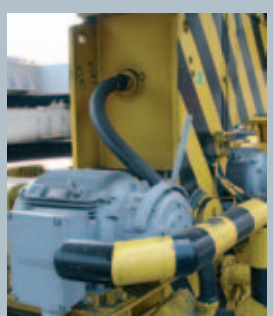
Catalog News HE 1 N · February 2007

cranes

Drive and
Control Components
for Hoisting Gear



SIEMENS

Related catalogs

Low-Voltage Motors D 81.1
IEC squirrel-cage motors
0.06 kW to 1250 kW

Order No.:
E86060-K5581-A111-A1-7600

Servo Motors DA 65.3
Synchronous and Asynchro-
nous Servo Motors for
SIMOVERT MASTERDRIVES

Order No.:
E86060-K5465-A301-A2-7600

Vector Control DA 65.10
SIMOVERT MASTERDRIVES VC
0.55 kW to 2300 kW

Order No.:
E86060-K5165-A101-A3-7600

Motion Control DA 65.11
SIMOVERT MASTERDRIVES MC
0.55 kW to 250 kW

Order No.:
E86060-K5165-A111-A3-7600

Catalog CA 01 CA 01
The Offline Mall of
Automation and Drives

Order No.:
CD-ROM: E86060-D4001-A110-C5-7600
DVD: E86060-D4001-A510-C5-7600

A&D Mall
Internet:
http://www.siemens.com/automation/mall

Cranes
Drive and Control Components for Hoisting Gear

Catalog HE 1 N
February 2007

Supercedes:
Catalog HE 1 · 1999, Part 2

The products and systems described in this catalog are manufactured and marketed using a certified quality management system in accordance with EN ISO 9001. The certificate is recognized in all IQNet countries.

SIEMENS

Welcome to Automation and Drives

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

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

Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners.
They will be glad to assist you.

Introduction

1

Short description

Overview

Siemens has for many years been one of the leading manufacturers of crane motors. This catalog covers the current range of three-phase motors for use in cranes. In addition to these motors, 1LG6 and 1LA8/1LL8/1PQ8 motors (catalog D 81.1) are used as traversing, luffing, and hoisting motors in converter-fed drives.

This catalog is aimed at crane manufacturers, system integrators, and crane operators. To make it easier to select motors, they are listed by speed and output (continuous and intermittent duty). The tables indicate the rated motor torques and the maximum permissible speeds.

The squirrel-cage motors with the DURIGNIT 2000 winding insulation are suitable for use on SIMOVERT MASTERDRIVES frequency converters. Since the hoisting motors in particular operate in a large field weakening range during converter operation, you must check – alongside the usual design criteria such as thermal load (effective torque) and maximum acceleration torque – whether the motor can still generate the required maximum torque in the field weakening range. A torque-speed diagram can be created to check this.

The requirements regarding the motors varies depending on the application conditions:

a) Gantry cranes that are used in production halls are not usually directly subjected to climatic influences. The motors do not necessarily need high degrees of protection or special paint.

b) Cranes located in seaports are often exposed to harsh weather, which means that special measures must be taken to protect the motors against corrosion, as well as the ingress of dust and water.

c) Cranes in steel works are often subject to very high ambient temperatures. The electrical and mechanical design (e.g. special bearings) must take this into account.

The various sections of this catalog cover the following motors:

Motor types	Designation	Degree of protection (standard version)	Type of cooling	Frame size	Output range (S3 – 40%)	Rated torque	Applications	Selection table as of page
					kW	Nm		
1LP4/6	Three-phase squirrel-cage motor with fitted DC-operated disk brake	IP55	Natural cooling	**132 S – 280 M**	2.4 to 105	23.9 to 695	Traversing and trolley travel motors	2/10
1LG4/6	Three-phase squirrel-cage motor Hoisting motors with fitted separately-driven fan	IP55	Surface cooling with forced ventilation	**315 L**	127 to 418	1265 to 2939	Hoisting motors (e.g. for stacker cranes)	3/3
1PH7	Three-phase squirrel-cage motor	IP55	Forced ventilation	**280**	140 to 228 [1] (at 480 V)	2228 to 3629	Hoisting motors	4/3
1PL6	Three-phase squirrel-cage motor	IP23	Forced ventilation	**280**	345 to 566 [1] (at 480 V)	3295 to 5405	Hoisting motors in the power house	4/15
1LT9	Three-phase slip ring motor	IP54	Surface cooling	**100 L – 200 L**	1.5 to 29	15 to 200	Traversing and hoisting gear motors	5/10
1LT8	Three-phase slip ring motor	IP54	Surface cooling	**225 M – 315 L**	20 to 315	246 to 2200	Hoisting gear motors	5/12
1LV9	Three-phase slip ring motor with fitted DC-operated disk brake	IP54	Surface cooling	**100 L – 200 L**	1.5 to 29	15 to 200	Traversing motors	6/6

Applications

Siemens hoisting gear motors are particularly suitable for hoisting operations under difficult conditions. These robust motors

- Offer a high degree of protection (with the exception of 1PL6) and are particularly suitable for harsh operating conditions;
- Offer torque reserves that can handle high impulse loads;
- Are specially optimized for high-inertia drives with high torque.

In conjunction with the fitted disk brakes, the highly compact 1LG4/6 brake motors are ideal for traversing gear in modern converter-fed cranes.

1PH7 and 1PL6 three-phase squirrel-cage motors are compact, forced-ventilated asynchronous motors with squirrel-cage rotors and degrees of protection IP55 (1PH7) and IP23 (1PL6). The motors are ventilated with a radial, separately-driven fan unit installed as standard. These motors are particularly suitable for use in enclosed rooms. The 1PH7 motors can also be set up outdoors with the right options.

The 1LT and 1LV three-phase slip ring motors:

- Have increased magnetization to achieve a greater stalling torque;
- Have reinforced banding to allow for higher speeds;
- Have degree of protection IP54 with open condensate drain holes, which allow condensate inside the motor to drain off;
- Are suitable for use with a stator-circuit phase-angle controller.

[1] Higher outputs available on request.

Technical specifications

Standards and regulations

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

Title	IEC	DIN/EN	Valid for machine type	
			Squirrel-cage rotor	Slip ring rotor
General specifications for rotating electrical machines	IEC 60034-1 IEC 60085	EN 60034-1	✓	✓
Asynchronous three-phase motors for general use with standardized dimensions and outputs	IEC 60072 mounting dimensions only	EN 50347	✓	✓
Start-up characteristics for rotating electrical machines	IEC 60034-12	EN 60034-12	✓	✓
Terminal designations and direction of rotation for rotating electrical machines	IEC 60034-8	EN 60034-8	✓	✓
Designation for construction type, installation and terminal box position	IEC 60034-7	EN 60034-7	✓	✓
Entry to terminal box	-	prDIN 42925 (08/99)	✓	✓
Built-in thermal protection	IEC 60034-11	-	✓	✓
Noise limit values for rotating electrical machines	IEC 60034-9	EN 60034-9	✓	✓
IEC standard voltages	IEC 60038	EN 60038	✓	✓
Cooling methods for rotating electrical machines	IEC 60034-6	EN 60034-6	✓	✓
Mechanical vibrations for rotating electrical machines	IEC 60034-14	EN 60034-14	✓	✓
Vibration limits	-	DIN ISO 10816	✓	✓
Degrees of protection for rotating electrical machines	IEC 60034-5	EN 60034-5	✓	✓
Surface-cooled three-phase motors for intermittent duty – mounting dimensions		DIN 42681		✓
Conical shaft extensions for electrical machines		DIN 1448		✓

Testing, quality assurance, acceptance inspection

Type testing is carried out for new machines. In series production, each motor is subjected to a routine test.

As part of quality assurance measures, the motors are subjected to in-process inspections.

Type test or routine test certificates can be issued upon request (must be specified in the order).

If motors are inspected by a customer or his agent, this incurs additional outlay because each motor will already have undergone standard testing. The inspection criteria must be specified in the order (fully clarified), as this is then used as a basis for calculating the overhead and billable costs.

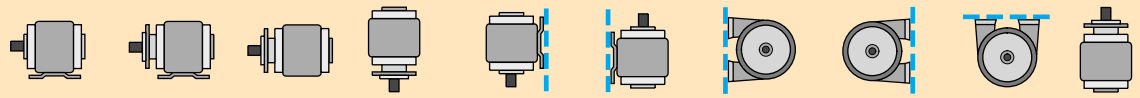
Technical explanations

Technical specifications

Types of construction in accordance with EN 60034-7/IEC 60034-7

Hoisting gear motors are primarily used in construction types IM B3, IM B5, IM V1, and IM B35, although they can be supplied in other construction types (please inquire).

The individual sections in this catalog provide information about the listed available construction types of the various motor series.



EN 600034-7 Code I	IM B3	IM B35	IM B5	IM V1	IM V5	IM V6	IM B6	IM B7	IM B8	IM V3
EN 600034-7 Code II	IM 1001	IM 2001	IM 3001	IM 3011	IM 1011	IM 1031	IM1051	IM 1061	IM 1071	IM 3031

Insulation

The insulation system protects the winding against aggressive gases, vapors, dust, oil and increased air humidity. It can withstand the vibrational stresses and ambient conditions that normally occur in hoisting operations.

Temperature classes

In EN 60034-1, the winding insulation (incl. impregnating material) is classified into temperature classes which are assigned specific overtemperatures.

The motor output specifications are uniformly based on a coolant temperature of 40 °C at a site altitude of 1000 m above sea level for all insulation classes. The various sections in this catalog provide information about the permissible outputs under other ambient conditions.

Temperature limit in K according to temperature class

B	F	H
80	105	125

Mechanical balance quality

Dynamic balancing

The rotors in the hoisting gear motors are balanced dynamically by means of a half featherkey in accordance with EN 60034-14 corresponding to vibration severity grade "N". To fulfill more stringent requirements regarding the balance quality, low-vibration versions can also be supplied (extra charge; please inquire).

Full-key balanced machines can also be supplied as special versions (please inquire).

Vibration severity

The vibration severity is the RMS value of the vibration velocity (frequency range from 10 to 1000 Hz).

A motor balanced in accordance with the relevant standard, however, may vibrate more strongly at the operating site.

This can be caused by the following factors:

- Unsuitable foundation
- Interference from the driven machine
- Components with a natural frequency that is almost identical to the frequency of the residual unbalance of the motor.

In cases such as these, each element in the system – not just the motor itself – needs to be checked.

The table below shows the limit values of electrical machines in accordance with EN 60034-14.

Limit values for vibration severity in mm/s		**RMS value for the shaft height H in mm**				
		Free suspension				**Rigid installation**
Vibration severity grade	Rated motor speed rpm	56 < H ≤ 132	132 < H ≤ 225	225 < H ≤ 400	H > 400	H > 400
		mm/s	mm/s	mm/s	mm/s	mm/s
N	600 to 3600	1.8	2.8	3.5	3.5	2.8
R	600 to 1900	0.71	1.12	1.8	2.8	1.8
	> 1900 to 3600	1.12	1.8	2.8	2.8	1.8
S	600 to 1800	0.45	0.71	1.12	-	-
	> 1800 to 3600	0.71	1.12	1.8	-	-

It must be noted that the measured values have a permissible tolerance of ± 10% from the above values.

The balancing type is stamped on the face of the DE shaft extension.

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

Technical specifications

Bearings

All motors are equipped with rolling-contact bearings.

Motors equipped with cylindrical roller bearings are shipped with a rotor shipping brace to prevent brinelling in the DE bearings during transportation and service life.

Shaft extensions

The squirrel-cage motors and the slip ring motors up to and including frame size 160 have cylindrical shaft extensions, while the slip ring motors above and including frame size 180 have a conical shaft extension. The motors are always supplied with a featherkey inserted in the shaft.

Coupling

The standard versions of hoisting gear motors are designed for coupling output. Pinion, chain, and belt outputs generate greater cantilever forces and bearing loads, which must be taken into account.

Motor protection

Hoisting gear motors are operated with a higher load factor for intermittent duty. If there is excessive power consumption, an undervoltage in the supply, an excessive ON duration, excessive coolant temperatures or if the heat is not being dissipated adequately (speed of naturally cooled machines is too low), this can cause the temperature in the windings to rise and the motors to overheat. Direct and indirect measures can be taken to protect the motors from overheating. An adequate monitoring concept should take into account all the relevant factors.

In intermittent duty, devices that offer indirect protection (e.g. circuit-breakers, overload relays, or I^2t monitors) can only partly detect the causes of overheating.

The most reliable method is to detect excessively high temperatures directly at the point at which they occur (i.e. the machine windings). In this way, the effects of all possible causes can be detected by a single means.

The resistance of the PTC thermistor detectors integrated in the windings increases significantly if the response temperature is exceeded. A tripping unit (catalog LV1) detects this increase and uses a contact to interrupt in the open-loop control circuit. An additional detector loop for emitting a warning signal just below the shutdown temperature can also be used in process-critical production processes to allow working cycles that have already been started to be brought to an end.

It is recommended that KTY 84 temperature sensors be installed in converter-fed drives (the basic versions of 1PL6 and 1PH7 motors are equipped with these sensors as standard). This sensor is embedded in the winding head of the motor in the same manner as a PTC thermistor. The data is evaluated directly in the converter. Warning and shutdown response limits can be set. Since only one sensor can be evaluated in the converter, this motor protection method is only suitable in single-motor drives; PTC thermistors are recommended for drives with more than one motor (e.g crane traversing gears).

Motor dimensioning

Overview

Motor dimensioning

When motors for hoisting gear drives are dimensioned (high-inertia drives), two criteria must be taken into account:

- The required maximum torque (starting torque)
- The rated output (thermal motor capacity).

When you check the torque, you check whether the motor can generate the required maximum torque (e.g. for acceleration). The maximum permissible torque is greater than the rated torque and is often specified as a multiple of the rated torque. An adequate safety margin from the stalling torque must be maintained.

When the output is dimensioned, the rated motor output is adjusted in accordance with the effective power demand of the load. The rated motor output depends on the motor temperature which, in turn, is influenced by the operating mode and the thermal behavior of the motor. This is why the the rated motor data varies depending on the different operating modes in accordance with EN 60034-1. The data is usually specified for one or more of the following operating modes:

- Continuous duty S1
  (also corresponds to intermittent duty S3 – 100%)
- Short-time duty S2
- Intermittent duty S3

Intermittent duties S4 and S5 vary to such an extent that accurate data can only be provided when certain additional conditions have been clearly defined.

The operating modes are defined in accordance with EN 60034-1.

Symbols used in formulae:

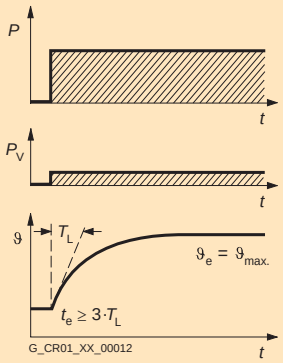
P	Load / specified motor output
P_V	Power loss of the motor
ϑ_e	Final temperature, steady-state temperature
ϑ_{max}	Max. winding temperature in relevant operating mode
ϑ_{mean}	Mean steady-state temperature
t_e	Operating time
t_p	Idle time
t_s	Duty cycle duration
T_L	Thermal time constant of the motor (running)
T_{St}	Thermal time constant of the motor (stationary)

Overview

Continuous duty (S1)

Definition

Operation with a constant load state, the duration of which is sufficient to attain thermal equilibrium.



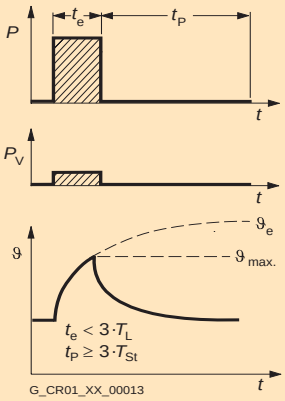
Explanation

The operating time t_e of the motor must be greater than 3 x T_L to ensure that thermal equilibrium is attained. The rated motor output for continuous duty must be designed such that the final temperature ϑ_e matches the permissible winding temperature. Start-up is deliberately discounted under the assumption that a single high-inertia start will not achieve the final temperature. The length of the subsequent idle time is insignificant. Caution is advised, however, when high-inertia starting is carried out on a warm machine or when a machine is started up several times in succession. Certain restrictions may apply or advice from a third party should be sought.

Short-time duty (S2)

Definition

Operation with a constant load state which does not, however, last long enough to attain thermal equilibrium, followed by idle time that lasts until the machine temperature differs from the coolant temperature by no more than 2 K.



Explanation

The operating time t_e must be less than 3 x T_L to ensure that the theoretical final temperature is not reached. The rated motor output and the operating time are harmonized in such a way that the maximum winding temperature ϑ_{max} does not exceed the permissible values. Here, too, start-up is deliberately discounted because it is assumed that the machine starts up cold and the start-up procedure is short with respect to the operating time t_e.

The rated motor output for short-time duty can be higher than for continuous duty, although the permissible operating time must also be specified. The shorter the operating time, the higher the rated output of the machine. Operating times of 10, 30, 60, and 90 min are recommended (see also "Selection and ordering data" for "1LT9 and 1LT8 three-phase slip ring motors ").

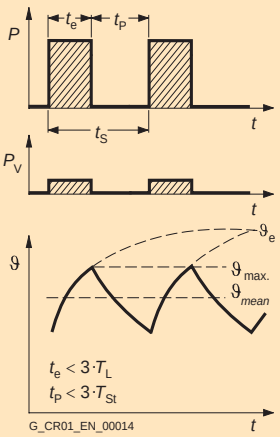
The subsequent idle time must be sufficiently long to ensure that the machine can cool back down to the ambient temperature (i.e. t_P is greater than or equal to 3 x T_{St}) because otherwise the maximum temperature will be exceeded the next time a similar duty cycle is carried out.

Overview

Intermittent duty without the effect of the start-up process (S3)

Definition

Operation that involves a sequence of similar duty cycles, each with a constant-load period and idle time, whereby the starting current does not have a noticeable effect on the temperature rise (the duty cycle duration is generally short enough to ensure that thermal equilibrium is not attained).



Explanation

The operating time t_e must be less than 3 x T_L to ensure that the theoretical final temperature ϑ_e is not reached. The subsequent idle time t_p, however, is also less than 3 x T_{St}, which means that the ambient temperature is no longer reached. A mean steady-state value ϑ_{mean} develops around which the temperature varies, but is below the theoretical final temperature ϑ_e.

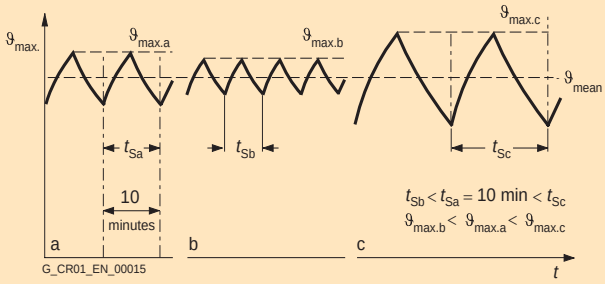
The rated motor output during intermittent duty is greater than during continuous duty. The time constants T_L and T_{St} may be different. This influences the rated output during intermittent duty and is taken into account in the S3 motor tables.

To determine the most suitable motor, therefore, a knowledge of the operating and idle times is required in addition to the required output during the operating time. These are specified by the duty cycle duration (total time) and the cyclic duration factor (CDF) as a percentage of the duty cycle duration. If the duty cycle duration is not specified, it is assumed to be 10 minutes (in accordance with EN 60034-1). The S3 motor tables are based on this value. Values of 15, 25, 40, and 60% are recommended for the cyclic duration factor.

Effect of varying duty cycle durations

The S3 rated output is designed in such a way that the temperature peaks ϑ_{max} match the permissible values with a 10 minute duty cycle duration (see "a" in diagram below). Shorter duty cycle durations are not critical because lower temperature peaks occur at the same mean winding temperature ϑ_{mean} (see "b" in diagram below). Since longer duty cycle durations result in higher temperature peaks (see "c" in diagram below) which, in turn, reduce the service life of the insulation, advice from a third party should be sought in this case.

In S3 duty, the start-up processes are not discounted; the relevant standard assumes that they do not have any significant influence on the temperature rise. Any number of duty cycles can be carried out per hour provided that this standard is fulfilled.

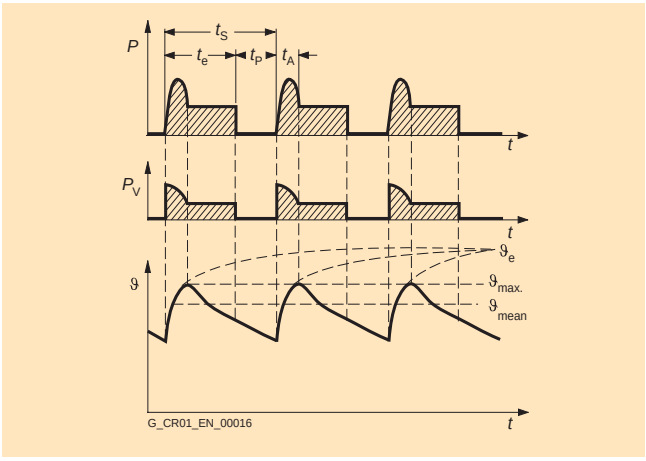


Overview

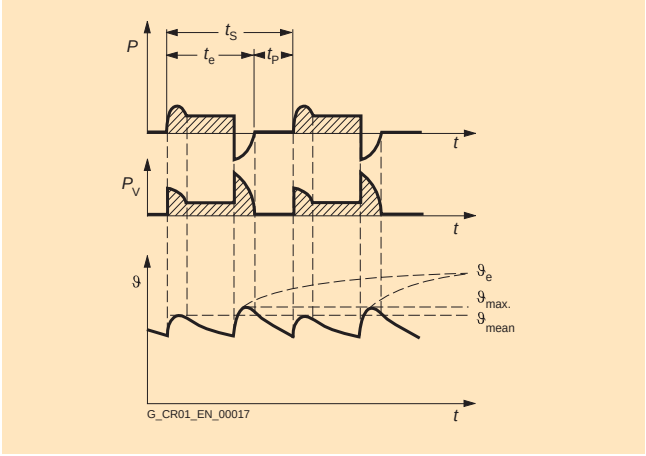
Intermittent duty with effect of the start-up process (S4)
Intermittent duty with effect of the start-up process and electrical braking (S5)

Definition

Operation that involves a sequence of similar duty cycles, each with a noticeable start-up time, a constant-load period, a period of rapid electrical braking (with S5), and idle time.



Intermittent duty S4



Intermittent duty S5

Explanation

These operating modes closely resemble S3 duty, except that the temperature rise caused by start-up and, in some cases, electrical braking is also detected. This additional power loss depends on the acceleration torque and the time in which this occurs; in other words, it depends on the linear and rotating masses to be accelerated (kinetic energy). The masses that are moved, therefore, must be known. These are based on the moment of inertia referred to the motor shaft. How often and over what period of time the masses are subject to acceleration and braking procedures must also be known.

The more duty cycles performed by the drives in hoisting gear in each hour (e.g. short traveling distances or low hoisting heights), the greater the importance of the acceleration work for motor dimensioning purposes.

To accurately dimension a motor for operating modes S4 and S5, therefore, the following specifications are required in addition to the steady-state output:

- Cyclic duration factor (CDF)
- External moment of inertia
- Acceleration or acceleration torque
- Accelerating time
- Number of working cycles per hour.

General performance specifications for motors in S4/S5 duty are not possible because they always vary depending on the specific conditions under which the driven machine is operating (external moment of inertia) and the operating mode (working cycles, ON duration). The hoisting gear drives do not have a constant load across several working cycles but instead have a collective load.

Motor dimensioning

Overview

Calculating the effective value, ON duration

Actual duty can also be converted to a thermally equivalent S3 mode by means of "effective value calculation", which means that the S3 motor tables can be used again.

A torque diagram (duty cycle diagram) must be available when the calculation is performed (see adjacent diagrams).

The value (assumed to be constant throughout the operating time) that would generate the same temperature rise as the actual torque is defined as the effective torque. The ON duration is the sum of operating times with respect to the total duty cycle duration.

If the individual traveling duty cycles are not the same (e.g. due to different loads or distances), all the different traveling cycles must be included in the effective value and ON duration calculation until they repeat themselves.

Differences in thermal behavior when the motor is running and when it is at a standstill are already taken into account with respect to the ON durations in the S3 tables. For this reason, M_{eff} must be calculated with respect to the operating time t_E and not to the duty cycle duration t_S.

To ensure that the effective value can be defined with sufficient accuracy, however, the operating phases during which the motor is not cooled as efficiently must be taken into account (e.g. during correction runs at low speeds and with naturally cooled motors).

Effects such as these can only be taken into account by the motor manufacturer.

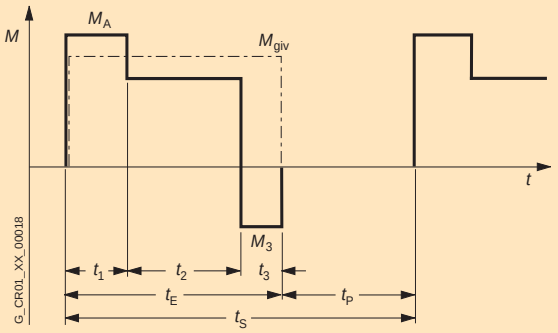
The operating conditions for hoisting and traversing gears also vary enormously:

- The external moment of inertia with respect to the motor moment of inertia is usually much greater in traversing gear than in hoisting gear; in other words, the acceleration and braking energy are more relevant for traversing gear than for hoisting gear even when the number of duty cycles performed and the ON duration are the same.
- The steady-state torque (load torque) with respect to the rated motor torque is usually greater in hoisting gear than in traversing gear (traveling resistance).
- The torque diagram for traversing gear does not take the direction of travel into account (without wind forces). The effect of the payload is minimal with high traversing gear weights; i.e. with handling cranes, it is repeated after each travel movement (after the second travel movement at the latest).
- The torque diagram for hoisting cranes is largely dependent on the load. The motor torques when the same load is hoisted and lowered are different (efficiency) and, in the case of handling cranes, a traveling duty cycle with a load is usually followed by a traveling duty cycle with empty load tackle (collective loading; see also FEM, Section I, Calculation Principles for Cranes); i.e. the cycle required for calculating the effective value is repeated after the fourth travel movement at the earliest.

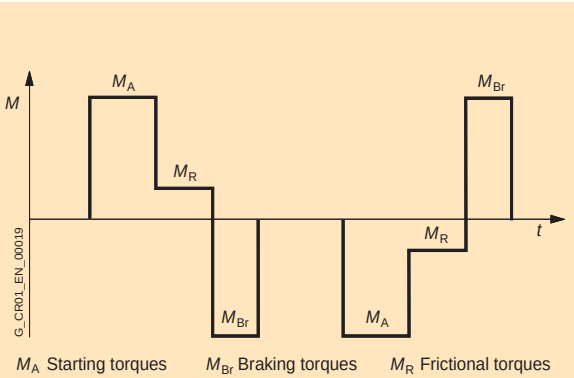
$$M_{eff} = \sqrt{\frac{\Sigma M^2 \cdot t}{t_E}}$$

ED ON duration $\frac{t_E \cdot 100}{t_S}$ %

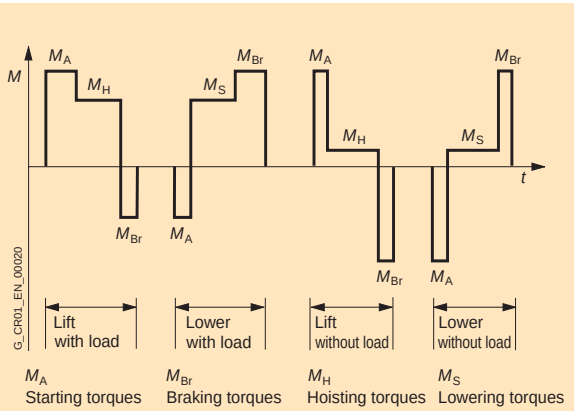
M_1, M_2, M_3	Torques in travel diagram
t_1, t_2, t_3	Operating times of torques M_1, M_2, M_3
t_P	Idle time
t_E	Operating time of motor = $t_1 + t_2 + t_3$
t_S	Duty cycle duration = $t_E + t_P$



Torque diagram



Typical torque diagram for traversing gear across one conveying cycle



Typical torque diagram for hoisting gear across one conveying cycle

Brake motors with fitted DC-operated spring-operated brake

2

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Overview

Three-phase squirrel-cage motor 1LP with fitted DC-operated spring-operated brake

The naturally cooled crane-type motors of type 1LP4 and 1LP6 form a compact drive unit when combined with the fitted spring-operated brake and are ideal for application as traversing motors. The DC-operated brake is designed as a holding brake, but is also capable of emergency shutdown braking operations at maximum motor speed. In the case of power failure, the brake is applied automatically by its spring force and brings the drive to a standstill.

Product range

The product range includes frame sizes 132 S to 280 M in the 5.5 kW to 132 kW power range for 4-pole motors, or in the 3 kW to 90 kW power range for 6-pole motors, for duty type S3 – 25% in each case.
As the table below shows, more than one type of brake can be fitted to a motor. This flexibility allows the user to tailor the drive unit – comprising of the motor and brake – to the exact requirements of the crane manufacturer.

The motors can also be ordered without a brake. The same order numbers apply, but the brake options are excluded.

Motor frame size	Brake type							
	KFB 10 100 Nm	KFB 16 160 Nm	KFB 25 250 Nm	KFB 30 300 Nm	KFB 40 400 Nm	KFB 63 630 Nm	KFB 100 1000 Nm	KFB 160 1600 Nm
132	X							
160	X	X						
180	X	X	X	X	X			
200		X	X	X	X			
225			X	X	X	X		
250			X	X	X	X	X	X
280					X	X	X	X

Technical specifications

Electrical design

Operating voltage

The crane-type brake motors are available for the following rated voltages:

- 400 V 3 AC, 50 Hz
- 460 V 3 AC, 50 Hz
- 500 V 3 AC, 50 Hz
- 690 V 3 AC, 50 Hz

The specifications change as follows for motors operating on a rated frequency of 60 Hz:

Rated speed +20%
Rated power +15%.

The standard model of brake coil is supplied for connection to 207 V DC (see also technical specifications for brakes).

Motor protection

The following protective equipment can be installed (see also Options):

- 3 PTC thermistors for tripping
- 3 PTC thermistors for tripping and 3 PTC thermistors for alarm
- 1 KTY 84-130 temperature sensor for evaluation in the converter
- 3 bimetallic-element switches (Klixon) for tripping

Standstill heating

The motors can be provided with an anti-condensation heating device. The heat outputs are as follows:

Motor frame size	Heat output W
132 to 160	100
180 to 200	55
225 to 250	92
280	109

Voltages, see Options.

It is also possible to connect a voltage (which should equal approximately 4 to 10% of the rated motor voltage) to stator terminals U1 and V1. 20 to 30% of the motor rated current is normally sufficient to provide adequate heating.

Insulation

The motor windings are designed to comply with insulation class F.

Dielectric strength

See Catalog D 81.1.

2

Technical specifications

Mechanical design

1LP4/1LP6 motors are naturally cooled units without fans. Depending on the frame size, brakes with different torques can be built onto the motors. The housing and terminal box are made of grey cast iron. The brake itself does not have a separate terminal box; all the brake connections, whether coil, microswitch or heater, are taken to the motor terminal box.

Types of construction

The motors are available in types of construction IM B3, IM B35, IM V5, IM B5 and IM V1. Other types of construction on request. The position of the condensate drain holes is determined by the construction type.

Housing

The housing and terminal box of the motor are made of grey cast-iron.
The DE flange and the feet (bolted-on) can be supplied in GGG 40 as an option.

Type of protection

The degree of protection of the standard motor models is IP55. IP56 is also available as an option.
The water drain holes on motors with this degree of protection must be opened at regular intervals as part of the maintenance cycle to allow any condensate that has collected inside the motor to drain off.

Paint finish

The motors are coated as standard in a special paint finish RAL 7030 with a coat thickness of 180 µm. Other colours are available at an additional cost.
A further option is an "offshore paint finish" with a coat thickness of 220 µm.

Mounted equipment

Encoders, such as the POG10 incremental encoder (made by Hübner), can be mounted on the brake motors.
The brakes themselves can be supplied with an emergency manual release mechanism (see KFB spring-operated brake "Emergency release with hand lever").

Terminal box

On standard models, the terminal box is mounted on the top at the DE and is always the next size larger than on the basic models of the 1LG motor. The feet are cast iron.

The terminal box can also be positioned on the left or right (as viewed from the DE), but this option is only possible on motors with bolted-on feet. If the motor is to have bolted-on feet and a terminal box positioned on top, options **K11** and **J22** must be selected in the order.

All connecting terminals for the motor and brake including auxiliaries are housed in the motor terminal box.

Motor frame size	Terminal box	Terminal stud	Max. cross section mm²	Cable entry hole	Sealing area mm
132, 160	GT320	M5	16	M40 x 1.5	19 to 28
180	GT341	M5	16	M40 x 1.5	19 to 28
200	GT491	M6	25	M50 x 1.5	27 to 35
225	GT591	M8	35	M50 x 1.5	27 to 35
250, 280	GT691	M10	120	M63 x 1.5	32 to 42

Auxiliary terminal designations

Temperature sensor	Terminal designation
3 PTC thermistors for pre-warning	1TP1-1TP2
3 PTC thermistors for tripping	2TP1-2TP2
Bimetallic (NC contact)	2TP1-2TP2
Anti-condensation heating (motor)	HE1-HE2
Brake coil DC	BA1-BA2
Brake coil AC	BD1-BD2
Anti-condensation heating (brake)	BRHE1-BRHE2
Microswitch brake opened	BRS1-BRS3
Microswitch brake air-gap monitoring	BRS1-BRS3

Shaft extension

Standard brake motors are designed with a cylindrical shaft extension.

Maximum speed

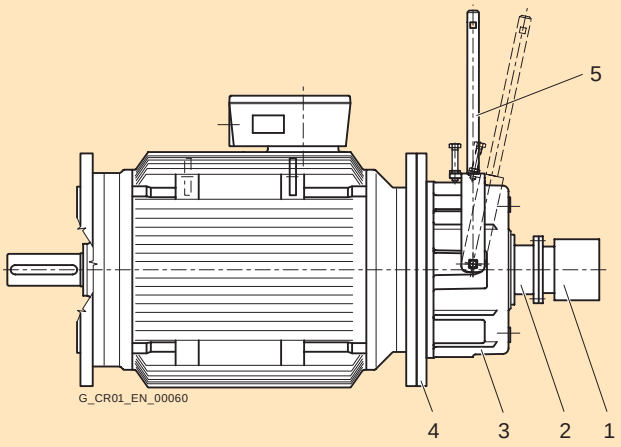
The maximum permissible speed is 3000 rpm.

Bearings

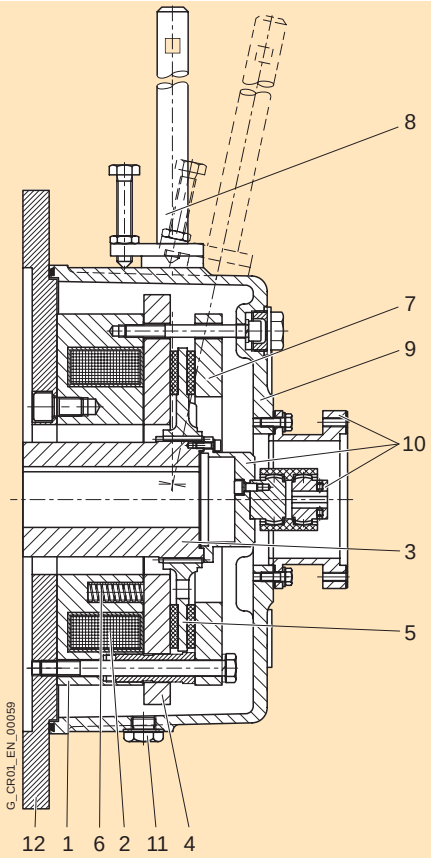
Motor frame size	DE bearings	NDE bearings
132	6208 2ZC3	6208 2ZC3
160	6209 2ZC3	6209 2ZC3
180	6210 ZC3	6210 ZC3
200	6212 ZC3	6212 ZC3
225	6213 ZC3	6213 ZC3
250	6215 ZC3	6215 ZC3
280	6217 C3	6217 C3

Design of KFB Spring-operated brake

The electromagnetic double-disc spring-operated brake KFB (see picture on the bottom right) is intended to operate solely as a holding brake for this application. With the exception of emergency braking, it may only be operated as a dynamically loaded operational brake if it is appropriately dimensioned (see pages 2/7 and 2/9) or after consultation with the manufacturer. It is a spring-loaded, electrically released, double-disc brake, which operates when the power is switched off. When the coil (**2**) is energised with a DC voltage, the brake is released electromagnetically. If the coil (**2**) is de-energised, the springs (**6**) press the armature plate (**4**) axially against the friction-lining carrier (**5**) which in turn presses against the brake flange (**7**). This sequence provides the braking action. The brake is released when the coil (**2**) is energised. The magnetic field attracts the armature plate (**4**) towards the coil form (**1**), counteracting the spring pressure on the coil form. The air gap can be adjusted within a wide range, ensuring high availability of the brake. The motor and brake are coupled by means of a flange (**12**). Emergency brake release is possible by means of two emergency release screws – optionally with hand lever release.
As a result of the compact design with the enclosed coil form housing and appropriate sealing from the shaft, the brake has degree of protection IP67 when the housing is closed.
All the brake connections such as coil, microswitch, etc. are taken to the motor terminal box.



1 Rotary encoder POG10
2 Tacho bushing T2 with coupling and assembly components
3 KFB brake
4 IEC mounting flange
5 Hand lever for emergency release (option)



1 Coil form
2 Coil
3 Hub
4 Armature plate
5 Friction-lining carrier
6 Springs
7 Brake flange
8 Hand lever
9 Housing
10 Tacho assembly components
11 Service screw
12 Mounting flange

2

Design of KFB Spring-operated brake

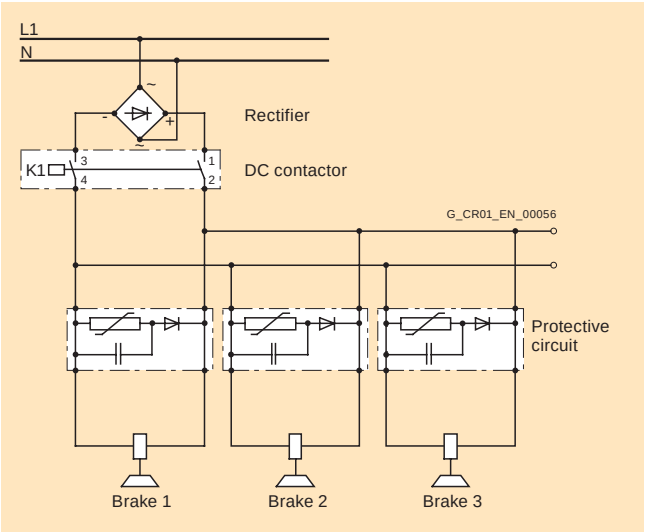
Protective element

The brakes should be operated at the DC end, i.e. between the rectifier and coil (see circuit diagram below). This ensures a significantly shorter closing time than if the brake were operated at the AC end. A protective element (varistor + spark quenching) must be fitted in parallel to each brake coil. This protects the brake coil against excessively high de-energization voltages on the one hand, and the contactor contacts on the other. These protective elements should be installed close to the brake coils where possible, e.g. in the motor terminal box or in a distribution board on the subframes in the case of traversing gear.
Protective elements PE-400/150/5 are directly available from the manufacturer [1] under order number 008099300249.

Technical specifications

Protective element	
Max. connection voltage (coil voltage)	400 V DC
Max. coil current	5 A
Max. energy absorption of one trip	150 J
Max. continuous output (average) of energy absorption	5 W
Trip peak at max. coil current	< 450 V
Ambient temperature	–40 °C to +50°C
Permissible cross section of connecting lead	0.2 to 2.5 mm^2
Weight, approx.	0.2 kg
Type of protection	IP20

Dimension drawing, see page 2/24.



Special versions

Emergency release with hand lever, option **J25**

In addition to brake release at zero current via two emergency release screws, it is also possible to release the brake by means of a hand lever permanently mounted on the brake housing. The lever is lockable.

Microswitch for "brake released" monitoring, option **J26**

The brake can be fitted with a microswitch for monitoring the "brake released" state. The contact is rated for:

- < 30 V DC, 5.0 A
- < 125 V DC, 0.5 A
- < 250 V AC, 5.0 A

Microswitch for air-gap monitoring/wear, option **J24**

A 2nd microswitch can be fitted to monitor the "maximum air gap" function. Tripping of this contact indicates that full braking power is no longer available and the air gap must be adjusted immediately. The contact load rating is identical to that of the "brake released" microswitch.

Anti-condensation heating, option **J27**

The installation of a heater can prevent the formation of condensate, e.g. caused by fluctuations in temperature and air humidity, inside the brake. This heater must not be switched on when the motor is operating.
The heater is designed for a supply voltage of 230 V AC and a heat output of 40 W.

Encoder mounting, option **J28/J29**

An encoder (e.g. POG10) can be mounted on the brake.
It is also possible to retrofit an encoder by replacing the brake housing (the parts required, such as new housing, coupling, etc., can be ordered directly from the manufacturer [1] using the brake serial number as a reference).

Brake control unit BCU

A brake control unit (BCU) can also be used to supply and monitor the brake on single drives. For technical specifications, price, etc., please contact the manufacturer [1] directly.

Rectifier for brake in terminal box, option **C07**

The brake motors can also be supplied with a bridge rectifier already fitted.
Important!
It is absolutely necessary to observe that due to switching on the AC side the brake application time may be 10 times longer than the values indicated in the table on page 2/9.

[1] Manufacturer:
Pintsch Bamag GmbH
Hünxerstr. 149
D-46537 Dinslaken
Germany
Tel. (+49)2064/602-0
www.PintschBamag.de

Planning guidelines for KFB Spring-operated brakes

The following dimensioning parameters must be taken into account when a brake is selected:

Braking torque

On the assumption that the deceleration rate must be approximately equal to the acceleration rate, the braking torque should be calculated as follows:

$M_{BR} = M_{Ja} \times \eta^2$

M_{BR} = Braking torque of mechanical brake
M_{Ja} = Accelerating torque for accelerating linear-motion and rotating masses

Accordingly, the braking torque of the mechanical brake must be approximately equal to the required maximum motor torque.

Braking energy on emergency trip

The braking energy for occasional emergency trips must be checked to ensure that it does not cause the brake to overheat. Please refer to table "Technical specifications of brakes" for permissible values. The braking energy produced for traversing gear can be calculated approximately with the following equation:

$$Q = \frac{I_{tot} \times n_{Br}^2}{182,4 \times 10^3} \times \frac{M_{Br}}{M_{Br} \pm M_L} \left[\text{kJ}\right]$$

Q = Energy capability/braking energy in kJ
M_{Br} = Existing braking torque in Nm
M_L = Total of all load torques in Nm referred to the brake (motor) shaft
n_{Br} = Speed of brake (motor) shaft in rpm
I_{tot} = Total moment of inertia to be braked in kgm^2 reduced to the brake (motor) shaft
M_L = is positive if it supports braking (e.g. hoisting a load)
M_L = is negative if it counteracts braking (e.g. lowering a load)

The total moment of inertia I_{tot} is the sum of the individual moments of inertia of the plant components to be braked, reduced to the brake (motor) shaft, and the moment of inertia of the linear-motion masses. The equivalent mass inertia I_{Eqv} of a linear-motion mass m with velocity ν, referred to the brake (motor) speed n_{Br}, is calculated as follows:

$$I_{Eqv} = 91.2 \times m \times \left(\frac{\nu}{n_{Br}}\right)^2 \left[\text{kgm}^2\right]$$

m = Mass of the linear-motion load in kg
ν = Velocity of the linear-motion load in m/s
n_{Br} = Speed of the brake (motor) shaft in rpm

The velocity and/or speed to be entered here must equal the maximum values in normal operation. An increase in velocity resulting from wind forces may also need to be taken into account.

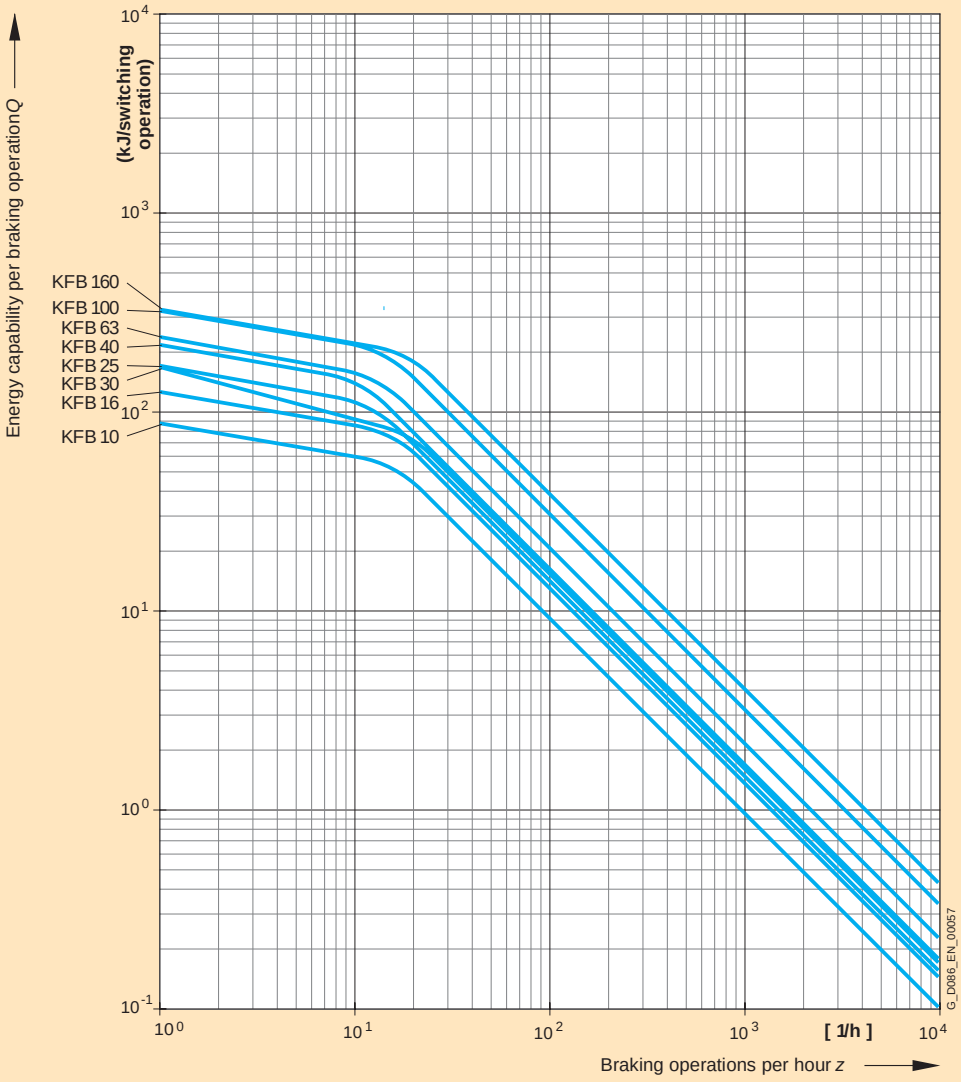
2

Planning guidelines for KFB Spring-operated brakes

Braking energy and energy capability

The brake must be capable of absorbing the heat produced by the occasional emergency braking operation. The maximum permissible energy capability *Q* is shown in the diagram below as a function of the number of switching operations.

The permissible energy capability *Q* for a single emergency trip can be found in table "Technical specifications of brakes".



When the switching energy per braking operation and number of braking operations per hour are known, the brake size can be calculated.
Example:

Q = 35 kJ/switching operations and
z = 100 braking operations/hour
= brake KFB 160

Energy capability *Q*, braking speed *n* = 1500 rpm

Technical specifications of KFB Spring-operated brakes

		KFB 10	KFB 16	KFB 25	KFB 30	KFB 40	KFB 63	KFB 100	KFB 160
Braking torque	Nm	100	160	250	300	400	630	1000	1600
Permissible speed	rpm	6000	6000	6000	6000	5500	4700	4000	3600
Rated voltage [1]	V DC	207	207	207	207	207	207	207	207
Rated power	W	100	118	160	154	188	206	316	340
Rated current	A	0.48	0.57	0.77	0.74	0.91	1	1.53	1.64
Mass inertia	kgm^2	0.0017	0.0037	0.0048	0.0055	0.0068	0.017	0.036	0.05
Weight, approx.	kg	19	28	42	50	55	74	106	168
Energy capability Q at n =1500 rpm/z = 1	kJ	88	126	169	167	216	235	321	331
Energy capability Q at n =1500 rpm/z = 100	kJ	8	11.7	12.6	13.8	14.5	18.4	27.1	34.8
Closing time t_1	ms	55	75	80	85	90	120	135	195
Release time t_2	ms	128	173	239	245	251	342	375	498

Q = Energy capability per braking operation [kJ per switching operation]
n = Speed [rpm]
z = Braking operations per hour [1/h]
t_1 = Closing time [2]: time from power OFF until 90% of rated braking torque is reached
t_2 = Release time [2]: time from power ON until 10% of rated braking torque is reached
t = Measured at 20°C

The normal version of the brake is supplied for a coil voltage of 207 V DC. Voltages of 110 V DC and 180 V DC are also available at no extra cost (please state in plain text in the order). Other coil voltages on request.

[1] Rated voltage according to DIN IEC 38 with tolerances of +6% and –10% according to DIN VDE 0580

[2] Switching time terms defined according to DIN VDE 0580; Closing time t_1 = Connection time t_1; Release time t_2 = Disconnection time t_2

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Additional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
4-pole, 1500 rpm, 50 Hz												
Intermittent duty S3 – 15% or S2 – 30 min.												
132 S	1440	6.6	43.8	13.7	72	22.8	0.018	**1LP6130-4CA 9** ■ ■■■		**1LP6130-4CM8** ■	–	55
132 M	1440	9	59.7	18.3	98	30.4	0.023	**1LP6133-4CA 9** ■ ■■■		**1LP6133-4CM8** ■	–	62
160 M	1440	13.2	87.5	25.8	144	43	0.043	**1LP6163-4CA 9** ■ ■■■		**1LP6163-4CM8** ■	–	100
160 L	1440	18	119.5	34.5	196	57	0.055	**1LP6166-4CA 9** ■ ■■■		**1LP6166-4CM8** ■	–	114
180 M	1455	22.2	146	42	242	70	0.099	**1LP4183-4CA 9** ■ ■■■		**1LP6183-4CM8** ■	135	150
180 L	1455	26.4	173	50	286	83	0.12	**1LP4186-4CA 9** ■ ■■■		**1LP6186-4CM8** ■	150	175
180 L	1455	36	236	71	392	118	0.14	**1LP4188-4CA 9** ■ ■■■		**–**	175	–
200 L	1455	36	236	67	392	112	0.19	**1LP4207-4CA 9** ■ ■■■		**1LP6207-4CM8** ■	195	220
200 L	1455	44	289	83	482	138	0.23	**1LP4208-4CA 9** ■ ■■■		**1LP6208-4CM8** ■	220	280
200 L	1458	54	354	102	596	170	0.29	**1LP4204-4CA 9** ■ ■■■		**–**	280	–
225 S	1467	44	286	82	480	136	0.37	**1LP4220-4CA 9** ■ ■■■		**1LP6220-4CM8** ■	255	290
225 M	1467	54	352	97	582	162	0.45	**1LP4223-4CA 9** ■ ■■■		**1LP6223-4CM8** ■	290	320
225 M	1467	66	430	119	712	198	0.49	**1LP4228-4CA 9** ■ ■■■		**–**	320	–
250 M	1474	66	427	120	710	200	0.69	**1LP4253-4CA 9** ■ ■■■		**1LP6253-4CM8** ■	375	445
250 M	1478	90	581	164	966	272	0.86	**1LP4258-4CA 9** ■ ■■■		**1LP6258-4CM8** ■	445	505
250 M	1478	108	698	195	1160	324	0.98	**1LP4254-4CA 9** ■ ■■■		**–**	505	–
280 S	1482	90	580	164	964	272	1.2	**1LP4280-4CA 9** ■ ■■■		**1LP6280-4CM8** ■	515	560
280 M	1483	108	695	192	1158	320	1.4	**1LP4283-4CA 9** ■ ■■■		**1LP6283-4CM8** ■	560	660
280 M	1485	132	849	238	1414	396	1.71	**1LP4288-4CA 9** ■ ■■■		**1LP6288-4CM8** ■	660	720
280 M	1484	158	1017	294	1698	490	1.9	**1LP4284-4CA 9** ■ ■■■		**–**	720	–

Type of construction:			
IM B3, IM V5		**0**	**0**
IM V1, IM B5		**1**	**1**
IM B35		**6**	**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
4-pole, 1500 rpm, 50 Hz												
Intermittent duty S3 – 25% or S2 – 60 min.												
132 S	1455	5.5	36	11.4	72	22.8	0.018	**1LP6130-4CA 9** ■ ■■■		**1LP6130-4CM8** ■	–	55
132 M	1455	7.5	49	15.2	98	30.4	0.023	**1LP6133-4CA 9** ■ ■■■		**1LP6133-4CM8** ■	–	62
160 M	1460	11	72	21.5	144	43	0.043	**1LP6163-4CA 9** ■ ■■■		**1LP6163-4CM8** ■	–	100
160 L	1460	15	98	28.5	196	57	0.055	**1LP6166-4CA 9** ■ ■■■		**1LP6166-4CM8** ■	–	114
180 M	1455	18.5	121	35	242	70	0.099	**1LP4183-4CA 9** ■ ■■■		**1LP6183-4CM8** ■	135	150
180 L	1455	22	143	41.5	286	83	0.12	**1LP4186-4CA 9** ■ ■■■		**1LP6186-4CM8** ■	150	175
180 L	1455	30	196	59	392	118	0.14	**1LP4188-4CA 9** ■ ■■■		**–**	175	–
200 L	1465	30	196	56	392	112	0.19	**1LP4207-4CA 9** ■ ■■■		**1LP6207-4CM8** ■	195	220
200 L	1465	37	241	69	482	138	0.23	**1LP4208-4CA 9** ■ ■■■		**1LP6208-4CM8** ■	220	280
200 L	1468	45	293	85	596	170	0.29	**1LP4204-4CA 9** ■ ■■■		**–**	280	–
225 S	1475	37	240	68	480	136	0.37	**1LP4220-4CA 9** ■ ■■■		**1LP6220-4CM8** ■	255	290
225 M	1475	45	291	81	582	162	0.45	**1LP4223-4CA 9** ■ ■■■		**1LP6223-4CM8** ■	290	320
225 M	1475	55	356	99	712	198	0.49	**1LP4228-4CA 9** ■ ■■■		**–**	320	–
250 M	1480	55	355	100	710	200	0.69	**1LP4253-4CA 9** ■ ■■■		**1LP6253-4CM8** ■	375	445
250 M	1482	75	483	136	966	272	0.86	**1LP4258-4CA 9** ■ ■■■		**1LP6258-4CM8** ■	445	505
250 M	1482	90	580	162	1160	324	0.98	**1LP4254-4CA 9** ■ ■■■		**–**	505	–
280 S	1485	75	482	136	964	272	1.2	**1LP4280-4CA 9** ■ ■■■		**1LP6280-4CM8** ■	515	560
280 M	1485	90	579	160	1158	320	1.4	**1LP4283-4CA 9** ■ ■■■		**1LP6283-4CM8** ■	560	660
280 M	1488	110	707	198	1414	396	1.71	**1LP4288-4CA 9** ■ ■■■		**1LP6288-4CM8** ■	660	720
280 M	1486	132	849	245	1698	490	1.9	**1LP4284-4CA 9** ■ ■■■		**–**	720	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Note
With duty type S2 – 60 min., the output of motors in frame sizes 132 and 160 is only 90% of the specified values.

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
4-pole, 1500 rpm, 50 Hz												
Intermittent duty S3 – 40%												
132 S	1462	4.4	28.7	10	72	22.8	0.018	**1LP6130-4CA 9** ■ ■■■		**1LP6130-4CM8** ■	–	55
132 M	1462	6	39.2	13.2	98	30.4	0.023	**1LP6133-4CA 9** ■ ■■■		**1LP6133-4CM8** ■	–	62
160 M	1470	8.8	57.2	18	144	43	0.043	**1LP6163-4CA 9** ■ ■■■		**1LP6163-4CM8** ■	–	100
160 L	1470	12	78	24.5	196	57	0.055	**1LP6166-4CA 9** ■ ■■■		**1LP6166-4CM8** ■	–	114
180 M	1455	14.8	96	30	242	70	0.099	**1LP4183-4CA 9** ■ ■■■		**1LP6183-4CM8** ■	135	150
180 L	1455	17.6	114	35	286	83	0.12	**1LP4186-4CA 9** ■ ■■■		**1LP6186-4CM8** ■	150	175
180 L	1455	24	156	52	392	118	0.14	**1LP4188-4CA 9** ■ ■■■		**–**	175	–
200 L	1472	24	156	47	392	112	0.19	**1LP4207-4CA 9** ■ ■■■		**1LP6207-4CM8** ■	195	220
200 L	1472	29	188	59	482	138	0.23	**1LP4208-4CA 9** ■ ■■■		**1LP6208-4CM8** ■	220	280
200 L	1474	36	233	73	596	170	0.29	**1LP4204-4CA 9** ■ ■■■		**–**	280	–
225 S	1480	29	187	57	480	136	0.37	**1LP4220-4CA 9** ■ ■■■		**1LP6220-4CM8** ■	255	290
225 M	1480	36	232	68	582	162	0.45	**1LP4223-4CA 9** ■ ■■■		**1LP6223-4CM8** ■	290	320
225 M	1480	44	284	82	712	198	0.49	**1LP4228-4CA 9** ■ ■■■		**–**	320	–
250 M	1486	44	282	82	710	200	0.69	**1LP4253-4CA 9** ■ ■■■		**1LP6253-4CM8** ■	375	445
250 M	1487	60	385	113	966	272	0.86	**1LP4258-4CA 9** ■ ■■■		**1LP6258-4CM8** ■	445	505
250 M	1487	72	462	135	1160	324	0.98	**1LP4254-4CA 9** ■ ■■■		**–**	505	–
280 S	1489	60	385	116	964	272	1.2	**1LP4280-4CA 9** ■ ■■■		**1LP6280-4CM8** ■	515	560
280 M	1489	72	462	131	1158	320	1.4	**1LP4283-4CA 9** ■ ■■■		**1LP6283-4CM8** ■	560	660
280 M	1490	88	564	168	1414	396	1.71	**1LP4288-4CA 9** ■ ■■■		**1LP6288-4CM8** ■	660	720
280 M	1489	105	673	208	1698	490	1.9	**1LP4284-4CA 9** ■ ■■■		**–**	720	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
4-pole, 1500 rpm, 50 Hz												
Intermittent duty S3 – 60%												
132 S	1475	3.3	21.4	8.3	72	22.8	0.018	**1LP6130-4CA 9** ■ ■■■		**1LP6130-4CM8** ■	–	55
132 M	1475	4.5	29.1	11	98	30.4	0.023	**1LP6133-4CA 9** ■ ■■■		**1LP6133-4CM8** ■	–	62
160 M	1480	6.6	42.6	14.5	144	43	0.043	**1LP6163-4CA 9** ■ ■■■		**1LP6163-4CM8** ■	–	100
160 L	1480	9	58	20	196	57	0.055	**1LP6166-4CA 9** ■ ■■■		**1LP6166-4CM8** ■	–	114
180 M	1455	11.1	72	25.5	242	70	0.099	**1LP4183-4CA 9** ■ ■■■		**1LP6183-4CM8** ■	135	150
180 L	1455	13.2	85	29	286	83	0.12	**1LP4186-4CA 9** ■ ■■■		**1LP6186-4CM8** ■	150	175
180 L	1455	18	116	44	392	118	0.14	**1LP4188-4CA 9** ■ ■■■		**–**	175	–
200 L	1480	18	116	39.5	392	112	0.19	**1LP4207-4CA 9** ■ ■■■		**1LP6207-4CM8** ■	195	220
200 L	1480	22	142	51	482	138	0.23	**1LP4208-4CA 9** ■ ■■■		**1LP6208-4CM8** ■	220	280
200 L	1481	27	174	63	596	170	0.29	**1LP4204-4CA 9** ■ ■■■		**–**	280	–
225 S	1485	22	141	46	480	136	0.37	**1LP4220-4CA 9** ■ ■■■		**1LP6220-4CM8** ■	255	290
225 M	1485	27	174	54	582	162	0.45	**1LP4223-4CA 9** ■ ■■■		**1LP6223-4CM8** ■	290	320
225 M	1485	33	212	65	712	198	0.49	**1LP4228-4CA 9** ■ ■■■		**–**	320	–
250 M	1490	33	211	67	710	200	0.69	**1LP4253-4CA 9** ■ ■■■		**1LP6253-4CM8** ■	375	445
250 M	1490	45	288	93	966	272	0.86	**1LP4258-4CA 9** ■ ■■■		**1LP6258-4CM8** ■	445	505
250 M	1490	54	346	111	1160	324	0.98	**1LP4254-4CA 9** ■ ■■■		**–**	505	–
280 S	1492	45	288	93	964	272	1.2	**1LP4280-4CA 9** ■ ■■■		**1LP6280-4CM8** ■	515	560
280 M	1492	54	346	104	1158	320	1.4	**1LP4283-4CA 9** ■ ■■■		**1LP6283-4CM8** ■	560	660
280 M	1492	66	422	141	1414	396	1.71	**1LP4288-4CA 9** ■ ■■■		**1LP6288-4CM8** ■	660	720
280 M	1491	79	506	175	1698	490	1.9	**1LP4284-4CA 9** ■ ■■■		**–**	720	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
4-pole, 1500 rpm, 50 Hz												
Intermittent duty S3 – 100% or continuous duty S1												
132 S	1485	2	12.9	7.2	72	22.8	0.018	**1LP6130-4CA 9** ■ ■■■		**1LP6130-4CM8** ■	–	55
132 M	1485	2.8	18	9.2	98	30.4	0.023	**1LP6133-4CA 9** ■ ■■■		**1LP6133-4CM8** ■	–	62
160 M	1490	4.1	26.3	11.5	144	43	0.043	**1LP6163-4CA 9** ■ ■■■		**1LP6163-4CM8** ■	–	100
160 L	1490	5.6	35.9	15.5	196	57	0.055	**1LP6166-4CA 9** ■ ■■■		**1LP6166-4CM8** ■	–	114
180 M	1455	6.9	44.5	21	242	70	0.099	**1LP4183-4CA 9** ■ ■■■		**1LP6183-4CM8** ■	135	150
180 L	1455	8.2	52.7	23.5	286	83	0.12	**1LP4186-4CA 9** ■ ■■■		**1LP6186-4CM8** ■	150	175
180 L	1455	11.2	72	34	392	118	0.14	**1LP4188-4CA 9** ■ ■■■		**–**	175	–
200 L	1488	11.2	72	31	392	112	0.19	**1LP4207-4CA 9** ■ ■■■		**1LP6207-4CM8** ■	195	220
200 L	1488	13.8	89	40	482	138	0.23	**1LP4208-4CA 9** ■ ■■■		**1LP6208-4CM8** ■	220	280
200 L	1488	16.8	108	49	596	170	0.29	**1LP4204-4CA 9** ■ ■■■		**–**	280	–
225 S	1491	13.8	88	36	480	136	0.37	**1LP4220-4CA 9** ■ ■■■		**1LP6220-4CM8** ■	255	290
225 M	1491	16.8	108	42	582	162	0.45	**1LP4223-4CA 9** ■ ■■■		**1LP6223-4CM8** ■	290	320
225 M	1491	20	128	49	712	198	0.49	**1LP4228-4CA 9** ■ ■■■		**–**	320	–
250 M	1495	20	128	52	710	200	0.69	**1LP4253-4CA 9** ■ ■■■		**1LP6253-4CM8** ■	375	445
250 M	1495	28	179	74	966	272	0.86	**1LP4258-4CA 9** ■ ■■■		**1LP6258-4CM8** ■	445	505
250 M	1495	34	217	88	1160	324	0.98	**1LP4254-4CA 9** ■ ■■■		**–**	505	–
280 S	1496	28	179	75	964	272	1.2	**1LP4280-4CA 9** ■ ■■■		**1LP6280-4CM8** ■	515	560
280 M	1496	34	217	80	1158	320	1.4	**1LP4283-4CA 9** ■ ■■■		**1LP6283-4CM8** ■	560	660
280 M	1496	41	262	111	1414	396	1.71	**1LP4288-4CA 9** ■ ■■■		**1LP6288-4CM8** ■	660	720
280 M	1495	49	313	138	1698	490	1.9	**1LP4284-4CA 9** ■ ■■■		**–**	720	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz												
Intermittent duty S3 – 15% or S2 – 30 min.												
132 S	930	3.6	37	9.6	60	16	0.015	**1LP6130-6CA 9** ■ ■■■		**1LP6130-6CM8** ■	–	50
132 M	930	4.8	49.3	11.3	80	18.8	0.019	**1LP6133-6CA 9** ■ ■■■		**1LP6133-6CM8** ■	–	57
132 M	930	6.6	67.8	15.6	110	26	0.025	**1LP6134-6CA 9** ■ ■■■		**1LP6134-6CM8** ■	–	66
160 M	950	9	90.5	20.5	150	34	0.044	**1LP6163-6CA 9** ■ ■■■		**1LP6163-6CM8** ■	–	103
160 L	950	13.2	133	29.5	218	49	0.063	**1LP6166-6CA 9** ■ ■■■		**1LP6166-6CM8** ■	–	122
180 L	960	18	179	35.5	296	59	0.18	**1LP4186-6CA 9** ■ ■■■		**1LP6186-6CM8** ■	145	170
180 L	960	22	219	45	364	75	0.2	**1LP4188-6CA 9** ■ ■■■		**1LP6188-6CM8** ■	170	215
180 L	965	26	257	52	432	87	0.255	**1LP4184-6CA 9** ■ ■■■		**–**	215	–
200 L	968	22	217	44	362	73	0.24	**1LP4206-6CA 9** ■ ■■■		**1LP6206-6CM8** ■	185	200
200 L	968	26	256	52	430	87	0.29	**1LP4207-6CA 9** ■ ■■■		**1LP6207-6CM8** ■	200	235
200 L	968	36	355	72	588	120	0.36	**1LP4208-6CA 9** ■ ■■■		**1LP6208-6CM8** ■	235	305
200 L	969	44	434	88	724	146	0.48	**1LP4204-6CA 9** ■ ■■■		**–**	305	–
225 M	974	36	353	69	586	114	0.49	**1LP4223-6CA 9** ■ ■■■		**1LP6223-6CM8** ■	270	315
225 M	974	44	431	84	722	140	0.62	**1LP4228-6CA 9** ■ ■■■		**1LP6228-6CM8** ■	315	355
225 M	974	54	529	104	880	174	0.75	**1LP4224-6CA 9** ■ ■■■		**–**	355	–
250 M	978	44	430	84	722	140	0.76	**1LP4253-6CA 9** ■ ■■■		**1LP6253-6CM8** ■	355	390
250 M	978	54	527	101	876	168	0.93	**1LP4258-6CA 9** ■ ■■■		**1LP6258-6CM8** ■	390	440
250 M	978	66	644	125	1070	208	1.07	**1LP4254-6CA 9** ■ ■■■		**–**	440	–
280 S	982	54	525	100	872	166	1.1	**1LP4280-6CA 9** ■ ■■■		**1LP6280-6CM8** ■	455	500
280 M	983	66	642	120	1066	200	1.4	**1LP4283-6CA 9** ■ ■■■		**1LP6283-6CM8** ■	490	550
280 M	982	90	875	163	1454	272	1.65	**1LP4288-6CA 9** ■ ■■■		**1LP6288-6CM8** ■	550	660
280 M	982	108	1050	199	1746	332	1.94	**1LP4284-6CA 9** ■ ■■■		**–**	660	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**

State in addition to order number:		
400 VΔ, 50 Hz	**9**	**L5G**
460 VΔ, 50 Hz	**9**	**L5H**
500 VΔ, 50 Hz	**9**	**L5J**

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz												
Intermittent duty S3 – 25% or S2 – 60 min.												
132 S	950	3	30	8	60	16	0.015	**1LP6130-6CA 9** ■■■■		**1LP6130-6CM8** ■	–	50
132 M	950	4	40	9.4	80	18.8	0.019	**1LP6133-6CA 9** ■■■■		**1LP6133-6CM8** ■	–	57
132 M	950	5.5	55	13	110	26	0.025	**1LP6134-6CA 9** ■■■■		**1LP6134-6CM8** ■	–	66
160 M	960	7.5	75	17	150	34	0.044	**1LP6163-6CA 9** ■■■■		**1LP6163-6CM8** ■	–	103
160 L	960	11	109	24.5	218	49	0.063	**1LP6166-6CA 9** ■■■■		**1LP6166-6CM8** ■	–	122
180 L	970	15	148	29.5	296	59	0.18	**1LP4186-6CA 9** ■■■■		**1LP6186-6CM8** ■	145	170
180 L	970	18.5	182	37.5	364	75	0.2	**1LP4188-6CA 9** ■■■■		**1LP6188-6CM8** ■	170	215
180 L	975	22	216	43.5	432	87	0.255	**1LP4184-6CA 9** ■■■■		**–**	215	–
200 L	975	18.5	181	36.5	362	73	0.24	**1LP4206-6CA 9** ■■■■		**1LP6206-6CM8** ■	185	200
200 L	975	22	215	43.5	430	87	0.29	**1LP4207-6CA 9** ■■■■		**1LP6207-6CM8** ■	200	235
200 L	975	30	294	60	588	120	0.36	**1LP4208-6CA 9** ■■■■		**1LP6208-6CM8** ■	235	305
200 L	976	37	362	73	724	146	0.48	**1LP4204-6CA 9** ■■■■		**–**	305	–
225 M	978	30	293	57	586	114	0.49	**1LP4223-6CA 9** ■■■■		**1LP6223-6CM8** ■	270	315
225 M	978	37	361	70	722	140	0.62	**1LP4228-6CA 9** ■■■■		**1LP6228-6CM8** ■	315	355
225 M	978	45	440	87	880	174	0.75	**1LP4224-6CA 9** ■■■■		**–**	355	–
250 M	982	37	361	70	722	140	0.76	**1LP4253-6CA 9** ■■■■		**1LP6253-6CM8** ■	355	390
250 M	982	45	438	84	876	168	0.93	**1LP4258-6CA 9** ■■■■		**1LP6258-6CM8** ■	390	440
250 M	982	55	535	104	1070	208	1.07	**1LP4254-6CA 9** ■■■■		**–**	440	–
280 S	985	45	436	83	872	166	1.1	**1LP4280-6CA 9** ■■■■		**1LP6280-6CM8** ■	455	500
280 M	985	55	533	100	1066	200	1.4	**1LP4283-6CA 9** ■■■■		**1LP6283-6CM8** ■	490	550
280 M	985	75	727	136	1454	272	1.65	**1LP4288-6CA 9** ■■■■		**1LP6288-6CM8** ■	550	660
280 M	985	90	873	166	1746	332	1.94	**1LP4284-6CA 9** ■■■■		**–**	660	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Note
With duty type S2 – 60 min., the output of motors in frame sizes 132 and 160 is only 90% of the specified values.

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz												
Intermittent duty S3 – 40%												
132 S	960	2.4	23.9	7	60	16	0.015	**1LP6130-6CA 9** ■ ■■■		**1LP6130-6CM8** ■	–	50
132 M	960	3.2	31.8	8.3	80	18.8	0.019	**1LP6133-6CA 9** ■ ■■■		**1LP6133-6CM8** ■	–	57
132 M	960	4.4	43.8	11.4	110	26	0.025	**1LP6134-6CA 9** ■ ■■■		**1LP6134-6CM8** ■	–	66
160 M	970	6	59	15.5	150	34	0.044	**1LP6163-6CA 9** ■ ■■■		**1LP6163-6CM8** ■	–	103
160 L	970	8.8	86.5	22	218	49	0.063	**1LP6166-6CA 9** ■ ■■■		**1LP6166-6CM8** ■	–	122
180 L	981	12	118	24	296	59	0.18	**1LP4186-6CA 9** ■ ■■■		**1LP6186-6CM8** ■	145	170
180 L	981	14.8	144	32	364	75	0.2	**1LP4188-6CA 9** ■ ■■■		**1LP6188-6CM8** ■	170	215
180 M	984	17.6	171	37	432	87	0.255	**1LP4184-6CA 9** ■ ■■■		**–**	215	–
200 L	980	14.8	144	31.5	362	73	0.24	**1LP4206-6CA 9** ■ ■■■		**1LP6206-6CM8** ■	185	200
200 L	980	17.6	172	36.5	430	87	0.29	**1LP4207-6CA 9** ■ ■■■		**1LP6207-6CM8** ■	200	235
200 L	980	24	234	52	588	120	0.36	**1LP4208-6CA 9** ■ ■■■		**1LP6208-6CM8** ■	235	305
200 L	981	29	282	63	724	146	0.48	**1LP4204-6CA 9** ■ ■■■		**–**	305	–
225 M	984	24	233	46	586	114	0.49	**1LP4223-6CA 9** ■ ■■■		**1LP6223-6CM8** ■	270	315
225 M	984	29	281	56	722	140	0.62	**1LP4228-6CA 9** ■ ■■■		**1LP6228-6CM8** ■	315	355
225 M	984	36	349	70	880	174	0.75	**1LP4224-6CA 9** ■ ■■■		**–**	355	–
250 M	986	29	281	58	722	140	0.76	**1LP4253-6CA 9** ■ ■■■		**1LP6253-6CM8** ■	355	390
250 M	986	36	349	70	876	168	0.93	**1LP4258-6CA 9** ■ ■■■		**1LP6258-6CM8** ■	390	440
250 M	986	44	426	86	1070	208	1.07	**1LP4254-6CA 9** ■ ■■■		**–**	440	–
280 S	989	36	348	71	872	166	1.1	**1LP4280-6CA 9** ■ ■■■		**1LP6280-6CM8** ■	455	500
280 M	989	44	425	85	1066	200	1.4	**1LP4283-6CA 9** ■ ■■■		**1LP6283-6CM8** ■	490	550
280 M	989	60	579	116	1454	272	1.65	**1LP4288-6CA 9** ■ ■■■		**1LP6288-6CM8** ■	550	660
280 M	989	72	695	141	1746	332	1.94	**1LP4284-6CA 9** ■ ■■■		**–**	660	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz												
Intermittent duty S3 – 60%												
132 S	975	1.8	17.6	6.3	60	16	0.01	**1LP6130-6CA 9** ■ ■■■		**1LP6130-6CM8** ■	–	50
132 M	975	2.4	23.5	7.3	80	18.8	0.01	**1LP6133-6CA 9** ■ ■■■		**1LP6133-6CM8** ■	–	57
132 M	975	3.3	32.3	9.8	110	26	0.02	**1LP6134-6CA 9** ■ ■■■		**1LP6134-6CM8** ■	–	66
160 M	980	4.5	44	13	150	34	0.04	**1LP6163-6CA 9** ■ ■■■		**1LP6163-6CM8** ■	–	103
160 L	980	6.6	64.3	18.8	218	49	0.06	**1LP6166-6CA 9** ■ ■■■		**1LP6166-6CM8** ■	–	122
180 L	984	9	88	20	296	59	0.18	**1LP4186-6CA 9** ■ ■■■		**1LP6186-6CM8** ■	145	170
180 L	984	11.1	108	26	364	75	0.2	**1LP4188-6CA 9** ■ ■■■		**1LP6188-6CM8** ■	170	215
180 L	986	13.2	128	30	432	87	0.25	**1LP4184-6CA 9** ■ ■■■		**–**	215	–
200 L	986	11.1	108	26	362	73	0.24	**1LP4206-6CA 9** ■ ■■■		**1LP6206-6CM8** ■	185	200
200 L	986	13.2	128	29	430	87	0.29	**1LP4207-6CA 9** ■ ■■■		**1LP6207-6CM8** ■	200	235
200 L	986	18	174	43	588	120	0.36	**1LP4208-6CA 9** ■ ■■■		**1LP6208-6CM8** ■	235	305
200 L	986	22	213	52	724	146	0.48	**1LP4204-6CA 9** ■ ■■■		**–**	305	–
225 M	988	18	174	37	586	114	0.49	**1LP4223-6CA 9** ■ ■■■		**1LP6223-6CM8** ■	270	315
225 M	988	22	213	46	722	140	0.62	**1LP4228-6CA 9** ■ ■■■		**1LP6228-6CM8** ■	315	355
225 M	988	27	261	57	880	174	0.75	**1LP4224-6CA 9** ■ ■■■		**–**	355	–
250 M	990	22	212	47	722	140	0.76	**1LP4253-6CA 9** ■ ■■■		**1LP6253-6CM8** ■	355	390
250 M	990	27	260	57	876	168	0.93	**1LP4258-6CA 9** ■ ■■■		**1LP6258-6CM8** ■	390	440
250 M	990	33	318	70	1070	208	1.07	**1LP4254-6CA 9** ■ ■■■		**–**	440	–
280 S	992	27	260	56	872	166	1.1	**1LP4280-6CA 9** ■ ■■■		**1LP6280-6CM8** ■	455	500
280 M	992	33	318	68	1066	200	1.4	**1LP4283-6CA 9** ■ ■■■		**1LP6283-6CM8** ■	490	550
280 M	992	45	433	92	1454	272	1.65	**1LP4288-6CA 9** ■ ■■■		**1LP6288-6CM8** ■	550	660
280 M	992	54	520	113	1746	332	1.94	**1LP4284-6CA 9** ■ ■■■		**–**	660	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia (without brake)	Order No.	Addi-tional ID code	Order No. for	Weight, approx. (without brake)	
	n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LP4	1LP6
	rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz												
Intermittent duty S3 – 100% or continuous duty S1												
132 S	988	1.1	10.6	5.7	60	16	0.015	**1LP6130-6CA 9** ■ ■■■		**1LP6130-6CM8** ■	–	50
132 M	988	1.5	14.5	6.4	80	18.8	0.019	**1LP6133-6CA 9** ■ ■■■		**1LP6133-6CM8** ■	–	57
132 M	988	2	19.3	8.5	110	26	0.025	**1LP6134-6CA 9** ■ ■■■		**1LP6134-6CM8** ■	–	66
160 M	988	2.8	27	11	150	34	0.044	**1LP6163-6CA 9** ■ ■■■		**1LP6163-6CM8** ■	–	103
160 L	988	4.1	39.6	15.5	218	49	0.063	**1LP6166-6CA 9** ■ ■■■		**1LP6166-6CM8** ■	–	122
180 L	990	5.6	54	16	296	59	0.18	**1LP4186-6CA 9** ■ ■■■		**1LP6186-6CM8** ■	145	170
180 L	990	6.9	67	21	364	75	0.2	**1LP4188-6CA 9** ■ ■■■		**1LP6188-6CM8** ■	170	215
180 L	991	8.2	79	24.5	432	87	0.255	**1LP4184-6CA 9** ■ ■■■		**–**	215	–
200 L	991	6.9	66.5	20	362	73	0.24	**1LP4206-6CA 9** ■ ■■■		**1LP6206-6CM8** ■	185	200
200 L	991	8.2	79	23	430	87	0.29	**1LP4207-6CA 9** ■ ■■■		**1LP6207-6CM8** ■	200	235
200 L	991	11.2	108	34	588	120	0.36	**1LP4208-6CA 9** ■ ■■■		**1LP6208-6CM8** ■	235	305
200 L	991	13.8	133	41	724	146	0.48	**1LP4204-6CA 9** ■ ■■■		**–**	305	–
225 M	993	11.2	108	28.5	586	114	0.49	**1LP4223-6CA 9** ■ ■■■		**1LP6223-6CM8** ■	270	315
225 M	993	13.8	133	35	722	140	0.62	**1LP4228-6CA 9** ■ ■■■		**1LP6228-6CM8** ■	315	355
225 M	993	16.8	162	43.5	880	174	0.75	**1LP4224-6CA 9** ■ ■■■		**–**	355	–
250 M	994	13.8	133	35	722	140	0.76	**1LP4253-6CA 9** ■ ■■■		**1LP6253-6CM8** ■	355	390
250 M	994	16.8	161	42	876	168	0.93	**1LP4258-6CA 9** ■ ■■■		**1LP6258-6CM8** ■	390	440
250 M	994	20	192	52	1070	208	1.07	**1LP4254-6CA 9** ■ ■■■		**–**	440	–
280 S	995	16.8	161	43	872	166	1.1	**1LP4280-6CA 9** ■ ■■■		**1LP6280-6CM8** ■	455	500
280 M	995	20	192	52	1066	200	1.4	**1LP4283-6CA 9** ■ ■■■		**1LP6283-6CM8** ■	490	550
280 M	995	28	269	71	1454	272	1.65	**1LP4288-6CA 9** ■ ■■■		**1LP6288-6CM8** ■	550	660
280 M	995	34	326	86	1746	332	1.94	**1LP4284-6CA 9** ■ ■■■		**–**	660	–

Type of construction:			
IM B3, IM V5	**0**		**0**
IM V1, IM B5	**1**		**1**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

For moment of inertia and weight of brakes, see technical specifications of brakes on page 2/9.

Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

Selection and ordering data

Options

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

Special motor versions	Additional identification code **-Z** with order code and plain text if required
Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping	**A11**
Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	**A12**
Motor temperature detection with embedded temperature sensor KTY 84-130	**A23**
3 bimetallic switches (Klixon) for tripping	**A31**
Anti-condensation heating for 230 V	**K45**
Anti-condensation heating for 115 V	**K46**
Insulated bearing cartridge	**L27**
Acceptance test certificate 3.1 according to EN 10204	**B02**
Temperature class F, used acc. to B, coolant temperature 50 °C, derating approx. 8%	**C23**
Temperature class F, used acc. to B, coolant temperature 60 °C, derating approx. 18%	**C25**
Connection box on RHS	**K09**
Connection box on LHS	**K10**
Connection box on NDE	**M64**
Bolted-on feet	**K11**
Foot made of GGG 40, only in conjunction with K11 or K09 / K10	**J22**
IP56 degree of protection (non-heavy-sea)	**K52**
Cable entry, maximum configuration	**K55**
All cable glands EMC	**J05**
Rotation of the terminal box through 90°, entry from DE	**K83**
Rotation of the terminal box through 90°, entry from NDE	**K84**
Rotation of terminal box through 180°	**K85**
Flange end shield made of GGG 40	**J20**
Standard shaft made of stainless steel	**M65**
Special paint finish "Offshore" in RAL 7030, stone grey, coat thickness 220 µm	**M91**
Special paint finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	**Y54** • and special paint finish RAL ....
Second rating plate, loose	**K31**
Extra rating plate or rating plate with different data	**Y80** • and identification code

• This order code only determines the price of the version – additional plain text is required.

Selection and ordering data

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

Special brake versions	Additional identification code **-Z** with order code and plain text if required
Mounting of brake KFB 10	**J30**
Mounting of brake KFB 16	**J31**
Mounting of brake KFB 25	**J32**
Mounting of brake KFB 30	**J33**
Mounting of brake KFB 40	**J34**
Mounting of brake KFB 63	**J35**
Mounting of brake KFB 100	**J36**
Mounting of brake KFB 160	**J37**
Mounting of brake KFB 10, supplied by customer	**J40**
Mounting of brake KFB 16, supplied by customer	**J41**
Mounting of brake KFB 25, supplied by customer	**J42**
Mounting of brake KFB 30, supplied by customer	**J43**
Mounting of brake KFB 40, supplied by customer	**J44**
Mounting of brake KFB 63, supplied by customer	**J45**
Mounting of brake KFB 100, supplied by customer	**J46**
Mounting of brake KFB 160, supplied by customer	**J47**
Brake coil voltage 400 V AC	**C01**
Hand lever release for brake	**J25**
Microswitch "brake released"	**J26**
Microswitch "air-gap monitoring"	**J24**
Brake anti-condensation heating 230 V	**J27**
Mounting of pulse encoder POG10 DN 1024 I (encoder is supplied by works)	**J28**
Prepared for mounting pulse encoder	**J29**
Mounting of rotary pulse encoder POG10 DN 1024I on motor without fan (without mounting of brake)	**G80**
Rectifier for brake in terminal box (connection voltage 230 V AC)	**C07**

Non-standard brake coil voltage on request

Ordering example:

Selection criteria		Order No.	Order codes
Motor type	Brake motor without external fan, degree of protection IP55, gray cast iron model	**1LP4**. . .-	
Frame size	180 M	1LP4**183**-	
No. of poles/speed	4-pole	1LP4183-**4**	
Version	Crane-type version	1LP4183-4**CA** . .	
Voltage/frequency	400 VΔ, 50 Hz	1LP4183-4CA**9** .	**L5G**
Type of construction	IM B5	1LP4183-4CA9**1**	L5G
Special version	Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	1LP4183-4CA91-**Z**	L5G **A12**
	Anti-condensation heating for 230 V	1LP4183-4CA91-**Z**	L5G A12 **K45**
	Mounting of brake KFB 25	1LP4183-4CA91-**Z**	L5G A12 K45 **J32**
	Hand lever release for brake	1LP4183-4CA91-**Z**	L5G A12 K45 J32 **J25**
	Microswitch "brake released"	1LP4183-4CA91-**Z**	L5G A12 K45 J32 J25 **J26**
	Brake anti-condensation heating 230 V	1LP4183-4CA91-**Z**	L5G A12 K45 J32 J25 J26 **J27**
	Mounting of pulse encoder POG10 DN 1024 I (encoder is supplied by works)	1LP4183-4CA91-**Z**	L5G A12 K45 J32 J25 J26 J27 **J28**
Complete identification codes for required version of brake motor		**1LP4183-4CA91-Z L5G A12 K45 J32 J25 J26 J27 J28**	

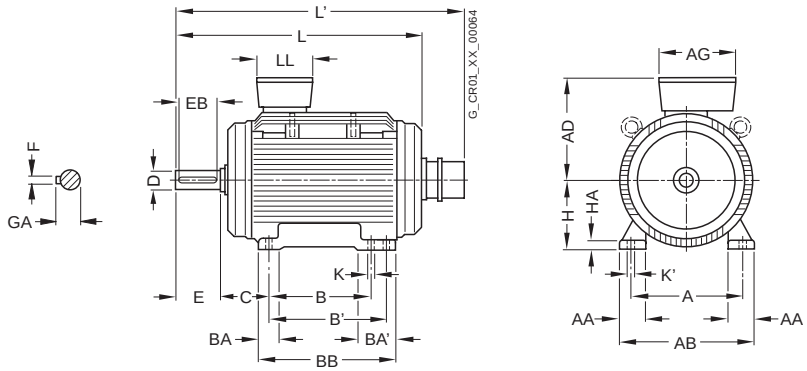
Brake motors with fitted DC-operated spring-operated brake

Three-phase squirrel-cage motors 1LP4, 1LP6

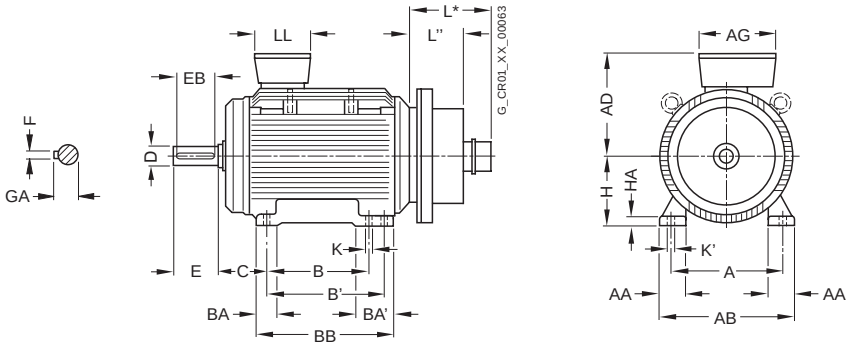
Dimensional drawings

1LP4 and 1LP6, type IM B3

with pulse encoder POG10



with brake and pulse encoder POG10



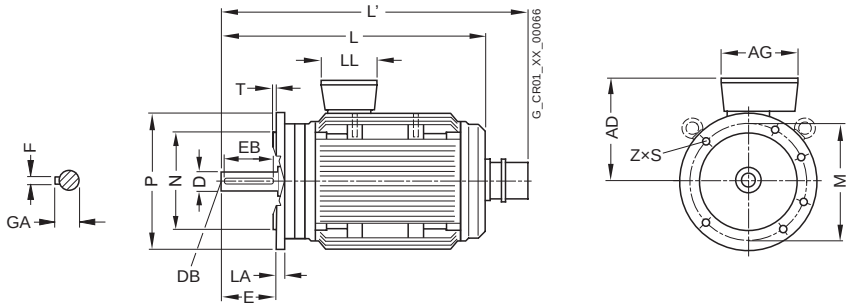
For motor			Dimension designation acc. to IEC																	
Frame size	Type	No. of poles	A	AA	AB	AD	AG	B	B'	BA	BA'	BB	C	H	HA	K	K'	L [1]	L' [1]	LL
132S	1LP6130	4, 6	216	53	256	228	208	140		49	–	180	89	132	15	12	16	397	582	178
132M	1LP6133	4, 6	216	53	256	228	208	178		49	–	218	89	132	15	12	16	397	582	178
	1LP6134	6																397	582	
160M	1LP6163	4, 6	254	60	300	256	208	210		57	–	256	108	160	18	15	19	529	714	178
160L	1LP6166	4, 6	254	60	300	256	208	254		57	–	300	108	160	18	15	19	529	714	178
180M	1LP4183, 1LP6183	4	279	65	339	288	220	241		70	111	328	121	180	20	15	19	562	714	164
180L	1LP4186, 1LP6186	4, 6	279	65	339	288	220	241	279	70	111	328	121	180	20	15	19	562	714	164
	1LP4188, 1LP6188	4, 6																613	765	
	1LP4184	6																643	795	
200L	1LP4206, 1LP6206	6	318	70	378	307	310	305		80	80	355	133	200	25	19	25	617	764	232
	1LP4207, 1LP6207	4, 6																617	764	
	1LP4208, 1LP6208	4, 6																617	764	
	1LP4204	4, 6																734	881	
225S	1LP4220, 1LP6220	4	356	80	436	410	300	286		85	110	361	149	225	34	19	25	670	830	236
225M	1LP4223, 1LP6223	4, 6	356	80	436	410	300	286	311	85	110	361	149	225	34	19	25	670	830	236
	1LP4228, 1LP6228	4, 6																730	890	
	1LP4224	6																780	910	
250M	1LP4253, 1LP6253	4, 6	406	100	490	496	380	349		100	100	409	168	250	40	24	30	764	930	307
	1LP4258, 1LP6258	6																764	930	
	1LP4258, 1LP6258	4																834	1000	
	1LP4254	4, 6																834	1000	
280S	1LP4280, 1LP6280	4, 6	457	100	540	536	380	368		100	151	479	190	280	40	24	30	830	1005	307
280M	1LP4283, 1LP6283	4, 6	457	100	540	536	380	368	419	100	151	479	190	280	40	24	30	830	1005	307
	1LP4288, 1LP6288	6																830	1005	
	1LP4288, 1LP6288	4																940	1115	
	1LP4284	6																940	1115	
	1LP4284	4																990	1165	

[1] Dimensions L and L' on request for 1LP6 motors, frame sizes 180 M to 280 M.

Dimensional drawings

1LP4 and 1LP6, type IM B5

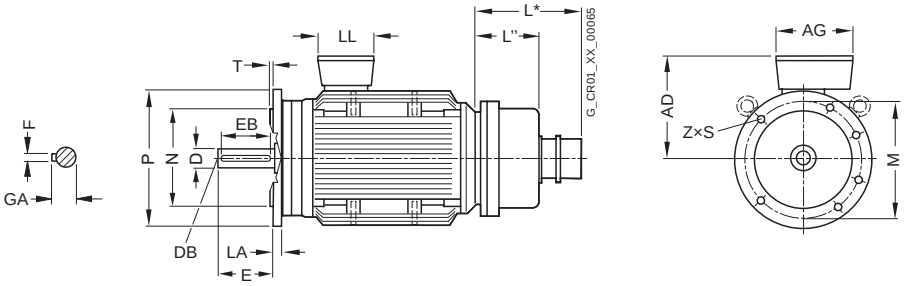
with pulse encoder POG10



Brake assembly

Brake	L'' with brake mm
KFB 10	max. 150
KFB 16	max. 175
KFB 25	max. 180
KFB 30	max. 180
KFB 40	max. 185
KFB 63	max. 200
KFB 100	max. 215
KFB 160	max. 230

with brake and pulse encoder POG10



Brake mounting + POG10

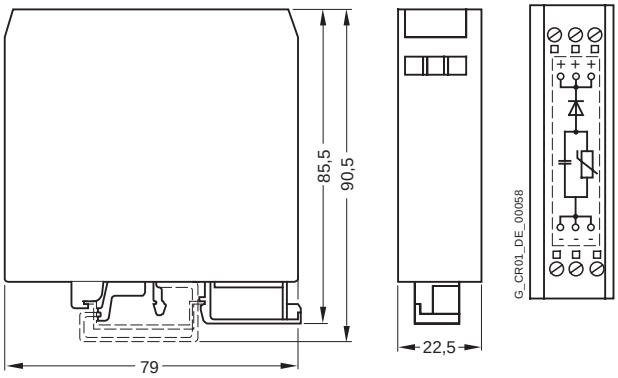
Brake	L* with brake + POG10 mm
KFB 10	max. 315
KFB 16	max. 330
KFB 25	max. 345
KFB 30	max. 345
KFB 40	max. 355
KFB 63	max. 370
KFB 100	max. 385
KFB 160	max. 400

For motor			DE shaft extension						Flange dimensions						
Frame size	Type	No. of poles	D	DB	E	EB	F	GA	LA	M	N	P	S	T	Z
132S	1LP6130	4, 6	38	M12	80	70	10	41	12	265	230	300	14.5	4	4
132M	1LP6133 1LP6134	4, 6 6	38	M12	80	70	10	41	12	265	230	300	14.5	4	4
160M	1LP6163	4, 6	42	M16	110	90	12	45	13	300	250	350	18.5	5	4
160L	1LP6166	4, 6	42	M16	110	90	12	45	13	300	250	350	18.5	5	4
180M	1LP4183, 1LP6183	4	48	M16	110	100	14	51.5	13	300	250	350	18.5	5	4
180L	1LP4186, 1LP6186 1LP4188, 1LP6188 1LP4184	4, 6 4, 6 6	48	M16	110	100	14	51.5	13	300	250	350	18.5	5	4
200L	1LP4206, 1LP6206 1LP4207, 1LP6207 1LP4208, 1LP6208 1LP4204	6 4, 6 4, 6 4, 6	60	M20	140	125	18	64	15	350	300	400	18.5	5	4
225S	1LP4220, 1LP6220	4	60	M20	140	125	18	64	16	400	350	450	18.5	5	8
225M	1LP4223, 1LP6223 1LP4228, 1LP6228 1LP4224	4, 6 4, 6 6	60	M20	140	125	18	64	16	400	350	450	18.5	5	8
250M	1LP4253, 1LP6253 1LP4258, 1LP6258 1LP4258, 1LP6258 1LP4254	4, 6 6 4 4, 6	65	M20	140	125	18	69	18	500	450	550	22	6	8
280S	1LP4280, 1LP6280	4, 6	75	M20	140	125	20	79.5	18	500	450	550	22	6	8
280M	1LP4283, 1LP6283 1LP4288, 1LP6288 1LP4288, 1LP6288 1LP4284 1LP4284	4, 6 6 4 6 4	75	M20	140	125	20	79.5	18	500	450	550	22	6	8

2

Dimensional drawings

Protective element



Hoisting motors with fitted external fan

3

Hoisting motors with fitted external fan

Three-phase squirrel-cage motors 1LG4, 1LG6 frame size 315 L

Overview

The separately ventilated three-phase motors 1LG4 of frame size 315 are especially suitable for use as hoisting motors in medium-output drives. The axially mounted external fan means that the motors can operate for long periods with rated torque at low speeds, an operating characteristic required, for example, for the hoisting gear of Goliath cranes or bridge construction cranes.

Encoder mounting

The following encoders can be mounted – between the motor NDE and the external fan – (HOG 10 DN 1024 I encoders are installed on hoisting gear):

- HOG 10D.....
- HOG 10D..... with centrifugal switch FSL
- HOG 10D..... with centrifugal switch ESL (on request).

The connections of the encoder and centrifugal switch (if applicable) are taken to an auxiliary terminal box. As a result, the fan unit does not need to be disassembled when the encoder cables are connected on the system.

The table below shows an overview of the available motor outputs.

Product range

Motor type	Number of poles	Winding utilization factor	Output 50 Hz S1/kW	Rated speed 50 Hz rpm	Output 69 Hz S1/kW	Rated speed 69 Hz rpm	Output 87 Hz S1/kW	Rated speed 87 Hz rpm
1LG4316-6	6	F	117	987	150	1367	181	1726
1LG4317-6	6	F	141	987	180	1367	219	1726
1LG4318-6	6	F	171	987	219	1367	265	1726
1LG4314-6	6	F	214	987	274	1367	332	1726
1LG4316-8	8	F	101	736	129	1022	156	1291
1LG4317-8	8	F	123	736	157	1022	191	1291
1LG4318-8	8	F	148	736	189	1022	229	1291
1LG4314-8	8	F	179	736	229	1022	277	1291

Technical specifications

The maximum permissible field-weakening speed is 2600 rpm for all the variants listed above.

The following rated voltages are available:

- 400 V 3 AC
- 460 V 3 AC
- 500 V 3 AC
- 690 V 3 AC (special insulation!)

The standard version of the external fan motor is designed for
50 Hz, 3 AC 220 – 240 VΔ/380 – 420 VY, 2.0/1.15 A
60 Hz, 3 AC 440 – 480 VY, 1.05 A
Other rated voltages can be ordered with order code **Y81** in plain text.

We recommend that the external fan motor is ordered with an anti-condensation heater for outdoor installations. Cables for the external fan motors must always enter from below. The fan cowl can be turned accordingly.
The motors are available in types of construction B3 and B35. Type of construction B5 on request.

The basic model of motor 1LG4 without external fan is described in Catalog D 81.1. The electrical data of the motors for intermittent duty S3 plus the relevant planning data can be found on the following pages.
The special models normally required for hoisting gear are the only options included in this catalog. For further options, see catalog D 81.1.

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1000 rpm, 50 Hz											
Intermittent duty S3 – 25%											
979	169	1648	298	2264	426	3.2	**1LG4316-6CA 9** ■ ■■■		**1LG6316-6CM8** ■	925	1045
979	204	1990	360	2728	510	4	**1LG4317-6CA 9** ■ ■■■		**1LG6317-6CM8** ■	1015	1215
979	248	2419	440	3308	618	4.7	**1LG4318-6CA 9** ■ ■■■		**1LG6318-6CM8** ■	1215	1280
979	310	3024	550	4140	765	5.5	**1LG4314-6CA 9** ■ ■■■		–	1435	–
Intermittent duty S3 – 40%											
983	147	1428	260	2264	426	3.2	**1LG4316-6CA 9** ■ ■■■		**1LG6316-6CM8** ■	925	1045
983	177	1719	312	2728	510	4	**1LG4317-6CA 9** ■ ■■■		**1LG6317-6CM8** ■	1015	1215
983	215	2089	380	3308	618	4.7	**1LG4318-6CA 9** ■ ■■■		**1LG6318-6CM8** ■	1215	1280
983	269	2613	478	4140	765	5.5	**1LG4314-6CA 9** ■ ■■■		–	1435	–
Intermittent duty S3 – 60%											
985	131	1270	232	2264	426	3.2	**1LG4316-6CA 9** ■ ■■■		**1LG6316-6CM8** ■	925	1045
985	158	1532	278	2728	510	4	**1LG4317-6CA 9** ■ ■■■		**1LG6317-6CM8** ■	1015	1215
985	191	1852	340	3308	618	4.5	**1LG4318-6CA 9** ■ ■■■		**1LG6318-6CM8** ■	1215	1280
985	239	2317	428	4140	765	5.5	**1LG4314-6CA 9** ■ ■■■		–	1435	–
Intermittent duty S3 – 100% or continuous duty S1											
987	117	1132	210	2264	426	3.2	**1LG4316-6CA 9** ■ ■■■		**1LG6316-6CM8** ■	925	1045
987	141	1364	252	2728	510	4	**1LG4317-6CA 9** ■ ■■■		**1LG6317-6CM8** ■	1015	1215
987	171	1654	305	3308	618	4.7	**1LG4318-6CA 9** ■ ■■■		**1LG6318-6CM8** ■	1215	1280
987	214	2070	386	4140	765	5.5	**1LG4314-6CA 9** ■ ■■■		–	1435	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

Hoisting motors with fitted external fan

Three-phase squirrel-cage motors 1LG4, 1LG6 frame size 315 L

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 50 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
8-pole, 750 rpm, 50 Hz											
Intermittent duty S3 – 25%											
727	146	1918	275	2622	390	3.1	**1LG4316-8CB 9** ■ ■■■		**1LG6316-8CM8** ■	900	1040
727	178	2338	334	3192	468	3.9	**1LG4317-8CB 9** ■ ■■■		**1LG6317-8CM8** ■	1055	1135
727	215	2824	402	3840	562	4.5	**1LG4318-8CB 9** ■ ■■■		**1LG6318-8CM8** ■	1135	1305
727	259	3402	465	4646	655	5.5	**1LG4314-8CB 9** ■ ■■■		**–**	1415	–
Intermittent duty S3 – 40%											
731	127	1659	236	2622	390	3.1	**1LG4316-8CB 9** ■ ■■■		**1LG6316-8CM8** ■	900	1040
731	155	2025	286	3192	468	3.9	**1LG4317-8CB 9** ■ ■■■		**1LG6317-8CM8** ■	1055	1135
731	186	2430	342	3840	562	4.5	**1LG4318-8CB 9** ■ ■■■		**1LG6318-8CM8** ■	1135	1305
731	225	2939	353	4646	655	5.5	**1LG4314-8CB 9** ■ ■■■		**–**	1415	–
Intermittent duty S3 – 60%											
734	113	1470	207	2622	390	3.1	**1LG4316-8CB 9** ■ ■■■		**1LG6316-8CM8** ■	900	1040
734	139	1809	255	3192	468	3.9	**1LG4317-8CB 9** ■ ■■■		**1LG6317-8CM8** ■	1055	1135
734	166	2160	303	3840	562	4.5	**1LG4318-8CB 9** ■ ■■■		**1LG6318-8CM8** ■	1135	1305
734	202	2628	353	4646	655	5.5	**1LG4314-8CB 9** ■ ■■■		**–**	1415	–
Intermittent duty S3 – 100% or continuous duty S1											
736	101	1311	187	2622	390	3.1	**1LG4316-8CB 9** ■ ■■■		**1LG6316-8CM8** ■	900	1040
736	123	1596	227	3192	468	3.9	**1LG4317-8CB 9** ■ ■■■		**1LG6317-8CM8** ■	1055	1135
736	148	1920	272	3840	562	4.5	**1LG4318-8CB 9** ■ ■■■		**1LG6318-8CM8** ■	1135	1305
736	179	2323	320	4646	655	5.5	**1LG4314-8CB 9** ■ ■■■		**–**	1415	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 50 Hz	**9**	**L5G**	
460 VΔ, 50 Hz	**9**	**L5H**	
500 VΔ, 50 Hz	**9**	**L5J**	

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 69 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1380 rpm, 69 Hz											
Intermittent duty S3 – 25%											
1356	218	1535	388	2096	536	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5W**	925	1045
1356	261	1838	455	2514	655	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5W**	1015	1215
1356	318	2240	554	3060	788	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5W**	1215	1280
1356	397	2796	695	3828	990	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 40%											
1361	189	1326	335	2096	536	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5W**	925	1045
1361	227	1593	396	2514	655	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5W**	1015	1215
1361	276	1937	477	3060	788	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5W**	1215	1280
1361	345	2421	598	3828	990	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 60%											
1365	168	1175	298	2096	536	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5W**	925	1045
1365	202	1413	353	2514	655	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5W**	1015	1215
1365	245	1714	424	3060	788	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5W**	1215	1280
1365	307	2148	535	3828	990	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 100% or continuous duty S1											
1367	150	1048	268	2096	536	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5W**	925	1045
1367	180	1257	316	2514	655	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5W**	1015	1215
1367	219	1530	388	3060	788	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5W**	1215	1280
1367	274	1914	476	3828	990	5.5	**1LG4314-6CA 9** ■■■		–	1435	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 69 Hz	**9**	**L5N**	
460 VΔ, 69 Hz	**9**	**L5P**	
500 VΔ, 69 Hz	**9**	**L5Q**	

Hoisting motors with fitted external fan

Three-phase squirrel-cage motors 1LG4, 1LG6 frame size 315 L

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 69 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
8-pole, 1035 rpm, 69 Hz											
Intermittent duty S3 – 25%											
1009	187	1770	351	2410	490	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5W**	900	1040
1009	228	2158	418	2934	585	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5W**	1055	1135
1009	274	2593	502	3532	700	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5W**	1135	1305
1009	332	3142	600	4280	846	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 40%											
1015	162	1524	300	2410	490	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5W**	900	1040
1015	198	1863	357	2934	585	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5W**	1055	1135
1015	238	2239	427	3532	700	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5W**	1135	1305
1015	288	2710	512	4280	846	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 60%											
1019	144	1350	266	2410	490	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5W**	900	1040
1019	176	1649	315	2934	585	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5W**	1055	1135
1019	212	1987	378	3532	700	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5W**	1135	1305
1019	256	2399	455	4280	846	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 100% or continuous duty S1											
1022	129	1205	239	2410	490	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5W**	900	1040
1022	157	1467	280	2934	585	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5W**	1055	1135
1022	189	1766	336	3532	700	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5W**	1135	1305
1022	229	2140	408	4280	846	5.5	**1LG4314-8CB 9** ■■■		–	1415	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 69 Hz	**9**	**L5N**	
460 VΔ, 69 Hz	**9**	**L5P**	
500 VΔ, 69 Hz	**9**	**L5Q**	

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 87 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
6-pole, 1740 rpm, 87 Hz											
Intermittent duty S3 – 25%											
1714	262	1460	461	2002	646	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5X**	925	1045
1714	318	1772	548	2424	782	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5X**	1015	1215
1714	384	2140	665	2932	932	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5X**	1215	1280
1714	481	2680	848	3674	1195	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 40%											
1721	228	1265	397	2002	646	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5X**	925	1045
1721	276	1532	469	2424	782	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5X**	1015	1215
1721	334	1853	572	2932	932	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5X**	1215	1280
1721	418	2319	728	3674	1195	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 60%											
1724	203	1124	355	2002	646	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5X**	925	1045
1724	245	1357	420	2424	782	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5X**	1015	1215
1724	297	1645	509	2932	932	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5X**	1215	1280
1724	372	2061	648	3674	1195	5.5	**1LG4314-6CA 9** ■■■		–	1435	–
Intermittent duty S3 – 100% or continuous duty S1											
1726	181	1001	318	2002	646	3.2	**1LG4316-6CA 9** ■■■		**1LG6316-6CM9** ■ **L5X**	925	1045
1726	219	1212	380	2424	782	4	**1LG4317-6CA 9** ■■■		**1LG6317-6CM9** ■ **L5X**	1015	1215
1726	265	1466	454	2932	932	4.7	**1LG4318-6CA 9** ■■■		**1LG6318-6CM9** ■ **L5X**	1215	1280
1726	332	1837	580	3674	1195	5.5	**1LG4314-6CA 9** ■■■		–	1435	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 87 Hz	**9**	**L5R**	
460 VΔ, 87 Hz	**9**	**L5S**	
500 VΔ, 87 Hz	**9**	**L5T**	

Hoisting motors with fitted external fan

Three-phase squirrel-cage motors 1LG4, 1LG6 frame size 315 L

Selection and ordering data

Rated speed	Rated output	Rated torque	Rated current (at 400 V)	Max. torque	Max. current	Moment of inertia	Order No.	Addi-tional ID code	Order No. for	Weight, approx.	
n_{rated}	P_{rated}	M_{rated}	I_{rated}	M_{max}	I_{max}	J			690 VY, 87 Hz	1LG4	1LG6
rpm	kW	Nm	A	Nm	A	kgm^2				kg	kg
8-pole, 1305 rpm, 87 Hz											
Intermittent duty S3 – 25%											
1275	226	1693	412	2308	578	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5X**	900	1040
1275	277	2075	508	2826	735	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5X**	1055	1135
1275	332	2487	609	3388	855	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5X**	1135	1305
1275	402	3011	712	4098	1005	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 40%											
1282	196	1460	351	2308	578	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5X**	900	1040
1282	241	1795	434	2826	735	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5X**	1055	1135
1282	288	2145	522	3388	855	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5X**	1135	1305
1282	349	2600	610	4098	1005	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 60%											
1287	175	1299	315	2308	578	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5X**	900	1040
1287	214	1588	383	2826	735	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5X**	1055	1135
1287	256	1900	460	3388	855	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5X**	1135	1305
1287	310	2300	538	4098	1005	5.5	**1LG4314-8CB 9** ■■■		–	1415	–
Intermittent duty S3 – 100% or continuous duty S1											
1291	156	1154	280	2308	578	3.1	**1LG4316-8CB 9** ■■■		**1LG6316-8CM9** ■ **L5X**	900	1040
1291	191	1413	340	2826	735	3.9	**1LG4317-8CB 9** ■■■		**1LG6317-8CM9** ■ **L5X**	1055	1135
1291	229	1694	410	3388	855	4.5	**1LG4318-8CB 9** ■■■		**1LG6318-8CM9** ■ **L5X**	1135	1305
1291	277	2049	478	4098	1005	5.5	**1LG4314-8CB 9** ■■■		–	1415	–

Type of construction:			
IM B3	**0**		**0**
IM B35	**6**		**6**
State in addition to order number:			
400 VΔ, 87 Hz	**9**	**L5R**	
460 VΔ, 87 Hz	**9**	**L5S**	
500 VΔ, 87 Hz	**9**	**L5T**	

Selection and ordering data

Options

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

Special versions	Additional identification code **-Z** with order code and plain text if required
Motor protection through PTC thermistor with 3 embedded temperature sensors for tripping	**A11**
Motor protection through PTC thermistor with 6 embedded temperature sensors for tripping and alarm	**A12**
Motor temperature detection with embedded temperature sensor KTY 84-130	**A23**
Anti-condensation heating for 230 V	**K45**
Anti-condensation heating for 115 V	**K46**
Insulated bearing cartridge	**L27**
Mounting of the rotary pulse encoder to be supplied, type HOG 10 D or HOG 10 D with centrifugal switch	**H75**
Special paint finish in other standard RAL colours: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	**Y54** • and special paint finish RAL ....
Special paint finish in RAL 7030, stone grey, coat thickness 90 µm	**K26**
Special paint finish "Offshore" in RAL 7030, stone grey, coat thickness 220 µm	**M91**
Non-standard cable entry holes, specify size and number in plain text	**Y73**• and identification code
Connection box on RHS	**K09**
Connection box on LHS	**K10**
Rotation of the terminal box through 90°, entry from DE	**K83**
Rotation of the terminal box through 90°, entry from NDE	**K84**
Rotation of terminal box through 180°	**K85**
Second rating plate, loose	**K31**
Extra rating plate or rating plate with different data	**Y80** • and identification code
Non-standard voltage and/or frequency of the external fan motor, anti-condensation heating	**Y81** • and identification code
Extra rating plate with identification code	**Y82** • and identification code

• This order code only determines the price of the version – additional plain text is required.

Selection and ordering data

Ordering example:

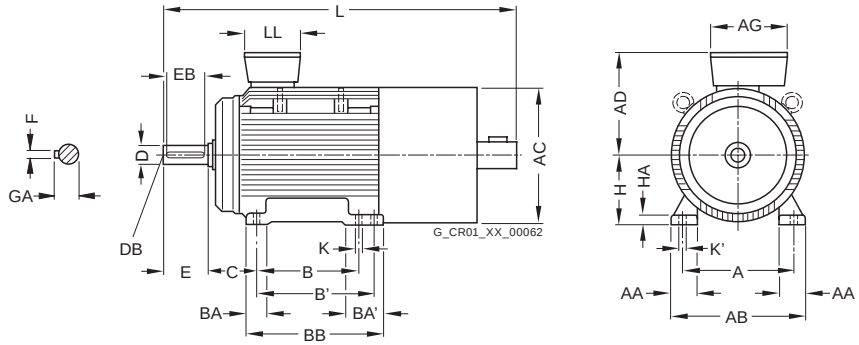
Selection criteria		Order No.	Order codes
Motor type	Standard motor with improved efficiency, IP55 degree of protection, cast-iron version	**1LG4**. . .-	
Frame size	315 L	1LG4**316-**	
No. of poles/speed	6-pole	1LG4316-**6**	
Version	Crane-type version	1LG4316-6**CA** . .	
Voltage/frequency	400 VΔ, 50 Hz	1LG4316-6CA**9** .	**L5G**
Type of construction	IM B3	1LG4316-6CA9**0**	L5G
Special version	Motor temperature detection with embedded temperature sensor KTY 84-130	1LG4316-6CA90-**Z**	L5G **A23**
	Mounting of the rotary pulse encoder to be supplied, type HOG 10 D or HOG 10 D with centrifugal switch	1LG4316-6CA90-**Z**	L5G A23 **H75**
	Anti-condensation heating for 230 V	1LG4316-6CA90-**Z**	L5G A23 H75 **K45**
Complete identification codes for required version of hoisting motor		**1LG4316-6CA90-Z L5G A23 H75 K45**	

Hoisting motors with fitted external fan

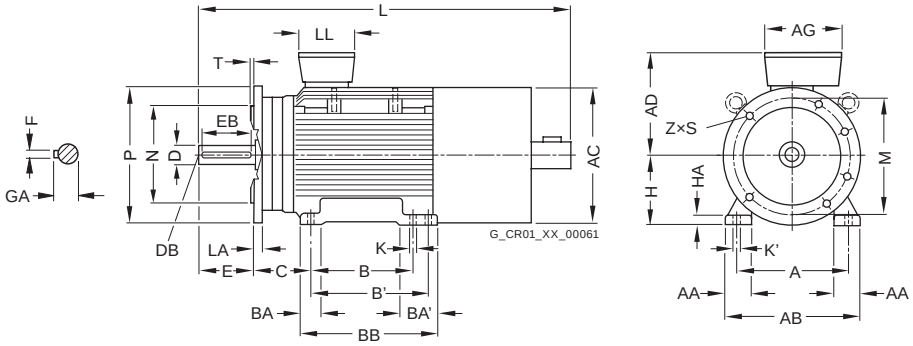
Three-phase squirrel-cage motors 1LG4, 1LG6 frame size 315 L

Dimensional drawings

1LG4/1LG6, type IM B3



1LG4/1LG6, type IM B35



For motor		Dimension designation acc. to IEC																	
Type	**Number of poles**	**A**	**AA**	**AB**	**AD**	**AG**	**B**	**B'**	**BA**	**BA'**	**BB**	**C**	**H**	**HA**	**K**	**K'**	**L**	**AC**	**LL**
1LG4316 1LG6316	6, 8 6, 8	508	120	610	495	379	457	508	125	176	578	216	315	50	28	35	1522	610	307
1LG4317 1LG6317 1LG6317	6, 8 6 8	508	120	610	495	379	457	508	125	176	578	216	315	50	28	35	1522 1662 1522	610	307
1LG4318 1LG4318 1LG6318 1LG6318	6 8 6 8	508	120	610	495	379	457	508	155 125 155 125	250 176 250 176	666 578 666 578	216	315	30 50 30 50	28	35	1662 1522 1662 1662	610	307
1LG4314	6, 8	508	120	610	495	379	457	508	155	250	666	216	315	30	28	35	1749	610	307

For motor		DE shaft extension						Flange dimensions						
Type	**Number of poles**	**D**	**DB**	**E**	**EB**	**F**	**GA**	**LA**	**M**	**N**	**P**	**S**	**T**	**Z**
1LG4316 1LG6316	6, 8 6, 8	80	M20	170	140	22	85	22	600	550	660	22	6	8
1LG4317 1LG6317	6, 8 6, 8	80	M20	170	140	22	85	22	600	550	660	22	6	8
1LG4318 1LG6318	6, 8 6, 8	80	M20	170	140	22	85	22	600	550	660	22	6	8
1LG4314	6, 8	80	M20	170	140	22	85	22	600	550	660	22	6	8

Three-phase squirrel-cage motors

4

Three-phase squirrel-cage motors 1PH7 and 1PL6

Overview

Three-phase motors 1PH7 and 1PL6 (frame size 280)

The 1PH7 and 1PL6 asynchronous motors (frame size 280) can be used as hoisting motors for hoisting gear, for example. This range of compact motors was designed to fulfill the special requirements of motors for hoisting gear.

1PH7 and PL6 asynchronous motors feature the following different characteristics:

- 1PH7 motors are compact, externally-ventilated asynchronous motors with a squirrel-cage rotor and a degree of protection of IP55. They are ventilated with a radial, separately-driven fan unit, which is installed as standard. With the "enhanced corrosion protection" option, the motors can also be installed outdoors.
- 1PL6 motors are compact, externally-ventilated asynchronous motors with a squirrel-cage rotor and a degree of protection of IP23. They are also ventilated with a radial, separately-driven fan unit, which is installed as standard. These motors are particularly suitable for installation in an enclosed room.

Benefits

They have been designed specifically for use in conjunction with the SIMOVERT MASTERDRIVES drive system. The motors offer maximum performance in the minimum space and can be operated at zero speed with no reduction in the torque.

- 1PL6 motors are also available in frame size 225 for hoisting gear with a lower output. For the technical specifications, see catalog DA 65.3.
- 1PH7 and 1PL6 motors can also be fitted with brakes on the non-drive end. For more information, please contact your local Siemens representative.

More information

For detailed technical descriptions and dimensional drawings, see catalog DA 65.3. All the electrical data for intermittent duty S3 is provided on the following pages.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 400 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 500 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	500	17	118	2254	206	3010	290	1000	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	147	2808	256	3990	380	1150	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	191	3648	332	5080	480	1150	2050	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	500	17	98	1872	173	3010	290	1200	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	123	2349	216	3990	380	1500	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	160	3056	280	5080	480	1500	2050	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	500	17	80	1529	144	3010	290	1650	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	100	1909	180	3990	380	1950	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	130	2481	233	5080	480	1950	2050	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 800 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	800	27	184	2197	313 (at 400 V)	3940	610	2000	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	228	2722	401 (at 385 V)	5510	885	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	279	3331	514 (at 370 V)	7010	1160	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	800	27	154	1838	264 (at 400 V)	3940	610	2200	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	191	2280	340 (at 385 V)	5510	885	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	234	2793	436 (at 370 V)	7010	1160	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	800	27	125	1492	220 (at 400 V)	3940	610	2200	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	155	1850	285 (at 385 V)	5510	885	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	190	2268	365 (at 370 V)	7010	1160	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1150 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1150	38.6	250	2076	438 (at 400 V)	5300	1200	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	309	2566	573 (at 380 V)	7150	1700	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	382	3172	692 (at 385 V)	8980	2110	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1150	38.6	209	1736	372 (at 400 V)	5300	1200	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	258	2143	489 (at 380 V)	7150	1700	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	320	2657	589 (at 385 V)	8980	2110	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1150	38.6	170	1414	314 (at 400 V)	5300	1200	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	210	1745	514 (at 380 V)	7150	1700	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	260	2160	497 (at 385 V)	8980	2110	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 400 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1750 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1750	58.7	331	1806	561	4660	1600	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	397	2166	669	5550	1895	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	500	2729	840	7410	2560	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1750	58.7	277	1512	473	4660	1600	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	332	1812	562	5550	1895	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	418	2281	707	7410	2560	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1750	58.7	225	1228	393	4660	1600	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	270	1474	466	5550	1895	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	340	1856	586	7410	2560	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 480 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 600 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	600	20.3	140	2228	205	3230	310	1400	1620	900	500	300	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	600	20.3	176	2801	255	4580	435	1500	2130	1110	670	450	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	600	20.3	228	3629	331	6190	590	1600	2830	1500	860	570	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	600	20.3	117	1862	173	3230	310	1700	1620	900	500	300	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	600	20.3	148	2356	216	4580	435	1800	2130	1110	670	450	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	600	20.3	191	3040	279	6190	590	1900	2830	1500	860	570	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	600	20.3	95	1512	144	3230	310	2200	1620	900	500	300	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	600	20.3	120	1910	180	4580	435	2200	2130	1110	670	450	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	600	20.3	155	2467	233	6190	590	2200	2830	1500	860	570	6.3	**1PH7 288-■AB■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1000 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1000	34	221	2111	315 (at 480 V)	4160	680	2200	2150	1270	840	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	1000	34	272	2598	401 (at 480 V)	6250	1020	2200	3170	1900	1240	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	1000	34	338	3228	514 (at 460 V)	7760	1295	2200	4010	2430	1570	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1000	34	185	1767	265 (at 480 V)	4160	680	2200	2150	1270	840	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	1000	34	228	2177	340 (at 480 V)	6250	1020	2200	3170	1900	1240	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	1000	34	283	2703	436 (at 460 V)	7760	1295	2200	4010	2430	1570	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1000	34	150	1433	220 (at 480 V)	4160	680	2200	2150	1270	840	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	1000	34	185	1767	285 (at 480 V)	6250	1020	2200	3170	1900	1240	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	1000	34	230	2197	365 (at 460 V)	7760	1295	2200	4010	2430	1570	6.3	**1PH7 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1350 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1350	45.3	294	2080	437 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1350	45.3	360	2547	573 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1350	45.3	448	3169	693 (at 450 V)	9350	2210	2210	7640	4260	2850	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1350	45.3	246	1740	372 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1350	45.3	301	2129	489 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1350	45.3	375	2653	589 (at 450 V)	9350	2210	2200	7640	4260	2850	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1350	45.3	200	1416	314 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1350	45.3	245	1733	414 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1350	45.3	305	2158	497 (at 450 V)	9350	2210	2200	7640	4260	2850	6.3	**1PH7 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 455 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 2000 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	2000	67	375	1791	562	4780	1655	2200	4780	2900	1950	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	2000	67	456	2177	669	5740	1980	2200	5740	3460	2300	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	2000	67	566	2703	841	7560	2625	2200	7560	4880	3300	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	2000	67	314	1499	473	4780	1655	2200	4780	2900	1950	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	2000	67	381	1819	563	5740	1980	2200	5740	3460	2300	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	2000	67	474	2263	707	7560	2625	2200	7560	4880	3300	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	2000	67	255	1218	393	4780	1655	2200	4780	2900	1950	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	2000	67	310	1480	466	5740	1980	2200	5740	3460	2300	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	2000	67	385	1838	586	7560	2625	2200	7560	4880	3300	6.3	**1PH7 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 690 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 500 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	500	17	113	2158	114	3010	170	1050	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	141	2693	143	3990	225	1250	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	184	3514	185	5080	278	1150	2070	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	500	17	95	1815	96	3010	170	1300	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	118	2254	121	3990	225	1550	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	154	2941	156	5080	278	1500	2070	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	500	17	77	1471	80	3010	170	1700	1110	550	320	250	4.2	**1PH7 284-■AB■■-0■■■**	1300
280	500	17	96	1834	101	3990	225	1950	1570	770	420	340	5.2	**1PH7 286-■AB■■-0■■■**	1500
280	500	17	125	2388	130	5080	278	1950	2070	1010	550	440	6.3	**1PH7 288-■AB■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 800 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	800	27	169	2017	169 (at 690 V)	3940	355	2200	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	213	2543	223 (at 665 V)	5510	515	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	272	3247	295 (at 640 V)	7010	675	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	800	27	141	1683	143 (at 690 V)	3940	355	2200	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	178	2125	190 (at 665 V)	5510	515	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	228	2722	250 (at 640 V)	7010	675	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	800	27	115	1373	120 (at 690 V)	3940	355	2200	3200	1480	880	610	4.2	**1PH7 284-■AC■■-0■■■**	1300
280	800	27	145	1731	160 (at 665 V)	5510	515	2200	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	185	2208	210 (at 640 V)	7010	675	2200	5610	2610	1300	1010	6.3	**1PH7 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1150 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1150	38.6	241	2001	244 (at 690 V)	5300	700	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	298	2475	321 (at 655 V)	7150	990	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	369	3064	388 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1150	38.6	202	1677	208 (at 690 V)	5300	700	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	250	2076	274 (at 655 V)	7150	990	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	309	2566	331 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1150	38.6	164	1362	176 (at 690 V)	5300	700	2200	3500	2020	1380	4.2	**1PH7 284-■AD■■-0■■■**	1300
280	1150	38.6	203	1686	233 (at 655 V)	7150	990	2200	4450	2540	1700	5.2	**1PH7 286-■AD■■-0■■■**	1500
280	1150	38.6	251	2084	280 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PH7 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Three-phase squirrel-cage motors 1PH7

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 690 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PH7 28. asynchronous motors, degree of protection IP55, operating speed 1750 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1750	58.7	319	1741	315	4660	935	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	384	2096	376	5550	1110	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	484	2641	472	7410	1495	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1750	58.7	267	1457	265	4660	935	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	321	1757	316	5550	1110	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	405	2210	398	7410	1495	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1750	58.7	217	1184	221	4660	935	2200	3770	2420	1650	4.2	**1PH7 284-■AF■■-0■■■**	1300
280	1750	58.7	261	1424	262	5550	1110	2200	4500	2890	1980	5.2	**1PH7 286-■AF■■-0■■■**	1500
280	1750	58.7	329	1795	330	7410	1495	2200	5800	3750	2600	6.3	**1PH7 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PH7 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm^2		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 800 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	800	27.3	263	3140	491 (at 400 V)	3940	610	1200	2860	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27.3	359	4285	643 (at 385 V)	5510	885	1400	4450	2030	1200	790	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	800	27.3	456	5443	834 (at 370 V)	7010	1160	1450	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	800	27.3	240	2865	410 (at 400 V)	3940	610	1400	2860	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27.3	308	3677	537 (at 385 V)	5510	885	1600	4450	2030	1200	790	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	800	27.3	381	4548	696 (at 370 V)	7010	1160	1700	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	800	27.3	195	2328	335 (at 400 V)	3940	610	1700	2860	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27.3	250	2984	440 (at 385 V)	5510	885	1900	4450	2030	1200	790	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	800	27.3	310	3701	570 (at 370 V)	7010	1160	2100	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PL6

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1150 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1150	38.9	412	3421	696 (at 400 V)	5300	1200	2000	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	522	4335	926 (at 380 V)	7150	1700	2000	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	639	5306	1114 (at 385 V)	8980	2110	2100	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1150	38.9	344	2857	582 (at 400 V)	5300	1200	2200	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	437	3629	775 (at 380 V)	7150	1700	2200	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	535	4443	931 (at 385 V)	8980	2110	2200	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1150	38.9	280	2325	478 (at 400 V)	5300	1200	2200	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	355	2944	637 (at 380 V)	7150	1700	2200	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	435	3607	765 (at 385 V)	8980	2110	2200	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 400 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1750 rpm Supply voltage 400 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1750	59	544	2969	906	4660	1600	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	654	3569	1085	5550	1895	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	823	4491	1362	7410	2560	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1750	59	455	2483	755	4660	1600	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	547	2985	903	5550	1895	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	689	3760	1133	7410	2560	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1750	59	370	2019	616	4660	1600	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	445	2429	736	5550	1895	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	560	3055	924	7410	2560	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PL6

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1000 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1000	34	345	3295	492 (at 480 V)	4160	680	1400	2150	1270	840	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	1000	34	456	4355	643 (at 480 V)	6250	1020	1700	3170	1900	1240	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	1000	34	566	5405	834 (at 460 V)	7760	1295	1700	4010	2430	1570	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1000	34	289	2760	410 (at 480 V)	4160	680	1700	2150	1270	840	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	1000	34	381	3639	537 (at 480 V)	6250	1020	2100	3170	1900	1240	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	1000	34	474	4572	696 (at 460 V)	7760	1295	2200	4010	2430	1570	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1000	34	235	2244	335 (at 480 V)	4160	680	2200	2150	1270	840	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	1000	34	310	2961	440 (at 480 V)	6250	1020	2200	3170	1900	1240	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	1000	34	385	3677	570 (at 460 V)	7760	1295	2200	4010	2430	1570	6.3	**1PL6 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1350 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1350	45.5	478	3381	696 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1350	45.5	603	4266	925 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1350	45.5	742	5249	1114 (at 450 V)	9350	2210	2200	7640	4260	2850	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1350	45.5	400	2830	582 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1350	45.5	504	3565	774 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1350	45.5	621	4393	931 (at 450 V)	9350	2210	2200	7640	4260	2850	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1350	45.5	325	2299	478 (at 470 V)	5580	1255	2200	4710	2800	1900	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1350	45.5	410	2901	637 (at 445 V)	7490	1780	2200	5730	3440	2290	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1350	45.5	505	3573	765 (at 450 V)	9350	2210	2200	7640	4260	2850	6.3	**1PL6 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Three-phase squirrel-cage motors 1PL6

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 455 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No.	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 2000 rpm Supply voltage 480 V 3 AC for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	2000	67.3	610	2913	907	4780	1655	2200	4780	2900	1950	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	2000	67.3	735	3510	1085	5740	1980	2200	5740	3460	2300	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	2000	67.3	926	4422	1362	7560	2625	2200	7540	4880	3300	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	2000	67.3	510	2435	755	4780	1655	2200	4780	2900	1950	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	2000	67.3	615	2937	903	5740	1980	2200	5740	3460	2300	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	2000	67.3	775	3701	1133	7560	2625	2200	7540	4880	3300	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	2000	67.3	415	1981	616	4780	1655	2200	4780	2900	1950	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	2000	67.3	500	2387	736	5740	1980	2200	5740	3460	2300	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	2000	67.3	630	3009	924	7560	2625	2200	7540	4880	3300	6.3	**1PL6 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1000 rpm	1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	Nm	kgm^2		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 800 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters															
Intermittent duty S3 – 40%															
280	800	27	261	3115	271 (at 690 V)	3940	355	1200	3200	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27	353	4214	364 (at 665 V)	5510	515	1250	4450	2030	1200	790	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	800	27	441	5264	467 (at 640 V)	7010	675	1250	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 60%															
280	800	27	228	2722	226 (at 690 V)	3940	355	1500	3200	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27	295	3522	305 (at 665 V)	5510	515	1700	4450	2030	1200	790	5.2	**1PH7 286-■AC■■-0■■■**	1500
280	800	27	369	4405	390 (at 640 V)	7010	675	1700	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)															
280	800	27	185	2208	185 (at 690 V)	3940	355	2000	3200	1480	880	610	4.2	**1PL6 284-■AC■■-0■■■**	1300
280	800	27	240	2865	250 (at 665 V)	5510	515	2100	4450	2030	1200	790	5.2	**1PL6 286-■AC■■-0■■■**	1500
280	800	27	300	3581	320 (at 640 V)	7010	675	2200	5610	2610	1300	1010	6.3	**1PL6 288-■AC■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Three-phase squirrel-cage motors 1PL6

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated}	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 1500 rpm	2000 rpm	2500 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm²		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1150 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1150	38.9	399	3313	393 (at 690 V)	5300	700	2100	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	506	4202	521 (at 655 V)	7150	990	2100	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	620	5149	627 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1150	38.9	334	2774	329 (at 690 V)	5300	700	2200	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	424	3521	436 (at 655 V)	7150	990	2200	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	519	4310	524 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1150	38.9	272	2259	270 (at 690 V)	5300	700	2200	3500	2020	1380	4.2	**1PL6 284-■AD■■-0■■■**	1300
280	1150	38.9	344	2857	359 (at 655 V)	7150	990	2200	4450	2540	1700	5.2	**1PL6 286-■AD■■-0■■■**	1500
280	1150	38.9	422	3504	431 (at 665 V)	8980	1230	2200	5200	3140	1900	6.3	**1PL6 288-■AD■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Selection and ordering data

Frame size	Operating characteristics [1] Rated speed n_{rated}	Rated frequency f_{rated}	Rated output P_{rated}	Rated torque M_{rated}	Rated current I_{rated} at 690 V	Max. torque M_{max} [2]	Max. current I_{max} [2]	Max. speed at const. output (field weakening) n_2	Max. torque M_{max} [2] at 2000 rpm	2500 rpm	3000 rpm	Moment of inertia J	Order No. [3]	Weight, approx.
	rpm	Hz	kW	Nm	A	Nm	A	rpm	Nm	Nm	Nm	kgm^2		kg
1PL6 28. asynchronous motors, degree of protection IP23, operating speed 1750 rpm Supply voltage 690 V 3 AC [3] for SIMOVERT MASTERDRIVES Vector Control converters														
Intermittent duty S3 – 40%														
280	1750	59	528	2881	510	4660	935	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	635	3465	611	5550	1110	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	799	4360	766	7410	1495	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 60%														
280	1750	59	441	2407	425	4660	935	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	531	2898	509	5550	1110	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	668	3645	638	7410	1495	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700
Intermittent duty S3 – 100% (S1)														
280	1750	59	359	1959	347	4660	935	2200	3770	2420	1650	4.2	**1PL6 284-■AF■■-0■■■**	1300
280	1750	59	432	2357	415	5550	1110	2200	4500	2890	1980	5.2	**1PL6 286-■AF■■-0■■■**	1500
280	1750	59	543	2963	520	7410	1495	2200	5800	3750	2600	6.3	**1PL6 288-■AF■■-0■■■**	1700

Order no. supplements, see page 4/24

[1] For further operating characteristics and configuration data, see the configuration guidelines for 1PL6 asynchronous motors.

[2] Maximum torque/current that is briefly present for dynamic operations (e.g. accelerating). For thyristor or diode supplies, the values specified must be reduced by 15% due to voltage tolerances.

[3] With a line voltage of 690 V, the motors must be ordered with option **C30**.

Three-phase squirrel-cage motors 1PH7 and 1PL6

Selection and ordering data

Order number supplement

Position of the order number	1	2	3	4	5	6	7		8	9	10	11	12		13	14	15	16		
	1	**P**	**.**	**.**	**2**	**8**	**.**	**–**	■	**A**	**.**	■	■	**–**	**0**	■	■	■	**–**	**Z**

Separately-driven fan and terminal box with construction type IM B3/IM B35
When the separately-driven fan is mounted on the ND end, the direction of air flow is NDE > DE; when the separately-driven fan is mounted on the D end, the direction of air flow is DE > NDE.

Separately-driven fan	terminal box		
• NDE top		**0**	
	NDE right		**0**
	NDE left		**1**
	NDE top		**–**
	DE top (not IM B35)		**5**
• NDE right		**1**	
	NDE right		**–**
	NDE left		**1**
	NDE top		**2**
	DE top (not IM B35)		**5**
• NDE left		**2**	
	NDE right		**0**
	NDE left		**–**
	NDE top		**2**
	DE top (not IM B35)		**5**
• DE top		**3**	
	NDE right		**–**
	NDE left		**–**
	NDE top		**2**
	DE top (not IM B35)		**–**
• DE right		**4**	
	NDE right		**–**
	NDE left		**–**
	NDE top		**2**
	DE top (not IM B35)		**–**
• DE left		**5**	
	NDE right		**–**
	NDE left		**–**
	NDE top		**2**
	DE top (not IM B35)		**–**

Construction type

• IM B3	**0**
• IM B35	**3**

Drive type and vibration severity grade

Drive type	Vibration severity grade	
• Coupling	N	**A**
• Coupling	R	**B**

Shaft extension, balancing

• Half-key balancing	**A**
• Full key balancing	**C**

Paint finish

• Primed	**0**
• Standard paint finish, anthracite, RAL 7016	**3**
• Special paint finish, anthracite RAL 7016	**6**

Special version [1]	**Z**

[1] Specify required version with order code or in plain text as shown in the table on page 4/25.

Selection and ordering data

Options

Additional identification codes for special 1PH7 and 1PL6 motor versions

Version	Order code
Winding version 690 V	**C30**
Fan unit with filter	**G14**
Pulse encoder POG10 or POG10 with centrifugal switch (specify in the order; the built-on devices must be supplied to the factory)	**G80**
Second rating plate	**K31**
Anti-condensation heating 230 V, 200 W	**K45**
Cable entry plate, terminal box, customer-specific (plain text is required)	**K55**
Terminal box rotated through +90 degrees	**K83**
Terminal box rotated through –90 degrees	**K84**
Terminal box rotated through 180 degrees	**K85**
Condensate hole provided (not sealed) (only required for 1PH7)	**L12**
Enhanced corrosion protection for installation in industrial areas or exposed to sea air (only possible for 1PH7 motors)	**L29**
Additional back-off thread on motor feet (for ease of installation)	**M83**
Special paint finish RAL...	**R2Y**
Deviating rating plate data	**Y80**

The KTY 84 sensor for monitoring the motor temperature is installed as standard and does not need to be ordered separately. (A second KTY 84 sensor is also installed for backup.)

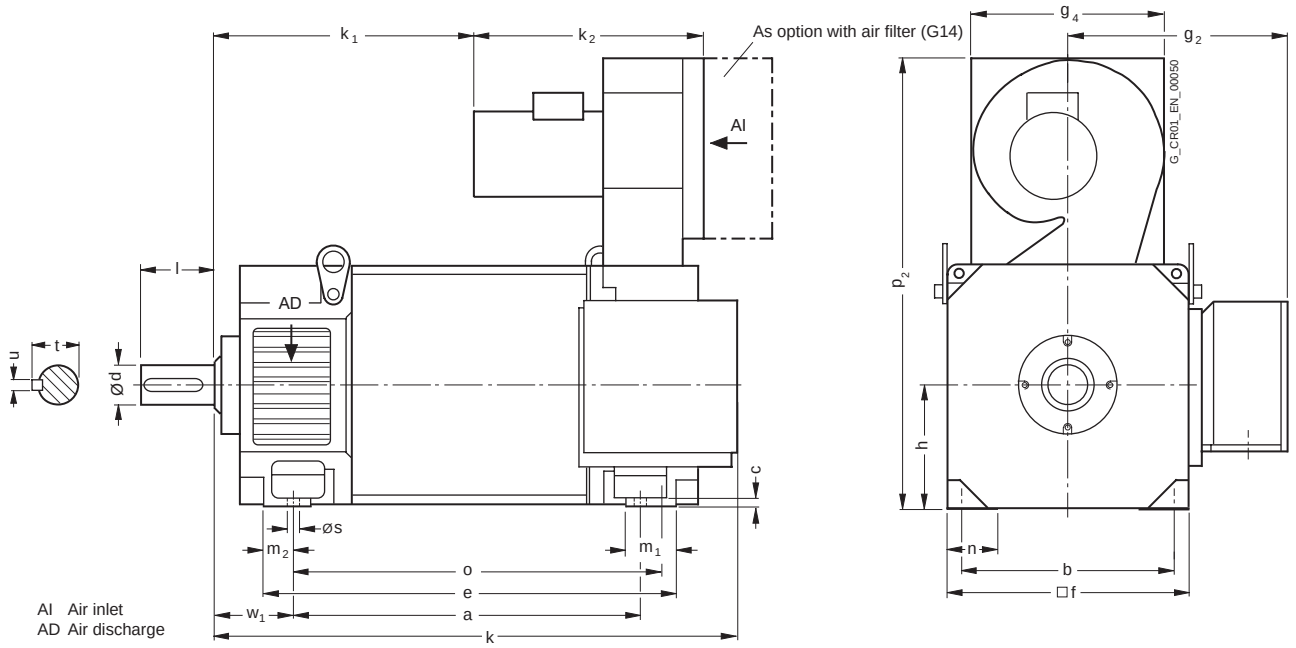
For further options, see catalog DA 65.3.

Three-phase squirrel-cage motors 1PH7 and 1PL6

Dimensional drawings

Construction type IM B3

For motor			Dimensions to																	DE shaft extension				
Frame size	Type	DIN IEC	a B	b A	c HA	e BB	f AB	g_2 AD	g_4 –	h H	k LB	k_1 –	k_2 –	m_1 –	m_2 –	n AA	o –	p_2 –	s K	w_1 C	d D	l E	t GA	u FA
280	1P.. 284		684	457	22	840	560	518	449	280	1146	489	546	108	78	100	731	1042	24	190	95	170	100	25
	1P.. 286		794			950					1256	599					841							
	1P.. 288		924			1080					1386	729					971							



If encoder POG 10 (without centrifugal switch) is mounted, this increases the length k of the motor by 80 mm.

Three-phase slip ring motors

5

Three-phase slip ring motors 1LT9 and 1LT8

Overview

Three-phase slip ring motor with conical shaft extension

Three-phase slip ring motor with cylindrical shaft extension

Hoisting gear drives – for cranes in particular – are subject to extremely high torques during acceleration. Voltage dips can also occur during acceleration phases. A high stalling torque is essential, therefore, for ensuring that the crane operates reliably.

The hoisting gear motors 1LT9 and 1LT8 are designed specifically for intermittent duty and are characterized by their:

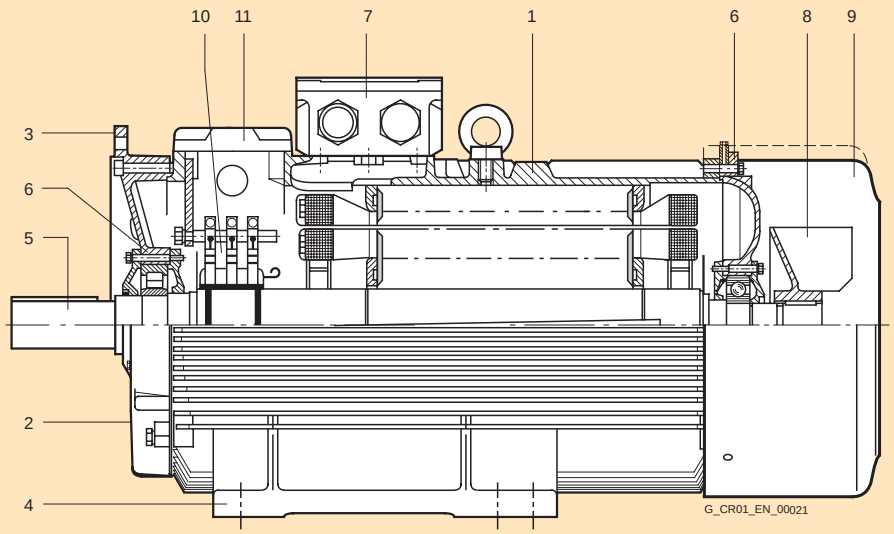
- Rugged design
- High stalling torque
- High resistance to extreme climates

DIN 42681 requires a relative stalling torque of at least 2.2 times the rated torque, SEB 841 101-70 of at least 2.5 times the rated torque at 40% ON duration.

The relative stalling torques of the hoisting gear motors manufactured by Siemens AG are significantly higher than these values. They are largely maintained even at 25% ON duration, which ensures that cranes can still operate reliably if they are overloaded or if voltage dips occur.

All hoisting gear motors are suitable for use with stator-circuit phase-angle control. The tacho-generator required for sensing the speed can be mounted on the ND end of the motor.

The diagram below shows the design of slip ring motor 1LT8 (frame size 225 M to 315 M).



1 Housing
2 End shield
3 Flange end shield
4 Foot
5 Rotor
6 Bearing
7 Terminal box
8 Fan
9 Fan cowl
10 Slip ring contact system
11 Operating cover

Design of slip ring motor 1LT8

Technical specifications

Electrical design

Standard winding

The hoisting gear motors manufactured by Siemens AG are supplied with a standard winding for the following rated voltages:

- 50 Hz, 3 AC 380 V, 400 V, 500 V, 660 V, 690 V
- 60 Hz, 3 AC 460 V

Motors with a winding for 50 Hz, 3 AC 380 V / 400 V can also be connected to supplies with 60 Hz, 3 AC 440 V / 460 V, although they must be operated at a maximum 110% of the 50 Hz output. The speed varies in proportion to the frequency and the rotor standstill voltage in the ratio of 440 V / 380 V or 460 V / 400 V. The torque overload capability does not change (see also the selection and ordering data).

Non-standard winding

The motors are equipped with a non-standard winding for operating voltages of between 380 and 690 V, 50 or 60 Hz that are outside the values specified above. The technical data at 50 Hz roughly corresponds with the catalog specifications for the motors with standard windings. At 60 Hz, the rated output changes to approximately 110% of the rated output at 50 Hz. Further technical data for 60 Hz is available on request.

Tolerances

In accordance with IEC 60034-1, the following deviations from the rated data are permitted:

- Slip ± 20%
- Stalling torque – 10%
- Moment of inertia ± 10%

Insulation

In the standard version, the stator and rotor winding have temperature class F.

In accordance with IEC 60034-1, the stator windings are tested at a test voltage of 2 x U_{rated} + 1000 V (but at least 1500 V). The rotor windings of hoisting gear motors are tested with 4 times the rotor standstill voltage + 1000 V.

PTC thermistor temperature sensors

The standard 1LT motors are not supplied with temperature sensors. If required, however, three or six temperature sensors can be installed in the stator winding of these motors for warning and/or shutdown purposes.

In all cases, the terminals for the temperature sensors are located in the terminal box.

Description of terminals

Temperature sensor	Terminal designation Frame size 100 to 200	as of frame size 225
Warning	1, 2	1TP1, 1TP2
Shutdown	3, 4	2TP1, 2TP2

Terminal box

The terminal box is located on the top of all standard hoisting gear motors. A side arrangement is possible up to frame size 200 L.

The terminal box for 1LT motors has cable entries on only one side, although it can be rotated through 180° with fixed terminals. In the standard version, the cable entries are on the right (as viewed from the drive end). All terminal boxes fulfill degree of protection IP55.

Specially marked terminals are provided for the protective conductor.

If required, two additional holes M20 x 1.5 can be provided for 1LT8 motors. If a motor with PTC thermistors and anti-condensation heating is ordered, two M20 x 1.5 holes are provided as standard in the terminal box.

Motor type	Thread Terminal bolt Stator	Cable entry Stator	Thread Terminal stud Rotor	Cable entry Rotor	Cable entry Additional equipment
1LT9 107 **1LT9 113** **1LT9 114**	M5	M25 x 1.5	M5	M25 x 1.5	M16 x 1.5
1LT9 133 **1LT9 134** **1LT9 135**	M6	M32 x 1.5	M6	M32 x 1.5	M16 x 1.5
1LT9 163 **1LT9 166** **1LT9 186**	M8	M40 x 1.5	M8	M40 x 1.5	2 x M16 x 1.5
1LT9 206 **1LT9 207**	M10	M50 x 1.5	M10	M50 x 1.5	2 x M16 x 1.5
1LT8 223 **1LT8 224** **1LT8 253** **1LT8 254-4**	M8	M50 x 1.5	M8	M50 x 1.5	M20 x 1.5
1LT8 254-6/8/10 **1LT8 280** **1LT8 283**	M10	M63 x 1.5	M8	M63 x 1.5	M20 x 1.5
1LT8 310 **1LT8 313**	M10	M63 x 1.5	M8	M63 x 1.5	M20 x 1.5
1LT8 314 **1LT8 315** **1LT8 317** [1)] **1LT8 318** [1)]	M12	Encapsulated gland	M10	M63 x 1.5	M20 x 1.5

[1)] Version 220/380 VΔ/Y or 230/400 VΔ/Y not available.

Three-phase slip ring motors 1LT9 and 1LT8

Technical specifications

Slip rings and brushgear

Motor type	Position	Accessibility	Cover	Brushgear	Slip ring Material
1LT9 107 — 1LT9 207	On non-drive end in pot-type end shield	From above, rotatable through 90° later	Cast iron	Two-arm clamp-type brush holder	Cast bronze
1LT8 223 — 1LT8 313	On drive end, integrated in cast-iron housing	From above	Cast iron	Box-type brush holder	Brass
1LT8 314 — 1LT8 318	On non-drive end in pot-type end shield	From above	Cast iron	Two-arm clamp-type brush holder	Brass

Mechanical design

Construction types

In accordance with EN 60034-7, flange in accordance with DIN 42948.

The hoisting gear motors up to frame size 200 L can be operated in mounting positions IM B6, IM B7, IM B8, IM V5, and IM V6 or IM V1 (except the basic construction types IM B3 or IM B5). When an order is placed, however, the installation type must be specified (because of the position of the condensate drain holes, for example).

For this reason, they are normally designated only with the basic construction type on the rating plate.

If motors of frame size 180 in a construction type with feet are mounted on the wall, it is recommended that the motor feet are supported.

Hoisting gear motors as of size 225 M can only be supplied in construction types IM B3, IM B35, and IM V1.

A protective top cover is required for all construction types in which the shaft extension is facing down.

If basic construction type IM B3 or IM B5 is used in a different mounting position, the position of the condensate drain holes must be taken into account (if necessary, turn the end shield). Condensate inside the motor must be allowed to drain off through the condensation water drain holes.

Housing

The motor housing is made of gray cast iron.

Housing feet

The undersides of the feet are machined. The relevant tolerances are specified in the dimensions table.

Shaft extensions

In the standard version, the hoisting gear motors are supplied as follows:

- 1LT9 up to frame size 160: with a cylindrical shaft extension in accordance with DIN 748 [1)]
- 1LT9 as of frame size 180: with a conical shaft extension in accordance with DIN 1448 [2)]
- 1LT8: with a conical shaft extension (in accordance with DIN 1448) [2)]

Other shaft extensions (e.g. in accordance with DIN 42681) are available on request. Conical shaft extensions have a 1:10 pitch, a threaded stem, and are provided with a spring washer and hexagon nut.

With all motors, the end face on the ND end is accessible and is suitable for mounting a speed sensor. Motors in the basic construction types IM B3 and IM B5 can also be supplied with two shaft extensions.

As of frame size 180, the motors are equipped with a conical shaft extension, which is more suitable for transmitting high impulse torques because it ensures that the coupling is fitted more securely to the shaft extension.

The featherkey on conical shaft extensions simply provides additional security. Under normal operating conditions, it does not need to transmit any forces because the entire torque is transmitted via the conical fit. The hole for the coupling half must always be made using a taper plug gage, whereby the smallest diameter must be between 0.2 and 0.6 mm smaller than the diameter d_2 or d_3 of the shaft extension.

When the coupling half is pushed onto the shaft extension, the end face is approximately 2-6 mm from the shaft shoulder. This ensures that the shoulder nut does not push against the thread end when it is tightened and that it sits securely on the shaft.

The couplings are normally mounted cold. The coupling hub is pushed on in an axial direction and expands to such an extent that the required frictional locking for transmitting the torque is ensured. A specific torque or gage is not required.

Mounted tachometer

In closed-loop drive control systems with a control range, a tacho-generator can be fitted to sense the speed on the ND end of the motor. It is mounted on the fan cowl.

The following tachometers are preferred:

- On motors of frame size 100 to 200
  GMP 1.0 S-4, construction type IM B5 S
  U_{rated} = 100 V at 1000 rpm I_{rated} = 100 mA
  Brush quality H 73
  Degree of protection IP55
- On motors of frame size 225 to 315
  GMP 1.0, LT-4, construction type IM B5 N
  U_{rated} = 100 V at 1000 rpm
  I_{rated} = 100 mA
  Brush quality H 73
  Degree of protection IP55

If a different tachometer is to be fitted, information should be requested (e.g. HOG10). Tachometers are provided by the factory.

[1)] Conical shaft extension available at extra charge.

[2)] Cylindrical shaft extension available at extra charge.

Technical specifications

Degree of protection in accordance with DIN VDE 0530-5

Hoisting gear motors are mainly operated in intermittent duty S3. In this operating mode, there is a high risk of condensate building up inside the motor, particularly if the motor is operated outdoors. The condensate must be able to drain off, which is why the following degrees of protection have been defined for standard hoisting gear motors:

- Motor housing IP54 with open water drain holes
- Terminal box IP55

Higher degrees of protection are available (IP55), although they are not recommended for motors that operate in intermittent duty due to the build-up of condensate inside the motor.
If flange motors are to be fitted to a gear unit with neither an intermediate housing nor a coupling, a seal to protect against the ingress of oil must be fitted to the flange end shield. If this seal is not fitted on the gear unit side, the appropriate options for the motor must be ordered. With 1LT9 motors, a radial seal is then fitted to the DE end shield. If nothing is specified in the order regarding the gearbox mounting, it is assumed that a coupling is used for transmitting power.

Maximum permissible speed

The maximum permissible operating speed is specified in the technical specifications / selection tables. In accordance with IEC 60034-1, the motors are run at 1.2 times this speed over a period of 2 minutes as part of an overspeed test.

Special versions of hoisting gear motors are available for higher operating speeds (please inquire).

Water (condensate) drain holes

Hoisting gear motors with degree of protection IP54 always have water (condensate) drain holes that prevent water from collecting inside the motor.

With degree of protection IP55, the water drain holes are always sealed. The water drain holes on motors with this degree of protection must be opened at regular intervals as part of the maintenance cycle to allow any condensate that has collected inside the motor to drain off.

Mechanical balance quality

The rotors in hoisting gear motors are dynamically balanced with an inserted half featherkey. This corresponds to vibration severity grade N (normal). Guidelines regarding vibrations generated by the motor are defined in IEC 60034-14.

If special requirements exist with regard to the mechanical balance quality, the rotors can also be balanced in accordance with other vibration severity grades (see table on page 1/4).

Rating plates

A stainless steel rating plate specifying the rated motor data is fitted to the housing or fan cowl of Siemens hoisting gear motors.

1LT9 motors have international rating plates, while 1LT8 motors have dual-language ones (German/English).

Other language combinations or single-language rating plates can also be fitted (extra charge).

The following data is specified as standard:

- Operating voltage
- Construction type
- IP54 degree of protection
- Rated power
- Rated current
- Rated speed
- Rotor current

Rated output, current, and speed are specified for S3 -15, -25, -40, -60, -100% ON duration.

If a higher degree of protection or insulation class is required, this can also be specified accordingly.

Replaceability of older motors

1LT9 and 1LT8 motors can usually replace older motors. Since the standards are subject to change, however, it is advisable in certain cases to check the technical data and mounting dimensions. Special attention must be paid to the following:

- Position of the terminal boxes
- Foot dimensions and shaft heights
- Shaft extensions
- Characteristic rotor resistance k

$$k = \frac{u_2}{i_2 \times \sqrt{3}}$$

u_2 Rotor standstill voltage
i_2 Rotor current

Special versions can sometimes be adapted to older versions.

Three-phase slip ring motors 1LT9 and 1LT8

Technical specifications

Bearings

All hoisting gear motors are equipped with standard rolling-contact bearings that comply with the following standards:

- Deep-groove ball bearings
  - 62..C3, DIN 625
  - 63..C3, DIN 625
- Cylindrical-roller bearing
  - NU..., DIN 5412

The bearings of the 1LT9 motors are greased for life. An optional regreasing device can also be installed for exceptional operating conditions. High-temperature, long-life grease is used for lubrication. The bearings used are listed in the table in the section "Bearing assignment for 1LT9 motors". Cylindrical-roller bearings are installed in drives with increased lateral forces.

In all cases, the bearing seal is compatible with the ordered motor degree of protection.

The standard 1LT8 motors are equipped with bearings of dimension series 03 with permanent lubrication. The bearing play for all deep-groove ball bearings complies with C3; for cylindrical-roller bearings, the bearing play is "standard".

An optional regreasing device can also be installed in motors for exceptional operating conditions (e.g. coolant temperature above 55 °C). High-temperature grease is used for lubrication. Regreasing devices are available for all motors at extra cost.

For drives in which high lateral forces occur (e.g. pinion output in crane slewing gear), cylindrical-roller bearings are installed in 1LT8 motors on the DE instead of deep-groove ball bearings (assuming that the end shield has not been modified).

The bearing seal in all motors complies with degree of protection IP54, whereby the bearing is sealed externally by a V ring. Anti-corrosion measures may be required if the motor is installed in a corrosive environment (please inquire).

With 1LT8 motors, measurement nipples can be fitted to the end shield to monitor the bearings in accordance with the "shock pulse measurement" (SPM) method.

Rolling-contact bearings

The bearings for hoisting gear motors 1LT9 and 1LT8 are designed for coupling outputs. The bearings for motors up to frame size 313 are greased for life; as of size 314, a regreasing device is installed.

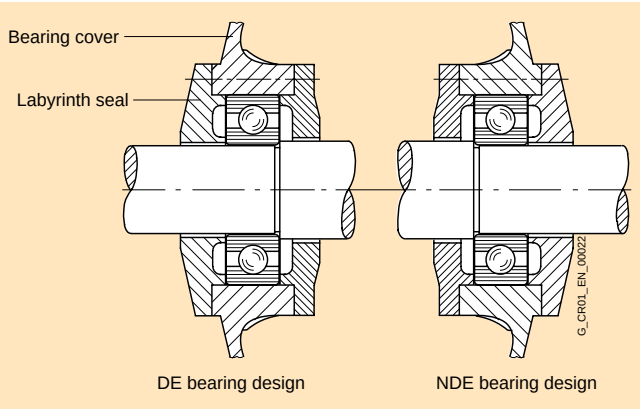
If required, motors up to frame size 313 can also be supplied with a regreasing device (optional). Reinforced bearings are required for drives with increased lateral forces (code: K20).

Bearing assignment for 1LT9 motors

Type	DE bearings	V-ring	NDE bearings	V-ring	Figure
1LT9 107	6206 2Z C3	-	6206 C3	-	See section "Frame sizes 100 to 132"
1LT9 113/114	6306 2Z C3	-	6306 C3	-	
1LT9 133/134/135	6308 C3	-	6308 C3	-	
1LT9 163/166	6309 C3	-	6309 C3	-	See section "Frame sizes 160 to 200"
1LT9 186	6311 C3	-	6310 C3	-	
1LT9 206/207	6313 C3	-	6312 C3	-	

Frame sizes 100 to 132

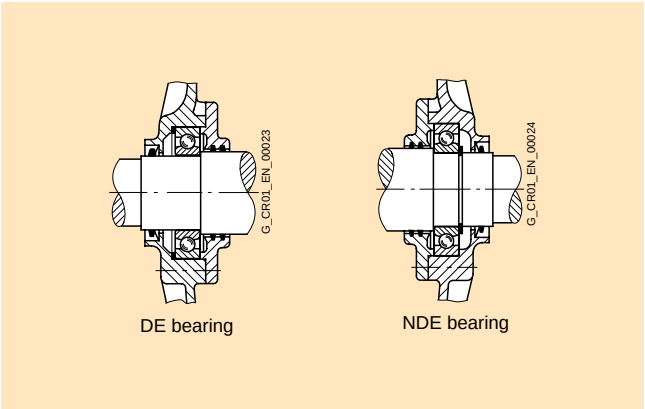
Frame size 100 and 112 motors are equipped as standard with bearings fixed by means of retaining rings DIN 471 and DIN 472 on the ND end. With frame size 132, the location bearing on the ND end is positioned in the end shield hub by means of a bearing cover.



Bearing arrangement for frame sizes 100 to 132

Frame sizes 160 to 200

The bearing assignment is for illustration purposes only; binding statements about the bearings for motors that have already been delivered can be requested. Please specify the serial number.



Bearing arrangement for frame sizes 160 to 200

Technical specifications

Bearing assignment for 1LT8 motors

The bearing assignment is for illustration purposes only; binding statements about the bearings for motors that have already been delivered can be requested. Please specify the serial number.

Motor type	No. of poles	DE bearings	V-ring	NDE bearings	V-ring	Fig. DE bearings	Fig. NDE bearings
1LT8 223	4, 6, 8	6313 C3	65 A	6113 C3	60 A	1	2
1LT8 224	4, 6, 8	6313 C3	65 A	6113 C3	60 A		
1LT8 253	4, 6, 8, 10	6315 C3	75 A	6313 C3	65 A	1	2
1LT8 254	4	6315 C3	75 A	6313 C3	65 A		
1LT8 254	6, 8, 10	6316 C3	80 A	6314 C3	80 A		
1LT8 280	4, 6, 8, 10	6317 C3	85 A	6314 C3	70 A	1	2
1LT8 283	4	6317 C3	85 A	6314 C3	70 A		
1LT8 283	6, 8, 10	6317 C3	85 A	6314 C3	70 A		
1LT8 310	4, 6, 8, 10	6319 C3	95 A	6316 C3	80 A	1	2
1LT8 313	4, 6, 8, 10	6319 C3	95 A	6316 C3	80 A	1	2
1LT8 314	4, 6, 8	6320 C3	RB 100 [1]	6317 C3 [2]	85 A	3	4
1LT8 315	4, 6, 8	6320 C3	RB 100 [1]	6317 C3 [2]	85 A	3	4
1LT8 317	4, 6, 8	6320 C3	RB 100 [1]	6317 C3 [2]	85 A	3	4
1LT8 318	4	6320 C3	RB 100 [1]	6317 C3 [2]	85 A	3	4

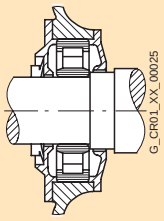


Fig. 1:

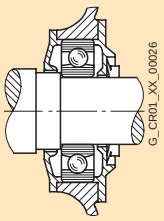


Fig. 2:

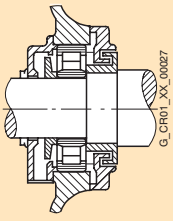


Fig. 3:

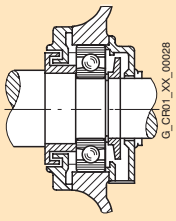


Fig. 4:

Bearing assignment for 1LT8 motors

Environmental influences and special versions

Ventilation

Hoisting gear motors are equipped with an external fan on the NDE, which blows the cooling air over the housing along the ribs distributed over the circumference (regardless of the direction of rotation). Thermoplastic radial fans are used in standard versions. For ambient temperatures of > 60 °C die-cast aluminum radial fans are used.

The fan cowl for all versions is made of sheet steel. If speed sensing devices (e.g. tacho-generator) are installed, the motors are fitted with cast-metal fan cowls. When the fans are suitably dimensioned and the flow of cooling air to the ribbed housing is optimized, effective heat dissipation is ensured even at speeds below the rated speed.

[1] Gamma ring

[2] For vertical construction types Q 317.

Three-phase slip ring motors 1LT9 and 1LT8

Technical specifications

Paint finish in accordance with RAL 7030

The standard paint finish in accordance with RAL 7030 is suitable for indoor and (in temperate climates) outdoor use. In extreme climates (e.g. constantly high humidity or chemically corrosive atmospheres), a special paint finish is necessary.

A special paint finish is also necessary if it is expected that the motor will be stored outdoors for a long period of time and it cannot be protected against rain.

For other exceptional ambient conditions, special surface protectors can also be supplied (optional).

Version with	Suitable for climate group in accordance with IEC publication 721-2-1	Temperature resistance	Composition (a top coat only is applied to silumin parts)	
			Primer	Top coat
Standard paint finish	**Moderate**			
	For indoors and outdoors Short-term: up to 100% rel. humidity at temperatures of up to +30 °C	Short-term: +120 °C	Base: alkyd resin or CN amino resin	Up to frame size 200 Base: nitro combi; From frame size 225 and above Base: polyurethane
	Continuous: up to 85% rel. humidity at temperatures of up to +25 °C	Continuous: +100 °C		
Special paint finish	**Worldwide**			
	For outdoor use Short-term: up to 100% rel. humidity at temperatures of up to +35 °C	Short-term: +140 °C	Base: alkyd resin or CN amino resin	Up to frame size 200 Base: epoxide; From frame size 225 and above Base: polyurethane (2 coats)
	Continuous: up to 98% rel. humidity at temperatures of up to +30 °C Also: for aggressive atmospheres up to 1% acid and alkali concentration or permanent dampness in sheltered rooms	Continuous: +120 °C		

Anti-condensation heating

Hoisting gear motors that are installed outdoors and subject to fluctuating temperatures and humidity can additionally be equipped with an anti-condensation heater which prevents condensation from forming when the motor is at a standstill. Anti-condensation heating is also recommended when motors are used in very cold environments. Anti-condensation heating must not be switched on during operation.

The table below shows the heat output of anti-condensation heaters.

For motors 1LT9/1LT8	Supply voltage	Heat output
Frame size	**V**	**W**
100 L to 112 M	115 or 230	40
132 M to 160 L	115 or 230	100
180 M to 200 L	115 or 230	100
225 S to 250 M	115 or 230	55
280 S to 315 L	115 or 230	100

Description of terminals	
Frame size 100 to 200	9, 10
As of frame size 225	HE1, HE2

Resistance to extreme climates of motors 1LT9 and 1LT8

The version with enhanced corrosion protection is also decontaminable. The data apply to the corrosion protection. The temperature limits for electrical machines must also be observed.

	Standard version	Version with enhanced corrosion protection
Climatic areas	A and T in accordance with DIN 50019	H and M in accordance with DIN 50019
Climatic group	Moderate (in accordance with IEC 721-2-1)	Worldwide (in accordance with IEC 721-2-1)

Radio interference

Hoisting gear motors with slip ring rotors generally fulfill radio interference suppression level N in accordance with EN 550014-1 (IEC/CISPR 14-1), which is sufficient for installation in industrial and residential areas.

Technical specifications

Temperature and site altitude

In accordance with IEC 60034, the rated outputs for intermittent duty (S3 -15, -25, -40, -60, and -100%) apply at a frequency of 50 Hz, with a coolant temperature (*CT*) of 40 °C, and at a site altitude of up to 1000 m above sea level.

Under other conditions, the permissible output must be determined in accordance with the tables below. Note that this only applies to the nominal output (i.e. the thermal utilization of the motor). The absolute torques that can be utilized (start-up torque; stalling torque) are not affected and still correspond with the values in the selection tables.

As far as dimensioning the hoisting gear motors is concerned, this means that the factors specified below must always be taken into account if the effective torque rather than the start-up torque was the deciding factor in the choice of the drive motor.

Effect of the coolant temperature

At site altitudes of up to 1000 m above sea level and when the coolant temperature (*CT*) is not 40 °C, the factors in the table below are used for the permissible output as a function of the thermal class. For *CT* 10 up to *CT* 35, a correction of the temperature rise limit is agreed upon in accordance with DIN EN 60034-1.

***CT* °C**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**
$P_{perm.}/P_{rated}$	1.16	1.13	1.11	1.08	1.06	1.03	1	0.96	0.92	0.87	0.82

Effect of site altitude

If the machine is to be operated at an altitude of between 1000 m and 4000 m and the maximum coolant temperature has not been defined, the following is assumed:

- The reduced cooling effect caused by the altitude is compensated by a decrease in the maximum ambient temperature to under 40 °C.

This assumption is valid when the coolant temperatures (see table below) as a function of the site altitude and thermal class are not exceeded. The motors can be operated at the rated output as specified in the catalog.

Assuming that the coolant temperature is 40 °C even at higher altitudes, the factors listed in the table "Effect of coolant temperature and site altitude" apply for the permissible output.

Altitude *m*	***CT* max. °C at $P = P_{rated}$**
1000	40
2000	30
3000	19
4000	9

Effect of coolant temperature and site altitude

If the coolant temperature is not specified for site altitudes of more than 1000 m above sea level, the table under "Effect of site altitude" applies.

If the coolant temperatures are different to those specified in this table, the relevant factors in the table under "Effect of coolant temperature" and the table below must be multiplied with each other to yield the permissible output. Coolant temperature and site altitude are rounded up to 5 °C or 500 m.

If the motor is derated significantly for the above reasons, the operating values are not as favorable as a result of the partial load utilization of the motors. Motors whose output has been derated by 15% or more, therefore, must be ordered with a non-standard winding.

Altitude m	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**	**4000**
Permissible output / rated output	1	0.97	0.94	0.9	0.86	0.82	0.77

Three-phase slip ring motors 1LT9

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 3000 rpm)											
Intermittent duty S3 – 15%											
100 L	1200	2.5	19.8	1.9	6.4	24	2.05	85	0.006	**1LT9 107-4AA ■■**	40
112 M	1350	3.7	27.6	2.5	8.2	23	2.65	110	0.012	**1LT9 113-4AA ■■**	48
112 M	1300	5	36.7	2.3	11.7	27	3	140	0.013	**1LT9 114-4AA ■■**	50
132 M	1370	6.8	48	2.5	15	33	2.25	140	0.024	**1LT9 133-4AA ■■**	69
132 M	1390	8	55	2.7	17.1	31	3.15	170	0.032	**1LT9 134-4AA ■■**	80
132 M	1390	9.5	65	2.5	20.5	35	2.7	180	0.035	**1LT9 135-4AA ■■**	86
160 M	1395	13	89	2.4	27.6	47	2.2	180	0.062	**1LT9 163-4AA ■■**	138
160 L	1410	19.5	132	2.7	40.9	48	3.1	260	0.083	**1LT9 166-4AA ■■**	150
180 L	1440	27	182	2.5	55	61	2.43	270	0.154	**1LT9 186-4AA ■■**	215
200 L	1425	33	221	2.3	61	95	1.48	230	0.2	**1LT9 206-4AA ■■**	245
200 L	1430	40	267	2.5	76	92	1.69	270	0.24	**1LT9 207-4AA ■■**	260
Intermittent duty S3 – 25%											
100 L	1245	2.3	17.7	2.2	5.7	20	2.45	85	0.006	**1LT9 107-4AA ■■**	40
112 M	1365	3.3	24	2.9	7.5	20	3.2	110	0.012	**1LT9 113-4AA ■■**	48
112 M	1325	4.5	32.4	2.6	10.5	23	3.5	140	0.013	**1LT9 114-4AA ■■**	50
132 M	1390	5.7	39.6	3	12.8	28	2.8	140	0.024	**1LT9 133-4AA ■■**	69
132 M	1400	7	47.8	3.1	15.1	26.5	3.8	170	0.032	**1LT9 134-4AA ■■**	80
132 M	1410	8.7	59	2.7	18.6	30.5	3.05	180	0.035	**1LT9 135-4AA ■■**	86
160 M	1410	11	74.5	2.9	24	40	2.6	180	0.062	**1LT9 163-4AA ■■**	138
160 L	1425	16.5	111	3.3	38	40	3.75	260	0.083	**1LT9 166-4AA ■■**	150
180 L	1445	23	154	2.9	48	54	2.89	270	0.154	**1LT9 186-4AA ■■**	215
200 L	1435	28	186	2.7	53	77	1.72	230	0.2	**1LT9 206-4AA ■■**	245
200 L	1440	34	226	2.9	64	78	2	270	0.24	**1LT9 207-4AA ■■**	260
Intermittent duty S3 – 40%											
100 L	1290	2	14.9	2.6	5	17	2.9	85	0.006	**1LT9 107-4AA ■■**	40
112 M	1380	3	21	3.2	6.9	18	3.55	110	0.012	**1LT9 113-4AA ■■**	48
112 M	1350	4	28.3	3	9.5	19	4.25	140	0.013	**1LT9 114-4AA ■■**	50
132 M	1400	5	34.2	3.5	11.4	25	3.25	140	0.024	**1LT9 133-4AA ■■**	69
132 M	1410	6.3	42.7	3.5	13.7	24	4.25	170	0.032	**1LT9 134-4AA ■■**	80
132 M	1425	7.5	50	3.2	16.2	26	3.6	180	0.035	**1LT9 135-4AA ■■**	86
160 M	1425	10	57	3.2	23	36	2.9	180	0.062	**1LT9 163-4AA ■■**	138
160 L	1435	14.5	96.5	3.7	35	35	4.3	260	0.083	**1LT9 166-4AA ■■**	150
180 L	1450	20	133	3.3	43	46	3.39	270	0.154	**1LT9 186-4AA ■■**	215
200 L	1445	24	159	3.2	46	66	2.01	230	0.2	**1LT9 206-4AA ■■**	245
200 L	1445	29	192	3.4	56	66	2.36	270	0.24	**1LT9 207-4AA ■■**	260

Order no. supplements, see page 5/22

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 3000 rpm)											
Intermittent duty S3 – 60%											
100 L	1320	1.8	12.9	2.9	4.6	15	3.3	85	0.006	**1LT9 107-4AA ■■**	40
112 M	1400	2.6	18	3.8	6.1	16	4.3	110	0.012	**1LT9 113-4AA ■■**	48
112 M	1375	3.5	24.3	3.5	9.1	16	5	140	0.013	**1LT9 114-4AA ■■**	50
132 M	1410	4.5	30.5	3.9	10.5	22	3.7	140	0.024	**1LT9 133-4AA ■■**	69
132 M	1425	5.3	35.5	4.2	12	20	5.2	170	0.032	**1LT9 134-4AA ■■**	80
132 M	1430	6.6	41.1	3.7	15	23.5	4.2	180	0.035	**1LT9 135-4AA ■■**	86
160 M	1435	8.5	56.6	3.8	20	30	3.45	180	0.062	**1LT9 163-4AA ■■**	138
160 L	1445	12.5	82.6	4.4	33	30	5	260	0.083	**1LT9 166-4AA ■■**	150
180 L	1455	17.5	116	3.8	39	41	3.8	270	0.154	**1LT9 186-4AA ■■**	215
200 L	1450	21	138	3.7	44	57	2.33	230	0.2	**1LT9 206-4AA ■■**	245
200 L	1450	25	165	3.9	50	57	2.73	270	0.24	**1LT9 207-4AA ■■**	260
Intermittent duty S3 – 100%											
100 L	1360	1.5	10.5	3.6	4.1	12	4.1	85	0.006	**1LT9 107-4AA ■■**	40
112 M	1410	2.2	15	4.5	5.6	13	4.9	110	0.012	**1LT9 113-4AA ■■**	48
112 M	1390	3	20.6	4.1	8.3	14	5.8	140	0.013	**1LT9 114-4AA ■■**	50
132 M	1420	4	26.9	4.4	9.5	19	4.25	140	0.024	**1LT9 133-4AA ■■**	69
132 M	1430	4.8	32	4.7	11.2	17.6	5.6	170	0.032	**1LT9 134-4AA ■■**	80
132 M	1440	5.5	37	4.5	13	19	5.2	180	0.035	**1LT9 135-4AA ■■**	86
160 M	1440	7.5	49.6	4.3	19	27	3.85	180	0.062	**1LT9 163-4AA ■■**	138
160 L	1450	11	72.4	5	32	27	5.6	260	0.083	**1LT9 166-4AA ■■**	150
180 L	1460	15	94	4.5	36	35	4.45	270	0.154	**1LT9 186-4AA ■■**	215
200 L	1460	18.5	121	4.2	37	50	2.66	230	0.2	**1LT9 206-4AA ■■**	245
200 L	1455	22	145	4.5	45	50	3.12	270	0.24	**1LT9 207-4AA ■■**	260

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance *k*: approx. +20%

Three-phase slip ring motors 1LT8

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 2200 rpm)											
Intermittent duty S3 – 15%											
225 M	1455	53	348	2.8	96.5	99	1.92	330	0.48	**1LT8 224-4AA ■■**	330
250 M	1467	65	423	2.6	117	206	0.55	195	0.57	**1LT8 253-4AA ■■**	425
250 M	1465	80	522	2.4	138	210	0.65	235	0.632	**1LT8 254-4AA ■■**	450
280 S	1465	105	685	2.3	186	270	0.51	240	1.25	**1LT8 280-4AA ■■**	590
280 M	1478	132	854	3.2	233	263	0.68	310	1.85	**1LT8 283-4AA ■■**	710
315 S	1479	160	1034	3.3	268	319	0.56	310	2.85	**1LT8 310-4AA ■■**	890
315 M	1475	190	1232	3.1	310	313	0.69	375	3.48	**1LT8 313-4AA ■■**	1010
315 M	1479	225	1455	3.1	373	339	0.7	410	5.32	**1LT8 314-4AA ■■**	1275
315 M	1481	270	1743	3.1	437	330	0.88	505	5.96	**1LT8 315-4AA ■■**	1350
315 L	1484	340	2191	3.1	560	328	1.13	640	7.29	**1LT8 317-4AA ■■**	1540
315 L	1472	430	2794	2.6	728	362	1.16	725	8.06	**1LT8 318-4AA ■■**	1620
Intermittent duty S3 – 25%											
225 M	1460	45	295	3.3	82	84	2.27	330	0.48	**1LT8 224-4AA ■■**	330
250 M	1472	55	357	3	99	174	0.65	195	0.57	**1LT8 253-4AA ■■**	425
250 M	1470	68	442	2.8	119	179	0.77	235	0.632	**1LT8 254-4AA ■■**	450
280 S	1470	90	585	2.7	159	232	0.6	240	1.25	**1LT8 280-4AA ■■**	590
280 M	1480	110	710	3.9	199	219	0.82	310	1.85	**1LT8 283-4AA ■■**	710
315 S	1483	132	851	4	221	263	0.68	310	2.85	**1LT8 310-4AA ■■**	890
315 M	1480	160	1034	3.7	264	264	0.82	375	3.48	**1LT8 313-4AA ■■**	1010
315 M	1482	190	1226	3.6	315	286	0.83	410	5.32	**1LT8 314-4AA ■■**	1275
315 M	1483	230	1483	3.7	380	281	1.04	505	5.96	**1LT8 315-4AA ■■**	1350
315 L	1486	290	1866	3.6	477	280	1.32	640	7.29	**1LT8 317-4AA ■■**	1540
315 L	1479	360	2328	3.1	606	302	1.39	725	8.06	**1LT8 318-4AA ■■**	1620
Intermittent duty S3 – 40%											
225 M	1465	39	254	3.8	72	73	2.61	330	0.48	**1LT8 224-4AA ■■**	330
250 M	1475	48	311	3.5	87.5	152	0.74	195	0.57	**1LT8 253-4AA ■■**	425
250 M	1475	58	376	3.3	103	152	0.89	235	0.632	**1LT8 254-4AA ■■**	450
280 S	1475	75	486	3.2	135	193	0.72	240	1.25	**1LT8 280-4AA ■■**	590
280 M	1483	95	612	4.5	174	189	0.95	310	1.85	**1LT8 283-4AA ■■**	710
315 S	1485	115	740	4.6	195	229	0.78	310	2.85	**1LT8 310-4AA ■■**	890
315 M	1482	140	903	4.3	230	231	0.94	375	3.48	**1LT8 313-4AA ■■**	1010
315 M	1484	165	1062	4.2	276	249	0.95	410	5.32	**1LT8 314-4AA ■■**	1275
315 M	1485	200	1288	4.2	334	245	1.19	505	5.96	**1LT8 315-4AA ■■**	1350
315 L	1487	250	1608	4.2	411	241	1.53	640	7.29	**1LT8 317-4AA ■■**	1540
315 L	1482	315	2033	3.6	523	260	1.61	725	8.06	**1LT8 318-4AA ■■**	1620

Order no. supplements, see page 5/22

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 2200 rpm)											
Intermittent duty S3 – 60%											
225 M	1470	34	221	4.3	64	64	2.98	330	0.48	**1LT8 224-4AA ■■**	330
250 M	1478	42	271	4	77.5	133	0.85	195	0.57	**1LT8 253-4AA ■■**	425
250 M	1477	51	330	3.7	91.5	134	1.01	235	0.632	**1LT8 254-4AA ■■**	450
280 S	1475	68	440	3.5	124	175	0.79	240	1.25	**1LT8 280-4AA ■■**	590
280 M	1484	85	547	5.0	160	169	1.06	310	1.85	**1LT8 283-4AA ■■**	710
315 S	1487	100	643	5.3	173	199	0.9	310	2.85	**1LT8 310-4AA ■■**	890
315 M	1483	125	806	4.8	208	206	1.05	375	3.48	**1LT8 313-4AA ■■**	1010
315 M	1486	150	965	4.6	253	226	1.05	410	5.32	**1LT8 314-4AA ■■**	1275
315 M	1486	180	1158	4.7	304	220	1.33	505	5.96	**1LT8 315-4AA ■■**	1350
315 L	1489	225	1445	4.7	370	217	1.7	640	7.29	**1LT8 317-4AA ■■**	1540
315 L	1485	280	1803	4	465	234	1.79	725	8.06	**1LT8 318-4AA ■■**	1620
Intermittent duty S3 – 100%											
225 M	1475	30	194	4.9	58	56	3.4	330	0.48	**1LT8 224-4AA ■■**	330
250 M	1482	37	238	4.5	69	117	0.96	195	0.57	**1LT8 253-4AA ■■**	425
250 M	1480	45	290	4.2	82.5	118	1.15	235	0.632	**1LT8 254-4AA ■■**	450
280 S	1480	60	387	4	112	154	0.9	240	1.25	**1LT8 280-4AA ■■**	590
280 M	1486	75	482	5.7	145	149	1.2	310	1.85	**1LT8 283-4AA ■■**	710
315 S	1488	90	578	5.8	158	179	1	310	2.85	**1LT8 310-4AA ■■**	890
315 M	1485	110	708	5.4	185	181	1.2	375	3.48	**1LT8 313-4AA ■■**	1010
315 M	1488	132	848	5.3	223	199	1.19	410	5.32	**1LT8 314-4AA ■■**	1275
315 M	1488	160	1028	5.3	270	196	1.49	505	5.96	**1LT8 315-4AA ■■**	1350
315 L	1490	200	1283	5.3	332	193	1.91	640	7.29	**1LT8 317-4AA ■■**	1540
315 L	1488	250	1607	4.5	419	213	1.97	725	8.06	**1LT8 318-4AA ■■**	1620

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance *k*: approx. +20%

Three-phase slip ring motors 1LT9

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2500 rpm)											
Intermittent duty S3 – 15%											
100 L	880	1.8	19.5	2.8	6	15	2.7	80	0.01	**1LT9 107-6AA ■■**	40
112 M	930	2.5	25.7	2.5	7.3	19	2.4	90	0.018	**1LT9 113-6AA ■■**	48
112 M	870	3.8	43	2.1	10.8	23	2.9	115	0.018	**1LT9 114-6AA ■■**	48
132 M	850	5.2	58.4	2.1	13.8	34	1.85	110	0.032	**1LT9 133-6AA ■■**	69
132 M	900	6	64	2.4	15.7	31	2.2	130	0.038	**1LT9 134-6AA ■■**	80
132 M	870	7	77	2.2	19.5	38	2.1	140	0.046	**1LT9 135-6AA ■■**	86
160 M	930	9.5	98	2.2	28	34	2.9	180	0.094	**1LT9 163-6AA ■■**	138
160 L	920	13.5	142	2	31	36	4.2	260	0.128	**1LT9 166-6AA ■■**	150
180 L	930	21	216	2.1	45	58	2.3	230	0.193	**1LT9 186-6AA ■■**	215
200 L	940	28	285	2.2	57	69	2.1	255	0.245	**1LT9 207-6AA ■■**	245
Intermittent duty S3 – 25%											
100 L	890	1.7	18.2	2.8	5.8	13.5	3	80	0.01	**1LT9 107-6AA ■■**	40
112 M	940	2.3	23.4	2.7	6.9	17	2.65	90	0.018	**1LT9 113-6AA ■■**	48
112 M	890	3.3	37.1	2.5	9.7	20	3.3	115	0.018	**1LT9 114-6AA ■■**	48
132 M	875	4.7	51.3	2.4	13.2	32	2	110	0.032	**1LT9 133-6AA ■■**	69
132 M	920	5.2	54	2.8	14.3	26	2.7	130	0.038	**1LT9 134-6AA ■■**	80
132 M	890	6.5	70	2.4	18.2	34	2.4	140	0.046	**1LT9 135-6AA ■■**	86
160 M	940	8	81	2.7	19	29	3.6	180	0.094	**1LT9 163-6AA ■■**	138
160 L	930	11.5	118	2.4	27	32	4.7	260	0.128	**1LT9 166-6AA ■■**	150
180 L	940	17.5	178	2.5	38	48	2.8	230	0.193	**1LT9 186-6AA ■■**	215
200 L	950	24	240	2.5	49	59	2.5	255	0.245	**1LT9 207-6AA ■■**	245
Intermittent duty S3 – 40%											
100 L	900	1.5	16	3.1	5.6	12	3.55	80	0.01	**1LT9 107-6AA ■■**	40
112 M	950	2	20	3.2	6.4	15.5	3.25	90	0.018	**1LT9 113-6AA ■■**	48
112 M	910	3	32.9	2.8	9.2	18	3.7	115	0.018	**1LT9 114-6AA ■■**	48
132 M	900	4	42.7	2.9	12.1	26	2.45	110	0.032	**1LT9 133-6AA ■■**	69
132 M	930	4.5	46	3.3	13.2	22	3.1	130	0.038	**1LT9 134-6AA ■■**	80
132 M	910	5.5	58	2.8	15.8	26.5	3.05	140	0.046	**1LT9 135-6AA ■■**	86
160 M	950	7	70	3.1	17.4	25	4	180	0.094	**1LT9 163-6AA ■■**	138
160 L	940	10	102	2.8	24	27	5.6	260	0.128	**1LT9 166-6AA ■■**	150
180 L	950	15	151	2.9	34	41	3.2	230	0.193	**1LT9 186-6AA ■■**	215
200 L	955	20	200	3	42	49	3	255	0.245	**1LT9 207-6AA ■■**	245

Order no. supplements, see page 5/22

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2500 rpm)											
Intermittent duty S3 – 60%											
100 L	920	1.3	13.5	3.6	5.7	11	4.2	80	0.01	**1LT9 107-6AA ■■**	40
112 M	960	1.8	18	3.7	6.2	13.5	3.6	90	0.018	**1LT9 113-6AA ■■**	48
112 M	925	2.6	28	3.3	8.5	15	4.4	115	0.018	**1LT9 114-6AA ■■**	48
132 M	910	3.6	37.8	3.3	11.4	23	2.75	110	0.032	**1LT9 133-6AA ■■**	69
132 M	935	4.1	42	3.7	12.4	20	3.6	130	0.038	**1LT9 134-6AA ■■**	80
132 M	925	4.8	50	3.2	15	23	3.5	140	0.046	**1LT9 135-6AA ■■**	86
160 M	960	6	60	3.6	16.2	21	4.9	180	0.094	**1LT9 163-6AA ■■**	138
160 L	950	8.5	85	3.2	22	23	6.5	260	0.128	**1LT9 166-6AA ■■**	150
180 L	955	13	130	3.3	30	35	3.8	230	0.193	**1LT9 186-6AA ■■**	215
200 L	960	17.5	174	3.5	38	42	3.5	255	0.245	**1LT9 207-6AA ■■**	245
Intermittent duty S3 – 100%											
100 L	935	1.1	11.2	4.3	5	9.2	4.9	80	0.01	**1LT9 107-6AA ■■**	40
112 M	965	1.5	15	4.5	5.7	11.5	4.1	90	0.018	**1LT9 113-6AA ■■**	48
112 M	940	2.2	23.3	4	8	13	5.1	115	0.018	**1LT9 114-6AA ■■**	48
132 M	920	3	31	4	11	18	3.5	110	0.032	**1LT9 133-6AA ■■**	69
132 M	940	3.5	35.6	4.4	11.6	18	4.4	130	0.038	**1LT9 134-6AA ■■**	80
132 M	940	4	40	3.8	14	18.5	4.4	140	0.046	**1LT9 135-6AA ■■**	86
160 M	965	5.5	54.5	4	15.2	20	5.2	180	0.094	**1LT9 163-6AA ■■**	138
160 L	960	7.5	74.6	3.7	20	21	7.2	260	0.128	**1LT9 166-6AA ■■**	150
180 L	960	11	109	3.9	27	30	4.4	230	0.193	**1LT9 186-6AA ■■**	215
200 L	965	15	148	4	35	36	4.1	255	0.245	**1LT9 207-6AA ■■**	245

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance *k*: approx. +20%

Three-phase slip ring motors 1LT8

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2080 rpm)											
Intermittent duty S3 – 15%											
225 M	960	35	348	2.2	68.5	87	1.66	250	0.464	**1LT8 223-6AA ■■**	305
225 M	960	42	418	2	79	90	1.86	290	0.535	**1LT8 224-6AA ■■**	320
250 M	965	55	545	2.1	103	243	0.33	140	1	**1LT8 253-6AA ■■**	425
250 M	974	70	687	2.1	126	247	0.41	175	1.61	**1LT8 254-6AA ■■**	580
280 S	975	85	833	2.2	159	276	0.4	190	1.82	**1LT8 280-6AA ■■**	600
280 M	975	105	1030	2.1	188	276	0.49	235	2.37	**1LT8 283-6AA ■■**	700
315 S	980	140	1366	2.2	253	333	0.49	260	3.95	**1LT8 310-6AA ■■**	950
315 M	978	165	1613	2.1	296	329	0.54	310	4.31	**1LT8 313-6AA ■■**	1000
315 M	980	190	1854	2	329	340	0.59	345	6.8	**1LT8 314-6AA ■■** [1]	1290
315 M	981	230	2242	2	415	319	0.81	445	8	**1LT8 315-6AA ■■** [1]	1380
315 L	983	280	2724	2	491	336	0.88	515	9.6	**1LT8 317-6AA ■■** [1]	1590
Intermittent duty S3 – 25%											
225 M	965	30	297	2.8	60	74	2.09	250	0.464	**1LT8 223-6AA ■■**	305
225 M	965	35	347	2.5	66	75	2.29	290	0.535	**1LT8 224-6AA ■■**	320
250 M	975	48	470	2.4	90	212	0.44	140	1	**1LT8 253-6AA ■■**	425
250 M	975	60	588	2.4	111	212	0.55	175	1.61	**1LT8 254-6AA ■■**	580
280 S	975	72	706	2.6	133	235	2.7	190	1.82	**1LT8 280-6AA ■■**	600
280 M	975	90	883	2.4	160	236	0.61	235	2.37	**1LT8 283-6AA ■■**	700
315 S	985	115	1116	2.7	206	273	0.55	260	3.95	**1LT8 310-6AA ■■**	950
315 M	981	140	1365	2.5	249	279	0.64	310	4.31	**1LT8 313-6AA ■■**	1000
315 M	982	160	1558	2.4	276	286	0.7	345	6.8	**1LT8 314-6AA ■■** [1]	1290
315 M	984	195	1895	2.4	344	271	0.95	445	8	**1LT8 315-6AA ■■** [1]	1380
315 L	986	240	2328	2.3	411	336	1.03	515	9.6	**1LT8 317-6AA ■■** [1]	1590
Intermittent duty S3 – 40%											
225 M	970	25	246	3.2	49.5	62	2.33	250	0.464	**1LT8 223-6AA ■■**	305
225 M	970	30	295	2.9	58	64	2.62	290	0.535	**1LT8 224-6AA ■■**	320
250 M	975	40	392	3.0	76	176	0.5	140	1	**1LT8 253-6AA ■■**	425
250 M	980	50	488	3.0	93	177	0.64	175	1.61	**1LT8 254-6AA ■■**	580
280 S	980	63	615	3.2	118	205	0.56	190	1.82	**1LT8 280-6AA ■■**	600
280 M	980	75	732	2.9	135	197	0.69	235	2.37	**1LT8 283-6AA ■■**	700
315 S	987	100	969	3.1	181	238	0.63	260	3.95	**1LT8 310-6AA ■■**	950
315 M	984	120	1166	3	213	239	0.75	310	4.31	**1LT8 313-6AA ■■**	1000
315 M	984	140	1360	2.7	241	251	0.79	345	6.8	**1LT8 314-6AA ■■** [1]	1290
315 M	986	170	1649	2.8	295	236	1.09	445	8	**1LT8 315-6AA ■■** [1]	1380
315 L	988	210	2033	2.6	358	252	1.18	515	9.6	**1LT8 317-6AA ■■** [1]	1590

Order no. supplements, see page 5/22

[1] Trans-standard motors (larger trans-standard motors available on request).

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2080 rpm)											
Intermittent duty S3 – 60%											
225 M	973	22	216	3.6	45	55	2.62	250	0.464	**1LT8 223-6AA ■■**	305
225 M	975	26	255	3.3	54	56	2.99	290	0.535	**1LT8 224-6AA ■■**	320
250 M	980	34	332	3.4	65	150	0.57	140	1	**1LT8 253-6AA ■■**	425
250 M	980	42	410	3.5	79	149	0.73	175	1.61	**1LT8 254-6AA ■■**	580
280 S	985	53	514	3.6	102	173	0.65	190	1.82	**1LT8 280-6AA ■■**	600
280 M	983	65	632	3.3	118	171	0.81	235	2.37	**1LT8 283-6AA ■■**	700
315 S	988	87	842	3.6	162	207	0.73	260	3.95	**1LT8 310-6AA ■■**	950
315 M	986	105	1018	3.4	188	209	0.86	310	4.31	**1LT8 313-6AA ■■**	1000
315 M	986	125	1212	3.1	217	224	0.89	345	6.8	**1LT8 314-6AA ■■** [1]	1290
315 M	987	150	1453	3.1	260	208	1.24	445	8	**1LT8 315-6AA ■■** [1]	1380
315 L	989	185	1789	3	315	222	1.34	515	9.6	**1LT8 317-6AA ■■** [1]	1590
Intermittent duty S3 – 100%											
225 M	978	18.5	181	4.3	39.5	46	3.14	250	0.464	**1LT8 223-6AA ■■**	305
225 M	980	22	214	3.9	39	47	3.56	290	0.535	**1LT8 224-6AA ■■**	320
250 M	980	30	292	3.8	58.5	132	0.68	140	1	**1LT8 253-6AA ■■**	425
250 M	985	37	359	4.0	72	131	0.84	175	1.61	**1LT8 254-6AA ■■**	580
280 S	987	45	436	4.2	88	146	0.75	190	1.82	**1LT8 280-6AA ■■**	600
280 M	986	55	533	4	102	144	0.94	235	2.37	**1LT8 283-6AA ■■**	700
315 S	990	75	724	4.1	143	178	0.84	260	3.95	**1LT8 310-6AA ■■**	950
315 M	988	90	871	4	165	180	0.99	310	4.31	**1LT8 313-6AA ■■**	1000
315 M	987	110	1066	3.5	193	197	1.01	345	6.8	**1LT8 314-6AA ■■** [1]	1290
315 M	989	132	1276	3.6	228	183	1.4	445	8	**1LT8 315-6AA ■■** [1]	1380
315 L	990	160	1545	3.5	273	192	1.55	515	9.6	**1LT8 317-6AA ■■** [1]	1590

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

[1] Trans-standard motors (larger trans-standard motors available on request).

Three-phase slip ring motors 1LT9

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 750 rpm (max. permissible operating speed 1875 rpm)											
Intermittent duty S3 – 15%											
160 L	685	9.5	133	1.8	26	29	3.7	200	0.125	**1LT9 166-8AA ■■**	150
180 L	690	15	208	2	43	50	2.64	210	0.21	**1LT9 186-8AA ■■**	190
200 L	705	22	299	2	59	57	2.53	250	0.34	**1LT9 207-8AA ■■**	260
Intermittent duty S3 – 25%											
160 L	695	8	110	2.2	24	26	4.4	200	0.125	**1LT9 166-8AA ■■**	150
180 L	710	12.5	168	2.3	37	41	3.19	210	0.21	**1LT9 186-8AA ■■**	190
200 L	715	18	241	2.4	48	44	3.14	250	0.34	**1LT9 207-8AA ■■**	260
Intermittent duty S3 – 40%											
160 L	705	7	95	2.5	22	22	5.2	200	0.125	**1LT9 166-8AA ■■**	150
180 L	715	10.5	140	2.7	33	34	3.79	210	0.21	**1LT9 186-8AA ■■**	190
200 L	710	15	202	2.9	41	38	3.8	250	0.34	**1LT9 207-8AA ■■**	260
Intermittent duty S3 – 60%											
160 L	710	6	80.7	2.9	20	18.5	6.25	200	0.125	**1LT9 166-8AA ■■**	150
180 L	710	9	121	3.1	31	28	4.49	210	0.21	**1LT9 186-8AA ■■**	190
200 L	725	13	172	3.3	38	33	4.37	250	0.34	**1LT9 207-8AA ■■**	260
Intermittent duty S3 – 100%											
160 L	715	5.5	73.5	3.2	19	16.5	7	200	0.125	**1LT9 166-8AA ■■**	150
180 L	735	7.5	97	3.8	28	23	5.51	210	0.21	**1LT9 186-8AA ■■**	190
200 L	730	11	144	3.9	34	28	5.15	250	0.34	**1LT9 207-8AA ■■**	260

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance *k*: approx. +20%

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm²		kg
Synchronous speed 750 rpm (max. permissible operating speed 1875 rpm)											
Intermittent duty S3 – 15%											
225 M	705	30	407	1.8	66	85	1.61	220	0.464	**1LT8 223-8AA ■■**	305
225 M	720	35	465	2	75.5	80	1.95	270	0.57	**1LT8 224-8AA ■■**	330
250 M	720	42	558	1.9	86	173	0.5	150	1	**1LT8 253-8AA ■■**	425
250 M	728	55	722	1.7	110	179	0.61	190	1.78	**1LT8 254-8AA ■■**	600
280 S	725	70	923	1.9	142	216	0.53	200	1.95	**1LT8 280-8AA ■■**	660
280 M	726	90	1185	1.8	183	222	0.65	250	2.37	**1LT8 283-8AA ■■**	710
315 S	730	110	1441	1.8	214	239	0.72	285	3.95	**1LT8 310-8AA ■■**	950
315 M	730	140	1834	1.6	277	240	0.87	360	4.31	**1LT8 313-8AA ■■**	1000
315 M	733	160	2088	1.9	308	353	0.46	280	6.8	**1LT8 314-8AA ■■** [1]	1290
315 M	735	190	2472	1.8	362	309	0.71	380	8.1	**1LT8 315-8AA ■■** [1]	1390
315 L	735	220	2863	1.6	420	309	0.82	440	9.8	**1LT8 317-8AA ■■** [1]	1600
Intermittent duty S3 – 25%											
225 M	715	25	334	2.1	56	71	1.95	220	0.464	**1LT8 223-8AA ■■**	305
225 M	725	30	395	2.3	65	69	2.44	270	0.57	**1LT8 224-8AA ■■**	330
250 M	725	35	461	2.2	72	144	0.62	150	1	**1LT8 253-8AA ■■**	425
250 M	730	48	629	1.9	96	157	0.8	190	1.78	**1LT8 254-8AA ■■**	600
280 S	730	60	786	2.2	125	185	0.66	200	1.95	**1LT8 280-8AA ■■**	660
280 M	730	75	982	2.1	151	185	0.8	250	2.37	**1LT8 283-8AA ■■**	710
315 S	735	93	1210	2.2	179	202	0.81	285	3.95	**1LT8 310-8AA ■■**	950
315 M	732	115	1502	2	225	198	1.05	360	4.31	**1LT8 313-8AA ■■**	1000
315 M	736	140	1819	2.2	268	309	0.52	280	6.8	**1LT8 314-8AA ■■** [1]	1290
315 M	739	160	2070	2.1	297	260	0.84	380	8.1	**1LT8 315-8AA ■■** [1]	1390
315 L	737	195	2530	1.8	372	274	0.93	440	9.8	**1LT8 317-8AA ■■** [1]	1600
Intermittent duty S3 – 40%											
225 M	720	20	265	2.7	47	56	2.27	220	0.464	**1LT8 223-8AA ■■**	305
225 M	730	25	327	2.8	55.5	57	2.73	270	0.57	**1LT8 224-8AA ■■**	330
250 M	725	30	396	2.6	62.5	124	0.7	150	1	**1LT8 253-8AA ■■**	425
250 M	735	40	520	2.3	81	130	0.91	190	1.78	**1LT8 254-8AA ■■**	600
280 S	730	50	655	2.7	106	154	0.75	200	1.95	**1LT8 280-8AA ■■**	660
280 M	735	63	820	2.6	130	156	0.93	250	2.37	**1LT8 283-8AA ■■**	710
315 S	737	80	1038	2.5	157	173	0.95	285	3.95	**1LT8 310-8AA ■■**	950
315 M	735	100	1301	2.3	197	172	1.21	360	4.31	**1LT8 313-8AA ■■**	1000
315 M	739	115	1488	2.6	221	254	0.64	280	6.8	**1LT8 314-8AA ■■** [1]	1290
315 M	740	140	1809	2.4	262	228	0.96	380	8.1	**1LT8 315-8AA ■■** [1]	1390
315 L	739	170	2200	2.1	327	239	1.06	440	9.8	**1LT8 317-8AA ■■** [1]	1600

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

[1] Trans-standard motors (larger trans-standard motors available on request).

Three-phase slip ring motors 1LT8

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 750 rpm (max. permissible operating speed 1875 rpm)											
Intermittent duty S3 – 60%											
225 M	725	18	237	3.0	43	51	2.59	220	0.464	**1LT8 223-8AA ■■**	305
225 M	730	22	288	3.2	50.5	51	3.06	270	0.57	**1LT8 224-8AA ■■**	330
250 M	730	26	340	3	57	107	0.81	150	1	**1LT8 253-8AA ■■**	425
250 M	737	32	415	2.9	66	104	1.05	190	1.78	**1LT8 254-8AA ■■**	600
280 S	735	44	572	3.1	97	136	0.85	200	1.95	**1LT8 280-8AA ■■**	660
280 M	737	55	713	3	118	136	1.06	250	2.37	**1LT8 283-8AA ■■**	710
315 S	739	70	906	2.9	138	152	1.08	285	3.95	**1LT8 310-8AA ■■**	950
315 M	738	88	1140	2.6	173	161	1.38	360	4.31	**1LT8 313-8AA ■■**	1000
315 M	740	105	1357	2.9	207	232	0.7	280	6.8	**1LT8 314-8AA ■■** [1]	1290
315 M	741	125	1613	2.7	237	203	1.08	380	8.1	**1LT8 315-8AA ■■** [1]	1390
315 L	740	150	1938	2.4	287	211	1.2	440	9.8	**1LT8 317-8AA ■■** [1]	1600
Intermittent duty S3 – 100%											
225 M	728	15	197	3.6	38	42	3.02	220	0.464	**1LT8 223-8AA ■■**	305
225 M	735	18.5	240	3.8	45	43	3.63	270	0.57	**1LT8 224-8AA ■■**	330
250 M	735	22	286	3.5	50	91	0.95	150	1	**1LT8 253-8AA ■■**	425
250 M	740	27	349	3.4	56	88	1.25	190	1.78	**1LT8 254-8AA ■■**	600
280 S	735	37	481	3.6	86	114	1.01	200	1.95	**1LT8 280-8AA ■■**	660
280 M	740	47	607	3.4	108	116	1.3	250	2.37	**1LT8 283-8AA ■■**	710
315 S	740	60	775	3.4	123	130	1.27	285	3.95	**1LT8 310-8AA ■■**	950
315 M	740	75	969	3.1	153	129	1.61	360	4.31	**1LT8 313-8AA ■■**	1000
315 M	742	90	1160	3.4	182	198	0.82	280	6.8	**1LT8 314-8AA ■■** [1]	1290
315 M	742	110	1418	3	214	179	1.23	380	8.1	**1LT8 315-8AA ■■** [1]	1390
315 L	742	132	1701	2.7	252	186	1.37	440	9.8	**1LT8 317-8AA ■■** [1]	1600

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

[1] Trans-standard motors (larger trans-standard motors available on request).

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 600 rpm (max. permissible operating speed 1500 rpm)											
Intermittent duty S3 – 15%											
250 M	575	30	499	1.8	75	148	0.49	125	0.937	**1LT8 253-3AA ■■**	425
250 M	578	35	579	1.9	89	144	0.6	150	1.61	**1LT8 254-3AA ■■**	580
280 S	575	48	798	1.7	119	185	0.5	160	1.82	**1LT8 280-3AA ■■**	600
280 M	580	60	990	1.7	148	190	0.59	195	2.37	**1LT8 283-3AA ■■**	710
315 S	584	75	1228	1.7	180	197	0.69	235	3.95	**1LT8 310-3AA ■■**	1000
315 M	583	90	1476	1.7	211	195	0.84	285	4.31	**1LT8 313-3AA ■■**	1050
Intermittent duty S3 – 25%											
250 M	580	26	428	2.1	65	129	0.56	125	0.937	**1LT8 253-3AA ■■**	425
250 M	580	32	528	2.1	83	132	0.66	150	1.61	**1LT8 254-3AA ■■**	580
280 S	580	42	692	2	112	162	0.57	160	1.82	**1LT8 280-3AA ■■**	600
280 M	583	55	902	1.9	136	174	0.65	195	2.37	**1LT8 283-3AA ■■**	710
315 S	584	70	1142	1.9	172	184	0.74	235	3.95	**1LT8 310-3AA ■■**	1000
315 M	584	87	1425	1.8	206	189	0.87	285	4.31	**1LT8 313-3AA ■■**	1050
Intermittent duty S3 – 40%											
250 M	580	23	380	2.4	59	114	0.63	125	0.937	**1LT8 253-3AA ■■**	425
250 M	585	28	457	2.4	76	115	0.75	150	1.61	**1LT8 254-3AA ■■**	580
280 S	585	37	605	2.3	105	143	0.65	160	1.82	**1LT8 280-3AA ■■**	600
280 M	585	48	785	2.1	124	152	0.74	195	2.37	**1LT8 283-3AA ■■**	710
315 S	585	60	976	2.2	149	158	0.86	235	3.95	**1LT8 310-3AA ■■**	1000
315 M	586	75	1224	2.1	176	163	1.01	285	4.31	**1LT8 313-3AA ■■**	1050
Intermittent duty S3 – 60%											
250 M	585	20	327	2.8	54	99	0.73	125	0.937	**1LT8 253-3AA ■■**	425
250 M	587	24	391	2.8	71	99	0.87	150	1.61	**1LT8 254-3AA ■■**	580
280 S	587	32	521	2.7	96	124	0.74	160	1.82	**1LT8 280-3AA ■■**	600
280 M	587	42	684	2.4	116	133	0.85	195	2.37	**1LT8 283-3AA ■■**	710
315 S	586	52	843	2.6	133	137	0.99	235	3.95	**1LT8 310-3AA ■■**	1000
315 M	590	65	1057	2.5	155	141	1.17	285	4.31	**1LT8 313-3AA ■■**	1050
Intermittent duty S3 – 100%											
250 M	590	16.5	267	3.4	50	82	0.88	125	0.937	**1LT8 253-3AA ■■**	425
250 M	590	20	324	3.6	66	82	1.06	150	1.61	**1LT8 254-3AA ■■**	580
280 S	589	27	438	3.2	94	104	0.89	160	1.82	**1LT8 280-3AA ■■**	600
280 M	589	35	568	2.9	107	111	1.01	195	2.37	**1LT8 283-3AA ■■**	710
315 S	590	44	710	3.1	122	116	1.17	235	3.95	**1LT8 310-3AA ■■**	1000
315 M	590	55	891	3.0	134	119	1.38	285	4.31	**1LT8 313-3AA ■■**	1050

Order no. supplements, see page 5/22

At 460 V 3 AC, 60 Hz, the following technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

Trans-standard motors (10-pole) available on request

Three-phase slip ring motors 1LT9 and 1LT8

Selection and ordering data

Order number supplement

Position of the order number	1	2	3	4	5	6	7		8	9	10	11	12		
	1	**L**	**T**	**9**	**.**	**.**	**.**	**–**	**.**	**A**	**A**	■	■	**–**	**Z**
	1	**L**	**T**	**8**	**.**	**.**	**.**	**–**	**.**	**A**	**A**	■	■	**–**	**Z**

Frame size	
No. of poles	
Voltage and frequency	
50 Hz	
• 380 V	**1**
• 400 V	**4**
• 500 V	**3**
• 660 V	**7**
• 690 V	**6**
60 Hz	
• 460 V	**8**
Other voltage and/or frequency [1]	**9**
Construction type	
• IM B3	**0**
• IM B5 [2]	**1**
• IM B35	**6**
• IM V1 (with protective cover)	**4**
Special version [3]	**Z**

5

[1] Option: Order code L1Y and plain text.
[2] Only possible up to frame size 200 L.
[3] Specify required version with order code or in plain text as shown in the table on page 5/23.

Selection and ordering data

Options

Additional identification codes for special 1LT9 and 1LT8 motor versions

Version	For explanations, see page	Order code and/or plain text
Higher coolant temperatures or site altitude on request	5/9	CT ...°C (round up to 5°) or site altitude ...m above sea level (round up to 500 m) Specify required output
Motor protection by PTC thermistor [1] - With three in-built temperature sensors for warning purposes - With three in-built temperature sensors for shutdown purposes - With six in-built temperature sensors for warning and shutdown purposes	5/3	 **A10** **A11** **A12**
Non-standard cable entry Rotation of terminal box through 180°	5/3	**K85**
Terminal box, side, right Terminal box, side, left (only possible up to frame size 200 L)	5/3	**K09** **K10**
Second standard shaft extension [2]	5/4	**K16**
Radial seal on DE for flange-mounting motors [3]	5/6	**K17**
Reinforced bearing on DE SPM measurement nipple (as of frame size 225)	5/6	**K20** **G50**
Anti-condensation heating - For 230 V - For 115 V	5/8	 **K45** **K46**
Fitted tacho-generator GMP 1.0 s-4; IM B5	5/4	**G37**
Paint finish: - Standard paint finish in colors other than RAL 7030 - Special paint finish in RAL 7030 - Special paint finish in colors other than RAL 7030	5/7	 **Y53** – and additional plain text: Standard paint finish RAL... **K26** **Y54** – and additional plain text: Special paint finish RAL...
Regreasing device	5/6	**K40**
IP55 degree of protection	5/5	**K49**

Ordering example:

Hoisting gear motor	**1LT8**											
75 kW at S3 – 40%, frame size 280 S		**280**										
Four-pole, 1500 rpm				**4**								
Operating voltage 380 V 3 AC, 50 Hz							**4**					
Construction type IM B3								**0**				
Identification for special version										**Z**		
Order code for anti-condensation heating for 230 V												**K45**
This order number uniquely identifies the version of the hoisting gear motor:	**1LT8**	**280**	**–**	**4**	**A**	**A**	**4**	**0**	**–**	**Z**		
	K45											

[1] For appropriate tripping unit, see catalog LV1.

[2] For motors as of frame size 180 M in vertical construction types, the transmittable torque needs to be recalculated (please inquire).

[3] Not possible for construction type IM V3.

Three-phase slip ring motors 1LT9 and 1LT8

Selection and ordering data

Outputs of 1LT9 motors in S2 duty

Frame size	Type	Rated outputs of motors 1LT9 in short-time duty S2								
		at 1500 rpm for			at 1000 rpm for			at 750 rpm for		
		30 min	60 min	90 min	30 min	60 min	90 min	30 min	60 min	90 min
		kW	kW	kW	kW	kW	kW	kW	kW	kW
100 L	1LT9 107	1.9	1.7	1.6	1.4	1.3	1.2			
112 M	1LT9 113	2.8	2.5	2.3	1.8	1.7	1.5			
	1LT9 114	3.8	3.3	3.1	2.8	2.5	2.3			
132 M	1LT9 133	5	4.5	4.2	3.9	3.4	3.1			
	1LT9 134	6.6	5.7	5.2	4.8	4.1	3.8			
	1LT9 135	7.3	6.3	5.8	5.3	4.6	4.3			
160 M	1LT9 163	9.5	8.2	7.5	7.6	6.5	6			
160 L	1LT9 166	14.3	12.3	11.3	11.3	9.7	8.8	6.7	6.3	5.8
180 L	1LT9 186	21	18.5	17	16	14	12.5	11	9.5	8.5
200 L	1LT9 206	28	24	21						
	1LT9 207	34	29	25	24	20	17.5	18	15	13

Outputs of 1LT8 motors in S2 duty (available on request).

Dimensional drawings

Binding dimensions

The dimensions specified for the construction types listed on the right are binding for all listed versions.

Construction type	Binding dimensions
IM B3	a, b, h, s, w_1, d, l, t, u
IM B5 IM B14 IM V1	b_1, e_1, i_2, s_2, d, l, t, u
IM B35	a, b, b_1, e_1, h, i_2, s, s_2, w_1, d, l, t, u

Dimensions in accordance with DIN 42939

In the standard version, the shaft extensions of the motors up to frame size 160 in accordance with DIN 748 are cylindrical while the shaft extensions for motors as of frame size 180 in accordance with DIN 1448 are conical.

Dimensional tolerance

The tolerances on the right apply to the dimensions a, b, e_1 and h specified in the dimensions tables.

Keyways and featherkeys (dimensions t, t_1, u and u_1) are manufactured in accordance with DIN 6885 (sheet 2).

Measurement	Dimensions	Tolerance
a and b	up to 250 mm more than 250 mm to 500 mm more than 500 mm to 750 mm	± 0.75 mm ± 1.0 mm ± 1.5 mm
e_1	up to 200 mm more than 200 mm up to 500 mm more than 500 mm	± 0.25 mm ± 0.5 mm ± 1.0 mm
h	up to 250 mm more than 250 mm	- 0.5 mm - 1.0 mm

Fits

The shaft extensions specified in the dimensions tables and the diameter of the centering disk are designed in accordance with the following fits.

The drilled holes of couplings and belt pulleys should have at least an ISO H7 fit. Cylindrical shaft extensions are equipped with a centering thread in accordance with DIN 332, sheet 2.

Dimensions	ISO fit in accordance with DIN 748, DIN 7160, DIN 7161 and DIN 42948	
d and d_1	Up to 11 mm ∅	j6
	More than 11 mm ∅	k6
	More than 50 mm ∅	m6
b_1	Up to 230 mm ∅	j6
	More than 230 mm ∅	h6

Shaft extension diameter	Thread
Up to 30 mm	M10
More than 30 up to 38 mm	M12
More than 38 up to 50 mm	M16
More than 50 up to 85 mm	M20

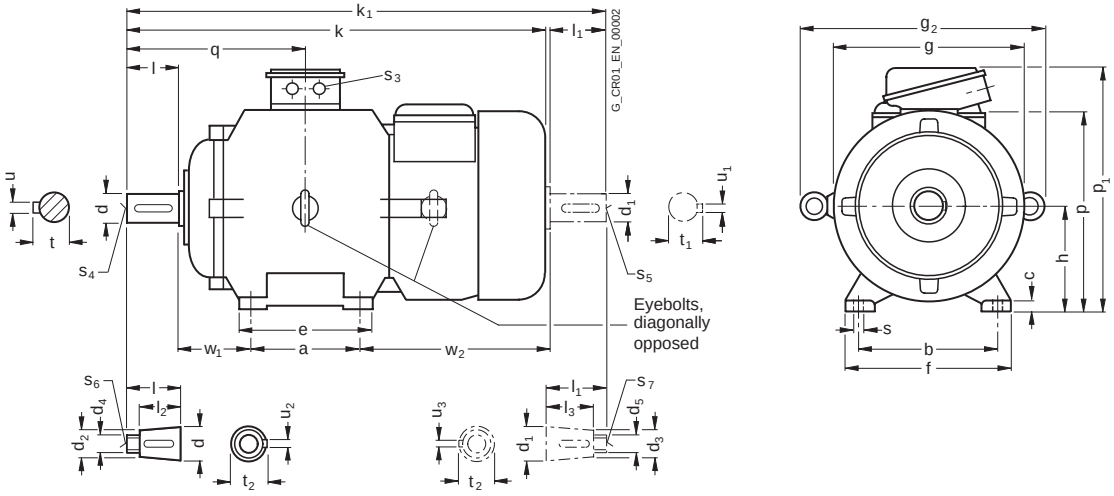
Hexagon nut on conical shaft extensions in standard version motors (shoulder nuts)

Dimensions						Associated spring washer form B
d_4, d_5	c	d_8	e	m	s	DIN 127
M30 x 2	5	36	63.5	19	55	36
M36 x 3	5	42	63.5	19	55	42
M42 x 3	5	48	75	25	65	48
M48 x 3	6	56	86.5	25	75	56
M56 x 4	6	64	98	28	85	64
M64 x 4	6	72	110	28	95	72
M72 x 4	6	80	121	34	105	80
M80 x 4	6	90	133	34	115	90

Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT9

Construction type IM B3



For motor Frame size	Type	DIN IEC	Dimensions to a B	b A	c HA	e BB	f AB	g AC	g_2	h H	k L	k_1 LC	p HB	p_1 HD	q	s [1] K	s_3 K	w_1 C	w_2 CA
100 L	1LT9 107		140	160	14	175	200	195	268	100	493	559	198	273	193	M10	2 x M25 x 1.5	63	236
112 M	1LT9 113		140	190	14	175	235	219	282	112	531.5	597.5	222	297	200	M10	2 x M25 x 1.5	70	254
	1LT9 114																		
132 M	1LT9 133		178	216	18	220	260	260	350	132	618	713	265	327	258	M10	2 x M32 x 1.5	89	360
	1LT9 134																		
	1LT9 135																		
160 M	1LT9 163		210	254	24	264	314	315	422	160	726	866	320	413	323	M12	2 x M40 x 1.5	108	403
160 L	1LT9 166		254			308					770	910			345				425
180 L	1LT9 186		279	279	26	310	350	350	456	180	865	1005	360	450	370.5	M12	2 x M40 x 1.5	121	494.5
200 L	1LT9 206		305	318	30	365	400	388	512	200	924	1064	394	496	395.5	M16	2 x M50 x 1.5	133	542.5
	1LT9 207																		

For motor Frame size	Type	DIN IEC	Cyl. shaft extensions DE [2] d D [3]	l E [3]	t GA [3]	u F [3]	s_4	Cyl. shaft extensions NDE d_1 DA [3]	l_1 EA [3]	t_1 GA [3]	u_1 F [3]	s_5
100 L	1LT9 107		28	60	31	8	M10	28	60	31	8	M10
112 M	1LT9 113		28	60	31	8	M10	28	60	31	8	M10
	1LT9 114											
132 M	1LT9 133		38	80	41	10	M12	38	80	41	10	M12
	1LT9 134											
	1LT9 135											
160 M	1LT9 163		42	110	45	12	M16	42	110	45	12	M16
160 L	1LT9 166											
180 L	1LT9 186		48	110	51.5	14	M16	48	110	51.5	14	M16
200 L	1LT9 206		55	110	59	16	M20	55	110	59	16	M20
	1LT9 207											

For motor Frame size	Type	DIN IEC	Conical shaft extension DE [4] d	d_2	d_4	l	l_2	t_2	u_2	s_6	Conical shaft extension NDE d_1	d_3	d_5	l_1	l_3	t_3	u_3	s_7
180 L	1LT9 186		48	39.8	M30 x 2	110	82	48.9	12	M10	48	39.8	M30 x 2	110	82	48.9	12	M10
200 L	1LT9 206		55	46.8	M36 x 3	110	82	56.4	14	M12	55	46.8	M36 x 3	110	82	56.4	14	M12
	1LT9 207																	

1) Through-holes for bolt.

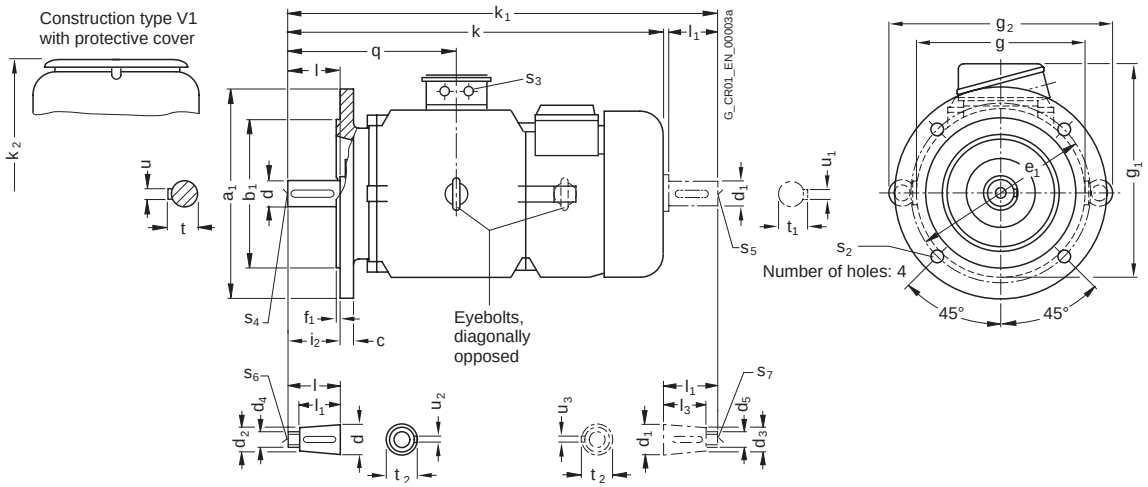
2) Conical shaft extension for frame sizes 100 to 160 (on request).

3) Designation defined for cylindrical shaft extensions only.

4) Cylindrical shaft extension for frame sizes 180 and 200 (non-standard).

Dimensional drawings for 1LT9

Construction types IM B5 and IM V1



For motor			Dimensions to															
Frame size	Type	DIN IEC	a_1 p	b_1 N	c_1 LA	e_1 M	f_1 T	s_2 S	z Z	g AC	g_1	g_2	i_2 LE	k L	k_1 LC	k_2 [1] LM	q	s_3 K
100 L	1LT9 107		250	180	16	215	4	14	4	195	271	268	60	493	559	519	193	2 x M25 x 1.5
112 M	1LT9 113 1LT9 114		250	180	16	215	4	14	4	219	295	282	60	531.5	587.5	559	200	2 x M25 x 1.5
132 M	1LT9 133 1LT9 134 1LT9 135		300	230	20	265	4	14	4	260	325	350	80	618	713	648	258	2 x M32 x 1.5
160 M **160 L**	1LT9 163 1LT9 166		350	250	20	300	5	18	4	315	410	422	110	726	866	761	323	2 x M40 x 1.5
180 L	1LT9 186		350	250	20	300	5	18	4	350	445	456	110	865	1005	903	370.5	2 x M40 x 1.5
200 L	1LT9 206 1LT9 207		400	300	20	350	5	18	4	388	485	512	110	924	1064	964	395.5	2 x M50 x 1.5

For motor			Cyl. shaft extensions DE [2]					Cyl. shaft extensions NDE				
Frame size	Type	DIN IEC	d D [3]	l E [3]	t GA [3]	u F [3]	s_4	d_1 DA [3]	l_1 EA [3]	t_1 GA [3]	u_1 F [3]	s_5
100 L	1LT9 107		28	60	31	8	M10	28	60	31	8	M10
112 M	1LT9 113 1LT9 114		28	60	31	8	M10	28	60	31	8	M10
132 M	1LT9 133 1LT9 134 1LT9 135		38	80	41	10	M12	38	80	41	10	M12
160 M **160 L**	1LT9 163 1LT9 166		42	110	45	12	M16	42	110	45	12	M16
180 L	1LT9 186		48	110	51.5	14	M16	48	110	51.5	14	M16
200 L	1LT9 206 1LT9 207		55	110	59	16	M20	55	110	59	16	M20

For motor			Conical shaft extensions DE [4]								Conical shaft extension NDE							
Frame size	Type	DIN IEC	d	d_2	d_4	l	l_2	t_2	u_2	s_6	d_1	d_3	d_5	l_1	l_3	t_3	u_3	s_7
180 L	1LT9 186		48	39.8	M30 x 2	110	82	48.9	12	M10	48	39.8	M30 x 2	110	82	48.9	12	M10
200 L	1LT9 206 1LT9 207		48	39.8	M30 x 2	110	82	48.9	12	M10	48	39.8	M30 x 2	110	82	48.9	12	M10

[1] Construction type IM V1 with protective cover.

[2] Conical shaft extension for frame sizes 100 to 160 (on request).

[3] Designation defined for cylindrical shaft extensions only.

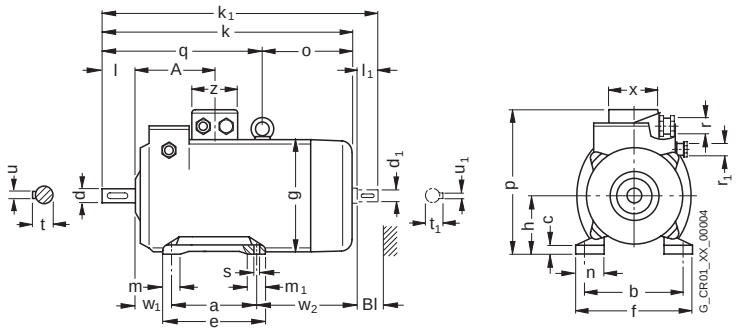
[4] Cylindrical shaft extension for frame sizes 180 and 200 (non-standard).

Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT8

1LT8 223 to 1LT8 313, construction type IM B3

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54



Frame size	Type	No. of poles	DIN	a	b	c	d	Tol-erance d	d_1	Tol-erance d_1	e	f	g	h	Tol-erance h	k	k_1	l	l_1	m	m_1	n	o
			IEC	B	A	HA	D	-	DA	-	BB	AB	AC	H	-	L	LC	E	EA	BA	-	AA	-
225 M	1LT8 223	4,6,8		311	356	25	60	m6	55	m6	368	413	390	225	-0.5	957	1081	140	110	75	75	75	329
	1LT8 224	4,6,8		311	356	25	60	m6	55	m6	368	413	390	225	-0.5	957	1081	140	110	75	75	75	329
250 M	1LT8 253	4,6,8,10		349	406	28	70	m6	60	m6	412	471	440	250	-0.5	1072	1224	140	140	84	84	84	427
	1LT8 254	4		349	406	28	70	m6	60	m6	412	471	440	250	-0.5	1072	1224	140	140	84	84	84	427
	1LT8 254	6,8,10		349	406	28	70	m6	60	m6	412	469	490	250	-0.5	1166	1321	140	140	84	84	84	420
280 S	1LT8 280	4,6,10		368	457	40	80	m6	65	m6	431	522	490	280	-1.0	1201	1350	170	140	96	96	94	420
	1LT8 280	8		368	457	40	80	m6	65	m6	482	522	490	280	-1.0	1281	1430	170	140	96	138	94	500
280 M	1LT8 283	4		419	457	40	80	m6	65	m6	482	522	490	280	-1.0	1281	1430	170	140	96	138	94	500
	1LT8 283	6,8,10		419	457	40	80	m6	65	m6	482	522	490	280	-1.0	1281	1430	170	140	96	138	94	500
315 S	1LT8 310	4		406	508	44	90	m6	70	m6	520	590	550	315	-1.0	1363	1515	170	140	120	120	126	582
	1LT8 310	6,8,10		406	508	44	90	m6	70	m6	572	590	550	315	-1.0	1443	1595	170	140	120	172	126	662
315 M	1LT8 313	4,6,8,10		457	508	44	90	m6	70	m6	572	590	550	315	-1.0	1443	1595	170	140	120	172	126	662

Frame size	Type	No. of poles	DIN	p (I) B3	p (II) B3	q	r (I)	r (II)	r_1	s	t	t_1	u	u_1	w_1	w_2	A	Bl	x (I)	x (II)	z (I)	z (II)
			IEC	HD	-	-	-	-	-	K	GA	GC	F	FA	C	CA	-	-	-	-	-	-
225 M	1LT8 223	4,6,8		525		628	M50 x 1.5		M50 x 1.5	19	64	59	18	16	149	371	331	40	212		207	
	1LT8 224	4,6,8		525		628	M50 x 1.5		M50 x 1.5	19	64	59	18	16	149	371	331	40	212		207	
250 M	1LT8 253	4,6,8,10		576		645	M50 x 1.5		M50 x 1.5	24	74.5	64	20	18	168	426	342	45	212		207	
	1LT8 254	4		576		645	M50 x 1.5		M50 x 1.5	24	74.5	64	20	18	168	426	342	45	212		207	
	1LT8 254	6,8,10		638		746	M63 x 1.5		M63 x 1.5	24	74.5	64	20	18	168	524	411	50	280		242	
280 S	1LT8 280	4,6,10		668		776	M63 x 1.5		M63 x 1.5	24	85	69	22	18	190	483	411	50	280		242	
	1LT8 280	8		668		776	M63 x 1.5		M63 x 1.5	24	85	69	22	18	190	563	411	50	280		242	
280 M	1LT8 283	4		668		776	M63 x 1.5		M63 x 1.5	24	85	69	22	18	190	512	411	50	280		242	
	1LT8 283	6,8,10		668		776	M63 x 1.5		M63 x 1.5	24	85	69	22	18	190	512	411	50	280		242	
315 S	1LT8 310	4		735	695	781	M63 x 1.5	66	M63 x 1.5	28	95	74.5	25	20	216	583	416	55	280	387	242	242
	1LT8 310	6,8,10		735	695	781	M63 x 1.5	66	M63 x 1.5	28	95	74.5	25	20	216	663	416	55	280	387	242	242
315 M	1LT8 313	4,6,8,10		735	695	781	M63 x 1.5	66	M63 x 1.5	28	95	74.5	25	20	216	612	416	55	280	387	242	242

Note:

2^{nd} Shaft extension for direct coupling only

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II) Terminal box with encapsulated cable gland

Center holes in the shaft extension DIN 332-DS

from d = 55 mm M12

from d = 60 up to d = 70 mm M16

up to d = 80 mm M20

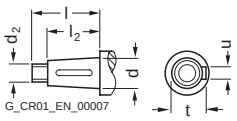
from d = 90 mm M24

Dimensional drawings for 1LT8

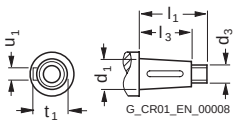
1LT8 223 to 1LT8 313, construction type IM B3

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN IEC	d D	d_1 DA	d_2 -	d_3 -	l E	l_1 EA	l_2 -	l_3 -	t GA	t_1 GC	u F	u_1 FA
225 M	1LT8 223	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
	1LT8 224	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
250 M	1LT8 253	4,6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	4		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
280 S	1LT8 280	4,6,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
	1LT8 280	8		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
280 M	1LT8 283	4		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
	1LT8 283	6,8,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
315 S	1LT8 310	4		90	70	M56 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 310	6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 M	1LT8 313	4,6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

2nd Shaft extension for direct coupling only

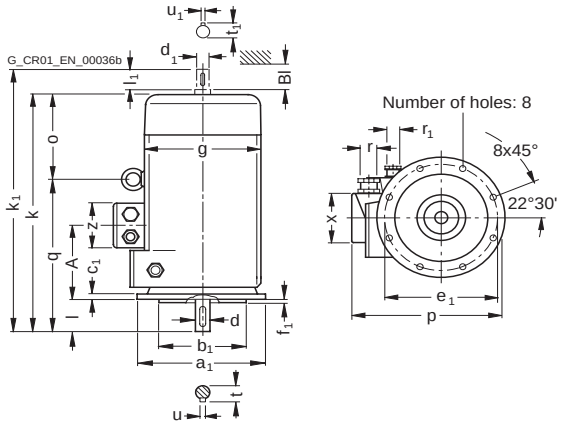
Conical shaft extensions DIN 1448

Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT8

1LT8 223 to 1LT8 313, construction type IM V1

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54



Frame size	Type	No. of poles	DIN	a_1	b_1	Toler-ance b_1	c_1	d	Toler-ance d	d_1	Toler-ance d_1	e_1	f_1	g	k	k_1	l	l_1	o	p (I)	p (II)
			IEC	P	N	-	LA	D	-	DA	-	M	T	AC	L	LC	E	EA	-	HD	-
225 M	1LT8 223	4,6,8		450	350	h6	16	60	m6	55	m6	400	5	390	957	1081	140	110	329	525	
	1LT8 224	4,6,8		450	350	h6	16	60	m6	55	m6	400	5	390	957	1081	140	110	329	525	
250 M	1LT8 253	4,6,8,10		550	450	h6	18	70	m6	60	m6	500	5	440	1072	1224	140	140	427	601	
	1LT8 254	4		550	450	h6	18	70	m6	60	m6	500	5	440	1072	1224	140	140	427	601	
	1LT8 254	6,8,10		550	450	h6	18	70	m6	60	m6	500	5	490	1166	1321	140	140	420	663	
280 S	1LT8 280	4,6,10		550	450	h6	22	80	m6	65	m6	500	5	490	1201	1350	170	140	420	668	
	1LT8 280	8		550	450	h6	22	80	m6	65	m6	500	5	490	1281	1430	170	140	500	668	
280 M	1LT8 283	4		550	450	h6	22	80	m6	65	m6	500	5	490	1281	1430	170	140	500	668	
	1LT8 283	6,8,10		550	450	h6	22	80	m6	65	m6	500	5	490	1281	1430	170	140	500	668	
315 S	1LT8 310	4		660	550	h6	22	90	m6	70	m6	600	6	550	1363	1515	170	140	582	750	710
	1LT8 310	6,8,10		660	550	h6	22	90	m6	70	m6	600	6	550	1443	1595	170	140	662	750	710
315 M	1LT8 313	4,6,8,10		660	550	h6	22	90	m6	70	m6	600	6	550	1443	1595	170	140	662	750	710

Frame size	Type	No. of poles	DIN	q	r (I)	r (II)	r_1	s_1	t	t_1	u	u_1	A	Bl	x (I)	x (II)	z (I)	z (II)
			IEC	-	-	-	-	S	GA	GC	F	FA	-	-	-	-	-	-
225 M	1LT8 223	4,6,8		628	M50 x 1.5		M50 x 1.5	18	64	59	18	16	331	40	212		207	
	1LT8 224	4,6,8		628	M50 x 1.5		M50 x 1.5	18	64	59	18	16	331	40	212		207	
250 M	1LT8 253	4,6,8,10		645	M50 x 1.5		M50 x 1.5	18	74.5	64	20	18	342	45	212		207	
	1LT8 254	4		645	M50 x 1.5		M50 x 1.5	18	74.5	64	20	18	342	45	212		207	
	1LT8 254	6,8,10		746	M63 x 1.5		M63 x 1.5	18	74.5	64	20	18	411	50	280		242	
280 S	1LT8 280	4,6,10		776	M63 x 1.5		M63 x 1.5	18	85	69	22	18	411	50	280		242	
	1LT8 280	8		776	M63 x 1.5		M63 x 1.5	18	85	69	22	18	411	50	280		242	
280 M	1LT8 283	4		776	M63 x 1.5		M63 x 1.5	18	85	69	22	18	411	50	280		242	
	1LT8 283	6,8,10		776	M63 x 1.5		M63 x 1.5	18	85	69	22	18	411	50	280		242	
315 S	1LT8 310	4		781	M63 x 1.5	66	M63 x 1.5	22	95	74.5	25	20	416	55	280	387	242	242
	1LT8 310	6,8,10		781	M63 x 1.5	66	M63 x 1.5	22	95	74.5	25	20	416	55	280	387	242	242
315 M	1LT8 313	4,6,8,10		781	M63 x 1.5	66	M63 x 1.5	22	95	74.5	25	20	416	55	280	387	242	242

Note:

2nd Shaft extension for direct coupling only

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II) Terminal box with encapsulated cable gland from frame size 250 mm IM V1 available

Center holes in the shaft extension DIN 332-DS

from d = 55 mm M12

from d = 60 up to d = 70 mm M16

up to d = 80 mm M20

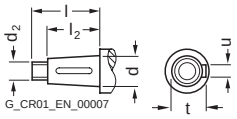
from d = 90 mm M24

Dimensional drawings for 1LT8

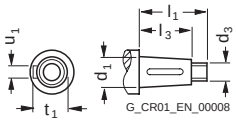
1LT8 223 to 1LT8 313, construction type IM V1

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN IEC	d D	d_1 DA	d_2 -	d_3 -	l E	l_1 EA	l_2 -	l_3 -	t GA	t_1 GC	u F	u_1 FA
225 M	1LT8 223	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
	1LT8 224	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
250 M	1LT8 253	4,6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	4		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
280 S	1LT8 280	4,6,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
	1LT8 280	8		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
280 M	1LT8 283	4		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
	1LT8 283	6,8,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
315 S	1LT8 310	4		90	70	M56 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 310	6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 M	1LT8 313	4,6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

2nd Shaft extension for direct coupling only

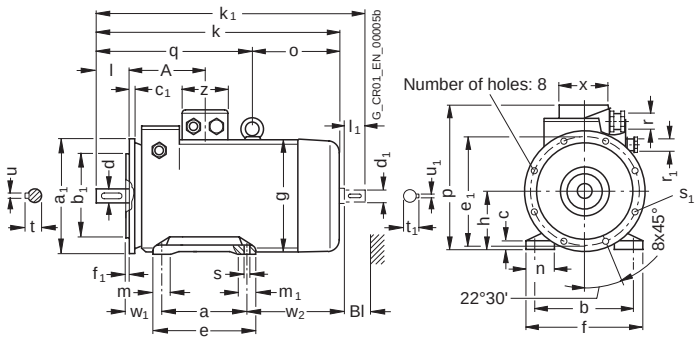
Conical shaft extensions DIN 1448

Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT8

1LT8 223 to 1LT8 313, construction type IM B35

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54



Frame size	Type	No. of poles	DIN	a	a_1	b	b_1	Tolerance b_1	c	c_1	d	Tolerance d	d_1	Tolerance d_1
			IEC	B	P	A	N	-	HA	LA	D	-	DA	
225 M	1LT8 223	4,6,8		311	450	356	350	h6	25	16	60	m6	55	m6
	1LT8 224	4,6,8		311	450	356	350	h6	25	16	60	m6	55	m6
250 M	1LT8 253	4,6,8,10		349	550	406	450	h6	28	18	70	m6	60	m6
	1LT8 254	4		349	550	406	450	h6	28	18	70	m6	60	m6
	1LT8 254	6,8,10		349	550	406	450	h6	28	18	70	m6	60	m6
280 S	1LT8 280	4,6,10		368	550	457	450	h6	40	22	80	m6	65	m6
	1LT8 280	8		368	550	457	450	h6	40	22	80	m6	65	m6
280 M	1LT8 283	4,6,8,10		419	550	457	450	h6	40	22	80	m6	65	m6
315 S	1LT8 310	4		406	660	508	550	h6	44	22	90	m6	70	m6
	1LT8 310	6,8,10		406	660	508	550	h6	44	22	90	m6	70	m6
315 M	1LT8 313	4,6,8,10		457	660	508	550	h6	44	22	90	m6	70	m6

Frame size	Type	No. of poles	DIN	e	e_1	f	f_1	g	h	Tolerance h	k	k_1	l	l_1	m	m_1
			IEC	BB	M	AB	T	AC	H	-	L	LC	E	EA	BA	-
225 M	1LT8 223	4,6,8		368	400	413	5	390	225	-0.5	957	1081	140	110	75	75
	1LT8 224	4,6,8		368	400	413	5	390	225	-0.5	957	1081	140	110	75	75
250 M	1LT8 253	4,6,8,10		412	500	471	5	440	250	-0.5	1072	1224	140	140	84	84
	1LT8 254	4		412	500	471	5	440	250	-0.5	1072	1224	140	140	84	84
	1LT8 254	6,8,10		412	500	469	5	490	250	-0.5	1166	1321	140	140	84	84
280 S	1LT8 280	4,6,10		431	500	522	5	490	280	-1.0	1201	1350	170	140	96	96
	1LT8 280	8		482	500	522	5	490	280	-1.0	1281	1430	170	140	96	138
280 M	1LT8 283	4,6,8,10		482	500	522	5	490	280	-1.0	1281	1430	170	140	96	138
315 S	1LT8 310	4		520	600	590	6	550	315	-1.0	1363	1515	170	140	120	120
	1LT8 310	6,8,10		572	600	590	6	550	315	-1.0	1443	1595	170	140	120	172
315 M	1LT8 313	4,6,8,10		572	600	590	6	550	315	-1.0	1443	1595	170	140	120	172

Dimensional drawings for 1LT8

1LT8 223 to 1LT8 313, construction type IM B35

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54

Frame size	Type	No. of poles	DIN	n	o	p (I)	p (II)	q	r (I)	r (II)	r_1	s	s_1	t	t_1
			IEC	AA	-	HD	-	-	-	-	-	K	S	GA	GC
225 M	1LT8 223	4,6,8		75	329	525		628	M50 x 1.5		M50 x 1.5	19	18	64	59
	1LT8 224	4,6,8		75	329	525		628	M50 x 1.5		M50 x 1.5	19	18	64	59
250 M	1LT8 253	4,6,8,10		84	427	601		645	M50 x 1.5		M50 x 1.5	24	18	74.5	64
	1LT8 254	4		84	427	601		645	M50 x 1.5		M50 x 1.5	24	18	74.5	64
	1LT8 254	6,8,10		84	420	663		746	M63 x 1.5		M63 x 1.5	24	18	74.5	64
280 S	1LT8 280	4,6,10		94	420	668		776	M63 x 1.5		M63 x 1.5	24	18	85	69
	1LT8 280	8		94	500	668		776	M63 x 1.5		M63 x 1.5	24	18	85	69
280 M	1LT8 283	4,6,8,10		94	500	668		776	M63 x 1.5		M63 x 1.5	24	18	85	69
315 S	1LT8 310	4		126	582	750	710	781	M63 x 1.5	66	M63 x 1.5	28	22	95	74.5
	1LT8 310	6,8,10		126	662	750	710	781	M63 x 1.5	66	M63 x 1.5	28	22	95	74.5
315 M	1LT8 313	4,6,8,10		126	662	750	710	781	M63 x 1.5	66	M63 x 1.5	28	22	95	74.5

Frame size	Type	No. of poles	DIN	u	u_1	w_1	w_2	A	Bl	x (I)	x (II)	z (I)	z (II)
			IEC	F	FA	C	CA	-	-	-	-	-	-
225 M	1LT8 223	4,6,8		18	16	149	371	331	40	212		207	
	1LT8 224	4,6,8		18	16	149	371	331	40	212		207	
250 M	1LT8 253	4,6,8,10		20	18	168	426	342	45	212		207	
	1LT8 254	4		20	18	168	426	342	45	212		207	
	1LT8 254	6,8,10		20	18	168	524	411	50	280		242	
280 S	1LT8 280	4,6,10		22	18	190	483	411	50	280		242	
	1LT8 280	8		22	18	190	563	411	50	280		242	
280 M	1LT8 283	4,6,8,10		22	18	190	512	411	50	280		242	
315 S	1LT8 310	4		25	20	216	583	416	55	280	387	242	242
	1LT8 310	6,8,10		25	20	216	663	416	55	280	387	242	242
315 M	1LT8 313	4,6,8,10		25	20	216	612	416	55	280	387	242	242

Note:

2nd Shaft extension for direct coupling only

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II) Terminal box with encapsulated cable gland

Center holes in the shaft extension DIN 332-DS

from d = 55 mm M12

from d = 60 up to d = 70 mm M16

up to d = 80 mm M20

from d = 90 mm M24

5

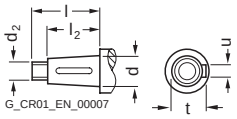
Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT8

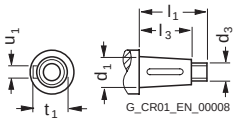
1LT8 223 to 1LT8 313, construction type IM B35

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN IEC	d D	d_1 DA	d_2 -	d_3 -	l E	l_1 EA	l_2 -	l_3 -	t GA	t_1 GC	u F	u_1 FA
225 M	1LT8 223	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
	1LT8 224	4,6,8		60	55	M42 x 3	M36 x 3	140	110	105	82	61.4	56.4	16	14
250 M	1LT8 253	4,6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	4		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
	1LT8 254	6,8,10		70	60	M48 x 3	M42 x 3	140	140	105	105	71.4	61.4	18	16
280 S	1LT8 280	4,6,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
	1LT8 280	8		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
280 M	1LT8 283	4,6,8,10		80	65	M56 x 4	M42 x 3	170	140	130	105	81.2	66.4	20	16
315 S	1LT8 310	4		90	70	M56 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 310	6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 M	1LT8 313	4,6,8,10		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

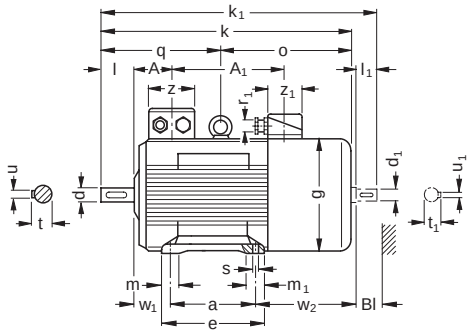
2nd Shaft extension for direct coupling only

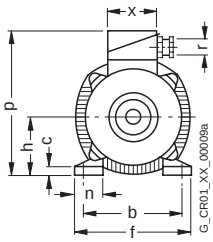
Conical shaft extensions DIN 1448

Dimensional drawings for 1LT8

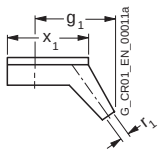
1LT8 314 to 1LT8 318, construction type IM B3

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54





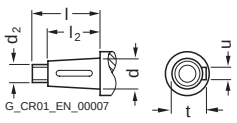
Terminal box with encapsulated cable gland



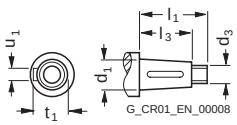
Frame size	Type	No. of poles	DIN	a	b	c	d	Toler-ance d	d_1	Toler-ance d_1	e	f	g	g_1	h	Toler-ance h	k	k_1	l	l_1	m	m_1	n	o
			IEC	B	A	HA	D	-	DA	-	BB	AB	AC		H	-	L	LC	E	EA	BA	-	AA	-
315 M	1LT8 314	4,6,8		457	508	44	90	m6	70	m6	573	590	610	370	315	-1.0	1644	1793	170	140	120	120	110	978
	1LT8 315	4,6,8		457	508	44	90	m6	70	m6	573	590	610	370	315	-1.0	1644	1793	170	140	120	120	110	978
315 L	1LT8 317	4,6,8		508	508	44	90	m6	70	m6	624	590	610	370	315	-1.0	1764	1913	170	140	120	120	110	1098
	1LT8 318	4		508	508	44	90	m6	70	m6	624	590	610	370	315	-1.0	1764	1913	170	140	120	120	110	1098

Frame size	Type	No. of poles	DIN	p (I) B3	p (II) B3	q	r (I)	r (II)	r_1	s	t	t_1	u	u_1	w_1	w_2	A	A_1	Bl	x (I)	x (II)	x_1	z (I)	z (II)	z_1
			IEC	HD	-	-	-	-	-	K	GA	GC	F	FA	C	CA	-	-	-	-	-		-	-	
315 M	1LT8 314	4,6,8		802	762	666	M63 x 1.5	92	M63 x 1.5	28	95	74.5	25	20	216	810	230	675	55	315	422	212	296	296	207
315 M	1LT8 315	4,6,8		802	762	666	M63 x 1.5	92	M63 x 1.5	28	95	74.5	25	20	216	810	230	675	55	315	422	212	296	296	207
315 L	1LT8 317	4,6,8		802	762	666	M63 x 1.5	92	M63 x 1.5	28	95	74.5	25	20	216	879	230	795	55	315	422	212	296	296	207
315 L	1LT8 318	4		802	762	666	M63 x 1.5	92	M63 x 1.5	28	95	74.5	25	20	216	879	230	795	55	315	422	212	296	296	207

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN	d	d_1	d_2	d_3	l	l_1	l_2	l_3	t	t_1	u	u_1
			IEC	D	DA	-	-	E	EA		-	GA	GC	F	FA
315 M	1LT8 314	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 315	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 L	1LT8 317	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 318	4		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

2nd Shaft extension for direct coupling only

Conical shaft extensions DIN 1448

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II) Terminal box with encapsulated cable gland

Center holes in the shaft extension DIN 332-DS

up to d = 80 mm M20

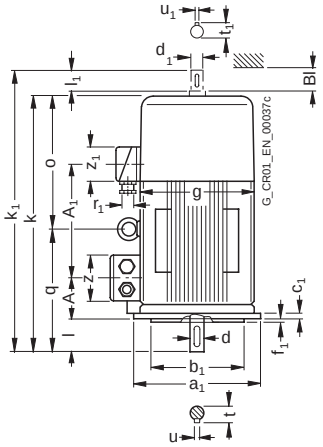
from d = 90 mm M24

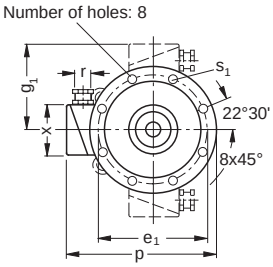
Three-phase slip ring motors 1LT9 and 1LT8

Dimensional drawings for 1LT8

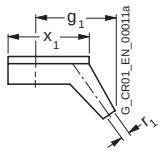
1LT8 314 to 1LT8 318, construction type IM V1

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54





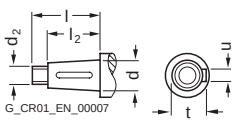
Terminal box with encapsulated cable gland



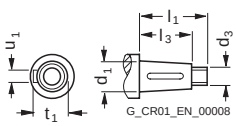
Frame size	Type	No. of poles	DIN	a_1	b_1	Toler-ance b_1	c_1	d	Toler-ance d	d_1	Toler-ance d_1	e_1	f_1	g	g_1	k	k_1	l	l_1	o	p (I)	p (II)
			IEC	P	N	-	LA	D	-	DA	-	M	T	AC		L	LC	E	EA	-	HD	-
315 M	1LT8 314	4,6,8		660	550	h6	22	90	m6	70	m6	600	6	610	370	1644	1793	170	140	978	817	777
	1LT8 315	4,6,8		660	550	h6	22	90	m6	70	m6	600	6	610	370	1644	1793	170	140	978	817	777
315 L	1LT8 317	4,6,8		660	550	h6	22	90	m6	70	m6	600	6	610	370	1764	1913	170	140	1098	817	777
	1LT8 318	4		660	550	h6	22	90	m6	70	m6	600	6	610	370	1764	1913	170	140	1098	817	777

Frame size	Type	No. of poles	DIN	q	r (I)	r (II)	r_1	s_1	t	t_1	u	u_1	A	A_1	Bl	x (I)	x (II)	x_1	z (I)	z (II)	z_1
			IEC	-	-	-	-	S	GA	GC	F	FA	-	-	-	-			-	-	
315 M	1LT8 314	4,6,8		666	M63 x 1.5	92	M63 x 1.5	22	95	74.5	25	20	230	675	55	315	422	212	296	296	207
	1LT8 315	4,6,8		666	M63 x 1.5	92	M63 x 1.5	22	95	74.5	25	20	230	675	55	315	422	212	296	296	207
315 L	1LT8 317	4,6,8		666	M63 x 1.5	92	M63 x 1.5	22	95	74.5	25	20	230	795	55	315	422	212	296	296	207
	1LT8 318	4		666	M63 x 1.5	92	M63 x 1.5	22	95	74.5	25	20	230	795	55	315	422	212	296	296	207

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN	d	d_1	d_2	d_3	l	l_1	l_2	l_3	t	t_1	u	u_1
			IEC	D	DA	-	-	E	EA	-	-	GA	GC	F	FA
315 M	1LT8 314	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 315	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 L	1LT8 317	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 318	4		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

2nd Shaft extension for direct coupling only

Conical shaft extensions DIN 1448

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II) Terminal box with encapsulated cable gland

Center holes in the shaft extension DIN 332-DS

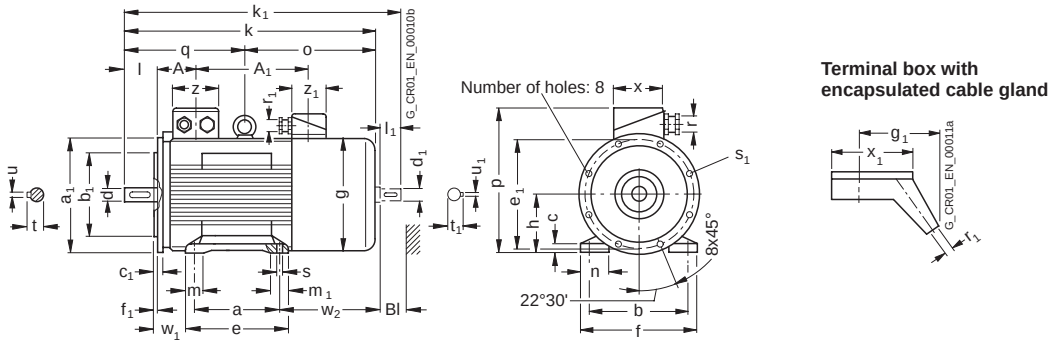
up to d = 80 mm M20

from d = 90 mm M24

Dimensional drawings for 1LT8

1LT8 314 to 1LT8 318, construction type IM B35

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54



Frame size	Type	No. of poles	DIN	a	a_1	b	b_1	Tolerance b_1	c	c_1	d	Tolerance d	d_1	Tolerance d_1	e	e_1	f	f_1	g	g_1	h	Tolerance h
			IEC	B	P	A	N	-	HA	LA	D	-	DA	-	BB	M	AB	T	AC		H	
315 M	1LT8 314	4,6,8		457	660	508	550	h6	44	22	90	m6	70	m6	573	600	590	6	610	370	315	-1.0
	1LT8 315	4,6,8		457	660	508	550	h6	44	22	90	m6	70	m6	573	600	590	6	610	370	315	-1.0
315 L	1LT8 317	4,6,8		508	660	508	550	h6	44	22	90	m6	70	m6	624	600	590	6	610	370	315	-1.0
	1LT8 318	4		508	660	508	550	h6	44	22	90	m6	70	m6	624	600	590	6	610	370	315	-1.0

Frame size	Type	No. of poles	DIN	k	k_1	l	l_1	m	m_1	n	o	p (I)	p (II)	q	r (I)	r (II)	r_1	s	s_1	t	t_1
			IEC	L	LC	E	EA	BA	-	AA	-	HD	-	-	-	-	-	K	S	GA	GC
315 M	1LT8 314	4,6,8		1644	1793	170	140	120	120	110	978	817	777	666	M63 x 1.5	92	M63 x 1.5	28	22	95	74.5
	1LT8 315	4,6,8		1644	1793	170	140	120	120	110	978	817	777	666	M63 x 1.5	92	M63 x 1.5	28	22	95	74.5
315 L	1LT8 317	4,6,8		1764	1913	170	140	120	120	110	1098	817	777	666	M63 x 1.5	92	M63 x 1.5	28	22	95	74.5
	1LT8 318	4		1764	1913	170	140	120	120	110	1098	817	777	666	M63 x 1.5	92	M63 x 1.5	28	22	95	74.5

Frame size	Type	No. of poles	DIN	u	u_1	w_1	w_2	A	A_1	Bl	x (I)	x (II)	x_1	z (I)	z (II)	z_1
			IEC	F	FA	C	CA	-	-	-	-	-		-	-	
315 M	1LT8 314	4,6,8		25	20	216	810	230	675	55	315	422	212	296	296	207
	1LT8 315	4,6,8		25	20	216	810	230	675	55	315	422	212	296	296	207
315 L	1LT8 317	4,6,8		25	20	216	879	230	795	55	315	422	212	296	296	207
	1LT8 318	4		25	20	216	879	230	795	55	315	422	212	296	296	207

Note:

2nd Shaft extension for direct coupling only

Conical shaft extensions DIN 1448

Bl = Minimum clearance for air inlet

(I) Terminal box for screwed gland DIN 46 320

(II)Terminal box with encapsulated cable gland

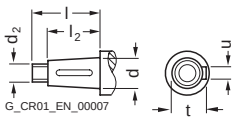
5

Dimensional drawings for 1LT8

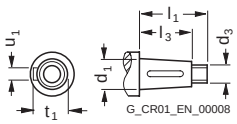
1LT8 314 to 1LT8 318, construction type IM B35

With surface cooling, cooling method IC 0141, intermittent duty S3
IEC 60072, degree of protection IP54

Conical shaft extension



Taper 1:10



Taper 1:10

Frame size	Type	No. of poles	DIN IEC	d D	d_1 DA	d_2 -	d_3 -	l E	l_1 EA	l_2 -	l_3 -	t GA	t_1 GC	u F	u_1 FA
315 M	1LT8 314	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 315	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
315 L	1LT8 317	4,6,8		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18
	1LT8 318	4		90	70	M64 x 4	M48 x 3	170	140	130	105	91.7	71.4	22	18

Note:

Center holes in the shaft extension DIN 332-DS

up to d = 80 mm M20

from d = 90 mm M24

Replacement parts

Type	Order No. Brush holder 1 set = 3 pcs per motor	Carbon brushes 1 set = 6 pcs per motor	Slip ring assembly
1LT9 107	**1LY7 710**	**1LY8 810**	**1LY9 910**
1LT9 113 **1LT9 114**	**1LY7 711**	**1LY8 811**	**1LY9 911**
1LT9 133 **1LT9 134** **1LT9 135**	**1LY7 712**	**1LY8 812**	**1LY9 912**
1LT9 163 **1LT9 166**	**1LY7 713**	**1LY8 813**	**1LY9 913**
1LT9 186	**1LY7 714**	**1LY8 814**	**1LY9 914**
1LT9 206 **1LT9 207**	**1LY7 715**	**1LY8 815**	**1LY9 915**

Type	No. of poles	Order No. Box-type brush holder 1 set = 3 pcs	Carbon brushes 1 set = 6 pcs	Slip ring assembly
1LT8 223 **1LT8 223** **1LT8 224**	4 6, 8 6, 8	**14487 01**	**24745 01** **01502 01** **01502 01**	**12302 01** **12302 01** **12302 01**
1LT8 253 **1LT8 254** **1LT8 254**	4, 6, 8, 10 4 6, 8, 10	**12275 01**	**50281 01** **50281 01** **50283 01**	**12286 01** **12286 01** **16527 01**
1LT8 280 **1LT8 283**	4, 6 4, 6	**12276 01**	**57441 01** **57441 01**	**16527 01** **16527 01**
1LT8 280 **1LT8 283**	8, 10 8, 10	**12275 01**	**50283 01** **50283 01**	**16527 01** **16527 01**
1LT8 310 **1LT8 313** **1LT8 310** **1LT8 313**	4, 6 4, 6 8, 10 8, 10	**12276 01**	**61869 01** **61869 01** **50285 01** **50285 01**	**16529 01** **16529 01** **16529 01** **16529 01**
1LT8 314 **1LT8 315** **1LT8 317** **1LT8 318**	4, 6, 8 4, 6, 8 4, 6, 8 4	**57402 01**	**57393 01** **57393 01** **57393 01** **57393 01**	**57703 01** **57793 01** **57793 01** **57793 01**

Notes

Three-phase slip ring motors with brake

6

Three-phase slip ring motors with brake

Three-phase slip ring motors 1LV9 with brake

Overview

Hoisting gear motor 1LV9 with brake

1LV9 hoisting gear motors with an integral disk brake ensure a compact drive unit. The DC-operated single-disk brake is integrated in the motor and, in conjunction with the motor, creates a self-contained unit. The single-disk brake, which is designed as a holding brake, has thermal reserves and can execute emergency stops from full motor speed. Since it functions as a fail-safe brake, its spring energy remains fully effective even if the excitation voltage fails.

Technical specifications

Version

The 1LV9 motor versions are compatible with the 1LT9 motors described in "Three-phase slip ring motors 1LT9 and 1LT8" (as of page 5/2) (with the exception of the brake components). The brakes are DC-operated. The required bridge rectifier is permanently built into the terminal box of the motor. The brake is fitted to the NDE of the motor, and the motor shaft extends through the brake. The rated braking torque and the air gap are set on delivery. The brake linings are asbestos-free.

Product range

The product range covers an output range from 1.5 kW to 29 kW at S3 - 40% with braking torques of 60 Nm to 250 Nm.

For further data and information regarding

- Motor winding, tolerances
- Rating plates
- Slip rings
- Brush holders, brushes
- Rolling-contact bearings
- Water drain holes
- Paint finish
- Output, effect of temperature and site altitude
- Output in S2 duty
- Anti-condensation heating for motors

refer to the 1LT9 motors in the section "Three-phase slip ring motors 1LT8 and 1LT9" (as of page 5/2).

Electrical design

Operating voltage

1LV9 hoisting gear motors with an integral disk brake are available from the catalog for the following standard voltages:

Motor voltage	Brake voltage
380 V 3 AC, 50 Hz	220 V 1 AC, 50/60 Hz
400 V 3 AC, 50 Hz	230 V 1 AC, 50/60 Hz
500 V 3 AC, 50 Hz	290 V 1 AC, 50/60 Hz
660 V 3 AC, 50 Hz	380 V 1 AC, 50/60 Hz
690 V 3 AC, 50 Hz	400 V 1 AC, 50/60 Hz
440 V 3 AC, 60 Hz	265 V 1 AC, 50/60 Hz

Terminal box, conductor connection

The connection cables for the integral disk brake are routed through the motor housing to separate terminals in the terminal box of the motor. The bridge rectifier for the brake is also located in the terminal box.

Thermistor protection

To protect the stator winding against excessive temperature rise, three or six temperature sensors for warning and/or shutdown purposes can be fitted.

Mechanical design

Construction types

The motors can be shipped in the following basic construction types:

- IM B3
- IM B5 and
- IM V1 with protective cover.

Other construction types are available on request.

Degree of protection

The standard 1LV9 brake motors have degree of protection IP54. Like the 1LT motors, the motor component can also be supplied with degree of protection IP55.

Mounted tachometer

The brake motors can be shipped with a fitted DC tacho-generator which indicates the speed and direction of rotation. It is fitted on the ND end of the motor.

Shaft extensions

In their standard version, the motors are supplied as follows:

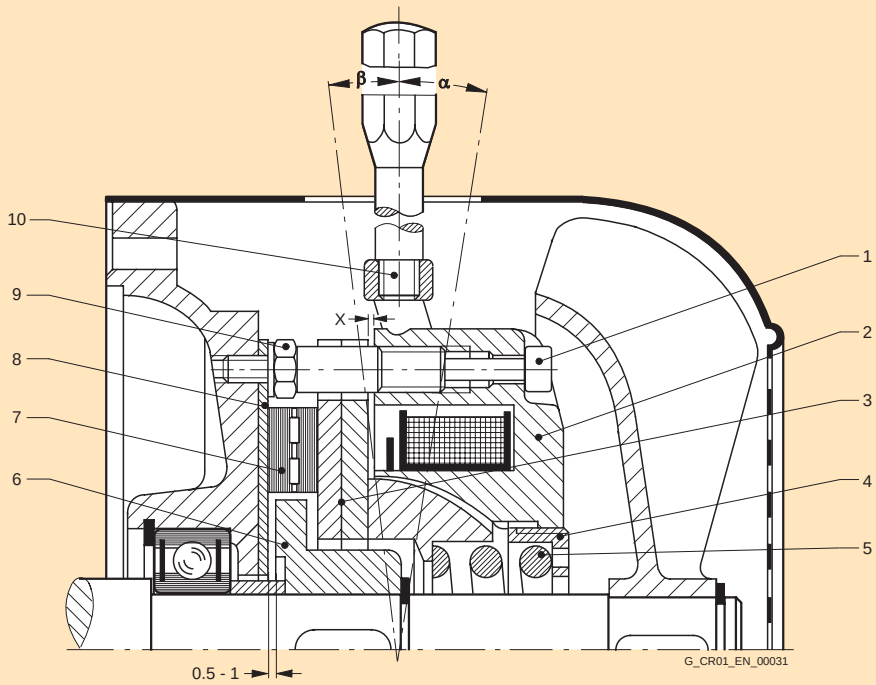
- 1LV9 up to frame size 160: with a cylindrical shaft extension in accordance with DIN 748 [1)]
- 1LV9 as of frame size 180: with a conical shaft extension in accordance with DIN 1448 [2)]

Other shaft extensions (e.g. in accordance with DIN 42681) are available on request.

1) Conical shaft extension available at extra charge.

2) Cylindrical shaft extension available at extra charge.

Technical specifications



1 Socket cap screw DIN 913 and 6912
2 Magnet
3 Armature
4 Adjusting ring
5 Spring
6 Hub
7 Lining
8 Second friction face
9 Setting piece
10 Manual release

View of the standard fitted brake

Brake design

Braking torque setting

The braking torque is set to the rated torque by default. It can be changed by turning the adjusting ring (4). When the braking torque M_B is changed, all the closing and release times specified in the table "Operating values of the spring-operated brake with DC operation, rated supply voltage 1 AC 50/60 Hz" (page 6/4) also change.

Mechanical brake release

To ensure that brakes can still be released even if the operating voltage fails, all the brakes can – if required – be equipped with a manual mechanical release device (specify order code K8. in the order). A manual mechanical release device cannot be retro-fitted.

Thermistor protection

Thermistor protection is not required for the magnet coil in the brake. It can carry its rated current continuously without assuming a permissible high temperature.

Anti-condensation heating

Anti-condensation heaters are not provided for the standard fitted brakes.

Insulation

The insulation for the excitation winding in the brakes fulfills thermal class B (standard).

Three-phase slip ring motors 1LV9 with brake

Technical specifications

Operating values of the spring-loaded disk brake with DC operation, rated supply voltage 1 AC 50/60 Hz

Motor Frame size	Type	Disk brake Type	Braking torque M_{rated}	Braking torque Adjustable From	Braking torque Adjustable To	Work of friction per cycle	Closing time with DC/AC shutdown	Release time	Power consumption	Moment of inertia of brake J
			Nm	Nm	Nm	J	ms	ms	W	kgm^2
100 L	1LV9 107- . . D . .	06.08.210	60	60	30	6500	40/200	160	52	0.561×10^{-3}
112 M	1LV9 113- . . D . .	06.08.210								
	1LV9 114- . . D . .	06.08.210								
132 M	1LV9 133- . . D . .	06.08.210	60	60	30	6500	40/200	160	52	0.561×10^{-3}
	1LV9 134- . . D . .	06.08.210								
	1LV9 135- . . D . .	06.08.210								
132 M	1LV9 133- . . A . .	07.08.210	100	100	50	11000	70/650	200	65	3.402×10^{-3}
	1LV9 134- . . A . .	07.08.210								
	1LV9 135- . . A . .	07.08.210								
160 M	1LV9 163- . . A . .	07.08.210	100	100	50	11000	70/650	200	65	3.402×10^{-3}
160 L	1LV9 166- . . A . .	07.08.210								
160 M	1LV9 163- . . B . .	09.08.210	250	250	125	40000	130/1400	310	75	16.915×10^{-3}
160 L	1LV9 166- . . B . .	09.08.210								
180 L	1LV9 186- . . B . .	09.08.210	250	250	125	40000	130/1400	310	75	16.915×10^{-3}
200 L	1LV9 206- . . B . .	09.08.210	250	250	125	40000	130/1400	310	75	16.915×10^{-3}
	1LV9 207- . . B . .	09.08.210								

Technical specifications

Environmental influences and special versions

Resistance to extreme climates

The brake motors can be used if the following conditions are fulfilled:

	Standard version	Version with enhanced corrosion protection
Climatic area	A and T to DIN 50019	H and M to DIN 50019
Climatic group	Moderate to IEC 721-2-1	Worldwide to IEC 721-2-1

The version with enhanced corrosion protection is also decontaminable. The brakes are designed as follows:

- Armature plate made of stainless steel

The data apply to the corrosion protection. The temperature limits for electrical machines must also be observed.

Three-phase slip ring motors with brake

Three-phase slip ring motors 1LV9 with brake

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 3000 rpm)											
Intermittent duty S3 – 15%											
100 L	1200	2.5	19.8	1.9	6.4	24	2.05	85	0.007	**1LV9 107-4** ■■■■	48.5
112 M	1350	3.7	27.6	2.5	8.2	23	2.65	110	0.013	**1LV9 113-4** ■■■■	57
112 M	1300	5	36.7	2.3	11.7	27	3	140	0.014	**1LV9 114-4** ■■■■	59
132 M	1370	6.8	48	2.5	15	33	2.25	140	0.025	**1LV9 133-4** ■■■■	78
132 M	1390	8	55	2.7	17.1	31	3.15	170	0.033	**1LV9 134-4** ■■■■	89
132 M	1390	9.5	65	2.5	20.5	35	2.7	180	0.036	**1LV9 135-4** ■■■■	95
160 M	1395	13	89	2.4	27.6	47	2.2	180	0.065	**1LV9 163-4** ■■■■	150
160 L	1410	19.5	132	2.7	40.9	48	3.1	260	0.086	**1LV9 166-4** ■■■■	162
180 L	1440	27	182	2.5	55	61	2.43	270	0.171	**1LV9 186-4** ■■■■	243
200 L	1425	33	221	2.3	61	95	1.48	230	0.22	**1LV9 206-4** ■■■■	273
200 L	1430	40	267	2.5	76	92	1.69	270	0.26	**1LV9 207-4** ■■■■	288
Intermittent duty S3 – 25%											
100 L	1245	2.3	17.7	2.2	5.7	20	2.45	85	0.007	**1LV9 107-4** ■■■■	48.5
112 M	1365	3.3	24	2.9	7.5	20	3.2	110	0.013	**1LV9 113-4** ■■■■	57
112 M	1325	4.5	32.4	2.6	10.5	23	3.5	140	0.014	**1LV9 114-4** ■■■■	59
132 M	1390	5.7	39.6	3	12.8	28	2.8	140	0.025	**1LV9 133-4** ■■■■	78
132 M	1400	7	47.8	3.1	15.1	26.5	3.8	170	0.033	**1LV9 134-4** ■■■■	89
132 M	1410	8.7	59	2.7	18.6	30.5	3.05	180	0.036	**1LV9 135-4** ■■■■	95
160 M	1410	11	74.5	2.9	24	40	2.6	180	0.065	**1LV9 163-4** ■■■■	150
160 L	1425	16.5	111	3.3	38	40	3.75	260	0.086	**1LV9 166-4** ■■■■	162
180 L	1445	23	154	2.9	48	54	2.89	270	0.171	**1LV9 186-4** ■■■■	243
200 L	1435	28	186	2.7	53	77	1.72	230	0.22	**1LV9 206-4** ■■■■	273
200 L	1440	34	226	2.9	64	78	2	270	0.26	**1LV9 207-4** ■■■■	288
Intermittent duty S3 – 40%											
100 L	1290	2	14.9	2.6	5	17	2.9	85	0.007	**1LV9 107-4** ■■■■	48.5
112 M	1380	3	21	3.2	6.9	18	3.55	110	0.013	**1LV9 113-4** ■■■■	57
112 M	1350	4	28.3	3	9.5	19	4.25	140	0.014	**1LV9 114-4** ■■■■	59
132 M	1400	5	34.2	3.5	11.4	25	3.25	140	0.025	**1LV9 133-4** ■■■■	78
132 M	1410	6.3	42.7	3.5	13.7	24	4.25	170	0.033	**1LV9 134-4** ■■■■	89
132 M	1425	7.5	50	3.2	16.2	26	3.6	180	0.036	**1LV9 135-4** ■■■■	95
160 M	1425	10	57	3.2	23	36	2.9	180	0.065	**1LV9 163-4** ■■■■	150
160 L	1435	14.5	96.5	3.7	35	35	4.3	260	0.086	**1LV9 166-4** ■■■■	162
180 L	1450	20	133	3.3	43	46	3.39	270	0.171	**1LV9 186-4** ■■■■	243
200 L	1445	24	159	3.2	46	66	2.01	230	0.22	**1LV9 206-4** ■■■■	273
200 L	1445	29	192	3.4	56	66	2.36	270	0.26	**1LV9 207-4** ■■■■	288

Order no. supplements, see page 6/10

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1500 rpm (max. permissible operating speed 3000 rpm)											
Intermittent duty S3 – 60%											
100 L	1320	1.8	12.9	2.9	4.6	15	3.3	85	0.007	**1LV9 107-4** ■■■■	48.5
112 M	1400	2.6	18	3.8	6.1	16	4.3	110	0.013	**1LV9 113-4** ■■■■	57
112 M	1375	3.5	24.3	3.5	9.1	16	5	140	0.014	**1LV9 114-4** ■■■■	59
132 M	1410	4.5	30.5	3.9	10.5	22	3.7	140	0.025	**1LV9 133-4** ■■■■	78
132 M	1425	5.3	35.5	4.2	12	20	5.2	170	0.033	**1LV9 134-4** ■■■■	89
132 M	1430	6.6	41.1	3.7	15	23.5	4.2	180	0.036	**1LV9 135-4** ■■■■	95
160 M	1435	8.5	56.6	3.8	20	30	3.45	180	0.065	**1LV9 163-4** ■■■■	150
160 L	1445	12.5	82.6	4.4	33	30	5	260	0.086	**1LV9 166-4** ■■■■	162
180 L	1455	17.5	116	3.8	39	41	3.8	270	0.171	**1LV9 186-4** ■■■■	243
200 L	1450	21	138	3.7	44	57	2.33	230	0.22	**1LV9 206-4** ■■■■	273
200 L	1450	25	165	3.9	50	57	2.73	270	0.26	**1LV9 207-4** ■■■■	288
Intermittent duty S3 – 100%											
100 L	1360	1.5	10.5	3.6	4.1	12	4.1	85	0.007	**1LV9 107-4** ■■■■	48.5
112 M	1410	2.2	15	4.5	5.6	13	4.9	110	0.013	**1LV9 113-4** ■■■■	57
112 M	1390	3	20.6	4.1	8.3	14	5.8	140	0.014	**1LV9 114-4** ■■■■	59
132 M	1420	4	26.9	4.4	9.5	19	4.25	140	0.025	**1LV9 133-4** ■■■■	78
132 M	1430	4.8	32	4.7	11.2	17.6	5.6	170	0.033	**1LV9 134-4** ■■■■	89
132 M	1440	5.5	37	4.5	13	19	5.2	180	0.036	**1LV9 135-4** ■■■■	95
160 M	1440	7.5	49.6	4.3	19	27	3.85	180	0.065	**1LV9 163-4** ■■■■	150
160 L	1450	11	72.4	5	32	27	5.6	260	0.086	**1LV9 166-4** ■■■■	162
180 L	1460	15	94	4.5	36	35	4.45	270	0.171	**1LV9 186-4** ■■■■	243
200 L	1460	18.5	121	4.2	37	50	2.66	230	0.22	**1LV9 206-4** ■■■■	273
200 L	1455	22	145	4.5	45	50	3.12	270	0.26	**1LV9 207-4** ■■■■	288

Order no. supplements, see page 6/10

At 460 V 3 AC, 60 Hz, the technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

Three-phase slip ring motors 1LV9 with brake

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2500 rpm)											
Intermittent duty S3 – 15%											
100 L	880	1.8	19.5	2.8	6	15	2.7	80	0.011	**1LV9 107-6** ■■■■	48.5
112 M	930	2.5	25.7	2.5	7.3	19	2.4	90	0.019	**1LV9 113-6** ■■■■	57
112 M	870	3.8	43	2.1	10.8	23	2.9	115	0.019	**1LV9 114-6** ■■■■	57
132 M	850	5.2	58.4	2.1	13.8	34	1.85	110	0.033	**1LV9 133-6** ■■■■	78
132 M	900	6	64	2.4	15.7	31	2.2	130	0.039	**1LV9 134-6** ■■■■	89
132 M	870	7	77	2.2	19.5	38	2.1	140	0.047	**1LV9 135-6** ■■■■	95
160 M	930	9.5	98	2.2	28	34	2.9	180	0.097	**1LV9 163-6** ■■■■	150
160 L	920	13.5	142	2	31	36	4.2	260	0.131	**1LV9 166-6** ■■■■	162
180 L	930	21	216	2.1	45	58	2.3	230	0.21	**1LV9 186-6** ■■■■	243
200 L	940	28	285	2.2	57	69	2.1	255	0.26	**1LV9 207-6** ■■■■	254
Intermittent duty S3 – 25%											
100 L	890	1.7	18.2	2.8	5.8	13.5	3	80	0.011	**1LV9 107-6** ■■■■	48.5
112 M	940	2.3	23.4	2.7	6.9	17	2.65	90	0.019	**1LV9 113-6** ■■■■	57
112 M	890	3.3	37.1	2.5	9.7	20	3.3	115	0.019	**1LV9 114-6** ■■■■	57
132 M	875	4.7	51.3	2.4	13.2	32	2	110	0.033	**1LV9 133-6** ■■■■	78
132 M	920	5.2	54	2.8	14.3	26	2.7	130	0.039	**1LV9 134-6** ■■■■	89
132 M	890	6.5	70	2.4	18.2	34	2.4	140	0.047	**1LV9 135-6** ■■■■	95
160 M	940	8	81	2.7	19	29	3.6	180	0.097	**1LV9 163-6** ■■■■	150
160 L	930	11.5	118	2.4	27	32	4.7	260	0.131	**1LV9 166-6** ■■■■	162
180 L	940	17.5	178	2.5	38	48	2.8	230	0.21	**1LV9 186-6** ■■■■	243
200 L	950	24	240	2.5	49	59	2.5	255	0.26	**1LV9 207-6** ■■■■	254
Intermittent duty S3 – 40%											
100 L	900	1.5	16	3.1	5.6	12	3.55	80	0.011	**1LV9 107-6** ■■■■	48.5
112 M	950	2	20	3.2	6.4	15.5	3.25	90	0.019	**1LV9 113-6** ■■■■	57
112 M	910	3	32.9	2.8	9.2	18	3.7	115	0.019	**1LV9 114-6** ■■■■	57
132 M	900	4	42.7	2.9	12.1	26	2.45	110	0.033	**1LV9 133-6** ■■■■	78
132 M	930	4.5	46	3.3	13.2	22	3.1	130	0.039	**1LV9 134-6** ■■■■	89
132 M	910	5.5	58	2.8	15.8	26.5	3.05	140	0.047	**1LV9 135-6** ■■■■	95
160 M	950	7	70	3.1	17.4	25	4	180	0.097	**1LV9 163-6** ■■■■	150
160 L	940	10	102	2.8	24	27	5.6	260	0.131	**1LV9 166-6** ■■■■	162
180 L	950	15	151	2.9	34	41	3.2	230	0.21	**1LV9 186-6** ■■■■	243
200 L	955	20	200	3	42	49	3	255	0.26	**1LV9 207-6** ■■■■	254

Order no. supplements, see page 6/10

Selection and ordering data

Frame size	Rated speed	Rated output	Rated torque M_{rated}	M_k/M_{rated} ±10%	Rated current I at 400 V	Rotor current i	Characteristic rotor resistance k	Rotor stand still voltage u	Moment of inertia J	Order No.	Weight, approx.
	rpm	kW	Nm		A	A		V	kgm^2		kg
Synchronous speed 1000 rpm (max. permissible operating speed 2500 rpm)											
Intermittent duty S3 – 60%											
100 L	920	1.3	13.5	3.6	5.7	11	4.2	80	0.011	**1LV9 107-6** ■■■■	48.5
112 M	960	1.8	18	3.7	6.2	13.5	3.6	90	0.019	**1LV9 113-6** ■■■■	57
112 M	925	2.6	28	3.3	8.5	15	4.4	115	0.019	**1LV9 114-6** ■■■■	57
132 M	910	3.6	37.8	3.3	11.4	23	2.75	110	0.033	**1LV9 133-6** ■■■■	78
132 M	935	4.1	42	3.7	12.4	20	3.6	130	0.039	**1LV9 134-6** ■■■■	89
132 M	925	4.8	50	3.2	15	23	3.5	140	0.047	**1LV9 135-6** ■■■■	95
160 M	960	6	60	3.6	16.2	21	4.9	180	0.097	**1LV9 163-6** ■■■■	150
160 L	950	8.5	85	3.2	22	23	6.5	260	0.131	**1LV9 166-6** ■■■■	162
180 L	955	13	130	3.3	30	35	3.8	230	0.21	**1LV9 186-6** ■■■■	243
200 L	960	17.5	174	3.5	38	42	3.5	255	0.26	**1LV9 207-6** ■■■■	254
Intermittent duty S3 – 100%											
100 L	935	1.1	11.2	4.3	5	9.2	4.9	80	0.011	**1LV9 107-6** ■■■■	48.5
112 M	965	1.5	15	4.5	5.7	11.5	4.1	90	0.019	**1LV9 113-6** ■■■■	57
112 M	940	2.2	23.3	4	8	13	5.1	115	0.019	**1LV9 114-6** ■■■■	57
132 M	920	3	31	4	11	18	3.5	110	0.033	**1LV9 133-6** ■■■■	78
132 M	940	3.5	35.6	4.4	11.6	18	4.4	130	0.039	**1LV9 134-6** ■■■■	89
132 M	940	4	40	3.8	14	18.5	4.4	140	0.047	**1LV9 135-6** ■■■■	95
160 M	965	5.5	54.5	4	15.2	20	5.2	180	0.097	**1LV9 163-6** ■■■■	150
160 L	960	7.5	74.6	3.7	20	21	7.2	260	0.131	**1LV9 166-6** ■■■■	162
180 L	960	11	109	3.9	27	30	4.4	230	0.21	**1LV9 186-6** ■■■■	243
200 L	965	15	148	4	35	36	4.1	255	0.26	**1LV9 207-6** ■■■■	254

Order no. supplements, see page 6/10

At 460 V 3 AC, 60 Hz, the technical data change as follows:

- Speed: approx. +20%
- Rated output: approx. +10%
- Rotor standstill voltage: approx. +15%
- Rotor current: approx. -5%
- Characteristic rotor resistance k: approx. +20%

Three-phase slip ring motors with brake

Three-phase slip ring motors 1LV9 with brake

Selection and ordering data

Order number supplement

Position of the order number	1	2	3	4	5	6	7		8	9	10	11	12		
	1	**L**	**V**	**9**	**.**	**.**	**.**	**–**	**.**	■	■	■	■	**–**	**Z**
Frame size															
No. of poles															
Version															
• Normal										**A**					
• With enhanced corrosion protection										**B**					
Brake design															
• Disk brake 100 Nm											**A**				
• Disk brake 250 Nm											**B**				
• Disk brake 60 Nm											**D**				
Voltage and frequency															
50 Hz															
• 380 V												**1**			
• 400 V												**4**			
• 500 V												**3**			
• 660 V												**7**			
• 690 V												**6**			
60 Hz															
• 460 V												**8**			
Other voltage and/or frequency [1]												**9**			
Construction type															
• IM B3													**0**		
• IM B5													**1**		
• IM V1 (with protective cover)													**4**		
Special version [2]															**Z**

[1] Option: Order code L1Y and plain text.

[2] Specify required version with order code or in plain text as shown in the table on page 6/11.

Selection and ordering data

Options

Additional identification codes for special 1LV9 motor versions

Version	For explanations, see page	Order code and/or plain text
Higher coolant temperatures or site altitude on request	5/9	CT ...°C (round up to 5°) or site altitude ...m above sea level (round up to 500 m) Specify required output
Motor protection by PTC thermistor [1] - With three in-built temperature sensors for warning purposes - With three in-built temperature sensors for shutdown purposes - With six in-built temperature sensors for warning and shutdown purposes	5/3	 **A10** **A11** **A12**
Non-standard cable entry Rotation of terminal box through 180°	5/3	**K85**
Terminal box, side, right Terminal box, side, left	5/3	**K09** **K10**
Second standard shaft extension [2]	5/4	**K16**
Radial seal on DE for flange-mounting motors [3]	5/6	**K17**
Reinforced bearing on DE	5/6	**K20**
Anti-condensation heating - For 230 V - For 115 V	5/8	 **K45** **K46**
Fitted tacho-generator GMP 1.0 s-4; IM B5	5/4	**G37**
Paint finish: - Standard paint finish in colors other than RAL 7030 - Special paint finish in RAL 7030 - Special paint finish in colors other than RAL 7030	5/7	 **Y53** – and additional plain text: Standard paint finish RAL... **K26** **Y54** – and additional plain text: Special paint finish RAL...
Regreasing device	5/6	**K40**
Degree of protection IP55 for motor	5/5	**K49**
Manual brake release	6/3	**K86** Manual brake release 60 Nm **K87** Manual brake release 100 Nm **K88** Manual brake release 250 Nm

Ordering example:

Hoisting gear motor with disk brake	**1LV9**											
Frame size 160 L (10 kW at S3 – 40%)		**166**										
6-pole, 1000 rpm				**6**								
Standard version					**A**							
Braking torque M_B = 250 Nm						**B**						
Operating voltage 380 V 3 AC, 50 Hz							**1**					
Construction type IM B3								**0**				
Identification for special version										**Z**		
Order code for manual brake release 250 Nm												**K88**
This order number uniquely identifies the version of the hoisting gear motor:	**1LV9**	**166**	–	**6**	**A**	**B**	**1**	**0**	–	**Z**		
	K88											

[1] For appropriate tripping unit, see catalog LV1.

[2] For motors as of frame size 180 M in vertical construction types, the transmittable torque needs to be recalculated (please inquire).

[3] Not possible for construction type IM V3.

Three-phase slip ring motors 1LV9 with brake

Dimensional drawings

Binding dimensions

The dimensions specified for the construction types listed on the right are binding for all listed versions.

For motors	Dimensions	Version in accordance with DIN
IM B3	a, b, h, s, w_1, d, l, t, u	42681
IM B5 IM V1	b_1, e_1, i_2, s_2, d, l, t, u	42948

In accordance with DIN 332, sheet 2, all shaft extensions have a centering thread (see table on right):

Shaft extension diameter	Thread
Up to 30 mm	M10
More than 30 up to 38 mm	M12
More than 38 up to 50 mm	M16
More than 50 up to 85 mm	M20

Fits

Flange dimension b_1, shaft extension dimension d, as well as keyway and featherkey dimensions t and u, are as follows:

Dimensions	Measurement	Fit	Version in accordance with DIN
b_1	Up to 230 mm	j6	7160
	Over 230 mm	h6	7160
d	Up to 11 mm	j6	7160
	More than 11 up to 50 mm	k6	7160
	Over 50 mm	m6	7160
t, u		-	6885, sheet 2

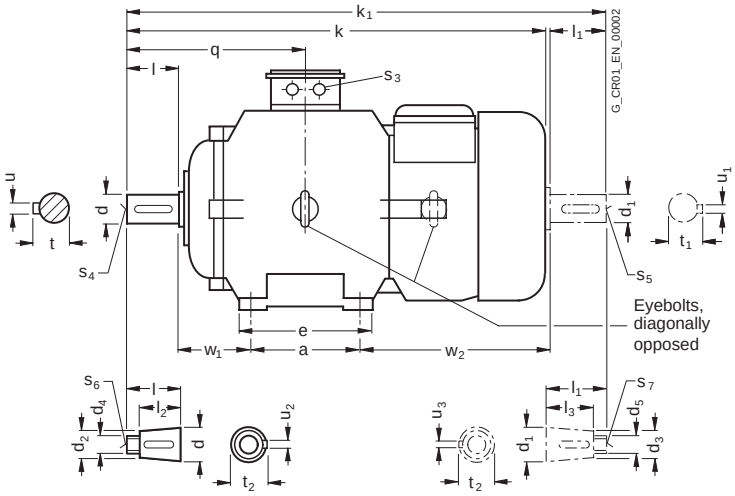
Tolerances

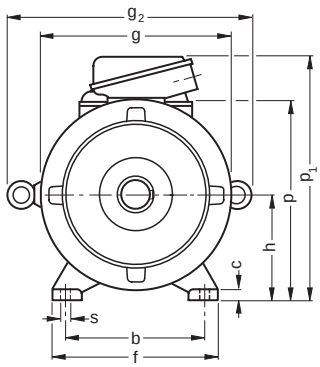
The tolerances for dimensions a, b, c_1 and h as specified on the right must be maintained:

Dimensions		Tolerances mm
a, b	Up to 250 mm	± 0.75
	More than 250 up to 500 mm	± 1.0
	More than 500 up to 700 mm	± 1.5
c_1	Up to 200 mm	± 0.25
	More than 200 up to 500 mm	± 0.5
	Over 500 mm	± 1.0
h	Up to 250 mm	- 0.5
	Over 250 mm	- 1.0

Dimensional drawings

Construction type IM B3





For motor Frame size	Type	DIN IEC	Dimensions to a B	b A	c HA	e BB	f AB	g AC	g_2	h H	k L	k_1 LC	p HB	p_1 HD	q	s [1] K	s_3 K	w_1 C	w_2 CA
100 L	1LV9 107		140	160	14	175	200	195	268	100	583	639	198	273	193	M10	2 x M25 x 1.5	63	326
112 M	1LV9 113		140	190	14	175	235	219	282	112	627.5	683.5	222	297	200	M10	2 x M25 x 1.5	70	364
	1LV9 114																		
132 M	1LV9 133		178	216	18	220	260	260	350	132	727	821	265	327	258	M10	2 x M32 x 1.5	89	394
	1LV9 134																		
	1LV9 135																		
160 M	1LV9 163		210	254	24	264	314	315	422	160	865	975	320	413	232	M12	2 x M40 x 1.5	108	467
160 L	1LV9 166		254			308					909	1019			345				
180 L	1LV9 186		279	279	26	310	350	350	456	180	1015	1155	360	450	370.5	M12	2 x M40 x 1.5	121	535
200 L	1LV9 206		305	318	30	365	400	388	512	200	1046	1186	394	496	395.5	M16	2 x M50 x 1.5	133	573
	1LV9 207																		

For motor			Cyl. shaft extensions DE [3]						Cyl. shaft extensions NDE				
Frame size	Type	DIN IEC	d D [2]	l E [2]	t GA [2]	u F [2]	s_4		d_1 DA [2]	l_1 EA [2]	t_1 GA [2]	u_1 F [2]	s_5
100 L	1LV9 107		28	60	31	8	M10		24	50	27	8	M8
112 M	1LV9 113		28	60	31	8	M10		24	50	27	8	M8
	1LV9 114												
132 M	1LV9 133		38	80	41	10	M12		32	80	35	10	M12
	1LV9 134												
	1LV9 135												
160 M	1LV9 163		42	110	45	12	M16		38	80	41	10	M12
160 L	1LV9 166												
180 L	1LV9 186		48	110	51.5	14	M16		42	110	45	12	M16
200 L	1LV9 206		55	110	59	16	M20		42/48	110	45/51.5	12/14	M16
	1LV9 207												

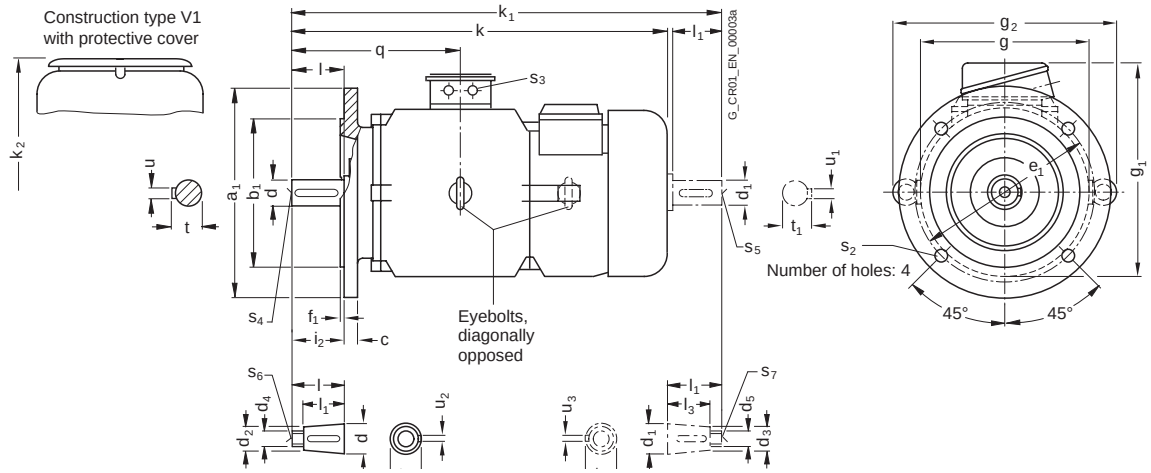
For motor			Conical shaft extensions DE [4]								Conical shaft extension NDE [5]							
Frame size	Type	DIN IEC	d	d_2	d_4	l	l_2	t_2	u_2	s_6	d_1	d_3	d_5	l_1	l_3	t_3	u_3	s_7
180 L	1LV9 186		48	39.8	M30 x 2	110	82	48.9	12	M10								
200 L	1LV9 206		55	46.8	M36 x 3	110	82	56.4	14	M12								
	1LV9 207																	

1) Through-hole for bolt.
2) Designation defined for cylindrical shaft extensions only.
3) Conical shaft extension for frame sizes 100 to 160 (on request).
4) Cylindrical shaft extension for frame sizes 180 and 200 (non-standard).
5) On request.

Three-phase slip ring motors 1LV9 with brake

Dimensional drawings

Construction types IM B5 and IM V1



For motor Frame size	Type	DIN IEC	Dimensions to a_1 B	b_1 A	c_1 LA	e_1 M	f_1 M	s_2 S	g AC	g_1	g_2	i_2 LE	k L	k_1 LC	k_2 [1] LM	q	s_3 K
100 L	1LV9 107		250	180	16	215	4	14	195	271	268	60	583	639	609	193	2 x M25 x 1.5
112 M	1LV9 113		250	180	16	215	4	14	219	295	282	60	628	683.5	654	200	2 x M25 x 1.5
	1LV9 114																
132 M	1LV9 133		300	230	20	265	4	14	260	325	350	80	727	821	757	258	2 x M32 x 1.5
	1LV9 134																
	1LV9 135																
160 M	1LV9 163		350	250	20	300	5	18	315	410	422	110	865	975	900	323	2 x M40 x 1.5
160 L	1LV9 166												909	1019	1048	345	
180 L	1LV9 186		350	250	20	300	5	18	350	445	456	110	1015	1155	1053	370.5	2 x M40 x 1.5
200 L	1LV9 206		400	300	20	350	5	18	388	485	512	110	1091	1231	1131	395.5	2 x M50 x 1.5
	1LV9 207																

For motor Frame size	Type	DIN IEC	Cyl. shaft extensions DE [2] d D [3]	l E [3]	t GA [3]	u F [3]	s_4	Cyl. shaft extensions NDE d_1 DA [3]	l_1 EA [3]	t_1 GA [3]	u_1 F [3]	s_5
100 L	1LV9 107		28	60	31	8	M10	24	50	27	8	M8
112 M	1LV9 113		28	60	31	8	M10	24	50	27	8	M8
	1LV9 114											
132 M	1LV9 133		38	80	41	10	M12	32	80	35	10	M12
	1LV9 134											
	1LV9 135											
160 M	1LV9 163		42	110	45	12	M16	38	80	41	10	M12
160 L	1LV9 166											
180 L	1LV9 186		48	110	51.5	14	M16	42	110	45	12	M16
200 L	1LV9 206		55	110	59	16	M20	42/48	110	45/51.5	12/14	M16
	1LV9 207											

For motor Frame size	Type	DIN IEC	Conical shaft extensions DE [4] d	d_2	d_4	l	l_2	t_2	u_2	s_6	Conical shaft extension NDE [5] d_1	d_3	d_5	l_1	l_3	t_3	u_3	s_7
180 L	1LV9 186		48	39.8	M30 x 2	110	82	48.9	12	M10								
200 L	1LV9 206		55	46.8	M36 x 3	110	82	56.4	14	M12								
	1LV9 207																	

1) Construction type IM V1 with protective cover.
2) Conical shaft extension for frame sizes 100 to 160 (on request).
3) Designation defined for cylindrical shaft extensions only.
4) Cylindrical shaft extension for frame sizes 180 and 200 (non-standard).
5) On request.

Replacement parts

Motor type 1LV9	Order No. Brush holder 1 set = 3 pcs per motor	Carbon brushes 1 set = 6 pcs per motor	Slip ring assembly
107	1LY7 710	1LY8 810	1LY9 910
113 114	1LY7 711	1LY8 811	1LY9 911
133 134 135	1LY7 712	1LY8 812	1LY9 912
163 166	1LY7 713	1LY8 813	1LY9 913
186	1LY7 714	1LY8 814	1LY9 914
206 207	1LY7 715	1LY8 815	1LY9 915

Spring-loaded brake (complete brake)	
Brake with 60 Nm	Type 06.08.210
Brake with 100 Nm	Type 07.08.210
Brake with 250 Nm	Type 09.08.210

Notes

Appendix

7

Siemens Contacts Worldwide

At

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

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

In most cases you can obtain a contact partner for

- Technical Support,
- Spare parts/repairs,
- Service,
- Training,
- Sales or
- Consultation/engineering.

You start by selecting a

- Country,
- Product or
- Sector.

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

A&D in the WWW

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

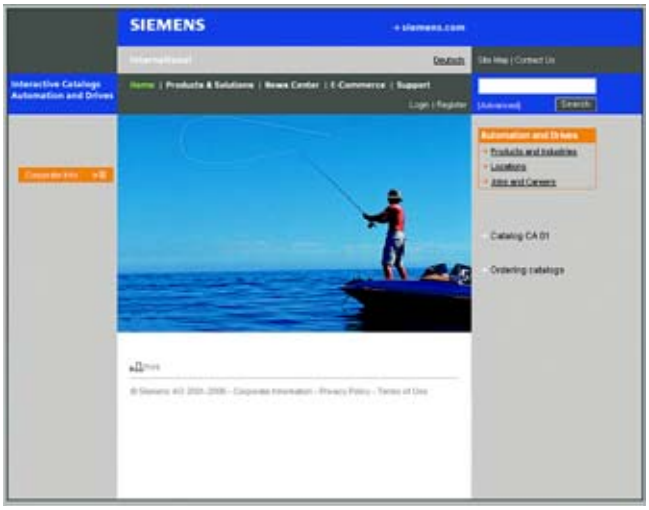
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

http://www.siemens.com/automation

you will find everything you need to know about products, systems and services.

Product Selection Using the Offline Mall of Automation and Drives



Detailed information together with convenient interactive functions:
The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.
All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found in the Internet under

http://www.siemens.com/automation/ca01

or on CD-ROM or DVD.

Easy Shopping with the A&D Mall

The A&D Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online, as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

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

Conditions of sale and delivery
Export regulations

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

For customers with a seat or registered office in Germany

The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

For customers with a seat or registered office outside of Germany

The "General Terms of Payment" as well as the "General Conditions for Supplies of Siemens, Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.
The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products.

An exact explanation of the metal factor and the text of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
  (for customers based in Germany)
- 6ZB5310-0KS53-0BA1
  (for customers based outside Germany)

or download them from the Internet
http://www.siemens.com/automation/mall
(Germany: A&D Mall Online-Help System)

Export regulations

The products listed in this catalog / price list may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog / price list:

AL	Number of the German Export List Products marked other than "N" require an export license. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "AL" not equal to "N" are subject to a European or German export authorization when being exported out of the EU.
ECCN	Export Control Classification Number Products marked other than "N" are subject to a reexport license to specific countries. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "ECCN" not equal to "N" are subject to a US re-export authorization.

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_ohne MZ/En 05.09.06

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

Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

	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
SIMOVERT PM Modular Converter Systems	DA 45
SIEMOSYN Motors	DA 48
MICROMASTER 410/420/430/440 Inverters	DA 51.2
MICROMASTER 411/COMBIMASTER 411	DA 51.3
SIMOVERT MASTERDRIVES Vector Control	DA 65.10
SIMOVERT MASTERDRIVES Motion Control	DA 65.11
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3
SIMODRIVE 611 universal and POSMO	DA 65.4
Low-Voltage Three-Phase-Motors	
IEC Squirrel-Cage Motors	D 81.1
Automation Systems for Machine Tools SIMODRIVE	NC 60
• Main Spindle/Feed Motors	
• Converter Systems SIMODRIVE 611/POSMO	
Automation Systems for Machine Tools SINAMICS	NC 61
• Main Spindle/Feed Motors	
• Drive System SINAMICS S120	
Drive and Control Components for Hoisting Equipment	HE 1
Electrical Installation Technology	
PDF: ALPHA Small Distribution Boards and Distribution Boards, Terminal Blocks	*ET A1*
PDF: ALPHA 8HP Molded-Plastic Distribution System	*ET A3*
BETA Low-Voltage Circuit Protection	ET B1
PDF: DELTA Switches and Socket Outlets	*ET D1*
GAMMA Building Controls	ET G1
Human Machine Interface Systems SIMATIC HMI	ST 80

	Catalog
Industrial Communication for Automation and Drives	IK PI
Low-Voltage	
Controls and Distribution – SIRIUS, SENTRON, SIVACON	LV 1
Controls and Distribution – Technical Information SIRIUS, SENTRON, SIVACON	LV 1 T
SIDAC Reactors and Filters	LV 60
SIVENT Fans	LV 65
SIVACON 8PS Busbar Trunking Systems	LV 70
Motion Control System SIMOTION	PM 10
Process Instrumentation and Analytics	
Field Instruments for Process Automation Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters	FI 01
PDF: Indicators for panel mounting	*MP 12*
SIREC Recorders and Accessories	MP 20
SIPART, Controllers and Software	MP 31
SIWAREX Weighing Systems	WT 01
Continuous Weighing and Process Protection	WT 02
Process Analytical Instruments	PA 01
PDF: Process Analytics, Components for the System Integration	*PA 11*
SIMATIC Industrial Automation Systems	
SIMATIC PCS Process Control System	ST 45
Products for Totally Integrated Automation and Micro Automation	ST 70
SIMATIC PCS 7 Process Control System	ST PCS 7
Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7.1
Migration solutions with the SIMATIC PCS 7 Process Control System	ST PCS 7.2
pc-based Automation	ST PC
SIMATIC Control Systems	ST DA
SIMATIC Sensors	FS 10
SIPOS Electric Actuators	
Electric Rotary, Linear and Part-turn Actuators	MP 35
Electric Rotary Actuators for Nuclear Plants	MP 35.1/.2
Systems Engineering	
Power supplies SITOP power	KT 10.1
System cabling SIMATIC TOP connect	KT 10.2
System Solutions	
Applications and Products for Industry are part of the interactive catalog CA 01	
TELEPERM M Process Control System	
PDF: AS 488/TM automation systems	*PLT 112*

PDF: These catalogs are only available as pdf files.

Token fee: 2.00 €/2.00 $ | Subject to change without prior notice | Dispo 18401 | KG 0107 1.0 E 132 En / 722148 | Printed in Germany | © Siemens AG 2006

www.siemens.com/cranes

Siemens AG

Automation and Drives
Motion Control Systems
Postfach 31 80
91050 Erlangen
GERMANY

www.siemens.com/automation

Order No. E86060-K1300-A111-A1-7600