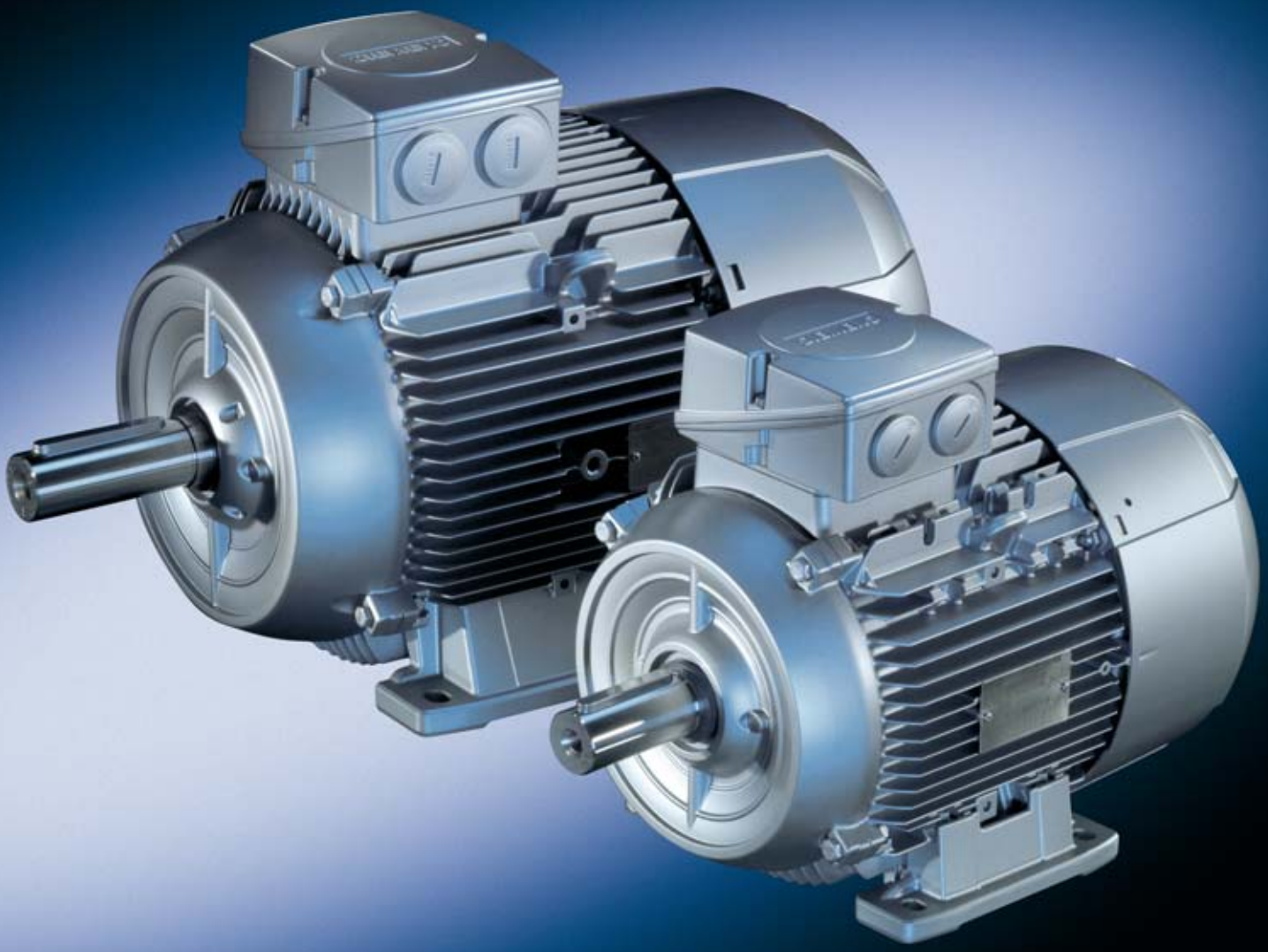
Catalog News D 81.1 N • April 2007



Low-Voltage MOTORS 1LE1

IEC Squirrel-Cage Motors
New Generation 1LE1
Frame size 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-A1-7600

SINAMICS G130 D 11
Drive Converter Chassis Units
SINAMICS G150
Drive Converter Cabinet Units
Order No.:
E86060-K5511-A101-A3-7600

SINAMICS G110/SINAMICS G120 D 11.1
Inverter Chassis Units
SINAMICS G120D
Distributed Frequency Inverters
Order No.:
E86060-K5511-A111-A4-7600

MICROMASTER DA 51.2
MICROMASTER 410/420/430/440
Inverters
0.12 kW to 250 kW
Order No.:
E86060-K5151-A121-A5-7600

MICROMASTER/COMBIMASTER DA 51.3
MICROMASTER 411 Inverters
COMBIMASTER 411 Distributed
Drive Solutions
Order No.:
E86060-K5251-A131-A2-7600

Industrial Communication for Automation and Drives IK PI
Part 6: ET 200 Distributed I/O
ET 200S FC Frequency Converter
Order No.:
E86060-K6710-A101-B4-7600

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 and Drives
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 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

Catalog News
D 81.1 N · April 2007

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

SIEMENS

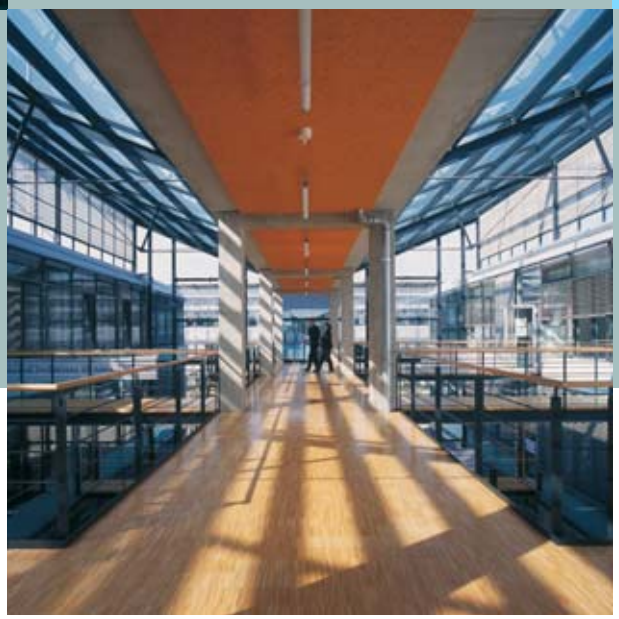
Siemens Automation and Drives. Welcome

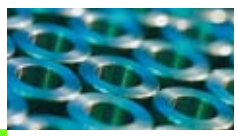
More than 60,000 people aiming for the same goal: increasing your competitiveness. That's Siemens Automation and Drives.

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.

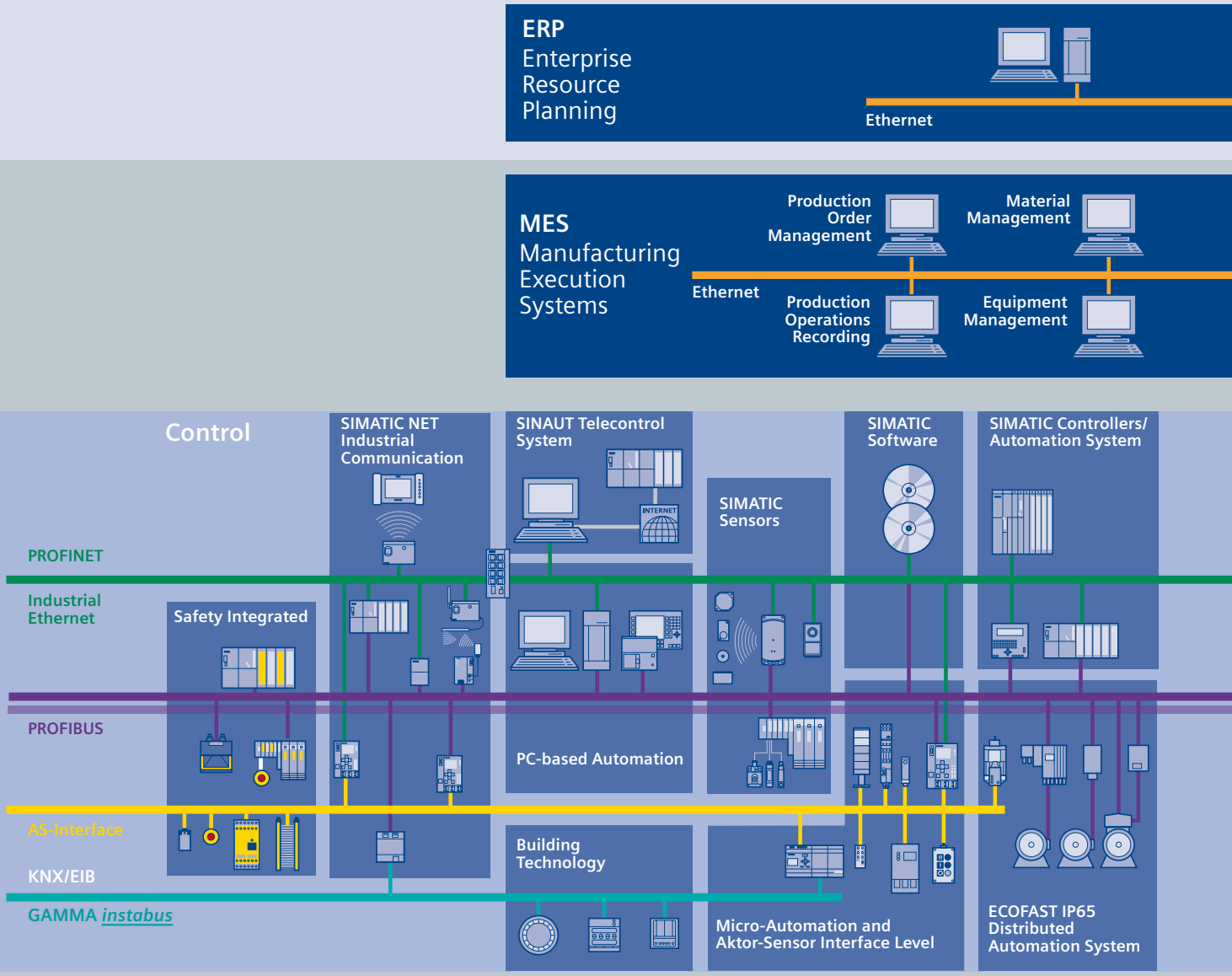




Sharpen your competitive edge. Totally Integrated Automation

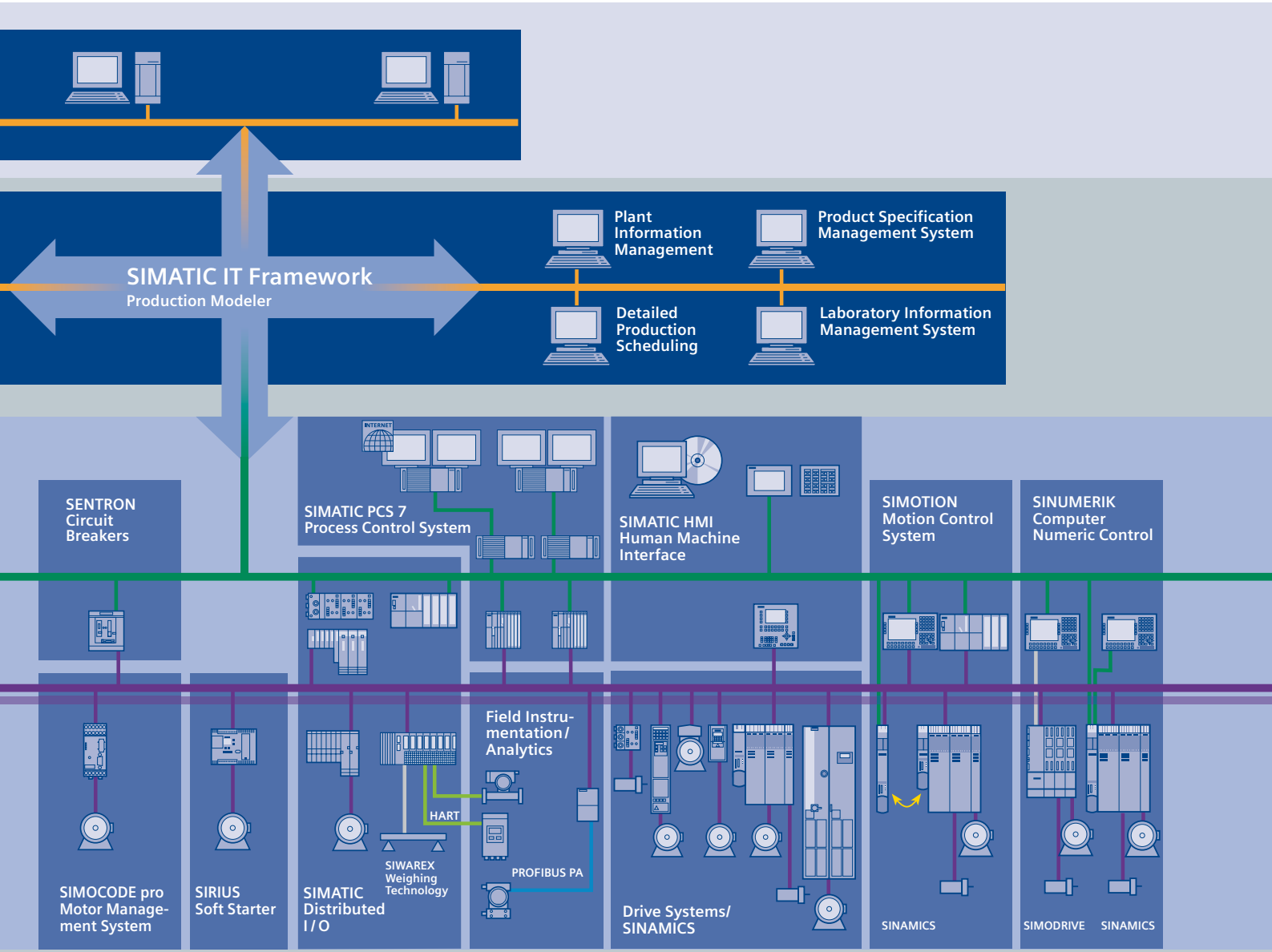
With Totally Integrated Automation (TIA), Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all sectors – from incoming goods to outgoing goods, from the field level through the production control level to connection with the corporate management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



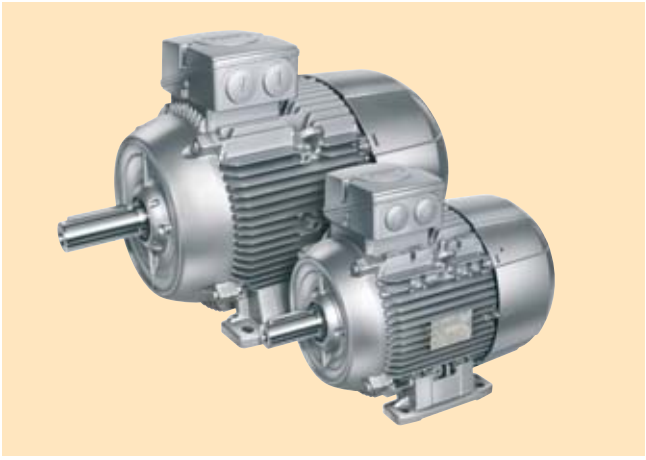
It goes without saying that you profit from Totally Integrated Automation during the entire life cycle of your plants – from the first planning steps, through operation, right up to modernization. Consistent integration in the further development of our products and systems guarantees a high degree of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



Notes

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. 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 builders 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.

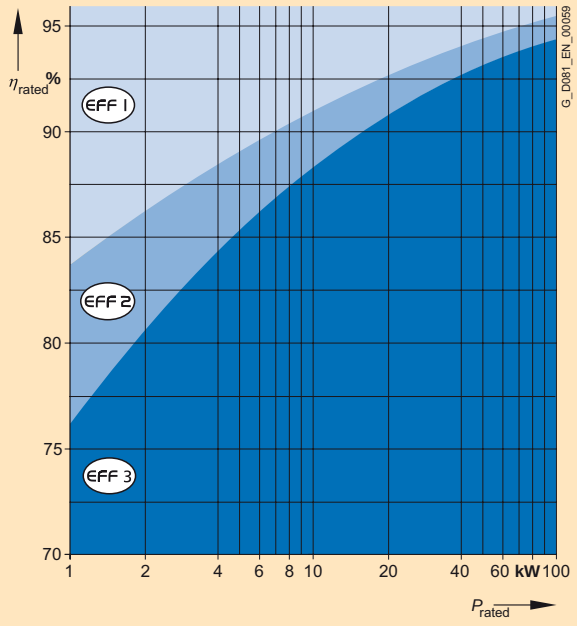
Classified energy-saving motors for an efficient energy balance

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_N, $\eta_{3/4}$ 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. 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

Orientation

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_N 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 largest shaft height. These compact motors are also optimized for efficiency and therefore reduce the operating costs.

Motors without fan cover and without external fan

Forced-air cooled motors with surface cooling without fan cover and without 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-aluminium 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. 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, screw-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 500 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 industry as well as for most climatic requirements such as those of offshore applications. Their large range of line voltages enables them to be used all over the world.

The wide field of implementation includes the following applications:

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

Technical specifications

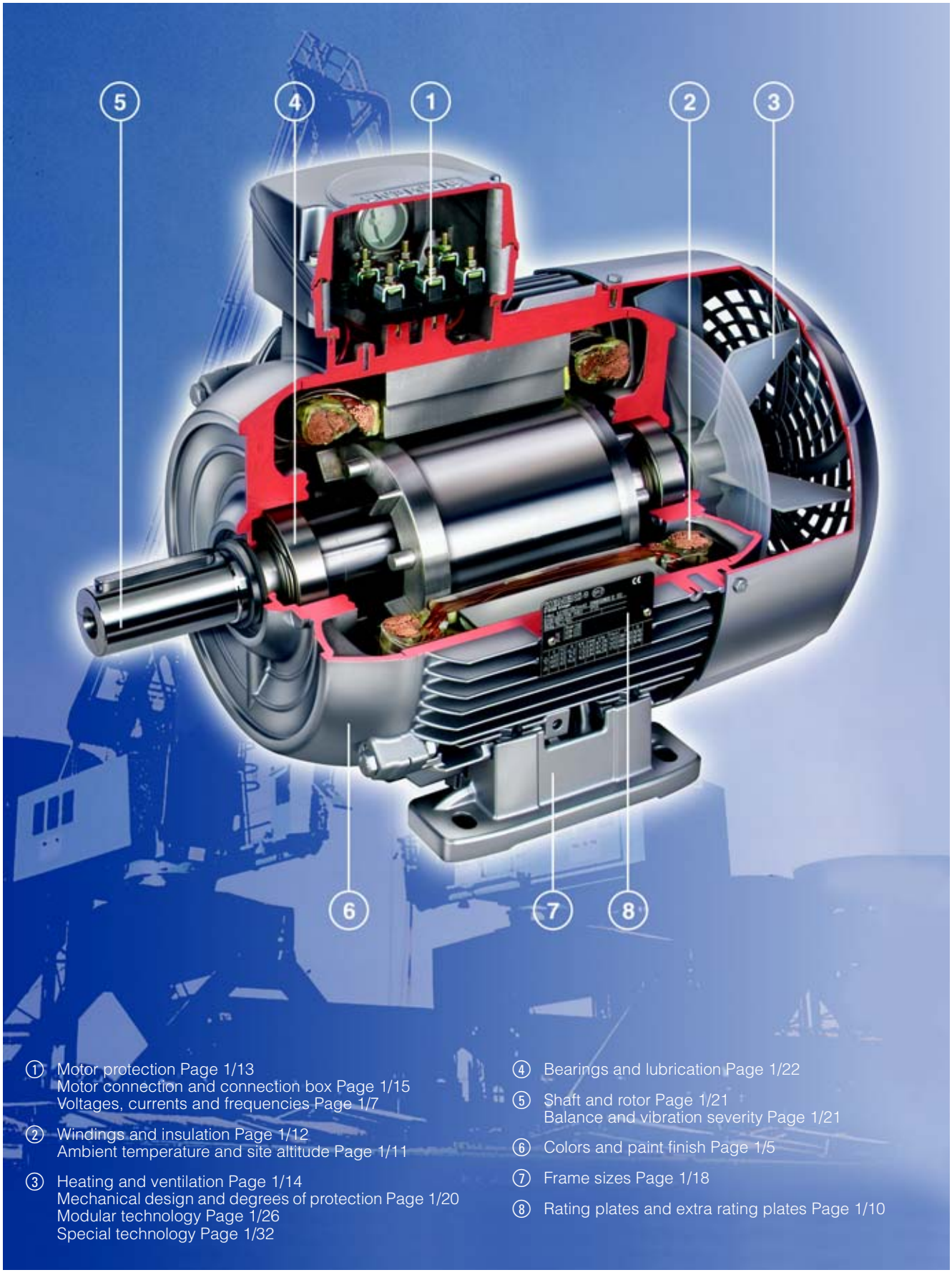
The following table lists the most important technical data.

Technical data at a glance

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: • Improved efficiency (EFF2) • High efficiency (EFF1) Self-ventilated motors with increased output and: • Improved efficiency • High efficiency Forced-air-cooled motors without external fan and fan cover with: • Improved efficiency (EFF2) • High efficiency (EFF1)
Marking	EU/CEMEP efficiency classification, EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPACT: 2-, 4-, 6-pole (motor version available soon)
Rated speed (synchronous speed)	750 ... 3000 rpm
Rated torque	11 ... 150 Nm
Insulation of the stator winding according to EN 60034-1 (IEC 60034-1)	Temperature class F, used acc. to temperature class 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)
Maximum ambient 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 severity level according to EN 60034-14 (IEC 60034-14)	Level A (normal); optional Level B; these vibration levels are valid from December 1, 2006
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	• 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”

Orientation

Schematic diagram of a low-voltage motor



① Motor protection Page 1/13
Motor connection and connection box Page 1/15
Voltages, currents and frequencies Page 1/7

② Windings and insulation Page 1/12
Ambient temperature and site altitude Page 1/11

③ Heating and ventilation Page 1/14
Mechanical design and degrees of protection Page 1/20
Modular technology Page 1/26
Special technology Page 1/32

④ Bearings and lubrication Page 1/22

⑤ Shaft and rotor Page 1/21
Balance and vibration severity Page 1/21

⑥ Colors and paint finish Page 1/5

⑦ Frame sizes Page 1/18

⑧ Rating plates and extra rating plates Page 1/10

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.

Titel	IEC	DIN/EN
General specifications for rotating electrical machines	IEC 60034-1, IEC 60085	DIN EN 60034-1
Specification of the losses and efficiency of rotating electrical machines	IEC 60034-2	DIN EN 60034-2
Asynchronous AC motors for general use with standardized dimensions and outputs	IEC 60072 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 terminal box position	IEC 60034-7	DIN EN 60034-7
Entry to terminal box	–	DIN 42925
Built-in thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values for rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods for rotating electrical machines	IEC 60034-6	DIN EN 60034-6
Vibration severity of rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection of rotating electrical machines	IEC 60034-5	DIN EN 60034-5

National standards

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

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

Titel	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 ±5% / frequency tolerance of ±2% (Design A). If utilized, the permitted limit temperature of the temperature class may be exceeded by 10 K.

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

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

With η being a decimal number.

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

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

Slip ±20% (for motors <1 kW ±30% is permissible)
Locked-rotor current +20%
Locked-rotor torque –15% to +25%
Breakdown torque –10%
Moment of inertia ±10%

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 concentration 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 defined order codes (e.g. **S24**) or order code Y51/Y54 and the RAL number in plain text.

For very corrosive environments, motors can be painted with offshore paint CERAM-KOTE 54 (only on request).

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

If required, the motors can also be supplied coated in primer, order code **S01**, or unpainted (cast-iron parts in primer) using order code **S00**.

Orientation

Special finish in standard RAL colors with defined order codes

For 1LE1, the special finish RAL 7030 stone gray is the standard version.

RAL No.	Color name	Order code
1002	Sand yellow	**S24**
1013	Pearl white	**S25**
3000	Flame red	**S26**
6011	Mignonette green	**S20**
6021	Pale green	**S27**
7001	Silver gray	**S28**
7031	Blue gray	**S21**
7032	Pebble gray	**S22**
7035	Light gray	**S29**
9001	Cream	**S30**
9002	Gray white	**S31**
9005	Jet black	**S23**

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

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

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	Saphire 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 aluminium
2011	Deep orange	5013	Cobalt blue	7009	Green gray	9007	Gray aluminium
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		

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 and packing dimensions

Packing weights							
For motors		For land transport					
Frame size	Type	Type of construction IM B3			Types of construction IM B5, IM V1		
		In box Tare	On battens Tare	In crate Tare	In box Tare	On battens Tare	In crate Tare
		kg	kg	kg	kg	kg	kg
100 L	**1LE1 ... -1A.4**	a. s.	–	–	a. s.	–	–
	1LE1 ... -1A.5	a. s.	–	–	a. s.	–	–
	1LE1 ... -1A.6	a. s.	–	–	a. s.	–	–
112 M	**1LE1 ... -1B.2**	a. s.	–	–	a. s.	–	–
	1LE1 ... -1B.6	a. s.	–	–	a. s.	–	–
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	–	–

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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 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 German/English 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.

Voltages, currents and frequencies

Standard voltages

EN 60034-1 differentiates between Category A (combination of voltage deviation ±5% and frequency deviation ±2%) and Category B (combination of voltage deviation ±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.

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 and where applicable 690 V. The DIN IEC 60038 standard specifies a tolerance of ±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 VΔ/400 VY, 50 Hz	220 ... 240 VΔ/380 ... 420 VY, 50 Hz	22
400 VΔ/690 VY, 50 Hz	380 ... 420 VΔ/660 ... 725 VY, 50 Hz	34
500 VY, 50 Hz	–	27
500 VΔ, 50 Hz	–	40

Orientation

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 enquire.

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”.

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	
		I	*I*	*I*	*I*	*I*	*I*	*I*	*I*
		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 - Aluminium series 1LE1									
1LE1002-1A.4	100 L	a. s.	a. s.	a. s.	a. s.		a. s.	a. s.	a. s.
1LE1002-1A.5	100 L	a. s.	a. s.	a. s.	a. s.		a. s.	a. s.	a. s.
1LE1002-1B.2	112 M	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C.0	132 S	10.9	10.4	11.5	11.5	7.3	7.8	a. s.	a. s.
1LE1002-1C.1	132 S	14.5	13.1	–	–	–	–	–	–
1LE1002-1C.2	132 M	–	–	15.2	15.3	9.3	9.5	a. s.	a. s.
1LE1002-1C.3	132 M	–	–	–	–	13.7	12.1	–	–
1LE1002-1D.2	160 M	21.5	19.9	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	18.3	18.8
Self-ventilated energy-saving motors with high efficiency - Aluminum series 1LE1									
Forced-air cooled motors without external fan and fan cover with high efficiency - Aluminium series 1LE1									
1LE1001-1A.4	100 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1A.5	100 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B.2	100 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C.0	132 S	10.1	10.5	11.4	11.4	a. s.	a. s.	a. s.	a. s.
1LE1001-1C.1	132 S	14.2	13.7	–	–	–	–	–	–
1LE1001-1C.2	132 M	–	–	14.8	14.4	8.6	8.9	a. s.	a. s.
1LE1001-1C.3	132 M	–	–	–	–	12.0	11.9	–	–
1LE1001-1D.2	160 M	20.0	21.0	21.5	20.5	16.0	15.5	9.7	10.0
1LE1001-1D.3	160 M	28.0	27.0	–	–	–	–	13.9	13.2
1LE1001-1D.4	160 L	34.0	33.0	28.5	27.5	23.5	22.5	18.0	17.1
Self-ventilated motors with increased output with improved efficiency - Aluminium series 1LE1									
1LE1002-1A.6	100 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B.6	112 M	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C.6	132 M	20.3	18.1	a. s.	a. s.	a. s.	a. s.	–	–
1LE1002-1D.6	160 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–	–
Self-ventilated motors with increased output and high efficiency - Aluminum series 1LE1									
1LE1001-1A.6	100 L	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B.6	112 M	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C.6	132 M	a. s.	a. s.	21.5	21.0	16.5	16.5	–	–
1LE1001-1D.6	160 L	38.5	37.5	35.5	34.5	30.5	29.0	–	–

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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 φ 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 allowed limits, the locked-rotor torque, the pull-up torque and the breakdown torque vary with the approximate square of the value, but the locked-rotor current varies approximately linearly.

In the case of squirrel-cage motors, the locked-rotor torque and breakdown torque are listed in the selection tables as multiples of the rated torque.
The normal practice is to start squirrel-cage motors directly on line. The torque class indicates that with direct-on-line starting, even if there is –5% undervoltage, it is possible to start up the motor against a load torque of

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

of the rated torque.

Orientation

Rating plate and extra rating plates

DIN EN 60034-1 lays down that the appropriate 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 can be indicated on the rating plate and on the packaging label, order code **Y84**.

An extra rating plate for identification codes is also possible, order code **Y82**.
An extra rating plate or a rating plate with different rating plate data can also be ordered, order code **Y80**.

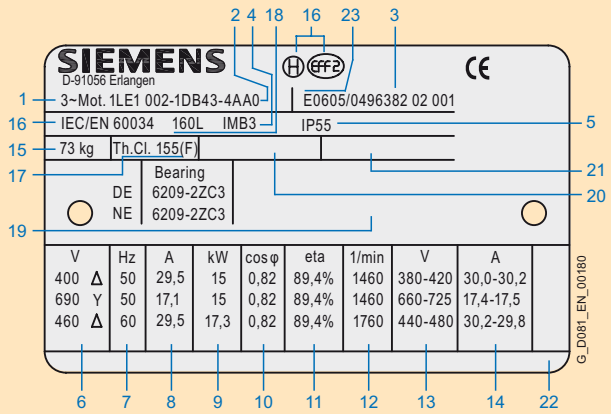
In the standard version, the rating plate is available in international format or in the German/English language. The language for the rating plate can be ordered by specifying in plain text. An overview of the languages that can be ordered, at additional cost in some cases, is provided in the table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

Overview of the languages on the rating plate

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

□ Standard version
○ With no extra charge

Example of a rating plate



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 temberature 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

Ambient temperature and site altitude

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

For higher ambient 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 a maximum output of the motor of:

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

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

Abbreviation	Description	Unit
$P_{max.}$	Maximum 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 F and used in temperature class B. Under non-standard operating conditions, if they are to be used in class B, the maximum output must be determined from the tables below.

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

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

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

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

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

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

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

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

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

Ambient temperature:
All motors can be used in the standard version at ambient temperatures between –20 to +40 °C.
Motors can be used in temperature class F

- at 40 °C with service factor 1.1, i.e. the motor can be continuously overloaded with 10% of the rated output 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 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 motors intended for operation at temperatures below freezing, please enquire.

Orientation

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 m^3 of air. Moisture condensation should be prevented from forming on the winding. Please enquire if higher values are required.

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

Temperature class F, used in accordance with F, with service
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 F, used in accordance with F, for increased output
When used according to temperature class 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 F, used in accordance with 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 F. Order codes N01, N02 and N03 are not possible. This applies to motors up to 500 V.

Temperature class F, used in accordance with F, other requirements
The motors can be ordered according to temperature class F for use according to temperature class F with other customized requirements if they are specified in plain text in the order.
Order code **Y52**

Temperature class F, used in accordance with B, coolant temperature 45 °C, approx. 4% derating
For the 1LE1 motor series, a version for temperature class F can be used according to temperature class B at a maximum coolant temperature of 45 °C with a 4% reduction in rated output.
Order code **N05**

Temperature class F, used in accordance with B, coolant temperature 50 °C, approx. 8% derating
For the 1LE1 motor series, a version for temperature class F can be used according to temperature class B at a maximum coolant temperature of 50 °C with a 8% reduction in rated output.
Order code **N06**

Temperature class F, used in accordance with B, coolant temperature 55 °C, approx. 13% derating
For the 1LE1 motor series, a version for temperature class F can be used according to temperature class B at a maximum coolant temperature of 55 °C with a 13% reduction in rated output.
Order code **N07**

Temperature class F, used in accordance with B, coolant temperature 60 °C, approx. 18% derating
For the 1LE1 motor series, a version for temperature class F can be used according to temperature class B at a maximum coolant temperature of 60 °C with a 18% reduction in rated output.
Order code **N08**

Motor protection

The order variants for motor protection are coded with letters in the 15th position of the order number and, if necessary, using order codes.

In the standard version, the motor is designed without motor protection.
15th position in Order No. letter **A**

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

Current-dependent protection devices

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

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

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

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

Protection devices that are motor temperature sensitive

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

When a limit temperature is reached, these **bimetal switches** (NC contacts) can deactivate an auxiliary circuit. The circuit can only be reclosed following a considerable fall in temperature. When the motor current rises quickly (e.g. with a locked rotor), these switches are not suitable due to their large thermal time constants.
3 temperature detectors for tripping
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 restarting 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 thermistor with 3 embedded temperature sensors for tripping. In the connection box, 2 auxiliary terminals are required.
15th position in 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.

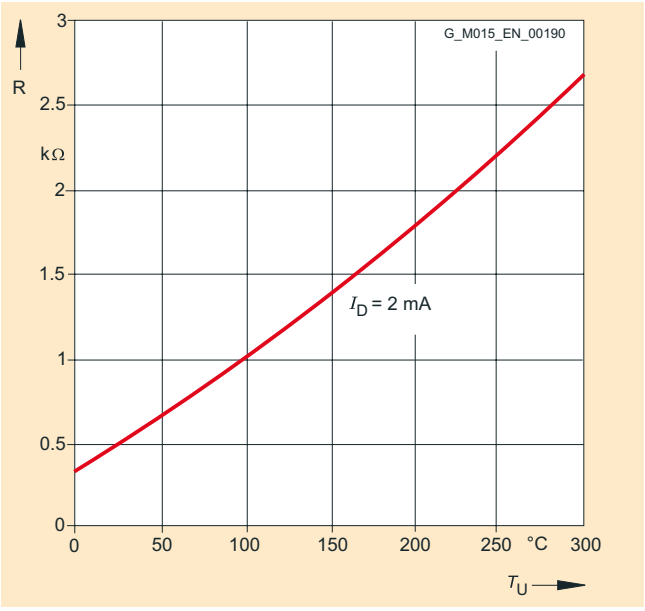
Motor protection with PTC thermistors with 6 embedded temperature sensors for alarm and tripping. In the connection box, 4 auxiliary terminals are required.
15th position in Order No. letter **C**

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 enquire.

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 in 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**

Orientation

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.

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

Motor series	Frame size	Heater output in Watt (W) Line voltage at	
		230 V	115 V
		Order code **Q02**	Order code **Q03**
1LE1	100	a. s.	a. s.
1LE1	112	a. s.	a. s.
1LE1	132 … 160	100	100

a. s. Available soon

Fans/Separately driven fans

Motors of frame sizes 100 to 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 to 160, see Page 1/27.

Line voltage of separately driven fan for 1LE1 motors:
The line voltage tolerance of the separately driven fan is ±5%; voltage range, Page 1/27.

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

For design of the fan/separately driven fan and the fan cover, see the 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 (KT) 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 an external fan and without a 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 maximum motor heating levels. For a higher cooling air flow, the operating temperature of the motor can be reduced.

Frame size	Required cooling air flow for number of poles									
	2		4				6		8	
	EFF1/EFF2		EFF1		EFF2		EFF1/EFF2		EFF1/EFF2	
	50 Hz m^3/min	60 Hz m^3/min	50 Hz m^3/min	60 Hz m^3/min	50 Hz m^3/min	60 Hz m^3/min	50 Hz m^3/min	60 Hz m^3/min	50 Hz m^3/min	60 Hz m^3/min
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132	6.3	7.3	4.6	5.7	4.6	5.7	3.1	3.7	2.4	2.8
160	10. 4	12.6	6.3	7.5	7	8.5	4.5	5.5	3.3	4.0

a. s. Available soon

1) The external fan cover is supplied in metal.

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 number.

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**.

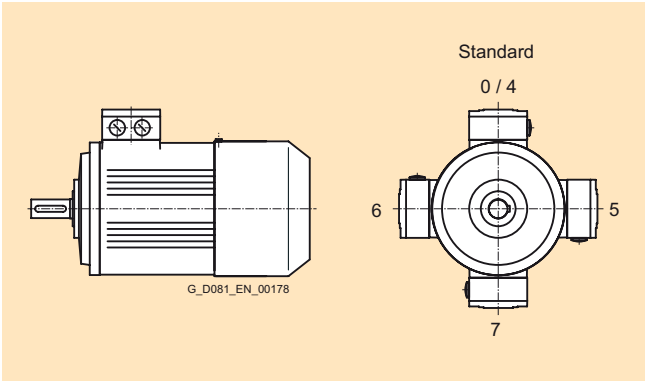
The standard position of the connection box for all other motors is on top
16th position of Order No. digit **4**.

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 (apart from motors with increased output), screw-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

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 (for 1LE1 motors special version).
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.

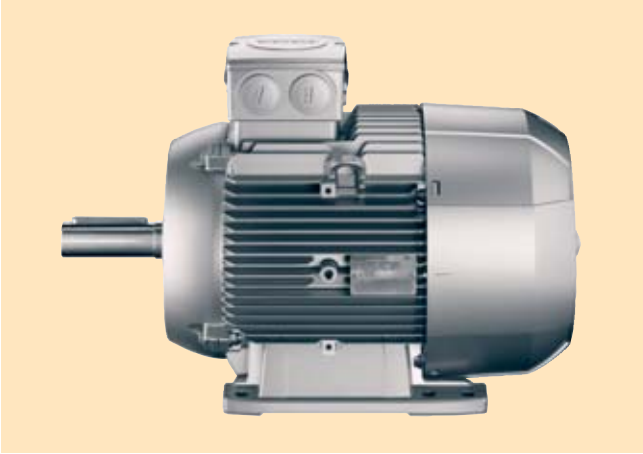
Motor connection

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 maximum current in accordance with DIN VDE 0298

For motors with auxilliary terminals (e.g. 15th position of Order No. is letter **B**, an M16 x 1.5 cable gland with plug is additonally provided. For further details, see the data sheet function in the SD generator (available soon).

The connection box is located on the housing and bolted in place. The terminal 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

Orientation

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):
If no other code is specified:

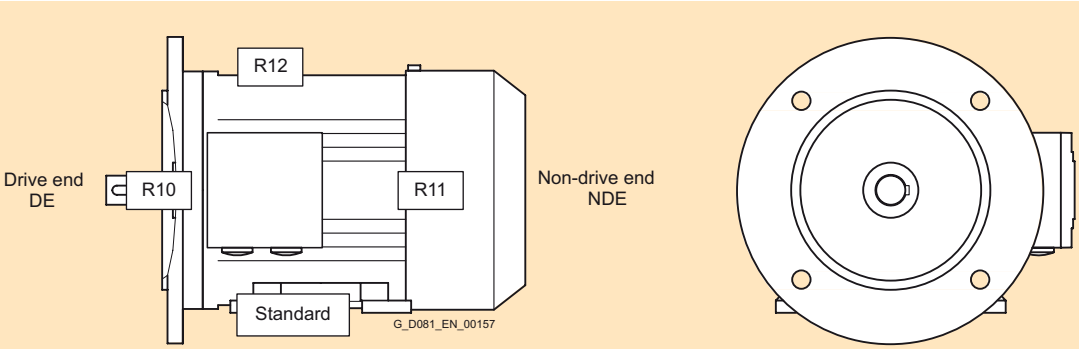
- Cable entry from below the motor

With additional order code **R12**:

- Cable entry from 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.
Cable entry, standard configuration
Order code **R15**



Connection, circuit and connection boxes

Type 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	a. s.	a. s.	a. s.
1LE1	112	a. s.	a. s.	a. s.
1LE1	132 … 160	2 entries complete with sealing plugs and locknuts Connection box is mounted and bolted in place.	Aluminum alloy	Without cable lug

a. s. Available soon

Possible positions of the connection boxes for 1LE1 motors

Motors	Frame size	Connection box position			Rotation of connection box		
		Above	Side, right or left	Retroffiting possible	90°	180°	Retroffiting possible
1LE1	100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1	112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1	132 … 160	O	O	–[1]	O	O	Yes

O Available version
a. s. Available soon

Connection boxes for 1LE1 motors in standard version

Frame size	Connection box	Number of terminals	Contact screw thread	Max. connectable cross-section	Outer cable diameter (sealing range)	Cable entry [2]	Two-part plate Max. outer cable diameter
				mm^2	mm		mm
1LE1							
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–
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
a. s. Available soon

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 132 to 160, the external (line) connections can be made without the need for cable lugs.

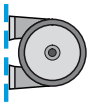
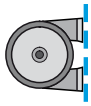
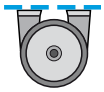
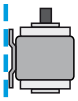
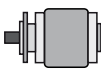
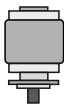
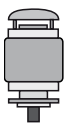
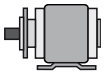
1) Retrofittable screwed-on feet (16th position of Order No. digit **5, 6, 7** and **4** with order code **H01**).

2) Designed for cable glands with O-ring.

Orientation

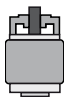
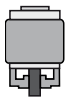
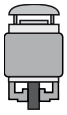
Frame sizes

Standard frame sizes and special frame sizes

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

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

[1] A second shaft extension **L05** is not possible.

Frame size acc. to EN 60034-7		Frame size	Letter 14th position of the Order No.	Order No. supplement **-Z** with order code
With standard flange				
IM B14/IM 3601		100 L to 160 L	**K**	–
IM V19/IM 3631		100 L to 160 L	**L**	–
IM V18/IM 3611 without protective cover		100 L to 160 L	**M**	–
IM V 18/IM 3611 with protective cover		100 L to 160 L	**M**[1)]	**+ H00**[1)]
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 (EN 1492-1) and/or clamping bands (EN 12195-2) must be used.

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

Orientation

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 screw-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	Aluminium 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**
The motor is at frame size 132 approx. 11 mm longer and at frame size 160 approx. 6 mm longer, see also “Dimensions and weights”, Pages 1/35 to 1/38.

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**
The motor is at frame size 132 approx. 51 mm longer and at frame size 160 approx. 46 mm longer, see also “Dimensions and weights”, Pages 1/35 to 1/38.

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 KT 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 “Frame sizes”, 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 fo 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 reccommend 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 reduced measuring-surface sound pressure level L_{pfA} in dB (A).
This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level is also specified as L_{WA} in dB (A).
The specified values are valid at 50 Hz (see the selection and ordering data). The tolerance is +3 dB. At 60 Hz, the values are approximately 4 dB (A) higher. Please enquire about the noise levels for motors with increased output or converter-fed motors.

Balance and vibration severity

All of the rotors are dynamically balanced with half key. This corresponds to vibration severity level A. The vibrational characteristics and behavior of electrical machinery is specified in DIN EN 60034-14 Sept. 2004. “Half key balancing” is specified here based on DIN ISO 8821.

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

F = Balancing with full key
H = Balancing with half key (standard)
N = Balancing without key

This is indicated on the rating plate of the motors.
Full-key balancing (F) is possible on request with order code **L02** (extra charge).

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

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

Vibration severity level A is the standard version.

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

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

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

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

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

Vibration severity level	Machine installation	Shaft height H in mm								
		56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
		s_{rms} µm	v_{rms} mm/s	a_{rms} mm/s²	s_{rms} µm	v_{rms} mm/s	a_{rms} mm/s²	s_{rms} µm	v_{rms} mm/s	a_{rms} mm/s²
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 transmitt the full rated output via an output coupling.

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

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

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

Dimensions and tolerances for keyways and keys are 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 enquire 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 parallel roller bearings (e.g. bearings for increased cantilever forces, order code **L22**), brake or encoder mounting.

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

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

Orientation

Bearings and lubrication

Bearing lifetime (nominal lifetime)

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

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

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

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 bearing diagrams, Page 1/24).

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

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 bearing diagrams, Page 1/24).
Order code **L21**

On request, the located bearing can also be supplied at the drive end (DE) (see Figure 3 of the bearing diagrams, Page 1/24).
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) – maximum axial load, Page 1/25, is currently being determined.

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 re-greasing at defined re-greasing 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 enquire where applicable).

For converter-fed operation in particular, compliance with the mechanical limit speeds n_{max} at maximum supply frequency f_{max} is essential, see the 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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112 M	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132 S/M	5600	90	4200	140	3600	180	3000	200
160 M/L	4800	80	4200	140	3600	180	3000	200

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

Permanent lubrication[1]			
Type series	Frame size	Number of poles	Grease lifetime up to KT 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 KT 40 °C[2]
1LE1	100 … 160	2 to 8	8000 h

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

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

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

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 "Bearing diagrams", Page 1/24.

For motors frame size	Number of poles	Drive end (DE) bearing		Non-drive end NDE bearing		Figures, Page 1/24
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	a. s.	a. s.	a. s.	a. s.	**a. s.**
112 M	2 to 8	a. s.	a. s.	a. s.	a. s.	**a. s.**
132 S/M	2 to 8	6208 2ZC3[1)]	6208 2ZC3[1)]	6208 2ZC3[1)]	6208 2ZC3[1)]	**Fig. 2**
160 M/L	2 to 8	6209 2ZC3[1)]	6209 2ZC3[1)]	6209 2ZC3[1)]	6209 2ZC3[1)]	**Fig. 2**

a. s. Available soon

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

Please enquire 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		Figures, Page 1/24
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	a. s.	a. s.	a. s.	a. s.	
112 M	2 to 8	a. s.	a. s.	a. s.	a. s.	
132 S/M	2 to 8	6308 ZC3	6308 ZC3	6208 2ZC3[1)]	6208 2ZC3[1)]	**No figure**
160 M/L	2 to 8	6309 ZC3	6309 ZC3	6209 2ZC3[1)]	6209 2ZC3[1)]	**No figure**

a. s. Available soon

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

Please enquire 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		Figures, Page 1/24
		Horizontal type of construction	Vertical type of construction	Horizontal type of construction	Vertical type of construction	
1LE1						
100 L	2 to 8	a. s.	a. s.	a. s.	a. s.	**a. s.**
112 M	2 to 8	a. s.	a. s.	a. s.	a. s.	**a. s.**
132 S/M	2 to 8	6308 ZC3	6308 ZC3	6308 2ZC3[1)]	6308 2ZC3[1)]	**Fig. 2**
160 M/L	2 to 8	6309 ZC3	6309 ZC3	6309 2ZC3[1)]	6309 2ZC3[1)]	**Fig. 2**

a. s. Available soon

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

Orientation

Diagrams of bearings

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

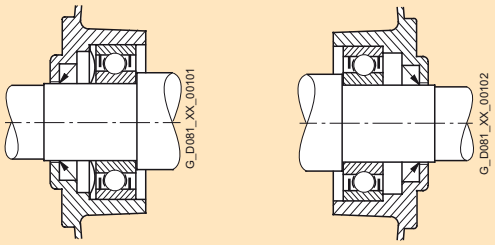


Fig. 2: Drive-end bearing Non-drive end bearing
Located bearings for 1LE1 frame size 160

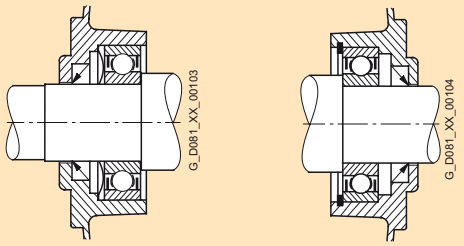
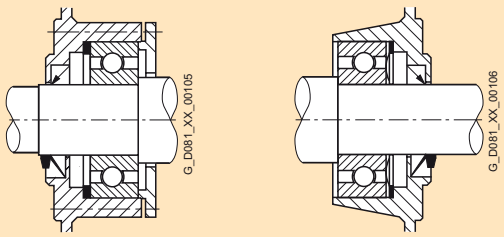
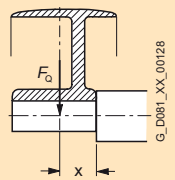


Fig. 3: Drive-end bearing Non-drive end bearing



Maximum cantilever forces

Maximum cantilever forces, basic version



In order to calculate the maximum cantilever forces for a radial load, the line of force (i.e. the 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 maximum cantilever forces at 60 Hz are approx. 80% of the 50 Hz values (please enquire).

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.

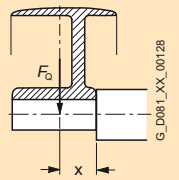
Refer to “Bearing design for increased cantilever forces”, Page 1/25.

Maximum cantilever forces for the basic 50 Hz version
Valid are: x_0 values for x = 0 and $x_{max.}$ values for x = l (l = shaft extension)

For motors			Maximum cantilever force	
			at x_0	at $x_{max.}$
Frame size	Order No.	Number of poles	Type	Type
			N	N
1LE1 motors, standard values (excluding motors with increased output)				
100	**1LE100.-1AA**	2	a. s.	a. s.
	1LE100.-1AB	4	a. s.	a. s.
	1LE100.-1AC	6	a. s.	a. s.
	1LE100.-1AD	8	a. s.	a. s.
112	**1LE100.-1BA**	2	a. s.	a. s.
	1LE100.-1BB	4	a. s.	a. s.
	1LE100.-1BC	6	a. s.	a. s.
	1LE100.-1BD	8	a. s.	a. s.
132	**1LE100.-1CA**	2	1490	1180
	1LE100.-1CB	4	1940	1530
	1LE100.-1CC	6	2260	1780
	1LE100.-1CD	8	2500	1980
160	**1LE100.-1DA**	2	1560	1240
	1LE100.-1DB	4	2040	1590
	1LE100.-1DC	6	2350	1820
	1LE100.-1DD	8	2610	2030

a. s. Available soon

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-running types of construction.

Maximum cantilever forces for 50 Hz for 1LE1
Deep-groove ball bearings at the drive end (DE) – Order code L22
Valid are: x_0 values for x = 0 and $x_{max.}$ values for x = l
(l = shaft extension)

For motors			Maximum cantilever force	
			at x_0	at $x_{max.}$
Frame size	Order No.	Number of poles	Type	Type
			N	N
1LE1 motors, standard values (excluding motors with increased output)				
100	**1LE100.-1AA**	2	a. s.	a. s.
	1LE100.-1AB	4	a. s.	a. s.
	1LE100.-1AC	6	a. s.	a. s.
	1LE100.-1AD	8	a. s.	a. s.
112	**1LE100.-1BA**	2	a. s.	a. s.
	1LE100.-1BB	4	a. s.	a. s.
	1LE100.-1BC	6	a. s.	a. s.
	1LE100.-1BD	8	a. s.	a. s.
132	**1LE100.-1CA**	2	2250	1820
	1LE100.-1CB	4	2720	2170
	1LE100.-1CC	6	3100	2420
	1LE100.-1CD	8	3400	2700
160	**1LE100.-1DA**	2	2810	2170
	1LE100.-1DB	4	3540	2750
	1LE100.-1DC	6	4070	3160
	1LE100.-1DD	8	4510	3500

a. s. Available soon

Maximum axial load

1LE motors in vertical type of construction – basic version (exept 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		Load		Load		Load		Load		Load		Load		Load	
	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
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

a. s. Available soon

The values shown do not assume a cantilever force on the shaft extension.
The maximum loads are valid for operation at 50 Hz; for 60 Hz, please enquire.

The calculation of the maximum axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog “Accessories and spare parts”, Page 1/86.
Please enquire if the load direction alternates.

1LE motors in horizontal type of construction – basic version (exept motors with increased output)

Frame size	3000 rpm				1500 rpm				1000 rpm				750 rpm			
	Tensile load	Thrust load (N) with radial load at		without radial load	Tensile load	Thrust load (N) with radial load at		without radial load	Tensile load	Thrust load (N) with radial load at		without radial load	Tensile load	Thrust load (N) with radial load at		without radial load
		x_0	$x_{max.}$			x_0	$x_{max.}$			x_0	$x_{max.}$			x_0	$x_{max.}$	
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
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

a. s. Available soon

The values shown do not assume a cantilever force on the shaft extension.
The maximum loads are valid for operation at 50 Hz; for 60 Hz, please enquire.

The calculation of the maximum axial load was based on the drive with generally available coupling. For suppliers, see the relevant section of the catalog “Accessories and spare parts”, Page 1/86.
Please enquire if the load direction alternates.

Orientation

Modular technology

Basic versions

The range of potential applications for the 1LE1 motors can be broadened considerably by mounting the following modules (e.g. the motors can be used 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 Δ l. For an explanation of the additional dimensions and weights, see “Modular technology” “Dimensions and weights”.

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 Δ l. For an explanation of the additional dimensions and weights, see “Modular technology” “Dimensions and weights”, Pages 1/35 to 1/38. 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 ±10%
Current input without load	200 mA	150 mA
Maximum load current per output	max. 100 mA	max. 20 mA
Pulses per revolution	1024	1024
Outputs	2 square-wave pulses A, B – 2 inverted square-wave pulses A, B Zero pulse and inverted zero pulse	
Pulse offset between the two outputs	90° ±20%	90° ±20%
Output amplitude	$U_{High} > U_B - 3.5$ V $U_{Low} < 3$ V	$U_{High} > 2.5$ V $U_{Low} < 0.5$ V
Minimum edge interval	0.8 µs at 160 kHz	0.45 µs at 300 kHz
Edge steepness (without load or cable)	t_+, t_- ≤200 ns	t_+, t_- ≤100 ns
Maximum frequency	160 kHz	300 kHz
Maximum speed	9000 rpm	12000 rpm
Temperature range	–20 to +80 °C	–20 to +100 °C
Degree of protection	IP66	IP66
Maximum radial cantilever force	60 N	60 N
Maximum axial force	40 N	40 N
Connection system	12-pin connector (mating connector is supplied)	
Certification	CSA, UL	CSA, UL
Weight	0.3 kg	0.3 kg

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 enquire 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. Ambient temperature $AT_{max.}$ 50 °C, please enquire for higher ambient temperatures.
When the separately driven fan is mounted, the length of the motor increases by Δ l. For an explanation of the additional dimensions and weights, see “Modular technology” “Dimensions and weights”, Pages 1/35 to 1/38.

Technical data of the separately driven fan

Frame size	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current
	V		Hz	rpm	kW	A
100	1 AC	200 to 277	50	2790	0.070	0.25
	3 AC	200 to 290 Δ	50	2830	0.086	0.267
	3 AC	346 to 500 Y	50	2830	0.083	0.156
	1 AC	200 to 277	50	3280	0.088	0.25
	3 AC	200 to 332 Δ	60	3490	0.093	0.271
	3 AC	346 to 575 Y	60	3490	0.093	0.157
112	1 AC	200 to 277	50	2720	0.073	0.26
	3 AC	200 to 290 Δ	50	2770	0.085	0.269
	3 AC	346 to 500 Y	50	2770	0.082	0.151
	1 AC	200 to 277	50	3000	0.107	0.31
	3 AC	200 to 332 Δ	60	3280	0.094	0.273
	3 AC	346 to 575 Y	60	3280	0.094	0.158
132	1 AC	200 to 277	50	2860	0.115	0.39
	3 AC	200 to 290 Δ	50	2880	0.130	0.442
	3 AC	346 to 500 Y	50	2880	0.138	0.24
	1 AC	200 to 277	50	3380	0.185	0.52
	3 AC	200 to 332 Δ	60	3470	0.148	0.407
	3 AC	346 to 575 Y	60	3470	0.148	0.235
160	1 AC	200 to 277	50	2780	0.225	0.84
	3 AC	200 to 290 Δ	50	2840	0.218	0.713
	3 AC	346 to 500 Y	50	2830	0.220	0.401
	3 AC	200 to 332 Δ	60	3400	0.280	0.798
	3 AC	346 to 575 Y	60	3400	0.280	0.461

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 enery per brakeing 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 Δ l. For an explanation of the additional dimensions and weights, see "Modular technology" "Dimensions and weights", Pages 1/35 to 1/38.

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.

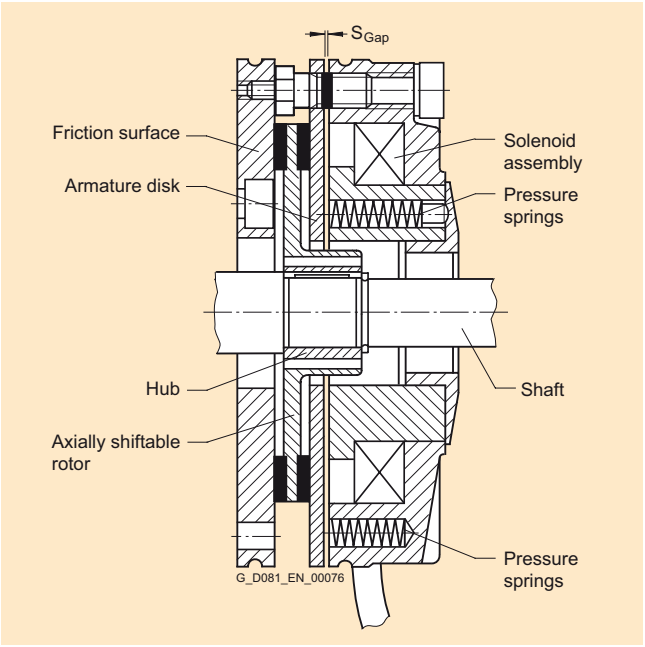
Please enquire if motors with brakes are to be operated below the freezing point or in very humid environments (e.g. close to the sea) with long standstill times.

Design and mode of operation

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

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

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



Design of the 2LM8 spring-operated disk brake

Rating plate

The brake data are specified on the motor rating plate.

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			Voltage	Current/power input [1]		Brake application time t_2 [2]	Brake release time	Brake moment of inertia	Noise level L_p with rated air gap	Service capability of the brake: Lifetime of brake lining L	Service capability of the brake: Air gap adjustment required after braking energy L_N
			1500 rpm	3000 rpm	Max. speed									
		Nm	%	%	%	V	A	W	ms	ms	kgm²	dB (A)	Nm · 10⁶	Nm · 10⁶
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.

Lifetime of the brake lining

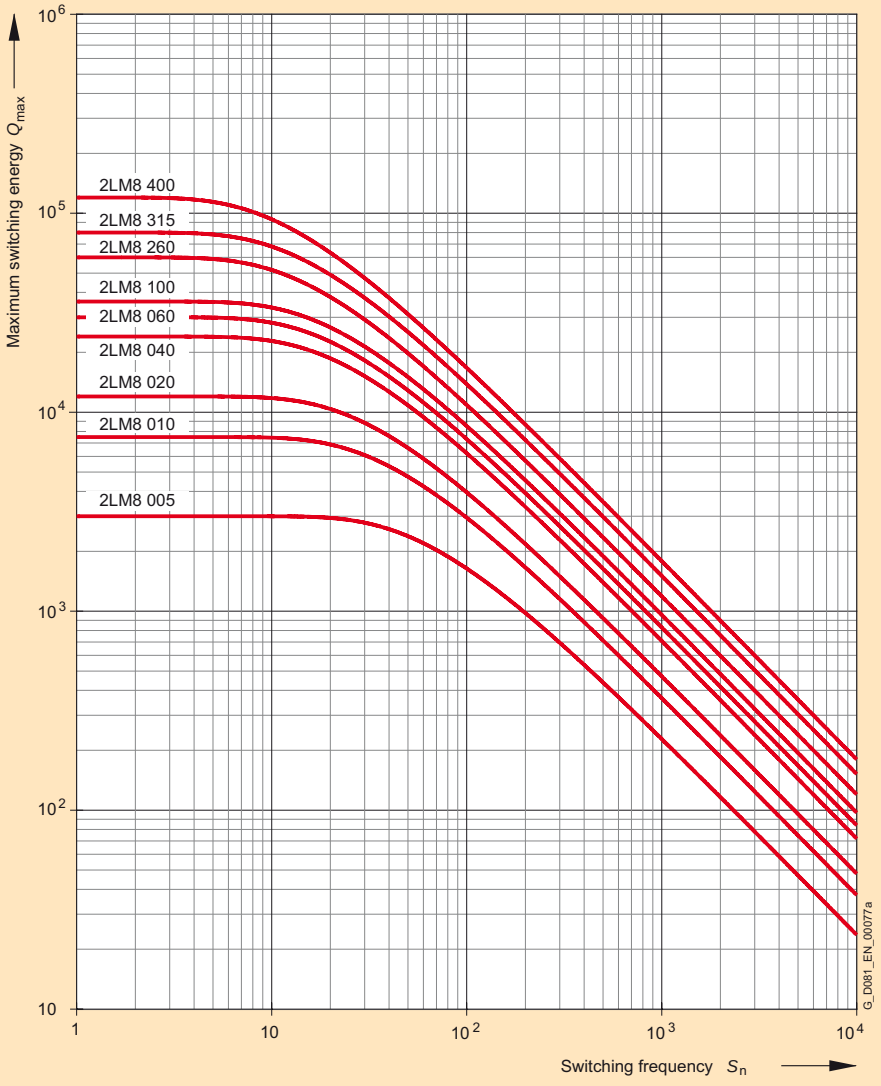
The braking energy L_N up to when the brake should be adjusted, depends on various factors. The main influencing factors include the masses to be braked, the operating speed, the operating frequency and therefore the temperature at the frictional surfaces. It is therefore not possible to specify a value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

When used as operating brake, the specific frictional surface wear (wear volume for the frictional work) is approximately 0.05 up to 2 cm^3/kWh.

Maximum speeds

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

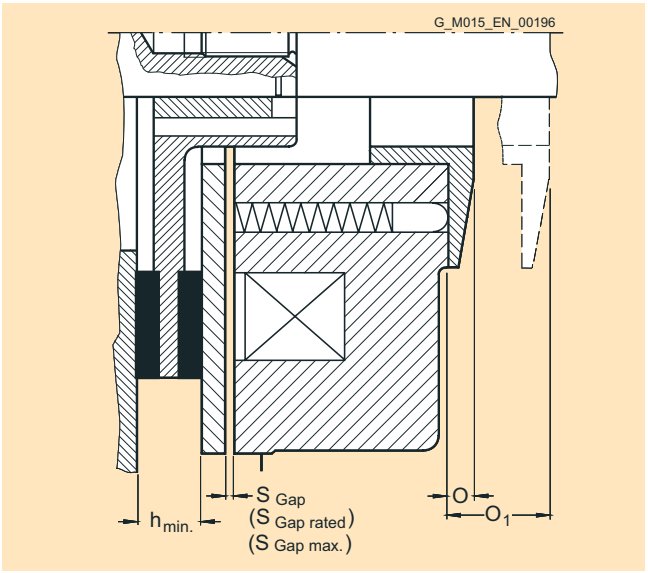
Orientation

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 $S_{Gap\ rated}$ at the latest when the maximum air gap $S_{Gap\ max.}$ is reached.



Configuration of motors with brakes

Braking time

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

a.) The application time of the brake t_2

b.) The braking time t_{Br}

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

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

Braking energy per braking operation Q_{max}

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

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

a.) The energy of the moments of inertia in Nm

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

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

b.) The braking energy in Nm against a load torque

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

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

Run-on revolutions U

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

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

t_2 Brake application time in ms

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

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

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

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

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

The interval between adjustments N in can be calculated in terms of operations by dividing the braking energy L_{rated} which the brake can output until it is necessary to readjust the working air gap by Q_{max}:

$$N = \frac{L_{rated}}{Q_{max}}$$

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).

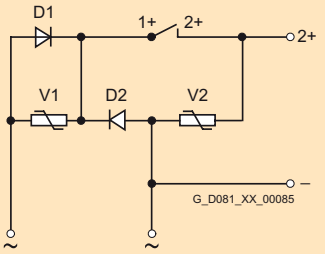
Manual brake release with lever

The brakes can be supplied with a mechanical manual release with lever.
Order code **F50**.

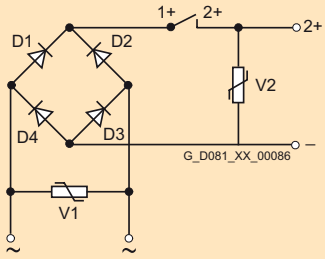
The dimensions of the brake lever depend on the motor frame size and can be read from the dimension drawing generator for motors in the SD configurator tool for low-voltage motors (available soon).

Bridge rectifier / half-wave rectifier

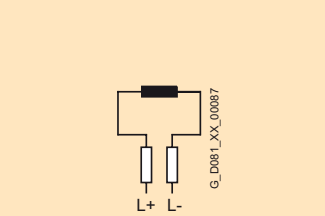
Brakes are connected through a standard bridge or half-wave rectifier or directly to the 2LM8 brake. See the circuit diagrams below.



Half-wave rectifier, 400 V AC



Bridge rectifier, 230 V AC



Brake connection for 24 V DC

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 and HOG9 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 “Modular technology” “Dimensions and weights”, Pages 1/35 to 1/38.

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**.

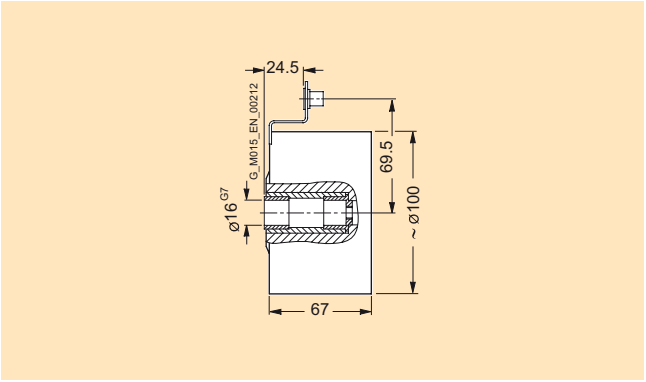
The LL 861 900 220 rotary pulse encoder can be provided by the customer and mounted by Siemens.
Order code **G71**.

*The LL 861 900 220 rotary pulse encoder can be retrofitted. The motor must be prepared for this. When the motor is ordered, the option “Prepared for mountings, center hole only” order code **G40** or the option “Prepared for mountings with shaft D16” order code **G42** must be specified (see “Mechanical design and degrees of protection”, Page 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 (Germany) 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 dimension 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
Maximum load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A’, B, B’, 0, 0’
Pulse offset between the two outputs	90° ±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 radial cantilever force	300 N
Maximum axial force	100 N
Connection system	Terminal strips in encoder cable connection M20 x 1.5 radial
Weight	Approx. 1.3 kg

HOG9 D 1024 rotary pulse encoder

The encoder is fitted with insulated bearings.

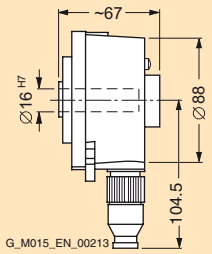
The HOG9 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G05**.

The HOG9 D 1024 I rotary pulse encoder can be provided by the customer and mounted by Siemens.
Order code **G72**.

*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:
Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

http://www.huebner-berlin.de/index_uk
e-mail: info@huebner-berlin.de



Mounting dimensions for HOG9 D 1024 I rotary pulse encoder

Technical data for HOG9 D 1024 I (TTL version)

Supply voltage U_B	**+9 V to +30 V**
Current input without load	50 mA to 100 mA
Maximum load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} \geq$ UB – 3.5 V $U_{Low} \leq$ 1.5 V
Mark space ratio	1:1 ±10%
Edge steepness	10 V/µs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	–20 to +100 °C
Degree of protection	IP65
Maximum radial cantilever force	150 N
Maximum 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

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 1LE1 motors with **F01** (mounted brake) from the "Modular technology" range can be combined with the HOG 10 D 1024 I rotary pulse encoders from the "Special technology" range.

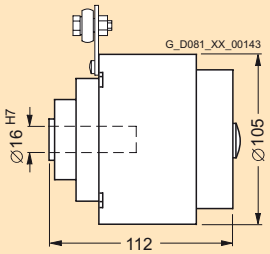
The HOG10 D 1024 I rotary pulse encoder can be supplied already mounted.
Order code **G06**.

The HOG10 D 1024 I rotary pulse encoder can be provided by the customer and mounted by Siemens.
Order code **G73**.

*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:
Hübner Elektromaschinen AG
10967 Berlin
Planufer 92b
Tel. +49 (0) 30-6 90 03-0
Fax +49 (0) 30-6 90 03-1 04

http://www.huebner-berlin.de/index_uk
e-mail: info@huebner-berlin.de



Mounting dimensions for HOG10 D 1024 I rotary pulse encoder

Technical data for HOG10 D 1024 I (HTL version)

Supply voltage U_B	**+9 V to +30 V**
Current input without load	Approx. 100 mA
Maximum load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	4 short-circuit proof square-wave pulses A, B and A', B'
Pulse offset between the two outputs	90° ±20%
Output amplitude	$U_{High} \geq$ UB – 3.5 V $U_{Low} \leq$ 1.5 V
Mark space ratio	1:1 ±20%
Edge steepness	10 V/µs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	–20 to +100 °C
Degree of protection	IP66
Maximum radial cantilever force	150 N
Maximum 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

Dimensions and weight

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

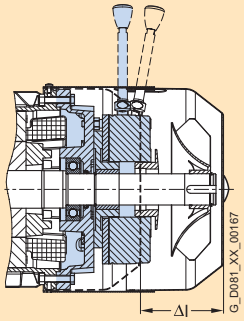


Fig. 2 Standard protective cover for types of construction
Order code **H00**

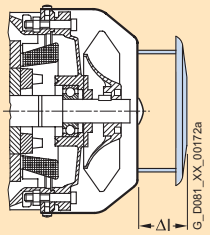


Fig. 3 Rotary pulse encoder (on cowl)
Order code **G01/G02/G04/G71/G05/G06/G72/G73**
[protective cover as standard]

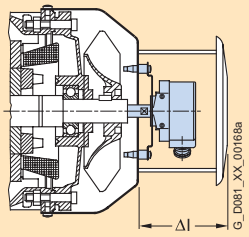


Fig. 4 Brake and rotary pulse encoder (on cowl)
Order code **F01**
+ G01/G02/G04/G71/G05/G06/G72/G73
[manual release optional order code **F50**;
protective cover as standard]

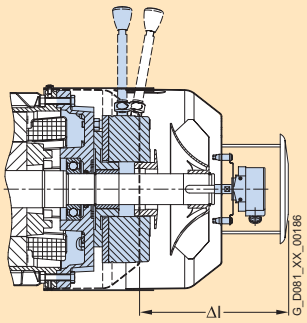


Fig. 5 Separately driven fan
Order code **F70**

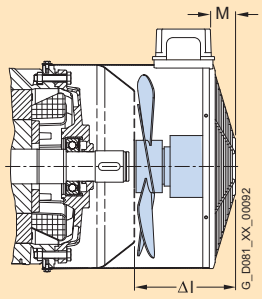
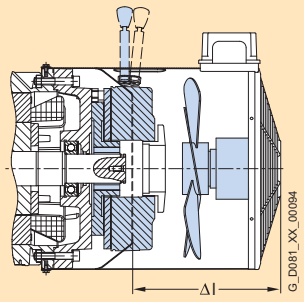


Fig. 6 Brake and separately driven fan
Order code **F01 + F70**
[optionally with manual release order code **F50**]



Dimensions ΔI and weights, see pages 1/37 and 1/38.

Orientation

Fig. 7 Rotary pulse encoder (under the cowl) and separately driven fan
Order code **F70**
+ G01/G02/G04/G71/G05/G72

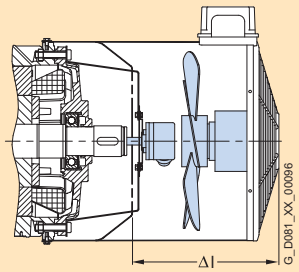


Fig. 8 Brake, rotary pulse encoder (under the cowl) and separately driven fan
Order code **F01 + F70**
+ G01/G02/G04/G71/G05/G72
[manual release optional order code **F50**]

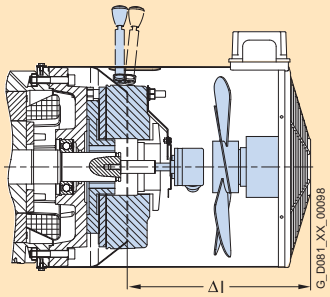


Fig. 9 Protective cover for separately driven fan
Order code **H00**

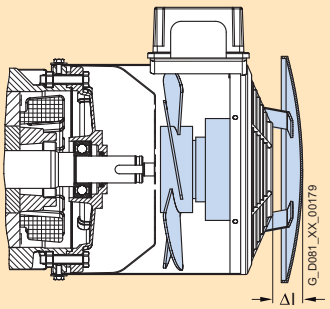


Fig. 10 Prepared for mountings – only center hole
(for Brake order code **F01** and/or rotary pulse encoder order codes **G01**/**G02**/**G04**/**G71**/**G05**/**G72**)
Order code **G40**

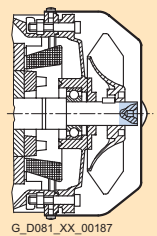
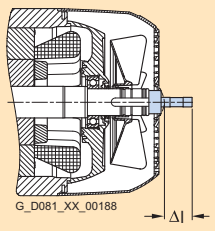


Fig. 11 Prepared for mountings with shaft D12/D16
Order codes **G41**/**G42**



Dimensions ΔI and weights, see pages 1/37 and 1/38.

	Relevant diagram											
	1		2		3							
Frame size	Brake		Protective cover		Rotary pulse encoder including protective cover							
					1XP8 012		LL 861 900 220		HOG9 D 1024 I		HOG10 D 1024 I	
	Order code		Order code		Order codes		Order codes		Order codes		Order codes	
	F01		H00		G01, G02		G04, G71		G05, G72		G06, G73	
	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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132	114	11.9	35.5	0.7	51.5	1.3	78.5	2.4	78.5	2	121.5	2.7
160	130	30.7	34	0.7	50	1.5	77	2.7	77	2.3	120	3

a. s. Available soon

	Relevant diagram										
	4								5		
Frame size	Brake and rotary pulse encoder (on cowl)								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/G71		+ G05/G72		+ G06/G73				
	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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132	165.5	13	192.5	14.2	192.5	13.8	235.5	14.5	109.5	40	3.8
160	180	32	207	33.1	207	32.7	250	33.4	130	40	6.4

a. s. Available soon

	Relevant diagram									
	6		7							
Frame size	Brake and separately driven fan		Separately driven fan and rotary pulse encoder (under cowl)							
	Order codes		Order codes		Order codes		Order codes		Order codes	
	F01 + F70		F70		F70		F70		F70	
			+ G01/G02		+ G04/G71		+ G05/G72		+ G06/G73	
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg
1LE1										
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–	–
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–	–
132	191.5	14.2	191.5	4.8	191.5	5.9	191.5	5.5	–	–
160	205	34.3	205	8	205	9.1	205	8.7	–	–

a. s. Available soon

	Relevant diagram										
	8								9		
Frame size	Brake, separately driven fan and rotary pulse encoder (under cowl)								Protective cover for separately driven fan		
	Order codes		Order codes		Order codes		Order codes		Order code		
	F01 + F70		F01 + F70		F01 + F70		F01 + F70		H00		
	+ G01/G02		+ G04/G71		+ G05/G72		+ G06/G73				
	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Δl	Weight approx.	Diameter of the fan cowl
	mm	kg	mm	kg	mm	kg	mm	kg	mm	kg	mm
1LE1											
100	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–	–	a. s.	a. s.	a. s.
112	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	–	–	a. s.	a. s.	a. s.
132	245.5	15.3	245.5	16.3	245.5	15.9	–	–	24	2.4	300
160	270	36.2	270	37.2	270	36.8	–	–	31	3	338

a. s. Available soon

Orientation

Frame size	Relevant diagram 10 Prepared for mountings – only center hole (for Brake order code **F01** and/or rotary pulse encoder order codes **G01**/**G02**/**G04**/**G71**/**G05**/**G72**) Order code **G40**		Relevant diagram 11 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	a. s.	a. s.	a. s.	a. s.	a. s.
112	0	a. s.	a. s.	a. s.	a. s.	a. s.
132	0	0.1	10.8	0.3	50.8	0.4
160	0	0.2	5.6	0.5	45.6	0.7

a. s. Available soon

Selection and Ordering Data

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

1st step	**Technical requirements for the motor**		
Determine the required product profile, the following are required:	Rated frequency and rated voltage	3 AC 50/60 Hz, 400, 500 or 690 V	
	Duty	Standard duty (continuous duty S1 according to DIN EN 60034-1)	
	Degree of protection or type of explosion protection required	IP..	
	Rated speed (No. of poles)	n =..... rpm	
	Rated output	P =..... kW	
	Rated torque	$M = P \cdot 9550/n$ =..... Nm	
	Type of construction	IM..	
2nd step	**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)
3rd step	**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.		
4thstep	**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.		
5. step	**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.).		
6th step			
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.		

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 (Position 1 to 7) identifies the motor type; the second block (Position 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 (Position 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																				
Position 1 to 4: Digit, letter, letter, digit	**New generation** Design or version (motor type) • 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															
Position 5 to 7: 3 digits	• Motors with high efficiency (High Efficiency, EFF1), aluminium housing					0	0	1												
	• Motors with improved efficiency (Improved Efficiency, EFF2), aluminium housing					0	0	2												
Position 8, 9 and 11: Digit, letter, digit	**Motor frame size** (frame size as a combination of shaft height and overall length, encoded)									1	A ... D		0 ... 6							
Position 10: Letter	**Number of poles** A – D = 2-, 4-, 6-, 8-pole											A ... D								
Position 12 and 13: 2 digits	**Voltage, circuit and frequency**													0 ... 9		0 ... 8				
Position 14: Letter	**Type of construction** (A – V)																A ... V			
Position 15: Letter	**Motor protection** (A – Z; special versions encoded)																	A ... Z		
Position 16: Digit	**Mechanical design (motor version and connection box position)** • **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** - Connection box on top - Connection box on RHS (viewed from DE) - Connection box on LHS (viewed from DE) - Connection box below																		0 4 5 6 7	
	Special order versions: encoded – additional short code required not encoded – additional plain text required																			- Z

Ordering example

Selection criteria	Requirement	Structure of the Order No.
Motor type	New generation Standard motor with high efficiency EFF1, IP55 degree of protection, aluminium version	1LE1001-❑❑❑❑❑-❑❑❑❑
Motor frame size/No. of poles/speed	4-pole/1500 rpm	**1LE1001-1DB2❑-❑❑❑❑**
Rated output	11 kW	
Voltage and frequency	230 VΔ/400 VY, 50 Hz	**1LE1001-1DB22-2❑❑❑**
Type of construction	IM V5 with protective cover[1]	**1LE1001-1DB22-2C❑❑-Z** **H00**
Special versions	3 PTC thermistors (motor protection with 3 embedded temperature sensors for tripping[2])	**1LE1001-1DB22-2CB❑-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.

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) 56	63	71	80	90	100	112	132	160
General Line – Motors with shorter delivery time	Self-ventilated	IP55	Aluminium						**1.5 ... 18.5 kW**			
Energy-saving motors with improved efficiency (Improved Efficiency EFF2)	Self-ventilated	IP55	Aluminium						**0.75 ... 18.5 kW**			
Energy-saving motors with high efficiency (High Efficiency EFF1)	Self-ventilated	IP55	Aluminium						**0.75 ... 18.5 kW**			
Motors with increased output and improved efficiency	Self-ventilated	IP55	Aluminium						**2.2 ... 22 kW**			
Motors with increased output and high efficiency	Self-ventilated	IP55	Aluminium						**2.2 ... 22 kW**			
Motors without external fan and fan cover with improved efficiency	Forced-air-cooled	IP55	Aluminium						**0.75 ... 18.5 kW**			
Motors without external fan and fan cover with high efficiency	Forced-air-cooled	IP55	Aluminium						**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 ... 112 M** **132 M ... 160 L**	3 ... 4 5.5 ... 18.5	Available soon 2905 ... 2935	Available soon 18 ... 60	Available soon 10.4 ... 34	**1/44 ... 1/47**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 4 5.5 ... 15	Available soon 1450 ... 1460	Available soon 36 ... 98	Available soon 11.2 ... 29.5	**1/48 ... 1/51**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	1.5 ... 2.2 3 ... 11	Available soon 945 ... 970	Available soon 30 ... 109	Available soon 6.8 ... 23.5	**1/52 ... 1/53**

Self-ventilated energy-saving motors with 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 ... 112 M** **132 M ... 160 L**	3 ... 4 5.5 ... 18.5	Available soon 2920 ... 2935	Available soon 18 ... 60	Available soon 10.8 ... 34	**1/54 ... 1/55**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 4 5.5 ... 15	Available soon 1450 ... 1460	Available soon 36 ... 98	Available soon 11.2 ... 29.5	**1/54 ... 1/55**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	1.5 ... 2.2 3 ... 11	Available soon 945 ... 970	Available soon 30 ... 109	Available soon 6.8 ... 23.5	**1/54 ... 1/55**
750, 8-pole	**100 L ... 112 M** **132 M ... 160 L**	0.75 ... 1.5 2.2 ... 7.5	Available soon 705 ... 720	Available soon 30 ... 100	Available soon 5.6 ... 18.6	**1/54 ... 1/55**

Self-ventilated energy-saving motors with 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 ... 112 M** **132 M ... 160 L**	3 ... 4 5.5 ... 18.5	Available soon 2945 ... 2955	Available soon 18 ... 60	Available soon 10.2 ... 33	**1/58 ... 1/59**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 4 5.5 ... 15	Available soon 1465 ... 1475	Available soon 36 ... 97	Available soon 10.6 ... 27.5	**1/58 ... 1/59**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	1.5 ... 2.2 3 ... 11	Available soon 970 ... 975	Available soon 30 ... 108	Available soon 6.4 ... 22	**1/58 ... 1/59**
750, 8-pole	**100 L ... 112 M** **132 M ... 160 L**	0.75 ... 1.5 2.2 ... 7.5	Available soon 720 ... 730	Available soon 29 ... 98	Available soon 5.3 ... 17.4	**1/58 ... 1/59**

Selection and ordering data (continued)

Self-ventilated motors with increased output and 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 ... 112 M** **132 M ... 160 L**	4 ... 5.5 11 ... 22	Available soon 2920 ... 2930	Available soon 36 ... 72	Available soon 19.4 ... 39	**1/62 ... 1/63**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	4 ... 5.5 11 ... 18.5	Available soon 1450 ... 1460	Available soon 72 ... 121	Available soon 21.5 ... 35	**1/62 ... 1/63**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 3 2.5 ... 15	Available soon 950 ... 955	Available soon 75 ... 150	Available soon 16.6 ... 30.5	**1/62 ... 1/63**

Self-ventilated motors with increased output and 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 ... 112 M** **132 M ... 160 L**	4 ... 5.5 11 ... 22	Available soon 2950 ... 2951	Available soon 36 ... 71	Available soon 19 ... 38.5	**1/66 ... 1/67**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	4 ... 5.5 11 ... 18.5	Available soon 1465 ... 1475	Available soon 72 ... 120	Available soon 21 ... 34	**1/66 ... 1/67**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 3 2.5 ... 15	Available soon 970 ... 975	Available soon 74 ... 147	Available soon 15.8 ... 29.5	**1/66 ... 1/67**

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

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (without external fan and fan cover)						
3000, 2-pole	**100 L ... 112 M** **132 M ... 160 L**	3 ... 4 5.5 ... 18.5	Available soon 2905 ... 2935	Available soon 18 ... 60	Available soon 10.4 ... 34	**1/70 ... 1/71**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 4 5.5 ... 15	Available soon 1450 ... 1460	Available soon 36 ... 98	Available soon 11.2 ... 29.5	**1/70 ... 1/71**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	1.5 ... 2.2 3 ... 11	Available soon 945 ... 970	Available soon 30 ... 109	Available soon 6.8 ... 23.5	**1/70 ... 1/71**
750, 8-pole	**100 L ... 112 M** **132 M ... 160 L**	0.75 ... 1.5 2.2 ... 7.5	Available soon 705 ... 720	Available soon 30 ... 100	Available soon 5.6 ... 18.6	**1/70 ... 1/71**

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

Speed	Frame size	Rated output	Rated speed	Rated torque	Rated current at 400 V	Detailed selection and ordering data Page
rpm		kW	rpm	Nm	A	
Aluminum series 1LE1 (without external fan and fan cover)						
3000, 2-pole	**100 L ... 112 M** **132 M ... 160 L**	3 ... 4 5.5 ... 18.5	Available soon 2945 ... 2955	Available soon 18 ... 60	Available soon 10.2 ... 33	**1/74 ... 1/75**
1500, 4-pole	**100 L ... 112 M** **132 M ... 160 L**	2.2 ... 4 5.5 ... 15	Available soon 1465 ... 1475	Available soon 36 ... 97	Available soon 10.6 ... 27.5	**1/74 ... 1/75**
1000, 6-pole	**100 L ... 112 M** **132 M ... 160 L**	1.5 ... 2.2 3 ... 11	Available soon 970 ... 975	Available soon 30 ... 108	Available soon 6.4 ... 22	**1/74 ... 1/75**
750, 8-pole	**100 L ... 112 M** **132 M ... 160 L**	0.75 ... 1.5 2.2 ... 7.5	Available soon 720 ... 730	Available soon 29 ... 98	Available soon 5.3 ... 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.

General Line - Motors with shorter delivery time

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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} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
230 V△/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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
• With standard flange: IM B14, IM V18 without protective cover, IM V19[3]												
- Without motor protection												
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.

a. s. Available soon

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

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

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.

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 I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm^2	Noise at rated output: Measuring-surface sound pressure level at 50 Hz L_{pfA} dB(A)	Noise at rated output: Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
230 V∆/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								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CA02-2AA0	2	5.6	2.6	16	0.013	68	80	
1LE1002-1CA12-2AA0	2.2	6.4	3	16	0.016	68	80	
• With flange: IM B5, IM V1 without protective cover, IM V3[2]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CA02-2FA0	2	5.6	2.6	16	0.013	68	80	FF 265
1LE1002-1CA12-2FA0	2.2	6.4	3	16	0.016	68	80	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19[3]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130

a. s. Available soon

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

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

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.

General Line - Motors with shorter delivery time

1

Selection and Ordering Data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 50 Hz	Rated torque at 50 Hz	Efficiency Class according to CEMEP	Efficiency at 50 Hz 4/4-load	Efficiency at 50 Hz 3/4-load	Power factor at 50 Hz 4/4-load	Rated current at 400 V, 50 Hz			
P_{rated} kW	P_{rated} kW	FS	n_{rated} rpm	T_{rated} Nm	EFF2	η_{rated} %	η_{rated} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
400 V Δ/690 VY, 50 Hz; 460 V Δ, 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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
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

a. s. Available soon

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

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

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.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm^2	Noise at rated output: Measuring-surface sound pressure level at 50 Hz L_{pfA} dB(A)	Noise at rated output: Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B								
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz								
400 V∆/690 VY, 50 Hz; 460 V∆, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6[1]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CA03-4AA0	2	5.6	2.6	16	0.013	68	80	
1LE1002-1CA13-4AA0	2.2	6.4	3	16	0.016	68	80	
1LE1002-1DA23-4AA0	2.1	6.1	2.7	16	0.030	70	82	
1LE1002-1DA33-4AA0	2.4	6	3	16	0.036	70	82	
1LE1002-1DA43-4AA0	2.5	7	3.2	16	0.044	70	82	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CA03-4AB0	2	5.6	2.6	16	0.013	68	80	
1LE1002-1CA13-4AB0	2.2	6.4	3	16	0.016	68	80	
1LE1002-1DA23-4AB0	2.1	6.1	2.7	16	0.030	70	82	
1LE1002-1DA33-4AB0	2.4	6	3	16	0.036	70	82	
1LE1002-1DA43-4AB0	2.5	7	3.2	16	0.044	70	82	
• With flange: IM B5, IM V1 without protective cover, IM V3[2]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CA03-4FA0	2	5.6	2.6	16	0.013	68	80	FF 265
1LE1002-1CA13-4FA0	2.2	6.4	3	16	0.016	68	80	FF 265
1LE1002-1DA23-4FA0	2.1	6.1	2.7	16	0.030	70	82	FF 300
1LE1002-1DA33-4FA0	2.4	6	3	16	0.036	70	82	FF 300
1LE1002-1DA43-4FA0	2.5	7	3.2	16	0.044	70	82	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CA03-4FB0	2	5.6	2.6	16	0.013	68	80	FF 265
1LE1002-1CA13-4FB0	2.2	6.4	3	16	0.016	68	80	FF 265
1LE1002-1DA23-4FB0	2.1	6.1	2.7	16	0.030	70	82	FF 300
1LE1002-1DA33-4FB0	2.4	6	3	16	0.036	70	82	FF 300
1LE1002-1DA43-4FB0	2.5	7	3.2	16	0.044	70	82	FF 300

a. s. Available soon

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

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

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.

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} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
230 V Δ/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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB02-2AA0**		38
7.5	8.6	132M	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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
• With flange: IM B5, IM V1 without protective cover, IM V3[2]												
- Without motor protection												
2.2	2.55	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB02-2FA0**		43
7.5	8.6	132M	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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
• With standard flange: IM B14, IM V18 without protective cover, IM V19[3]												
- Without motor protection												
2.2	2.55	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.

a. s. Available soon

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

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

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.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm^2	Noise at rated output: Measuring-surface sound pressure level at 50 Hz L_{pfA} dB(A)	Noise at rated output: Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
230 VD/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								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CB02-2AA0	2.3	6.2	2.7	16	0.019	64	76	
1LE1002-1CB22-2AA0	2.9	6.6	2.5	16	0.024	64	76	
1LE1002-1DB22-2AA0	2.3	6.4	3.1	16	0.044	64	76	
1LE1002-1DB42-2AA0	2.5	7	3.4	16	0.056	64	76	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
• With flange: IM B5, IM V1 without protective cover, IM V3[2]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CB02-2FA0	2.3	6.2	2.7	16	0.019	64	76	FF 265
1LE1002-1CB22-2FA0	2.9	6.6	2.5	16	0.024	64	76	FF 265
1LE1002-1DB22-2FA0	2.3	6.4	3.1	16	0.044	64	76	FF 300
1LE1002-1DB42-2FA0	2.5	7	3.4	16	0.056	64	76	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
• With standard flange: IM B14, IM V18 without protective cover, IM V19[3]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130

a. s. Available soon

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

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

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.

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} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
400 V Δ/690 VY, 50 Hz; 460 V Δ, 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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB03-4AA0**		38
7.5	8.6	132M	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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB03-4AB0**		38
7.5	8.6	132M	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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB03-4FA0**		43
7.5	8.6	132M	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	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB03-4FB0**		43
7.5	8.6	132M	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	132M	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

a. s. Available soon

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

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

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.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm^2	Noise at rated output: Measuring-surface sound pressure level at 50 Hz L_{pfA} dB(A)	Noise at rated output: Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B								
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz								
400 V∆/690 VY, 50 Hz; 460 V∆, 60 Hz								
• Without flange: IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6[1]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CB03-4AA0	2.3	6.2	2.7	16	0.019	64	76	
1LE1002-1CB23-4AA0	2.9	6.6	2.5	16	0.024	64	76	
1LE1002-1DB23-4AA0	2.3	6.4	3.1	16	0.044	64	76	
1LE1002-1DB43-4AA0	2.5	7	3.4	16	0.056	64	76	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CB03-4AB0	2.3	6.2	2.7	16	0.019	64	76	
1LE1002-1CB23-4AB0	2.9	6.6	2.5	16	0.024	64	76	
1LE1002-1DB23-4AB0	2.3	6.4	3.1	16	0.044	64	76	
1LE1002-1DB43-4AB0	2.5	7	3.4	16	0.056	64	76	
• With flange: IM B5, IM V1 without protective cover, IM V3[2]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CB03-4FA0	2.3	6.2	2.7	16	0.019	64	76	FF 265
1LE1002-1CB23-4FA0	2.9	6.6	2.5	16	0.024	64	76	FF 265
1LE1002-1DB23-4FA0	2.3	6.4	3.1	16	0.044	64	76	FF 300
1LE1002-1DB43-4FA0	2.5	7	3.4	16	0.056	64	76	FF 300
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CB03-4FB0	2.3	6.2	2.7	16	0.019	64	76	FF 265
1LE1002-1CB23-4FB0	2.9	6.6	2.5	16	0.024	64	76	FF 265
1LE1002-1DB23-4FB0	2.3	6.4	3.1	16	0.044	64	76	FF 300
1LE1002-1DB43-4FB0	2.5	7	3.4	16	0.056	64	76	FF 300
• With flange: IM B35								
- Without motor protection								
1LE1002-1CB03-4JA0	2.3	6.2	2.7	16	0.019	64	76	FF 265
1LE1002-1CB23-4JA0	2.9	6.6	2.5	16	0.024	64	76	FF 265
1LE1002-1DB23-4JA0	2.3	6.4	3.1	16	0.044	64	76	FF 300
1LE1002-1DB43-4JA0	2.5	7	3.4	16	0.056	64	76	FF 300

a. s. Available soon

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

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

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.

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			m kg
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
230 V∆/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	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	132 S	955	30		80	79.4	0.74	7.3	**1LE1002-1CC02-2AA0**		34
4	4.6	132M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC22-2AA0**		39
5.5	6.3	132M	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	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	132 S	955	30		80	79.4	0.74	7.3	**1LE1002-1CC02-2FA0**		39
4	4.6	132M	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	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	132 S	945	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	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
400 V∆/690 VY, 50 Hz; 460 V∆, 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	132M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC23-4AA0**		39
5.5	6.3	132M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC33-4AA0**		48
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC23-4AA0**		72
11	12.6	160 L	965	109		87.6	87.7	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	132M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC23-4AB0**		39
5.5	6.3	132M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC33-4AB0**		48
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC23-4AB0**		72
11	12.6	160 L	965	109		87.6	87.7	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	132M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC23-4FA0**		44
5.5	6.3	132M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC33-4FA0**		53
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC23-4FA0**		81
11	12.6	160 L	965	109		87.6	87.7	0.77	23.5	**1LE1002-1DC43-4FA0**		101
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping												
4	4.6	132M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC23-4FB0**		44
5.5	6.3	132M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC33-4FB0**		53
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC23-4FB0**		81
11	12.6	160 L	965	109		87.6	87.7	0.77	23.5	**1LE1002-1DC43-4FB0**		101

a. s. Available soon

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

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

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.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque with direct starting as multiple of rated torque T_{LR}/T_{rated}	Locked-rotor current as multiple of rated current I_{LR}/I_{rated}	Breakdown torque T_B/T_{rated}	Torque class CL	Moment of inertia J kgm^2	Noise at rated output: Measuring-surface sound pressure level at 50 Hz L_{pfA} dB(A)	Noise at rated output: Sound pressure level at 50 Hz L_{WA} dB(A)	Flange size according to DIN EN 50347
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B								
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz								
230 V∆/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								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	
1LE1002-1CC02-2AA0	2	4.6	2.6	16	0.017	63	75	
1LE1002-1CC22-2AA0	2.1	4.7	2.5	16	0.021	63	75	
1LE1002-1CC32-2AA0	2.5	5.2	2.8	16	0.027	63	75	
• With flange: IM B5, IM V1 without protective cover, IM V3[2]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CC02-2FA0	2	4.6	2.6	16	0.017	63	75	FF 265
1LE1002-1CC22-2FA0	2.1	4.7	2.5	16	0.021	63	75	FF 265
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FF 215
1LE1002-1CC02-2FB0	2	4.6	2.6	16	0.017	63	75	FF 265
• With standard flange: IM B14, IM V18 without protective cover, IM V19[3]								
- Without motor protection								
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	FT 130
400 V∆/690 VY, 50 Hz; 460 V∆, 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	0.021	63	75	
1LE1002-1CC33-4AA0	2.5	5.2	2.8	16	0.027	63	75	
1LE1002-1DC23-4AA0	2.1	5.5	2.9	16	0.056	68	80	
1LE1002-1DC43-4AA0	1.9	5.9	2.7	16	0.078	68	80	
- With motor protection with PTC thermistors with 3 embedded temperature sensors for tripping								
1LE1002-1CC03-4AB0	2	4.6	2.6	16	0.017	63	75	
1LE1002-1CC23-4AB0	2.1	4.7	2.5	16	0.021	63	75	
1LE1002-1CC33-4AB0	2.5	5.2	2.8	16	0.027	63	75	
1LE1002-1DC23-4AB0	2.1	5.5	2.9	16	0.056	68	80	
1LE1002-1DC43-4AB0	1.9	5.9	2.7	16	0.078	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	0.017	63	75	FF 265
1LE1002-1CC23-4FA0	2.1	4.7	2.5	16	0.021	63	75	FF 265
1LE1002-1CC33-4FA0	2.5	5.2	2.8	16	0.027	63	75	FF 265
1LE1002-1DC23-4FA0	2.1	5.5	2.9	16	0.056	68	80	FF 300
1LE1002-1DC43-4FA0	1.9	5.9	2.7	16	0.078	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	0.021	63	75	FF 265
1LE1002-1CC33-4FB0	2.5	5.2	2.8	16	0.027	63	75	FF 265
1LE1002-1DC23-4FB0	2.1	5.5	2.9	16	0.056	68	80	FF 300
1LE1002-1DC43-4FB0	1.9	5.9	2.7	16	0.078	68	80	FF 300

a. s. Available soon

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

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

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.

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, Pages 1/56 to 1/57.	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
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	**1LE1002-1CA0❑-❑❑❑❑**		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	**1LE1002-1CA1❑-❑❑❑❑**		40
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	**1LE1002-1DA2❑-❑❑❑❑**		60
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	**1LE1002-1DA3❑-❑❑❑❑**		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	**1LE1002-1DA4❑-❑❑❑❑**		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB0❑-❑❑❑❑**		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	**1LE1002-1CB2❑-❑❑❑❑**		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	**1LE1002-1DB2❑-❑❑❑❑**		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	**1LE1002-1DB4❑-❑❑❑❑**		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	132 S	955	30		80	79.4	0.74	7.3	**1LE1002-1CC0❑-❑❑❑❑**		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC2❑-❑❑❑❑**		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC3❑-❑❑❑❑**		48
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC2❑-❑❑❑❑**		72
11	12.6	160 L	965	109		87.6	87.7	0.77	23.5	**1LE1002-1DC4❑-❑❑❑❑**		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
1.1	1.3	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
1.5	1.75	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	132 S	705	30		76.6	76.4	0.74	5.6	**1LE1002-1CD0❑-❑❑❑❑**		37
3	3.45	132 M	710	40		79	78.5	0.71	7.7	**1LE1002-1CD2❑-❑❑❑❑**		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	**1LE1002-1DD2❑-❑❑❑❑**		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	**1LE1002-1DD3❑-❑❑❑❑**		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	**1LE1002-1DD4❑-❑❑❑❑**		91

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Order No. supplements, see Pages 1/56 to 1/57.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CA0❑-❑❑❑❑	2	5.6	2.6	16	0.013	68	80
1LE1002-1CA1❑-❑❑❑❑	2.2	6.4	3	16	0.016	68	80
1LE1002-1DA2❑-❑❑❑❑	2.1	6.1	2.7	16	0.030	70	82
1LE1002-1DA3❑-❑❑❑❑	2.4	6	3	16	0.036	70	82
1LE1002-1DA4❑-❑❑❑❑	2.5	7	3.2	16	0.044	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CB0❑-❑❑❑❑	2.3	6.2	2.7	16	0.019	64	76
1LE1002-1CB2❑-❑❑❑❑	2.9	6.6	2.5	16	0.024	64	76
1LE1002-1DB2❑-❑❑❑❑	2.3	6.4	3.1	16	0.044	64	76
1LE1002-1DB4❑-❑❑❑❑	2.5	7	3.4	16	0.056	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CC0❑-❑❑❑❑	2	4.6	2.6	16	0.017	63	75
1LE1002-1CC2❑-❑❑❑❑	2.1	4.7	2.5	16	0.021	63	75
1LE1002-1CC3❑-❑❑❑❑	2.5	5.2	2.8	16	0.027	63	75
1LE1002-1DC2❑-❑❑❑❑	2.1	5.5	2.9	16	0.056	68	80
1LE1002-1DC4❑-❑❑❑❑	1.9	5.9	2.7	16	0.078	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CD0❑-❑❑❑❑	1.5	3.8	1.9	13	0.019	53	65
1LE1002-1CD2❑-❑❑❑❑	1.7	4.1	2.1	13	0.024	53	65
1LE1002-1DD2❑-❑❑❑❑	1.7	3.8	2.3	13	0.044	68	80
1LE1002-1DD3❑-❑❑❑❑	1.6	4	2.2	13	0.056	68	80
1LE1002-1DD4❑-❑❑❑❑	1.7	3.8	2.2	13	0.077	68	80

a. s. Available soon

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1002-1A..❑-❑...	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B..❑-❑...	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C..❑-❑...	**132 S/M**	○	○	○	○	✓	✓	✓	✓
1LE1002-1D..❑-❑...	**160 M/L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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

Motor type	Motor 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...-❑..	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-❑..	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-❑..	**132 S/M**	**FT 165**	✓	✓	✓	✓	✓
1LE1002-1D...-❑..	**160 M/L**	**FT 215**	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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 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 extra price).

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1002-1A...-..❑.	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-..❑.	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-..❑.	**132 S/M**	❑	✓	✓	✓	✓	✓
1LE1002-1D...-..❑.	**160 M/L**	❑	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motortyp	Motor 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**	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-...❑	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-...❑	**132 S/M**	❑	✓	✓	✓
1LE1002-1D...-...❑	**160 M/L**	❑	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

[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.

Self-ventilated energy-saving motors with high efficiency

Selection and Ordering Data (continued)

Rated output at		Frame size	Operating values at rated output							Order No.	Price	Weight
50 Hz	60 Hz		Rated speed at 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, Pages 1/60 to 1/61.	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
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	**1LE1001-1CA0❑-❑❑❑❑**		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.88	13.8	**1LE1001-1CA1❑-❑❑❑❑**		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	**1LE1001-1DA2❑-❑❑❑❑**		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	**1LE1001-1DA3❑-❑❑❑❑**		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	**1LE1001-1DA4❑-❑❑❑❑**		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
4	4.6	112 M	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	**1LE1001-1CB0❑-❑❑❑❑**		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	**1LE1001-1CB2❑-❑❑❑❑**		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	**1LE1001-1DB2❑-❑❑❑❑**		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	**1LE1001-1DB4❑-❑❑❑❑**		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	132 S	970	30		86	85.9	0.73	6.9	**1LE1001-1CC0❑-❑❑❑❑**		38
4	4.6	132 M	970	39		86	86.5	0.78	8.6	**1LE1001-1CC2❑-❑❑❑❑**		43
5.5	6.3	132 M	970	54		88	89	0.77	11.8	**1LE1001-1CC3❑-❑❑❑❑**		52
7.5	8.6	160 M	975	73		89	89.6	0.77	15.8	**1LE1001-1DC2❑-❑❑❑❑**		77
11	12.6	160 L	975	108		89.5	90.5	0.80	22	**1LE1001-1DC4❑-❑❑❑❑**		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
1.1	1.3	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
1.5	1.75	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	**1LE1001-1CD0❑-❑❑❑❑**		41
3	3.45	132 M	720	40		77.5	76.5	0.61	9.2	**1LE1001-1CD2❑-❑❑❑❑**		49
4	4.6	160 M	730	52		87	88	0.69	9.6	**1LE1001-1DD2❑-❑❑❑❑**		69
5.5	6.3	160 M	730	72		87.5	89	0.69	13.2	**1LE1001-1DD3❑-❑❑❑❑**		82
7.5	8.6	160 L	730	98		88	89	0.72	17	**1LE1001-1DD4❑-❑❑❑❑**		94

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Order No. supplements, see Pages 1/60 to 1/61.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CA0❑-❑❑❑❑	1.8	6.6	2.9	16	0.020	68	80
1LE1001-1CA1❑-❑❑❑❑	2.2	7.5	3.1	16	0.024	68	80
1LE1001-1DA2❑-❑❑❑❑	2.1	7.4	3.2	16	0.045	70	82
1LE1001-1DA3❑-❑❑❑❑	2.4	7.6	3.4	16	0.053	70	82
1LE1001-1DA4❑-❑❑❑❑	2.9	7.9	3.6	16	0.061	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CB0❑-❑❑❑❑	2.3	6.9	2.9	16	0.027	64	76
1LE1001-1CB2❑-❑❑❑❑	2.3	6.9	2.9	16	0.034	64	76
1LE1001-1DB2❑-❑❑❑❑	2.2	6.7	2.8	16	0.065	64	76
1LE1001-1DB4❑-❑❑❑❑	2.5	7.3	3	16	0.083	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CC0❑-❑❑❑❑	1.6	5.6	2.6	13	0.024	63	75
1LE1001-1CC2❑-❑❑❑❑	1.6	5.6	2.5	13	0.029	63	75
1LE1001-1CC3❑-❑❑❑❑	1.9	6.1	2.8	16	0.037	63	75
1LE1001-1DC2❑-❑❑❑❑	1.8	6.3	2.8	16	0.075	68	80
1LE1001-1DC4❑-❑❑❑❑	1.7	6.2	2.7	16	0.098	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CD0❑-❑❑❑❑	1.4	3.6	1.8	10	0.027	53	65
1LE1001-1CD2❑-❑❑❑❑	1.5	3.7	1.9	10	0.035	53	65
1LE1001-1DD2❑-❑❑❑❑	1.8	4.3	2	13	0.065	68	80
1LE1001-1DD3❑-❑❑❑❑	2.1	4.4	2.1	13	0.083	68	80
1LE1001-1DD4❑-❑❑❑❑	1.9	4.5	2.1	13	0.098	68	80

a. s. Available soon

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1001-1A..❑-❑...	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B..❑-❑...	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C..❑-❑...	**132 S/M**	○	○	○	○	✓	✓	✓	✓
1LE1001-1D..❑-❑...	**160 M/L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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	Motor 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...-❑..	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-❑..	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-❑..	**132 S/M**	❑	❑	❑	❑	❑	❑	✓	**FF 265**	✓	✓	✓	✓	✓
1LE1001-1D...-❑..	**160 M/L**	❑	❑	❑	❑	❑	❑	✓	**FF 300**	✓	✓	✓	✓	✓

Motor type	Motor 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...-❑..	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-❑..	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-❑..	**132 S/M**	**FT 165**	✓	✓	✓	✓	✓
1LE1001-1D...-❑..	**160 M/L**	**FT 215**	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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 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 extra price).

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1001-1A...-..❑.	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-..❑.	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-..❑.	**132 S/M**	□	✓	✓	✓	✓	✓
1LE1001-1D...-..❑.	**160 M/L**	□	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motor type	Motor 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**	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-...❑	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-...❑	**132 S/M**	□	✓	✓	✓
1LE1001-1D...-...❑	**160 M/L**	□	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

[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.

Self-ventilated motors with increased output and 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, Pages 1/64 to 1/65.	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} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, with increased output, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
4	4.6	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
11	12.6	132 M	2920	36		90	90.7	0.90	19.4	**1LE1002-1CA6❑-❑❑❑❑**		53
22	24.5	160 L	2930	72		91	91.3	0.90	39	**1LE1002-1DA6❑-❑❑❑❑**		85
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
4	4.6	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
11	12.6	132 M	1450	72		88.8	89.3	0.84	21.5	**1LE1002-1CB6❑-❑❑❑❑**		58
18.5	21.3	160 L	1460	121		90	90.2	0.85	35	**1LE1002-1DB6❑-❑❑❑❑**		85
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
7.5	8.6	132 M	950	75		85.4	85.7	0.76	16.6	**1LE1002-1CC6❑-❑❑❑❑**		54
15	17.3	160 L	955	150		88	88.8	0.81	30.5	**1LE1002-1DC6❑-❑❑❑❑**		109

a. s. Available soon

Order No. supplements, see Pages 1/64 to 1/65.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, with increased output, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CA6❑-❑❑❑❑	2.8	7.5	3.7	16	0.022	68	80
1LE1002-1DA6❑-❑❑❑❑	2.6	7.5	3.2	16	0.049	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CB6❑-❑❑❑❑	2.5	7.2	3	16	0.033	64	76
1LE1002-1DB6❑-❑❑❑❑	2.7	7.2	3.2	16	0.068	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CC6❑-❑❑❑❑	2.6	5.3	2.7	16	0.032	63	75
1LE1002-1DC6❑-❑❑❑❑	2.1	5.3	2.5	16	0.094	68	80

a. s. Available soon

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1002-1A..❑-❑...	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B..❑-❑...	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C..❑-❑...	**132 M**	○	○	○	○	✓	✓	✓	✓
1LE1002-1D..❑-❑...	**160 L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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

Motor type	Motor 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...-❑..	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-❑..	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-❑..	**132 M**	**FT 165**	✓	✓	✓	✓	✓
1LE1002-1D...-❑..	**160 L**	**FT 215**	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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 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 extra price).

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1002-1A...-..❑.	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-..❑.	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-..❑.	**132 M**	❑	✓	✓	✓	✓	✓
1LE1002-1D...-..❑.	**160 L**	❑	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motor type	Motor 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**	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-...❑	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-...❑	**132 M**	❑	✓	✓	✓
1LE1002-1D...-...❑	**160 L**	❑	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

[1] For appropriate tripping unit see Catalog LV 1.
[2] With type of construction screwed-on feet as standard.

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 see, motor protection and connection box see table, Pages 1/68 to 1/69.	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} %	$\cos\varphi_{rated}$	I_{rated} A			m kg
Version of motors: temperature class F, IP55 degree of protection, with increased output, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
4	4.6	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
11	12.6	132 M	2955	36		91	92	0.89	19.6	**1LE1001-1CA6❑-❑❑❑❑**		57
22	24.5	160 L	2950	71		92.2	92.8	0.90	38.5	**1LE1001-1DA6❑-❑❑❑❑**		94
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
4	4.6	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
5.5	6.3	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
11	12.6	132 M	1465	72		91	91.4	0.84	21	**1LE1001-1CB6❑-❑❑❑❑**		64
18.5	21.3	160 L	1475	120		92.4	92.8	0.85	34	**1LE1001-1DB6❑-❑❑❑❑**		100
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
3	3.45	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	**a. s.**		a. s.
7.5	8.6	132 M	970	74		88	88.5	0.76	16.2	**1LE1001-1CC6❑-❑❑❑❑**		64
15	17.3	160 L	975	147		90.6	91	0.81	29.5	**1LE1001-1DC6❑-❑❑❑❑**		115

a. s. Available soon

Order No. supplements, see Pages 1/68 to 1/69.

Selection and Ordering Data (continued)

Order No.	Locked-rotor torque	Locked-rotor current	Breakdown torque	Torque class	Moment of inertia	Noise at rated output	
	with direct starting as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, with increased output, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CA6❑-❑❑❑❑	2.5	7.9	3.2	16	0.031	68	80
1LE1001-1DA6❑-❑❑❑❑	2.7	7.7	3.3	16	0.068	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CB6❑-❑❑❑❑	2.9	7.7	3.1	16	0.046	64	76
1LE1001-1DB6❑-❑❑❑❑	2.8	7.7	3.3	16	0.099	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CC6❑-❑❑❑❑	2.1	6.5	3	16	0.046	63	75
1LE1001-1DC6❑-❑❑❑❑	1.9	6.5	2.9	16	0.12	68	80

a. s. Available soon

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1001-1A..❑-❑...	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B..❑-❑...	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C..❑-❑...	**132 M**	○	○	○	○	✓	✓	✓	✓
1LE1001-1D..❑-❑...	**160 L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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	Motor 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...-❑..	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-❑..	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-❑..	**132 M**	❑	❑	❑	❑	❑	❑	✓	**FF 265**	✓	✓	✓	✓	✓
1LE1001-1D...-❑..	**160 L**	❑	❑	❑	❑	❑	❑	✓	**FF 300**	✓	✓	✓	✓	✓

Motor type	Motor 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...-❑..	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-❑..	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-❑..	**132 M**	**FT 165**	✓	✓	✓	✓	✓
1LE1001-1D...-❑..	**160 L**	**FT 215**	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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 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 extra price).

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1001-1A...-..❑.	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-..❑.	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-..❑.	**132 M**	◘	✓	✓	✓	✓	✓
1LE1001-1D...-..❑.	**160 L**	◘	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motor type	Motor 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**	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-...❑	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-...❑	**132 M**	◘	✓	✓	✓
1LE1001-1D...-...❑	**160 L**	◘	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

[1] For appropriate tripping unit see Catalog LV 1.
[2] With type of construction screwed-on feet as standard.

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, Pages 1/72 to 1/73.	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
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
5.5	6.3	132 S	2905	18	EFF2	86	86.6	0.89	10.4	**1LE1002-1CA0❑-❑❑❑❑-Z F90**		35
7.5	8.6	132 S	2925	24	EFF2	87.6	87.8	0.88	14	**1LE1002-1CA1❑-❑❑❑❑-Z F90**		40
11	12.6	160 M	2920	36	EFF2	88.4	88.7	0.85	21	**1LE1002-1DA2❑-❑❑❑❑-Z F90**		60
15	17.3	160 M	2930	49	EFF2	89.5	89.6	0.84	29	**1LE1002-1DA3❑-❑❑❑❑-Z F90**		68
18.5	21.3	160 L	2935	60	EFF2	90.9	91	0.86	34	**1LE1002-1DA4❑-❑❑❑❑-Z F90**		78
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
3	3.45	100 L	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
4	4.6	112 M	a. s.	a. s.	EFF2	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
5.5	6.3	132 S	1450	36	EFF2	86	86.5	0.83	11.2	**1LE1002-1CB0❑-❑❑❑❑-Z F90**		38
7.5	8.6	132 M	1450	49	EFF2	87	87.4	0.83	15	**1LE1002-1CB2❑-❑❑❑❑-Z F90**		44
11	12.6	160 M	1460	72	EFF2	88.4	88.1	0.82	22	**1LE1002-1DB2❑-❑❑❑❑-Z F90**		62
15	17.3	160 L	1460	98	EFF2	89.4	89.7	0.82	29.5	**1LE1002-1DB4❑-❑❑❑❑-Z F90**		73
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
3	3.45	132 S	955	30		80	79.4	0.74	7.3	**1LE1002-1CC0❑-❑❑❑❑-Z F90**		34
4	4.6	132 M	950	40		83	83.4	0.76	9.2	**1LE1002-1CC2❑-❑❑❑❑-Z F90**		39
5.5	6.3	132 M	950	55		85	85.3	0.75	12.4	**1LE1002-1CC3❑-❑❑❑❑-Z F90**		48
7.5	8.6	160 M	970	74		86	86.2	0.73	17.2	**1LE1002-1DC2❑-❑❑❑❑-Z F90**		72
11	12.6	160 L	965	109		87.6	87.7	0.77	23.5	**1LE1002-1DC4❑-❑❑❑❑-Z F90**		92
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
1.1	1.3	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
1.5	1.75	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
2.2	2.55	132 S	705	30		76.6	76.4	0.74	5.6	**1LE1002-1CD0❑-❑❑❑❑-Z F90**		37
3	3.45	132 M	710	40		79	78.5	0.71	7.7	**1LE1002-1CD2❑-❑❑❑❑-Z F90**		44
4	4.6	160 M	720	53		80	78.7	0.69	10.4	**1LE1002-1DD2❑-❑❑❑❑-Z F90**		60
5.5	6.3	160 M	720	73		83.5	83.9	0.70	13.6	**1LE1002-1DD3❑-❑❑❑❑-Z F90**		72
7.5	8.6	160 L	715	100		83.5	84.7	0.70	18.6	**1LE1002-1DD4❑-❑❑❑❑-Z F90**		91

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Order No. supplements, see Pages 1/72 to 1/73.

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 as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CA0❑-❑❑❑❑-Z F90	2	5.6	2.6	16	0.013	68	80
1LE1002-1CA1❑-❑❑❑❑-Z F90	2.2	6.4	3	16	0.016	68	80
1LE1002-1DA2❑-❑❑❑❑-Z F90	2.1	6.1	2.7	16	0.030	70	82
1LE1002-1DA3❑-❑❑❑❑-Z F90	2.4	6	3	16	0.036	70	82
1LE1002-1DA4❑-❑❑❑❑-Z F90	2.5	7	3.2	16	0.044	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CB0❑-❑❑❑❑-Z F90	2.3	6.2	2.7	16	0.019	64	76
1LE1002-1CB2❑-❑❑❑❑-Z F90	2.9	6.6	2.5	16	0.024	64	76
1LE1002-1DB2❑-❑❑❑❑-Z F90	2.3	6.4	3.1	16	0.044	64	76
1LE1002-1DB4❑-❑❑❑❑-Z F90	2.5	7	3.4	16	0.056	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CC0❑-❑❑❑❑-Z F90	2	4.6	2.6	16	0.017	63	75
1LE1002-1CC2❑-❑❑❑❑-Z F90	2.1	4.7	2.5	16	0.021	63	75
1LE1002-1CC3❑-❑❑❑❑-Z F90	2.5	5.2	2.8	16	0.027	63	75
1LE1002-1DC2❑-❑❑❑❑-Z F90	2.1	5.5	2.9	16	0.056	68	80
1LE1002-1DC4❑-❑❑❑❑-Z F90	1.9	5.9	2.7	16	0.078	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1CD0❑-❑❑❑❑-Z F90	1.5	3.8	1.9	13	0.019	53	65
1LE1002-1CD2❑-❑❑❑❑-Z F90	1.7	4.1	2.1	13	0.024	53	65
1LE1002-1DD2❑-❑❑❑❑-Z F90	1.7	3.8	2.3	13	0.044	68	80
1LE1002-1DD3❑-❑❑❑❑-Z F90	1.6	4	2.2	13	0.056	68	80
1LE1002-1DD4❑-❑❑❑❑-Z F90	1.7	3.8	2.2	13	0.077	68	80

a. s. Available soon

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

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1002-1A..❑-❑...-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B..❑-❑...-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C..❑-❑...-Z F90	**132 S/M**	○	○	○	○	✓	✓	✓	✓
1LE1002-1D..❑-❑...-Z F90	**160 M/L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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	Motor 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...-.❑..-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-.❑..-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-.❑..-Z F90	**132 S/M**	❑	❑	❑	❑	❑	❑	**FF 265**	✓	✓	✓	✓
1LE1002-1D...-.❑..-Z F90	**160 M/L**	❑	❑	❑	❑	❑	❑	**FF 300**	✓	✓	✓	✓

Motor type	Motor 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...-.❑..-Z F90	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-.❑..-Z F90	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-.❑..-Z F90	**132 S/M**	**FT 165**	✓	✓	✓	✓
1LE1002-1D...-.❑..-Z F90	**160 M/L**	**FT 215**	✓	✓	✓	✓

❑ Standard version
✓ With extra price

a. s. Available soon

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1002-1A...-..❑.-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-..❑.-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-..❑.-Z F90	**132 S/M**	◘	✓	✓	✓	✓	✓
1LE1002-1D...-..❑.-Z F90	**160 M/L**	◘	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motor type	Motor frame size	Position 16: Connection box (connection box code)			
		Connection box top [2]	Connection box on RHS [3]	Connection box on LHS [3]	Connection box bottom [3]
		4	**5**	**6**	**7**
1LE1002-1A...-...❑-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.
1LE1002-1B...-...❑-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1002-1C...-...❑-Z F90	**132 S/M**	◘	✓	✓	✓
1LE1002-1D...-...❑-Z F90	**160 M/L**	◘	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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.

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	For Order No. supplements for voltage, type of construction, motor protection and connection box see table, Pages 1/76 to 1/77.	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
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B												
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz												
3	3.45	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
4	4.6	112 M	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
5.5	6.3	132 S	2950	18	EFF1	89.5	90.6	0.87	10.2	**1LE1001-1CA0❑-❑❑❑❑-Z F90**		39
7.5	8.6	132 S	2950	24	EFF1	90	91	0.87	13.8	**1LE1001-1CA1❑-❑❑❑❑-Z F90**		43
11	12.6	160 M	2955	36	EFF1	90.8	91	0.87	20	**1LE1001-1DA2❑-❑❑❑❑-Z F90**		67
15	17.3	160 M	2955	48	EFF1	91.4	91.5	0.88	27	**1LE1001-1DA3❑-❑❑❑❑-Z F90**		75
18.5	21.3	160 L	2955	60	EFF1	92	92.5	0.88	33	**1LE1001-1DA4❑-❑❑❑❑-Z F90**		84
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz												
2.2	2.55	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
3	3.45	100 L	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
4	4.6	112 M	a. s.	a. s.	EFF1	a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
5.5	6.3	132 S	1465	36	EFF1	89.2	89.5	0.80	11.2	**1LE1001-1CB0❑-❑❑❑❑-Z F90**		42
7.5	8.6	132 M	1465	49	EFF1	90.1	91	0.83	14.4	**1LE1001-1CB2❑-❑❑❑❑-Z F90**		49
11	12.6	160 M	1470	71	EFF1	91.2	91.8	0.85	20.5	**1LE1001-1DB2❑-❑❑❑❑-Z F90**		71
15	17.3	160 L	1475	97	EFF1	92	92.4	0.85	27.5	**1LE1001-1DB4❑-❑❑❑❑-Z F90**		83
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz												
1.5	1.75	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
2.2	2.55	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
3	3.45	132 S	970	30		86	85.9	0.73	6.9	**1LE1001-1CC0❑-❑❑❑❑-Z F90**		38
4	4.6	132 M	970	39		86	86.5	0.78	8.6	**1LE1001-1CC2❑-❑❑❑❑-Z F90**		43
5.5	6.3	132 M	970	54		88	89	0.77	11.8	**1LE1001-1CC3❑-❑❑❑❑-Z F90**		52
7.5	8.6	160 M	975	73		89	89.6	0.77	15.8	**1LE1001-1DC2❑-❑❑❑❑-Z F90**		77
11	12.6	160 L	975	108		89.5	90.5	0.80	22	**1LE1001-1DC4❑-❑❑❑❑-Z F90**		93
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz												
0.75	0.86	100 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
1.1	1.3	110 L	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
1.5	1.75	112 M	a. s.	a. s.		a. s.	a. s.	a. s.	a. s.	a. s.		a. s.
2.2	2.55	132 S	725	29		77.5	76.7	0.63	6.5	**1LE1001-1CD0❑-❑❑❑❑-Z F90**		41
3	3.45	132 M	720	40		77.5	76.5	0.61	9.2	**1LE1001-1CD2❑-❑❑❑❑-Z F90**		49
4	4.6	160 M	730	52		87	88	0.69	9.6	**1LE1001-1DD2❑-❑❑❑❑-Z F90**		69
5.5	6.3	160 M	730	72		87.5	89	0.69	13.2	**1LE1001-1DD3❑-❑❑❑❑-Z F90**		82
7.5	8.6	160 L	730	98		88	89	0.72	17	**1LE1001-1DD4❑-❑❑❑❑-Z F90**		94

a. s. Available soon

Order No. supplements, see Pages 1/76 to 1/77.

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 as multiple of rated					Measuring-surface sound pressure level at 50 Hz	Sound pressure level at 50 Hz
	torque	current	torque				
	T_{LR}/T_{rated}	I_{LR}/I_{rated}	T_B/T_{rated}	CL	J kgm^2	L_{pfA} dB(A)	L_{WA} dB(A)
Version of motors: temperature class F, IP55 degree of protection, used acc. to temperature class B							
2-pole – 3000 rpm at 50 Hz, 3600 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CA0❑-❑❑❑❑-Z F90	1.8	6.6	2.9	16	0.020	68	80
1LE1001-1CA1❑-❑❑❑❑-Z F90	2.2	7.5	3.1	16	0.024	68	80
1LE1001-1DA2❑-❑❑❑❑-Z F90	2.1	7.4	3.2	16	0.045	70	82
1LE1001-1DA3❑-❑❑❑❑-Z F90	2.4	7.6	3.4	16	0.053	70	82
1LE1001-1DA4❑-❑❑❑❑-Z F90	2.9	7.9	3.6	16	0.061	70	82
4-pole – 1500 rpm at 50 Hz, 1800 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CB0❑-❑❑❑❑-Z F90	2.3	6.9	2.9	16	0.027	64	76
1LE1001-1CB2❑-❑❑❑❑-Z F90	2.3	6.9	2.9	16	0.034	64	76
1LE1001-1DB2❑-❑❑❑❑-Z F90	2.2	6.7	2.8	16	0.065	64	76
1LE1001-1DB4❑-❑❑❑❑-Z F90	2.5	7.3	3	16	0.083	64	76
6-pole – 1000 rpm at 50 Hz, 1200 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CC0❑-❑❑❑❑-Z F90	1.6	5.6	2.6	13	0.024	63	75
1LE1001-1CC2❑-❑❑❑❑-Z F90	1.6	5.6	2.5	13	0.029	63	75
1LE1001-1CC3❑-❑❑❑❑-Z F90	1.9	6.1	2.8	16	0.037	63	75
1LE1001-1DC2❑-❑❑❑❑-Z F90	1.8	6.3	2.8	16	0.075	68	80
1LE1001-1DC4❑-❑❑❑❑-Z F90	1.7	6.2	2.7	16	0.098	68	80
8-pole – 750 rpm at 50 Hz, 900 rpm at 60 Hz							
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1CD0❑-❑❑❑❑-Z F90	1.4	3.6	1.8	10	0.027	53	65
1LE1001-1CD2❑-❑❑❑❑-Z F90	1.5	3.7	1.9	10	0.035	53	65
1LE1001-1DD2❑-❑❑❑❑-Z F90	1.8	4.3	2	13	0.065	68	80
1LE1001-1DD3❑-❑❑❑❑-Z F90	2.1	4.4	2.1	13	0.083	68	80
1LE1001-1DD4❑-❑❑❑❑-Z F90	1.9	4.5	2.1	13	0.098	68	80

a. s. Available soon

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

Selection and Ordering Data (continued)

Order No. supplements

Motor type	Motor frame size	Position 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 date" for outputs at 60 Hz							
		22	**34**	**27**	**40**	**21**	**33**	**23**	**35**
1LE1001-1A..❑-❑...-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B..❑-❑...-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C..❑-❑...-Z F90	**132 S/M**	○	○	○	○	✓	✓	✓	✓
1LE1001-1D..❑-❑...-Z F90	**160 M/L**	○	○	○	○	✓	✓	✓	✓

○ With no extra charge
✓ With extra price
a. s. Available soon

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	Motor 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...-.❑..-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-.❑..-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	**FF 215**	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-.❑..-Z F90	**132 S/M**	❑	❑	❑	❑	❑	❑	**FF 265**	✓	✓	✓	✓
1LE1001-1D...-.❑..-Z F90	**160 M/L**	❑	❑	❑	❑	❑	❑	**FF 300**	✓	✓	✓	✓

Motor type	Motor 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...-.❑..-Z F90	**100 L**	**FT 130**	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-.❑..-Z F90	**112 M**	**FT 130**	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-.❑..-Z F90	**132 S/M**	**FT 165**	✓	✓	✓	✓
1LE1001-1D...-.❑..-Z F90	**160 M/L**	**FT 215**	✓	✓	✓	✓

❑ Standard version
✓ With extra price

a. s. Available soon

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.

Selection and Ordering Data (continued)

Motor type	Motor 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	3 temperature detectors for tripping [1]
		A	**B**	**C**	**F**	**Z**	**Z**
	Order code					**Q2A**	**Q3A**
1LE1001-1A...-..❑.-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1B...-..❑.-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
1LE1001-1C...-..❑.-Z F90	**132 S/M**	□	✓	✓	✓	✓	✓
1LE1001-1D...-..❑.-Z F90	**160 M/L**	□	✓	✓	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

Motor type	Motor 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 ...-...❑-Z F90	**100 L**	a. s.	a. s.	a. s.	a. s.
1LE1001-1B ...-...❑-Z F90	**112 M**	a. s.	a. s.	a. s.	a. s.
1LE1001-1C ...-...❑-Z F90	**132 S/M**	□	✓	✓	✓
1LE1001-1D ...-...❑-Z F90	**160 M/L**	□	✓	✓	✓

❑ Standard version
✓ With extra price
a. s. Available soon

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.

Selection and Ordering Data

Voltages

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

Not possible for General Line motors with a 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 positin of the Order No. and the appropriate order code.

Special versions	Voltage code 12th / 13th position of the Order No.		Additional identification code **-Z** with order code and plain text if required	Motor type frame size								
				56	63	71	80	90	100	112	132	160
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 (Aluminium)**								
Voltage at 60 Hz												
220 VΔ/380 VY; 50 Hz output	**9**	**0**	**M2A**						a. s.	a. s.	✓	✓
220 VΔ/380 VY; 60 Hz output	**9**	**0**	**M1A**						a. s.	a. s.	✓	✓
380 VΔ/660 VY; 50 Hz output	**9**	**0**	**M2B**						a. s.	a. s.	✓	✓
380 VΔ/660 VY; 60 Hz output	**9**	**0**	**M1B**						a. s.	a. s.	✓	✓
440 VY; 50 Hz output	**9**	**0**	**M2C**						a. s.	a. s.	✓	✓
440 VY; 60 Hz output	**9**	**0**	**M1C**						a. s.	a. s.	✓	✓
440 VΔ; 50 Hz output	**9**	**0**	**M2D**						a. s.	a. s.	✓	✓
440 VΔ; 60 Hz output	**9**	**0**	**M1D**						a. s.	a. s.	✓	✓
460 VY; 50 Hz output	**9**	**0**	**M2E**						a. s.	a. s.	✓	✓
460 VY; 60 Hz output	**9**	**0**	**M1E**						a. s.	a. s.	○	○
460 VΔ; 50 Hz output	**9**	**0**	**M2F**						a. s.	a. s.	✓	✓
460 VΔ; 60 Hz output	**9**	**0**	**M1F**						a. s.	a. s.	○	○
575 VY; 50 Hz output	**9**	**0**	**M2G**						a. s.	a. s.	✓	✓
575 VY; 60 Hz output	**9**	**0**	**M1G**						a. s.	a. s.	✓	✓
575 VΔ; 50 Hz output	**9**	**0**	**M2H**						a. s.	a. s.	✓	✓
575 VΔ; 60 Hz output	**9**	**0**	**M1H**						a. s.	a. s.	✓	✓
Non-standard voltages and / or frequencies												
Non-standard winding for voltages between 200 V and 690 V (voltages outside this range are available on request) [1]	**9**	**0**	**M1Y**						a. s.	a. s.	✓	✓

○ With no extra charge
✓ With extra charge
a. s. Available soon

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

Options

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

Not possible for General Line motors with a 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 (Aluminium)								
Motor connection and connection boxes										
Cable entry, standard configuration	**R15**						a. s.	a. s.	✓	✓
Rotation of the connection box through 90°, entry from DE	**R10**						a. s.	a. s.	○	○
Rotation of the connection box through 90°, entry from NDE	**R11**						a. s.	a. s.	○	○
Rotation of the connection box through 180°	**R12**						a. s.	a. s.	○	○
External earthing	**H04**						a. s.	a. s.	✓	✓
Windings and insulation										
Temperature class F, used acc. to F, with service factor (SF)	**N01**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, with increased output	**N02**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, with increased ambient temperature	**N03**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	**N05**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	**N06**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	**N07**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	**N08**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, other requirements	**Y52** • and identification code						a. s.	a. s.	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							a. s.	a. s.	❑	❑
Special finish in RAL 1002 sand yellow	**S24**						a. s.	a. s.	✓	✓
Special finish in RAL 1013 pearl white	**S25**						a. s.	a. s.	✓	✓
Special finish in RAL 3000 flame red	**S26**						a. s.	a. s.	✓	✓
Special finish in RAL 6011 reseda green	**S20**						a. s.	a. s.	✓	✓
Special finish in RAL 6021 pale green	**S27**						a. s.	a. s.	✓	✓
Special finish in RAL 7001 silver gray	**S28**						a. s.	a. s.	✓	✓
Special finish in RAL 7031 blue gray	**S21**						a. s.	a. s.	✓	✓
Special finish in RAL 7032 pebble gray	**S22**						a. s.	a. s.	✓	✓
Special finish in RAL 7035 light gray	**S29**						a. s.	a. s.	✓	✓
Special finish in RAL 9001 cream	**S30**						a. s.	a. s.	✓	✓

For legend and footnotes, see Page 1/82.

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 (Aluminium)								
Colors and paint finish (continued)										
Special finish in RAL 9002 gray white	**S31**						a. s.	a. s.	✓	✓
Special finish in RAL 9005 jet black	**S23**						a. s.	a. s.	✓	✓
Special finish in other standard RAL colors : RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	**Y54** • and special finish RAL….						a. s.	a. s.	✓	✓
Special finish in special RAL colors: for RAL colors, see "special finish in special RAL colors", Page 1/6	**Y51** • and special finish RAL….						a. s.	a. s.	✓	✓
Unpainted (only cast iron parts primed)	**S00**						a. s.	a. s.	○	○
Unpainted, only primed	**S01**						a. s.	a. s.	✓	✓
Modular technology – basic versions [1]										
Mounting of separately-driven fan	**F70**						a. s.	a. s.	✓	✓
Mounting of brake [2]	**F01**						a. s.	a. s.	✓	✓
Mounting of 1XP8012-10 (HTL) rotary pulse encoder [3]	**G01**						a. s.	a. s.	✓	✓
Mounting of 1XP8012-20 (TTL) rotary pulse encoder [3]	**G02**						a. s.	a. s.	✓	✓
Modular technology – additional versions										
Brake supply voltage 24 V DC	**F10**						a. s.	a. s.	✓	✓
Brake supply voltage 230 V AC, 50/60 Hz	**F11**						a. s.	a. s.	✓	✓
Brake supply voltage 400 V AC, 50/60 Hz	**F12**						a. s.	a. s.	✓	✓
Mechanical manual brake release with lever (no locking)	**F50**						a. s.	a. s.	✓	✓
Special technology [1]										
Mounting of LL 861 900 220 rotary pulse encoder [3]	**G04**						a. s.	a. s.	✓	✓
Mounting of LL 861 900 220 rotary pulse encoder to be provided [3]	**G71**						a. s.	a. s.	✓	✓
Mounting of HOG 9 D 1024 I rotary pulse encoder [3]	**G05**						a. s.	a. s.	✓	✓
Mounting of HOG 10 D 1024 I rotary pulse encoder [3][4]	**G06**						a. s.	a. s.	✓	✓
Mounting of HOG 9 rotary pulse encoder to be provided [3]	**G72**						a. s.	a. s.	✓	✓
Mounting of HOG 10 rotary pulse encoder to be provided [3][4]	**G73**						a. s.	a. s.	✓	✓
Mechanical design and degrees of protection										
Protective covering, as well as mechanical protection for the encoder [3]	**H00**						a. s.	a. s.	✓	✓
Screwed-on feet (instead of cast iron)	**H01**						a. s.	a. s.	✓	✓
Condensation drainage holes [5]	**H03**						a. s.	a. s.	✓	✓
Prepared for mountings, only centre hole	**G40**						a. s.	a. s.	✓	✓
Prepared for mountings with D12 shaft	**G41**						a. s.	a. s.	✓	✓
Prepared for mountings with D16 shaft	**G42**						a. s.	a. s.	✓	✓

For legend and footnotes, see Page 1/82.

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 (Aluminium)								
Bearings and Lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection [6]	**Q01**						a. s.	a. s.	✓	✓
Bearing design for increased cantilever forces	**L22**						a. s.	a. s.	✓	✓
Special bearing for DE and NDE, bearing size 63	**L25**						a. s.	a. s.	✓	✓
Regreasing device [6]	**L23**						a. s.	a. s.	✓	✓
Located bearing at DE	**L20**						a. s.	a. s.	✓	✓
Located bearing at NDE	**L21**						a. s.	a. s.	✓	✓
Balance and vibration severity										
Half-key balancing (standard)							a. s.	a. s.	❑	❑
Full-key balancing	**L02**						a. s.	a. s.	✓	✓
Balancing without fitted key	**L01**						a. s.	a. s.	✓	✓
Vibration severity level B	**L00**						a. s.	a. s.	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors [7]	**L08**						a. s.	a. s.	✓	✓
Second standard shaft extension	**L05**						a. s.	a. s.	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	**L07**						a. s.	a. s.	✓	✓
Standard shaft made of non-rusting steel	**L06**						a. s.	a. s.	✓	✓
Heating and ventilation										
Anti-condensation heaters for 230 V	**Q02**						a. s.	a. s.	✓	✓
Anti-condensation heaters for 115 V	**Q03**						a. s.	a. s.	✓	✓
Sheet metal fan cover	**F74**						a. s.	a. s.	✓	✓
Rating plate and extra rating plate										
Second rating plate, loose	**M10**						a. s.	a. s.	✓	✓
Nirosta rating plate	**M11**						a. s.	a. s.	✓	✓
Extra rating plate or rating plate with deviating rating plate data	**Y80** • and identification code						a. s.	a. s.	✓	✓
Extra rating plate with identification codes	**Y82** • and identification code						a. s.	a. s.	✓	✓
Additional information on rating plate and on package label	**Y84** • and identification code						a. s.	a. s.	✓	✓
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	**B00**						a. s.	a. s.	○	○
With one safety and start-up guide per box pallet	**B01**						a. s.	a. s.	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	**B02**						a. s.	a. s.	✓	✓
Operating instructions on CD enclosed	**B03**						a. s.	a. s.	✓	✓
Printed operating instructions English/German enclosed	**B04**						a. s.	a. s.	✓	✓
Wire-lattice pallet	**B99**						a. s.	a. s.	○	○
Connected in star for dispatch	**M01**						a. s.	a. s.	✓	✓
Connected in delta for dispatch	**M02**						a. s.	a. s.	✓	✓

For legend and footnotes, see Page 1/82.

❑ Standard version
○ With no extra charge
• This order code only determines the price of the version – Additional plain text is required.
✓ With extra charge
a. s. Available soon

1) A second shaft extension is not possible. Please enquire 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 covering as standard. The protective covering is not supplied with the combination rotary pulse encoder with separately-driven fan, as, in this case, the roatry pulse encoder is installed under the fan cover.

4) Not possible in combination with separately-driven fan.

5) 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.

6) Not possible when brake is mounted.

7) Can be combined with deep-groove bearings of series 60.., 62.. and 63… Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **L22**), brake mounting or encoder mounting.

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

Not possible for General Line motors with a shorter delivery time.

Special versions	Additional identification code **-Z** with order code and plain text if required	Motor type frame size 56	63	71	80	90	100	112	132	160
Forced-air cooled motors without external fan and fan cover with improved efficiency **Forced-air cooled motors without external fan and fan cover with high efficiency**										
		1LE1 (Aluminium)								
Motor connection and connection boxes										
Cable entry, normal mounting	**R15**						a. s.	a. s.	✓	✓
Rotation of the connection box through 90°, entry from DE	**R10**						a. s.	a. s.	○	○
Rotation of the connection box through 90°, entry from NDE	**R11**						a. s.	a. s.	○	○
Rotation of the connection box through 180°	**R12**						a. s.	a. s.	○	○
External earthing	**H04**						a. s.	a. s.	✓	✓
Windings and insulation										
Temperature class F, used acc. to F, with service factor (SF)	**N01**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, with increased output	**N02**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, with increased ambient temperature	**N03**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 45 °C, derating approx. 4%	**N05**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 50 °C, derating approx. 8%	**N06**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 55 °C, derating approx. 13%	**N07**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to B, ambient temperature 60 °C, derating approx. 18%	**N08**						a. s.	a. s.	✓	✓
Temperature class F, used acc. to F, other requirements	**Y52** • and indentification code						a. s.	a. s.	✓	✓
Colors and paint finish										
Special finish in RAL 7030 stone gray							a. s.	a. s.	❑	❑
Special finish in RAL 1002 sand yellow	**S24**						a. s.	a. s.	✓	✓
Special finish in RAL 1013 pearl white	**S25**						a. s.	a. s.	✓	✓
Special finish in RAL 3000 flame red	**S26**						a. s.	a. s.	✓	✓
Special finish in RAL 6011 reseda green	**S20**						a. s.	a. s.	✓	✓
Special finish in RAL 6021 pale green	**S27**						a. s.	a. s.	✓	✓
Special finish in RAL 7001 silver gray	**S28**						a. s.	a. s.	✓	✓
Special finish in RAL 7031 blue gray	**S21**						a. s.	a. s.	✓	✓
Special finish in RAL 7032 pebble gray	**S22**						a. s.	a. s.	✓	✓
Special finish in RAL 7035 light gray	**S29**						a. s.	a. s.	✓	✓
Special finish in RAL 9001 cream	**S30**						a. s.	a. s.	✓	✓
Special finish in RAL 9002 gray white	**S31**						a. s.	a. s.	✓	✓
Special finish in RAL 9005 jet black	**S23**						a. s.	a. s.	✓	✓

For legend and footnotes, see Page 1/85.

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 (Aluminium)								
Colors and paint finish (continued)										
Special finish in other standard RAL colors : RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	**Y54** • and special finish RAL….						a. s.	a. s.	✓	✓
Special finish in special-RAL colors: for RAL colors, see "special finish in special RAL colors", Page 1/6	**Y51** • and special finish RAL….						a. s.	a. s.	✓	✓
Unpainted (only cast iron parts primed)	**S00**						a. s.	a. s.	○	○
Unpainted, only primed	**S01**						a. s.	a. s.	✓	✓
Mechanical design and degree of protection										
Screwed-on feet (instead of cast iron)	**H01**						a. s.	a. s.	✓	✓
Condensation drainage holes [1]	**H03**						a. s.	a. s.	✓	✓
Bearings and Lubrication										
Measuring nipple for SPM shock pulse measurement for bearing inspection	**Q01**						a. s.	a. s.	✓	✓
Bearing design for increased canteliver forces	**L22**						a. s.	a. s.	✓	✓
Special bearing for DE and NDE, bearing size 63	**L25**						a. s.	a. s.	✓	✓
Regreasing device	**L23**						a. s.	a. s.	✓	✓
Located bearing at DE	**L20**						a. s.	a. s.	✓	✓
Located bearing at NDE	**L21**						a. s.	a. s.	✓	✓
Balance and vibration severity										
Half-key balancing (standard)							a. s.	a. s.	❑	❑
Full-key balancing	**L02**						a. s.	a. s.	✓	✓
Balancing without fitted key	**L01**						a. s.	a. s.	✓	✓
Vibration severity level B	**L00**						a. s.	a. s.	✓	✓
Shaft and rotor										
Concentricity of shaft extension, coaxiality and linear movement in accordance with DIN 42955 Tolerance R for flange-mounting motors [2]	**L08**						a. s.	a. s.	✓	✓
Concentricity of shaft extension in accordance with DIN 42955 Tolerance R	**L07**						a. s.	a. s.	✓	✓
Standard shaft made of non-rusting steel	**L06**						a. s.	a. s.	✓	✓
Heating and ventillation										
Anti-condensation heaters for 230 V	**Q02**						a. s.	a. s.	✓	✓
Anti-condensation heaters for 115 V	**Q03**						a. s.	a. s.	✓	✓
Sheet fan cover	**F74**						a. s.	a. s.	✓	✓
Rating plate and extra rating plate										
Second rating plate, loose	**M10**						a. s.	a. s.	✓	✓
Nirosta rating plate	**M11**						a. s.	a. s.	✓	✓
Extra rating plate or rating plate with deviating rating plate data	**Y80** • and identification code						a. s.	a. s.	✓	✓
Extra rating plate with identification codes	**Y82** • and identification code						a. s.	a. s.	✓	✓
Additional information on rating plate and on package label	**Y84** • and identification code						a. s.	a. s.	✓	✓

For legend and footnotes, see Page 1/85.

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 (Aluminium)								
Packaging, safety notes, documentation and test certificates										
Without safety and commissioning note. Customer's declaration of renouncement required.	**B00**						a. s.	a. s.	○	○
With one safety and start-up guide per box pallet	**B01**						a. s.	a. s.	○	○
Acceptance test certificate 3.1 in accordance with EN 10204	**B02**						a. s.	a. s.	✓	✓
Operating instructions on CD enclosed	**B03**						a. s.	a. s.	✓	✓
Printed operating instructions English/German enclosed	**B04**						a. s.	a. s.	✓	✓
Wire-lattice pallet	**B99**						a. s.	a. s.	○	○
Connected in star for dispatch	**M01**						a. s.	a. s.	✓	✓
Connected in delta for dispatch	**M02**						a. s.	a. s.	✓	✓

❑ Standard version
○ With no extra charge
• This order code only determines the price of the version – Additional plain text is required.
✓ With extra charge
a. s. Available soon

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.

2) Can be combined with deep-groove bearings of series 60.., 62.. and 63… Not possible in combination with parallel roller bearings (e.g. bearings for increased cantilever forces, order code **L22**), brakd mounting or encoder mounting.

Accessories and spare parts

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.

Available from:
A. Friedr. Flender AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 (0) 2871-92 2185
Fax +49 (0) 2871-92 2579

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

Mounting of encoder

In the case of supply or mounting by the customer.

Options G72, G73

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

http://www.huebner-berlin.de/index_uk
e-mail: info@huebner-berlin.de

Option G71

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

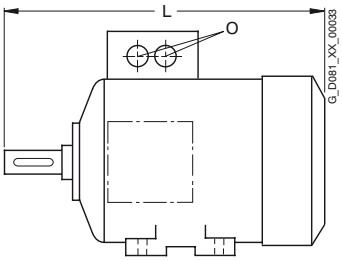
Spare motors and repair parts

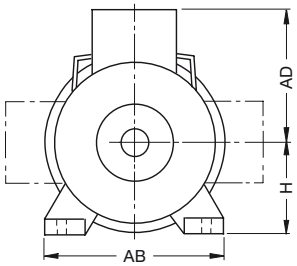
- Supply commitment for spare motors and repair parts following delivery of the motor
  - For up to 5 years, in the event of total motor failure, Siemens will supply a comparable motor with regard to the mounting dimensions and functions (the type series may vary).
  - Repair parts will be supplied for 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” article “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

Overview

Overall dimensions





Frame size	Type 1LE1	Number of poles	Dimensions L	AD	H	AB	O
100 L	General Line – Motors with shorter delivery time		a. s. [1]	166	100	196	2 x M32 x 1,5
	Self-ventilated energy-saving motors with improved/high efficiency		a. s. [1]	166	100	196	2 x M32 x 1,5
	Self-ventilated motors with increased output and improved/high efficiency		a. s. [1]	166	100	196	2 x M32 x 1,5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		a. s.	166	100	196	2 x M32 x 1,5
112 M	General Line – Motors with shorter delivery time		a. s. [1]	177	112	226	2 x M32 x 1,5
	Self-ventilated energy-saving motors with improved/high efficiency		a. s. [1]	177	112	226	2 x M32 x 1,5
	Self-ventilated motors with increased output and improved/high efficiency		a. s. [1]	177	112	226	2 x M32 x 1,5
	Forced-air-cooled motors without external fan and fan cover with improved/high efficiency		a. s.	177	112	226	2 x M32 x 1,5
132 S/ 132 M	General Line – Motors with shorter delivery time		464.5 [1]	202	132	256	2 x M32 x 1.5
	Self-ventilated energy-saving motors with improved/high efficiency		464.5 [1]	202	132	256	2 x M32 x 1.5
	Self-ventilated motors with increased output and improved/high efficiency		514.5 [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

a. s. Available soon

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

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	to 30	j6
	over 30 to 50	k6
	over 50	m6
N	to 250	j6
	over 250	h6
F, FA		h9

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

- Dimension tolerances

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

Dimension designation	Dimensions	Permitted deviation
A, B	to 250	±0.75
	over 250 to 500	±1.0
	over 500 to 750	±1.5
	over 750 to 1000	±2.0
	over 1000	±2.5
H	to 250	–0.5
	over 250	–1.0
E, EA		–0.5

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

- All dimensions are specified in mm.

More information

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.

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, 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.

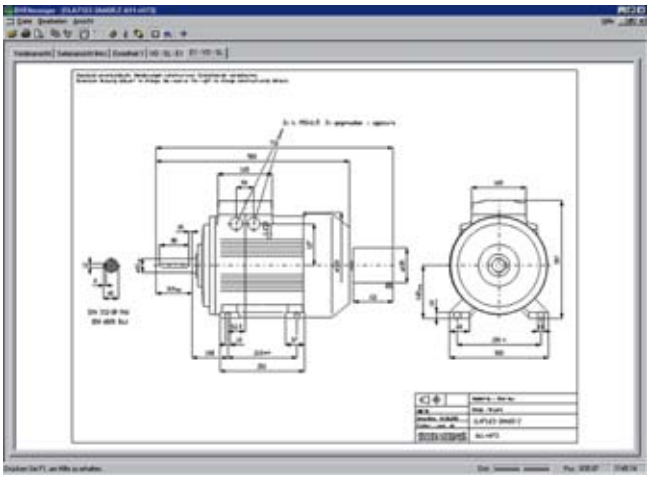
Order No. for CA 01, English international:
CD-ROM: E86060-D4001-A110-C5-7600
DVD: E86060-D4001-A510-C5-7600

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

Dimension sheet generator

(part of the SD configurator)

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



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

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

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

The SD configurator has been integrated into the 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.

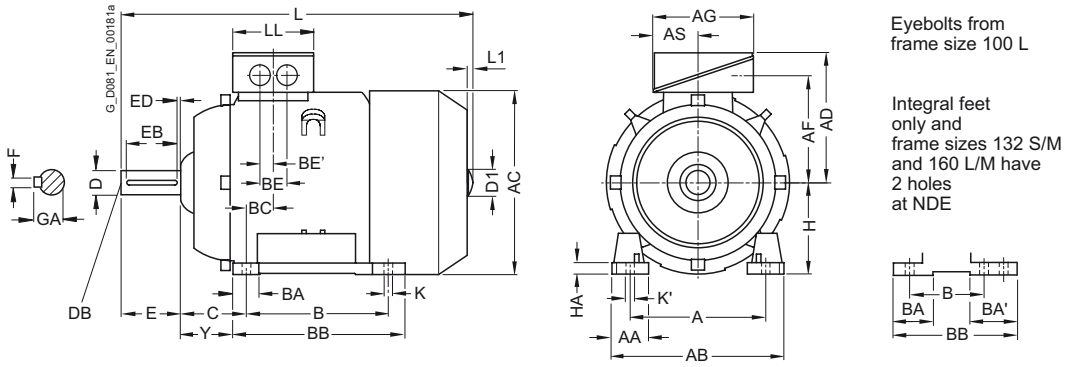
Dimensions

1

Dimensional drawings

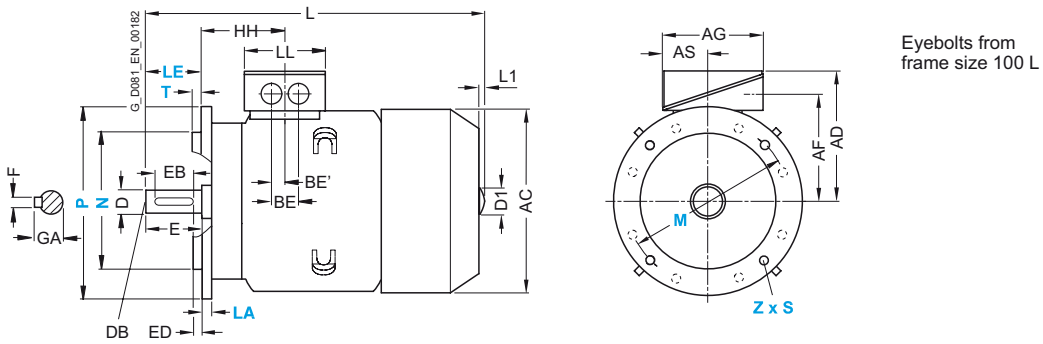
Aluminium series 1LE1, frame sizes 100 to 160 - General Line - motors with shorter delivery time

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	AD'	AF	AF'	AG	AS	B*	BA	BA'	BB	BC	BE	BE'	C	H	HA	Y
100 L	2, 4, 6, 8	a. s.	a. s.	196	a. s.	166	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	100	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	226	a. s.	177	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	112	a. s.	a. s.
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	70.5	140	38	76	218	26.5	48	24	89	132	15	a. s.
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	70.5	178	38	76	218	26.5	48	24	89	132	15	a. s.
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	77.5	210	44	89	300	47	57	28.5	108	160	18	a. s.
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	18	a. s.

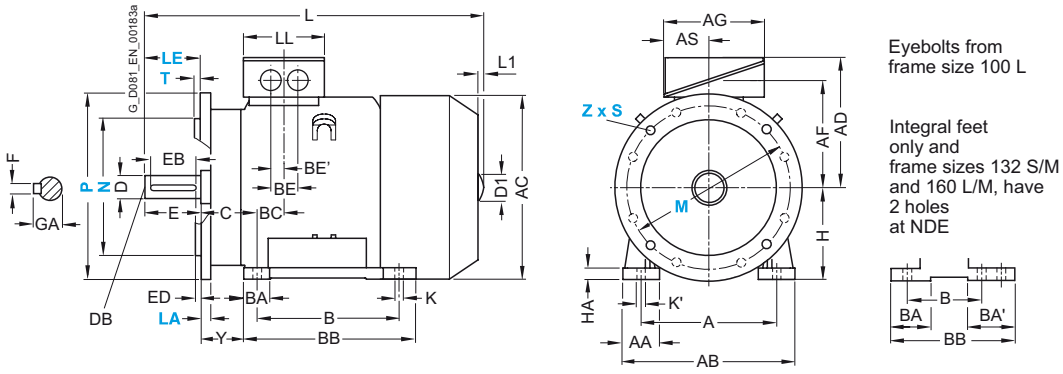
a. s. Available soon

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

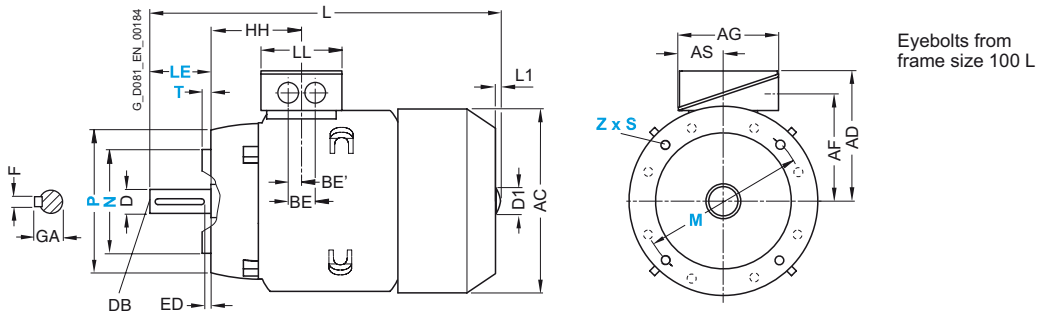
Dimensional drawings (continued)

Aluminium 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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132 S	2, 4, 6, 8	115.5	12	16	464.5	8.5	39	130	38	M12	80	70	5	10	41
132 M	2, 4, 6, 8	115.5	12	16	464.5	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

a. s. Available soon

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

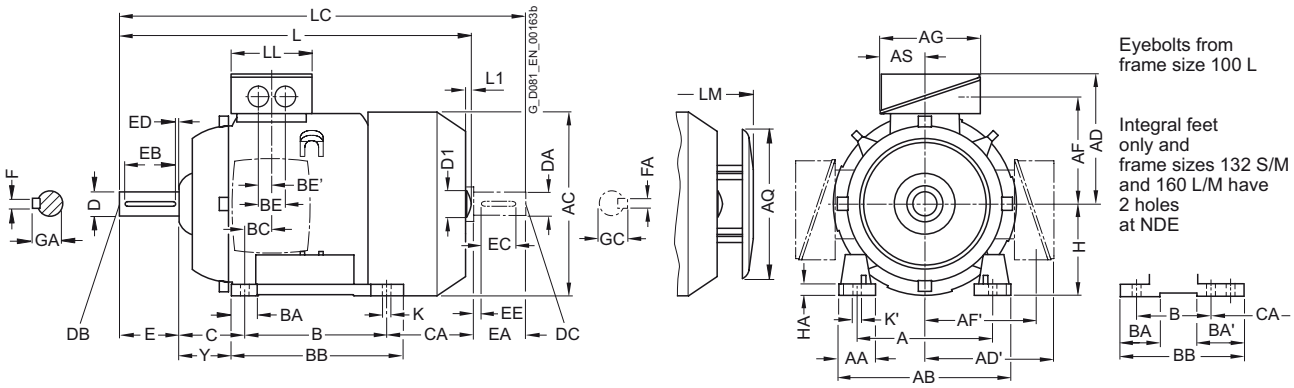
Dimensions

1

Dimensional drawings (continued)

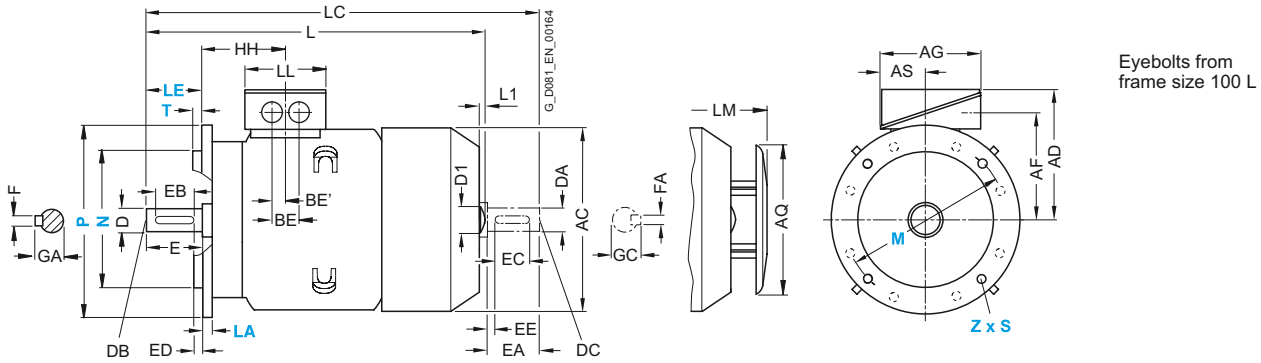
Aluminium series 1LE1, frame sizes 100 to 160 - self-ventilated energy-saving motors with improved/high efficiency

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
100 L	2, 4, 6, 8	a. s.	a. s.	196	a. s.	166	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	100	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	226	a. s.	177	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	112	a. s.	a. s.
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	260	70.5	140	38	76 [1]	218 [2]	26.5	48	24	89	128.5 [3]	132	15	a. s.
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 [3]	132	15	a. s.
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	260	77.5	210	44	89 [4]	300 [5]	47	57	28.5	108	148 [6]	160	18	a. s.
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 [6]	160	18	a. s.

a. s. Available soon

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

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

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

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

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

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

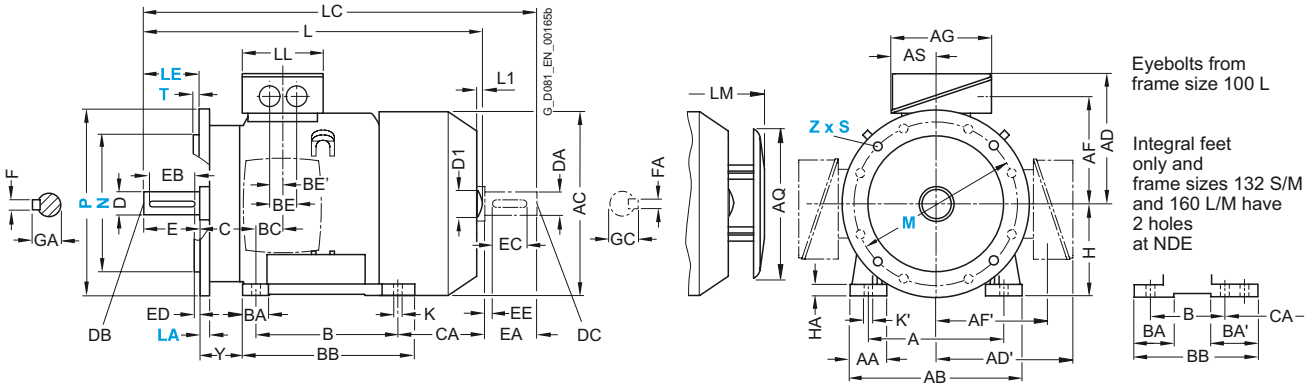
6) With screwed-on feet, dimension CA is 192 mm.

Dimensional drawings (continued)

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

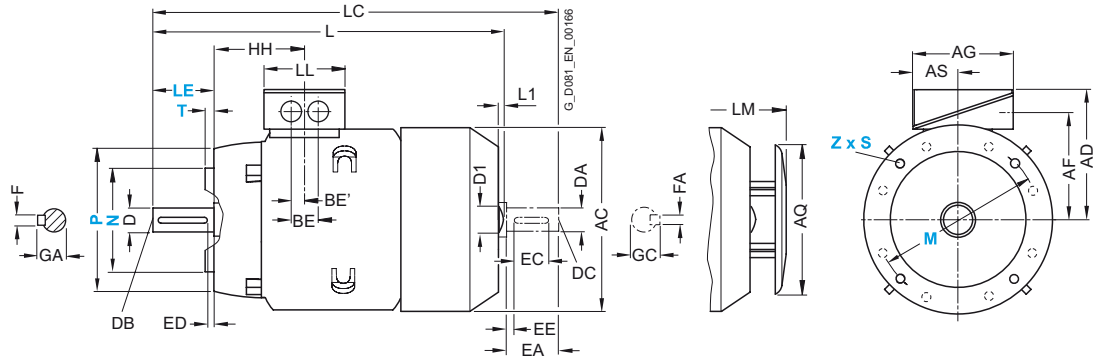
Type of construction IM B35

For flange dimensions, see Page 1/98 (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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132 S	2, 4, 6, 8	115.5	12	16	464.5	8.5	39	535.5	130	500	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31
132 M	2, 4, 6, 8	115.5	12	16	464.5	8.5	39	535.5	130	500	38	M12	80	70	5	10	41	28	M10	60	50	5	8	31
160 M	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45
160 L	2, 4, 6, 8	155	15	19	604	10	45	730	145	638	42	M16	110	90	10	12	45	42	M16	110	90	10	12	45

a. s. Available soon

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

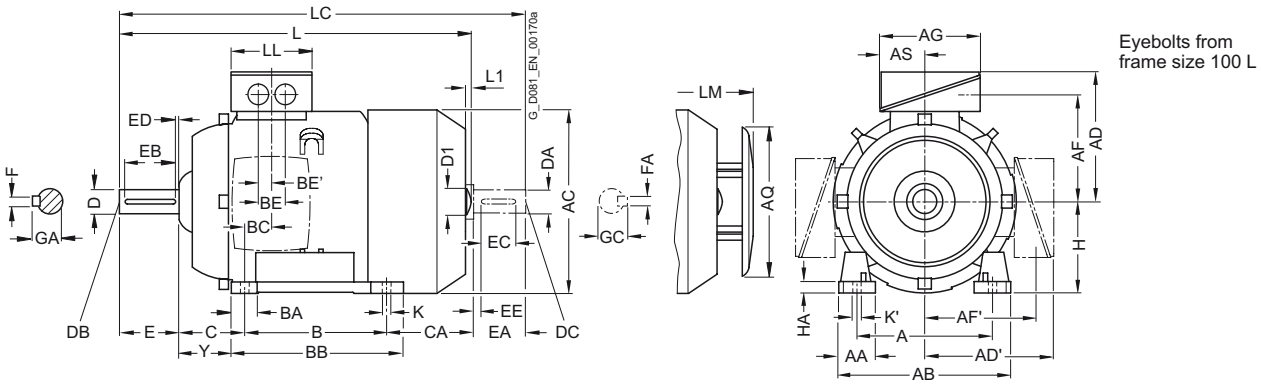
Dimensions

1

Dimensional drawings (continued)

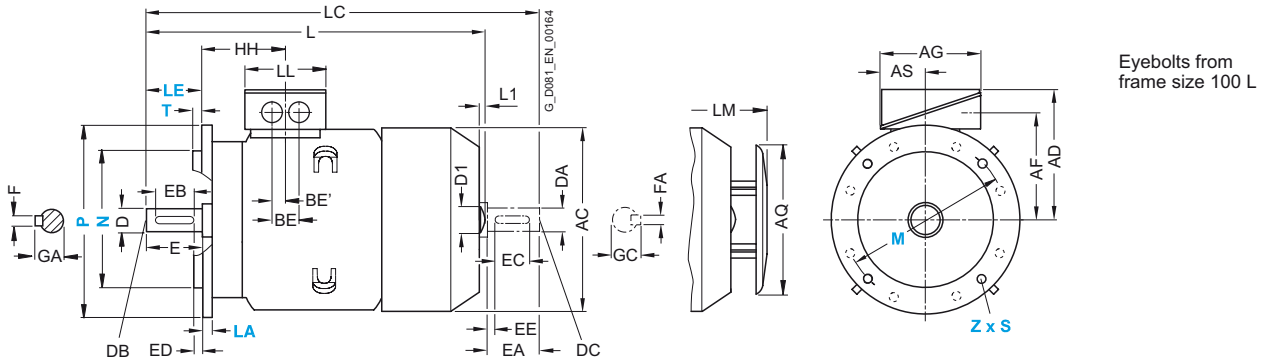
Aluminium series 1LE1, frame sizes 100 to 160 - self-ventilated motors with increased output and improved/high efficiency

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
100 L	2, 4, 6, 8	a. s.	a. s.	196	a. s.	166	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	100	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	226	a. s.	177	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	112	a. s.	a. s.
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	a. s.
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	a. s.

a. s. Available soon

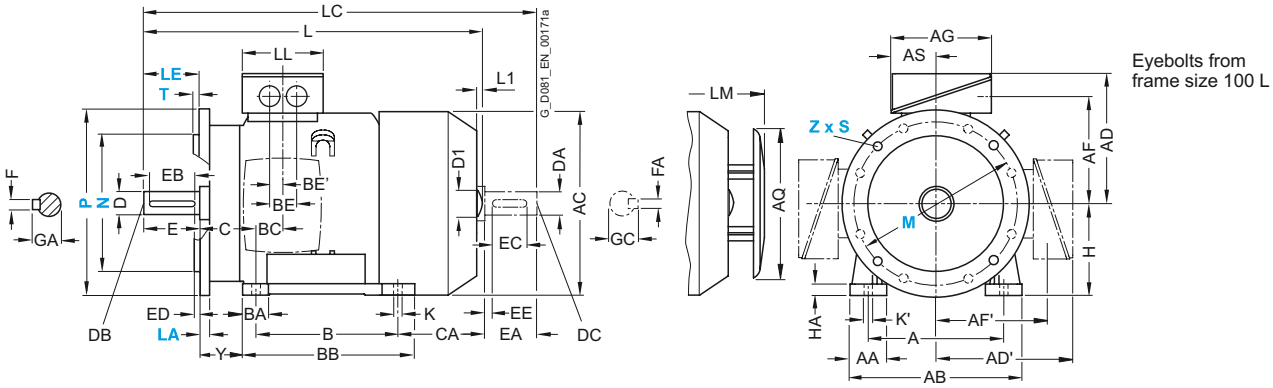
* This dimension is assigned in DIN EN 50347 to the frame size listed.

Dimensional drawings (continued)

Aluminium series 1LE1, frame sizes 100 to 160 - self-ventilated motors with increased output and improved/high efficiency

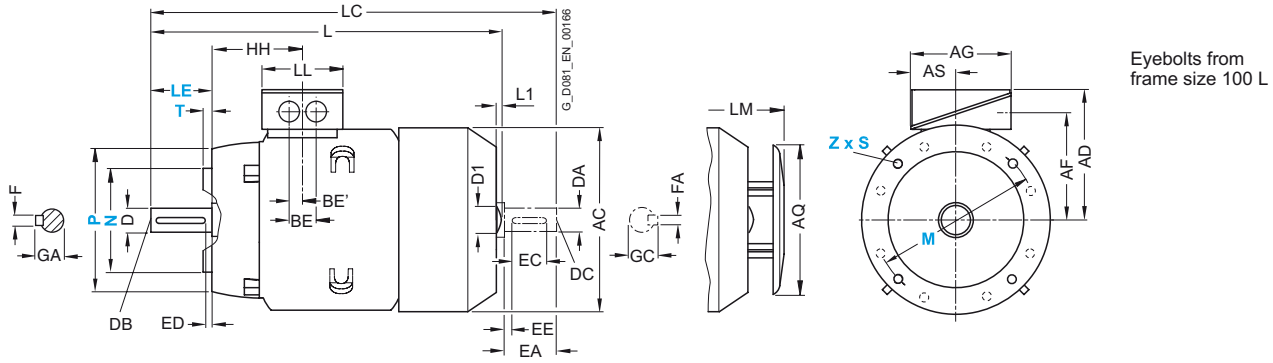
Type of construction IM B35

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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
132 M	2, 4, 6, 8	115.5	12	16	514.5	8.5	39	585.5	130	550	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

a. s. Available soon

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

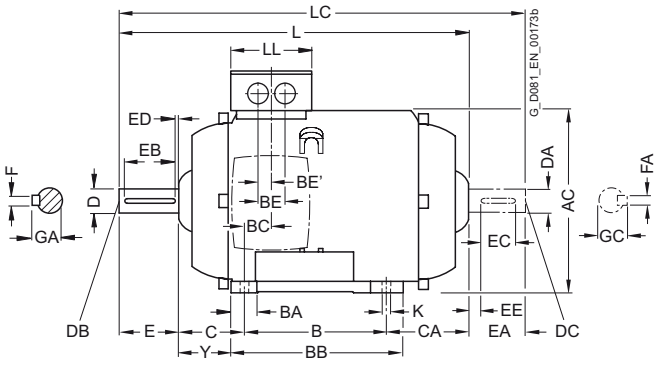
Dimensions

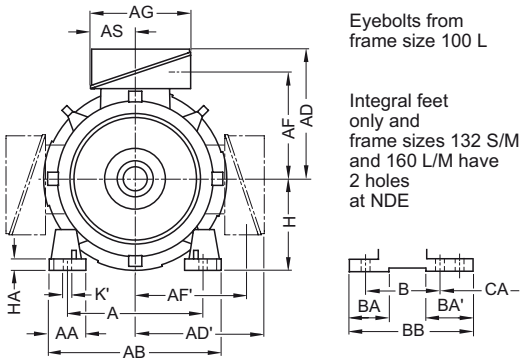
1

Dimensional drawings (continued)

Aluminium 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



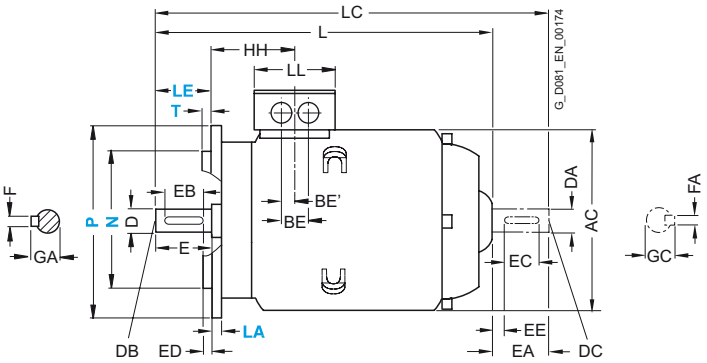


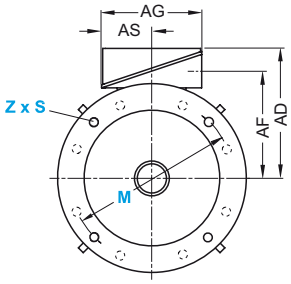
Eyebolts from frame size 100 L

Integral feet only and 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	HA	Y
100 L	2, 4, 6, 8	a. s.	a. s.	196	a. s.	166	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	100	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	226	a. s.	177	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	112	a. s.	a. s.
132 S	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	70.5	140	38	76 [1]	218 [2]	26.5	48	24	89	–	132	15	a. s.
132 M	2, 4, 6, 8	216	53	256	262	202	202	159.5	159.5	155	70.5	178	38	76	218	26.5	48	24	89	–	132	15	a. s.
160 M	2, 4, 6, 8	254	60	300	314	236.5	236.5	190	190	175	77.5	210	44	89 [3]	300 [4]	47	57	28.5	108	–	160	18	a. s.
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	18	a. s.

a. s. Available soon

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

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

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

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

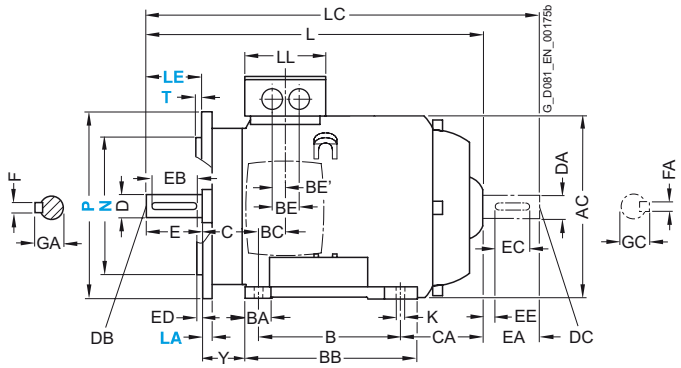
4) With screwed-on feet, dimension BB is 256 mm.

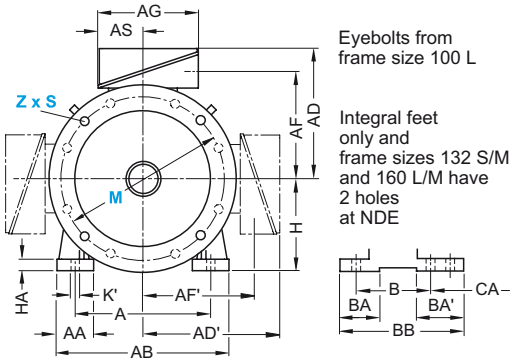
Dimensional drawings (continued)

Aluminium 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)



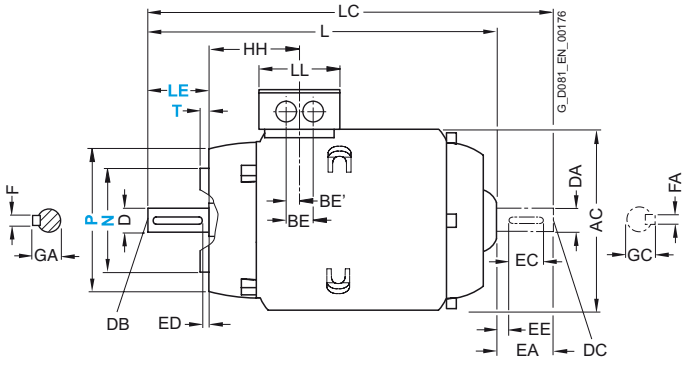


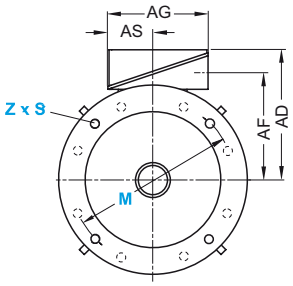
Eyebolts from frame size 100 L

Integral feet only and frame sizes 132 S/M and 160 L/M have 2 holes at NDE

Type of construction IM B14

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**						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	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
112 M	2, 4, 6, 8	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.	a. s.
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	–	–	–	–	–	–	–

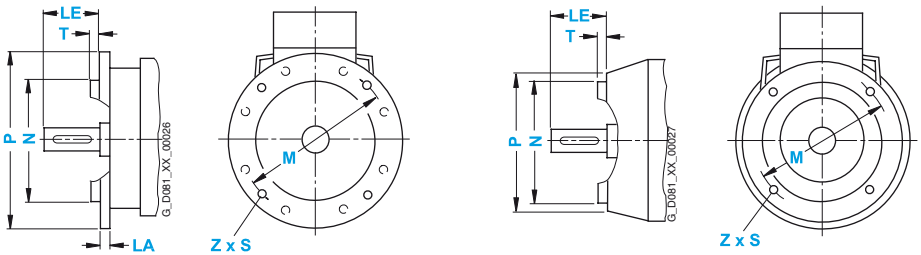
a. s. Available soon

Dimensions

1

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

Flange holes

Through holes for screwed union connections according to EN 50347 and EN 20273 serie “coarse”.

Positional toleration according to EN ISO 5458[1)].

Flange **FT** (IM B14) **S** Thread Size	Flange **FF** (IM B5) **S** (Tolerance H17) Diameter Size	Positional tolerance [1)]
M5	5.8	0.4
M6	7	0.5
M8	10	1
M10	12	1
M12	14.5	1.25
M16	18.5	1.25

1) Positional tolerance according to ISO 1101 for through holes, blind holes and threaded holes on one hole circle. It encloses the tolerance of the hole circle diameter, the tolerance of the angular pitch and the external concentricity of the hole circle to the center diameter as a reference object.

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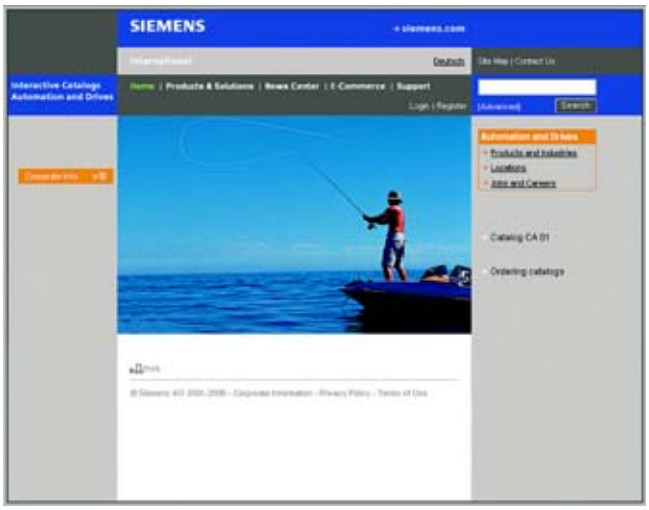

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Subject index

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.

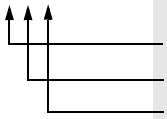
Percentage method

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.

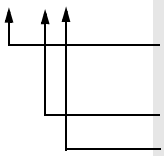
Metal factor examples

L E A – – –



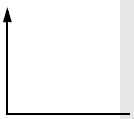
Basis for % surcharge: List price
Silver: basis 150 €, step range 50 €, 0.5%
Copper: basis 150 €, step range 50 €, 0.1 %
No surcharge for aluminum
No surcharge for lead
No surcharge for gold

N – A 6 – –



Basis for % surcharge: Customer net price
No surcharge for silver
Copper: basis 150 €, step range 50 €, 0.1 %
Aluminum acc. to weight, basic offic. price 225 €
No surcharge for lead
No surcharge for gold

– – 3 – – –



No basis necessary
No surcharge for silver
Copper acc. to weight, basic official price150 €
No surcharge for aluminum
No surcharge for lead
No surcharge for gold

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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	Official price	Official price	Official price	
			151 € – 200 €	201 € – 250 €	251 € – 300 €	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	Calculation based on raw material weight
3	150	
4	175	
5	200	
6	225	
7	300	
8	400	
9	555	

Misc.	
–	No metal surcharge

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2

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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".

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	Catalog
Automation and Drives	
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	
Variable-Speed Drives	
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11
SINAMICS G110 Inverter Chassis Units	D 11.1
SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters	D 12
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
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