
11	12.6	160 L	965	110		87.6	87.9	0.77	23.5	1LE1002-1DC4Q-0000Q-Z F90		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	695	10.4		66	60.2	0.65	2.45	1LE1002-1AD4Q-0000Q-Z F90		17
1.1	1.3	100 L	695	15.1		70.2	67.6	0.65	3.5	1LE1002-1AD5Q-0000Q-Z F90		22
1.5	1.75	112 M	675	20		69.5	69.7	0.71	4.4	1LE1002-1BD2Q-0000Q-Z F90		25
2.2	2.55	132 S	720	30		78.8	76.4	0.65	6.2	1LE1002-1CD0Q-0000Q-Z F90		37
3	3.45	132 M	715	40		78.5	77.9	0.65	8.5	1LE1002-1CD2Q-0000Q-Z F90		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	1LE1002-1DD2Q-0000Q-Z F90		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	1LE1002-1DD3Q-0000Q-Z F90		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	1LE1002-1DD4Q-0000Q-Z F90		91

Order No. supplements, see from Page 1/72.

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Forced-air cooled motors without external fan and fan cover with improved efficiency

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Selection and ordering data (continued)

Order No. with -Z and order code	Locked-rotor torque with direct starting	Locked-rotor current as multiple of rated current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	Measuring-surface sound pressure level at 50 Hz L_{pA} dB(A)	Sound pressure level at 50 Hz L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1002-1AA4Q-QQQQ-Z F90	3.2	6.2	3.3	16	0.0034	72	84
1LE1002-1BA2Q-QQQQ-Z F90	2.7	7.3	3.7	16	0.0067	69	81
1LE1002-1CA0Q-QQQQ-Z F90	2	5.6	2.6	16	0.01267	68	80
1LE1002-1CA1Q-QQQQ-Z F90	2.2	6.4	3	16	0.01601	68	80
1LE1002-1DA2Q-QQQQ-Z F90	2.1	6.1	2.7	16	0.02971	70	82
1LE1002-1DA3Q-QQQQ-Z F90	2.5	6.1	3.2	16	0.03619	70	82
1LE1002-1DA4Q-QQQQ-Z F90	2.5	7	3.2	16	0.04395	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1002-1AB4Q-QQQQ-Z F90	2.3	5.1	2.7	16	0.0059	63	75
1LE1002-1AB5Q-QQQQ-Z F90	2.4	5.4	2.6	16	0.0078	63	75
1LE1002-1BB2Q-QQQQ-Z F90	2.2	5.3	2.6	16	0.0102	58	70
1LE1002-1CB0Q-QQQQ-Z F90	2.3	6.2	2.7	16	0.0186	64	76
1LE1002-1CB2Q-QQQQ-Z F90	2.5	6.6	2.9	16	0.02371	64	76
1LE1002-1DB2Q-QQQQ-Z F90	2.3	6.4	3.1	16	0.04395	64	76
1LE1002-1DB4Q-QQQQ-Z F90	2.5	7	3.4	16	0.05616	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1002-1AC4Q-QQQQ-Z F90	2.1	4.1	2.4	16	0.0065	61	73
1LE1002-1BC2Q-QQQQ-Z F90	2.3	4.1	2.5	16	0.0092	68	80
1LE1002-1CC0Q-QQQQ-Z F90	2	4.6	2.6	16	0.0167	63	75
1LE1002-1CC2Q-QQQQ-Z F90	2.1	4.7	2.5	16	0.02116	63	75
1LE1002-1CC3Q-QQQQ-Z F90	2.5	5.2	2.8	16	0.02734	63	75
1LE1002-1DC2Q-QQQQ-Z F90	2.1	5.5	2.9	16	0.04993	68	80
1LE1002-1DC4Q-QQQQ-Z F90	2.2	5.4	2.8	16	0.0678	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1002-1AD4Q-QQQQ-Z F90	1.8	2.8	2	16	0.0056	66	78
1LE1002-1AD5Q-QQQQ-Z F90	1.5	2.9	1.8	16	0.0078	66	78
1LE1002-1BD2Q-QQQQ-Z F90	1.8	3	1.9	16	0.0094	66	78
1LE1002-1CD0Q-QQQQ-Z F90	1.5	3.5	2.1	13	0.0186	53	65
1LE1002-1CD2Q-QQQQ-Z F90	1.5	3.3	2	13	0.02372	53	65
1LE1002-1DD2Q-QQQQ-Z F90	1.7	3.8	2.3	13	0.0439	68	80
1LE1002-1DD3Q-QQQQ-Z F90	1.6	4	2.2	13	0.0562	68	80
1LE1002-1DD4Q-QQQQ-Z F90	1.7	3.8	2.2	13	0.0772	68	80

IEC Squirrel-Cage Motors

New Generation 1LE1

Forced-air cooled motors without external fan and fan cover with improved efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1002-1A...-Q...-Z F90	100 L	○	○	○	○	✓	✓	✓	✓
1LE1002-1B...-Q...-Z F90	112 M	○	○	○	○	✓	✓	✓	✓
1LE1002-1C...-Q...-Z F90	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1002-1D...-Q...-Z F90	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange						With flange (acc. to DIN EN 50347)				
		IM B3 2)3)	IM B6 3)	IM B7 3)	IM B8 3)	IM V6 3)	IM V5 without protective cover ³⁾	Flange size	IM B5 3)4)	IM V1 without protective cover ³⁾	IM V3 3)	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1LE1002-1A...-Q...-Z F90	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1B...-Q...-Z F90	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1002-1C...-Q...-Z F90	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1002-1D...-Q...-Z F90	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)				
		With standard flange (acc. to DIN EN 50347)				
		Flange size	IM B14 3)5)	IM V19 3)	IM V18 without protective cover ³⁾	IM B34
			K	L	M	N
		Order No. supplement -Z with order code				
1LE1002-1A...-Q...-Z F90	100 L	FT 130	✓	✓	✓	✓
1LE1002-1B...-Q...-Z F90	112 M	FT 130	✓	✓	✓	✓
1LE1002-1C...-Q...-Z F90	132 S/M	FT 165	✓	✓	✓	✓
1LE1002-1D...-Q...-Z F90	160 M/L	FT 215	✓	✓	✓	✓

□ Standard version

✓ With additional charge

- ¹⁾ A rated voltage range is also specified on the rating plate.
- ²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
- ³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- ⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
- ⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

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Forced-air cooled motors without external fan and fan cover with improved efficiency

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Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC thermistors for tripping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1002-1A...-...Q.-Z F90	100 L	□	✓	✓	✓	✓	✓
1LE1002-1B...-...Q.-Z F90	112 M	□	✓	✓	✓	✓	✓
1LE1002-1C...-...Q.-Z F90	132 S/M	□	✓	✓	✓	✓	✓
1LE1002-1D...-...Q.-Z F90	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1002-1A...-...Q-Z F90	100 L	□	✓	✓	✓
1LE1002-1B...-...Q-Z F90	112 M	□	✓	✓	✓
1LE1002-1C...-...Q-Z F90	132 S/M	□	✓	✓	✓
1LE1002-1D...-...Q-Z F90	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".


³⁾ With type of construction, screwed-on feet as standard.

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Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Rated output at		Frame size	Operating values at rated output							Order No. with -Z and order code	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm		η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A	For Order No. supplements for voltage, type of construction, motor protection and connection box, see table from Page 1/76.	IM B3 type of construction	IM B3 type of construction approx. m kg
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	2905	9.9	EFF1	86.7	87.5	0.84	5.9	1LE1001-1AA4Q-QQQQ-Z F90		21
4	4.6	112 M	2950	13	EFF1	88	88.5	0.86	7.4	1LE1001-1BA2Q-QQQQ-Z F90		27
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	1LE1001-1CA0Q-QQQQ-Z F90		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	1LE1001-1CA1Q-QQQQ-Z F90		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	1LE1001-1DA2Q-QQQQ-Z F90		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	1LE1001-1DA3Q-QQQQ-Z F90		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	1LE1001-1DA4Q-QQQQ-Z F90		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	1455	14	EFF1	86.4	87	0.81	4.55	1LE1001-1AB4Q-QQQQ-Z F90		21
3	3.45	100 L	1455	20	EFF1	87.4	88	0.82	6	1LE1001-1AB5Q-QQQQ-Z F90		25
4	4.6	112 M	1460	26	EFF1	88.3	88.5	0.81	8.1	1LE1001-1BB2Q-QQQQ-Z F90		29
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	1LE1001-1CB0Q-QQQQ-Z F90		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	1LE1001-1CB2Q-QQQQ-Z F90		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	1LE1001-1DB2Q-QQQQ-Z F90		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	1LE1001-1DB4Q-QQQQ-Z F90		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	970	15		84.5	84.6	0.73	3.5	1LE1001-1AC4Q-QQQQ-Z F90		25
2.2	2.55	112 M	965	22		85	86.5	0.75	5	1LE1001-1BC2Q-QQQQ-Z F90		29
3	3.45	132 S	970	30		86	85.6	0.74	6.9	1LE1001-1CC0Q-QQQQ-Z F90		38
4	4.6	132 M	970	39		86	86.5	0.78	8.6	1LE1001-1CC2Q-QQQQ-Z F90		43
5.5	6.3	132 M	970	54		88	89	0.77	11.8	1LE1001-1CC3Q-QQQQ-Z F90		52
7.5	8.6	160 M	975	73		89	89.6	0.77	15.8	1LE1001-1DC2Q-QQQQ-Z F90		77
11	12.6	160 L	975	108		89.5	90.5	0.80	22	1LE1001-1DC4Q-QQQQ-Z F90		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	725	9.9		67	65	0.57	2.85	1LE1001-1AD4Q-QQQQ-Z F90		21
1.1	1.3	110 L	725	14		67	64.5	0.57	4.15	1LE1001-1AD5Q-QQQQ-Z F90		25
1.5	1.75	112 M	715	20		75	75.5	0.65	4.45	1LE1001-1BD2Q-QQQQ-Z F90		29
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	1LE1001-1CD0Q-QQQQ-Z F90		41
3	3.45	132 M	720	40		81	82	0.64	8.4	1LE1001-1CD2Q-QQQQ-Z F90		49
4	4.6	160 M	730	52		87	88	0.69	9.6	1LE1001-1DD2Q-QQQQ-Z F90		69
5.5	6.3	160 M	735	72		87.5	89	0.69	13.2	1LE1001-1DD3Q-QQQQ-Z F90		82
7.5	8.6	160 L	730	98		88	89	0.72	17	1LE1001-1DD4Q-QQQQ-Z F90		94

Order No. supplements, see from Page 1/76.

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New Generation 1LE1

Forced-air cooled motors without external fan and fan cover with high efficiency

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Selection and ordering data (continued)

Order No. with -Z and order code	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting torque	as multiple of rated current	torque			Measuring- surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm ²	L_{pA} dB(A)	L_{WA} dB(A)
Motor version: temperature class 155 (F), IP55 degree of protection, used acc. to temperature class 130 (B)							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
1LE1001-1AA4Q-QQQQ-Z F90	2.3	7	3.3	16	0.0044	72	84
1LE1001-1BA2Q-QQQQ-Z F90	2.4	7.4	3.3	16	0.0092	69	81
1LE1001-1CA0Q-QQQQ-Z F90	1.8	6.7	2.9	16	0.02012	68	80
1LE1001-1CA1Q-QQQQ-Z F90	2.2	7.5	3.1	16	0.02353	68	80
1LE1001-1DA2Q-QQQQ-Z F90	2.1	7.4	3.2	16	0.04471	70	82
1LE1001-1DA3Q-QQQQ-Z F90	2.4	7.6	3.4	16	0.05277	70	82
1LE1001-1DA4Q-QQQQ-Z F90	2.9	7.9	3.6	16	0.06085	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
1LE1001-1AB4Q-QQQQ-Z F90	2.1	6.9	3.3	16	0.0086	63	75
1LE1001-1AB5Q-QQQQ-Z F90	2	6.9	3.1	16	0.0109	63	75
1LE1001-1BB2Q-QQQQ-Z F90	2.5	7.1	3.2	16	0.014	58	70
1LE1001-1CB0Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.02698	64	76
1LE1001-1CB2Q-QQQQ-Z F90	2.3	6.9	2.9	16	0.03353	64	76
1LE1001-1DB2Q-QQQQ-Z F90	2.2	6.7	2.8	16	0.06495	64	76
1LE1001-1DB4Q-QQQQ-Z F90	2.5	7.3	3	16	0.08281	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
1LE1001-1AC4Q-QQQQ-Z F90	2	6.2	2.9	16	0.0113	61	73
1LE1001-1BC2Q-QQQQ-Z F90	2.1	6	3.1	16	0.0139	68	80
1LE1001-1CC0Q-QQQQ-Z F90	1.6	5.6	2.6	13	0.02371	63	75
1LE1001-1CC2Q-QQQQ-Z F90	1.6	5.6	2.5	13	0.02918	63	75
1LE1001-1CC3Q-QQQQ-Z F90	1.9	6.1	2.8	16	0.03673	63	75
1LE1001-1DC2Q-QQQQ-Z F90	1.8	6.3	2.8	16	0.0754	68	80
1LE1001-1DC4Q-QQQQ-Z F90	1.7	6.2	2.7	16	0.0975	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
1LE1001-1AD4Q-QQQQ-Z F90	1.5	3.8	2.6	13	0.0086	66	78
1LE1001-1AD5Q-QQQQ-Z F90	1.7	3.8	2.9	13	0.0109	66	78
1LE1001-1BD2Q-QQQQ-Z F90	1.4	3.6	2	13	0.014	66	78
1LE1001-1CD0Q-QQQQ-Z F90	1.4	3.6	1.8	10	0.02698	53	65
1LE1001-1CD2Q-QQQQ-Z F90	1.6	3.9	2.1	10	0.03463	53	65
1LE1001-1DD2Q-QQQQ-Z F90	1.8	4.3	2	13	0.0649	68	80
1LE1001-1DD3Q-QQQQ-Z F90	2.1	4.4	2.1	13	0.0828	68	80
1LE1001-1DD4Q-QQQQ-Z F90	1.9	4.5	2.1	13	0.0982	68	80

IEC Squirrel-Cage Motors

New Generation 1LE1

Forced-air cooled motors without external fan and fan cover with high efficiency

Selection and ordering data (continued)

Order No. supplements

Motor type	Frame size	Positions 12 and 13: Voltages (voltage codes)							
		Standard voltages				Further voltages			
		50 Hz				50 Hz			
		230 VΔ/400 VY	400 VΔ/690 VY	500 VY	500 VΔ	220 VΔ/380 VY	380 VΔ/660 VY	415 VY	415 VΔ
		60 Hz				Rated voltage range			
		460 VY	460 VΔ			(210 ... 230 VΔ/360 ... 400 VY) ¹⁾	(360 ... 400 VΔ/625 ... 695 VY) ¹⁾	(395 ... 435 VY) ¹⁾	(395 ... 435 VΔ) ¹⁾
		see "Selection and ordering data" for outputs at 60 Hz							
		22	34	27	40	21	33	23	35
1LE1001-1A...-Q...-Z F90	100 L	○	○	○	○	✓	✓	✓	✓
1LE1001-1B...-Q...-Z F90	112 M	○	○	○	○	✓	✓	✓	✓
1LE1001-1C...-Q...-Z F90	132 S/M	○	○	○	○	✓	✓	✓	✓
1LE1001-1D...-Q...-Z F90	160 M/L	○	○	○	○	✓	✓	✓	✓

○ Without additional charge
✓ With additional charge

Order other voltages with voltage code **9** in position 12, code **0** in position 13 and the corresponding order code (see "Special versions" in the "Selection and ordering data" under "Voltages", Page 1/78).

Motor type	Frame size	Position 14: Types of construction (type letter)										
		Without flange						With flange (acc. to DIN EN 50347)				
		IM B3 ²⁾³⁾	IM B6 ³⁾	IM B7 ³⁾	IM B8 ³⁾	IM V6 ³⁾	IM V5 without protective cover ³⁾	Flange size	IM B5 ³⁾⁴⁾	IM V1 without protective cover ³⁾	IM V3 ³⁾	IM B35
		A	T	U	V	D	C		F	G	H	J
		Order No. supplement -Z with order code										
1LE1001-1A...-Q...-Z F90	100 L	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1B...-Q...-Z F90	112 M	□	□	□	□	□	□	FF 215	✓	✓	✓	✓
1LE1001-1C...-Q...-Z F90	132 S/M	□	□	□	□	□	□	FF 265	✓	✓	✓	✓
1LE1001-1D...-Q...-Z F90	160 M/L	□	□	□	□	□	□	FF 300	✓	✓	✓	✓

Motor type	Frame size	Position 14: Types of construction (type letter)				
		With standard flange (acc. to DIN EN 50347)				
		Flange size	IM B14 3) 5)	IM V19 3)	IM V18 without protective cover 3)	IM B34
			K	L	M	N
		Order No. supplement -Z with order code	—	—	—	—
1LE1001-1A...-Q...-Z F90	100 L	FT 130	✓	✓	✓	✓
1LE1001-1B...-Q...-Z F90	112 M	FT 130	✓	✓	✓	✓
1LE1001-1C...-Q...-Z F90	132 S/M	FT 165	✓	✓	✓	✓
1LE1001-1D...-Q...-Z F90	160 M/L	FT 215	✓	✓	✓	✓

□ Standard version

✓ With extra price

- ¹⁾ A rated voltage range is also specified on the rating plate.
- ²⁾ The types of construction IM B6/7/8, IM V6 and IM V5 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B3 is then stamped on the rating plate.
- ³⁾ The type of construction is stamped on the rating plate. When ordering with condensation drainage holes (order code **H03**), it is absolutely necessary to specify the type of construction for the exact position of the condensation drainage holes during manufacture.

- ⁴⁾ The types of construction IM V3 and IM V1 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B5 is then stamped on the rating plate.
- ⁵⁾ The types of construction IM V19 and IM V18 without protective cover are also possible as long as no condensation drainage holes (order code **H03**) and no stamping of these types of construction on the rating plate are required. As standard, the type of construction IM B14 is then stamped on the rating plate.

IEC Squirrel-Cage Motors

New Generation 1LE1

Forced-air cooled motors without external fan and fan cover with high efficiency

1

Selection and ordering data (continued)

Motor type	Frame size	Position 15: Motor protection (motor protection letter)					
		Without motor protection	Motor protection with PTC thermistors with 3 embedded temperature sensors for tripping ¹⁾	Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping ¹⁾	Motor temperature detection with embedded temperature sensor KTY 84-130 ¹⁾	NTC ther- mistors for trip- ping	Temperature detectors for tripping ¹⁾
		A	B	C	F	Z Q2A	Z Q3A
Order code							
1LE1001-1A...-□.-Z F90	100 L	□	✓	✓	✓	✓	✓
1LE1001-1B...-□.-Z F90	112 M	□	✓	✓	✓	✓	✓
1LE1001-1C...-□.-Z F90	132 S/M	□	✓	✓	✓	✓	✓
1LE1001-1D...-□.-Z F90	160 M/L	□	✓	✓	✓	✓	✓

- Standard version
 ✓ With additional charge

Motor type	Frame size	Position 16: Connection box (connection box code)			
		Connection box top ²⁾	Connection box on RHS ³⁾	Connection box on LHS ³⁾	Connection box bottom ³⁾
		4	5	6	7
1LE1001-1A ...-...Q-Z F90	100 L	□	✓	✓	✓
1LE1001-1B ...-...Q-Z F90	112 M	□	✓	✓	✓
1LE1001-1C ...-...Q-Z F90	132 S/M	□	✓	✓	✓
1LE1001-1D ...-...Q-Z F90	160 M/L	□	✓	✓	✓

- Standard version
 ✓ With additional charge

¹⁾ For appropriate tripping unit, see Catalog LV 1.

²⁾ With type of construction, cast feet as standard. Screwed-on feet are available with order code **H01**, see "Special versions".

³⁾ With type of construction, screwed-on feet as standard.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

Selection and ordering data

Voltages

Additional order codes for other voltages or voltage codes (without **-Z** supplement)

Not possible for General Line motors with shorter delivery time.

For some non-standard voltages at 50 or 60 Hz, order codes are specified. They are ordered by specifying the code digit **9** for voltage in the 12th position and **0** in the 13th position of the Order No. and the appropriate order code.

Special versions	Voltage code 12th / 13th position of the Order No.	Additional identi- fication code with order code and plain text if required	Motor type frame size								
			56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency Self-ventilated energy-saving motors with high efficiency Self-ventilated motors with increased output and improved efficiency Self-ventilated motors with increased output and high efficiency Forced-air cooled motors without external fan and fan cover with improved efficiency Forced-air cooled motors without external fan and fan cover with high efficiency											
			1LE1 (Aluminum)								
Voltage at 60 Hz											
220 VΔ/380 VY; 50 Hz output	9	0	M2A					✓	✓	✓	✓
220 VΔ/380 VY; 60 Hz output	9	0	M1A					✓	✓	✓	✓
380 VΔ/660 VY; 50 Hz output	9	0	M2B					✓	✓	✓	✓
380 VΔ/660 VY; 60 Hz output	9	0	M1B					✓	✓	✓	✓
440 VY; 50 Hz output	9	0	M2C					✓	✓	✓	✓
440 VY; 60 Hz output	9	0	M1C					✓	✓	✓	✓
440 VΔ; 50 Hz output	9	0	M2D					✓	✓	✓	✓
440 VΔ; 60 Hz output	9	0	M1D					✓	✓	✓	✓
460 VY; 50 Hz output	9	0	M2E					✓	✓	✓	✓
460 VY; 60 Hz output	9	0	M1E					○	○	○	○
460 VΔ; 50 Hz output	9	0	M2F					✓	✓	✓	✓
460 VΔ; 60 Hz output	9	0	M1F					○	○	○	○
575 VY; 50 Hz output	9	0	M2G					✓	✓	✓	✓
575 VY; 60 Hz output	9	0	M1G					✓	✓	✓	✓
575 VΔ; 50 Hz output	9	0	M2H					✓	✓	✓	✓
575 VΔ; 60 Hz output	9	0	M1H					✓	✓	✓	✓
Non-standard voltages and / or frequencies											
Non-standard winding for volt- ages between 200 V and 690 V (voltages outside this range are available on request) ¹⁾	9	0	M1Y					✓	✓	✓	✓

- Without additional charge
 ✓ With additional charge

¹⁾ Plain text must be specified in the order: voltage, frequency, circuit, required rated output in kW.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

Options

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Motor connection and connection boxes										
One cable entry, metal	R15						✓	✓	✓	✓
Rotation of the connection box through 90°, entry from DE	R10						○	○	○	○
Rotation of the connection box through 90°, entry from NDE	R11						○	○	○	○
Rotation of the connection box through 180°	R12						○	○	○	○
External earthing	H04						✓	✓	✓	✓
Windings and insulation										
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4%	N05						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8%	N06						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13%	N07						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18%	N08						✓	✓	✓	✓
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code						✓	✓	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							□	□	□	□
Special finish in other standard RAL colors : RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y54 • and special finish RAL....						✓	✓	✓	✓
Special finish in special RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 1/6	Y51 • and special finish RAL....						✓	✓	✓	✓
Unpainted (only cast iron parts primed)	S00						○	○	○	○
Unpainted, only primed	S01						✓	✓	✓	✓

For legend, see Page 1/81. For footnotes, see Page 1/82.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Modular technology – basic versions ¹⁾										
Mounting of separately driven fan	F70						✓	✓	✓	✓
Mounting of brake ²⁾	F01						✓	✓	✓	✓
Mounting of 1XP8012-10 (HTL) rotary pulse encoder ³⁾	G01						✓	✓	✓	✓
Mounting of 1XP8012-20 (TTL) rotary pulse encoder ³⁾	G02						✓	✓	✓	✓
Modular technology – additional versions										
Brake supply voltage 24 V DC	F10						✓	✓	✓	✓
Brake supply voltage 230 V AC, 50/60 Hz	F11						○	○	○	○
Brake supply voltage 400 V AC, 50/60 Hz	F12						✓	✓	✓	✓
Mechanical manual brake release with lever (no locking)	F50						✓	✓	✓	✓
Special technology ¹⁾										
Mounting of LL 861 900 220 rotary pulse encoder ³⁾	G04						✓	✓	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder ³⁾	G05						✓	✓	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder ³⁾	G06						✓	✓	✓	✓
Mechanical design and degrees of protection										
Protective cover, as well as mechanical protection for the encoder ³⁾	H00						✓	✓	✓	✓
Screwed-on feet (instead of cast)	H01						✓	✓	✓	✓
Condensation drainage holes ⁴⁾	H03						✓	✓	✓	✓
Prepared for mountings, only centre hole	G40						✓	✓	✓	✓
Prepared for mountings with D12 shaft	G41						✓	✓	✓	✓
Prepared for mountings with D16 shaft	G42						✓	✓	✓	✓
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection ⁵⁾	Q01						✓	✓	✓	✓
Bearing design for increased cantilever forces	L22						✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	L25						✓	✓	✓	✓
Regreasing device ⁵⁾	L23						✓	✓	✓	✓
Located bearing at DE	L20						✓	✓	✓	✓
Located bearing at NDE	L21						✓	✓	✓	□
Balance and vibration quantity										
Half-key balancing (standard)							□	□	□	□
Full-key balancing	L02						✓	✓	✓	✓
Balancing without fitted key	L01						✓	✓	✓	✓
Vibration quantity level A							□	□	□	□
Vibration quantity level B	L00						✓	✓	✓	✓

For legend, see Page 1/81. For footnotes, see Page 1/82.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

1

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Self-ventilated energy-saving motors with improved efficiency										
Self-ventilated energy-saving motors with high efficiency										
Self-ventilated motors with increased output and improved efficiency										
Self-ventilated motors with increased output and high efficiency										
		1LE1 (Aluminum)								
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08						✓	✓	✓	✓
Second standard shaft extension	L05						✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07						✓	✓	✓	✓
Standard shaft made of non-rusting steel	L06						✓	✓	✓	✓
Heating and ventilation										
Anti-condensation heaters for 230 V	Q02						✓	✓	✓	✓
Anti-condensation heaters for 115 V	Q03						✓	✓	✓	✓
Sheet metal fan cover	F74						✓	✓	✓	✓
Rating plate and extra rating plate										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code						✓	✓	✓	✓
Additional information on rating plate and on package label (max. of 20 characters)	Y84 • and identification code						✓	✓	✓	✓
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○
With one safety and start-up guide per box pallet	B01						○	○	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	B02						✓	✓	✓	✓
Operating instructions on CD enclosed	B03						✓	✓	✓	✓
Printed operating instructions English/German enclosed	B04						✓	✓	✓	✓
Wire-lattice pallet	B99						○	○	○	○
Connected in star for dispatch	M01						✓	✓	✓	✓
Connected in delta for dispatch	M02						✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- ✓ With additional charge

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

1

- ¹⁾ A second shaft extension is not possible. Please inquire for mounted brakes.
- ²⁾ When quoting or ordering, it is necessary to provide the brake supply voltage for order codes **F10**, **F11** and **F12**.
- ³⁾ All encoders are supplied with a protective cover as standard. The protective cover is not supplied with the combination rotary pulse encoder with separately driven fan, as, in this case, the rotary pulse encoder is installed under the fan cover.
- ⁴⁾ Supplied with the condensation drainage holes sealed at the drive end (DE) and non-drive end (NDE) (IP55, IP56, IP65). If condensation draining holes are required for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.
- ⁵⁾ Not possible when brake is mounted.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

1

Options or order codes (supplement **-Z** is required)

Not possible for General Line motors with shorter delivery time.

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size							
		56	63	71	80	90	100	112	132
Forced-air cooled motors without external fan and fan cover with improved efficiency									
Forced-air cooled motors without external fan and fan cover with high efficiency									
		1LE1 (Aluminum)							
Motor connection and connection boxes									
One cable entry, metal	R15	✓	✓	✓	✓				
Rotation of the connection box through 90°, entry from DE	R10	○	○	○	○				
Rotation of the connection box through 90°, entry from NDE	R11	○	○	○	○				
Rotation of the connection box through 180°	R12	○	○	○	○				
External earthing	H04	✓	✓	✓	✓				
Windings and insulation									
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	N01	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), with increased output	N02	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	N03	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 45 °C, derating approx. 4%	N05	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 50 °C, derating approx. 8%	N06	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 55 °C, derating approx. 13%	N07	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 130 (B), coolant temperature 60 °C, derating approx. 18%	N08	✓	✓	✓	✓				
Temperature class 155 (F), used acc. to 155 (F), other requirements	Y52 • and identification code	✓	✓	✓	✓				
Colors and paint finish									
Special finish in RAL 7030 stone gray		□	□	□	□				
Special finish in other standard RAL colors : RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005	Y54 • and special finish RAL....	○	✓	✓	✓				
Special finish in special-RAL colors: for RAL colors, see "Special finish in special RAL colors", Page 1/6	Y51 • and special finish RAL....	✓	✓	✓	✓				
Unpainted (only cast iron parts primed)	S00	○	○	○	○				
Unpainted, only primed	S01	✓	✓	✓	✓				

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
1LE1 (Aluminum)										
Mechanical design and degree of protection										
Screwed-on feet (instead of cast)	H01						✓	✓	✓	✓
Condensation drainage holes ¹⁾	H03						✓	✓	✓	✓
Bearings and lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	Q01						✓	✓	✓	✓
Bearing design for increased canteliver forces	L22						✓	✓	✓	✓
Special bearing for DE and NDE, bearing size 63	L25						✓	✓	✓	✓
Regreasing device	L23						✓	✓	✓	✓
Located bearing at DE	L20						✓	✓	✓	✓
Located bearing at NDE	L21						✓	✓	✓	□
Balance and vibration quantity										
Half-key balancing (standard)							□	□	□	□
Full-key balancing	L02						✓	✓	✓	✓
Balancing without fitted key	L01						✓	✓	✓	✓
Vibration quantity level A							□	□	□	□
Vibration quantity level B	L00						✓	✓	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors	L08						✓	✓	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	L07						✓	✓	✓	✓
Standard shaft made of non-rusting steel	L06						✓	✓	✓	✓
Heating and ventillation										
Anti-condensation heaters for 230 V	Q02						✓	✓	✓	✓
Anti-condensation heaters for 115 V	Q03						✓	✓	✓	✓
Sheet metal fan cover	F74						✓	✓	✓	✓
Rating plate and extra rating plate										
Second rating plate, loose	M10						✓	✓	✓	✓
Nirosta rating plate	M11						✓	✓	✓	✓
Extra rating plate or rating plate with deviating rating plate data	Y80 • and identification code						✓	✓	✓	✓
Extra rating plate with identification codes	Y82 • and identification code						✓	✓	✓	✓
Additional information on rating plate and on package label (max. of 20 characters)	Y84 • and identification code						✓	✓	✓	✓

For legend and footnotes, see Page 1/85.

IEC Squirrel-Cage Motors

New Generation 1LE1

Special versions

1

Special versions	Additional identification code -Z with order code and plain text if required	Motor type frame size								
		56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency										
Forced-air cooled motors without external fan and fan cover with high efficiency										
		1LE1 (Aluminum)								
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	B00						○	○	○	○
With one safety and start-up guide per box pallet	B01						○	○	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	B02						✓	✓	✓	✓
Operating instructions on CD enclosed	B03						✓	✓	✓	✓
Printed operating instructions English/German enclosed	B04						✓	✓	✓	✓
Wire-lattice pallet	B99						○	○	○	○
Connected in star for dispatch	M01						✓	✓	✓	✓
Connected in delta for dispatch	M02						✓	✓	✓	✓

- Standard version
- Without additional charge
- This order code only determines the price of the version – Additional plain text is required.
- ✓ With additional charge

¹⁾ Supplied with the condensation drainage holes sealed at the drive end (DE) and non-drive end (NDE) (IP55, IP56, IP65). If condensation draining holes are required for motors with IM B6, IM B7 or IM B8 type of construction (feet located on side or top), it is necessary to order the motors in their respective type of construction and order code **H03**, so that the condensation drainage holes can be mounted in the correct positional arrangement.

IEC Squirrel-Cage Motors

New Generation 1LE1

Accessories and spare parts

1

Overview

Couplings

The motor from Siemens is connected to the machine or gear unit through a coupling. Flender is an important coupling manufacturer with a wide range of products. For standard applications, Siemens recommends that elastic couplings of Flender types N-Eupex and Rupex or torsionally rigid couplings of types Arpex and Zapex are used. For special applications, Fludex and Elpex couplings are recommended.

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Tel. +49 (0) 2871-92 2185
Fax +49 (0) 2871-92 2579

<http://www.flender.com>
e-mail: couplings@flender.com

Mounting of encoder

In the case of mounting by the customer.

Baumer Hübner GmbH
10967 Berlin
Planufer 92b
Tel. +49 (0) 30-690 03-0
Fax +49 (0) 30-690 03-104

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

Leine & Linde (Deutschland) GmbH
73430 Aalen
Bahnhofstraße 36
Tel. +49 (0) 7361-78 093-0
Fax +49 (0) 7361-78 093-11

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

More information

Spare motors and repair parts

- Supply commitment for spare motors and repair parts following delivery of the motor
 - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
 - Repair parts will be supplied for up to 5 years.
 - For up to 10 years, Siemens will provide information and will, if necessary, supply documentation for repair parts.
- When repair parts are ordered, the following details must be provided:
 - Designation and part number
 - Order No. and factory number of the motor
- For bearing types, see the „Orientation“, „Technical data“, Page 1/23.
- For standard components, a supply commitment does not apply.
- Support – Hotline
In Germany
Tel.: 01 80 - 5 05 04 48

You will find telephone numbers for other countries on our Internet site:

<http://www.siemens.com/automation/service&support>

IEC Squirrel-Cage Motors

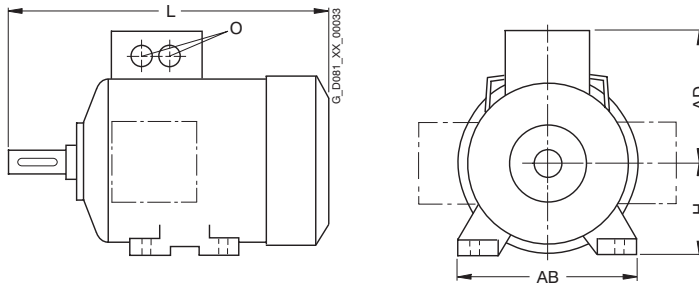
New Generation 1LE1

Dimensions

1

Overview

Overall dimensions



Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
100 L	General Line motors with shorter delivery time		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		395.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		430.5 ¹⁾	166	100	196	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		321.5	166	100	196	2 x M32 x 1.5
112 M	General Line motors with shorter delivery time		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		389 ¹⁾	177	112	226	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		414 ¹⁾	177	112	226	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		311	177	112	226	2 x M32 x 1.5

Frame size	Type	Number of poles	Dimensions				
			L	AD	H	AB	O
132 S/ 132 M	General Line motors with shorter delivery time		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		465 ¹⁾	202	132	256	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		515 ¹⁾	202	132	256	2 x M32 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		380.5	202	132	256	2 x M32 x 1.5
160 M/ 160 L	General Line motors with shorter delivery time		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		604 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		664 ¹⁾	236.5	160	300	2 x M40 x 1.5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		510	236.5	160	300	2 x M40 x 1.5

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

Overview (continued)

Notes on the dimensions

- Dimension drawings according to DIN EN 50347 and IEC 60072.

■ Fits

The shaft extensions specified in the dimension tables (DIN 748) and centering spigot diameters (DIN EN 50347) are machined with the following fits:

Dimension designation	ISO fit DIN ISO 286-2	
D, DA	up to 30	j6
	over 30 to 50	k6
	over 50	m6
N	up to 250	j6
	over 250	h6
F, FA		h9
K		H17
S	Flange (FF)	H17

The drilled holes of couplings and belt pulleys should have an ISO fit of at least H7.

■ Dimension tolerances

For the following dimensions, the admissible deviations are given below:

Dimension designation	Dimensions	Admissible deviation
H	up to 250	−0.5
	over 250	−1.0
E, EA		−0.5

Keyways and feather keyways (dimensions GA, GC, F and FA) are made in compliance with DIN 6885 Part 1.

- All dimensions are specified in mm.

IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

1

More information

SD configurator

SD configurator (on CD2 "Configuration" of catalog "CA01 – The Siemens A&D Offline Mall")



The interactive catalog CA 01 – the offline mall of Siemens Automation and Drives (A&D) – contains over 100 000 products with approximately 5 million potential drive system product variants.

The **SD configurator** has been developed to facilitate selection of the correct motor and/or converter from the wide spectrum of A&D SD products. It is integrated as a "selection aid" in this catalog.

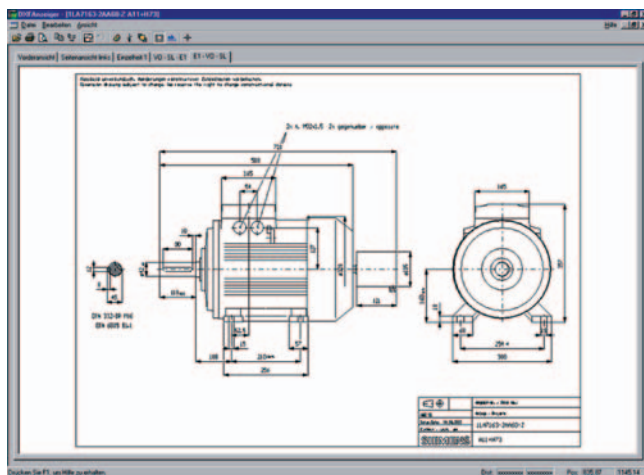
The **SD configurator** makes it easier to find the right drive solution. It supplies the correct order number as well as the corresponding documentation.

It can display operating instructions, factory test certificate, terminal box documentation, etc. and generates data sheets, dimension drawings and a start-up calculation for the relevant products.

Dimension sheet generator

(part of the SD configurator)

A dimension drawing can be created in the SD configurator for every configurable motor. A dimension drawing can be requested for every other motor.



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

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

SD configurator product range:

Low-voltage motors (energy-saving motors) with corresponding documentation and dimension drawings, low-voltage inverters of the MICROMASTER 4 product series, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters, and SIMATIC 200S FC frequency converters for distributed I/O.

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

Links to tips, tricks and downloads for functional or content updates can be found at this address.

Order No. for CA 01, English International:

CD-ROM: **E86060-D4001-A110-C5-7600**

DVD: **E86060-D4001-A510-C5-7600**

Note: The SD configurator offline tool within CA 01 can be updated for the new 1LE1 motor series online over the Internet.

When a complete Order No. is entered with or without order codes, a dimension drawing can be called up under the "Documentation" tab.

These dimension drawings can be presented in different views and sections and printed.

The corresponding dimension sheets can be exported, saved and processed further in DXF format (interchange/import format for CAD systems) or as bitmap graphics.

The SD configurator has been integrated into the CA 01 electronic catalog as a selection aid (for further information, see above).

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

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

Order No. for CA 01, English International

CD-ROM: **E86060-D4001-A110-C5-7600**

DVD: **E86060-D4001-A510-C5-7600**

Note:

The SD configurator offline tool within CA01 can be updated for the new 1LE1 motor series online over the Internet.

IEC Squirrel-Cage Motors

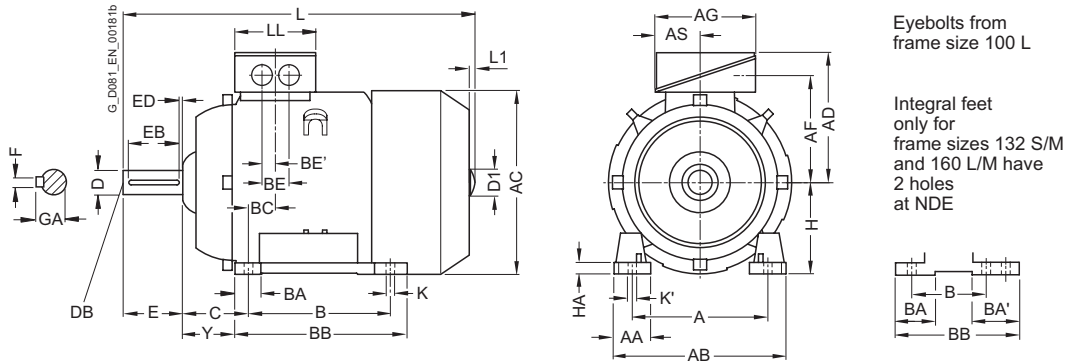
New Generation 1LE1

Dimensions

Dimensional drawings

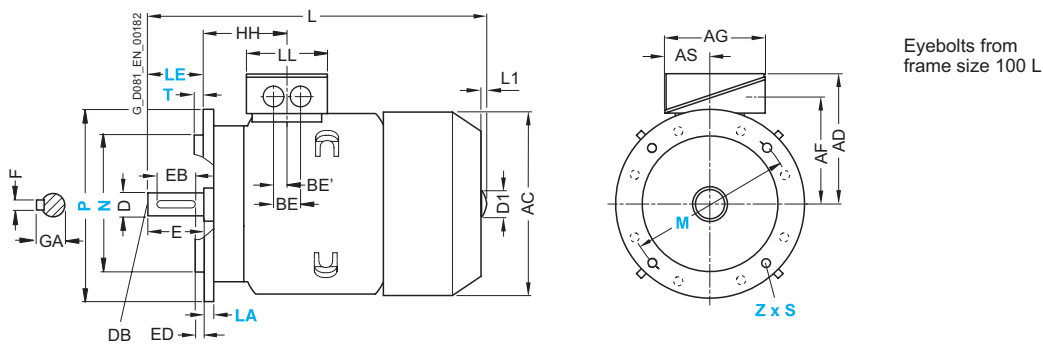
Aluminum series 1LE1, frame sizes 100 to 160 - General Line motors with shorter delivery time

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor	Dimension designation acc. to IEC																			
Frame size	Number of poles	A	AA	AB	AC	AD	AF	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	125.5	135	63.5	140	37.5	—	176	33.5	50	25	63	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	136.5	135	63.5	140	35.4	—	176	26	50	25	70	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	140	38	76	218	26.5	48	24	89	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	159.5	155	70.5	178	38	76	218	26.5	48	24	89	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	210	44	89	300	47	57	28.5	108	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	190	175	77.5	254	44	89	300	47	57	28.5	108	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

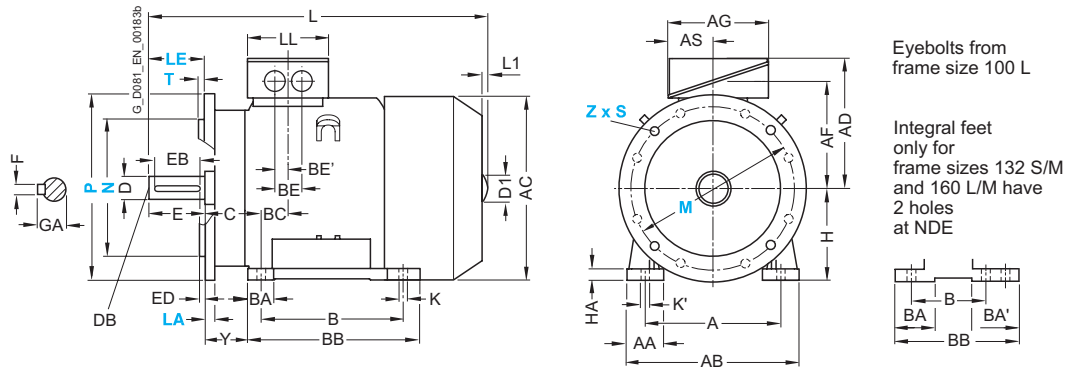
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Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 - General Line motors with shorter delivery time

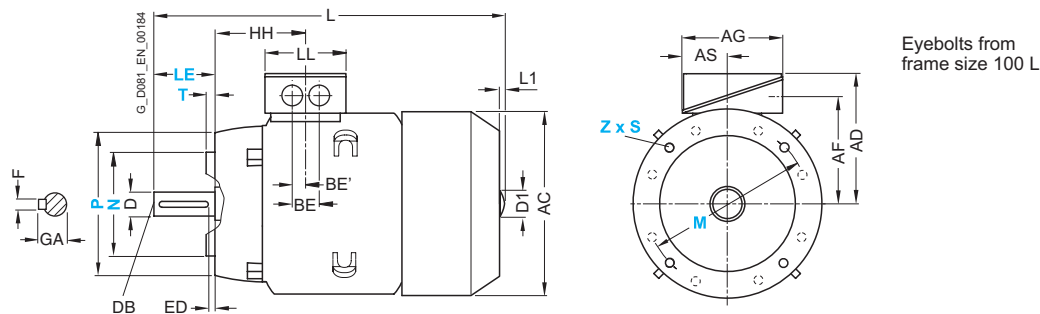
Type of construction IM B35

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor	Dimension designation acc. to IEC	DE shaft extension														
Frame size	Number of poles	HH	K	K'	L ¹⁾	L1	D1	LL	D	DB	E	EB	ED	F	GA	
100 L	2, 4, 6, 8	96.5	12	16	395.5	7	32	112	28	M10	60	50	5	8	31	
112 M	2, 4, 6, 8	96	12	16	389	7	32	112	28	M10	60	50	5	8	31	
132 S	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41	
132 M	2, 4, 6, 8	115.5	12	16	465	8.5	39	130	38	M12	80	70	5	10	41	
160 M	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45	
160 L	2, 4, 6, 8	155	15	19	604	10	45	145	42	M16	110	90	10	12	45	

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

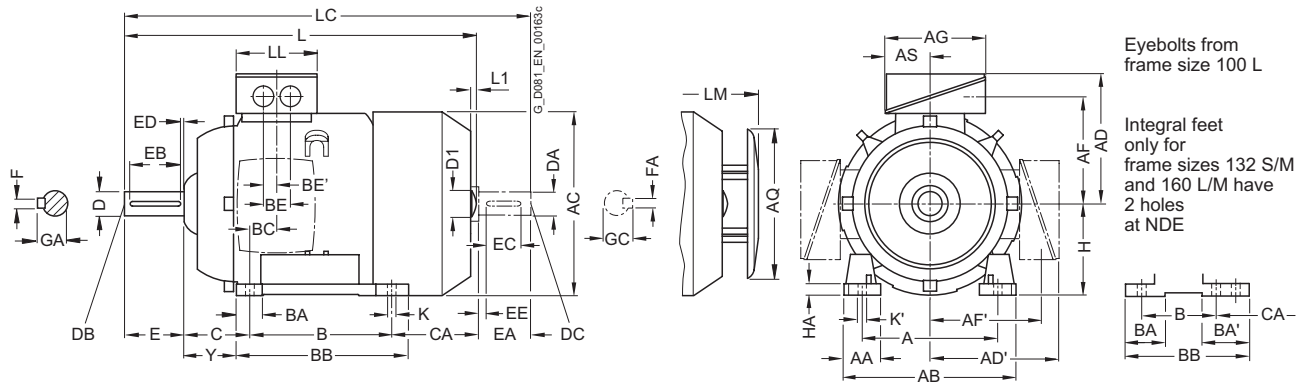
New Generation 1LE1

Dimensions

Dimensional drawings (continued)

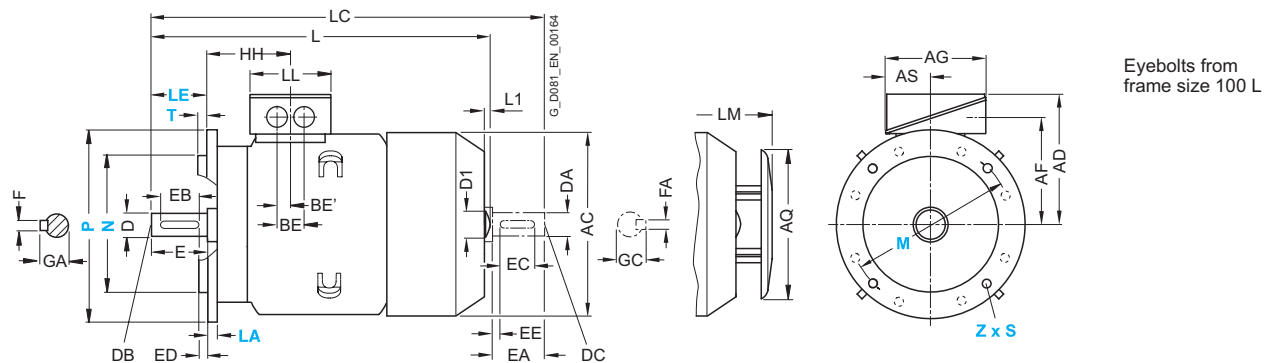
Aluminum series 1LE1, frame sizes 100 to 160 - self-ventilated energy-saving motors with improved/high efficiency

Type of construction IM B3



Types of construction IM B5 and IM V1

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																						
Frame size	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾
100 L	2, 4, 6, 8	160	42	196	198	166	166	125.5	125.5	135	195	63.5	140	37.5	–	176	33.5	50	25	63	141.2	100	12	45
112 M	2, 4, 6, 8	190	46	226	222	177	177	136.5	136.5	135	195	63.5	140	35.4	–	176	26	50	25	70	129.7	112	12	52
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	140	38	76 ²⁾	218 ³⁾	26.5	48	24	89	128.5 ⁴⁾	132	15	69
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	178	38	76	218	26.5	48	24	89	128.5 ⁴⁾	132	15	69
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	210	44	89 ⁵⁾	300 ⁶⁾	47	57	28.5	108	148 ⁷⁾	160	18	85
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	254	44	89	300	47	57	28.5	108	148 ⁷⁾	160	18	85

* This dimension is assigned in DIN EN 50347 to the frame size listed.

1) Additional information: not a standard dimension acc. to DIN 50347.

2) With screwed-on feet, dimension BA' is 38 mm.

3) With screwed-on feet, dimension BB is 180 mm.

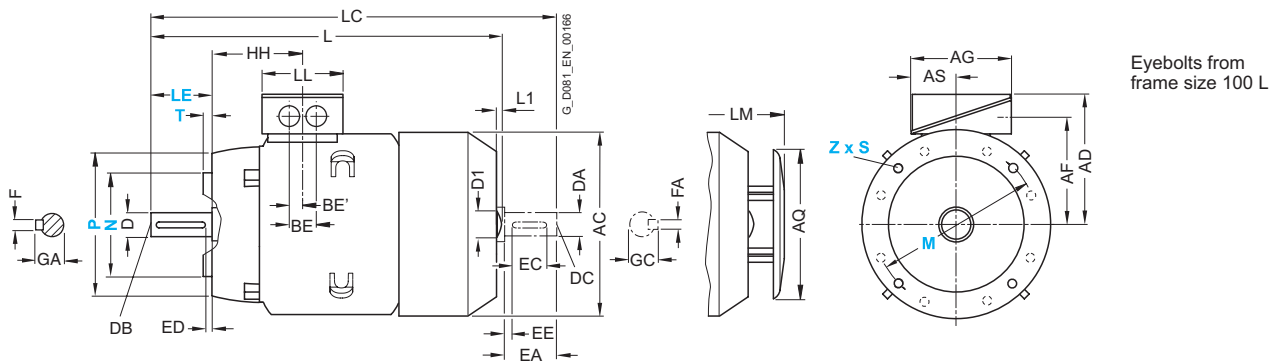
4) With screwed-on feet, dimension CA is 166.5 mm.

5) With screwed-on feet, dimension BA' is 44 mm.

6) With screwed-on feet, dimension BB is 256 mm.

7) With screwed-on feet, dimension CA is 192 mm.

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)

1/93

IEC Squirrel-Cage Motors

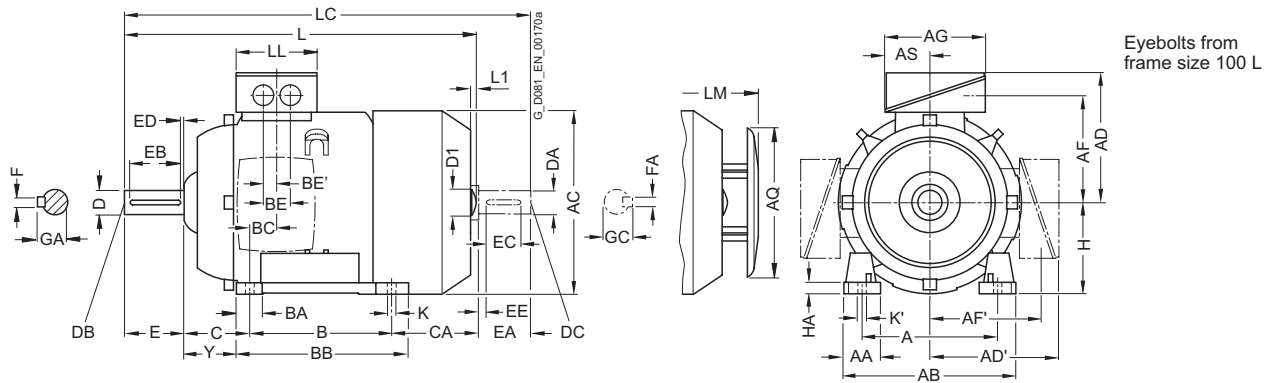
New Generation 1LE1

Dimensions

Dimensional drawings (continued)

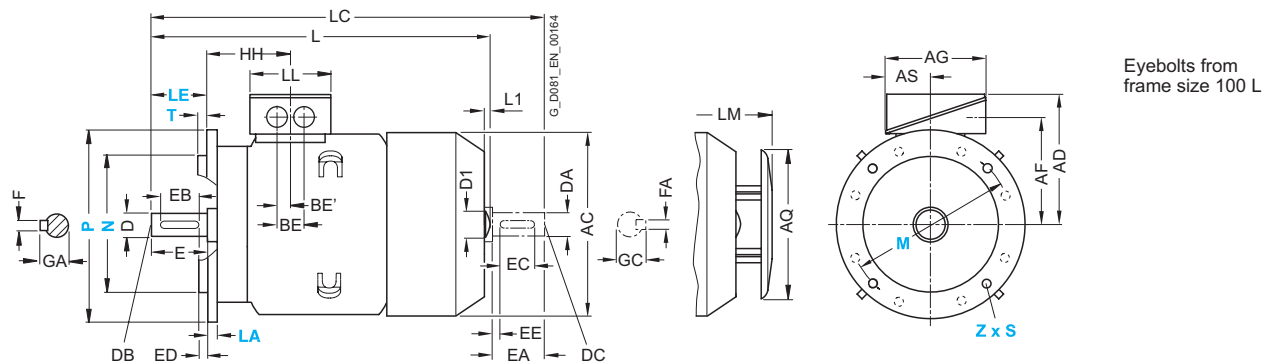
Aluminum series 1LE1, frame sizes 100 to 160 - self-ventilated motors with increased output and improved/high efficiency

Type of construction IM B3



Type of construction IM B5 and IM V1

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC																									
Frame size	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AQ	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H	HA	Y ¹⁾			
100 L	2, 4, 6, 8	160	42	196	198	166	166	125.5	125.5	135	195	63.5	140	37.5	–	176	33.5	50	25	63	176.2	100	12	45			
112 M	2, 4, 6, 8	190	46	226	222	177	177	136.5	136.5	135	195	63.5	140	35.4	–	176	26	50	25	70	155	112	12	52			
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	178	38	–	218	26.5	48	24	89	178.5	132	15	69			
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	254	44	–	300	47	57	28.5	108	208	160	18	85			

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

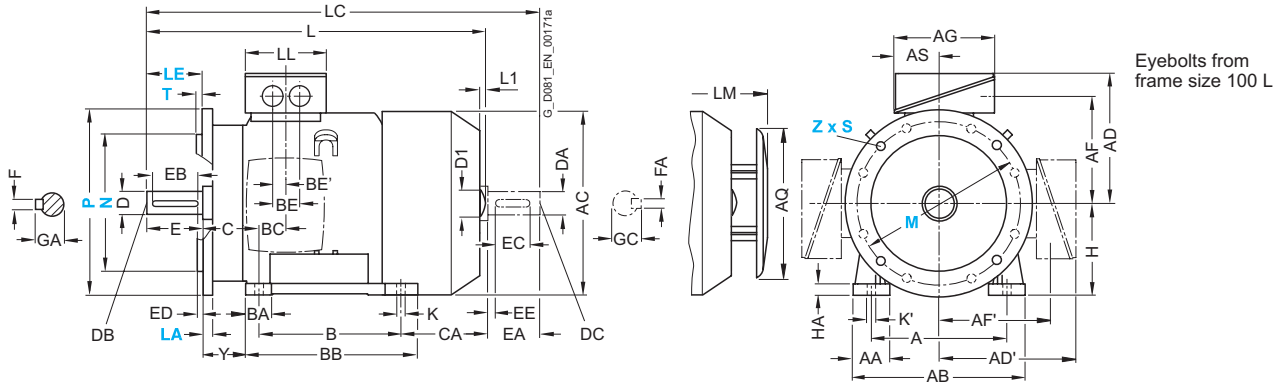
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Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 - self-ventilated motors with increased output and improved/high efficiency

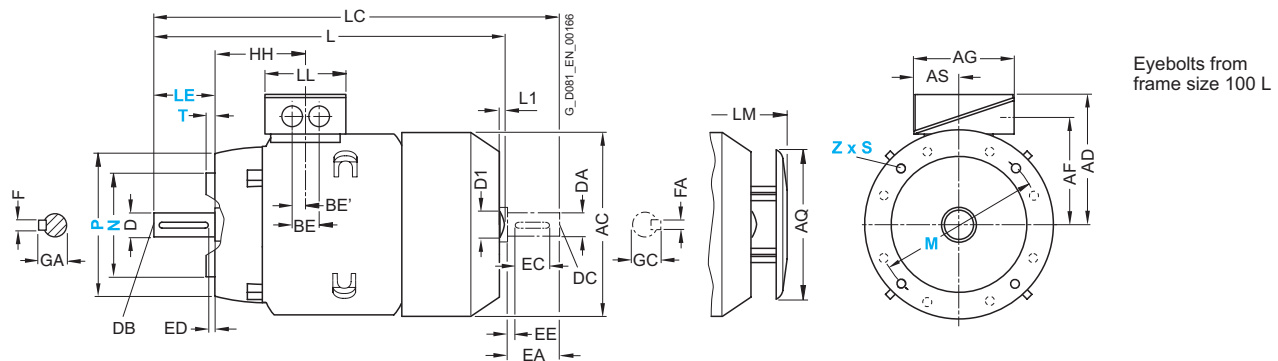
Type of construction IM B35

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC										DE shaft extension							NDE shaft extension									
Frame size	Number of poles	HH	K	K'	L ¹⁾	L1	D1	LC	LL	LM	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC				
100 L	2, 4, 6, 8	96.5	12	16	430.5	7	32	489.2	112	463.5	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27				
112 M	2, 4, 6, 8	96	12	16	414	7	32	475	112	447	28	M10	60	50	5	8	31	24	M8	50	40	5	8	27				
132 M	2, 4, 6, 8	115.5	12	16	515	8.5	39	585.5	130	550.5	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31				
160 L	2, 4, 6, 8	155	15	19	664	10	45	790	145	698	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45				

¹⁾ The length is specified as far as the tip of the fan cover.

IEC Squirrel-Cage Motors

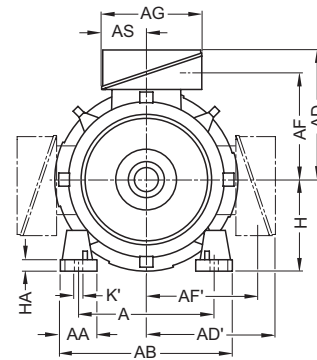
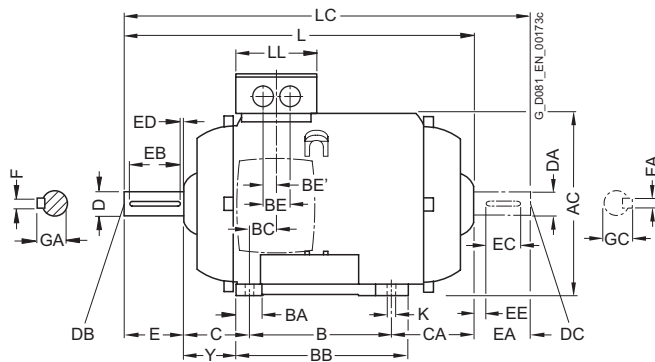
New Generation 1LE1

Dimensions

Dimensional drawings (continued)

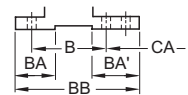
Aluminum series 1LE1, frame sizes 100 to 160 - forced-air cooled motors without external fan and fan cover with improved/high efficiency

Type of construction IM B3



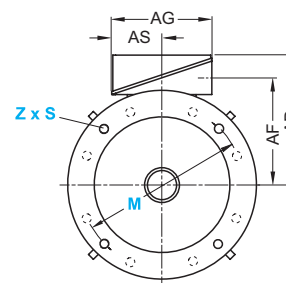
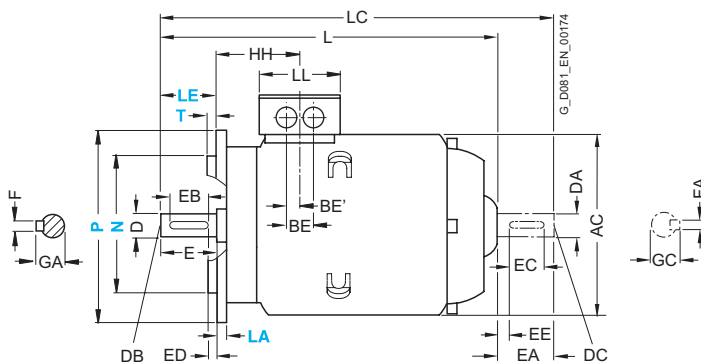
Eyebolts from frame size 100 L

Integral feet only for frame sizes 132 S/M and 160 L/M have 2 holes at NDE



Type of construction IM B5 and IM V1

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



Eyebolts from frame size 100 L

For motor		Dimension designation acc. to IEC																			
Frame size	Number of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	CA*	H
100 L	2, 4, 6, 8	160	42	196	197	166	166	125.5	125.5	135	63.5	140	37.5	—	176	33.5	50	25	63	—	100
112 M	2, 4, 6, 8	190	46	226	221	177	177	136.5	136.5	135	63.5	140	35.4	—	176	26	50	25	70	—	112
132 S	2, 4, 6, 8	216	53	256	261	202	202	159.5	159.5	155	70.5	140	38	76 ²⁾	218 ³⁾	26.5	48	24	89	—	132
132 M	2, 4, 6, 8	216	53	256	261	202	202	159.5	159.5	155	70.5	178	38	76	218	26.5	48	24	89	—	132
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	77.5	210	44	89 ⁴⁾	300 ⁵⁾	47	57	28.5	108	—	160
160 L	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	77.5	254	44	89	300	47	57	28.5	108	—	160

* This dimension is assigned in DIN EN 50347 to the frame size listed.

¹⁾ Additional information: not a standard dimension acc. to DIN 50347.

²⁾ With screwed-on feet, dimension BA' is 38 mm.

³⁾ With screwed-on feet, dimension BB is 180 mm.

⁴⁾ With screwed-on feet, dimension BA' is 44 mm.

⁵⁾ With screwed-on feet, dimension BB is 256 mm.

IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

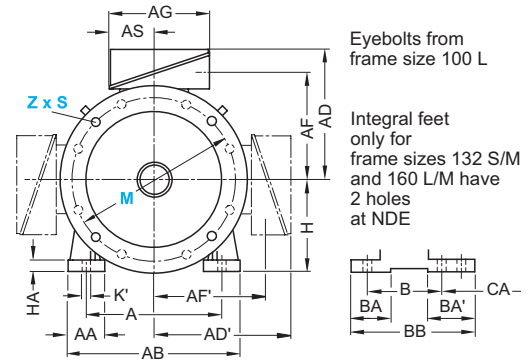
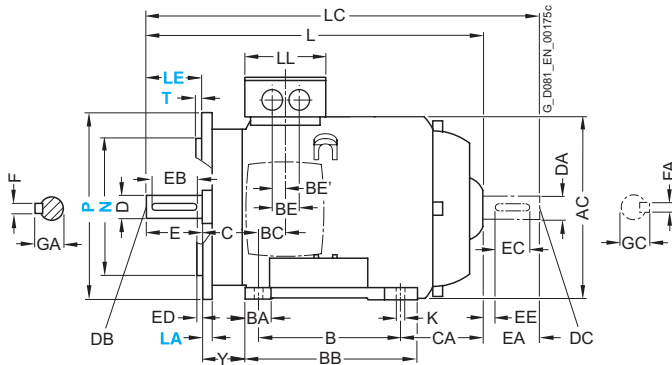
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Dimensional drawings (continued)

Aluminum series 1LE1, frame sizes 100 to 160 - forced-air cooled motors without external fan and fan cover with improved/high efficiency

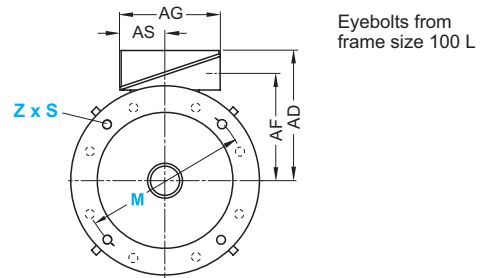
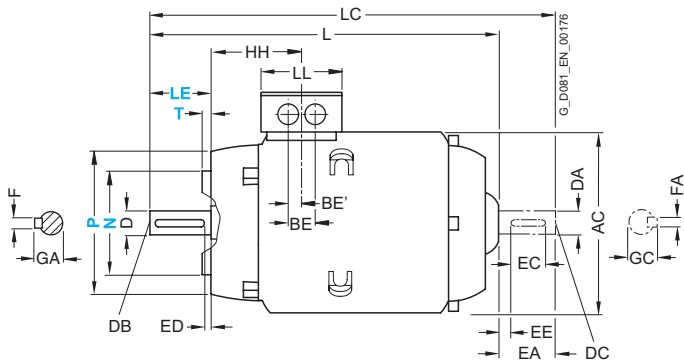
Type of construction IM B35

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



Type of construction IM B14

For flange dimensions, see Page 1/98 (Z = the number of retaining holes)



For motor		Dimension designation acc. to IEC						DE shaft extension							NDE shaft extension						
Frame size	Number of poles	HH	K	K'	L	LC	LL	D	DB	E	EB	ED	F	GA	DA	DC	EA	EC	EE	FA	GC
100 L	2, 4, 6, 8	96.5	12	16	321.5	–	112	28	M10	60	50	5	8	31	–	–	–	–	–	–	–
112 M	2, 4, 6, 8	96	12	16	311	–	112	28	M10	60	50	5	8	31	–	–	–	–	–	–	–
132 S	2, 4, 6, 8	115.5	12	16	380.5	–	130	38	M12	80	70	5	10	41	–	–	–	–	–	–	–
132 M	2, 4, 6, 8	115.5	12	16	380.5	–	130	38	M12	80	70	5	10	41	–	–	–	–	–	–	–
160 M	2, 4, 6, 8	155	15	19	510	–	145	42	M16	110	90	10	12	45	–	–	–	–	–	–	–
160 L	2, 4, 6, 8	155	15	19	510	–	145	42	M16	110	90	10	12	45	–	–	–	–	–	–	–

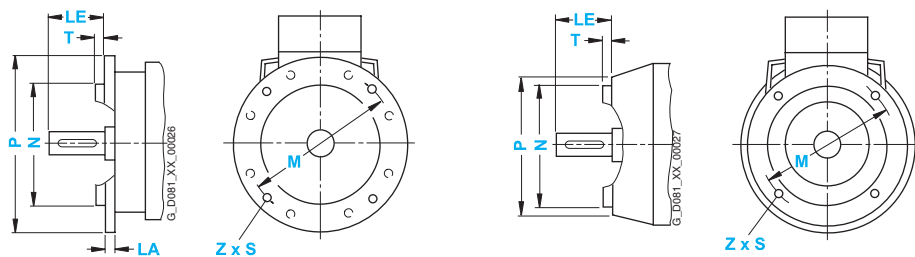
IEC Squirrel-Cage Motors

New Generation 1LE1

Dimensions

Dimensional drawings (continued)

Flange dimensions



In DIN EN 50347, flanges FF with through holes and flanges FT with tapped holes are assigned to frame sizes. The designation of flange A and C according to DIN 42948 (invalid since 09/2003) are also listed for information purposes. See the table below. (Z = the number of retaining holes)

Frame size	Type of construction	Flange type	Flange with Through holes (FF/A) Tapped holes (FT/C)		Dimension designation acc. to IEC								
			According to DIN EN 50347	Acc. to DIN 42948	LA	LE	M	N	P	S	T	Z	
100 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4	
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4	
112 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 215	A 250	11	60	215	180	250	14.5	4	4	
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 130	C 160	–	60	130	110	160	M8	3.5	4	
132 S, 132 M	IM B5, IM B35, IM V1, IM V3	Flange	FF 265	A 300	12	80	265	230	300	14.5	4	4	
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 165	C 200	–	80	165	130	200	M10	3.5	4	
160 M, 160 L	IM B5, IM B35, IM V1, IM V3	Flange	FF 300	A 350	13	110	300	250	350	18.5	5	4	
	IM B14, IM B34, IM V18, IM V19	Standard flange	FT 215	C 250	–	110	215	180	250	M12	4	4	

IEC Squirrel-Cage Motors

Appendix

Siemens contacts worldwide

At

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

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- technical support,
- spare parts/repairs,
- service,
- training,
- sales or
- consultation/engineering.

You start by selecting a

- country,
- product or
- sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

SIEMENS

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Contacts by country | Contacts by sector | Contacts by product | Reporting

Local Partners Worldwide

Germany

Are you looking for a local contact to help you with questions regarding Siemens Automation and Drives products, solutions and services?

O.K. First, please select the city nearest to your location:

→ (or to select a different country click here)

Berlin

Now select the appropriate team who you would like to deal with your enquiry:

Sales

Next >

52 Contact

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Local Partners Worldwide

Please select a sector

Select area/sector | Select city | Your contact(s)

Sectors Search a Sector

Which sector* is your question regarding?

☒ Video Systems, Visualization Systems
☐ Electrical Wholesaler
☐ Material Flow Controlling, Distribution and Logistics
☐ Assembly Control
☐ Paper Machines
☐ Production Automation in the Automotive Industry and Suppliers
☐ Production Logistics and Control Systems
☐ Production Machines, Textiles, Plastics, Metal Forming, Wood, Glass, Ceramic processing, Stone processing, Packaging, Printing, Cranes
☐ Process Control Systems
☐ Testing/Final Assembly

* This list contains industry sectors covered by Siemens Automation and Drives products and solutions.

Please select the team who you would like to deal with your enquiry:

Sales

Next >

52 Contact

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Find | Home | Personalization | About us | English

Contacts by country | Contacts by sector | **Contacts by product** | Reporting

Local Partners Worldwide

Please select a Siemens product group

Select area/product | Select city | Your contact(s)

Product Catalog Search a Product

Which product* does your question refer to?

☒ Drive Technology
☐ Automation systems
☐ Communication networks
☐ Low-Voltage Controls
☐ Electrical Installation Technology
☐ Process automation
☐ Sensor, measuring and testing technology
☐ Power supplies
☐ Safety systems - Safety Integrated
☐ System solutions and products for branches

* This list contains products and solutions provided by Siemens Automation and Drives.

Please select the team who you would like to deal with your enquiry:

Sales

Next >

52 Contact

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IEC Squirrel-Cage Motors

Appendix

A&D online services – Information and ordering on the Internet and on CD-ROM

A&D in the WWW



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

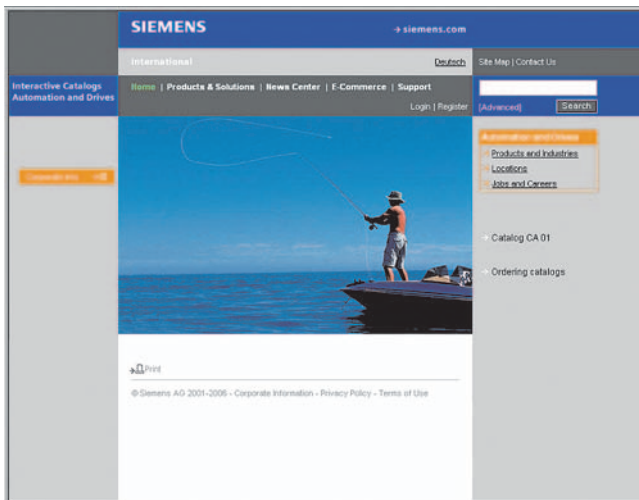
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

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

you will find everything you need to know about products, systems and services.

Product selection with the Offline Mall of Automation and Drives



Detailed information together with convenient interactive functions:

The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.

All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice, you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found on the Internet under

<http://www.siemens.com/automation/ca01>

or on CD-ROM or DVD.

Easy shopping with the A&D Mall



The A&D Mall is the virtual department store of Siemens AG on the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

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

Customer support – Our services for every phase of your project



In the face of harsh competition you need optimum conditions to keep ahead all the time:

a strong starting position, a sophisticated strategy and a team for the necessary support – in every phase.

Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and commissioning to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online support



The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

<http://www.siemens.com/automation/service&support>

Technical support



Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Phone: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
(0.14 €/min. from the German fixed network)

E-Mail: adsupport@siemens.com

In the United States, call toll-free:
Phone: +1 800 333 7421,
Fax: +1 423 262 2200
E-Mail: solutions.support@sea.siemens.com

In Canada, call:
Phone: +1 888 303 3353
E-Mail: cic@siemens.ca

In Asia:
Phone: +86 10 6475 7575,
Fax: +86 10 6474 7474
E-Mail: adsupport.asia@siemens.com

Technical consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consul-

ting on product and system questions right to the creation of the automation solution.¹⁾

Optimization and upgrading

To enhance productivity and save costs in your project, we

offer high-quality services in optimization and upgrading.¹⁾

Configuration and software engineering



Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.¹⁾

Service on site



With Service On Site, we offer services for startup and maintenance essential for ensuring system availability.

In Germany
Phone: 0180 50 50 444¹⁾
(0.14 €/min. from the German fixed network)

In the United States, call toll-free:
Phone: +1 800 333 7421

In Canada, call:
Phone: +1 888 303 3353

Repairs and spare parts



In the operating phase of a machine or automation system, we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
Phone: 0180 50 50 448¹⁾
(0.14 €/min. from the German fixed network)

In the United States, call toll-free:
Phone: +1 800 241 4453

In Canada, call:
Phone: +1 888 303 3353

¹⁾ You will find telephone numbers for other countries on our Internet site <http://www.siemens.com/automation/service&support>

IEC Squirrel-Cage Motors

Appendix

Customer support

Knowledge Base on CD-ROM



For those applications in which an online link to the Internet is not available, an extract from the information area that can be accessed free of charge is available on CD-ROM (Service & Support Knowledge Base). This CD-ROM contains all the product information (FAQs, downloads, tips and tricks, news) that was available at the time the CD was generated as well as general information about service and technical support.

On the CD-ROM, you will also find a full text search and our Knowledge Manager to search for specific solutions. The CD-ROM is updated every 4 months.

As is the case with our online information on the Internet, the Service & Support Knowledge Base CD is available complete with 5 languages (English, German, French, Italian and Spanish).

You can order the CD **Service and Support Knowledge Base** from your Siemens contact.

Order No.: **6ZB5310-0EP30-0BA2**

Ordering via the Internet
(with the Automation Value Card or credit card) at:

<http://www.siemens.com/automation/service&support>

in the shop.

Automation Value Card



Small card – lots of support

The Automation Value Card is an integral part of the comprehensive service concept with which Siemens Automation and Drives accompanies you in every phase of your automation project.

Whether you require certain services from our Technical Support or want to buy high-quality support tools in our online shop: You can always pay with the Automation Value Card. No costs for processing invoices, transparent and secure. With the card number that is only known to you and the associated PIN, you can check your current balance at any time as well as all the debits and credits.

Services on the card. This is how it works.

The card number and PIN are printed on the back of the Automation Value Card. When it is supplied, the PIN is covered by a scratch field so the full credit is guaranteed to be on the card.

By specifying the card number and PIN, you have complete access to the current range of Service and Support. The amount for the service obtained is deducted in the form of credits from the balance on your Automation Value Card.

All the offered services are priced in terms of credits independently of national currencies, so you can use the Automation Value Card worldwide.

Order Numbers for the Automation Value Card

Credits	Order No.
200	6ES7 997-0BA00-0XA0
500	6ES7 997-0BB00-0XA0
1000	6ES7 997-0BC00-0XA0
10000	6ES7 997-0BG00-0XA0

For detailed information about the offered services, visit our Internet site:

<http://www.siemens.com/automation/service&support>

Service & Support à la Card: Some examples

Technical Support

"Priority"	Priority handling for urgent cases
"24 h"	Availability round-the-clock
"Extended"	Technical advice for complex questions

Support tools in the Support Shop

"System Utilities"	Ready-to-use tools for design, analysis and checking
"Applications"	Complete topics including fully tested software
"Functions & Samples"	Modifiable function blocks to speed up your developments

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IEC Squirrel-Cage Motors

Appendix

Metal surcharges

Explanation of the metal factor

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded.

The surcharges will be determined based on the following criteria:

- Official price of the metal
Official price on the day prior to receipt of the order or prior to the release order (=daily price) for
- silver (sale price of the processed material),
- gold (sale price of the processed material)
Source: Umicore, Hanau
(<http://www.metalsmanagement.umicore.com>)
and for
- copper (low DEL notation + 1%),
- aluminum (aluminum in cables) and
- lead (lead in cables)
Source: German Trade Association for Cables and Conductors
(<http://www.kabelverband.de>)
- Metal factor of the products
Certain products are assigned a metal factor. The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used (weight or percentage method). An exact explanation is given below.

Structure of the metal factor

The metal factor consists of several digits; the first digit indicates whether the method of calculation refers to the list price or a discounted price (customer net price)
(L = list price / N = customer net price).

The remaining digits indicate the method of calculation used for the respective metal. If no surcharge is added, a "-" is used.

1st digit	List or customer net price using the percentage method
2nd digit	for silver (AG)
3rd digit	for copper (CU)
4th digit	for aluminum (AL)
5th digit	for lead (PB)
6th digit	for gold (AU)

Weight method

The weight method uses the basic official price, the daily price and the raw material weight. In order to calculate the surcharge, the basic official price must be subtracted from the daily price. The result is then multiplied by the raw material weight.

The basic official price can be found in the table below using the number (2 to 9) of the respective digit of the metal factor. The raw material weight can be found in the respective product descriptions.

Percentage method

Use of the percentage method is indicated by the letters A-Z at the respective digit of the metal factor.

The surcharge is increased – dependent on the deviation of the daily price compared with the basic official price – using the percentage method in "steps" and consequently offers surcharges that remain constant within the framework of this "step range". A higher percentage rate is charged for each new step. The respective percentage level can be found in the table below.

Metal factor examples

LEA---	<p>Basis for % surcharge: List price</p> <p>Silver: basis 150 €, step range 50 €, 0.5%</p> <p>Copper: basis 150 €, step range 50 €, 0.1 %</p> <p>No surcharge for aluminum</p> <p>No surcharge for lead</p> <p>No surcharge for gold</p>
N-A6--	<p>Basis for % surcharge: Customer net price</p> <p>No surcharge for silver</p> <p>Copper: basis 150 €, step range 50 €, 0.1 %</p> <p>Aluminum acc. to weight, basic offic. price 225 €</p> <p>No surcharge for lead</p> <p>No surcharge for gold</p>
--3--	<p>No basis necessary</p> <p>No surcharge for silver</p> <p>Copper acc. to weight, basic official price 150 €</p> <p>No surcharge for aluminum</p> <p>No surcharge for lead</p> <p>No surcharge for gold</p>

A&D/MZ_1/En 05.09.06

Values of the metal factor

Percentage method	Basic official price	Step range	% surcharge 1st step	% surcharge 2nd step	% surcharge 3rd step	% surcharge 4th step	% surcharge per additional step
			Official price 151 € – 200 €	Official price 201 € – 250 €	Official price 251 € – 300 €	Official price 301 € – 350 €	
A	150	50	0.1	0.2	0.3	0.4	0.1
B	150	50	0.2	0.4	0.6	0.8	0.2
C	150	50	0.3	0.6	0.9	1.2	0.3
D	150	50	0.4	0.8	1.2	1.6	0.4
E	150	50	0.5	1.0	1.5	2.0	0.5
F	150	50	0.6	1.2	1.8	2.4	0.6
G	150	50	0.7	1.4	2.1	2.8	0.7
H	150	50	1.2	2.4	3.6	4.8	1.2
I	150	50	1.6	3.2	4.8	6.4	1.6
J	150	50	1.8	3.6	5.4	7.2	1.8
K	150	50	2.0	3.5	5.0	6.5	1.5
L	150	50	2.2	4.4	6.6	8.8	2.2
M	150	50	2.5	5.0	7.5	10.0	2.5
			176 € – 225 €	226 € – 275 €	276 € – 325 €	326 € – 375 €	
O	175	50	0.1	0.2	0.3	0.4	0.1
P	175	50	0.2	0.4	0.6	0.8	0.2
Q	175	50	0.3	0.6	0.9	1.2	0.3
R	175	50	0.5	1.0	1.5	2.0	0.5
			226 € – 275 €	276 € – 325 €	326 € – 375 €	376 € – 425 €	
S	225	50	0.2	0.4	0.6	0.8	0.2
T	225	50	0.5	1.0	1.5	2.0	0.5
U	225	50	1.0	2.0	3.0	4.0	1.0
V	225	50	1.0	1.5	2.0	3.0	1.0
W	225	50	1.2	2.5	3.5	4.5	1.0
			126 € – 150 €	151 € – 175 €	176 € – 200 €	201 € – 225 €	
X	125	25	1.9	3.8	5.7	7.6	1.9
			151 € – 175 €	176 € – 200 €	201 € – 225 €	226 € – 250 €	
Y	150	25	0.3	0.6	0.9	1.2	0.3
			401 € – 425 €	426 € – 450 €	451 € – 475 €	476 € – 500 €	
Z	400	25	0.1	0.2	0.3	0.4	0.1

Price basis (1st digit)

- L Charged on the list price
 N Charged on the customer net price or discounted list price

Weight method	Basic official price
2	100
3	150
4	175
5	200
6	225
7	300
8	400
9	555

Calculation based on raw material weight

Misc.

- No metal surcharge

IEC Squirrel-Cage Motors

Appendix

Conditions of sale and delivery

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

For customers with a seat or registered office in Germany

The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

For customers with a seat or registered office outside of Germany

The "General Terms of Payment" as well as the "General Conditions for Supplies of Siemens, Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold, if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.

The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products. An exact explanation of the metal factor can be found on the page entitled "Metal surcharges".

The texts of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
(for customers based in Germany)
- 6ZB5310-0KS53-0BA1
(for customers based outside of Germany)

or download them from the Internet

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

(Germany: A&D Mall Online-Help System)

Export regulations

The products listed in this catalog may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog:

AL	Number of the <u>German Export List</u> Products marked other than "N" require an export license. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an " <u>AL</u> " <u>not equal to</u> "N" are subject to a European or German export authorization when being exported out of the EU.
ECCN	<u>Export Control Classification Number</u> . Products marked other than "N" are subject to a reexport license to specific countries. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an " <u>ECCN</u> " <u>not equal to</u> "N" are subject to a US re-export authorization.

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_mit MZ/En 05.09.06

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

Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

Automation and Drives		<i>Catalog</i>
Interactive catalog on CD-ROM and on DVD		
• The Offline Mall of Automation and Drives	CA 01	
Automation Systems for Machine Tools		
SINUMERIK & SIMODRIVE	NC 60	
SINUMERIK & SINAMICS	NC 61	
Drive Systems		
<u>Variable-Speed Drives</u>		
SINAMICS G110/SINAMICS G120	D 11.1	
Inverter Chassis Units		
SINAMICS G120D		
Distributed Frequency Inverters		
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11	
SINAMICS GM150/SINAMICS SM150	D 12	
Medium-Voltage Converters		
SINAMICS S120 Drive Converter Systems	D 21.1	
SINAMICS S150 Drive Converter Cabinet Units	D 21.3	
Asynchronous Motors Standardline	D 86.1	
Synchronous Motors with Permanent-Magnet Technology, HT-direct	D 86.2	
DC Motors	DA 12	
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1	
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2	
SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units	DA 22	
SIMOVERT PM Modular Converter Systems	DA 45	
SIEMOSYN Motors	DA 48	
MICROMASTER 410/420/430/440 Inverters	DA 51.2	
MICROMASTER 411/COMBIMASTER 411	DA 51.3	
SIMOVERT MASTERDRIVES Vector Control	DA 65.10	
SIMOVERT MASTERDRIVES Motion Control	DA 65.11	
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3	
SIMODRIVE 611 universal and POSMO	DA 65.4	
<u>Low-Voltage Three-Phase-Motors</u>		
IEC Squirrel-Cage Motors	D 81.1	
IEC Squirrel-Cage Motors: New Generation 1LE1	D 81.1 N	
<i>PDF: Geared Motors</i>	M 15	
<u>Automation Systems for Machine Tools SIMODRIVE</u>		
• Main Spindle/Feed Motors	NC 60	
• Converter Systems SIMODRIVE 611/POSMO		
<u>Automation Systems for Machine Tools SINAMICS</u>		
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• Drive System SINAMICS S120		
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