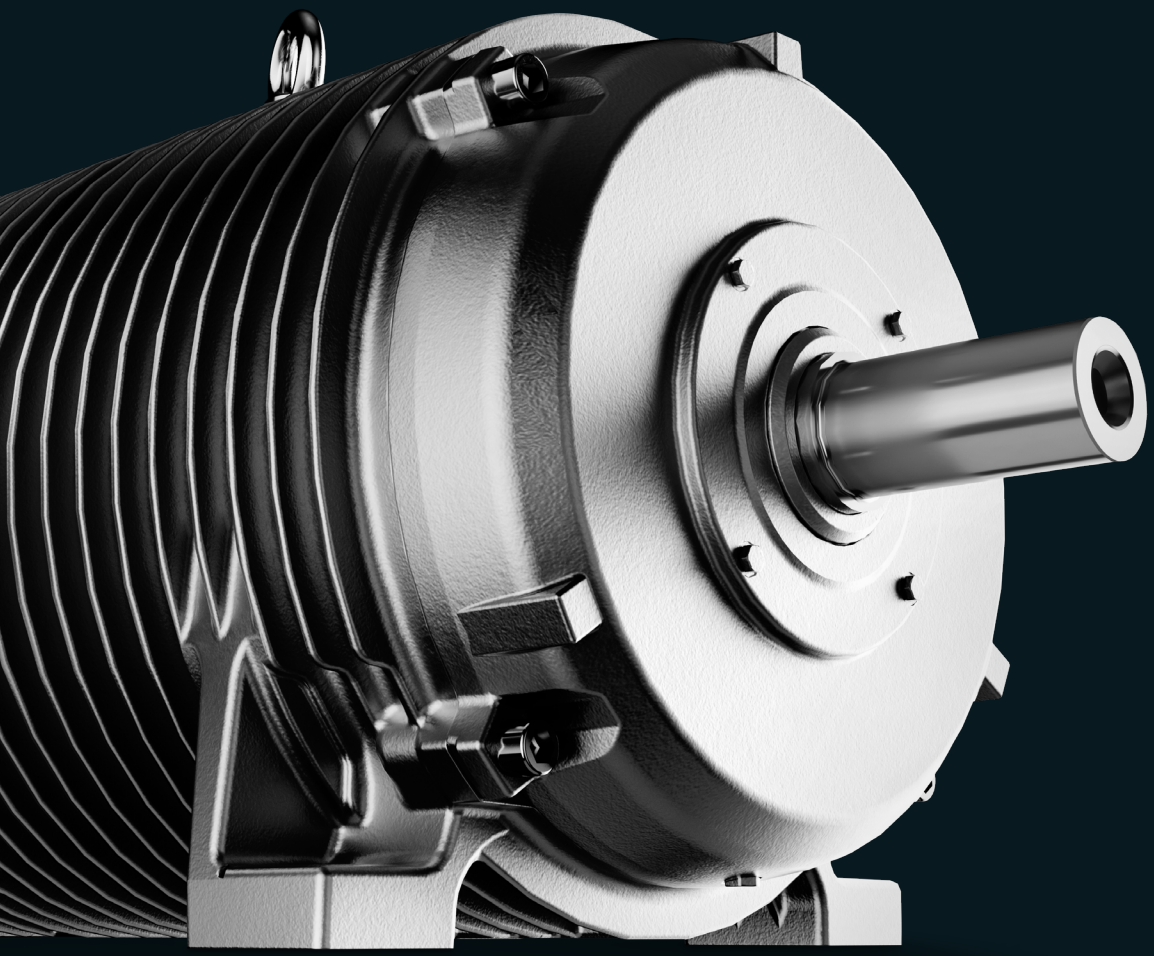
INNOMOTICS



Catalog ME 81 | Edition 04/2024

Innomotics Moves!

Application Specific Motors DP

1PC14
Steel Plant Motors
Roller Table Motors

innomotics.com/low-voltage-motors

Steel plant- and roller table motors

Refer to the Industry Mall for current updates of this catalog:
www.siemens.com/industrymall

Please contact your local Siemens branch.

The Siemens Businesses **Large Drives Applications** and **Low Voltage Motors** have been transferred to **Innomotics**. The brand change from Siemens to Innomotics is ongoing.

Siemens' or Innomotics' legal information, trademarks or logos contained in product related documents **do not necessarily represent the actual branding** used for the products. Any technical product information remains valid **independently of the brand.**

Orders received as of **August 1, 2024**, will be confirmed exclusively with the product mark **"Innomotics"** regarding the concerned products and services.

Independent of the order date, all ordered products or services with **delivery** dates from **April 1, 2025**, will be delivered with the product mark "Innomotics".

INNOMOTICS

A Siemens Business

Applicable standards, regulations and certificates

Applicable standards and regulations

1PC14 motors are in compliance with the series of international IEC 60034 product standards for rotating electrical machines, especially the parts of the following table.

Title	IEC/EN	DIN EN
General regulations, rotating electrical machinery	IEC 60034-1, IEC 60085	DIN EN 60034-1
Determining the losses and efficiency of rotating electrical machinery	IEC 60034-2-1	DIN EN 60034-2-1
Three-phase induction motors for general use with standardized dimensions and power ratings	IEC 60072 *) only mounting dimensions and power series (no frame size - power assignment)	DIN EN 50347 *) Mounting dimensions acc. to IEC 60072 and power assignment for Europe
Starting characteristics, rotating electrical machines	IEC 60034-12	DIN EN 60034-12
Connection designations and direction of rotation, rotating electrical machines	IEC 60034-8	DIN EN 60034-8
Designation for types of construction, mounting and terminal box position (IM code)	IEC 60034-7	DIN EN 60034-7
Introduction into the terminal box	–	DIN 42925
Integrated thermal protection	IEC 60034-11	DIN EN 60034-11
Noise limit values, rotating electrical machines	IEC 60034-9	DIN EN 60034-9
IEC standard voltages	IEC 60038	DIN IEC 60038
Cooling methods, rotating electrical machines (IC code)	IEC 60034-6	DIN EN 60034-6
Mechanical vibration, rotating electrical machines	IEC 60034-14	DIN EN 60034-14
Vibration limits	–	DIN ISO 10816
Degrees of protection, rotating electrical machines (IP code)	IEC 60034-5	DIN EN 60034-5
International efficiency classes, rotating electrical machines (IE code)	IEC 60034-30-1	DIN EN 60034-30

Tolerances of the electrical data

The following tolerances are permitted, according to DIN EN 60034:
For motors according to DIN EN 60034-1, a voltage tolerance of ±5 % applies and a frequency tolerance of ±2 % (range A); if they are utilized, then the permissible temperature limit of the temperature class may be exceeded by 10 K.

Efficiency η at
$P_N \leq 150$ kW: $-0.15 \cdot (1 - \eta)$
$P_N > 150$ kW: $-0.1 \cdot (1 - \eta)$

Where η is entered as decimal number.

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

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

Slip ±20 % (permissible for motors < 1 kW ±30 %)
Starting (inrush) current +20 %
Starting torque –15 % to +25 %
Stall torque –10 %
Moment of inertia ±10 %

Certifications

For product certifications, a distinction should be made between safety-relevant certificates and efficiency certificates.
In the European Union, comprehensive legislation has been signed off with the objective of reducing energy consumption and in turn reducing CO_2 emissions. Energy consumption and/or the efficiency of induction motors in industrial environments are handled in EU Regulations 640/209 and 2019/1781. This regulation must be applied in all countries of the European Economic Area up to June 30, 2021.
The new (EU)2019/1781 Regulation comes into force effective July 1, 2021. The essential content as well as exceptions of both regulations are explained in the following.

For additional information on globally applicable standards and legislation, see:
www.siemens.com/international-efficiency

Energy-saving motors for the European Economic Area according to EU Regulation 640/2009
Exceptions
- Motors that have been designed to be operated, completely immersed in liquid;
- Motors completely integrated in a product (e.g. a gearbox, a pump, a fan or a compressor), whose energy efficiency cannot be determined independent of this product;
- Motors that have been specifically designed for operation under the following conditions:
  - At altitudes exceeding 4000 meters above sea level;
  - At ambient temperatures above 60 °C;
  - At highest operating temperatures above 400 °C;
  - At ambient temperatures below –30 °C
  - For cooling liquid temperatures at the intake of a product below 0 °C or above 32 °C;
- Brake motors
- Completely enclosed non-ventilated motors (TENV motors)
- Total Enclosed Air Over (TEAO) motors

The following are not affected:
- Pole changing motors
- Synchronous motors
- Motors for periodic duty S2 to S9
- Single-phase motors
- Motors specifically developed for converter operation according to IEC 60034-25

The following changes came/come into force on these dates:

Since January 1, 2015:

Compliance with the legally mandated minimum efficiencies IE3 for power ratings from 7.5 to 375 kW (2-, 4-, 6-pole) or as Alternative, IE2 motor plus frequency converter.

Since January 1, 2017:

Compliance with the legally mandated minimum efficiencies IE3 for power ratings from 0. 75 to 375 kW (2-, 4-, 6-pole) or as Alternative, IE2 motor plus frequency converter.

From July 1, 2021:

Compliance with the legally mandated minimum efficiencies IE2 for power ratings from 0.12 to 0.75 kW (2-, 4-, 6- and 8-pole)
Compliance with the legally mandated minimum efficiencies IE3 for power ratings from 0.75 to 1000 kW (2-, 4-, 6- and 8-pole).

From July 1, 2023:

Compliance with the legally mandated minimum efficiencies IE4 for power ratings with a minimum of 75 kW and a maximum of 200 kW (2-, 4-, 6-pole).

Applicable standards, regulations and certificates

Exceptions
- Motors that have been designed to be operated, completely immersed in a liquid;
- Motors completely integrated in a product (e.g. a gearbox, a pump, a fan or a compressor), whose energy efficiency cannot be determined independent of this product
- Motors that have been specifically designed for operation under the following conditions:
  - At altitudes exceeding 4000 meters above sea level
  - At ambient temperatures above 60 °C
  - At the highest operating temperatures above 400 °C
  - At ambient temperatures below –30 °C
  - For cooling liquid temperatures at the intake of a product below 0 °C or above 32 °C
  - In hazardous zones in the sense of directive 2014/34/EU of the European Parliament and the European Council, which have been designed and certified for underground mining systems
  - Motors with integrated brake, which is an integral component of the inner motor design, and which can neither be removed nor supplied from a separate current source while the motor efficiency is being checked
  - Motors with an integrated speed control (compact drives) whose energy efficiency cannot be checked independent of the closed-loop speed control
  - Completely enclosed non-ventilated motors (TENV motors)

The following are not affected:
- Pole changing motors
- Synchronous motors
- Motors for periodic duty S2 to S9, (S3 and S6 ≤ 80%)
- Motors specifically developed for converter operation according to IEC 60034-25

When operated with a converter, possible restrictions according to the technical documentation must be taken into account!
When operated with a converter, the following recommendations always apply:
- Motor temperature sensing using an integrated temperature sensor
- Insulated bearings from frame size 225

Note:
Other minimum efficiency requirements exist in China, Korea and Australia. Requirements in other countries are being drawn up.

Energy-saving motors for the North American economic region according to EISA legislation

Since June 1, 2016, modified conditions apply according to the EISA legislation (Energy).
After this date, all motors must comply with the requirements as laid down in NEMA MG1 Table 12-12 (NPE = NEMA Premium Efficiency).
Motors, where previously EPAct legislation was applicable, must therefore comply with NPE from this date onwards. The NPE requirements apply to motors with the following characteristic data/application conditions:

- Line voltage ≤ 600 V
- Line frequency 60 Hz
- Power range, 1 HP to 500 HP
- Number of poles: 2-, 4-, 6-, 8-pole and geared motors
- Continuous duty S1 (in this case: 1PC1433)

Exceptions from the efficiency requirements according to EISA:

- Brake motors
- Converter motors

Note:

Option: Version according to UL with "Recognition Mark"
Order code **D31**:

This option can be ordered for 1PC1433 steel plant motors are not subject to EISA regulations (e.g. for deployment outside North America).

*) Observe possibly deviating dimensions for the distance between mounting feet B, see the dimension drawings

Windings and insulation

DURIGNIT IR 2000 insulation

The DURIGNIT IR 2000 insulation system comprises high-quality enameled wires and insulating sheet materials in conjunction with a temperature-resistant resin impregnation. It guarantees a high mechanical and electrical strength as well as high serviceability and a long motor service life. To a great extent, the insulation protects the winding against the influence of aggressive gases, vapors, dusts, oil and increased levels of humidity, and can withstand the usual vibration stresses that occur. The insulation is suitable for an absolute humidity up to 30 g water per m^3 air. Moisture condensation should be prevented from forming on the winding. Options **N30** and **N31** are available for higher values – see Page order code .

An inquiry must be submitted for extreme applications.

Restart with residual field and phase opposition

All motors are capable of restarting against 100 % residual field after power failure.

Winding and insulation design referred to the temperature class

All motors have temperature class 155 (F) as standard.

Motor protection

The motor protection order versions are coded at the 15th position of the Article number using letters and possibly supplemented by order codes.

As standard, 1PC1433 motors for line operation are not equipped with PTC thermistors; however, this is optionally possible
15th position of the Article No., letter **A**

1PC1443 and 1PC1463 motor types specifically for converter operation have as standard PTC thermistors for alarm and shutdown point.

15th position of the Article No., letter **C**

Alternative temperature sensing with one (letter **F**) or two KTY84-130 (letter **G**) (the PTC thermistors are then no longer applicable).

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

The following applies to all motors:

The motors are capable of handling 150 percent of the rated current at the rated voltage and rated frequency for two minutes (DIN EN 60034).

Current-dependent protective devices

Conventional fuses are only used to protect the line feeder cables in the case of a short-circuit. They are not suitable as overload protection for the motors.

Normally, motors are protected using thermally delayed overload protection (circuit breaker for motor protection or overload relay).

This protection is dependent on the current and is especially effective when the rotor is blocked.

Motor protection circuit breakers provide adequate protection for normal operation with short starting operations with starting (inrush) currents that are not too high and for a low number of starts per unit time. Motor protection circuit breakers are not suitable for heavy duty starting and for a high number of starts per unit time. As a result of differences in the thermal time constant of the protective device and the motor, unnecessary trips (nuisance trips) occur when the circuit breaker is set to the rated current.

Motor temperature-dependent protective devices and motor temperature sensing for converter operation

To shut down the motor before it overheats and to monitor the winding and/or motor temperature, depending on the specific requirement, various components can be integrated in the motor winding.

PTC thermistor - thermistor motor protection

PTC temperature sensors provide the most comprehensive protection against thermal motor overload. Any increase in the winding temperature above the permissible value can be precisely detected as a result of the low thermal capacity of these PDC thermistors (positive temperature coefficient) and the good thermal contact with the winding. The PTC resistance changes suddenly (step function) when the temperature limit is reached (rated response temperature). Tripping devices are used to evaluate the PTC thermistors and can be used to open auxiliary circuits. The PTC temperature sensors themselves are not capable of handling high currents and voltages. This would destroy the semiconductor. The switching hysteresis of PTC thermistors and tripping devices is low, which allows the drive to be quickly switched on again. This type of motor protection is recommended for motors with heavy-duty starting, periodic duty, load levels that vary significantly, high ambient temperatures and for fluctuating line supply voltages.

Motor protection using PTC thermistors for shutdown. 2 auxiliary terminals are required in the terminal box.

15th position of the Article No., letter **B**

Two temperature sensor circuits are installed if an alarm is required in addition to shutting down the motor. Normally, the alarm is issued 10 K below the shutdown temperature.

Motor protection using PTC thermistors for alarm and shutdown. Four auxiliary terminals are required in the terminal box.

15th position of the Article No., letter **C**

To achieve full thermal protection, a thermally delayed overcurrent trip must be combined with a PTC temperature sensor. Full motor protection solely using PTC thermistors is available on request.

KTY 84-130 temperature sensor

This temperature sensor is a semiconductor, whose resistance changes depending on the temperature according to a defined characteristic. However, in the measuring range, the KTY 84-130 has an almost linear, increasing characteristic.

In the same way as the components mentioned above, the temperature sensor is embedded in the motor winding overhang. It sets itself apart as a result of its excellent accuracy, high degree of reliability, temperature stability and fast response time. As a result of these properties, which facilitate an almost continuous monitoring of the winding temperature, the KTY 84-130 is the preferred solution for converter operation.

Motor temperature sensing using the integrated KTY 84-130 temperature sensor. 2 auxiliary terminals are required in the terminal box.

15th position of the Article No., letter **F**

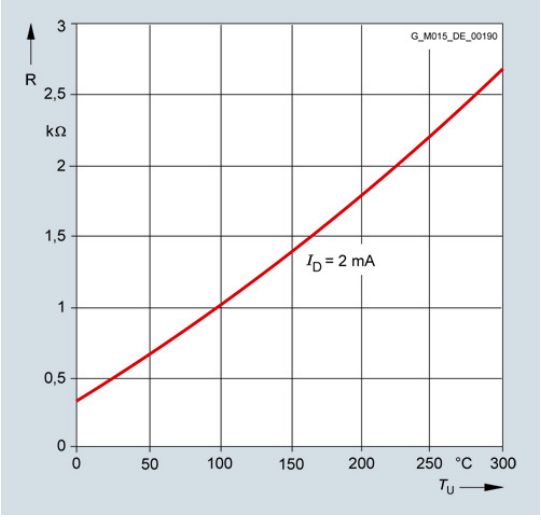
Motor temperature sensing using two integrated KTY 84-130 temperature sensors. 4 auxiliary terminals are required in the terminal box.

15th position of the Article No., letter **G**

For Siemens converters, which determine the motor temperature using the measurement principle described above, the temperatures required for alarm and shutdown can be set. For these devices, the measuring signal is directly evaluated in the converter itself.

For line operation, the 3RS10 temperature monitoring unit associated with the protective device can be ordered separately. Details on this are provided in Catalog IC 10,
Article No.: E86060-K1010-A101-A6.

KTY 84-130 temperature sensor characteristic



Pt100/Pt1000 resistance thermometer

For resistance thermometers, in the same way as the electronic components mentioned above, the temperature dependency of the electrical resistance of conductors is utilized to measure the temperature.

Pure metals manifest more significant changes to the resistance than alloys and have relatively constant temperature coefficients.

As temperature sensor, the Pt100 has a platinum wire winding, where the resistance changes with temperature according to a reproducible basic value series. Changes in the resistance are converted into current changes. The measuring resistors have a bifilar winding and are calibrated at 0 °C for 100 Ω ± 0 Ω. The basic values of the resistors (i.e. the dependency of the resistance on the temperature) as well as permissible deviations are laid down in DIN EN 60751.

Integration of 3 resistance thermometers (Pt100).

15th position of the Article No., letter **H**

Motor temperature sensing with 6 resistance thermometers Pt100. 12 auxiliary terminals are required in the terminal box.

15th position of the Article No., letter **J**

Motor temperature sensing using an integrated Pt1000 resistance thermometer. 2 auxiliary terminals are required in the terminal box.

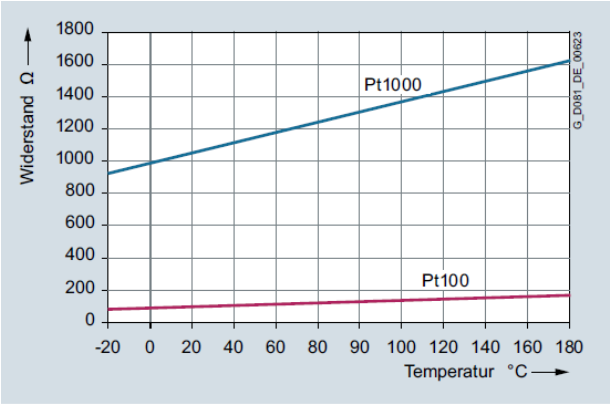
15th Position of the Article No., letter **K**

For Siemens converters, which determine the motor temperature using the measurement principle described above, the temperatures required for alarm and shutdown can be set. For these devices, the measuring signal is directly evaluated in the converter itself.

For line operation, the 3RS10 temperature monitoring relay associated with the protective device can be ordered separately.

For details on this, see Catalog IC 10, Article No.: E86060-K1010-A101-A7.

Pt100/Pt1000 resistance thermometer characteristic



Steelworks overview

In steel rolling mills and other metal processing domains different electrical requirements prevail, but also high mechanical requirements.
The analysis of plant/system-specific requirements can be subdivided into two areas.
On one hand, extremely hot areas subject to high loads and stress with typical reversing operation. **Roller table motors** should be used in these areas. Transport roller operations and working roller operations in rolling mills, close to rolling stands are in the meantime equipped with directly driven reversing rolls.

On the other hand, the downstream applications, slab feed, cooling section, post warming furnaces, straightening/leveling machines and shear lines, where the mechanical loads and stresses are significantly lower. The new **steel plant motors** from Siemens precisely address these applications. They are available for pure line operation (DOL) in efficiency class IE3, and also as optimized versions for pure converter operation (VSD).
The preselection as to whether steel plant or roller table motor must be made by the customer (orderer) depending on the prevailing load variables.

The approximate possible continuous vibration, the type and magnitude of shock as well as dirt and reversing requirements are also of significance when it comes to mechanically and electrically selecting and dimensioning the motors for a specific project.

The application defines the product

Steel plant motors have been specifically designed for use in metal production environments where there is a high level of load and stress in the form of vibration and shock. Their primary applications include transporting steel and aluminum as well as moving semi-finished products to cooling or heating systems or to metal sheet and foil coilers.

Roller table motors from Siemens with their ring rib design should be used for reversing rolling operation in the "hot area", close to rolling stands, where they are exposed to significant levels of dirt and extreme continuous vibration combined with continuous shock and impact.

Roller table motor application

Roller table motor application

Roller table motor application

Steel plant motor application

In the "hot area" with continuous vibration, powerful shocks and high levels of pollution

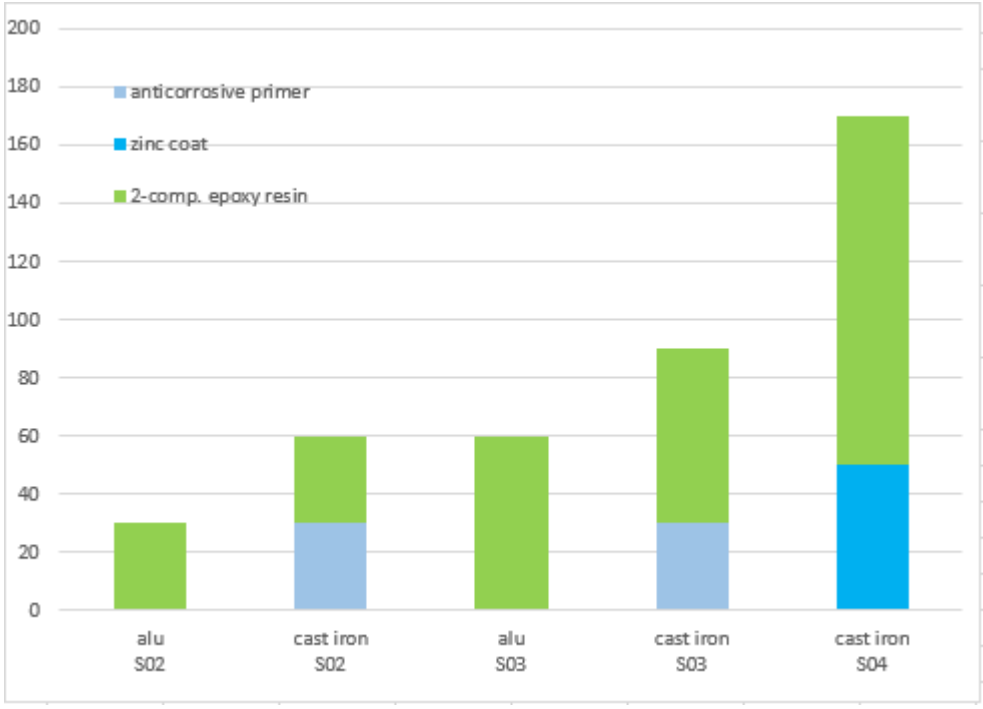
Applications in a typical steel plant

Area		Drive solutions
1	Slab furnace feed and reheating furnace	Steel plant motors
2	Descaling and slab transport	Steel plant motors
3	Roughing stand with edger	Roller-table motors
4	Finishing stand	Roller-table motors
5	Cooling line	Steel plant motors
6	Hot/cold straightening machine	Steel plant motors
7	Cooling table	SIMOTICS SD motors
8	Slitting line and adjustment	Steel plant motors

Colors and paint finish

High quality coating systems are available in various colors to protect drives against corrosion and external effects.

Additional ordering data **-Z** with order code				
S02 [5] **Normal steel plant paint finish 1PC1433; 1443; 1463**	**S03** [5] [6] **Normal roller table paint finish 1PC1423**	**S04** [5]	**S05**	**S06**
Paint finish, suitability of the paint finish for climatic group according to DIN IEC 60721-2-1				
Special paint finish C3	Special paint finish "Resistant to sea air" C4	Special paint finish "Offshore" C5	Paint finish inside the motor all bare internal parts primed with a rust-proofing paint [1]	Polyurethane-based topcoat, can only be ordered with **S03** or **S04**
Purpose				
				
Worldwide (global) for outdoor installation with direct solar radiation and/or the effects of the weather.	Recommended for indoor and outdoor installations with direct exposure to industrial climates with moderate SO_2 levels, VIK requirements, marine climates close to the coast; however, not offshore marine climates, e.g. for crane drives and in the paper industry.	Recommended for outdoor installations and the direct exposure to industrial climates with moderate SO_2 levels and offshore marine climates, e.g. for crane drives.	When requested, motors can be supplied with a paint finish inside the motor. Recommended where there is a risk of high levels of condensation	Direct solar radiation (UV light) can change the color. If color stability is specified, a polyurethane-based painting system as topcoat is recommended (RAL 7030). An inquiry is required for other colors.
Test requirements according to DIN EN ISO 12944-2 corrosivity category				
C3 "Low" durability	C4 "Low" durability	C5 "Low" durability	–	–
Also complies with requirements relating to categories				
C2 "medium"	C2 "high" C3 "medium"	C3 "high" C4 "medium"	–	–
Total coating thickness – nominal coating thickness in µm [2] [3]				
60 / 90	120 / 150	170	230	400



Colors and paint finish

Other available options	
S05 [1]	**Paint finish inside the motor**, all bare internal parts primed with a rust-proofing paint [1] When requested, motors can be supplied with a paint finish inside the motor. Recommended where there is a risk of high levels of condensation
S06 [5] [6] [7]	**Polyurethane-based topcoat**, can only be ordered with **S03, S04** or **S08** (provided as standard with **S09**) Direct solar radiation (UV light) can change the color. If color stability is specified, a polyurethane-based painting system as topcoat is recommended (RAL 7030). An inquiry is required for other colors.
Topcoat colors	
Normal version	RAL 7030 (stone grey)
Available colors	Deviating standard and special RAL colors, as well as non-standard colors should be ordered using order codes **Y53, Y56** or **Y66** with the required RAL number specified in plain text (or another number, if not RAL) (For a selection of the available numbers/colors, see the tables for order codes **Y53, Y56** and **Y66** on the next page). **S06** is only available in standard 7030
Treating bare surfaces of shaft extensions and flanges	
	With anticorrosion agents that displace water and hand perspiration

Motors in frame sizes 400 – in this case, the painting system process differs

S02	**S03** [4] [5]	**S04** [4]	**S05**	**S06**
Paint finish, suitability of the paint finish for climatic group according to DIN IEC 60721-2-1 (frame sizes 400)				
Special paint finish C3	Special paint finish "Resistant to sea air" C4	Special paint finish "Offshore" C5	–	–
Hydro 2-component polyurethane	Hydro 2-component polyurethane	Hydro 2-component polyurethane	–	–
Test requirements according to DIN EN ISO 12944-2 corrosivity category (frame sizes 400)				
C3 "Medium" durability	C4 "Medium" durability	C5 "Medium" durability	–	–
Total coating thickness – nominal coating thickness in µm [2] [3] **(frame sizes 400)**				
180	240	320	–	Coating thickness same as **S03/S04**

Note:
Bare parts have an anti-corrosion coating with limited service life for transport.

1) Machined rotor laminated core, shaft, inner diameter, cast-iron enclosure. Inner surfaces of the cast iron shields.
2) Total coating thickness:
- The coating thicknesses listed are average values of the exterior motor surfaces
- Coating thicknesses on inaccessible surfaces can differ (depressions, bases of ribs)

3) For thicker paint coatings, the paint coat can be electrostatically charged. This can result in electrostatic discharge. There is a risk of explosion if explosive mixtures are present at this instant. This can result in death, severe injury and material damage. If painted surfaces must be repainted, then one of the following requirements must be complied with:
- Limit the total coating thickness corresponding to the relevant explosion group:
  - IIA, IIB: Total coating thickness ≤ 2 mm
  - IIC: Total coating thickness ≤ 2 mm for motors belonging to Group II (gas)
- Limit the surface resistance of the paint used:
  - Surface resistance ≤ 1GΩ for motors belonging to Groups II and III (gas and dust)
- Limit the charge transfer:
  - 60 nC for equipment belonging to Group I or IIA
  - 25 nC for equipment belonging to Group IIB
  - 10 nC for equipment belonging to Group IIC
  - 200 nC for equipment belonging to Group III
- Breakdown voltage ≤ 4 kV for explosion Group III (dust)

  Note:
  Optional paint finishes for IIC with more than 200 µm coat thickness are available. Paint finishes with more than 200 µm are checked regarding electrostatic charging. Motors with a paint thickness exceeding 200 µm may only be painted over if the conditions mentioned above are strictly complied with.

4) Aluminum motors with cast iron parts (e.g. DE bearing shield) have a coating of primer > 30 µm on cast iron parts.
5) For Innomotics XP cast iron motors that are suitable for operation in dust Ex zones (Zones 21/22), for conductive paints there are restrictions regarding the colors that are available.
6) For Innomotics XP aluminum motors that are suitable for operation in dust Ex zones (Zones 21/22), for conductive paints there are restrictions regarding the colors that are available.
7) Conductive paints with colors, see Page 1/10.

Overview

Paint finish in other standard RAL colors – Order code Y53 (The RAL number must be specified in plain text)

RAL No.	Color name	RAL No.	Color name
1015	Light ivory	7011	Iron grey
3000	Flame red	7016	Anthracite grey
5002	Ultramarine blue	7031	Blue grey
5009	Azure blue	7032	Pebble grey
5010	Gentian blue	7035	Light grey
5012	Light blue	7037	Dusty grey
5015	Sky blue	8012	Red brown
6011	Reseda green	9005	Jet black
7001	Silver grey	9010	Pure white

Paint finish in special RAL colors – Order code Y56 (The RAL number must be specified in plain text)

RAL No.	Color name	RAL No.	Color name
1013	Oyster white	6020	Chrome green
2004	Pure orange	6021	Pale green
3002	Carmine red	6032	Signal green
3012	Beige red	7005	Mouse grey
3020	Traffic red	7012	Basalt grey
5000	Violet blue	7021	Black grey
5003	Sapphire blue	7022	Umbra grey
5005	Signal blue	7024	Graphite grey
5007	Brilliant blue	7038	Agate grey
5014	Pigeon blue	7042	Traffic grey A
5017	Traffic blue	7045	Telegrey 1
5018	Turquoise blue	9001	Cream
5019	Capri blue	9002	Grey white
5021	Water blue	9003	Signal white
5024	Pastel blue	9006	White aluminum
6000	Patina green	9007	Grey aluminum
6002	Leaf green	9016	Traffic white
6010	Grass green	9018	Papyrus white
6018	Yellow green	9023	Pearl dark grey

Paint finish in non-standard RAL colors – Order code Y66 – infrequently ordered RAL colors, colors with weak coverage, non-RAL colors (The color must be specified in plain text)

RAL No.	Color name	RAL No.	Color name
1001	Beige	1014	Ivory
1002	Sand yellow	1018	Zinc yellow
1003	Signal yellow	1019	Grey beige
1004	Golden yellow	1021	Rape yellow
1005	Honey yellow	1023	Traffic yellow
1006	Maize yellow	1028	Melon yellow
1007	Daffodil yellow	1033	Dahlia yellow
1011	Brown beige	1036	Pearl gold
1012	Lemon yellow	2000	Yellow orange

Continuation, see the right-hand column

Paint finish in non-standard RAL colors – Order code Y66 – infrequently ordered RAL colors, colors with weak coverage, non-RAL colors (The color must be specified in plain text)

RAL No.	Color name	RAL No.	Color name
1001	Beige	6016	Turquoise green
1002	Sand yellow	6017	May green
1003	Signal yellow	6019	Pastel green
1004	Golden yellow	6024	Traffic green
1005	Honey yellow	6025	Fern green
1006	Maize yellow	6026	Opal green
1007	Daffodil yellow	6027	Light green
1011	Brown beige	6029	Mint green
1012	Lemon yellow	6033	Mint turquoise
2001	Red orange	6034	Pastel turquoise
1014	Ivory	7000	Squirrel grey
1018	Zinc yellow	7004	Signal grey
1019	Grey beige	7009	Green grey
1021	Rape yellow	7010	Tarpaulin grey
1023	Traffic yellow	7013	Brown grey
1028	Melon yellow	7015	Slate grey
1033	Dahlia yellow	7023	Concrete grey
1036	Pearl gold	7026	Granite grey
2000	Yellow orange	7033	Cement grey
2002	Vermilion	7034	Yellow grey
2003	Pastel orange	7036	Platinum grey
2008	Bright red orange	7039	Quartz grey
2009	Traffic orange	7040	Window grey
2010	Signal orange	7043	Traffic grey B
2011	Deep orange	7044	Silk grey
2012	Salmon orange	7046	Telegrey 2
3001	Signal red	7047	Telegrey 4
3003	Ruby red	7048	Pearl mouse grey
3004	Purple red	8001	Ochre brown
3005	Wine red	8002	Signal brown
3007	Black red	8003	Clay brown
3011	Brown red	8008	Olive brown
3013	Tomato red	9004	Signal black
3015	Light pink	9011	Graphite black
3016	Coral red	9017	Traffic black
4005	Blue lilac	AS2700_N52	
4006	Traffic purple	BS06_C39	
5001	Green blue	BS381C_637	
5011	Steel blue	BS381C_355	
5013	Cobalt blue	BS4800_00E55	
5020	Ocean blue	BS4800_06E51	
5022	Night blue	BS4800_14E53	
5023	Distant blue	MAERSK 30070	
6001	Emerald green	MUN10B6/6	
6003	Olive green	MUN10GY8/4	
6004	Blue green	MUN10R5/16	
6005	Moss green	MUN7,5BG7/2	
6007	Bottle green	NCS_S1000_N	
6009	Fir green	NCS_S_1502_B	
6012	Black green	NCS_S7500_N	
6013	Reed green	PROROT	

Paint structures and colors not listed in the catalog are available on request.

Accessories

Couplings

The Siemens motor is connected to the driven machine or gearbox through a coupling. Siemens is a well-known coupling manufacturer with a broad product portfolio.

For standard applications, Siemens recommends elastic couplings, types N-EUPEX and RUPEX - or torsionally stiff couplings, types ARPEX and ZAPEX. FLUDEX and ELPEX-S couplings are recommended for special applications.

Source:

Siemens contact person – Ordering according to Catalog Siemens MD 10.1 "FLENDER standard couplings"

or

SIEMENS AG
Kupplungswerk Mussum
Industriepark Bocholt
Schlavenhorst 100
46395 Bocholt
Tel. +49 2871 922185
Fax +49 2871 922579

www.siemens.com
Email: flendercouplings@siemens.com

Taper pins according to DIN 258 with threaded journals and constant taper lengths

Taper pins are used for parts that are repeatedly released and removed. Using a taper reamer, a tapered hole is machined until the pin can be pressed in by hand so that the pin projects approx. 3 to 4 mm above the edge of the hole.

A hammer is then used to drive the pin into the correct position. The pin is removed from the hole by screwing on and tightening the nut.

Standard taper pins are available in specialist stores.

Source, e.g.:

Otto Roth GmbH & Co. KG
Rutesheimer Strasse 22
70499 Stuttgart
Tel. +49 711 1388-0
Fax. +49 711 1388-233

www.ottoroth.de
Email: info@ottoroth.de

Foundation blocks according to DIN 799

Foundation blocks are inserted in the stone foundation and cast in concrete. They are used to mount average-sized motors, clamping rails, pedestal bearings, base frames etc. After removing the mounting screws, motors can be shifted as required, without having to lift them.

When mounted for the first time, the foundation blocks - with taper pins - bolted to the motor (without shims), are first cast after the motor has been completely aligned. In this case, the motor is lowered by between 2 and 3 mm. The difference between the shaft heights is only aligned using shims during the final mounting. When repeatedly removing and re-mounting the motor, the taper pins ensure the precise position of the motor without having to realign it.</cf>

Source:

Lütgert & Co. GmbH
P.O. Box 42 51
33276 Gütersloh
Tel. +49 5241 7407-0
Fax +49 5241 7407-90

www.luetgert-antriebe.de
Email: info@luetgert-antriebe.de

Clamping rails with fixing screws and clamping screw according to DIN 42923

Clamping rails are used to easily and conveniently adjust the tension of the motor belt if a belt tensioning roller is not available. They are attached to the foundation using stone bolts or foundation blocks.

The assignment of clamping rails to motor frame size is specified in DIN 42923. For motors, frame sizes 355 up to 450, there are no standard clamping rails (an inquiry is required).

Source:

Lütgert & Co. GmbH
P.O. Box 42 51
33276 Gütersloh
Tel. +49 5241 7407-0
Fax +49 5241 7407-90

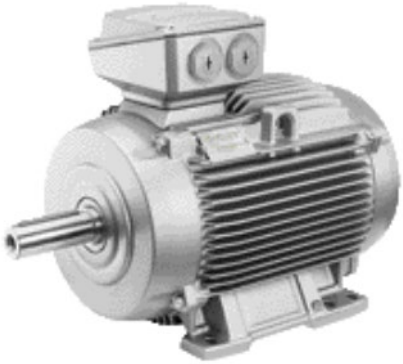
www.luetgert-antriebe.de
Email: info@luetgert-antriebe.de

More information

Replacement motors and repair parts

- Obligation to supply replacement motors and repair parts after the motor has been supplied:
  - When the complete motor fails, Siemens supplies a comparable replacement motor regarding mounting dimensions and functionality for up to 3 years after supplying the original motor (it is possible that a switch will be made to a new series).
  - The delivery of a replacement motor within 3 years does not result in the warranty period starting again.
  - Replacement motors, supplied after the active production phase of the motor series, are additionally marked as replacement motor on the rating plate.
  - For these replacement motors, replacement parts are only provided on request; repair or replacement is not possible.
  - After 3 years has elapsed (since supplying the original motor), these motors can still be repaired (according to the availability of the replacement parts required).
  - Up to 5 years after the original motor was supplied, replacement parts are available; for an additional period of 5 years, Siemens provides information about replacement parts and when required can provide the appropriate documentation.
- The following data is required when ordering repair parts:
  - Name of the part and part No.
  - Article No. and serial number of the motor
- Bearing assignment, see Section "Introduction".
- There is no obligation to repair standard parts.
- Support – Hotline
  In Germany
  Tel. +49 911 895 7 222

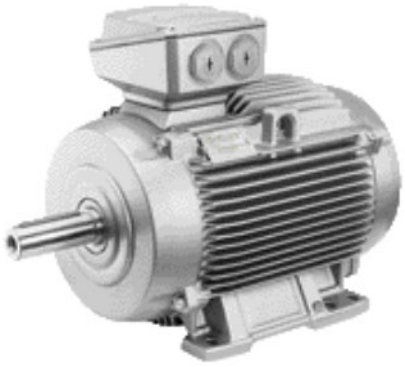
Local telephone numbers for various countries are available on the Internet page:
http://www.siemens.com/automation/service&support



2

2 Steel plant motors

Technical data (steel plant motors)



Steel plant motors offer users a wide range of advantages and benefits:

- High efficiency in efficiency class IE3 for line operation (DOL)
- Motors for converter operation with high efficiency
- Cast iron versions for aggressive ambient conditions, in corrosion protection class C3 (IEC 12944-2)
- Increased corrosion protection is available based on a specifically designed coating system
- Self-ventilated 1PC1433 motors for line operation (DOL) with efficiency class IE3
- Self-ventilated 1PC1443 motors for converter operation (VSD) SINAMICS S120
- Non-ventilated 1PC1463 motors in an enclosed design, without an external fan, for converter operation (VSD) SINAMICS S120
- Motors are suitable for vibration levels and shock according to Class 3M4 in compliance with EN 60721-3-3 (~10G incl.10 shocks/min)
- Simple commissioning when connected to SINAMICS S120 converters
- A wealth of know-how to address plant/system-specific designs
- Global service network with 24-hour service hotline for motors and converters
- High degree of security with respect to torque surges $M_k = 3 \cdot M_n$ for non-ventilated 1PC1463 motors

Enclosure design

Steel plant motors have a low vibration cast iron enclosure with a longitudinal rib design, as well as special vibration-damping bearing shields.

Bearings

Optimized bearing systems are used for safe, reliable and disturbance-free operation when subject to a combination of vibration and shock. Bearing series 63 are always used. The drive end (DE) is always equipped with a fixed bearing; the bearing preloading is realized at the non-drive end (NDE).

Bearing shields
The bearing shields at both ends have been specifically designed (shape and material) for applications involving high mechanical loads and stress, category 3M4 (EN 60721-3-3). It is absolutely crucial that the actual load and stress of the application are mirrored against this design data. In special cases, it is necessary to request that the selection and dimensioning are checked.

Electrical design

1PC1433 steel plant motors can be ordered in all the standard voltage versions, see selection and ordering data.

The normal version of 1PC1443 and 1PC1463 steel plant motors specifically for converter operation have a rated voltage of 400 V in the standard version; other voltages are optionally possible.

Type of connection
Frame sizes 112 M to 160 L: Star (neutral point in the winding overhang)

Frame sizes 180 L to 280 M: Delta

Insulation

All steel plant motors have the DURIGNIT IR 2000 insulating material system with temperature class 155 (F). Motor utilization for line operation at rated power and line operation corresponds to temperature class 130 (B), and for converter operation, temperature class 155 (F).
The versions for converter operation have been optimized for operation with SINAMICS S120 converters. A special insulation system guarantees that in four-quadrant operation the motors can be operated without any restrictions when connected to SINAMICS S120 converters (including Active Line Module) up to a max. line voltage of 480 V.

Max. voltage stress:

	Reinforced insulation system (Advanced)	Special insulation system (Premium)
$U_{phase-phase}$	≤ 3200 Vpp	≤ 4400 Vpp
$U_{phase-ground}$	≤ 2800 Vpp	≤ 3000 Vpp

Motor connection

The standard terminal boxes of the 1LE15 basis motor series are also used for the steel plant motors. The position can be appropriately modified. Larger terminal boxes are optionally available.

All motors are equipped with an outer grounding terminal.

Mounting foot concept

For motor types of construction with mounting feet and top-mounted terminal box, the mounting feet are cast onto the motor. For motor types of construction with mounting feet with terminal box mounted on the left/right-hand side for frame sizes 112 M up to 200 L the mounting feet are bolted on, for frame sizes 225 M to 280 M they are cast on.

Winding temperature monitoring

As standard, 1PC1433 motors for line operation are not equipped with PTC thermistors; however, this is optionally possible.

1PC1443 and 1PC1463 motor types specifically for converter operation have as standard PTC thermistors for alarm and shutdown point. Alternatively, temperature sensing with one or two KTY84-130 or Pt1000 (the PTC thermistors are then no longer installed).

Paint finish

Standard paint finish in RAL 7030, corrosion protection class C3 according to IEC 60721, Part 2-1.

Other colors and paint finishes are optionally possible.

Degree of protection

Standard version is IP55, optionally available, IP56 or IP65.

Deviating cooling medium temperature

Cooling medium temperatures higher than KT 40 °C must be derated according to the following table:

	Cooling medium temperature KT			
	40 °C	45 °C	50 °C	55 °C
Utilized to temperature class 155 (F) according to 130 (B)				
Reduction factor for line operation	1.00	0.96	0.92	0.87

Technical data (steel plant motors)

An overview of the technical data

An overview of the most important technical data for steel plant motors is listed in this table.

	Innomotics DP steel plant motors		
Series	1PC1433	1PC1443	1PC1463
Cooling method	IC 411 Self-ventilated	IC 411 Self-ventilated	IC 410 Non-ventilated
Power supply	Line operation	Converter operation	
Efficiency classes according to EN 60034-30	IE3 For a pure line motor	– (no IE Class for converter motors	
Frame sizes	112 M … 280 L		
No. of poles	4-pole: Frame sizes 112 ... 280 6-pole: Frame sizes 180 ... 280		
Frequencies	50 Hz, 60 Hz and project-specific rated operating points		
Standard voltages	230 V, 400 V, 460 V, 500 V, 690 V		
Rated speed	4-pole: 1500 rpm (50 Hz) 1800 rpm (60 Hz)	4-pole: 1500 rpm (50 Hz) 1800 rpm (60 Hz) 2610 rpm (87 Hz)	
	6-pole: 1000 rpm (50 Hz) 1200 rpm (60 Hz)	6-pole: 1000 rpm (50 Hz) 1200 rpm (60 Hz) 1740 rpm (87 Hz)	
Rated power	2.2 … 104 kW		3.1 … 36 kW
Rated torque	22 … 579 Nm	21 … 552 Nm	20 … 346 Nm
Accelerating torque	M_k = min. 3 · M_n for non-ventilated motors		
Operating modes	S1, S3, S6, S7, S9		
Enclosure material	Cast iron 20		
Enclosure type	Longitudinal ribs		
Temperature class	155 °C (F)		
Insulation acc. to EN 60034-1	Temperature class 155 (F), Durignit IR2000		
Winding insulation (can be changed)	Reinforced insulation system up to 500 V AC at a SINAMICS S120 frequency converter included as standard		
Mechanical strength	3M4 according to EN 60721-3-3 (~10G incl. 10 shocks/min)		
Degree of protection	Standard IP55, optional IP56, IP65		
Voltage	Line voltage 400 V (50 Hz), other voltages optionally available	Standard motor supply voltage: 400V (50Hz), insulation strength for converter operation up to 500V, 690V optionally available	
Certificates	CE, EAC		
Marking	IEC EN 60034		
Permissible cooling medium temperature	Standard -20 … +40 °C		
Types of construction according to EN 60034-7	IM B3, IM B5, IM V1, IM V3, IM B35		
Paint finish (Climatic group acc. to IEC 60721)	As standard RAL 7030, Class C3		
Vibration severity grade according to EN 60034-14	Level A, level B optional		
Shaft end according to DIN 748	Half-key balancing as standard		
Sound pressure level according to DIN EN ISO1680 (tolerance +3 dB)	See "Selection and ordering data"		
Weights	See "Selection and ordering data"		
Modular mounting concept	Pulse encoder, forced ventilation		
Unified and standard series concept	• Cast on enclosure mounting feet, optionally bolted on • Terminal box diagonally split, can be rotated through 4 × 90° • 63 bearing series at both ends as standard		
Options	See "Article number supplements and special versions".		

Overview (steel plant motors)

The Article No. comprises a combination of digits and letters and to provide a better overview, is subdivided into three hyphenated blocks.
For example:
1PC1433-1EB43-4AB4-Z
H00

Article number structure and logic corresponds to that of 1LE1 line motors.
The first block (positions 1 to 7) designates the motor type, the second block (positions 8 to 12) defines the motor frame size and length, the number of poles as well as in some instances the frequency/power and in the third block (positions 13 to 16) the frequency/power, the type of construction and additional design features are coded.

For deviations in the second and third block with respect to catalog data, a **Z** or **90** should be set alphanumerically.

Ordering data:

- Complete Article No. and order code(s) or plain text
- If a quotation exists, in addition to the Article No., the quotation No. should also be specified
- When ordering a complete replacement motor, in addition to the Article No. the serial number of the motor already supplied should be specified

Structure of the Article No.:			Position: 1	2	3	4	5	6	7	-	8	9	10	11	12	–	13	14	15	16	
1st to 5th position: digit, letter, letter, digit, digit	**Motor type**		**1**	**P**	**C**	**1**															
5th position: digit	**Version**						**4**														
6th position: digit	**Motor ventilation**	Roller table						**2**													
		Steel plant	IC411/IC416 (DOL – line operation)					**3**													
		Steel plant	IC411 (VSD – converter operation)					**4**													
		Steel plant	IC410 (VSD – converter operation)					**6**													
7th position: digit	**Efficiency class**		IE3						**3**												
8th and 9th position: digit, letter	**Motor frame size**		112								**1**	**B**									
			...								**...**	**...**									
			280								**2**	**D**									
10th position: letter	**No. of poles**		4-pole										**B**								
			6-pole										**C**								
11th position: digit	**Laminated core length**													**0**							
														...							
														8							
12th and 13th position: 2 digits	**Voltage, connection and frequency** (coded using two digits, see "Selection and ordering data")														**0**		**0**				
															...		**...**				
															9		**7**				
14th position: letter	**Type of construction** (coded with A ... J)																	**A**			
																		...			
																		J			
15th position: letter	**Motor protection** (coded with A ... J)																		**A**		
																			...		
																			J		
16th position: digit	**Terminal box position** (viewed from the DE)		Top-mounted terminal box																	**4**	
			Terminal box at the right																	**5**	
			Terminal box at the left																	**6**	
			Terminal box NDE																	**8**	
	Special order versions • Coded – additional order code required • Not coded – additional plain text required																				**– Z**

Ordering example

Selection criteria	Requirement	Structure of the Article No.
1PC14 motor type	Steel plant motor with high efficiency IE3, line operation, degree of protection IP55, cast iron version	1PC1433-■■■■■-■■■■
Motor frame size/pole number/speed	180 L/4-pole/1500 rpm	1PC1433-1EB4■-■■■■
Rated power	22 kW	
Voltage and frequency	400 VΔ/690 VY, 50 Hz	1PC1433-1EB43-4■■■
Type of construction with special version	IM B3 with protective cover	1PC1433-1EB43-4A■■-Z H00
Motor protection	Motor protection using PTC thermistors with 3 integrated temperature sensors for shutdown	1PC1433-1EB43-4AB■-Z H00
Terminal box position	Top-mounted terminal box (viewed from the DE)	1PC1433-1EB43-4AB4-Z H00

Overview (steel plant motors)

Connection when shipped, star

- Option for 1PC1433 steel plant motors – order code **M01**
- Standard for 1PC1443 and 1PC1463 steel plant motors in frame sizes 112 M to 160 L

For shipping, the motor terminal board is connected in the star configuration.

Connection when shipped, delta

- Option for 1PC1433 steel plant motors – order code **M02**
- Standard for 1PC1443 and 1PC1463 steel plant motors in frame sizes 180 L to 280 M

For shipping, the motor terminal board is connected in the delta configuration.

Packaging weights

For steel plant motors		For transport by land							
Frame size	Type	IM B3 type of construction				Types of construction IM B5, IM V1			
	1PC14..-	In box Tare weight	On wooden ISPM pallets with telescopic box Tare weight	On pallet Tare weight	In crate Tare weight	In box Tare weight	On wooden ISPM pallets with telescopic box Tare weight	On pallet Tare weight	In crate Tare weight
		kg	kg	kg	kg	kg	kg	kg	kg
112 M	**1B.2**	–	5.0	–	–	–	5.0	–	–
	1B.6	–	5.0	–	–	–	5.0	–	–
132 S	**1C.0**	4.7	–	–	–	5.2	–	–	–
	1C.1	4.7	–	–	–	5.2	–	–	–
132 M	**1C.2**	4.7	–	–	–	5.2	–	–	–
	1C.3	4.7	–	–	–	5.2	–	–	–
	1C.6	8.7	–	–	–	9.2	–	–	–
160 M	**1D.2**	4.8	–	–	–	5.7	–	–	–
	1D.3	4.8	–	–	–	5.7	–	–	–
160 L	**1D.4**	4.8	–	–	–	5.7	–	–	–
	1D.6	8.8	–	–	–	9.7	–	–	–
180		–	–	8.0	–	–	–	10.0	–
200		–	–	11.0	–	–	–	13.0	–
225		–	–	14.0	–	–	–	17.0	–
250		–	–	22.0	–	–	–	25.0	–
280		–	–	24.0	–	–	–	27.0	–

Data apply for individual packaging. Packing in wire lattice boxes is possible, order code **B99.**

Safety instructions

Compact Operating Instructions in German and English – enclosed in printed form.

Documentation

Printed operating instructions in German/English provided with the motor is optionally available
Order code **B04**

Test certificates

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

Extension to the liability for defects period

Innomotics 1PC14 low-voltage motors come as standard with a liability defect period of 24 months. It is also possible to extend this on a project-for-project basis.

Overview (steel plant motors)

Efficiency and power factor

Efficiency η for 4/4, 3/4 and 1/2 load and power factor cos φ are specified in the selection tables of the individual parts of this catalog for the rated power.

Rated speed and direction of rotation

The rated speeds are applicable at the rated operating data. The synchronous speed changes linearly with the line frequency. The motors are suitable for clockwise and counterclockwise rotation.

When connecting U1, V1, W1 to L1, L2, L3, the motor rotates clockwise when viewing the DE shaft end. Counterclockwise rotation can be selected by interchanging two phases.

Rated torque

The rated torque output at the shaft in Nm is

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

P rated power in kW
n speed in rpm

Note:
If the voltage deviates from its rated value within the permissible limits, then the starting, pull-up and stall torque change approximately as a square law and the starting (inrush) current changes approximately linearly.

For squirrel-cage induction motors, starting torques and stall torques are specified in the selection tables as multiple of the rated torque.
Squirrel-cage induction motors are preferably switched on directly. The torque classification indicates that when switched on directly, also with an undervoltage of –5 %, starting against a load torque of up to

- 160 % for squirrel cage class 16
- 130 % for squirrel cage class 13

of the rated torque is possible.

Motors specifically for converter operation

Steel plant motors 1PC1443 and 1PC1463 are specifically intended for converter operation. The catalog data is applicable for operation with Siemens SINAMICS converters. The catalog data is applicable for operation with SINAMICS S converters. When operated with another converter, the catalog data (thermal limit torques, maximum overload torques) are approximately applicable with the following constraints:

- The converter is operated with a rated pulse frequency of at least 4 kHz (≥ 90 kW 2 kHz).
- The converter can provide the rated voltage as listed in the catalog.
- Permissible voltage peaks with $\hat{U}_{LL} \leq 1600$ V, $\hat{U}_{LE} \leq 1400$ V, $t_s > 0.1$ µs

For SINAMICS G120 converters (from firmware version 4.7), the Innomotics GP/SD-VSD10 line can be selected as motor category in the SINAMICS converter using the STARTER software or at the converter operator panel (AOP - Advanced Operation Panel; BOP - Basic Operator Panel) and can be addressed using the motor code No.

Rated voltage

The tolerance according to DIN EN 60034-1 is applicable for the rated voltage. A rated voltage range is not specified. The rated motor voltages are selected so that when operated with a SINAMICS converter the voltage available is optimally utilized.

Insulation

The motors can be operated for line voltages ≤ 480/500 V at SINAMICS S converters (uncontrolled and controlled infeed) when complying with the permissible peak voltages specified above. Operation with higher line voltages (≥ 690 V) is possible for motors with a special insulation system 690 V (Premium), or by using suitable converter output circuitry (d*u*/d*t* or sine wave filter) to limit the voltage peaks that occur ($\hat{U}_{LL} \leq 1600$ V, $\hat{U}_{LE} \leq 1400$ V).

If converter output circuitry (du/dt or sine-wave filter) is available, then the insulation system can also be used for higher line voltages. This is also applicable for operation with pulse converters with voltage rise times $t_s > 0.1$ µs at the motor terminals.

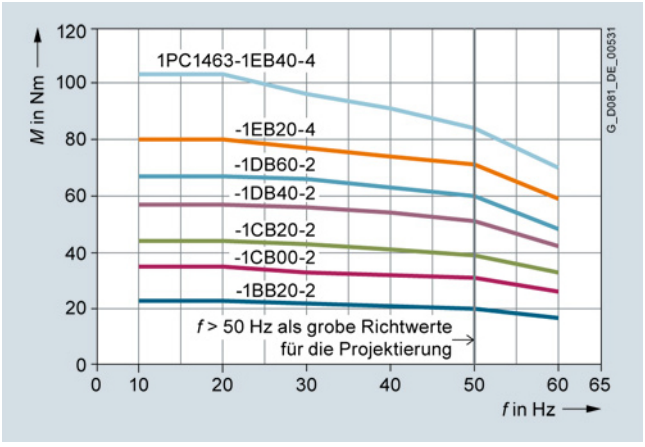
When operated at the converter with the power ratings specified in the catalog, then the motors are utilized corresponding to thermal class 155 (F) (service factor 1.0).

When a fault occurs when connected to an IT line supply (ground fault) then the insulation is excessively stressed. For a fault such as this, the process should be terminated as quickly as possible ($t < 2$ h) and the fault resolved. Operation connected to a TN line supply with corner point grounding is not recommended.

Overview (steel plant motors)

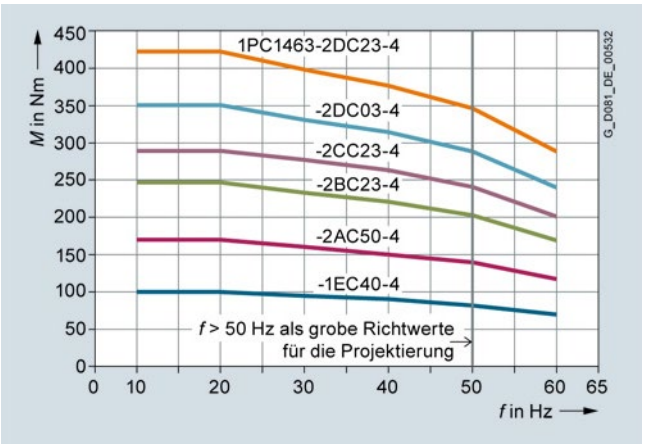
Torque-frequency characteristics for 4-pole 1PC1463 motors

Type	Frequency *f* Hz					
	10	**20**	**30**	**40**	**50**	**60**
	Torque *M* Nm					
1PC1463-1BB20-2	23.0	23.0	22.0	21.0	20.0	16.9
1PC1463-1CB00-2	35.0	35.0	33.0	32.0	31.0	26.2
1PC1463-1CB20-2	44.0	44.0	43.0	41.0	39.0	33.0
1PC1463-1DB40-2	57.0	57.0	56.0	54.0	51.0	42.3
1PC1463-1DB60-2	67.0	67.0	66.0	63.0	60.0	48.2
1PC1463-1EB20-4	80.0	80.0	77.0	74.0	71.0	59.0
1PC1463-1EB40-4	103.0	103.0	96.0	91.0	84.0	69.9



Torque-frequency characteristics for 6-pole 1PC1463 motors

Type	Frequency *f* Hz					
	10	**20**	**30**	**40**	**50**	**60**
	Torque *M* Nm					
1PC1463-1EC40-4	100.0	100.0	95.0	90.0	82.0	70.0
1PC1463-2AC50-4	170.0	170.0	160.0	150.0	140.0	117.0
1PC1463-2BC23-4	247.0	247.0	233.0	221.0	203.0	169.0
1PC1463-2CC23-4	289.0	289.0	277.0	263.0	241.0	201.0
1PC1463-2DC03-4	351.0	351.0	331.0	314.0	288.0	240.0
1PC1463-2DC23-4	422.0	422.0	398.0	377.0	346.0	288.0



Steel plant motors for line operation

For voltage and frequency fluctuations, EN 60034-1 makes a distinction between range A (combination of voltage deviation ±5 % and frequency deviation ±2 %) and range B (combination of voltage deviation ±10 % and frequency deviation +3/–5 %). The motors can provide their rated torque in range A as well as in range B. In range A, the temperature rise lies approximately 10 K higher than in rated operation.

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

For detailed data, see EN 60034-1.

According to the standard, longer operation is not recommended in range B. Rating plate labeling with a corresponding example, see "Rating plates and additional plates". The rated current at 400 V is specified in the selection and ordering data. Standard DIN IEC 60038 specifies a tolerance of ±10 % for line voltages 230 V, 400 V and 690 V.

Line voltages	Voltage code
1LE1 motors	
230 VΔ/400 VY, 50 Hz	22
400 VΔ/690 VY, 50 Hz	34
500 VY 50 Hz	27
500 VΔ; 50 Hz	40

Non-standard voltages and/or frequencies

The tolerance according to DIN EN 60034-1 is applicable for non-standard voltages.
Order codes are defined for some non-standard voltages at 50 or 60 Hz. The order is placed by specifying code **9** for the voltage at the 12th position of the Article No. as well as code **0** at the 13th position of the Article No. and the corresponding order code.

Overview (steel plant motors)

According to DIN EN 60034-1, for all motors, the approximate total weight is stamped on the rating plate.

In addition, a supplementary plate for the orderer's data is possible, supplementary text: 9 lines each with 40 characters, Order code **Y82.**

An additional rating plate with different rating plate data can be ordered (only for rated data, e.g. voltage, power, speed). Order code **Y80.**

Optionally, the number of additional plates can be ordered by specifying order codes Y82, Y80. This is not applicable for direction of rotation arrows, PTC thermistor plates/labels, other information plates/labels.

Additional (rating) plate(s), Order code **M10.**

In the standard version, the rating plate is international or in German/English. When ordering the language on the rating plate, this must be specified in plain text. An overview of the languages that can be ordered is provided in the subsequent table.

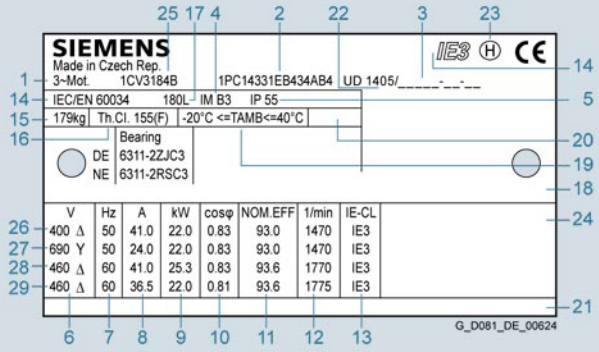
Overview of the languages on the rating plate

Motor type	Frame size	Rating plate	
		Germany (de)	English (en)
1PC14	112 ... 280	◘	○

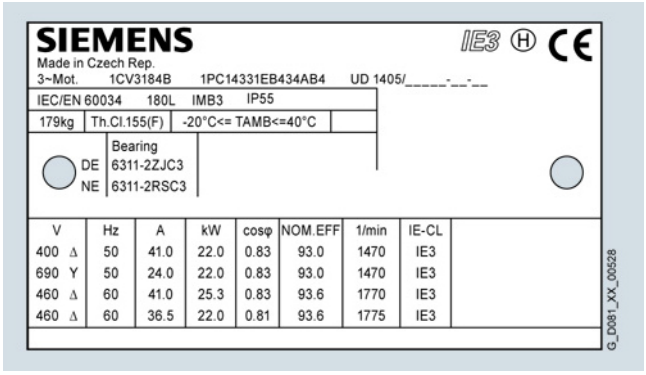
◘ Normal version
○ No additional price

Other languages on request

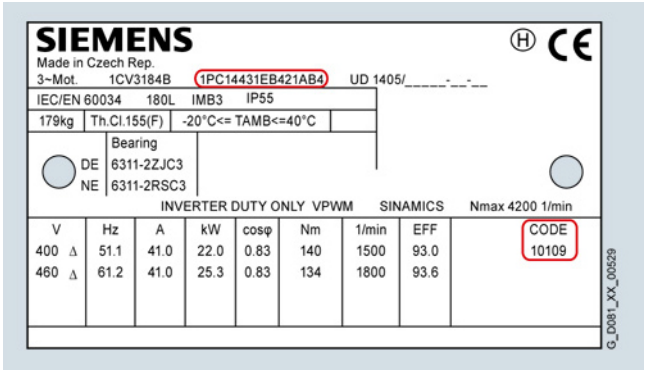
Examples of rating plates



1 Maschinenart: Drehstrom-Niederspannungsmotor
2 Artikel-Nr.
3 Fabriknummer (Ident.-Nr., Seriennummer)
4 Bauform
5 Schutzart
6 Bemessungsspannung [V] und Wicklungsschaltung
7 Frequenz [Hz]
8 Bemessungsstrom [A]
9 Bemesssungsleistung [kW]
10 Leistungsfaktor (cos φ)
11 Wirkungsgrad
12 Bemessungsdrehzahl [min^{-1}]
13 IE-Wirkungsgradklasse
14 Normen und Vorschriften
15 Maschinengewicht [kg]
16 Wärmeklasse
17 Baugröße
18 Zusatzangaben (optional)
19 Einsatztemperaturbereich (nur wenn abweichend von der Norm)
20 Aufstellhöhe (nur wenn größer als 1000 m)
21 Kundendaten (optional)
22 Herstelldatum JJMM
23 Halbkeilwuchtung
24 Code Letter „CL“
25 Motor Type Nummer (MT)
26 IEC-Normreihe Leistung 50 Hz (P50/50 Hz) 400 Δ
27 IEC-Normreihe Leistung 50 Hz (P50/50 Hz) 690 Δ
28 Äquivalente Leistung 60 Hz bei gleicher Ausnutzung wie IEC-Normreihe 50 Hz
29 IEC-Normreihe Leistung 60 Hz (P50/60 Hz)

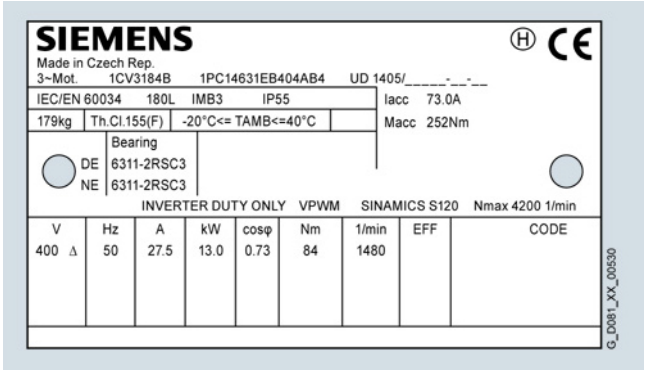


1PC1433 – motor for line operation, self-ventilated



1PC1443 – motor for converter operation, self-ventilated

The self-ventilated 1PC1443 motors also have a motor code so that they can be simply commissioned when connected to a SINAMICS S120.



1PC1463 – motor for converter operation, non-ventilated without external fan, enclosed version

Overview (steel plant motors)

For an approximate selection at higher cooling medium temperatures and/or for installation altitudes higher than 1000 m above sea level, the specified motor power should be reduced by factor k_{HT}.
Depending on the motor frame size or number poles, for different operating conditions the motors may be equipped with special windings.

The permissible motor power is obtained as follows:

$P_{zul} = P_N \cdot k_{HT}$

Reduction factor k_{HT} for deviating installation altitude and/or cooling medium temperature

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

Cooling medium temperature and installation altitude are rounded-off to 5°C and/or 500 m.

Overview (steel plant motors)

The following applies for 1PC1433 line motors:

The motor utilization at its operating power and for line operation corresponds to temperature class 130 (B).

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

In line operation and at rated power and rated voltage according to the selection table, all 1PC1433 motors have a service factor of 1.15.
Order code **N01**

Temperature class 155 (F), utilized according to 155 (F), for a higher power

When utilized to temperature class 155 (F), the rated power according to the selection and ordering data can be increased by 15 %.
Order code **N02**

Temperature class 155 (F), utilized according to 155 (F), with increased cooling medium temperature

For an unchanged catalog power for line operation it is permissible to increase the cooling medium temperature to 55 °C.
Order code **N03**

For orders with order codes **N02** and **N03** a service factor (SF) is not stamped on the rating plate.

The following applies to 1PC1443 and 1PC1463 converter motors:

Temperature class 155 (F), utilized to 155 (F), with increased cooling medium temperature

When operated with a converter with the specified catalog power ratings, then the motors are utilized corresponding to thermal class 155 (F). Order codes **N01**, **N02** and **N03** are not possible.

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

For all steel plant motors, temperature class according to 155 (F), utilized according to temperature class 155 (F) with other specific customer requirements is possible when an order is placed with additional plain text.
(On request)

Temperature class 180 (H) is possible as option:

Temperature class 180 (H), utilized according to 155 (F)

For 1PC1433 line motors, temperature class according to 180 (H), utilized according to temperature class 155 (F) with a maximum cooling medium temperature of 60 °C is possible when an order is placed with additional plain text.
Order code **Y75**

Temperature class 180 (H), utilized according to 180 (H) at rated power and a maximum cooling medium temperature of 60 °C

For 1PC1433 line motors, utilization according to temperature class 180 (H) at rated power and an increased cooling medium temperature and/or increased power is possible. This does not apply to 1PC1443 and 1463 converter motors.

The specified grease service life refers to a cooling medium temperature of 40 °C. When the cooling medium temperature is increased by 10 K, then the grease service life or the regreasing interval is halved.
Order code **N11**

Note:
The motor has to be specially selected and dimensioned as a result of the mechanical component check.

Overview (steel plant motors)

Increased humidity/temperature with 30 to 60 g water per m^3 air

For the steel plant motors, a version is possible for increased humidity in the range between 30 to 60 g water per m^3 air as a function of the temperature according to the subsequent table. This version includes condensation drain holes (closed and sealed).
Order code **N30** (includes order codes **H03** and **M11**)
An inquiry is required when simultaneously combining order code **N30** with mounted components (e.g. rotary pulse encoder)!

Increased air humidity/temperature with 60 to 100 g water per m^3 air

For the steel plant motors, a version is possible for increased humidity in the range above 60 to 100 g water per m3 air as a function of the temperature according to the subsequent table. This version includes condensation drain holes.
Order code **N31** (includes order codes **H03** and **M11**).
An inquiry is required when simultaneously combining order code **N31** with mounted components (e.g. rotary pulse encoder)!

Converting from an absolute to relative humidity

Relative humidity	Temperature							
	up to 20 °C	up to 30 °C	up to 40 °C	up to 50 °C	up to 60 °C	up to 70 °C	up to 80 °C	up to 90 °C
10%	2	3	5	8	13	20	29	42
15 %	3	5	8	12	19	30	44	63
20%	3	6	10	17	26	39	58	84
25 %	4	8	13	21	32	49	73	105
30 %	5	9	15	25	39	59	87	126
35%	6	11	18	29	45	69	102	146
40 %	7	12	20	33	52	79	116	167
45 %	8	14	23	37	58	89	131	188
50 %	9	15	26	41	65	98	145	209
55 %	10	17	28	46	71	108	160	230
60 %	10	19	31	50	78	118	174	251
65 %	11	20	33	54	84	128	189	272
70 %	12	21	36	58	91	138	203	293
75 %	13	23	38	62	97	148	218	314
80 %	14	24	41	66	104	157	233	335
85 %	15	26	43	70	110	167	247	356
90 %	16	27	46	74	117	177	262	377
95 %	16	29	49	79	123	187	276	398
100 %	17	30	51	83	130	197	291	419

In the standard version, the values in the table with blue background are covered (up to < 30 g water per m^3 air).

The values with light gray background in the table are covered with order code **N30** (30 to < 60 g water per m^3 air).

The values with dark gray background in the table are covered with order code **N31** (60 to < 100 g water per m^3 air).

An inquiry is necessary for requirements above 100 g water per m^3 air!

Overview (steel plant motors)

Anti-condensation heating

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

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

Motors should be equipped with anti-condensation heating if there is a risk of condensation forming on the winding as a result of the climatic situation, e.g. motors are stationary in humid environments or are subject to significant temperature fluctuations.
An additional cable entry is provided in the terminal box for the connecting cable:

Motor series	Frame size	Cable entry
Cast iron motors (SD)	≤ 180	1 x M16 x 1.5
	200	1 x M20 x 1.5
	≥ 225	2 x M20 x 1.5

It is not permissible that the anti-condensation heating is switched on while the motor is operational.

Frame size	Power rating of the anti-condensation heating	
	Supply voltage at	
	230 V	115 V (110 V)
	Order code **Q02**	Order code **Q03**
	W	W
112	25	25
132 … 200	50	50
225 … 250	92	92
280	109	109

As an alternative to anti-condensation heating, it is possible to connect a voltage that is approximately 4 to10 % of the rated motor voltage at the stator terminals U1 and V1; 20 to 30 % of the rated motor current is sufficient to achieve an adequate temperature rise.

Fan impeller, fan cover

The normal versions of 1PC1433 and 1PC1443 steel plant motors have a radial fan that cools independent of the motor direction of rotation (cooling method IC411 according to DIN EN 60034-6). The air flows from the NDE to the DE.

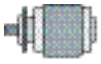
The fan impeller and fan cover are manufactured out of metal as standard.

If space is restricted, it must be carefully ensured that the minimum clearance is maintained between the fan cover and the wall/panel.

Clearance between the wall/panel and air grille	
Frame size	mm
112	25
132	30
160	40
180, 200	90
225, 250	100
280	110

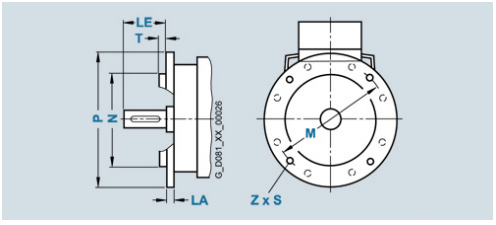
Overview (steel plant motors)

Standard and special types of construction

Type of construction according to DIN EN 60034-7		Frame size	Letter 14th position of the Article No.	Additional ordering data **–Z** with order code
Without flange				
IM B3/IM 1001		112 M to 280 L	**A**	**–**
With flange				
IM B5/IM 3001		112 M to 280 L	**F**	**–**
IM V1/IM 3011 without protective cover		112 M to 280 L	**G**	**–**
IM V1/IM 3011 with protective cover		112 M to 280 L	**G**	**+ H00** [1]
IM V3/IM 3031		112 M to 280 L	**H**	**–**
IM B35/IM 2001		112 M to 280 L	**J**	**–**

In standard DIN EN 50347, flange FF with through holes and flange FT with threaded holes are assigned

Flange dimension



In DIN EN 50347, flange FF with through holes and flange FT with threaded holes are assigned to the frame sizes.
The designation of flanges A and C according to DIN 42948 (no longer valid since September 2003) have been additionally listed for information purposes only. Refer to the assignment table below.
(**Z** = number of mounting holes)

Frame size	Type of construction	Flange type	Flange with through holes (**FF**/A)		Dimension designation according to **IEC**							
			according to DIN EN 50347	according to DIN 42948	**LA**	**LE**	**M**	**N**	**P**	**S**	**T**	**Z**
112 M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF215**	A 250	11	60	215	180	250	14.5	4	4
132 S/M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF265**	A 300	12	80	265	230	300	14.5	4	4
160 M/L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF300**	A 350	13	110	300	250	350	18.5	5	4
180 M/L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF300**	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF350**	A 400	15	110	350	300	400	18.5	5	4
225 S/M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF400**	A 450	16	140	400	350	450	18.5	5	8
250 M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF500**	A 550	18	140	500	450	550	18.5	5	8
280 S/M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF500**	A 550	18	140	500	450	550	18.5	5	8

1) Second cylindrical shaft end according to the standard **L05** is not possible.

Overview (steel plant motors)

Connection, circuit configuration and terminal boxes

Terminal box position

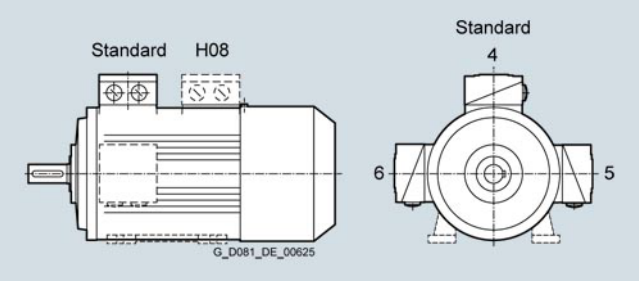
The terminal boxes of steel plant motors can be mounted in four different positions.
The terminal box position is coded using the 16th position of the motor Article No.
The following should be noted when defining the terminal box position:

- Motors with a foot mounting type of construction should always be viewed looking at the drive end with the shaft in a horizontal position The mounting feet are always in the "6 o'clock position".
- Motors with a flange type of construction (e.g. IM B5), whose flange has a condensation drain hole at the DE should always be viewed looking at the DE with the shaft in a horizontal position. The condensation drain hole is always in the "6 o'clock position".

All steel plant motors have cast on mounting feet. The terminal box can be subsequently rotated.

Terminal box mounted on the right-hand side:
16th position of the Article No. digit **5**

Terminal box mounted on the left-hand side:
16th position of the Article No. digit **6**



Position of the terminal box with the corresponding digit at the 16th position of the Article No.

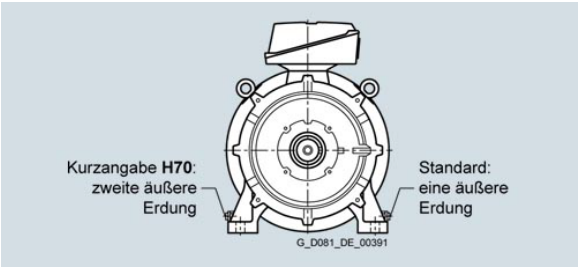
The number of winding ends depends on the actual winding type. Three-phase motors are connected to the three phase conductors L1, L2, L3 of a three-phase line supply. In the operating connection, the rated voltage of the motor must match the phase-to-phase conductor voltages of the line supply/converter output voltages.

When the three phases are operating in a time sequence and are connected to the motor terminals in alphabetic order U1, V1, W1, then the motor shaft rotates clockwise when looking at the drive end. The direction of rotation of the motor shaft can be reversed (counterclockwise direction of rotation) by interchanging two connecting cables.

Appropriately marked terminals are provided to connect the protective conductor.

A protective conductor terminal is provided in the terminal box for grounding. A grounding terminal is provided on the outside of the motor enclosure.

A second outer grounding terminal can be ordered.
Order code **H70**



Terminal box design

The number of terminals and the size of the terminal box are designed to address standard requirements.

A larger terminal box can be supplied to address special requirements and customer specifications.

Larger terminal box:
Order code **R50**

The terminal box can be changed over from the drive end (DE) to the non-drive end (NDE) if this is required as a result of the mounting position the motor and the terminal box colliding with machine components. In this case, utilization is only possible according to temperature class 155 (F). When rotating the terminal box at the NDE motor side, it should be noted that dimensions "C" and "CA" do not conform to the values according to EN 50347. Dimension drawings can be obtained through the DT Configurator.
Order code **H08**

Connecting motors

Line feeder cables
For motors with auxiliary terminals (e.g. for 15th position of the Article No., letter **B**) additional cable entry holes (depending on the frame size, M16 × 1.5 or M20 × 15) are provided.
For details, see the data sheet function in the DT Configurator.

The terminal box is screwed to the enclosure. For a terminal board with 6 terminal studs (standard version), the terminal box can be rotated through 4 × 90° on the connecting base of the motor enclosure.
Additional information is provided in the subsequent tables and the operating instructions.

Parallel feeder cables
For some motors, parallel feeder cables must be provided as a result of the maximum permissible current magnitude for each terminal.

These motors are appropriately marked in the selection and ordering data.

Motor connection and terminal box

Overview (steel plant motors)

Cable entry at the terminal box

When viewing the drive end (DE) of the steel plant motor with the shaft in a horizontal position and a top-mounted terminal box, the cable entry is always located on the right-hand side of the motor, as shown in the diagram. Standard position 0°. The terminal box can be rotated on the connecting base of the motor enclosure so that the cable entry can be brought into the positions listed below:

- Direction drive end (DE) (terminal box is rotated through 90°, cable entry from the DE) not possible for B5 types of construction!
  Order code **R10**
- Direction ventilation side (NDE) (terminal box is rotated through 90°, cable entry from the NDE)
  Order code **R11**
- Opposite to the standard position 0° (terminal box is rotated through 180°, cable entry opposite to the standard position 0°)
  Order code **R12**

The terminal box dimensions depend on the frame size and can be taken from "Dimension drawings" in Section "Dimensions". If the terminal box position (right-hand side, left-hand side or top) is changed, then the position of the cable entry should be checked, and if required ordered using the corresponding order code (**R10, R11** or **R12**).

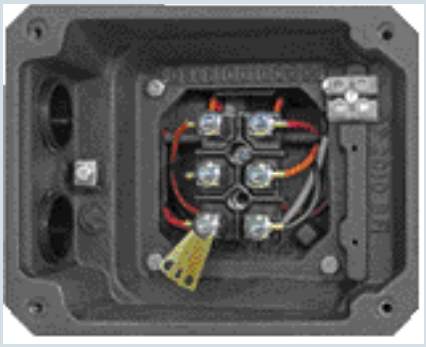
Detailed view of the terminal box in the standard position

Position of the cable entries with the appropriate order codes

Motor	Frame size	Terminal box	Terminal box position			Rotation of terminal box and/or cable entry			
			top	right-hand side	left-hand side	-90°	+90°	180°	Can be subsequently changed
			16th position of the Article No.			Article No. with **-Z** and order code			
Type		Type	**4**	**5**	**6**				
			Order code						
			–	–	–	**R10**	**R11**	**R12**	
1PC14	112 … 280	TB1F01 … TB1Q01							

Overview (steel plant motors)

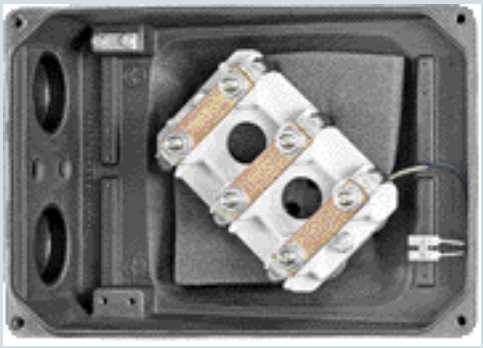
Terminal box type TB1F01, TH1H01



Terminal box type TB1J01

Terminal box type TB1L01

Terminal box type TB1N01



Terminal box type TB1Q01

Overview (steel plant motors)

Measures required when mounting gearboxes

Flange motors can be prepared when required for mounting to gearboxes.

It is recommended that the permissible bearing loads are carefully checked.

Hoisting lugs and transport

1PC14 steel plant motors without mounting feet have as standard four cast hoisting lugs that are arranged offset through 90°.

Enclosure material

Motor series	Frame size	Enclosure material	Enclosure mounting feet
1PC14	112 … 280	Cast iron	Cast on

Preparing for mounted components

Brakes as well as rotary encoders ("modular and special mounting technology") can be subsequently mounted. Steel plant motors must be appropriately prepared. Possible on request.

Rotary encoders:

- Leine & Linde, type LL 861 900 220, order code **G04**
- Hübner, type HOG 9 D 1024 I, order code **G05**
- Hübner, type HOG 10 D 1024 I, order code **G06**
- Hübner, type POG10 DN, 2 x 1024 I, order code **G09**

In addition, for subsequent encoder mounting, a motor shaft prepared with 16 mm cylindrical shaft end can be offered.
Order code **G42**

As standard, steel plant motors, prepared for mounted components provided by the customer, can be supplied without protective canopy (order code **G42**). Customers can mount these components themselves.

The standard protective canopy (order code **H00**) is not suitable for protecting additional mounted components, e.g. a rotary encoder.

Order code **G42** is not possible in conjunction with order code **L00** vibration severity grade B.

Degrees of protection

All steel plant motors have an IP55 degree of protection. They can be installed in dusty and/or humid environments. Steel plant motors are suitable for tropical climates. Guide value < 60 % relative humidity at KT 40 °C. Other requirements on request (see Table Converting from an absolute to relative *humidity* Page 2/12).

IP56, IP65, IP66 degrees of protection optionally available.

All degrees of protection as well as test conditions correspond to DIN EN 60529.

For steel plant motors with vertical shaft, users must apply the appropriate measures to prevent the ingress of liquids along the shaft.

For steel plant motors with shaft end facing downward, version "Protective canopy for types of construction", order code H00 is urgently recommended; see also explanations relating to "Types of construction".

The condensation drain holes at the drive end (DE) and non-drive end (NDE) are included as standard in frame sizes 225 to 280 (112 to 200 with option **H03**) and are delivered closed and sealed (IP55).

When used in corrosive environments, it is recommended to use non-rusting screws (external).
Order code **H07**

The vibration-proof version is the standard version. Continuously vibration proof to Class 3M4 according to IEC 721-3-3.

Noise characteristics for line operation

The noise is measured according to DIN EN ISO 1680 in a semi-anechoic chamber. It is specified as an A-weighted sound pressure level L_{pfA} in dB (A).
This value is the spatial average value of the sound pressure levels measured at the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level L_{WA} in dB (A) is also specified.

The specified values are applicable at 50 Hz and at the rated power (see the selection and ordering data). The tolerances +3 dB. At 60 Hz, the values increase by approximately 4 dB (A). Noise values of motors operated with converters available on request.

The rotor balancing type according to DIN EN 60034-14 Sept 2004 is marked on the face side of the customer-side shaft end DE / NDE:

F = Balancing with full feather key
(agreement with full feather key)
H = Balancing with half feather key
(agreement with half feather key) – standard
N = Balancing without feather key –
Plain text data is required (agreement without feather key)

For steel plant motors up to frame size 112 the marking is on the rating plate.
Balancing with full feather key (F) is possible with order code **L02** (additional price).

Balancing without feather key (N) is possible with order code **L01** (additional price).

Vibration severity grade A is the normal version and is applicable up to a rated frequency of 60 Hz.

Low vibration version B is available to address special requirements relating to the mechanical smooth running properties.
Order code **L00**

Order code **L00** vibration severity grade B is not possible in conjunction with order code **G42**.

To evaluate this vibration, evaluation zones A and B according to ISO 101816-3 apply.

The limit values specified in the following table are applicable for uncoupled motors, freely suspended and operating under no-load conditions.

For converter operation with frequencies higher than 60 Hz, special balancing is required to maintain the specified limit values (must be specified in plain text: maximum supply frequency/speed).

For more detailed information, see the online help in the DT Configurator.

Overview (steel plant motors)

Limit values (rms values) of the maximum vibration severity for vibration amplitude (s), vibration velocity (v) and acceleration (a) for shaft height H

Vibration severity grade	Motor mounting	Shaft height H in mm					
		56 ≤ H ≤ 132			132 < H ≤ 280		
		*s*rms	*v*rms	*a*rms	*s*rms	*v*rms	*a*rms
		µm	mm/s	mm/s^2	µm	mm/s	mm/s^2
A	Freely suspended	25	1.6	2.5	35	2.2	3.5
	Rigidly mounted	21	1.3	2.0	29	1.8	2.8
B	Freely suspended	11	0.7	1.1	18	1.1	1.7
	Rigidly mounted	–	–	–	14	0.9	1.4

Details, see Standard DIN EN 60034-14 Sept. 2004

Higher values must be first agreed on in writing. A component with twice the line supply frequency is considered to be dominating if the type test indicates that it is greater than 2.3 mm/s (rms value).

Overview (steel plant motors)

Shaft end

Centering bore 60° according to DIN 332, Part 2 with threaded bore M3 to M24 as a function of the shaft diameter (see the dimension tables in Catalog Section 2).

DE (DE shaft end)	
Diameter mm	Thread mm
> 28 ... 30	DR M10
> 30 ... 38	DR M12
> 38 ... 50	DR M16/DS M16
> 50 ... 75	DR M20/DS M20

Shaft end with standard dimensions without keyway

For 1PC14 steel plant motors, the standard shaft end with standard dimensions can be ordered without a keyway.
Order code **L04**

Standard stainless steel shaft

A standard stainless steel shaft can be ordered for 1PC14 steel plant motors.
This is only applicable for standard dimensions of the shaft end.
Order code **L06**

Special stainless steel materials only on request.

Non-standard cylindrical shaft end

The non-standard cylindrical shaft end is applicable for the drive end
(DE) The feather key is always supplied.
Order code **Y58**

For order code **Y58** non-standard cylindrical shaft end DE, the following applies:

- Dimension D: less or equal to the ball bearing inner diameter, tolerance field less than the tolerance field according to EN 50347.
- Dimension E: less than or equal to 2 × length E (standard) of the shaft end.

See the following table "Permissible changes at the DE shaft end" and dimension tables.

Permissible changes at the DE shaft end (**Y58**)

Motor series	Frame size	No. of poles	Shaft end length E in mm		Shaft end diameter D in mm		
			Stan-dard	up to maxi-mum	minimum	Stan-dard	up to maxi-mum 1)
1PC14	112	4 … 6	60	120	24	28	30
	132	4 … 6	80	120	24	38	40
	160	4 … 6	110	220	38	42	45
	180	4 … 6	110	220		48	48
	200	4 … 6	110	220	on req.	55	55
	225	4 … 6	140	280		60	60
	250	4 … 6	140	280		65	70
	280	4 … 6	140	280		75	80

Radial eccentricity of the shaft end, concentricity and axial eccentricity acc. to DIN 42955, tolerance R for flange mounting types of construction

Tolerance N (normal) and tolerance R (reduced) are defined in DIN 42955:

1. Radial eccentricity tolerances for the shaft end
2. Concentricity tolerances for the shaft end and the flange centering
3. Axial eccentricity tolerances for the shaft end and the flange surface

The radial eccentricity of the shaft end, concentricity and axial eccentricity acc. to DIN 42955, tolerance R for flange mounting types of construction can be ordered using order code **L08**.

The radial eccentricity of the shaft end acc. to DIN 42955, tolerance R for types of construction without flange can be ordered using order code **L07**.

Radial eccentricity tolerance for the shaft end

Diameter of the cylindrical shaft end d mm	Radial eccentricity tolerance N (normal) mm	 R (reduced) mm
> 28 … 30	0.04	0.021
> 30 … 50	0.05	0.025
> 50 … 75	0.06	0.03

Overview (steel plant motors)

Bearing service life (nominal service life)

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

Under average operating conditions, a service life (L_{10h}) of 100000 hours can be reached.

The bearing service life is essentially determined by the bearing size, the bearing load, the operating conditions, the speed and the grease service life. A bearing service life calculation is possible on request.

Bearing system

The bearing service life for steel plant motors mounted horizontally with a coupling output and without any supplementary axial loads is 40000 hours; when utilizing the maximum permissible load, it is 20000 hours. This is based on motor operation at 50 Hz. The nominal bearing service life is reduced when the motor is fed from a converter at higher frequencies.

For the permissible vibration values, measured at the bearing shield, evaluation zones A and B defined in ISO 10816 are applicable in order to achieve the calculated service life in continuous operation. For higher vibration velocities as a result of the operating situation, special agreements should be made (an inquiry is required).

Variable-speed steel plant motors have a different bearing service life for the same load as a result of the inherent physics. This dependency is linear. This means that if the frequency increases 20 % from 50 Hz to 60 Hz, then the service life for load levels specified in the catalog decreases by 20 % from 20000 down to 16000 hours.
If the frequency decreases 20 % from 50 Hz down to 40 Hz, then the service life for load levels specified in the catalog increases by 20 % from 20000 up to 24000 hours.

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6, it is only permissible that the belt tension acts in parallel or to the mounting plane and the mounting feet must be supported. For the foot-mounted type of construction, both mounting feet must be fixed.

In the basic bearing system version, the floating bearing is always arranged at the non-drive end (NDE) and the fixed bearing at the drive end (DE).

At the non-drive end (NDE), the bearing system is axially preloaded using a spring element. This arrangement guarantees a steady and uniform motor operation without any play (see bearing diagram 1 on the next page).

Reinforced deep-groove ball bearings, bearing series 63 are always used at both ends. For frame sizes 112 to 200, the bearings are sealed at both ends - and for frame sizes 225 to 280, open including the relubrication device.

A measuring nipple for the SPM shock pulse measurement system can be attached to monitor bearing vibration levels. In this case, motors have an M8 threaded bore in each bearing shield together with a measuring nipple with protective cap. If there is a second threaded bore, then this is closed using a sealing plug.
Order code **Q01**

Bearing insulation

To avoid damage caused by bearing currents, the bearings can be insulated for frame sizes 225 up to 280 – recommended from frame size 225 and higher.
Order code **L51** (insulated NDE bearing) means automatically a fixed bearing at the DE

Permanent lubrication

For permanent lubrication, the bearing grease service life is harmonized with the bearing service life. The precondition is that the motor is operated according to what is specified in the catalog. Steel plant motors in the basic version have permanent lubrication.

Regreasing

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

Frame sizes 112 to 200 can be optionally equipped with a nipple for regreasing the bearings.
Order code **L23**

For steel plant motors with regreasing device, regreasing intervals, grease quantity, grease type and possibly additional data are stamped on the lubrication plate or rating plate. Regreasing intervals for the basic version, see Table "Grease service life and regreasing intervals for horizontal mounting".

Mechanical stress, grease service life

As a result of high speeds above the rated speed in converter operation and the resulting increased vibration levels, the mechanical smooth running properties change, and the bearings are subject to increased mechanical stress. As a consequence, the grease service life and the bearing service life decrease (inquire if necessary).

If at all possible, rigid couplings should not be used. As a consequence, specifically for converter operation, the mechanical speed limits, n_{max} at the maximum supply frequency f_{max} should be taken into careful consideration, see the following Table "Mechanical speed limits n_{max} at the maximum supply frequency f_{max}".

We provide the SIPLUS CMS condition monitoring systems to monitor mechanical components. In the context of predictive maintenance, maintenance operations can be planned better and executed on time in an optimum fashion.
Order code **Q05**

Overview (steel plant motors)

Mechanical speed limits n_{max} at the maximum supply frequency f_{max} for 1PC14 steel plant motors with reinforced deep-groove ball bearings at both ends

Frame size	Type	4-pole		6-pole	
		nmax	fmax	nmax	fmax
	1PC14.3-	rpm	Hz	rpm	Hz
112 M	**1B…**	4200	140	3600	180
132 S/M	**1C…**	4200	140	3600	180
160 M/L	**1D…**	4200	140	3600	180
180 M/L	**1E...**	4200	140	3600	180
200 L	**2A...**	4200	140	3600	180
225 S/M	**2B…**	4500	150	4400	220
250 M	**2C…**	3700	123	3700	175
280 S/M	**2D…**	3000	100	3000	150

The specified speed limits are applicable for motors without any additional mounted components, for example brakes or rotary encoders. For these types of applications, the characteristic values of the mounted components involved should be taken into consideration.

Grease service life and regreasing intervals for horizontal mounting

Motor series	Frame size	No. of poles	
Permanent lubrication [1]			
			Grease service life up to KT 40°C [2]
1PC14	112 … 200	4, 6	20000 h or 40000 h [3]
Regreasing [1]			
			Regreasing interval up to KT ≤ 60°C [2]
1PC14	112 … 200	4, 6	8000 h [4]
	180 … 280	4, 6	8000 h

Regreasing interval as a function of the cooling medium temperature (KT)

For temperature class 155 (F):
KT 40 to 60 °C regreasing interval 8000 h
KT 60 to 80 °C regreasing interval 4000 h

For temperature class 180 (H),
KT 40 regreasing interval 8000 h
KT 45 to 60 °C regreasing interval 4000 h
KT 65 to 80 °C regreasing interval 2000 h

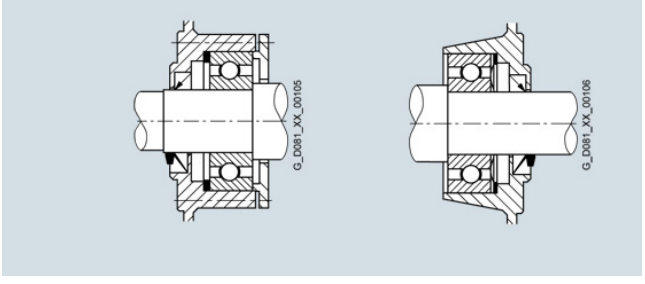
Bearing assignment for 1PC14 steel plant motors

Frame size	No. of poles	Drive end (DE) bearing horizontal and vertical types of construction	Non-drive end (NDE) bearing horizontal and vertical types of construction	Fig. No.
112 M	4, 6	6306 2RS C3	6306 2RS/2Z C3	**Fig. 1**
132 S/M	4, 6	6308 2RS C3	6308 2RS/2Z C3	
160 M/L	4, 6	6310 2RS C3	6310 2RS/2Z C3	
180 M/L	4, 6	6311 2RS C3	6311 2RS/2Z C3	
200 L	4, 6	6313 2RS C3	6313 2RS/2Z C3	
225 S/M	4, 6	6313 C3	6313 C3	
250 M	4, 6	6315 C3	6315 C3	
280 S/M	4, 6	6317 C3	6317 C3	

Bearing type RS for self-ventilated motors, NDE
Bearing type 2Z for non-ventilated motors, NDE

Bearing diagrams (steel plant motors)

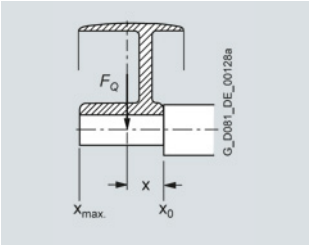
Fig. 1 DE bearing (fixed bearing) NDE bearing (floating bearing)



1) For special application conditions, the grease service life or regreasing interval is available on request.
2) When the cooling medium temperature increases above 80 °C, for each 10 K the grease service life and/or regreasing interval is halved.
3) 40000 h is applicable for horizontally mounted motors with coupling output without any supplementary axial loads.
4) For frame sizes 112 to 200 with relubrication device, the bearings are not equipped with sealing disks.

Overview (steel plant motors)

Permissible cantilever forces



To calculate the permissible cantilever forces for radial loads, the line of action (center of the belt pulley) of the cantilever force F_Q (N) must lie within the free shaft end (dimension x).

Dimension x (mm) is the distance between the point of application of force F_Q and the shaft shoulder. Dimension x_{max} corresponds to the shaft end length.

Total cantilever force $F_Q = c \cdot F_u$

Pretension factor c is a value gained from experience by the belt manufacturer. It can be approximated as follows:

For standard flat leather belts with tensioning roll, c = 2;
For V belts, c = 2 to 2.5;
For special plastic belts depending on the load type and the belt type, c = 2 to 2.5.

Circumferential force F_u (N) is calculated using the equation

F_u circumferential force in N
P rated motor power (transmitted power) kW
n rated motor speed in rpm
D belt pulley diameter in mm

Permissible cantilever forces

1PC1433, 1PC1443 and 1PC1463 steel plant motors at 50 Hz
The following apply: x_0 values for x = 0 and x_{max} values for x = l (l = shaft end)

For motors		Permissible cantilever force	
Frame size	No. of poles	for x_0 N	for x_{max} N
112	4	1960	1555
	6	2270	1800
132	4	2860	2250
	6	3320	2580
160	4	3450	2750
	6	4000	3160
180	4	4110	3270
	6	4720	3740
200	4	5480	4500
	6	6220	5110
225	4	6250	4900
	6	7200	5750
250	4	7600	6200
	6	8750	7350
280	4	8500	7000
	6	9800	8150

Overview (steel plant motors)

Permissible load in the axial direction

Steel plant-motors 1PC14 in a horizontal type of construction

Frame size	Type	1500 rpm Load tensile N	1500 rpm thrust N	1000 rpm Load tensile N	1000 rpm thrust N
112	1PC14.3-1BB2	1810	1250	–	–
	1PC14.3-1BC2	–	–	2090	1530
132	1PC14.3-1CB0	2820	1500	–	–
	1PC14.3-1CB2	2820	1500	–	–
	1PC14.3-1CC0	–	–	3290	1970
	1PC14.3-1CC2	–	–	3290	1970
	1PC14.3-1CC3	–	–	3250	1930
160	1PC14.3-1DB2	3050	2330	–	–
	1PC14.3-1DB4	3020	2300	–	–
	1PC1463-1DB6	2270	2990	–	–
	1PC14.3-1DC2	–	–	3550	2830
	1PC14.3-1DC4	–	–	3480	2760
180	1PC14.3-1EB2	3660	2510	–	–
	1PC14.3-1EB4	3630	2480	–	–
	1PC14.3-1EC4	–	–	4230	3080
200	1PC14.3-2AB5	4430	3620	–	–
	1PC14.3-2AC4	–	–	5210	4400
	1PC14.3-2AC5	–	–	5170	4360
225	1PC14.3-2BB0	3900	4950	–	–
	1PC14.3-2BB2	3900	4950	–	–
	1PC14.3-2BC2	–	–	4700	5750
250	1PC14.3-2CB2	4450	6050	–	–
	1PC14.3-2CC2	–	–	5500	7100
280	1PC14.3-2DB0	5100	6700	–	–
	1PC14.3-2DB2	5000	6600	–	–
	1PC14.3-2DC0	–	–	6350	7900
	1PC14.3-2DC2	–	–	6300	7850

Steel plant-motors 1PC14 in a vertical type of construction

Frame size	Type	1500 rpm **Shaft end facing down** Load facing down N	1500 rpm **down** Load facing up N	1500 rpm **up** Load facing down N	1500 rpm **up** Load facing up N	1000 rpm **down** Load facing down N	1000 rpm **down** Load facing up N	1000 rpm **up** Load facing down N	1000 rpm **up** Load facing up N
112	1PC14.3-1BB2	170	1340	1120	390	–	–	–	–
	1PC14.3-1BC2	–	–	–	–	160	1640	1410	390
132	1PC14.3-1CB0	440	1710	1280	870	–	–	–	–
	1PC14.3-1CB2	440	1710	1280	870	–	–	–	–
	1PC14.3-1CC0	–	–	–	–	470	2150	1780	840
	1PC14.3-1CC2	–	–	–	–	470	2150	1780	840
	1PC14.3-1CC3	–	–	–	–	420	2160	1690	890
160	1PC14.3-1DB2	2760	2610	2040	3330	–	–	–	–
	1PC14.3-1DB4	2680	2640	1960	3360	–	–	–	–
	1PC1463-1DB6	2630	2690	1910	3410	–	–	–	–
	1PC14.3-1DC2	–	–	–	–	3200	3180	2480	3900
	1PC14.3-1DC4	–	–	–	–	3050	3180	2330	3900
180	1PC14.3-1EB2	3240	2920	2090	4070	–	–	–	–
	1PC14.3-1EB4	3180	2930	2020	4090	–	–	–	–
	1PC14.3-1EC4	–	–	–	–	3740	3560	2580	4710
200	1PC14.3-2AB5	3820	4210	3010	5020	–	–	–	–
	1PC14.3-2AC4	–	–	–	–	4570	5010	3760	5820
	1PC14.3-2AC5	–	–	–	–	4470	5060	3660	5870
225	1PC14.3-2BB0	3150	5800	4200	4750	–	–	–	–
	1PC14.3-2BB2	3000	5850	4100	4850	–	–	–	–
	1PC14.3-2BC2	–	–	–	–	3650	6850	4700	5800
250	1PC14.3-2CB2	3250	7250	4850	5650	–	–	–	–
	1PC14.3-2CC2	–	–	–	–	4200	8350	5750	6750
280	1PC14.3-2DB0	3640	8500	5320	6930	–	–	–	–
	1PC14.3-2DB2	3170	8580	4790	6990	–	–	–	–
	1PC14.3-2DC0	–	–	–	–	5000	9570	6630	7990
	1PC14.3-2DC2	–	–	–	–	4700	9700	6350	8150

Overview (steel plant motors)

Mounting system, see Catalog D 81.1, Chapter 1 from Page 1/76

Selection and ordering data

P_N, 50 Hz	P_N, 60 Hz	Frame size	Operating values at rated power: n_N, 50 Hz	M_N, 50 Hz	IE Class 50 Hz	IE Class 60 Hz	η_N, 50 Hz, 4/4	η_N, 50 Hz, 3/4	η_N, 50 Hz, 2/4	$\cos\varphi_{N,5}$ 0 Hz, 4/4	I_N, 50 Hz, 400 V	M_A/M_N 50 Hz	I_A/I_N 50 Hz	M_K/M_N 50 Hz	L_{pfA}, 50 Hz	L_{WA}, 50 Hz	Cast iron series 1PC1433 – IE3 version in accordance with IEC 60034-30 Article No.	mIM B3	J	Torque class
kW	kW	FS	rpm	Nm			%	%	%		A				dB(A)	dB(A)		kg	kgm^2	CL
• Cooling: Self-ventilated (IC411) • Efficiency: Premium Efficiency IE3, service factor (SF) 1.15 • Insulation: Thermal class 155 (temperature class F), degree of protection IP55, utilized according to thermal class 130 (temperature class B)																				
4-pole: 1500 rpm at 50 Hz, 1800 rpm at 60 Hz [1]																				
4	4.55	112 M	1460	26	IE3	IE3	88.6	89.2	88.6	0.82	7.90	2.4	7.1	3.7	58	70	1PC1433-1BB2■-■■■■	47	0.017	16
5.5	6.3	132 S	1470	36	IE3	IE2	89.6	90.1	89.5	0.84	10.5	2.1	7.2	3.4	64	76	1PC1433-1CB0■-■■■■	75	0.046	16
7.5	8.6	132 M	1470	49	IE3	IE2	90.4	91.1	90.8	0.84	14.3	2.4	7.4	3.5	64	76	1PC1433-1CB2■-■■■■	83	0.046	16
11	12.6	160 M	1475	71	IE3	IE3	91.4	91.9	91.4	0.84	20.5	2.2	6.8	3.2	65	77	1PC1433-1DB2■-■■■■	116	0.083	16
15	17.3	160 L	1475	97	IE3	IE3	92.1	92.3	91.5	0.82	28.5	2.5	8.5	3.8	65	77	1PC1433-1DB4■-■■■■	135	0.099	16
18.5	21.3	180 M	1470	120	IE3	IE3	92.6	93.1	92.9	0.82	35.0	2.5	7.2	3.3	66	73	1PC1433-1EB2■-■■■■	172	0.13	16
22	25.3	180 L	1470	143	IE3	IE3	93.0	93.7	93.6	0.83	41.0	2.3	6.8	3.3	68	75	1PC1433-1EB4■-■■■■	182	0.14	16
30	34.5	200 L	1470	195	IE3	IE2	93.6	94.0	93.7	0.84	55.0	2.6	7.3	3.1	65	72	1PC1433-2AB5■-■■■■	246	0.22	16
37	42.5	225 S	1478	239	IE3	IE2	93.9	94.5	94.4	0.86	66.0	2.5	6.4	2.7	65	78	1PC1433-2BB0■-■■■■	295	0.42	16
45	52	225 M	1478	291	IE3	IE2	94.2	94.9	95.1	0.86	80.0	2.6	6.4	2.7	65	78	1PC1433-2BB2■-■■■■	330	0.47	16
55	63	250 M	1482	354	IE3	IE2	94.6	95.1	95.0	0.87	96.0	2.5	6.8	2.9	66	79	1PC1433-2CB2■-■■■■	430	0.85	16
75	86	280 S	1485	482	IE3	IE2	95.0	95.3	95.0	0.86	133	2.5	6.9	3.0	69	83	1PC1433-2DB0■-■■■■	580	1.4	16
90	104	280 M	1485	579	IE3	IE2	95.2	95.5	95.3	0.87	157	2.6	7.2	3.0	70	84	1PC1433-2DB2■-■■■■	680	1.7	16

Voltages				No. of poles	Frame size	Motor type	Version				Order code(s)
50 Hz	230 VΔ/400 VY	60 Hz 1)	460 VY	4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**	2	2		–
50 Hz	400 VΔ/690 VY	60 Hz 1)	460 VΔ	4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**	3	4		–
50 Hz	500 VY			4, 6	112 M ... 280 M	1PC1433-1B ... -2D	No additional price	2	7		–
50 Hz	500 VΔ			4, 6	112 M ... 280 M	1PC1433-1B ... -2D	No additional price	4	0		–
Additional voltages 1)			Pricing information, codes, order codes, descriptions Page 3/2					9	0		. . .
Types of construction				No. of poles	Frame size	Motor type	Version				Order code(s)
Without flange		IM B3 2)		4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**			A	–
With flange		IM B5 2)		4, 6	112 M ... 280 M	1PC1433-1B ... -2D	With additional price			F	–
Additional types of construction			Pricing information, codes, order codes, descriptions Page 3/3							■	. . .
Motor protection				No. of poles	Frame size	Motor type	Version				Order code(s)
PTC thermistor with 3 temperature sensors				4, 6	112 M ... 280 M	1PC1433-1B ... -2D	With additional price			B	–
Additional motor protection			Pricing information, codes, order codes, descriptions Page 3/4							■	. . .
Terminal box position				No. of poles	Frame size	Motor type	Version				Order code(s)
Top-mounted terminal box				4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**			4	–
Additional terminal box positions			Pricing information, codes, order codes, descriptions Page 3/5								
Special versions				No. of poles	Frame size	Motor type					Order code(s)
Options			Pricing information, order codes and descriptions, from Page 3/6				1PC1433-. . . . ■ – ■■■■				-Z . . .+. . .+. . .+. . .

1) Betriebswerte bei Bemessungsleistung für 60 Hz sind im Drive Technology Konfigurator (DT-Konfigurator; siehe Anhang unter „Tools und Projektierung“) hinterlegt.

2) Abgeleitete Bauformen von IM B3 (IM B6/7/8, IM V6 und IM V5), von IM B5 (IM V3 und IM V1) und von IM B14 (IM V19 und IM V18) möglich, sofern keine Stempelung dieser Bauformen auf dem Leistungsschild gefordert sind. Standardmäßig wird die Grundbauform IM B3, IM B5 oder IM B14 auf das Leistungsschild gestempelt. Bei abweichender Einbaulage ist die Angabe der Einbaulage zur richtigen Positionierung der Kondenswasserlöcher notwendig.

Selection and ordering data (continued)

			Operating values at rated power														Cast iron series 1PC1433 – IE3 version in accordance with IEC 60034-30 Article No.			
P_N, 50 Hz	P_N, 60 Hz	Frame size	nN, 50 Hz	MN, 50 Hz	IE Class 50 Hz	60 H z	ηN, 50 Hz, 4/4	ηN, 50 Hz, 3/4	ηN, 50 Hz, 2/4	cos φN, 50 Hz, 4/4	IN, 50 Hz, 400 V	MA/MN 50 Hz	IA/IN 50 Hz	MK/MN 50 Hz	LpfA, 50 Hz	LWA, 50 Hz		m*IM B3* kg	J kgm2	*Torque Class* CL
kW	kW	FS	rpm	Nm			%	%	%		A				dB(A)	dB(A)				
• Cooling: Self-ventilated (IC411) • Efficiency: Premium Efficiency IE3, service factor (SF) 1.15 • Insulation: Thermal class 155 (temperature class F), degree of protection IP55, utilized according to thermal class 130 (temperature class B)																				
6-pole: 1000 rpm at 50 Hz, 1200 rpm at 60 Hz [1]																				
2.2	2.55	112 M	970	22	IE3	IE2	84.3	85.0	83.9	0.75	5.00	2.2	5.6	2.8	65	74	1PC1433-1BC2 ■.■■■■	48	0.017	13
3	3.45	132 S	975	30	IE3	IE2	85.6	86.9	86.6	0.77	6.60	1.6	5.3	2.4	63	75	1PC1433-1CC0 ■.■■■■	71	0.029	13
4	4.55	132 M	975	39	IE3	IE2	86.8	88.0	87.8	0.77	8.60	1.7	5.6	2.5	63	75	1PC1433-1CC2 ■.■■■■	71	0.037	13
5.5	6.3	132 M	975	54	IE3	IE2	88.0	89.1	88.8	0.77	11.7	1.8	5.7	2.6	63	75	1PC1433-1CC3 ■.■■■■	84	0.046	13
7.5	8.6	160 M	980	73	IE3	IE2	89.1	90.1	89.7	0.76	16.0	1.9	4.9	2.3	67	79	1PC1433-1DC2 ■.■■■■	128	0.098	13
11	12.6	160 L	975	108	IE3	IE2	90.3	91.2	90.8	0.77	23.0	1.9	5.0	2.3	67	79	1PC1433-1DC4 ■.■■■■	153	0.12	13
15	18	180 L	975	147	IE3	IE2	91.2	92.0	91.9	0.80	29.5	2.3	5.9	2.8	61	68	1PC1433-1EC4 ■.■■■■	169	0.19	16
18.5	22	200 L	978	181	IE3	IE2	91.7	92.5	92.4	0.79	37.0	2.5	5.6	2.6	64	71	1PC1433-2AC4 ■.■■■■	221	0.28	16
22	26.5	200 L	978	215	IE3	IE2	92.2	93.1	93.2	0.79	43.5	2.5	5.6	2.6	61	68	1PC1433-2AC5 ■.■■■■	236	0.32	16
30	36	225 M	982	292	IE3	IE2	92.9	93.6	93.5	0.83	56.0	2.6	6.6	3.0	64	77	1PC1433-2BC2 ■.■■■■	330	0.67	16
37	44.5	250 M	985	359	IE3	IE2	93.3	94.0	94.0	0.85	67.0	2.7	7.0	2.9	62	75	1PC1433-2CC2 ■.■■■■	415	1	16
45	54	280 S	988	435	IE3	IE2	93.7	94.3	94.2	0.85	82.0	3.0	6.8	2.8	60	74	1PC1433-2DC0 ■.■■■■	520	1.4	16
55	66	280 M	988	532	IE3	IE2	94.1	94.6	94.4	0.85	99.0	3.2	7.2	3.0	60	74	1PC1433-2DC2 ■.■■■■	570	1.6	16

Voltages				No. of poles	Frame size	Motor type	Version			Order code(s)
50 Hz	230 VΔ/400 VY	60 Hz 1)	460 VY	4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**	2	2	–
50 Hz	400 VΔ/690 VY	60 Hz 1)	460 VΔ	4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**	3	4	–
50 Hz	500 VY			4, 6	112 M ... 280 M	1PC1433-1B ... -2D	No additional price	2	7	–
50 Hz	500 VΔ			4, 6	112 M ... 280 M	1PC1433-1B ... -2D	No additional price	4	0	–
Additional voltages 1)			Pricing information, codes, order codes, descriptions Page 3/2					9	0	. . .
Types of construction				No. of poles	Frame size	Motor type	Version			Order code(s)
Without flange		IM B3 2)		4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**		A	–
With flange		IM B5 2)		4, 6	112 M ... 280 M	1PC1433-1B ... -2D	With additional price		F	–
Additional types of construction			Pricing information, codes, order codes, descriptions Page 3/3						■	. . .
Motor protection				No. of poles	Frame size	Motor type	Version			Order code(s)
PTC thermistor with 3 temperature sensors				4, 6	112 M ... 280 M	1PC1433-1B ... -2D	With additional price		B	–
Additional motor protection			Pricing information, codes, order codes, descriptions Page 3/4						■	. . .
Terminal box position				No. of poles	Frame size	Motor type	Version			Order code(s)
Top-mounted terminal box				4, 6	112 M ... 280 M	1PC1433-1B ... -2D	**Normal**		4	–
Additional terminal box positions			Pricing information, codes, order codes, descriptions Page 3/5							
Special versions				No. of poles	Frame size	Motor type				Order code(s)
Options			Pricing information, order codes and descriptions, from Page 3/6				1PC1433-. . . . ■ – ■■■■		-Z	. . .+. . .+. . .+. . .

1) Betriebswerte bei Bemessungsleistung für 60 Hz sind im DriveTechnology Konfigurator (DT-Konfigurator; siehe Anhang unter „Tools und Projektierung“) hinterlegt.

2) Abgeleitete Bauformen von IM B3 (IM B6/7/8, IM V6 und IM V5), von IM B5 (IM V3 und IM V1) und von IM B14 (IM V19 und IM V18) möglich, sofern keine Stempelung dieser Bauformen auf dem Leistungsschild gefordert sind. Standardmäßig wird die Grundbauform IM B3, IM B5 oder IM B14 auf das Leistungsschild gestempelt. Bei abweichender Einbaulage ist die Angabe der Einbaulage zur richtigen Positionierung der Kondenswasserlöcher notwendig.

Steel plant motors 1PC1443 self-ventilated – line voltage 400 V/50 Hz, 440 V/60 Hz

Selection and ordering data

P_N, 50 Hz	P_N, 60 Hz	Frame size	Connection	Operating values at rated power fN	MN	ηN, 4/4 for converter operation	cosφN, 4/4	IN	1PC1443 cast iron series - version specifically for converter operation
kW	kW	FS		Hz	Nm	%		A	Article No.
• Cooling: Self ventilated (IC 411) • Insulation: Thermal class 155 (temperature class F), degree of protection IP55, utilized according to thermal class 155 (temperature class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 400 V/50 Hz, 440 V/60 Hz									
4-pole: 1500 rpm at 50 Hz, 1800 rpm at 60 Hz [1]									
4		112 M	Y	51.4	25.5	88.6	0.82	7.9	1PC1443-1BB2 . - . . . .
	4.55		Y	61.4	24.1	89.5	0.83	7.7	
5.5		132 S	Y	51.0	35.0	89.6	0.82	10.8	1PC1443-1CB0 . - . . . .
	6.3		Y	61.0	33.4	91.7	0.83	10.4	
7.5		132 M	Y	51.0	47.7	90.4	0.84	14.3	1PC1443-1CB2 . - . . . .
	8.6		Y	61.0	45.6	91.7	0.85	13.8	
11		160 M	Y	50.9	70.0	91.4	0.84	20.5	1PC1443-1DB2 . - . . . .
	12.6		Y	60.9	67.0	92.4	0.85	20.0	
15		160 L	Y	50.7	96.0	92.1	0.82	28.5	1PC1443-1DB4 . - . . . .
	17.5		Y	60.8	93.0	93.6	0.83	28.0	
18.5		180 M	Δ	51.0	118.0	92.6	0.82	35.0	1PC1443-1EB2 . - . . . .
	21.3		Δ	61.0	113.0	93.6	0.83	34.5	
22		180 L	Δ	51.1	140.0	93.0	0.83	41.0	1PC1443-1EB4 . - . . . .
	25.3		Δ	61.2	134.0	93.6	0.83	41.0	
30		200 L	Δ	50.9	191.0	93.6	0.84	55.0	1PC1443-2AB5 . - . . . .
	34.5		Δ	60.9	183.0	93.0	0.85	55.0	
37		225 S	Δ	50.7	236.0	93.9	0.86	66.0	1PC1443-2BB0 . - . . . .
	42.5		Δ	60.8	225.0	93.6	0.86	66.0	
45		225 M	Δ	50.8	286.0	94.2	0.86	80.0	1PC1443-2BB2 . - . . . .
	52		Δ	60.8	276.0	94.1	0.86	81.0	
55		250 M	Δ	50.6	350.0	94.6	0.87	96.0	1PC1443-2CB2 . - . . . .
	63		Δ	60.6	334.0	94.1	0.87	97.0	
75		280 S	Δ	50.5	477.0	95.0	0.86	133.0	1PC1443-2DB0 . - . . . .
	86		Δ	60.5	456.0	94.5	0.87	131.0	
90		280 M	Δ	50.5	573.0	95.2	0.87	157.0	1PC1443-2DB2 . - . . . .
	104		Δ	60.5	552.0	95.0	0.87	158.0	
6-pole: 1000 rpm at 50 Hz, 1200 rpm at 60 Hz									
2.2		112 M	Y	51.6	21.0	84.3	0.75	4.7	1PC1443-1BC2 . - . . . .
	2.55		Y	61.6	20.3	87.5	0.77	4.75	
3		132 S	Y	51.0	28.7	85.6	0.76	6.7	1PC1443-1CC0 . - . . . .
	3.45		Y	61.0	27.5	89.5	0.77	6.3	
4		132 M	Y	51.2	38.2	86.8	0.77	8.6	1PC1443-1CC2 . - . . . .
	4.55		Y	61.2	36.2	89.5	0.78	8.2	
5.5		132 M	Y	51.2	53.0	88.0	0.78	11.6	1PC1443-1CC3 . - . . . .
	6.3		Y	61.2	50.0	91.0	0.78	11.1	
7.5		160 M	Y	51.1	72.0	89.1	0.76	16.0	1PC1443-1DC2 . - . . . .
	8.6		Y	61.1	68.0	91.0	0.76	15.6	
11		160 L	Y	51.1	105.0	90.3	0.77	23.0	1PC1443-1DC4 . - . . . .
	12.6		Y	61.1	100.0	91.7	0.77	22.5	
15		180 L	Δ	51.4	143.0	91.2	0.80	29.5	1PC1443-1EC4 . - . . . .
	18		Δ	61.4	143.0	91.7	0.81	30.5	
18.5		200 L	Δ	51.2	176.0	91.7	0.79	37.0	1PC1443-2AC4 . - . . . .
	22		Δ	61.2	175.0	91.7	0.80	37.5	
22		200 L	Δ	51.3	210.0	92.2	0.79	43.5	1PC1443-2AC5 . - . . . .
	26.5		Δ	61.4	211.0	93.0	0.81	26.5	
30		225 M	Δ	51.0	286.0	92.9	0.83	56.0	1PC1443-2BC2 . - . . . .
	36		Δ	61.1	286.0	93.0	0.84	58.0	
37		250 M	Δ	50.8	353.0	93.3	0.85	67.0	1PC1443-2CC2 . - . . . .
	44.5		Δ	60.9	354.0	93.6	0.85	70.0	
45		280 S	Δ	50.6	430.0	93.7	0.85	82.0	1PC1443-2DC0 . - . . . .
	54		Δ	60.6	430.0	93.6	0.86	84.0	
55		280 M	Δ	50.6	525.0	94.1	0.85	99.0	1PC1443-2DC2 . - . . . .
	66		Δ	60.7	525.0	94.1	0.85	104.0	

All the technical data for converter operation

Selection and ordering data (continued)

Motor type	*m*IM B3	*J*	*L*pfA, Tolerance +3 dB(A) Load	*L*WA, Tolerance +3 dB(A) Load	Mech. speed limit	Terminal box type	**Preferred Motor Modules of the SINAMICS S120 other SINAMICS converters also possible – low-overload operating mode** [1]	Base load current *I*CH	Rated current *I*N	Single motor module booksize Width
	kg	kgm²	dB(A)	dB(A)	rpm		Type	A	A	mm
1PC1443-1BB2 . -	47	0.017	58.0	70.0	4200	TB1F01 ...	6SL3210-1TE21-0AA3	7.7	9.0	50
	47	0.017	62.0	74.0	4200		6SL3210-1TE21-0AA3	7.7	9.0	50
1PC1443-1CB0 . -	75	0.034	64.0	76.0	4200	TB1H01	6SL3210-1TE21-8AA3	15.3	18.0	50
	75	0.034	68.0	80.0	4200		6SL3210-1TE21-8AA3	15.3	18.0	50
1PC1443-1CB2 . -	83	0.046	64.0	76.0	4200	TB1H01	6SL3210-1TE21-8AA3	15.3	18.0	50
	83	0.046	68.0	80.0	4200		6SL3210-1TE21-8AA3	15.3	18.0	50
1PC1443-1DB2 . -	116	0.083	65.0	77.0	4200	TB1J01	6SL3210-1TE23-0AA3	25.5	30.0	100
	116	0.083	69.0	81.0	4200		6SL3210-1TE23-0AA3	25.5	30.0	100
1PC1443-1DB4 . -	135	0.099	65.0	77.0	4200	TB1J01	6SL3210-1TE23-0AA3	25.5	30.0	100
	135	0.099	69.0	81.0	4200		6SL3210-1TE23-0AA3	25.5	30.0	100
1PC1443-1EB2 . -	172	0.13	66.0	73.0	4200	TB1J01	6SL3210-1TE24-5AA3	38.0	45.0	150
	172	0.13	68.0	75.0	4200		6SL3210-1TE24-5AA3	38.0	45.0	150
1PC1443-1EB4 . -	182	0.14	68.0	75.0	4200	TB1J01	6SL3210-1TE24-5AA3	38.0	45.0	150
	182	0.14	70.0	77.0	4200		6SL3210-1TE24-5AA3	38.0	45.0	150
1PC1443-2AB5 . -	246	0.22	65.0	72.0	4200	TB1L01	6SL3210-1TE26-0AA3	52.0	60.0	150
	246	0.22	67.0	74.0	4200		6SL3210-1TE26-0AA3	52.0	60.0	150
1PC1443-2BB0 . -	295	0.42	65.0	78.0	4500	TB1L01	6SL3210-1TE28-5AA3	68.0	85.0	200
	295	0.42	68.0	82.0	4500		6SL3210-1TE28-5AA3	68.0	85.0	200
1PC1443-2BB2 . -	330	0.47	65.0	78.0	4500	TB1L01	6SL3210-1TE28-5AA3	68.0	85.0	200
	330	0.47	68.0	82.0	4500		6SL3210-1TE28-5AA3	68.0	85.0	200
1PC1443-2CB2 . -	430	0.85	66.0	79.0	3700	TB1N01	6SL3210-1TE31-3AA3	105.0	132.0	300
	430	0.85	68.0	82.0	3700		6SL3210-1TE31-3AA3	105.0	132.0	300
1PC1443-2DB0 . -	580	1.40	69.0	83.0	3000	TB1N01	6SL3210-1TE32-0AA4	141.0	200.0	300
	580	1.39	77.0	91.0	3000		6SL3210-1TE32-0AA4	141.0	200.0	300
1PC1443-2DB2 . -	680	1.7	70.0	84.0	3000	TB1N01	6SL3210-1TE32-0AA4	141.0	200.0	300
	680	1.7	79.0	93.0	3000		6SL3210-1TE32-0AA4	141.0	200.0	300
1PC1443-1BC2 . -	48	0.017	65.0	74.0	3600	TB1F01 ...	6SL3210-1TE15-0AA3	4.3	5.0	50
	48	0.017	65.0	77.0	3600		6SL3210-1TE15-0AA3	4.3	5.0	50
1PC1443-1CC0 . -	71	0.037	63.0	75.0	3600	TB1H01	6SL3210-1TE21-0AA3	7.7	9.0	50
	71	0.037	67.0	79.0	3600		6SL3210-1TE21-0AA3	7.7	9.0	50
1PC1443-1CC2 . -	71	0.037	63.0	75.0	3600	TB1H01	6SL3210-1TE21-0AA3	7.7	9.0	50
	71	0.037	67.0	79.0	3600		6SL3210-1TE21-0AA3	7.7	9.0	50
1PC1443-1CC3 . -	84	0.046	63.0	75.0	3600	TB1H01	6SL3210-1TE21-8AA3	15.3	18.0	50
	84	0.046	67.0	79.0	3600		6SL3210-1TE21-8AA3	15.3	18.0	50
1PC1443-1DC2 . -	128	0.098	67.0	79.0	3600	TB1J01	6SL3210-1TE21-8AA3	15.3	18.0	50
	128	0.098	70.0	82.0	3600		6SL3210-1TE21-8AA3	15.3	18.0	50
1PC1443-1DC4 . -	153	0.12	67.0	79.0	3600	TB1J01	6SL3210-1TE23-0AA3	25.5	30.0	100
	153	0.12	70.0	82.0	3600		6SL3210-1TE23-0AA3	25.5	30.0	100
1PC1443-1EC4 . -	169	0.19	61.0	68.0	3600	TB1J01	6SL3210-1TE23-0AA3	25.5	30.0	100
	169	0.19	61.0	68.0	3600		6SL3210-1TE23-0AA3	25.5	30.0	100
1PC1443-2AC4 . -	221	0.28	64.0	71.0	3600	TB1L01	6SL3210-1TE24-5AA3	38.0	45.0	150
	221	0.28	64.0	71.0	3600		6SL3210-1TE24-5AA3	38.0	45.0	150
1PC1443-2AC5 . -	236	0.32	61.0	68.0	3600	TB1L01	6SL3210-1TE24-5AA3	38.0	45.0	150
	236	0.32	63.0	70.0	3600		6SL3210-1TE24-5AA3	38.0	45.0	150
1PC1443-2BC2 . -	330	0.67	64.0	77.0	4400	TB1L01	6SL3210-1TE26-0AA3	52.0	60.0	150
	330	0.67	66.0	80.0	4400		6SL3210-1TE26-0AA3	52.0	60.0	150
1PC1443-2CC2 . -	415	1.00	62.0	75.0	3700	TB1N01	6SL3210-1TE28-5AA3	68.0	85.0	200
	415	1.00	63.0	76.0	3700		6SL3210-1TE28-5AA3	68.0	85.0	200
1PC1443-2DC0 . -	520	1.40	60.0	74.0	3000	TB1N01	6SL3210-1TE28-5AA3	68.0	85.0	200
	520	1.40	66.0	80.0	3000		6SL3210-1TE28-5AA3	68.0	85.0	200
1PC1443-2DC2 . -	570	1.60	60.0	74.0	3000	TB1N01	6SL3210-1TE31-3AA3	105.0	132.0	300
	570	1.60	66.0	80.0	3000		6SL3210-1TE31-3AA3	105.0	132.0	300

[1] Zusätzlich zum Power Module werden eine Control Unit und ein Operator Panel benötigt (siehe Kataloge D 31 bzw D 35).

Selection and ordering data

P_N, 50 Hz	P_N, 60 Hz	Frame size	Con-nection	Operating values at rated power: f_N	M_N	η_N, 4/4 for converter operation	$\cos\varphi_N$, 4/4	I_N	m IM B3	J	L_{pfA}, Tolerance +3 dB(A) Load	L_{WA}, Tolerance +3 dB(A) Load	Mech. speed limit	Terminal box type	**Cast iron series 1PC1463 –** Version specifically for converter operation
kW	kW	FS		Hz	Nm	%		A	kg	kgm²	dB(A)	dB(A)	rpm		Article No.
• Cooling: Non-ventilated in an enclosed version without external fan (IC 410) • Insulation: Thermal class 155 (temperature class F), degree of protection IP55, utilized according to thermal class 155 (temperature class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 400 V/50 Hz, 440 V/60 Hz															
4-pole: 1500 rpm at 50 Hz, 1800 rpm at 60 Hz [1]															
3.1	O.R.	**112 M**	Y O.R.	50.85 O.R.	20.0 O.R.	87.8 O.R.	0.73 O.R.	7.00 O.R.	47 O.R.	0.017 O.R.	57 O.R.	70 O.R.	4200 O.R.	TB1F01 ...	**1PC1463-1BB2 . - . . . .**
4.8	O.R.	**132 S**	Y O.R.	50.55 O.R.	31.0 O.R.	90.2 O.R.	0.72 O.R.	10.8 O.R.	74 O.R.	0.040 O.R.	58 O.R.	71 O.R.	4200 O.R.	TB1H01	**1PC1463-1CB0 . - . . . .**
6.1	O.R.	**132 M**	Y O.R.	50.70 O.R.	39.0 O.R.	91.3 O.R.	0.76 O.R.	12.6 O.R.	81 O.R.	0.046 O.R.	59 O.R.	72 O.R.	4200 O.R.	TB1H01	**1PC1463-1CB2 . - . . . .**
8	O.R.	**160 L**	Y O.R.	50.50 O.R.	51.0 O.R.	91.5 O.R.	0.72 O.R.	17.5 O.R.	130 O.R.	0.099 O.R.	59 O.R.	72 O.R.	4200 O.R.	TB1J01	**1PC1463-1DB4 . - . . . .**
9.3	O.R.	**160 L**	Y O.R.	50.50 O.R.	60.0 O.R.	92.5 O.R.	0.76 O.R.	19.1 O.R.	140 O.R.	0.11 O.R.	58 O.R.	71 O.R.	4200 O.R.	TB1J01	**1PC1463-1DB6 . - . . . .**
11	O.R.	**180 M**	Δ O.R.	50.60 O.R.	71.0 O.R.	93.5 O.R.	0.72 O.R.	23.5 O.R.	170 O.R.	0.13 O.R.	59 O.R.	72 O.R.	4200 O.R.	TB1J01	**1PC1463-1EB2 . - . . . .**
13	O.R.	**180 L**	Δ O.R.	50.70 O.R.	84.0 O.R.	94.1 O.R.	0.73 O.R.	27.5 O.R.	180 O.R.	0.14 O.R.	60 O.R.	73 O.R.	4200 O.R.	TB1J01	**1PC1463-1EB4 . - . . . .**
6-pole: 1000 rpm at 50 Hz, 1200 rpm at 60 Hz															
8.5	O.R.	**180 L**	Δ O.R.	50.80 O.R.	82.0 O.R.	92.2 O.R.	0.65 O.R.	20.5 O.R.	165 O.R.	0.19 O.R.	56 O.R.	69 O.R.	3600 O.R.	TB1J01	**1PC1463-1EC4 . - . . . .**
14.5	O.R.	**200 L**	Δ O.R.	50.60 O.R.	140 O.R.	93.0 O.R.	0.64 O.R.	35 O.R.	245 O.R.	0.32 O.R.	61 O.R.	74 O.R.	3600 O.R.	TB1L01	**1PC1463-2AC5 . - . . . .**
21	O.R.	**225 M**	Δ O.R.	50.55 O.R.	201 O.R.	92.8 O.R.	0.71 O.R.	46 O.R.	330 O.R.	0.67 O.R.	63 O.R.	76 O.R.	4400 O.R.	TB1L01	**1PC1463-2BC2 . - . . . .**
25	O.R.	**250 M**	Δ O.R.	50.40 O.R.	239 O.R.	93.6 O.R.	0.72 O.R.	54 O.R.	410 O.R.	1.00 O.R.	65 O.R.	78 O.R.	3700 O.R.	TB1N01	**1PC1463-2CC2 . - . . . .**
30	O.R.	**280 S**	Δ O.R.	50.35 O.R.	286 O.R.	93.8 O.R.	0.73 O.R.	63 O.R.	510 O.R.	1.40 O.R.	74 O.R.	85 O.R.	3000 O.R.	TB1N01	**1PC1463-2DC0 . - . . . .**
36	O.R.	**280 M**	Δ O.R.	50.35 O.R.	344 O.R.	94.1 O.R.	0.74 O.R.	75 O.R.	550 O.R.	1.60 O.R.	74 O.R.	85 O.R.	3000 O.R.	TB1N01	**1PC1463-2DC2 . - . . . .**

All the technical data for converter operation

*) Zusätzlich zum Power Module werden eine Control Unit und ein Operator Panel benötigt (siehe Kataloge D 31 bzw. D 35).

Selection and ordering data

Voltages	Article No. supplements										
	Voltage code 12th and 13th position of the Article No.	Additional identification code with order code and plain text if required	Frame size								
			112	132	160 ①	180	200	225	250	280	
			1PC1433 (DOL) ②								IEC IE3
			1PC1443 (VSD)								
			1PC1463+D7:Y34 (VSD)								
1PC14 . . - . . . . ■ - ■ . . .		Order code	112	132	160	180	200	225	250	280	
Voltage at 50 Hz or 60 Hz											
50 Hz 400 VY, 60 Hz 460 VY	**02**	-	◘	◘	◘	-	-	-	-	-	Only for: ② and ③
50 Hz 230 VΔ/400 VY, 60 Hz 460 VY	**22**	-	◘	◘	◘	◘	◘	◘	◘	◘	Only for: ②
50 Hz 400 VΔ/690 VY, 60 Hz 460 VΔ	**34**	-	◘	◘	◘	◘	◘	◘	◘	◘	Only for: ②
50 Hz 400 VΔ, 60 Hz 460 VΔ	**04**		-	-	-	◘	◘	◘	◘	◘	Only for: ② and ③
50 Hz 500 VY	**27**	-	○	○	○	○	○	○	○	○	Only for:
50 Hz 500 VΔ	**40**	-	○	○	○	○	○	○	○	○	Only for:
50 Hz 220 VΔ/380 VY, 60 Hz 440 VΔ	**21**	-	✓	✓	✓	✓	✓	✓	✓	✓	Only for: ③
50 Hz 380 VΔ/660 VY, 60 Hz 440 VΔ [1]	**33**	-	✓	✓	✓	✓	✓	✓	✓	✓	Only for: ③
50 Hz 380 VΔ			✓	✓	✓	✓	✓	✓	✓	✓	Only for: ③
50 Hz 240 VΔ/415 VY, 60 Hz 480 VY	**23**	-	✓	✓	✓	✓	✓	✓	✓	✓	Only for: ③
50 Hz 415 VΔ, 60 Hz 480 VΔ	**35**	-	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
Voltage at 60 Hz and required power											
220 VΔ/380 VY; 50-Hz-power	**90**	**M2A**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
220 VΔ/380 VY; 60-Hz-power	**90**	**M1A**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
380 VΔ/660 VY; 50-Hz-power	**90**	**M2B**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
380 VΔ; 50-Hz-power			✓	✓	✓	✓	✓	✓	✓	✓	Only for:
380 VΔ/660 VY; 60-Hz-power	**90**	**M1B**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
440 VY; 50-Hz-power	**90**	**M2C**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
440 VY; 60-Hz-power	**90**	**M1C**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
440 VΔ; 50-Hz-power	**90**	**M2D**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
440 VΔ; 60-Hz-power	**90**	**M1D**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
460 VY; 50-Hz-power	**90**	**M2E**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
460 VY; 60-Hz-power	**90**	**M1E**	○	○	○	○	○	○	○	○	Only for:
460 VΔ; 50-Hz-power	**90**	**M2F**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
460 VΔ; 60-Hz-power	**90**	**M1F**	○	○	○	○	○	○	○	○	Only for:
575 VY; 50-Hz-power	**90**	**M2G**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
575 VY; 60-Hz-power	**90**	**M1G**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
575 VΔ; 50-Hz-power	**90**	**M2H**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
575 VΔ; 60-Hz-power	**90**	**M1H**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:
Non-standard voltage and/or frequencies											
Non-standard winding [1]	**90**	**M1Y** • and customer specifi-cations	✓	✓	✓	✓	✓	✓	✓	✓	

Selection and ordering data

◘	Normal version
○	No additional cost
•	This order code only defines the version from a pricing perspective – additional plain text is required.
✓	With additional price
–	Not possible

1) Plain text must be specified when ordering: Voltage between 200 and 690 V (Voltages outside the range on request), frequency, connection, for 60 Hz additionally required rated power in kW.

Selection and ordering data

Types of construction		Article No. Supplements		Frame size									
		Type of construction code letter 14th position of the Article No.	Additional identification code with order code and plain text if required	112	132	160 ①	180	200	225	250	280		
				1PC1433 (DOL) ②								IEC	IE3
				1PC1443 (VSD) ③									
				1PC1463 (VSD)									
1PC14 . . - . . . . . -. ■ . .		■ . .	Order code	112	132	160	180	200	225	250	280		
Without flange													
IM B3		**A**	**–**	□	□	□	□	□	□	□	□		
With flange		**DIN EN 50347**		**FF215**	**FF265**	**FF300**	**FF300**	**FF350**	**FF400**	**FF500**	**FF500**		
		DIN 42948		**A 250**	**A 300**	**A 350**	**A 350**	**A 400**	**A 450**	**A 550**	**A 550**		
IM B5		**F**	**–**	✓	✓	✓	✓	✓	✓	✓	✓		
IM V1 without protective cover		**G**	**–**	✓	✓	✓	✓	✓	✓	✓	✓		
IM V1 with protective cover		**G**	**H00**	✓	✓	✓	✓	✓	✓	✓	✓		
IM V3		**H**	**–**	✓	✓	✓	✓	✓	✓	✓	✓		
IM B35		**J**	**–**	✓	✓	✓	✓	✓	✓	✓	✓		

□ Normal version
✓ With additional price

Selection and ordering data

Motor protection	Article No. Supplement											
	Motor protection code 15th position of the Article No.	Additional identification code with order code and plain text if required	Frame size									
			112	132	① 160	180	200	225	250	280		
			1PC1433 (DOL)		②						IEC	IE3
			1PC1443 (VSD)		③							
			1PC1463 (VSD)									
			Frame size									
1PC14 . . -. . . . . -. .	■ .		112	132	160	180	200	225	250	280		
Motor protection (winding protection)												
Without (Standard)	**A**	-	□	□	□	□	□	□	□	□	Not for:	and standard at ④
3 PTC thermistors – for tripping (2 terminals)	**B**	-	✓	✓	✓	✓	✓	✓	✓	✓		
6 PTC thermistors – for alarm and tripping (4 terminals)	**C**	-	✓	✓	✓	✓	✓	✓	✓	✓	standard at	and
1 temperature sensor KTY84-130 (2 terminals)	**F**	-	✓	✓	✓	✓	✓	✓	✓	✓		
2 temperature sensors KTY84-130 (4 terminals)	**G**	-	✓	✓	✓	✓	✓	✓	✓	✓		
3 Pt100 resistance thermometers – 2-wire circuit (6 terminals)	**H**	-	✓	✓	✓	✓	✓	✓	✓	✓		
6 Pt100 resistance thermometers – 2-wire circuit (12 terminals)	**J**	-	-	-	-	✓	✓	✓	✓	✓		

□ Normal version
✓ With additional price
– Not possible

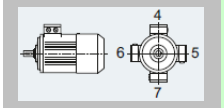
Note:
Options are also specifically available for bearing protection -
For order codes and descriptions, see from Page 3/6 and higher.

Article number supplements and special versions

Terminal box position

Steel plant motors 1PC1433, 1PC1443, 1PC1463

Selection and ordering data

Terminal box position	Article No. Supplement		Frame size									
	Terminal box position code 16th position of the Article No.	Additional identification code with order code and plain text if required	112	132	① 160	180	200	225	250	280		
			1PC1433 (DOL)		②						IEC	IE3
			1PC1443 (VSD)		③							
			1PC1463 (VSD)									
1PC14 . . - . . . . . - . .. ■			112	132	160	180	200	225	250	280		
Terminal box position												
Terminal box top [1]	**4**	-	□	□	□	□	□	□	□	□		
Terminal box on RHS [1]	**5**	-	✓	✓	✓	✓	✓	✓	✓	✓		
Terminal box on LHS [1]	**6**	-	✓	✓	✓	✓	✓	✓	✓	✓		

□ Normal version
✓ With additional price

1) For foot-mounting types of construction, cast mounting feet as standard.

Selection and ordering data

Special versions	Additional identification code -Z with order code and plain text if requirede	Frame size 112	132	160	180	200	225	250	280	IEC	IE3
		1PC1433 (DOL)									
		1PC1443 (VSD)									
		Motor protection									
1PC14. . . - . . . . . - . . . . -Z		112	132	160	180	200	225	250	280		
Motor protection											
Prepared for mounting a SIPLUS CMS 1000 vibration sensor	**Q05**	✓	✓	✓	✓	✓	✓	✓	✓		
Motor connection and terminal box											
External grounding		◘	◘	◘	◘	◘	◘	◘	◘		
Terminal box on NDE	**H08**	-	-	-	✓	✓	✓	✓	✓		
Second external grounding	**H70**	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the terminal box through 90°, entry from DE)	**R10**	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the terminal box through 90°, entry from NDE	**R11**	✓	✓	✓	✓	✓	✓	✓	✓		
Rotation of the terminal box through 180°	**R12**	○	○	○	✓	✓	✓	✓	✓		
One metal cable gland	**R15**	✓	✓	✓	✓	✓	✓	✓	✓		
EMC cable gland, maximum configuration	**R16**	-	-	-	✓	✓	✓	✓	✓		
Metal cable gland, maximum configuration	**R18**	✓	✓	✓	✓	✓	✓	✓	✓		
Larger terminal box	**R50**	✓	✓	-	✓	✓	✓	✓	✓		
Terminal box without cable entry opening	**R51**	-	-	-	○	○	○	○	○		
Silicon-free version	**R74**	◘	◘	◘	◘	◘	◘	✓	✓		
Windings and insulation											
Temperature class 180 (H) at rated power and max. CT 60 °C[1]	**N11**	✓	✓	✓	✓	✓	✓	✓	✓		
Farben und Anstrich											
Standard finish in RAL 7030 stone gray		◘	◘	◘	◘	◘	◘	◘	◘		
Special finish sea air resistant	**S03**	✓	✓	✓	✓	✓	✓	✓	✓		
Finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6(7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 (see Catalog Section 1 “Introduction”)	**Y53**	✓	✓	✓	✓	✓	✓	✓	✓		
Finish in special RAL colors: For RAL colors, see “Special finish in special RAL colors” (see Catalog Section 1 “Introduction”)	**Y56 •** and finish RAL….	✓	✓	✓	✓	✓	✓	✓	✓		
Modular technology – Basic version											
Mounting of separately driven fan	**F70**	✓	✓	✓	✓	✓	✓	✓	✓		

Selection and ordering data

Special technology											
Mounting of LL 861 900 220 rotary pulse encoder [3]	**G04**	✓	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 9 D 1024 I rotary pulse encoderl [3]	**G05**	✓	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 10 D 1024 I rotary pulse encoder [3]	**G06**	✓	✓	✓	✓	✓	✓	✓	✓		
Designs in accordance with standards and specifications											
Design according to UL with "Recognition Mark" [9]	**D31**	✓	✓	✓	✓	✓	✓	✓	✓		
Canadian regulations (CSA) [10]	**D40**	✓	✓	✓	✓	✓	✓	✓	✓		
Mechanical design and degrees of protection											
Prepared for mountings with D16 shaft	**G42**	✓	✓	✓	✓	✓	✓	✓	✓		
Protective cover [2] [3] [4]	**H00**	✓	✓	✓	✓	✓	✓	✓	✓	Only for:	and
Condensation drainage holes		◘	◘	◘	◘	◘	◘	◘	◘		
Rust-resistant screws (externally)	**H07**	✓	✓	✓	✓	✓	✓	✓	✓		
IP65 degree of protection [5]	**H20**	✓	✓	✓	✓	✓	✓	✓	✓		
Bearings and lubrication											
Regreasing device	**L23**	✓	✓	✓	✓	✓	◘	◘	◘		
Bearing insulation NDE	**L51**	–	–	–	-	-	✓	✓	✓	Only for:	
		–	–	–	-	-	✓	✓	◘	Only for:	and
Balance and vibration quantity											
Vibration quantity level A		◘	◘	◘	◘	◘	◘	◘	◘		
Vibration quantity level B	**L00**	✓	✓	✓	✓	✓	✓	✓	✓		
Balancing without key	**L01**	✓	✓	✓	✓	✓	✓	✓	✓		
Full-key balancing	**L02**	✓	✓	✓	✓	✓	✓	✓	✓		
Shaft and rotor											
Shaft extension with standard dimensions, without feather keyway	**L04**	✓	✓	✓	✓	✓	✓	✓	✓		
Standard shaft made of stainless steel	**L06**	-	-	-	✓	✓	✓	✓	✓		
Concentricity of shaft extension in accordance with DIN 42955 Tolerance	**L07**	✓	✓	✓	✓	✓	✓	✓	✓		
Concentricity of shaft extension, coaxiality and linear movement in acc. with DIN 42955 Tolerance R for flange-mounting motors	**L08**	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard cylindrical shaft extension DE) [6]	**Y58** • and customer specifications	✓	✓	✓	✓	✓	✓	✓	✓		
Special shaft steel as requested by customer	**Y60**	a. A.	a. A.	a. A.	a. A.	a. A.	a. A.	a. A.	a. A.		
Heating and ve											
Metal external fan	**F76**	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heating for 230 V	**Q02**	✓	✓	✓	✓	✓	✓	✓	✓		
Anti-condensation heating for 115 V	**Q03**	✓	✓	✓	✓	✓	✓	✓	✓		

Special versions	Additional identification code -Z with order code and plain text if requirede									
		Frame size								
		112	**132**	**160**	**180**	**200**	**225**	**250**	**280**	
		1PC1433 (DOL)								IEC IE3
		1PC1443 (VSD)								
		Motor protection								
1PC14. . . - . . . . . - . . . . . -Z		112	132	160	180	200	225	250	280	

Selection and ordering data

Special versions	Additional identification code -Z with order code and plain text if requirede	Frame size 112	132	160	180	200	225	250	280		
		1PC1433 (DOL)								IEC	IE3
		1PC1443 (VSD)									
		Motor protection									
1PC14. . . - . . . . . - . . . . -Z		112	132	160	180	200	225	250	280		
Rating plate and extra rating plates											
Second rating plate, loose	**M10**	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate with deviating rating plate data	**Y80** • and customer specifications	✓	✓	✓	✓	✓	✓	✓	✓		
Extra rating plate with customer specifications	**Y82** • and customer specifications	✓	✓	✓	✓	✓	✓	✓	✓		
Packaging, safety notes, documentation and test certificates											
Acceptance test certificate 3.1 according to EN 10204 [7]	**B02**	✓	✓	✓	✓	✓	✓	✓	✓		
Printed German/English Operating Instructions enclosed [8]	**B04**	✓	✓	✓	✓	✓	✓	✓	✓		

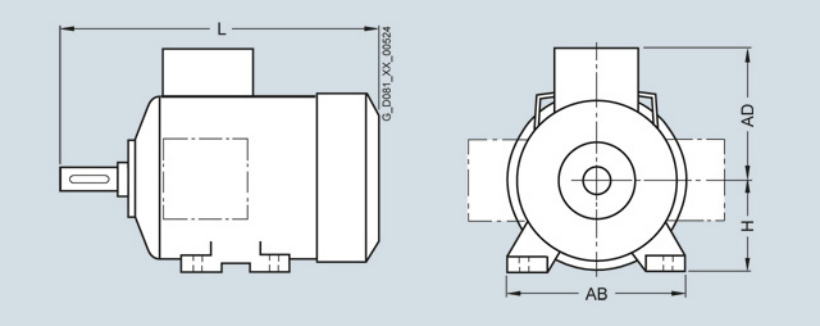
- ◘ Normal version
- ○ No additional cost
- • This order code only defines the version from a pricing perspective – additional plain text is required.
- ✓ With additional price
- O.R. Possible on request
- – Not possible

1) Cannot be used for motors in UL version (order code D31). The grease service life specified in Catalog Part 0 "Introduction" refers to KT 40 °C. When the cooling medium temperature is increased by 10 K, then the grease service life and/or regreasing interval is halved.
2) As standard, 1XP8 rotary pulse encoders with protective canopy are provided. The protective canopy is not mounted in the factory for the combination rotary pulse encoder with external fan, as in this case, the rotary pulse encoder is installed below the fan cover.
3) As standard, LL and HOG rotary pulse encoders with protective canopy are provided up to frame size 160. The protective canopy is omitted in the factory for a combination of rotary pulse encoder with separately driven fan, as in this case, the rotary pulse encoder is installed below the fan cover.
4) Order code H00 represents mechanical protection for the encoder.
5) Not possible in conjunction with rotary pulse encoder HOG 9 D 1024I (order code G05) and/or brake 2LM8 (order code 01).
6) When ordering motors with longer or shorter shaft ends than normal, then the required position and length of the keyway must be specified by providing a sketch. It must be observed that only feather keys according to DIN 6885 Form A may be used. The keyway position must be set, centered on the shaft extension. The length is defined by the manufacturer in accordance with the applicable standard. Not valid for: Tapered shafts, non-standard threaded spigots, non-standard shaft tolerances, friction-welded shaft spigots, shafts with extremely small diameters, special geometrical dimensions (e.g. square spigots), hollow shafts. Applicable for non-standard DE shaft ends The feather key is always supplied.
   The following applies to order codes Y58:
   - Dimensions D and DA ≤ ball bearing inner diameter (see dimension tables for "Dimensions")
   - Dimensions E and EA ≤ 2 x length E (standard) of the shaft end
7) The delivery time for the factory test certificate can differ from the motor delivery time.
8) The compact operating instructions are available as a PDF for all official European languages on the Internet at http://support.automation.siemens.com/WW/view/de/10803948/133300.
9) Possible up to a maximum of 600 V. The rated voltage without voltage range is stamped on the rating plate.
10) The rated voltage without voltage range is stamped on the rating plate.
11) A second shaft extension is not possible. Please inquire for mounted brakes.

Dimensions

Envelope dimension

Overview (steel plant motors)



Frame size	Type	Dimensions				
		L	AD	H	AB	O
112 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	407	195	112	226	2 × M32 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	340	195	112	256	2 × M32 × 1.5
132 S	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	457	214.5	132	256	2 × M32 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	372	214.5	132	256	2 × M32 × 1.5
132 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	507	214.5	132	256	2 × M32 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	422	214.5	132	256	2 × M32 × 1.5
160 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	594	265	160	300	2 × M40 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	500	265	160	300	2 × M40 × 1.5
160 L	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	654	265	160	300	2 × M40 × 1.5
	Cast iron series, non-ventilated					
	1PC1463- 1DB4 1DB6	500 560	265	160	300	2 × M40 × 1.5
180 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	669	286	180	339	2 × M40 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	571	286	180	339	2 × M40 × 1.5
180 L	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	699	286	180	339	2 × M40 × 1.5
	Cast iron series, non-ventilated					
	1PC1463- 1EB4 1EC4	671 571	286	180	339	2 × M40 × 1.5

Frame size	Type	Dimensions				
		L	AD	H	AB	O
200 L	Cast iron series, self-ventilated					
	1PC1433-, 1PC1443- 2AC4	721	315	200	378	2 × M50 × 1.5
	2AB5, 2AC5	746				
	Cast iron series, non-ventilated					
	1PC1463	652	315	200	378	2 × M50 × 1.5
225 S	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	788	338	225	436	2 × M50 × 1.5
225 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	848	338	225	436	2 × M50 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	728	338	225	436	2 × M50 × 1.5
250 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	887	410	250	490	2 × M63 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	762	410	250	490	2 × M63 × 1.5
280 S	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	960	433	280	540	2 × M63 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	830	433	280	540	2 × M63 × 1.5
280 M	Cast iron series, self-ventilated					
	1PC1433, 1PC1443	1070	433	280	540	2 × M63 × 1.5
	Cast iron series, non-ventilated					
	1PC1463	830	433	280	540	2 × M63 × 1.5

Overview (steel plant motors)

Explanation of the dimensions

- Dimension designations according to DIN EN 50347 and IEC 60072.
- Fits
  The shaft ends specified in the dimension tables (DIN 748) and centering edge diameter (DIN EN 50347) are implemented with the following fits:

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

  Bores for couplings and belt pulleys should have an ISO fit of at least H7.

- Dimension tolerances
  The subsequent permissible deviations apply to the following dimension designations:

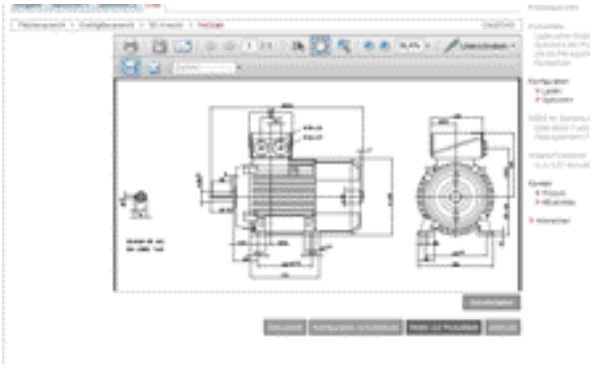
Dimension designation	Dimension	Permissible deviation
H	up to 250	– 0.5
	above 250	– 1.0
E, EA		– 0.5

  Keyways and feather keys (dimension GA, GC, F and FA) are machined according to DIN 6885 Part 1.
- All dimensions in mm.

Dimension drawing generator

(within the Drive Technology Configurator)

A dimension drawing can be generated in the Drive Technology Configurator (DT Configurator) for every motor that can be configured. A dimension drawing can be requested for all other motors.



As soon as a complete Article No. with or without order codes has been entered or configured, under the "Documentation" tab there is the option of calling up a dimension drawing.

These dimension drawings can be shown and printed in various views and sections.

The corresponding dimension drawings can be exported, saved and processed as DXF format (Interchange/Import-Format for CAD systems) or as bitmap graphic.

Online access to the Siemens Industry Mall

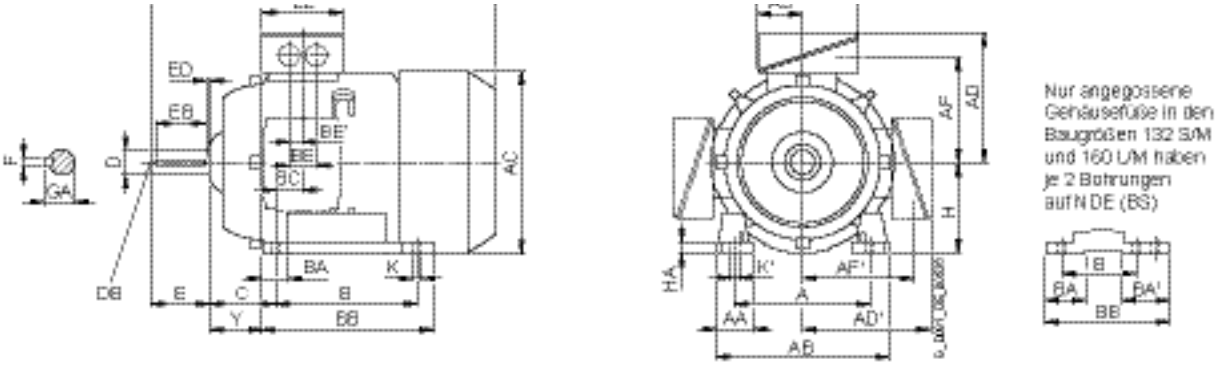
The DT Configurator is integrated in the Siemens Industry Mall and can be used on the Internet without any installation.
German: www.siemens.de/dt-konfigurator
English: www.siemens.com/dt-configurator

Offline access to the interactive CA01 Catalog

Further, the DT Configurator is also part of the interactive CA01 Catalog on DVD - the offline version of the Siemens Industry Mall. You can request the CA 01 through your local Siemens salesperson, or you can order it on the Internet: www.siemens.com/automation/CA01

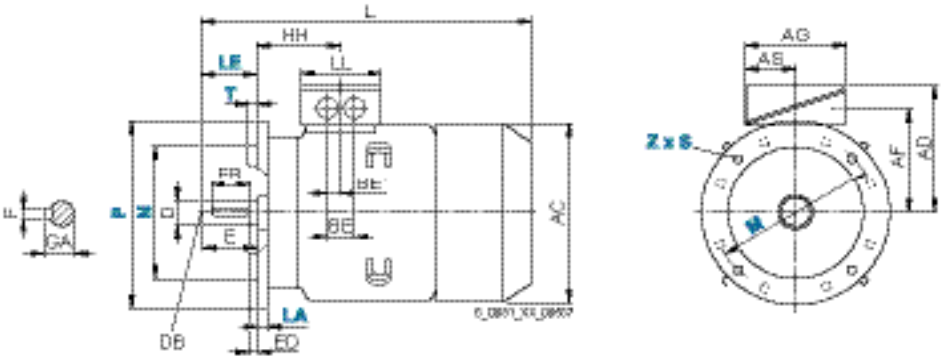
Dimension drawings (steel plant motors)

IM B3 type of construction



IM B5 and IM V1 types of construction

Flange dimensions, see page 1/39 (**Z** = number of mounting holes)



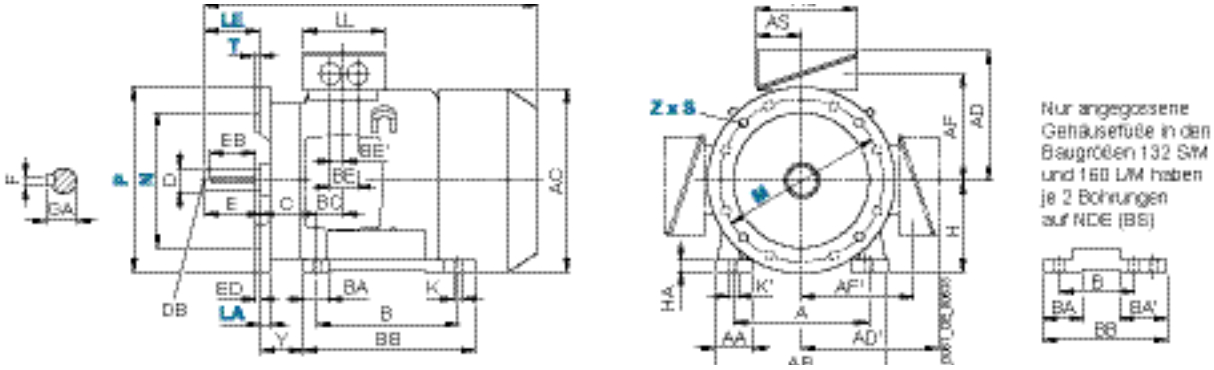
For motor	Type		Dimension designation according to **IEC**																			
Frame size	1PC1433- 1PC1443-	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B	BA	BA'	BB	BC	BE	BE'	C	H	HA	Y
112 M	all	4, 6	190	46	226	239	195	195	150	150	163	80.5	140	48	48	176	30	48	24	70	112	12	52
132 S	all	4, 6	216	53	256	281	214.5	214.5	169	169	163	80.5	140	52[5]	89[1]	218[3]	26.5	48	24	89	132	15	69
132 M	all	4, 6	216	53	256	281	214.5	214.5	169	169	163	80.5	178	52[5]	89[1]	218	26.5	48	24	89	132	15	69
160 M	all	4, 6	254	60	300	333.5	265	265	213	213	190	92	210	73[6]	117[2]	3004	37	60	30	108	160	18	85
160 L	all	4, 6	254	60	300	333.5	265	265	213	213	190	92	254	73[6]	117[2]	300	37	60	30	108	160	18	85

1) For screwed on mounting feet, dimension BA' is 95 mm.
2) For screwed on mounting feet, dimension BA' is 79 mm.
3) For screwed on mounting feet, dimension BB is 180 mm.
4) For screwed on mounting feet, dimension BB is 256 mm.
5) For screwed on mounting feet, dimension BA is 41 mm.
6) For screwed on mounting feet, dimension BA is 51 mm.

Dimension drawings (steel plant motors)

IM B35 type of construction

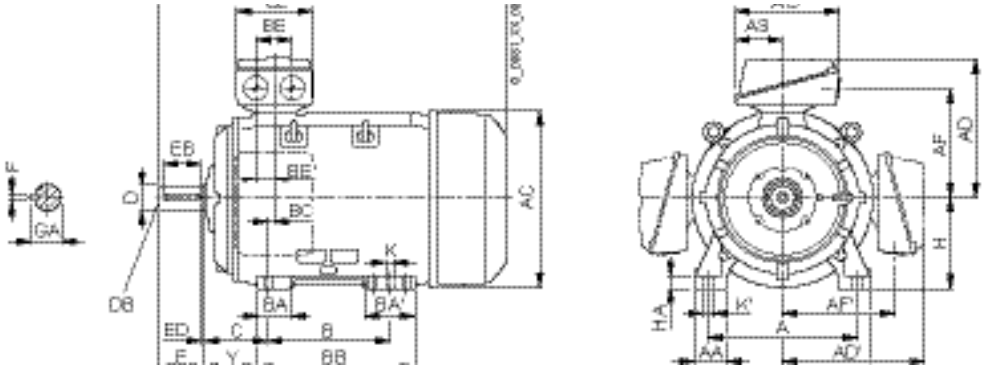
Flange dimensions, see page 1/39 (**Z** = number of mounting holes)



For motor	Type		Dimension designation according to **IEC**					DE shaft extension					
Frame size	1PC1433- 1PC1443-	No. of poles	HH	K	K'	L	LL	D	DB	E	EB	ED	F
112 M	all	4, 6	100.5	12	16	407	134	28	M10	60	50	5	8
132 S	all	4, 6	115.5	12	16	457	134	38	M12	80	70	5	10
132 M	all	4, 6	115.5	12	16	507	134	38	M12	80	70	5	10
160 M	all	4, 6	145	14.5	18	594	165	42	M16	110	90	10	12
160 L	all	4, 6	145	14.5	198	654	165	42	M16	110	90	10	12

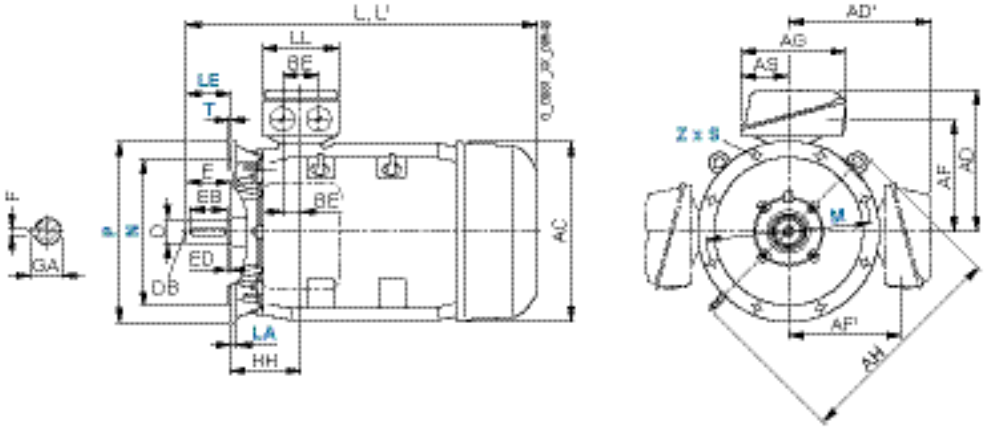
Dimension drawings (steel plant motors)

IM B3 type of construction



IM B5 and IM V1 types of construction

Flange dimensions, see page 1/39 (**Z** = number of mounting holes)

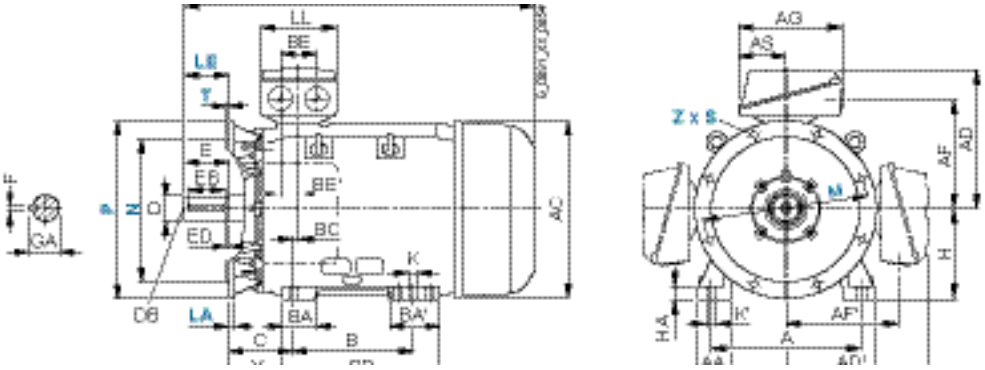


For motor	Type		Dimension designation according to **IEC**																		
Frame size	1PC1433- 1PC1443-	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AH	AS	B	BA	BA'	BB	BC	BE	BE'	C
180 M	all	4	279	65	339	356	286	286	234	234	190	468	92	241	85	120	328	34	60	30	121
180 L	all	4, 6	279	65	339	356	286	286	234	234	190	468	92	279	85	120	328	34	60	30	121
200 L	2AC4 2AB5, 2AC5	6 4, 6	318	70	378	396	315	315	259	259	266	533	112	305	104	104	355	31	85	42.5	133
225 S	all	4	356	80	436	449	338	338	282	282	266	556	112	311	92	117	361	15	85	42.5	149
225 M	all	4, 6	356	80	436	449	338	338	282	282	266	556	112	311	92	117	361	15	85	42.5	149
250 M	all	4, 6	406	100	490	497	410	410	322	322	319	620	145	349	102	102	409	24	110	55	168
280 S	all	4, 6	457	100	540	551	433	433	345	345	319	672	145	368	101	152	479	20	110	55	190
280 M	all	4, 6	457	100	540	551	433	433	345	345	319	672	145	419	101	152	479	20	110	55	190

Dimension drawings (steel plant motors)

IM B35 type of construction

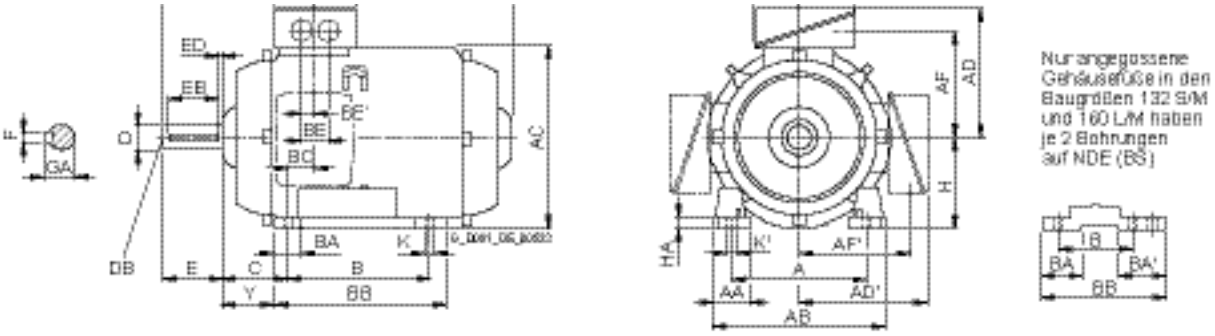
Flange dimensions, see page 1/39 (**Z** = number of mounting holes)



For motor	Type	No. of poles	Dimension designation according to **IEC**								DE shaft extension					
Frame size	1PC1433 1PC1443		H	HA	Y	HH	K	K'	L	LL	D	DB	E	EB	ED	F
180 M	all	4	180	20	95	155	15	19	669	165	48	M16	110	100	5	14
180 L	all	4, 6	180	20	95	155	15	19	699	165	48	M16	110	100	5	14
200 L	2AC4	6	200	25	108	164	19	25	721	197	55	M20	110	100	5	16
	2AB5, 2AC5	4, 6							746							
225 S	all	4	225	34	124	164	19	25	788	197	60	M20	140	125	10	18
225 M	all	4, 6	225	34	124	164	19	25	848	197	60	M20	140	125	10	18
250 M	all	4, 6	250	40	138	192	24	30	887	233	60	M20	140	125	10	18
280 S	all	4, 6	280	40	160	210	24	30	960	233	75	M20	140	125	10	20
280 M	all	4, 6	280	40	160	210	24	30	1070	233	75	M20	140	125	10	20

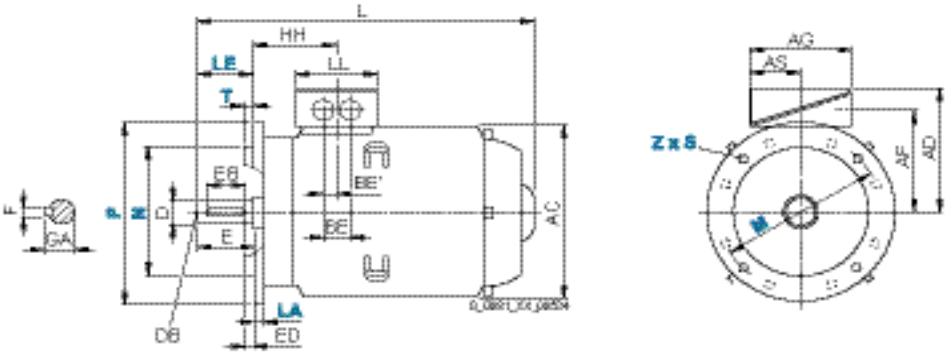
Dimension drawings (steel plant motors)

IM B3 type of construction



IM B5 and IM V1 types of construction

Flange dimensions, see page 1/39 (**Z** = number of mounting holes)



For motor	Type		Dimension designation acc. to IEC																	
Frame size	1PC1463-	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B	BA	BA'	BB	BC	BE	BE'	C
132 S	all	4	216	53	256	281	214.5	214.5	169	169	163	80.5	140	52[5]	89[1]	218[3]	26.5	48	24	89
132 M	all	4	216	53	256	281	214.5	214.5	169	169	163	80.5	178	52[5]	89[1]	218	26.5	48	24	89
160 L	1DB4	4	254	60	300	333.5	265	265	213	213	190	92	210	73[6]	117[2]	3004	37	60	30	108
	1DB6	4											254							
180 M	1EB2, 1EC4	4	279	65	339	356	286	286	234	234	190	92	241	85	120	328	34	60	30	121
180 L	1EB4	4	279	65	339	356	286	286	234	234	190	92	279	85	120	328	34	60	30	121
	1EC4	6											241							
200 L	2AC5	6	318	70	378	396	315	315	259	259	266	112	305	104	104	355	31	85	42.5	133
225 M	2BC2	6	356	80	436	449	338	338	282	282	266	112	311	92	117	361	15	85	42.5	149
250 M	2CC2	6	406	100	490	497	410	410	322	322	319	145	349	102	102	409	24	110	55	168
280 S	2DC0	6	457	100	540	551	433	433	345	345	319	145	368	101	152	479	20	110	55	190
280 M	2DC2	6	457	100	540	551	433	433	345	345	319	145	419	101	152	479	20	110	55	190

1) For screwed on mounting feet, dimension BA' is 95 mm.
2) For screwed on mounting feet, dimension BA' is 79 mm.
3) For screwed on mounting feet, dimension BB is 180 mm.
4) For screwed on mounting feet, dimension BB is 256 mm.
5) For screwed on mounting feet, dimension BA is 41 mm.
6) For screwed on mounting feet, dimension BA is 51 mm.

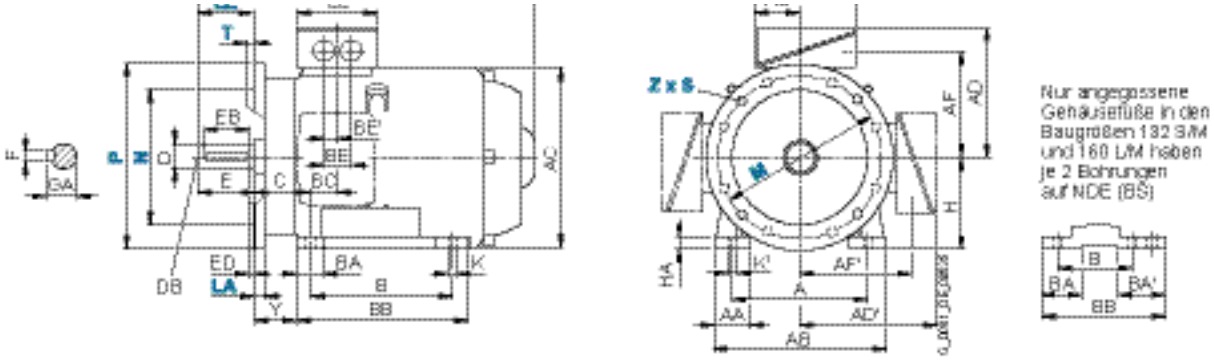
Dimensions
Cast iron series 1PC1463 – non-ventilated

Frame sizes 132 S to 280 M

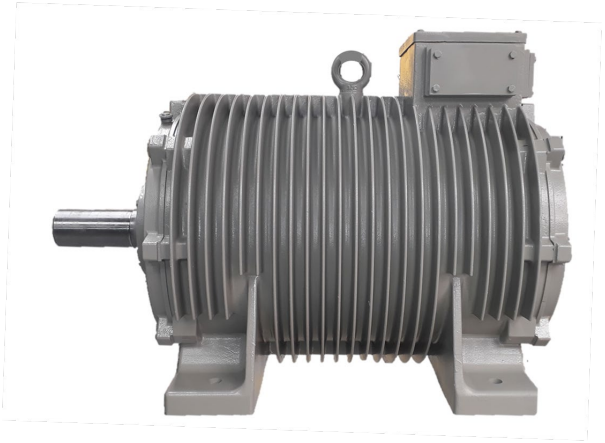
Dimension drawings (steel plant motors)

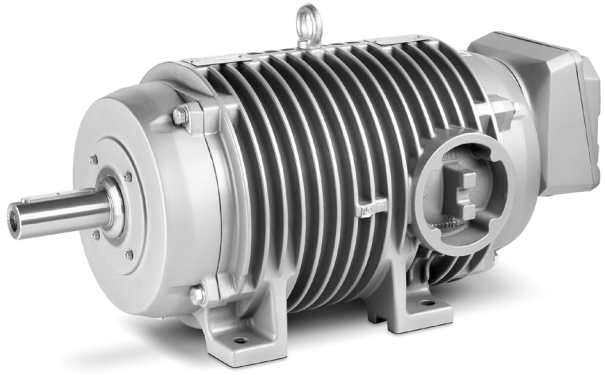
IM B35 type of construction

Flange dimensions, see page 1/39 (**Z** = number of mounting holes)



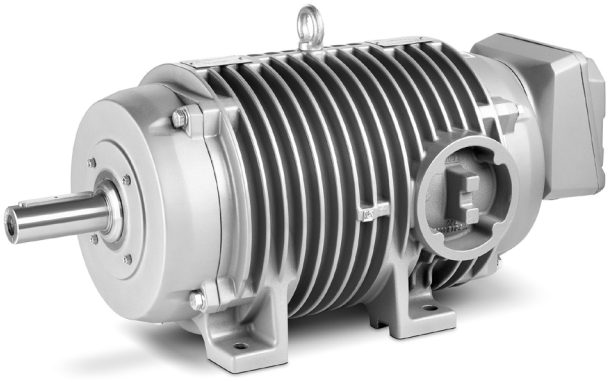
For motor	Type		Dimension designation acc. to IEC								DE shaft extension					
Frame size	1PC1463-	No. of poles	H	HA	Y	HH	K	K'	L	LL	D	DB	E	EB	ED	F
132 S	all	4	132	15	69	115.5	12	16	372	134	38	M12	80	70	5	10
132 M	all	4	132	15	69	115.5	12	16	434	134	38	M12	80	70	5	10
160 L	1DB4	4	160	18	85	145	14.5	18	500	165	42	M16	110	90	10	12
	1DB6	4							572							
180 M	1EB2	4	180	20	95	155	15	19	571	165	48	M16	110	100	5	14
180 L	1EB4	4	180	20	95	155	15	19	671	165	48	M16	110	100	5	14
	1EC4	6							571							
200 L	2AC5	6	200	25	108	164	19	25	652	197	55	M20	110	100	5	16
225 M	2BC2	6	225	34	124	164	19	25	728	197	60	M20	140	125	10	18
250 M	2CC2	6	250	40	138	192	24	30	762	233	65	M20	140	125	10	18
280 S	2DC0	6	280	40	160	210	24	30	830	233	75	M20	140	125	10	20
280 M	2DC2	6	280	40	160	210	24	30	830	233	75	M20	140	125	10	20

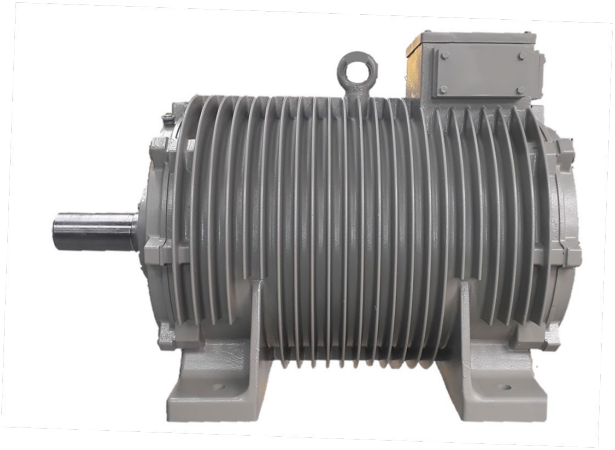




3 Roller table motors

Technical data (roller table motors)





These high end roller table motor products offer users a wide range of advantages and benefits:

- Enclosure with round ribs and bearing shields manufactured out of cast iron with nodular graphite (GGG).
- The round rib enclosure is torsionally stiff, and is suitable for addressing challenging applications with the highest mechanical requirements
- Standard version is:
  - Frame sizes 112 to 200 in degree of protection IP66
    Frame sizes 225 to 400 in degree of protection IP55
  - Frame sizes 112 to 200 special paint finish resistant to sea air in corrosion protection class C4
    Frame sizes 225 to 400 special paint finish resistant in corrosion protection class C3, class C4 optionally possible (Climatic groups acc. to IEC 60721, Part 2-1)
  - Frame sizes 112 to 200 stainless steel screws (external)
  - Frame sizes 112 to 200 with fixed bearing DE
    Frame sizes 225 to 400 with fixed bearing NDE and cylindrical rolling bearing DE
  - Frame sizes 112 to 200 standard shaft manufactured out of stainless steel X20Cr13 (1.4021)
    Frame sizes 225 to 400 standard shaft manufactured out of special steel 42CrMoS4.V
  - The rating plate is manufactured out of stainless steel
  - External grounding
  - Frame sizes 112 bis 200 connection when shipped, star
    Frame sizes 225 to 400 connection when shipped, star
  - 6 PTC thermistors – for alarm and shutdown
- Frame size 112 bis 200 optionally available with "Special sealing system - corrosion protection" to address especially high requirements relating to the environment with stainless steel insert.
- 1PC1423 roller table motors are suitable for applications with vibration and shock
  - In type of construction IM B3 to Class 3M6 according to EN 60721-3-3 (shocks up to 25g)
  - Frame sizes 112 to 200 in types of construction IMB5 and IMB35 to Class 3M4 according to EN 60721-3-3 (shocks up to 10g) available
    Values have been checked and confirmed in the test laboratory.
- Tried and tested drive system comprising Innomotics DP roller table motors and SINAMICS S120 converters (high insulation strength up to 500 V, optionally up to 690 V)
- Thermistor motor protection for alarm and shutdown is provided as standard
  Frame sizes 112 to 200, terminal box is mounted at the NDE bearing shield; optionally, the terminal box can be mounted on the right-hand side
  Frame sizes 225 to 400 terminal box at the enclosure, top-mounted direction non-drive end. Plates are screwed on to introduce the cables; drilled plates with two glands are optionally possible.
- Factory certification 2.1 describes the constraints relating to converter operation with SINAMICS S and SINAMICS G - and therefore represents valuable support for our customers when engineering and commissioning their drives. This is provided with every motor shipment. A wealth of know-how to address plant/system-specific designs.
- Global service network with 24-hour service hotline for motors and converters
- High surge torque capability M_k = 3 x M_n
- 24 months warranty period, optionally, 36 months.

Technical data (roller table motors)

Enclosure design

Further, roller table motors have a torsionally stiff round rib enclosure that is suitable for addressing challenging applications with the highest mechanical requirements.

Bearings

Optimized bearing systems are used for safe, reliable and disturbance-free operation when subject to a combination of vibration and shock.

Frame sizes 112 to 200
Bearing series 63 are always used. The drive end (DE) is always equipped with a fixed bearing; the bearing preloading is realized at the non-drive end (NDE).

Frame sizes 225 to 400
The motors have rolling bearings with permanent lubrication; from frame size 280 with regreasing. NU bearings are used at the drive end (DE), fixed bearings at the non-drive end (NDE). For frame sizes 315 to 400, bearing insulation is provided as standard to avoid bearing currents. This technology is optionally available in FS250…280.

Bearing shields
The bearing shields at both ends have been specifically designed (shape and material) for applications involving high mechanical loads and stress according to EN 60721-3-3. It is absolutely crucial that the actual load and stress of the application are mirrored against this design data. In special cases, it is necessary to request that the selection and dimensioning are checked.

Electrical design

1PC1423 motors specifically designed for converter operation have a rated voltage of 400 V in the normal version; other voltages are optionally possible up to 690 V.

Connection method:
Frame sizes 112 M to 200 L: Star (neutral point in the winding overhang)
Frame sizes 225 L to 400 delta (neutral point in the winding overhang)

Insulation

All motors have the DURIGNIT IR 2000 insulating material system with temperature class 155 (F). The motor utilization at its operating power and for converter operation corresponds to temperature class 155 (F).

The versions for converter operation have been optimized for operation with SINAMICS S120 converters. The special "Advanced" insulation system guarantees that in four-quadrant operation the motors can be operated without any restrictions when connected to SINAMICS S120 converters (including Active Line Module) up to a max. line voltage of 480 V. For 1PC1423 roller table motors, the "Premium" insulation system is optionally available for line voltages up to 690 V.

Max. voltage stress:

	Reinforced insulation system (Advanced)	Special insulation system (Premium)
$U_{phase-phase}$	≤ 3200 Vpp	≤ 4400 Vpp
$U_{phase-ground}$	≤ 2800 Vpp	≤ 3000 Vpp

Motor connection

Frame sizes 112 to 200
Standard version with the terminal box mounted at the NDE bearing shield; optionally, the terminal box can be mounted on the right side (required when mounting a rotary pulse encoder).

Frame sizes 225 to 400
Terminal box at the enclosure, top-mounted direction non-drive end Plates are screwed on to introduce the cables; drilled plates with two glands are optionally possible.

All motors are equipped with an outer grounding terminal.

Mounting foot concept

The mounting feet are cast on.

Winding temperature monitoring

1PC1423 roller table motors, specifically designed for converter operation, have as standard PTC thermistors for alarm and shutdown. Alternative temperature sensing with one or two KTY84-130 or Pt1000 (the PTC thermistors are then no longer installed).

Paint finish

Frame sizes 112 to 200
Special paint finish in corrosion protection class C4

Frame sizes 225 to 400
Standard paint finish in corrosion protection class C3, class C4 optionally possible
(climatic groups acc. to IEC 60721, Part 2-1)

Other colors and paint finishes are optionally possible.

Degree of protection

Frame sizes 112 to 200
Standard version: degree of protection IP66

Frame sizes 225 to 400
Standard version: degree of protection IP55

Deviating cooling medium temperature

Cooling medium temperatures higher than KT 40 °C require *power derating as shown in the following table:*

	Cooling medium temperature KT			
	40°C	45°C	50°C	55°C
Utilized to temperature class 155 (F) according to 130 (B) valid for non-ventilated roller table motors				
Reduction factor	1.00	0.96	0.92	0.87

Technical data (roller table motors)

An overview of the technical data

An overview of the most important technical data for roller table motors is listed in this table.

	Roller table motors
Series	1PC1423
Cooling method	IC 410 non-ventilated
Power supply	Line or converter operation
Efficiency classes according to EN 60034-30	IE3; for pure line motors (no IE Class for converter motors)
Frame sizes	112 M … 400
No. of poles	4-pole: Frame sizes 112 ... 180 6-pole: Frame sizes 180 ... 315 8-pole: Frame sizes 315 ... 400
Frequencies	50 Hz, 60 Hz and project-specific rated operating points
Standard voltages	230 V, 400 V, 460 V, 500 V, 690 V
Rated speed	4-pole: 1500 rpm (50 Hz) 1800 rpm (60 Hz) 2610 rpm (87 Hz)
	6-pole: 1000 rpm (50 Hz) 1200 rpm (60 Hz) 1740 rpm (87 Hz)
	8-pole: 750 rpm (50 Hz) 900 rpm (60 Hz) 1300 rpm (87 Hz)
Rated power	3.5 ... 66 kW
Rated torque	23 - 2135 Nm
Accelerating torque	M_k = min. 3 · M_n for non-ventilated motors
Operating modes	S3, S6, S7, S9
Enclosure material	EN-GJS-400-15 (GGG40)
Enclosure type	Round ribs
Temperature class	155 °C (F)
Insulation acc. to EN 60034-1	Temperature class 155 (F), Durignit IR2000
Winding insulation (can be changed)	• Reinforced "Advanced" insulation system up to 500 V AC connected to a SINAMICS S120 converter • Optional "Premium" insulation system up to 690 V AC connected to a SINAMICS S120 converter
Mechanical strength	• Frame sizes 112 M to 200 K: IM B3 type of construction 3M6 acc. to EN 60721-3-3 (including continuous shock up to 25g) • All other types of construction: 3M4 acc. to EN 60721-3-3 (including continuous shock up to 10g) • Frame sizes 225 L to 400: 3M4 acc. to EN 60721-3-3 (including continuous shock up to 10g)
Degree of protection	• Frame sizes 112 to 200, Standard IP66 • Frame sizes 200 to 400: Standard IP55, optional IP56, IP65
Voltage	Operating data for line voltages 400 V (50 Hz) and 690 V (50 Hz), other voltages/frequencies optionally available
Certificates	CE, EAC
Marking	IEC EN 60034
Permissible cooling medium temperature	• Standard -20 to +40 °C
Types of construction according to EN 60034-7	IM B3, IM B5, IM B35 Frame sizes 225 to 400 only IMB3
Paint finish (climatic group acc. to IEC 60721)	Frame sizes 112 to 200 as standard RAL 7030, Class C4 Frame sizes 225 to 400 as standard RAL 7030, Class C3
Vibration severity grade according to EN 60034-14	level A, level B optional
Shaft end according to DIN 748	Half key balancing as standard
Sound pressure level according to DIN EN ISO1680	See selection and ordering data
Weights	See selection and ordering data
Modular mounting concept	Pulse encoder optional
Options	See "Article number supplements and special versions".

Article number code

Overview (roller table motors)

The Article No. comprises a combination of digits and letters and to provide a better overview, is subdivided into three hyphenated blocks,
for example:
1PC1423-1EB49-0AC8-Z
H00

Article number structure and logic corresponds to that of 1LE1 line motors. The first block (positions 1 to 7) designates the motor type, the second block (positions 8 to 12) defines the motor frame size and length, the number of poles as well as in some instances the frequency/power and in the third block (positions 13 to 16) the frequency/power, the type of construction and additional design features are coded.

For deviations in the second and third block with respect to catalog data, a **Z** or **90** should be set alphanumerically.

Ordering data:

- Complete Article No. and order code(s) or plain text
- If a quotation exists, in addition to the Article No., the quotation No. should also be specified
- When ordering a complete replacement motor, in addition to the Article No. the serial number of the motor already supplied should be specified

Structure of the Article No.:			Position:	1	2	3	4	5	6	7	-	8	9	10	11	12	–	13	14	15	16	
1st to 5th position: digit, letter, letter, digit, digit	**Motor type**			**1**	**P**	**C**	**1**															
5th position: digit	**Version**							**4**														
6th position: digit	**Motor ventilation**	Roller tables	IC410 (VSD – converter operation)						**2**													
			IC411/IC416 (DOL – line operation)						**3**													
		Steel plant																				
		Steel plant	IC411 (VSD – converter operation)						**4**													
		Steel plant	IC410 (VSD – converter operation)						**6**													
7th position: digit	**High efficiency**									**3**												
8th and 9th position: digit, letter	**Motor frame size**		112									**1**	**B**									
			...									**...**	**...**									
			400									**4**	**A**									
10th position: letter	**No. of poles**		4-pole											**B**								
			6-pole											**C**								
			8-pole											**D**								
11th position: digit	**Laminated core length**														**0**							
															...							
															8							
12th and 13th position: 2 digits	**Voltage, connection and frequency** (coded using two digits, see "Selection and ordering data")															**0**		**0**				
																...		**...**				
																9		**7**				
14th position: letter	**Type of construction** (coded with A ... J)																		**A**			
																			...			
																			J			
15th position: letter	**Motor protection** (coded with C ... L)																			**C**		
																				...		
																				L		
16th position: digit	**Terminal box position** (viewed from the DE)		Top-mounted terminal box																		**4**	
			Terminal box at the right																		**5**	
			Terminal box NDE																		**8**	
	Special order versions • Coded – additional order code required • Not coded – additional plain text required																					**– Z**

Ordering example

Selection criteria	Requirement	Structure of the Article No.
1PC1423 motor	Roller table motor with High Efficiency. Converter operation, degree of protection IP66, cast iron version	1PC1423-■■■■■-■■■■
Motor frame size/pole number/speed	180 L/4-pole/1500 rpm	1PC1423-1EB4■-■■■■
Rated power	13 kW	
Voltage and frequency	690 VY, 50 Hz	1PC1423-1EB49-0■■■ M2Y
Type of construction with special version	IM B3	1PC1423-1EB49-0A■■ M2Y
Motor protection	Motor protection using PTC thermistors with 6 integrated Temperature sensors for alarm and shutdown	1PC1423-1EB49-0AC■ M2Y
Terminal box position	Terminal box NDE	1PC1423-1EB49-0AC8 M2Y

Safety notes, documentation, test certificates and extension of the liability for defects period

Overview (roller table motors)

Connection when shipped, star

- Standard for 1PC1423 motors in frame sizes 112 M to 200 L

For shipping, the motor terminal board is connected in the star configuration.

Connection when shipped, delta

- Standard for 1PC1423 motors in frame sizes 225 L to 400

For shipping, the motor terminal board is connected in the delta configuration.

Safety instructions

Operating Instructions in German and English – enclosed in printed form.

Test certificates

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

Extension to the liability for defects period

Innomotics 1PC14 low-voltage motors come as standard with a liability defect period of 24 months. It is also possible to extend this on a project-for-project basis.

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

Overview (roller table motors)

Efficiency and power factor

Efficiency η for 4/4, 3/4 and 1/2 -load and power factor cos φ are specified in the selection tables of the individual parts of this catalog for the rated power.

Rated speed and direction of rotation

The rated speeds are applicable at the rated operating data. The synchronous speed changes linearly with the line frequency. The motors are suitable for clockwise and counterclockwise rotation

When connecting U1, V1, W1 to L1, L2, L3, the motor rotates clockwise when viewing the DE shaft end. Counterclockwise rotation can be selected by interchanging two phases.

Rated torque

The rated torque output at the shaft in Nm is

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

P rated power in kW
n speed in rpm

Note:
If the voltage deviates from its rated value within the permissible limits, then the starting, pull-up and stall torque change approximately as a square law and the starting (inrush) current changes approximately linearly.

For squirrel-cage induction motors, starting torques and stall torques are specified in the selection tables as multiple of the rated torque.
Squirrel-cage induction motors are preferably switched on directly. The torque classification indicates that when switched on directly, also with an undervoltage of –5 %, starting against a load torque of up to

- 160 % for squirrel cage class 16
- 130 % for squirrel cage class 13

of the rated torque is possible.

Roller table motors specifically for converter operation

1PC1423 motors are specifically intended for converter operation. The catalog data is applicable for operation with Siemens SINAMICS converters. The catalog data is applicable for operation with SINAMICS S converters. When operated with another converter, the catalog data (thermal limit torques, maximum overload torques) are approximately applicable with the following constraints:

- The converter is operated with a rated pulse frequency of at least 4 kHz (≥ 90 kW 2 kHz).
- The converter can provide the rated voltage as listed in the catalog.
- Permissible voltage peaks of the standard insulation system (Advanced) $\hat{U}_{LL} \leq 1600$ V, $\hat{U}_{LE} \leq 1400$ V, $t_s > 0.1$ µs

For SINAMICS G120 converters (from firmware version 4.7), the Innomotics GP/SD-VSD10 line can be selected as motor category in the SINAMICS converter using the STARTER software or at the converter operator panel (AOP - Advanced Operation Panel; BOP - Basic Operator Panel) and can be addressed using the motor code No.

Rated voltage

The tolerance according to DIN EN 60034-1 is applicable for the rated voltage. A rated voltage range is not specified. The rated motor voltages are selected so that when operated with a SINAMICS converter the voltage available is optimally utilized.

Insulation

For line voltages ≤ 480/500 V, the motors can be operated with SINAMICS S converters (uncontrolled and controlled infeed) when complying with the permissible peak voltages specified above. Operation with higher line voltages (≥ 690 V) is possible when using suitable converter output circuitry (d*u*/d*t* or sine wave filter) to limit the voltage peaks that occur ($\hat{U}_{LL} \leq 1600$ V, $\hat{U}_{LE} \leq 1400$ V).

If converter output circuitry (du/dt or sine-wave filter) is available, then the insulation system can also be used for higher line voltages. This is also applicable for operation with pulse converters with voltage rise times $t_s > 0.1$ µs at the motor terminals.

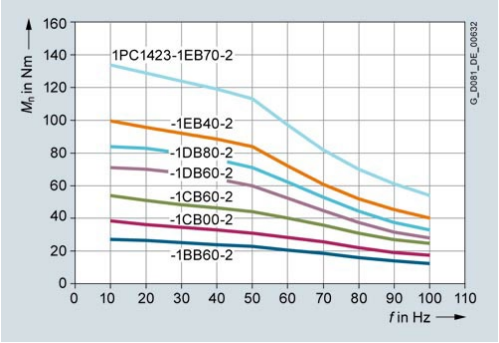
When operated at the converter with the power ratings specified in the catalog, then the motors are utilized corresponding to thermal class 155 (F) (service factor 1.0).

When a fault occurs when connected to an IT line supply (ground fault) then the insulation is excessively stressed. For a fault such as this, the process should be terminated as quickly as possible ($t < 2$ h) and the fault resolved. Operation connected to a TN line supply with corner point grounding is not recommended.

Overview (roller table motors)

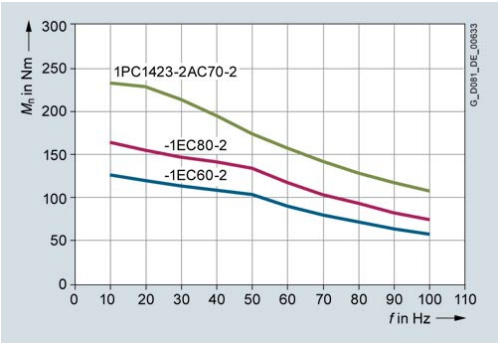
Torque-frequency characteristic 4-pole

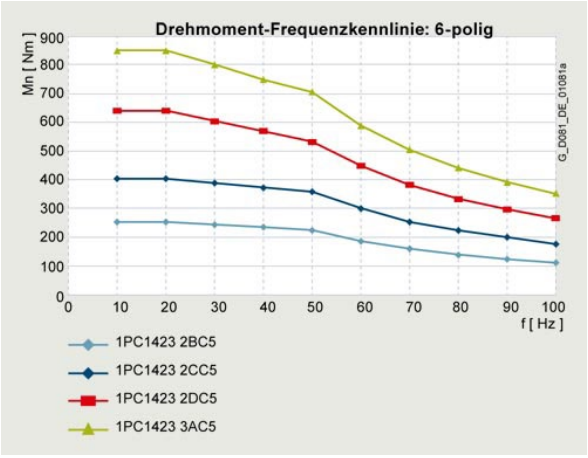
Type	Frequency f Hz									
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
	Torque M Nm									
1PC1423-1BB60-2	27.1	26.5	25.3	24.0	22.7	20.7	18.5	16.0	14.0	12.3
1PC1423-1CB00-2	38.3	36.2	34.4	32.9	31.0	28.4	25.6	22.0	19.2	17.5
1PC1423-1CB60-2	54.0	51.0	48.4	46.3	43.9	40.0	36.0	31.0	27.0	24.6
1PC1423-1DB60-2	71.0	70.1	67.6	64.2	60.0	52.4	44.8	37.6	31.7	27.9
1PC1423-1DB80-2	84.0	83.0	80.0	76.0	71.0	62.0	53.0	44.5	37.5	33.0
1PC1423-1EB40-2	99.6	95.8	92.1	88.4	84.0	72.1	60.9	52.0	45.3	40.1
1PC1423-1EB70-2	134.0	129.0	124.0	119.0	113.0	97.0	82.0	70.0	61.0	54.0



Torque-frequency characteristic 6-pole

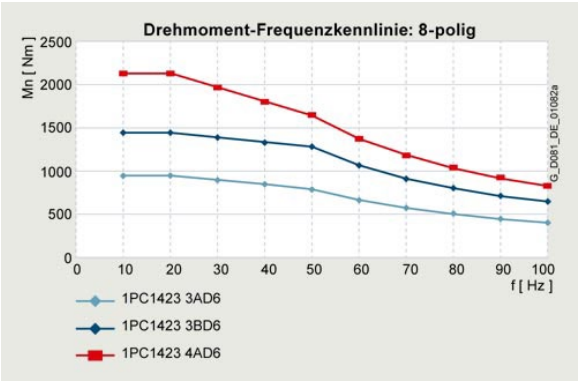
Type	Frequency f Hz									
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
	Torque M Nm									
1PC1423-1EC60-2	126	119	113	108	103	90	79	71	63	57
1PC1423-1EC80-2	164	155	147	141	134	117	103	93	82	74
1PC1423-2AC70-2	233	229	214	195	174	157	142	128	117	107
1PC1423-2BC60-2	255	255	245	235	225	188	161	141	125	113
1PC1423-2CC60-2	405	405	390	375	360	300	257	225	200	180
1PC1423-2DC60-2	640	640	605	570	535	446	382	334	297	268
1PC1423-3AC60-2	850	850	800	750	705	588	504	441	392	353





Torque-frequency characteristic 8-pole

Type	Frequency f Hz									
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
	Torque M Nm									
1PC1423-3AD69-0	950	950	900	850	795	663	568	497	442	398
1PC1423-3BD69-0	1445	1445	1390	1335	1280	1067	914	800	711	640
1PC1423-4AD69-0	2135	2135	1975	1800	1650	1375	1179	1031	917	825



Overview (roller table motors)

Roller table motors for line operation

For voltage and frequency fluctuations, EN 60034-1 makes a distinction between range A (combination of voltage deviation ±5 % and frequency deviation ±2 %) and range B (combination of voltage deviation ±10 % and frequency deviation +3/–5 %). The motors can provide their rated torque in range A as well as in range B. In range A, the temperature rise lies approximately 10 K higher than in rated operation.

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

For detailed data, see EN 60034-1.

According to the standard, longer operation is not recommended in range B. Rating plate labeling with a corresponding example, see "Rating plates and additional plates". The rated current at 400 V is specified in the selection and ordering data. Standard DIN IEC 60038 specifies a tolerance of ±10 % for line voltages 230 V, 400 V and 690 V.

Line voltages	Voltage code
1LE1 motors	
230 VΔ/400 VY, 50 Hz	22
400 VΔ/690 VY, 50 Hz	34
500 VY 50 Hz	27
500 VΔ, 50 Hz	40

Non-standard voltages and/or frequencies

The tolerance according to DIN EN 60034-1 is applicable for non-standard voltages.
Order codes are defined for some non-standard voltages at 50 or 60 Hz. The order is placed by specifying code **9** for the voltage at the 12th position of the Article No. as well as code **0** at the 13th position of the Article No. and the corresponding order code.

Overview(roller table motors)

According to DIN EN 60034-1, for all motors, the approximate total weight is stamped on the rating plate.

In addition, a supplementary plate for the orderer's data is possible, supplementary text: 9 lines each with 40 characters,
Order code **Y82.**

An additional rating plate with different rating plate data can be ordered (only for rated data,
e.g. voltage, power, speed),
Order code **Y80.**

Optionally, the number of additional plates can be ordered by specifying order codes Y82, Y80. This is not applicable for direction of rotation arrows, PTC thermistor plates/labels, other information plates/labels.

Additional (rating) plate(s),
Order code **M10.**

In the standard version, the rating plate is international or in German/English. When ordering the language on the rating plate, this must be specified in plain text. An overview of the languages that can be ordered is provided in the subsequent table.

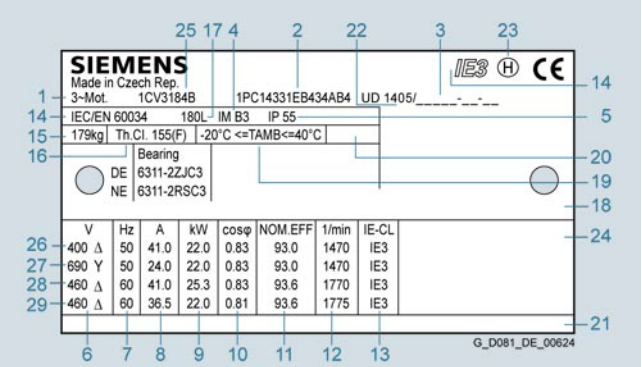
Overview of the languages on the rating plate

Motor type	Frame size	Rating plate	
		Germany (de)	English (en)
1PC14	112 … 400	◘	○

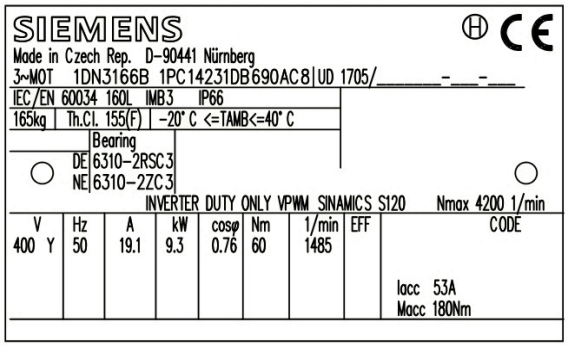
◘ Normal version
○ No additional price

Other languages on request

Examples of rating plates



1 Maschinenart: Drehstrom-Niederspannungsmotor
2 Artikel-Nr.
3 Fabriknummer (Ident.-Nr., Seriennummer)
4 Bauform
5 Schutzart
6 Bemessungsspannung [V] und Wicklungsschaltung
7 Frequenz [Hz]
8 Bemessungsstrom [A]
9 Bemesssungsleistung [kW]
10 Leistungsfaktor (cos φ)
11 Wirkungsgrad
12 Bemessungsdrehzahl [min^{-1}]
13 IE-Wirkungsgradklasse
14 Normen und Vorschriften
15 Maschinengewicht [kg]
16 Wärmeklasse
17 Baugröße
18 Zusatzangaben (optional)
19 Einsatztemperaturbereich (nur wenn abweichend von der Norm)
20 Aufstellhöhe (nur wenn größer als 1000 m)
21 Kundendaten (optional)
22 Herstelldatum JJMM
23 Halbkeilwuchtung
24 Code Letter „CL"
25 Motor Type Nummer (MT)
26 IEC-Normreihe Leistung 50 Hz (P50/50 Hz) 400 Δ
27 IEC-Normreihe Leistung 50 Hz (P50/50 Hz) 690 Δ
28 Äquivalente Leistung 60 Hz bei gleicher Ausnutzung wie IEC-Normreihe 50 Hz
29 IEC-Normreihe Leistung 60 Hz (P50/60 Hz)



1PC1423 – Roller table motor for converter operation with a SINAMICS S120

Cooling medium temperature

Overview (roller table motors)

For an approximate selection at higher cooling medium temperatures and/or for installation altitudes higher than 1000 m above sea level, the specified motor power should be reduced by factor k_{HT}.

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

The permissible power of the roller table motor is obtained as follows:

$P_{zul} = P_N \times k_{HT}$

Reduction factor k_{HT} for deviating installation altitude and/or cooling medium temperature

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

Cooling medium temperature and installation altitude are rounded-off to 5°C and/or 500 m.

Windings and insulation

Overview (roller table motors)

Temperature class 155 (F), utilized to 155 (F), with increased cooling medium temperature

When operated with a converter with the specified catalog power ratings, then the motors are utilized corresponding to thermal class 155 (F).

Temperature class 155 (F), utilized to 155 (F), other requirements/specifications

For all roller table motors, temperature class according to 155 (F), utilized according to temperature class 155 (F) with other specific customer requirements is possible when an order is placed with additional plain text. (On request)

Temperature class 180 (H) is possible as option:

Temperature class 180 (H), utilized according to 180 (H) at rated power and a maximum cooling medium temperature of 60 °C

Order code **N11**

The specified grease service life refers to a cooling medium temperature of 40 °C. When the cooling medium temperature is increased by 10 K, then the grease service life or the regreasing interval is halved.

Note:
The motor has to be specially selected and dimensioned as a result of the mechanical component check.

Increased humidity/temperature with 30 to 60 g water per m^3 air

A version is possible for increased humidity in the range between 30 to 60 g water per m^3 air as a function of the temperature according to the subsequent table.

Increased air humidity/temperature with 60 to 100 g water per m^3 air

A version is possible for increased humidity in the range between 60 and 100 g water per m^3 air as a function of the temperature according to the subsequent table.

Converting from an absolute to relative humidity

Relative humidity	Temperature							
	up to 20 °C	up to 30 °C	up to 40 °C	up to 50 °C	up to 60 °C	up to 70 °C	up to 80 °C	up to 90 °C
10%	2	3	5	8	13	20	29	42
15 %	3	5	8	12	19	30	44	63
20%	3	6	10	17	26	39	58	84
25 %	4	8	13	21	32	49	73	105
30 %	5	9	15	25	39	59	87	126
35%	6	11	18	29	45	69	102	146
40 %	7	12	20	33	52	79	116	167
45 %	8	14	23	37	58	89	131	188
50 %	9	15	26	41	65	98	145	209
55 %	10	17	28	46	71	108	160	230
60 %	10	19	31	50	78	118	174	251
65 %	11	20	33	54	84	128	189	272
70 %	12	21	36	58	91	138	203	293
75 %	13	23	38	62	97	148	218	314
80 %	14	24	41	66	104	157	233	335
85 %	15	26	43	70	110	167	247	356
90 %	16	27	46	74	117	177	262	377
95 %	16	29	49	79	123	187	276	398
100 %	17	30	51	83	130	197	291	419

In the standard version, the values in the table with blue background are covered (up to < 30 g water per m^3 air).

The values with light gray background in the table are covered with order code **N30** (30 to < 60 g water per m^3 air).

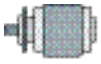
The values with dark gray background in the table are covered with order code **N31** (60 to < 100 g water per m^3 air).

An inquiry is necessary for requirements above 100 g water per m^3 air!

Note:
Cooling medium temperature and installation altitude can be found from Page 3/11 Overview!

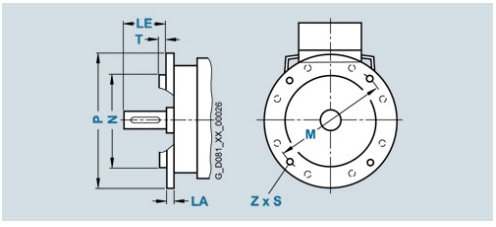
Overview (roller table motors) (continued)

Standard and special types of construction

Type of construction according to DIN EN 60034-7		Frame size	Letter 14th position the Article No.	Additional ordering data **–Z** with order code
Without flange				
IM B3/IM 1001		112 to 400	**A**	**–**
With flange				
IM B5/IM 3001		112 to 200	**F**	**–**
IM B35/IM 2001		112 to 200	**J**	**–**

In standard DIN EN 50347, flange FF with through holes and flange FT with threaded holes are assigned

Flange dimension



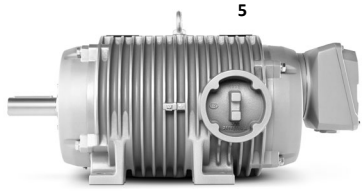
In DIN EN 50347, flange FF with through holes and flange FT with threaded holes are assigned to the frame sizes.
The designation of flanges A and C according to DIN 42948 (no longer valid since September 2003) have been additionally listed for information purposes only. Refer to the assignment table below. (**Z** = number of mounting holes)

Frame size	Type of construction	Flange type	Flange with through holes (**FF**/A)		Dimension designation according to **IEC**							
			according to DIN EN 50347	according to DIN 42948	**LA**	**LE**	**M**	**N**	**P**	**S**	**T**	**Z**
112 M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF215**	A 250	11	60	215	180	250	14.5	4	4
132 S/M	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF265**	A 300	12	80	265	230	300	14.5	4	4
160 M/L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF300**	A 350	13	110	300	250	350	18.5	5	4
180 M/L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF300**	A 350	13	110	300	250	350	18.5	5	4
200 L	IM B5, IM B35, IM V1, IM V3	Standard flange	**FF350**	A 400	15	110	350	300	400	18.5	5	4

Overview (roller table motors)

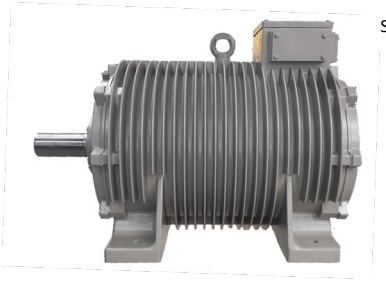
Connection, circuit configuration and terminal boxes

Terminal box position



Standard 8

Position of the terminal box with the corresponding digit at the 16th position of the Article No. for frame sizes 112-200



Standard 4

Position of the terminal box with the corresponding digit at the 16th position of the Article No. for frame sizes 225-400

Connecting motors

Line feeder cables

For motors with auxiliary terminals (e.g. for 15th position of the Article No., letter **B**) additional cable entry holes (depending on the frame size, M16 × 1.5 or M20 × 15) are provided.
For details, see the data sheet function in the DT Configurator.

The terminal box is screwed to the enclosure. For a terminal board with 6 terminal studs (standard version), the terminal box can be rotated through 4 × 90° on the connecting base of the motor enclosure.
Additional information is provided in the subsequent tables and the operating instructions.

Parallel feeder cables

For some motors, parallel feeder cables must be provided as a result of the maximum permissible current magnitude for each terminal.

These motors are appropriately marked in the selection and ordering data.

Cable entry at the terminal box

Roller table motors 1PC1423 have as standard

- Frame sizes 112-200 with terminal box at the NDE bearing shield, optional at the enclosure - optional, right-hand side.
- Frame sizes 225-400 with top-mounted terminal box at the enclosure,
  Direction NDE
- Grounding terminal at the enclosure

Position of the cable entries with the appropriate order codes

Motor	Frame size	Terminal box	Terminal box position		
			Right-hand side	Bearing shield NDE	Top
			16th position of the Article No.		
Type		Type	**5**	**8**	**4**
1PC1423	112 … 200	TB1F71 … TB1J71	✓	☐	
	225 - 400	1XB7422 … 1XB7622			☐

☐ Standard

Overview (roller table motors)

Technical data for 1PC1423 motor terminal boxes

Frame size	Terminal box [1]	Number of terminals	Thread of the contact screw	Max. conductor size	Cable outer diameter (sealing area)	Cable entry [2]
	Standard			mm2	mm	
112	TB1F71	3	M5	10	11 … 21	1 × M32 × 1.5
132					9 … 17	1 × M25 × 1.5
160	TB1J71	3	M6	16	19 … 28/	2 × M40 × 1.5/
180					9 … 13	2 × M20 × 1.5
200						
225	1XB7222	6	M6	16	19 … 28/ 9 … 13	1 × M40 × 1.5/ 1 × M20 × 1.5
250	1XB7222	6	M6	16	19 … 28/ 9 … 13	1 × M50 × 1.5/ 1 × M20 × 1.5
280	1XB7322	6	M8	50	24 ... 35 9 … 13	1 × M50 × 1.5/ 1 × M20 × 1.5
315	1XB7322	6	M8	50	24 ... 35 9 … 13	1 × M50 × 1.5/ 1 × M20 × 1.5
355	1XB7322	6	M8	50	24 ... 35 9 … 13	1 × M50 × 1.5/ 1 × M20 × 1.5
400	gt540	6	M10	120	24 ... 35 9 … 13	1 × M50 × 1.5/ 1 × M20 × 1.5

For frame sizes 225 to 400, the plates screwed to the terminal box are undrilled.
Optionally drilled, in which case 2 metric glands are supplied.

For roller table motors in frame sizes

- 225 a plate is screwed to the NDE.
- 250 to 400 one plate each screwed to NDE and to the right-hand side and left-hand side. The 3 plates are compatible

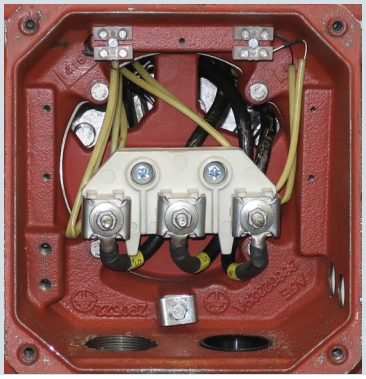
Terminal connection

Terminals that are used to connect the connecting cables to the motor winding are mounted on the terminal board. The terminals are designed, so that for frame sizes 112 to 315, a connection can be established from the outside (line connection) without requiring any cable lugs.

Fundamental data on terminal boxes for 1PC14 roller table motors

Motor	Frame size	Terminal box	Cable entries/retaining	Terminal box material	Connecting line feeder cables
1PC1423	112 … 132	TB1F71 TB1J71	2 cable glands incl. sealing plugs, Thread in the terminal box, Terminal box mounted and screwed	Cast iron	• Cable lug • Rigid cable, without cable lug
	160 … 200	TB1J71	4 cable glands incl. sealing plugs, Thread in the terminal box, Terminal box mounted and screwed	Cast iron with spheroidal graphite	• Cable lug • Rigid cable, without cable lug
	225 … 400	XB7222, XB7322, gt540	2 cable glands incl. sealing plugs, Thread in the terminal box		• Rigid cable XB7222 and XB7322, no cable lug • gt540 with cable lug

Terminal box type TB1F71



Terminal box type XB7222

1) When ordering replacement or repair parts, in addition to the precise designation of the parts, always specify the motor type and the serial number.

2) Designed for cable gland with O-ring

Overview (roller table motors)

Measures required when mounting gearboxes

Flange motors can be prepared when required for mounting to gearboxes.

It is recommended that the permissible bearing loads are carefully checked.

Hoisting lugs and transport

1PC14 roller table motors without mounting feet have as standard four cast hoisting lugs that are arranged offset through 90°.

Enclosure material

Motor series	Frame size	Enclosure material	Enclosure mounting feet
1PC14	112 … 400	Cast iron	Cast on

Preparing for mounted components

Brakes as well as rotary encoders ("modular and special mounting technology") can be subsequently mounted. The motors must be appropriately prepared. Possible on request.

Rotary encoders:

- Leine & Linde, type LL 861 900 220, order code **G04**
- Hübner, type HOG 9 D 1024 I, order code **G05**
- Hübner, type HOG 10 D 1024 I, order code **G06**
- Hübner, type POG10 DN, 2 x 1024 I, order code **G09**

For frame sizes 112 to 200, when mounting a rotary encoder, the terminal box is arranged on the right-hand side. Mounting not possible for larger roller table motors.

In addition, for subsequent encoder mounting, a motor shaft prepared with 16 mm cylindrical shaft end can be offered.
Order code **G42**

As standard, motors that are prepared for mounted components provided by the customer, can be supplied without protective canopy (order code **G42**). Customers can mount these components themselves.

The standard protective canopy (order code **H00**) is not suitable for protecting additional mounted components, e.g. a rotary encoder.

Order code **G42** is not possible in conjunction with order code **L00** vibration severity grade B.

Degrees of protection

All roller table motors, frame sizes 112 to 200 have degree of protection IP66; frame sizes 225 to 400, degree of protection IP55. They can be installed in dusty and/or humid environments. The motors are suitable for tropical climates. Guide value < 60 % relative humidity at KT 40 °C. Other requirements on request (see Table, Page 13 "Converting from an absolute to relative *humidity*").

IP56, IP65 degrees of protection optionally available.

All degrees of protection as well as test conditions correspond to DIN EN 60529.

For motors with vertical shaft, users must apply the appropriate measures to prevent the ingress of liquids along the shaft.

For motors with shaft end facing downward, version "Protective canopy for types of construction", order code **H00** is urgently recommended; see also explanations relating to "Types of construction".

The condensation drain holes are included as standard and are closed and sealed when the motor is supplied.

When used in corrosive environments, it is recommended to use non-rusting screws (external). Order code **H07**

For roller table motors, frame sizes 112 to 200 stainless steel screws in the standard version, in frame sizes 225 to 400 optionally available.

The vibration-proof version is the standard version. Continuously vibration proof to Class 3M4 according to IEC 721-3-3:199.

Noise characteristics for line operation

The noise is measured according to DIN EN ISO 1680 in a semi-anechoic chamber. It is specified as an A-weighted sound pressure level L_{pfA} in dB (A).
This value is the spatial average value of the sound pressure levels measured at the measuring surface. The measuring surface is a cube 1 m away from the surface of the motor. The sound power level L_{WA} in dB (A) is also specified.

The specified values are applicable at 50 Hz and at the rated power (see the selection and ordering data). The tolerances +3 dB. At 60 Hz, the values increase by approximately 4 dB (A). Noise values of motors operated with converters available on request.

The rotor balancing type according to DIN EN 60034-14 Sept 2004 is marked on the face side of the customer-side shaft end DE / NDE:

F = Balancing with full feather key
(agreement with full feather key)
H = Balancing with half feather key
(agreement with half feather key) – standard
N = Balancing without feather key –
Plain text data is required (agreement without feather key)

For motors up to frame size 112 the marking is on the rating plate.
Balancing with full feather key (F) is possible with order code **L02** (additional price).

Balancing without feather key (N) is possible with order code **L01** (additional price).

Vibration severity grade A is the normal version and is applicable up to a rated frequency of 60 Hz.

Low vibration version B is available to address special requirements relating to the mechanical smooth running properties.
Order code **L00**

Order code **L00** vibration severity grade B is not possible in conjunction with order code **G42**.

To evaluate this vibration, evaluation zones A and B according to ISO 101816-3 apply.

The limit values specified in the following table are applicable for uncoupled motors, freely suspended and operating under no-load conditions.

For converter operation with frequencies higher than 60 Hz, special balancing is required to maintain the specified limit values (must be specified in plain text: maximum supply frequency/speed).

For more detailed information, see the online help in the DT Configurator.

Measures required when mounting gearboxes, preparing for mounted components, noise characteristics

Overview (roller table motors)

Limit values (rms values) of the maximum vibration severity for vibration amplitude (s), vibration velocity (v) and acceleration (a) for shaft height H

Vibration severity grade	Motor mounting	Shaft height H in mm					
		56 ≤ H ≤ 132			132 < H ≤ 280		
		*s*rms	*v*rms	*a*rms	*s*rms	*v*rms	*a*rms
		µm	mm/s	mm/s^2	µm	mm/s	mm/s^2
A	Freely suspended	25	1.6	2.5	35	2.2	3.5
	Rigidly mounted	21	1.3	2.0	29	1.8	2.8
B	Freely suspended	11	0.7	1.1	18	1.1	1.7
	Rigidly mounted	–	–	–	14	0.9	1.4

Details, see Standard DIN EN 60034-14 Sept. 2004.

Higher values must be first agreed on in writing. A component with twice the line supply frequency is considered to be dominating if the type test indicates that it is greater than 2.3 mm/s (rms value).

Overview (roller table motors)

Shaft end

Centering bore 60° according to DIN 332, Part 2 with threaded bore M3 to M24 as a function of the shaft diameter (see the dimension tables in Catalog Section 2).

DE (DE shaft end)	
Diameter	Thread
mm	mm
> 28 ... 30	DR M10
> 30 ... 38	DR M12
> 38 ... 50	DR M16/DS M16
> 50 ... 85	DR M20/DS M20
> 85 ... 130	DS M24

Shaft end with standard dimensions without keyway

For 1PC1423 roller table motors, the standard shaft end with standard dimensions can be ordered without a keyway.
Order code **L04**

Standard stainless steel shaft

For roller table motors, the standard shaft is manufactured out of stainless steel.

Frame sizes 112 to 200 in X20Cr13 (1.4021)
Frame sizes 225 to 400 in 42CrMoS4.V

Special stainless steel materials only on request.

Non-standard cylindrical shaft end

The non-standard cylindrical shaft end is applicable for the drive end
DE The feather key is always supplied.
Order code **Y58**

For order code **Y58** non-standard cylindrical shaft end DE, the following applies:

- Dimension D: less or equal to the ball bearing inner diameter, tolerance field less than the tolerance field according to EN 50347.
- Dimension E: less than or equal to 2 × length E (standard) of the shaft end.

See the following table "Permissible changes at the DE shaft end" and dimension tables.

Permissible changes at the DE shaft end (**Y58**)

Motor series	Frame size	No. of poles	Shaft end length E in mm		Shaft end diameter D in mm		
			Stan-dard	up to maxi-mum	minimum	Stan-dard	up to maxi-mum [1]
1PC14	112	4	60	120	24	28	30
	132	4	80	120	24	38	40
	160	4	110	220	38	42	45
	180	4 … 6	110	25520	on req.	48	48
	200	46	110	220400		55	55
	225	4, 6	140	280		60	60
	250	46	140	280		65	70
	280	4, 6	140	280		75	80
	315	6 ….8	170	340		85	O.R.
	355	8	210	420		100	O.R.
	400	8	210	420		110	O.R.

1) A shaft shoulder is not possible for the maximum diameter

Radial eccentricity of the shaft end, concentricity and axial eccentricity acc. to DIN 42955, tolerance R for flange mounting types of construction

Tolerance N (normal) and tolerance R (reduced) are defined in DIN 42955:

1. Radial eccentricity tolerances for the shaft end
2. Concentricity tolerances for the shaft end and the flange centering
3. Axial eccentricity tolerances for the shaft end and the flange surface

The radial eccentricity of the shaft end, concentricity and axial eccentricity acc. to DIN 42955, tolerance R for flange mounting types of construction can be ordered using order code **L08**.

The radial eccentricity of the shaft end acc. to DIN 42955, tolerance R for types of construction without flange can be ordered using order code **L07**.

Radial eccentricity tolerance for the shaft end

Diameter of the cylindrical shaft end	Radial eccentricity tolerance	
d	N (normal)	R (reduced)
mm	mm	mm
> 28 … 30	0.04	0.021
> 30 … 50	0.05	0.025
> 50 … 75	0.06	0.03

Overview (roller table motors)

Bearing service life (nominal service life)

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

Under average operating conditions, a service life (L_{10h}) of 100000 hours can be reached.

The bearing service life is essentially determined by the bearing size, the bearing load, the operating conditions, the speed and the grease service life. A bearing service life calculation is possible on request.

Bearing system

The bearing service life for horizontally mounted motors for a coupling output without any supplementary axial loads is 40000 hours, and when utilizing the maximum permissible load, it is 20000 hours. This is based on motor operation at 50 Hz. The nominal bearing service life is reduced when the motor is fed from a converter at higher frequencies.

For the permissible vibration values, measured at the bearing shield, evaluation zones A and B defined in ISO 10816 are applicable in order to achieve the calculated service life in continuous operation. For higher vibration velocities as a result of the operating situation, special agreements should be made (an inquiry is required).

Variable-speed motors have a different bearing service life for the same load as a result of the inherent physics. This dependency is linear. This means that if the frequency increases 20 % from 50 Hz to 60 Hz, then the service life for load levels specified in the catalog decreases by 20 % from 20000 down to 16000 hours.
If the frequency decreases 20 % from 50 Hz down to 40 Hz, then the service life for load levels specified in the catalog increases by 20 % from 20000 up to 24000 hours.

It should be observed that for types of construction IM B6, IM B7, IM B8, IM V5 and IM V6, it is only permissible that the belt tension acts in parallel or to the mounting plane and the mounting feet must be supported. For the foot-mounted type of construction, both mounting feet must be fixed.

In the basic bearing system version, for frame sizes 112-200, the fixed bearing is arranged at the drive end (DE) and the floating bearing at the non-drive end. At the non-drive end (NDE), the bearing system is axially preloaded using a spring element. This arrangement guarantees a steady and uniform motor operation without any play (see bearing diagram 1 on the next page).

For larger motors, the fixed bearing is arranged at the non-drive end (NDE).
For frame sizes 112 to 200, reinforced and sealed deep-groove ball bearings with permanent lubrication, bearing series 63 are used at both ends. For frame sizes 225 to 400, open cylindrical roller bearings (NUxxx) are used at the drive end (DE), for frame sizes 280 to 400 including regreasing system, for frame sizes 225 to 250 as an option. The deep-groove ball bearing (62xx) at the non-drive end NDE is equipped as a location bearing. Nominal service life 40,000 hours for coupling operation.

A measuring nipple for the SPM shock pulse measurement system can be attached to monitor bearing vibration levels. In this case, motors have an M8 threaded bore in each bearing shield together with a measuring nipple with protective cap. If there is a second threaded bore, then this is closed using a sealing plug.
Order code **Q01**

Bearing insulation

To avoid damage caused by bearing currents, the bearings can be insulated for frame sizes 225 up to 280 – recommended from frame size 225 and higher.
Order code **L51** (insulated NDE bearing) means automatically a fixed bearing at the DE (not applicable for NU bearings in frame sizes 225-400). For frame sizes 315 to 400 insulated bearings are already included as standard.

Permanent lubrication

For permanent lubrication, the bearing grease service life is harmonized with the bearing service life. The precondition is that the motor is operated according to what is specified in the catalog. The motors in the basic version have permanent lubrication. The lubricant service life for permanently lubricated bearings is 20,000 operating hours for a cooling medium temperature of 40 °C.

Regreasing

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

Frame sizes 112 to 200 can be optionally equipped with a nipple for regreasing the bearings.
Order code **L23**

For motors with regreasing device, regreasing intervals, grease quantity, grease type and possibly additional data are stamped on the lubrication plate or rating plate. Regreasing intervals for the basic version, see Table "Grease service life and regreasing intervals for horizontal mounting".

Mechanical stress, grease service life

As a result of high speeds above the rated speed in converter operation and the resulting increased vibration levels, the mechanical smooth running properties change, and the bearings are subject to increased mechanical stress. As a consequence, the grease service life and the bearing service life decrease (inquire if necessary).

If at all possible, rigid couplings should not be used. As a consequence, specifically for converter operation, the mechanical speed limits, n_{max} at the maximum supply frequency f_{max} should be taken into careful consideration, see the following Table "Mechanical speed limits n_{max} at the maximum supply frequency f_{max}".

We provide the SIPLUS CMS condition monitoring systems to monitor mechanical components. In the sense of predictive maintenance, maintenance operations can be planned better and executed on time in an optimum fashion.
Order code **Q05,** only on request.

Overview (roller table motors)

Grease service life and regreasing intervals for horizontal mounting

Motor series	Frame size	No. of poles	
Permanent lubrication [1]			
			Grease service life up to KT 40°C [2]
1PC14	112 … 200	4, 6	20000 h or 40000 h [3]
Regreasing [1]			
			Regreasing interval up to KT ≤ 60°C [2]
1PC14	112 … 200	4, 6	8000 h [4]
	180 … 280	4, 6	8000 h
	315 … 355		6000 h
	400		6000 h

Regreasing interval as a function of the cooling medium temperature (KT)

For temperature class 155 (F):
KT 40 to 60 °C regreasing interval 8000 h
KT 60 to 80 °C regreasing interval 4000 h

For temperature class 180 (H),
KT 40 regreasing interval 8000 h
KT 45 to 60 °C regreasing interval 4000 h
KT 65 to 80 °C regreasing interval 2000 h

Bearing arrangement for 1PC1423 roller table motors

Frame size	No. of poles	Drive end (DE) bearing horizontal and vertical types of construction	Non-drive end (NDE) bearing horizontal and vertical types of construction	Fig. No.
112 M	4	6306 2RS C3	6306 2RS/2Z C3	
132 S/M	4	6308 2RS C3	6308 2RS/2Z C3	
160 M/L	4	6310 2RS C3	6310 2RS/2Z C3	**Fig. 2**
180 M/L	4, 6	6311 2RS C3	6311 2RS/2Z C3	
200 L	6	6313 2RS C3	6313 2RS/2Z C3	

Frame size	No. of poles	Drive end (DE) bearing horizontal type of construction	Non-drive end (NDE) bearing horizontal type of construction	
225 S/M	6	NU213	6213 C3	
250 M	6	NU215	6215 C3	
280 S/M	6	NU216	6216 C3	**Fig. 5**
315 L	6, 8	NU218	6218 C3	
355 L	8	NU222	6222 C3	
400	8	NU224	6224 C3	

Bearing diagrams

Fig. 2 DE bearing (fixed bearing) NDE bearing (floating bearing)
Standard Special sealing system (Order code H91)

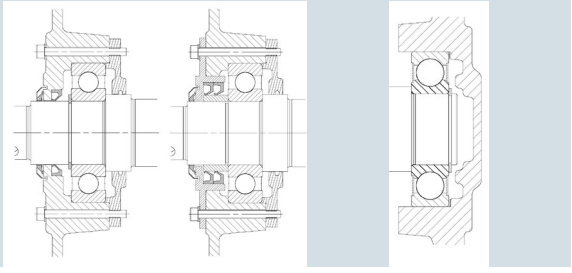
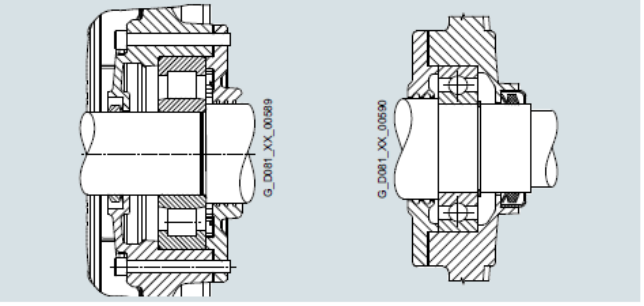


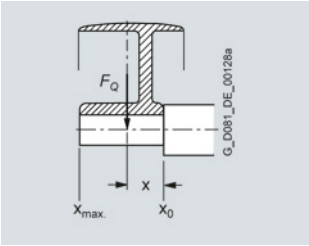
Bild 5 DE-Lager NDE-Lager



1) For special application conditions, the grease service life or regreasing interval on request.
2) When the cooling medium temperature increases above 80 °C, for each 10 K, the grease service life and/or regreasing interval is halved.
3) 40000 h is applicable for horizontally mounted motors with coupling output without additional axial loads.
4) For frame sizes 112 to 200 with relubrication device, the bearings are not equipped with sealing disks.

Overview (roller table motors)

Permissible cantilever forces



To calculate the permissible cantilever forces for radial loads, the line of action (center of the belt pulley) of the cantilever force F_Q (N) must lie within the free shaft end (dimension x).

Dimension x (mm) is the distance between the point of application of force F_Q and the shaft shoulder. Dimension $x_{max.}$ corresponds to the shaft end length.

Total cantilever force $F_Q = c \cdot F_u$

Pretension factor c is a value gained from experience by the belt manufacturer. It can be approximated as follows:

For standard flat leather belts with tensioning roll, c = 2;
For V belts, c = 2 to 2.5;
For special plastic belts depending on the load type and the belt type, c = 2 to 2.5.

Circumferential force F_u (N) is calculated using the equation

F_u circumferential force in N
P rated motor power (transmitted power) kW
n rated motor speed in rpm
D belt pulley diameter in mm

Permissible cantilever forces

1PC1423 roller table motors at 50 Hz
The following apply: x_0 values for x = 0 and x_{max} values for x = l (l = shaft end)

For motors		Permissible cantilever force	
		for x_0	for x_{max}
Frame size	Type	N	N
112	1PC1423-1BB2	1890	1590
132	1PC1423-1CB0	2910	2420
	1PC1423-1CB6	2760	2300
160	1PC1423-1DB6	4450	3660
	1PC1423-1DB8	4420	3640
180	1PC1423-1EB4	5270	4050
	1PC1423-1EB7	5030	4050
	1PC1423-1EC6	5960	4050
	1PC1423-1EC8	5700	4050
200	1PC1423-2AC7	6880	5820
225	1PC1423-2BC6	O.R.	O.R.
250	1PC1423-2CC6	O.R.	O.R.
280	1PC1423-2DC6	O.R.	O.R.
315	1PC1423-3AC6	O.R.	O.R.
	1PC1423-3AD6	O.R.	O.R.
355	1PC1423-3BD6	O.R.	O.R.
400	1PC1423-4AD6	O.R.	O.R.

Overview (roller table motors)

Motors in a horizontal type of construction

Frame size	Type	1500 rpm Load tensile N	1500 rpm thrust N	1000 rpm Load tensile N	1000 rpm thrust N	750 rpm Load tensile N	750 rpm thrust N
112	1PC1423-1BB2	1220	1740	–	–	–	–
132	1PC1423-1CB0	1680	2720	–	–	–	–
	1PC1423-1CB6	1600	2640	–	–	–	–
160	1PC1423-1DB6	2770	3590	–	–	–	–
	1PC1423-1DB8	2740	3560	–	–	–	–
180	1PC1423-1EB4	3400	4360	–	–	–	–
	1PC1423-1EB7	3280	4240	–	–	–	–
	1PC1423-1EC6	–	–	4080	5040	–	–
	1PC1423-1EC8	–	–	3930	4890	–	–
200	1PC1423-2AC7	–	–	5030	5670	–	–
225	1PC1423-2BC6	–	–	O.R.	O.R.	–	–
250	1PC1423-2CC6	–	–	O.R.	O.R.	–	–
280	1PC1423-2DC6	–	–	O.R.	O.R.	–	–
315	1PC1423-3AC6	–	–	O.R.	O.R.	–	–
	1PC1423-3AD6	–	–	–	–	O.R.	O.R.
355	1PC1423-3BD6	–	–	–	–	O.R.	O.R.
400	1PC1423-4AD6	–	–	–	–	O.R.	O.R.

Motors in a vertical type of construction

Frame size	Type	1500 rpm, Shaft end facing down, Load facing down N	1500 rpm, Shaft end facing down, Load facing up N	1500 rpm, Shaft end facing up, Load facing down N	1500 rpm, Shaft end facing up, Load facing up N	1000 rpm, Shaft end facing down, Load facing down N	1000 rpm, Shaft end facing down, Load facing up N	1000 rpm, Shaft end facing up, Load facing down N	1000 rpm, Shaft end facing up, Load facing up N	750 rpm, Shaft end facing down, Load facing down N	750 rpm, Shaft end facing down, Load facing up N	750 rpm, Shaft end facing up, Load facing down N	750 rpm, Shaft end facing up, Load facing up N
112	1PC1423-1BB2	1080	1880	1600	1360	–	–	–	–	–	–	–	–
132	1PC1423-1CB0	1480	2920	2520	1880	–	–	–	–	–	–	–	–
	1PC1423-1CB6	1340	2900	2380	1860	–	–	–	–	–	–	–	–
160	1PC1423-1DB6	2380	3980	3200	3160	–	–	–	–	–	–	–	–
	1PC1423-1DB8	2320	3980	3140	3160	–	–	–	–	–	–	–	–
180	1PC1423-1EB4	2930	4830	3890	3870	–	–	–	–	–	–	–	–
	1PC1423-1EB7	2690	4830	3650	3870	–	–	–	–	–	–	–	–
	1PC1423-1EC6	–	–	–	–	3480	5640	4440	4680	–	–	–	–
	1PC1423-1EC8	–	–	–	–	3200	5620	4160	4660	–	–	–	–
200	1PC1423-2AC7	–	–	–	–	4080	6620	4720	5980	–	–	–	–
225	1PC1423-2BC6	–	–	–	–	O.R.	O.R.	O.R.	O.R.	–	–	–	–
250	1PC1423-2CC6	–	–	–	–	O.R.	O.R.	O.R.	O.R.	–	–	–	–
280	1PC1423-2DC6	–	–	–	–	O.R.	O.R.	O.R.	O.R.	–	–	–	–
315	1PC1423-3AC6	–	–	–	–	O.R.	O.R.	O.R.	O.R.	–	–	–	–
	1PC1423-3AD6	–	–	–	–	–	–	–	–	O.R.	O.R.	O.R.	O.R.
355	1PC1423-3BD6	–	–	–	–	–	–	–	–	O.R.	O.R.	O.R.	O.R.
400	1PC1423-4AD6	–	–	–	–	–	–	–	–	O.R.	O.R.	O.R.	O.R.

Overview (roller table motors)

Mounting system, see Catalog D 81.1, Chapter 1 from Page 1/76

Roller table motors 1PC1423 non-ventilated – line voltage 400 V/50 Hz

Selection and ordering data

Operating values at rated power						**Cast iron series 1PC1423 –** Version specifically for converter operation				
$P_{N,}$ 50 Hz	**Frame size**	Operating control	*Speed*	M_N	*Macc*	$\eta_{N,}$ 4/4 for converter operation	$\cos\varphi_{N,}$ 4/4 for converter operation	I_N	I_{acc}	
kW	**FS**		rpm	Nm	Nm	%		A	A	Article No.
• Cooling: Non-ventilated (IC 410) • Insulation: Thermal class 155 (thermal class F), degree of protection IP66, utilized according to thermal class 155 (thermal class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 400 V/50 Hz										
4-pole: 1500 rpm at 50 Hz										
3.5	**112 M**	Y	1475	23	69	88.2	0.75	7.6	21.0	**1PC1423-1BB69-0...**
4.8	**132 M**	Y	1480	31	93	89.2	0.71	10.9	28.5	**1PC1423-1CB09-0...**
6.8	**132 M**	Y	1480	44	132	90.2	0.71	15.3	39.5	**1PC1423-1CB69-0...**
9.3	**160 L**	Y	1485	60	180	91.0	0.76	19.1	53.0	**1PC1423-1DB69-0...**
11	**160 L**	Y	1485	71	213	91.4	0.75	23.0	61.0	**1PC1423-1DB89-0...**
13	**180 L**	Y	1480	84	252	91.8	0.74	27.5	73.0	**1PC1423-1EB49-0...**
17.5	**180 L**	Y	1480	110	330	92.5	0.74	37.0	95.0	**1PC1423-1EB79-0...**
6-pole: 1000 rpm at 50 Hz										
10.6	**180 L**	Y	985	100	300	90.2	0.65	26.0	62.0	**1PC1423-1EC69-0...**
13.8	**180 L**	Y	985	130	390	90.9	0.68	32.0	85.0	**1PC1423-1EC89-0...**
18	**200 L**	Y	990	170	510	91.7	0.63	45.0	103.0	**1PC1423-2AC79-0...**
20	**225 M**	D	975	225	900	92.0	0.66	55	190	**1PC1423-2BC69-0...**
33	**250 M**	D	975	360	1440	93.0	0.71	82	305	**1PC1423-2CC69-0...**
50	**280 M**	D	975	535	2140	93.8	0.74	114	435	**1PC1423-2DC69-0...**
67	**315**	D	982	705	2820	94.0	0.74	150	570	**1PC1423-3AC69-0...**
8-pole 750 rpm at 50 Hz										
55	**315**	D	728	795	3180	94.9	0.62	148	490	**1PC1423-3AD69-0...**
92	**355**	D	735	1280	5120	94.8	0.61	245	790	**1PC1423-3BD69-0...**
120	**400**	D	735	1650	6600	95.0	0.62	310	1010	**1PC1423-4AD69-0...**

Roller table motors 1PC1423 non-ventilated – line voltage 400 V/50 Hz

Selection and ordering data

Motor type	$m_{IM\ B3}$	J	L_{pfA}, Tolerance +3 dB(A) Load	L_{WA}, Tolerance +3 dB(A) Load	Mech. speed limit	Terminal box type	**Preferred Motor Modules of the SINAMICS S120** other SINAMICS converters also possible – low-overload operating mode [1]	Base load current I_{CH}	Rated current I_N	Single motor module booksize Width
	kg	kgm²	dB(A)	dB(A)	rpm		Type	A	A	mm
• Cooling: Non-ventilated (IC 410) • Insulation: Thermal class 155 (thermal class F), degree of protection IP66, utilized according to thermal class 155 (thermal class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 400 V/50 Hz										
4-pole: 1500 rpm at 50 Hz										
1PC1423-1BB69-0...	66	0.019	63	75	4200	TB1F71	6SL3120-1TE21-0AD0	7.7	9.0	50
1PC1423-1CB09-0...	89	0.035	68	80	4200	TB1F71	6SL3120-1TE21-8AC0	15.3	18.0	50
1PC1423-1CB69-0...	105	0.049	68	80	4200	TB1F71	6SL3120-1TE21-8AC0	15.3	18.0	50
1PC1423-1DB69-0...	166	0.102	61	74	4200	TB1J71	6SL3120-1TE23-0AC0	25.5	30.0	100
1PC1423-1DB89-0...	173	0.112	61	74	4200	TB1J71	6SL3120-1TE23-0AC0	25.5	30.0	100
1PC1423-1EB49-0...	212	0.158	67	81	4200	TB1J71	6SL3120-1TE23-0AC0	25.5	30.0	100
1PC1423-1EB79-0...	250	0.204	67	81	4200	TB1J71	6SL3210-1TE24-5AA3	38.0	45.0	150
6-pole: 1000 rpm at 50 Hz										
1PC1423-1EC69-0...	222	0.247	77	90	3600	TB1J71	6SL3120-1TE23-0AC0	25.5	30.0	100
1PC1423-1EC89-0...	252	0.318	77	90	3600	TB1J71	6SL3120-1TE23-0AC0	25.5	30.0	100
1PC1423-2AC79-0...	325	0.503	64	77	3600	TB1J71	6SL3120-1TE24-5AA3	38.0	45.0	150
1PC1423-2BC69-0...	400	1.0	63	76	4400	1XB7222	To be defined in project			
1PC1423-2CC69-0...	600	1.8	64	77	3700	1XB7222	To be defined in project			
1PC1423-2DC69-0...	800	3.0	66	80	3000	1XB7322	To be defined in project			
1PC1423-3AC69-0...	1100	5.2	72	87	2600	1XB7322	To be defined in project			
8-pole 750 rpm at 50 Hz										
1PC1423-3AD69-0...	1100	5.2	72	87	2600	1XB7322	To be defined in project			
1PC1423-3BD69-0...	1600	9.5	68	83	2600	1XB7322	To be defined in project			
1PC1423-4AD69-0...	2100	19	65	80	2200	GT 540	To be defined in project			

1) In addition to the Power Module, a Control Unit and an operator panel are required (see Catalogs D 31 and D 35).

Selection and ordering data

Operating values at rated power						**Cast iron series 1PC1423 –** Version specifically for converter operation				
$P_{N,\ 50\ Hz}$	**Frame size**	Operating control	*Speed*	M_N	*Macc*	η_N, 4/4 for converter operation	$\cos\varphi_N$, 4/4 for converter operation	I_N	I_{acc}	
kW	**FS**		rpm	Nm	Nm	%		A	A	Article No.
• Cooling: Non-ventilated (IC 410) • Insulation: Thermal class 155 (thermal class F), degree of protection IP66, utilized according to thermal class 155 (thermal class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 690 V/50 Hz										
4-pole: 1500 rpm at 50 Hz										
3.5	**112 M**	Y	1475	23	69	88.2	0.75	4.4	12.1	**1PC1423-1BB69-0...**
4.8	**132 M**	Y	1480	31	93	89.2	0.71	6.3	16.5	**1PC1423-1CB09-0...**
6.8	**132 M**	Y	1480	44	132	90.2	0.71	8.8	23.0	**1PC1423-1CB69-0...**
9.3	**160 L**	Y	1485	60	180	91.0	0.76	11.0	30.5	**1PC1423-1DB69-0...**
11	**160 L**	Y	1485	71	213	91.4	0.75	13.3	35.0	**1PC1423-1DB89-0...**
13	**180 L**	Y	1480	84	252	91.8	0.74	15.9	42.0	**1PC1423-1EB49-0...**
17.5	**180 L**	Y	1480	110	330	92.5	0.74	21.5	55.0	**1PC1423-1EB79-0...**
6-pole: 1000 rpm at 50 Hz										
10.6	**180 L**	Y	985	100	300	90.2	0.65	15.0	36.0	**1PC1423-1EC69-0...**
13.8	**180 L**	Y	985	130	390	90.9	0.68	18.5	49.0	**1PC1423-1EC89-0...**
18	**200 L**	Y	990	170	510	91.7	0.63	26.0	60.0	**1PC1423-2AC79-0...**
20	**225 M**	D	975	210	840	91.8	0.64	30.5	108	**1PC1423-2BC69-0v**
33	**250 M**	D	975	335	1340	92.5	0.70	45	172	**1PC1423-2CC69-0...**
50	**280 M**	D	975	510	2040	93.4	0.73	64	245	**1PC1423-2DC69-0...**
67	**315**	D	982	675	2700	94.0	0.74	84	325	**1PC1423-3AC69-0...**
8-pole: 750 rpm at 50 Hz										
55	**315**	D	728	760	3040	94.6	0.62	83	270	**1PC1423-3AD69-0...**
92	**355**	D	735	1220	4880	94.8	0.60	138	450	**1PC1423-3BD69-0...**
120	**400**	D	735	1590	6360	95.0	0.62	174	580	**1PC1423-4AD69-0...**

Selection and ordering data

Motor type	$m_{IM\ B3}$	J	L_{pfA}, Tolerance +3 dB(A) Load	L_{WA}, Tolerance +3 dB(A) Load	Mech. speed limit	Terminal box type	**Preferred Motor Modules of the SINAMICS S120** other SINAMICS converters also possible – low-overload operating mode [1]	Base load current I_{CH}	Rated current I_N	Single motor module booksize Width
	kg	kgm²	dB(A)	dB(A)	rpm		Type	A	A	mm
• Cooling: Non-ventilated (IC 410) • Insulation: Thermal class 155 (thermal class F), degree of protection IP66, utilized according to thermal class 155 (thermal class F) • Converter operation with uncontrolled infeed – SINAMICS S; rated voltage 690 V/50 Hz										
4-pole: 1500 rpm at 50 Hz										
1PC1423-1BB69-0...	66	0.019	63	75	4200	TB1F71	6SL3210-1PH21-4_L0	14.0	14.0	200
1PC1423-1CB09-0...	89	0.035	68	80	4200	TB1F71	6SL3210-1PH21-4_L0	14.0	14.0	200
1PC1423-1CB69-0...	105	0.049	68	80	4200	TB1F71	6SL3210-1PH21-4_L0	14.0	14.0	200
1PC1423-1DB69-0...	166	0.102	61	74	4200	TB1J71	6SL3210-1PH21-4_L0	14.0	14.0	200
1PC1423-1DB89-0...	173	0.112	61	74	4200	TB1J71	6SL3210-1PH21-4_L0	14.0	14.0	200
1PC1423-1EB49-0...	212	0.158	67	81	4200	TB1J71	6SL3210-1PH22-0_L0	19.0	19.0	200
1PC1423-1EB79-0...	250	0.204	67	81	4200	TB1J71	6SL3210-1PH22-3_L0	23.0	23.0	200
6-pole: 1000 rpm at 50 Hz										
1PC1423-1EC69-0...	222	0.247	77	90	3600	TB1J71	6SL3210-1PH22-0_L0	19.0	19.0	200
1PC1423-1EC89-0...	252	0.318	77	90	3600	TB1J71	6SL3210-1PH22-0_L0	19.0	19.0	200
1PC1423-2AC79-0...	325	0.503	64	77	3600	TB1J71	6SL3210-1PH22-7_L0	27.0	27.0	200
1PC1423-2BC69-0...	400	1.0	63	76	4400	1XB7222	To be defined in project			
1PC1423-2CC69-0...	600	1.8	64	77	3700	1XB7222	To be defined in project			
1PC1423-2DC69-0...	800	3.0	66	80	3000	1XB7322	To be defined in project			
1PC1423-3AC69-0...	1100	5.2	72	87	3000	1XB7322	To be defined in project			
8-pole: 750 rpm at 50 Hz										
1PC1423-3AD69-0...	1100	5.2	72	87	2600	1XB7322	To be defined in project			
1PC1423-3BD69-0...	1600	9.5	68	83	2600	1XB7322	To be defined in project			
1PC1423-4AD69-0...	2100	19	65	80	2200	GT540	To be defined in project			

1) In addition to the Power Module, a Control Unit and an operator panel are required (see Catalogs D 31 and D 35).

Selection and ordering data

Voltages	Article No. supplements				Frame size												
	Voltage code 12th and 13th position of the Article No.		Additional identification code with order code and plain text if required		112	132	160	180	200	225	250	280	315	355	400		
					1PC1423											IEC	IE3
1PC1. . . . -	■	- ■	. . .	Order code	112	132	160	180	200	225	250	280	315	355	400		
Anormale Spannung und/oder Frequenzen																	
Anormale Wicklung für Anschlussspannung < 500 V mit Umrichterbetrieb (Advanced) [1]	**9**	**0**	**M1Y**	• and customer specifi-cations	○	○	○	○	○	○	○	○	○	○	○		
Anormale Wicklung für Anschlussspannung > 500 V bis 690 V mit Umrichterbetrieb (Premium) [1]	**9**	**0**	**M2Y**	•and customer specifi-cations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

○ No additional cost
✓ With additional price

1) Plain text must be specified when ordering: Voltage between 200 and 690 V (voltages outside the range on the request), frequency, connection and required rated power in kW.

Selection and ordering data

Types of construction	Article No. Supplements		Baugröße												
	Type of construc-tion code letter 14th position of the Article No	Additional identification code with order code and plain text if required	112	132	160	180	200	225	250	280	315	355	400	IEC	IE3
			1PC1423												
			112	132	160	180	200	225	250	280	315	355	400		
Without flange															
IM B3 [1]	A	-	□	□	□	□	□	□	□	□	□	□	□		
With flange	nach DIN EN 50347 nach DIN 42948		FF215 A 250	FF265 A 300	FF300 A 350	FF300 A 350	FF350 A 400								
IM B5 [1]	F	-	✓	✓	✓	✓	✓	-	-	-	-	-	-		
IM B35 [1]	J	-	✓	✓	✓	✓	✓	-	-	-	-	-	-		

□ Normal version
✓ With additional price
– Not possible

1) The type of construction is stamped on the rating plate. When ordering with condensation drain holes (order code H03) is for a deviating mounting position, the data of the mounting position for the correct positioning of the condensation drain holes is required.

Selection and ordering data

Motor protection	Article No. Supplement														
	Motor protection code 15th position of the Article No	Additional identification code with order code and plain text if required	Frame size												
			112	132	160	180	200	225	250	280	315	355	400		
			1PC1423											IEC	IE3
			112	132	160	180	200	225	250	280	315	355	400		
Motor protection															
6 PTC thermistors – for alarm and tripping (4 terminals) [1]	**C**	-	◘	◘	◘	◘	◘	◘	◘	◘	◘	◘	◘		
3 Pt100 resistance thermometers – 2-wire circuit (6 terminals) [1]	**H**	-	✓	✓	✓	✓	✓	–	–	–	–	–	–		
6 Pt100 resistance thermometers – 2-wire circuit (12 terminals) [1]	**J**	-	–	–	–	✓	✓	–	–	–	–	–	–		
1 Pt1000 resistance thermometer (2 terminals) [1]	**K**	-	○	○	○	○	○	–	–	–	–	–	–		
2 Pt1000 resistance thermometers (4 terminals) [1]	**L**	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

◘ Normal version
○ No additional cost
✓ With additional price
– Not possible

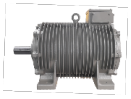
1) An evaluation with the associated tripping unit (see Catalog IC 10) is recommended.

Article number supplements and special versions

Terminal box position

1PC1423 roller table motors

Selection and ordering data

Terminal box position	Article No. Supplement		Frame size											
 	Terminal box position code 16th position of the Article No.	Additional identification code with order code and plain text if required	112	132	160	180	200	225	250	280	315	355	400	
			1PC1423											IEC IE3
			112	132	160	180	200	225	250	280	315	355	400	
Terminal box position														
Terminal box NDE	**8**	-	□	□	□	□	□	-	-	-	-	-	-	
Terminal box on RHS	**5**	-	✓	✓	✓	✓	✓	-	-	-	-	-	-	
Terminal box top	**4**	-	-	-	-	-	-	□	□	□	□	□	□	

□ Normal version
✓ With additional price
– Not possible

Selection and ordering data

Special versions	Additional identification code -Z with order code and plain text if requirede	Frame size 112	132	160	180	200	225	250	280	315	355	400		
		1PC1423											IEC	IE3
1PC1. . . - . . . . . - . . . . -Z	Order code	112	132	160	180	200	225	250	280	315	355	400		
Motor protection														
1 Pt1000 resistance thermometer (2 terminals) [1]	Q35	✓	✓	✓	✓	✓	–	–	–	–	–	–		
2 Pt1000 resistance thermometers (4 terminals)) [1]	Q36	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Motor connection and terminal box														
External grounding	H04	□	□	□	□	□	□	□	□	□	□	□		
Terminal box with holes and metric metal cable entries [2]	R40	✓	✓	✓	✓	✓	–	–	–	–	–	–	Only for:	Frame size 112 to 20
Cast-iron auxiliary terminal box (small)	R62	✓	✓	✓	✓	✓	–	–	–	–	–	–		
Windings and insulation														
Temperature class 180 (H) at rated power and max. CT 60 °C	N11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Only for:	Frame size 112 to 20
Colors and paint finish														
Special finish sea air resistant	S03	□	□	□	□	□	□	□	□	□	□	□		
Internal coating	S05	□	□	□	□	□	□	□	□	□	□	□		
Finish in other standard RAL colors: RAL 1002, 1013, 1015, 1019, 2003, 2004, 3000, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6011, 6019, 6021, 7000, 7001, 7004, 7011, 7016, 7022, 7031, 7032, 7033, 7035, 9001, 9002, 9005 (siehe (see Catalog Section 1 “Introduction”)	Y53 • and finish RAL….	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Finish in special RAL colors: RAL colors, see “Special finish in special RAL colors” (see Catalog Section 1 “Introduction”)	Y56 • and finish RAL….	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Non-standard colors Colors, see “Paint finish in non-standard colors” (see Catalog Section 1 “Introduction”)	Y66 • and finish	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Special technology														
Mounting of LL 861 900 220 rotary pulse encoder [3]	G04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 9 D 1024 I rotary pulse encoder [3]	G05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Mounting of HOG 10 D 1024 I rotary pulse encoder [3]	G06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Mounting of rotary pulse encoder POG 10 DN, 2 x 1024 [3]	G09	✓	✓	✓	✓	✓	–	–	–	–	–	–		
Mechanical design and degrees of protection														
IP65 degree of protection	H20						✓	✓	✓	✓	✓	✓	Only for:	Frme size 225 to 400
IP56 degree of protection	H22						✓	✓	✓	✓	✓	✓	Only for:	Frme size 225 to 400
IP66 degree of protection		□	□	□	□	□	–	–	–	–	–	–	Only for:	Frme size 225 to 400
Vibration-proof version; vibration resistance to Class 3M6 acc. to IEC721-3-3		□	□	□	□	□	–	–	–	–	–	–	Only for:	IM B3 Frame size 112 to 200
Vibration-proof version; vibration resistance to Class 3M4 acc. to IEC721-3-3		□	□	□	□	□	–	–	–	–	–	–	Only for:	IM B5, IM B35 Frame size 112 to 200
		–	–	–	–	–	□	□	□	□	□	□	Only for:	IM B3

Selection and ordering data

Special versions	Additional identification code -Z with order code and plain text if requirede	Frame size 112	132	160	180	200	225	250	280	315	355	400		
		1PC1423											IEC	IE3
1PC1. . . - . . . . . - . . . . -Z	Order code	112	132	160	180	200	225	250	280	315	355	400		
Condensation drainage holes [4]	H03	□	□	□	□	□	□	□	□	□	□	□		
Rust-resistant screws (externally)	H07	□	□	□	□	□	–	–	–	–	–	–		
Special sealing system - corrosion protection	H91	✓	✓	✓	✓	✓	–	–	–	–	–	–	Only for:	Frame size 112 to 200
Mount provided coupling	L98	–	–	–	–	–	✓	✓	✓	✓	✓	✓	Only for:	Frame size 112 to 200
Designs in accordance with standards and specifications														
TR CU product safety certificate EAC for Eurasian customs union	D47	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Bearings and lubrication														
Located bearing DE	L20	□	□	□	□	□	–	–	–	–	–	–		
Regreasing device	L23	✓	✓	✓	✓	✓	✓	✓	□	□	□	□		
Bearing insulation NDE	L51	–	–	–	–	–	✓	✓	✓	□	□	□	Only for:	Frme size 225 to 400
Measuring nipple for SPM shock pulse measurement for bearing inspection	Q01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Balance and vibration quantity														
Vibration quantity level A		□	□	□	□	□	□	□	□	□	□	□		
Half-key balancing (standard)		□	□	□	□	□	–	–	–	–	–	–		
Shaft and rotor														
Shaft extension with standard dimensions, without feather keyway	L04	✓	✓	✓	✓	✓	–	–	–	–	–	–	Only for:	Frame size 112 to 200
Standard shaft made of stainless steel	L06	□	□	□	□	□	✓	✓	□	□	□	□		
Special design tapered shaft end without key acc. to DIN 1448	L09	✓	✓	✓	✓	✓	a.A.	a.A.	a.A.	a.A.	a.A.	a.A.	Only for:	Frame size 112 to 200
Non-standard cylindrical shaft extension DE) [5]	Y58 • and customer specifica	✓	✓	✓	✓	✓	a.A.	a.A.	a.A.	a.A.	a.A.	a.A.	Only for:	Frame size 112 to 200
Rating plate and extra rating plates														
Rating plate, stainless steel	M11	□	□	□	□	□	□	□	□	□	□	□		
Extra rating plate with customer specifications	Y82 •and customer specifica	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Extension of the liability for defects														
Extension of the liability for defects by 24 months to a total of 36 months (3 years) from delivery [6]	Q82	-	-	-	4,6%	4,6%	4,6%	4,6%	4,6%	4,6%	4,6%	4,6%		
Packaging, safety notes, documentation and test certificates														
Operating instruction compact german/english printed [7]		□	□	□	□	□	–	–	–	–	–	–		
Acceptance test certificate 3.1 according to EN 10204 [8]	B02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Document – Electrical data sheet	B60	✓	✓	✓	✓	✓	–	–	–	–	–	–		
Document – Order dimensional drawing	B61	✓	✓	✓	✓	✓	–	–	–	–	–	–		
Connected in star for dispatch	M01	□	□	□	□	□	–	–	–	–	–	–		
Connected in delta for dispatch	M02	–	–	–	–	–	□	□	□	□	□	□		

Selection and ordering data

- □ Normal version
- • This order code only defines the version from a pricing perspective – additional plain text is required.
- ✓ With additional price
- O.R. Possible on request
- – Not possible

1) An evaluation with the associated tripping unit (see Catalog IC 10) is recommended.
2) Terminal box with bores metric cable entry
   - FS 112/132: 2 metric cable glands
   - FS 160/180: 2 sealing caps and 2 metric cable glands
3) Only possible with terminal box mounted on the right-hand side.
4) When delivered, the condensation drain holes at the DE and at the NDE are closed and sealed (frame sizes 112 to 200 IP66; frame sizes 225 to 400 IP55) If the condensation drain holes for motors, types of construction IM B6, IM B7 or IM B8 (foot-mounted version at the side or at the top) are required, then the bearing shields at the drive end (DE) and non-drive end (NDE) must be rearranged so that the condensation drain holes located between the mounting feet when supplied are located at the bottom.
5) Wearing parts (bearings) are not included in the warranty extension.
6) The compact operating instructions are available as a PDF for all official European languages on the Internet at http://support.automation.siemens.com/WW/view/de/40761976.
7) The delivery time for the factory test certificate can differ from the motor delivery time.

Overview (roller table motors)

Frame size	Type	Dimen-sions L	AD	H	AB	O
112 M	Cast iron series, non-ventilated					
	1PC1423	405	195	112	256	1 × M32 × 1.5 1 × M25 × 1.5
132 M	Cast iron series, non-ventilated					
	1PC1423	505	214.5	132	256	1 × M32 × 1.5 1 × M25 × 1.5
160 L	Cast iron series, non-ventilated					
	1PC1423	655	265	160	300	2 × M40 × 1.5/ 2 × M20 × 1.5
180 L	Cast iron series, non-ventilated					
	1PC1423	716	286	180	339	2 × M40 × 1.5/ 2 × M20 × 1.5

Frame size	Type	Dimen-sions L	AD	H	AB	O
200 K	Cast iron series, non-ventilated					
	1PC1423	752	315	200	378	2 × M40 × 1.5/ 2 × M20 × 1.5
225	Cast iron series, non-ventilated t					
	1PC1423	816	325	225	440	1 × M40 × 1.5/ 1 × M20 × 1.5
250	Cast iron series, non-ventilated					
	1PC1423	910	345	250	490	1 × M50 × 1.5/ 1 × M20 × 1.5
280	Cast iron series, non-ventilated					
	1PC1423	999	400	280	550	1 × M50 × 1.5/ 1 × M20 × 1.5
315	Cast iron series, non-ventilated					
	1PC1423	1141	425	315	620	1 × M50 × 1.5/ 1 × M20 × 1.5
355	Cast iron series, non-ventilated					
	1PC1423	1319	455	355	700	1 × M50 × 1.5/ 1 × M20 × 1.5
400	Cast iron series, non-ventilated					
	1PC1423	1369	555	400	790	1 × M50 × 1.5/ 1 × M20 × 1.5

Overview (roller table motors)

Explanation of the dimensions

Dimension designations according to DIN EN 50347 and IEC 60072

Fits

The shaft ends (DIN 748) and centering edge diameter (DIN EN 50347), specified in the dimension tables, are implemented with the following fits:

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

Bores for couplings and belt pulleys should have an ISO fit of at least H7.

Project-specific dimension drawings and data sheets can be provided on request.

Dimension tolerances

For the following dimension designations, the subsequent permissible deviations apply:

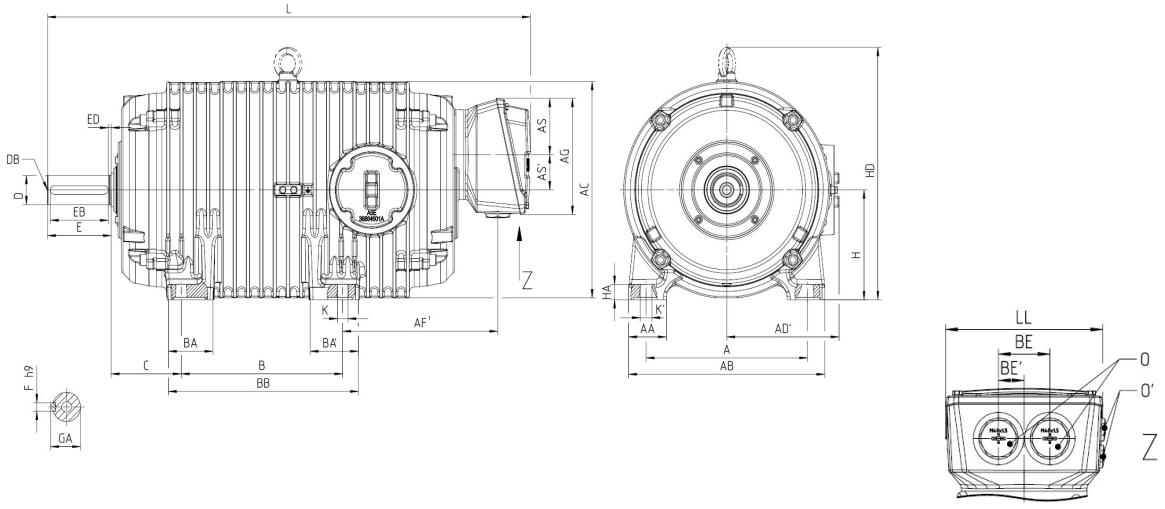
Dimension designation		Dimensionpermissible Deviation
H	up to 250	– 0.5
	above 250	– 1.0
E, EA		– 0.5

Keyways and feather keys (dimension GA, GC, F and FA) are machined according to DIN 6885 Part 1.

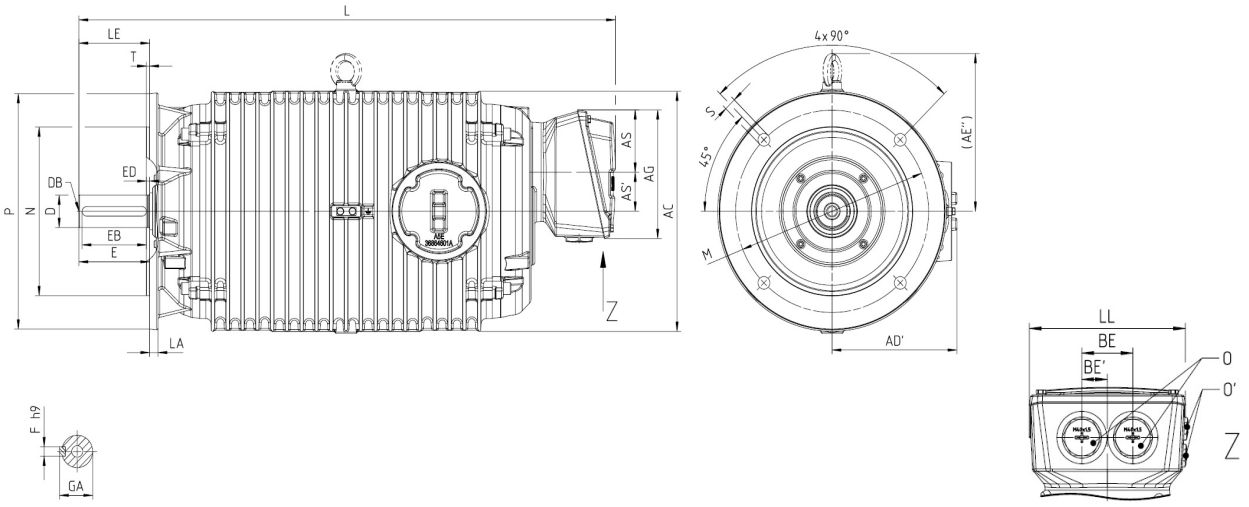
All dimensions in mm.

Dimension drawings (roller table motors)

IM B3 type of construction (terminal box NDE)



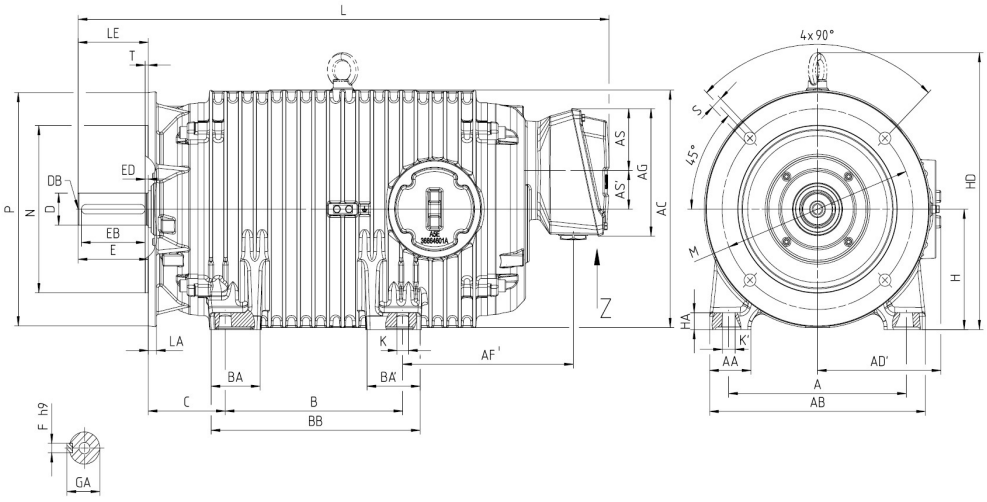
IM B5 type of construction (terminal box NDE)

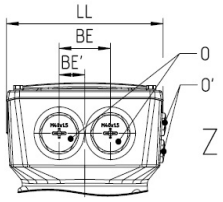


For motor			Dimension designation acc. to IEC																	
Frame size	Type 1PC1423	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B	BA	BA'	BB	BC	BE	BE'	C
112 M	all	4	190	46	226	222		–		–	185	92	140 159	48	71	195	–	52	26	70
132 M	all	4	216	53	256	260	–	–	–	–	185	92	178 203	57.5	82.5	243	–	52	26	89
160 L	all	4	254	60	300	315	–	–	–	–	191	92	254	70.5	82.5	300	–	60	30	108
180 L	all	4.6	279	65	339	356	–	–	–	–	191	92	279	76.5	83	328	–	60	30	121
200 L	all	4.6	318	70	378	395	–	–	–	–	191	92	355	75	93	405	–	60	30	133

Dimension drawings (roller table motors)

IM B35 type of construction (terminal box NDE)

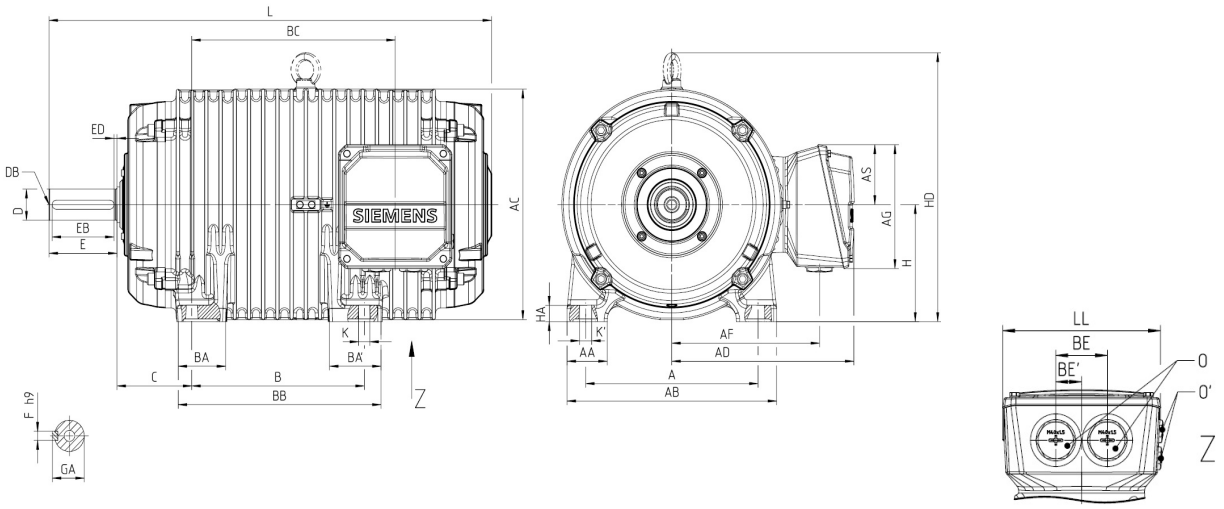




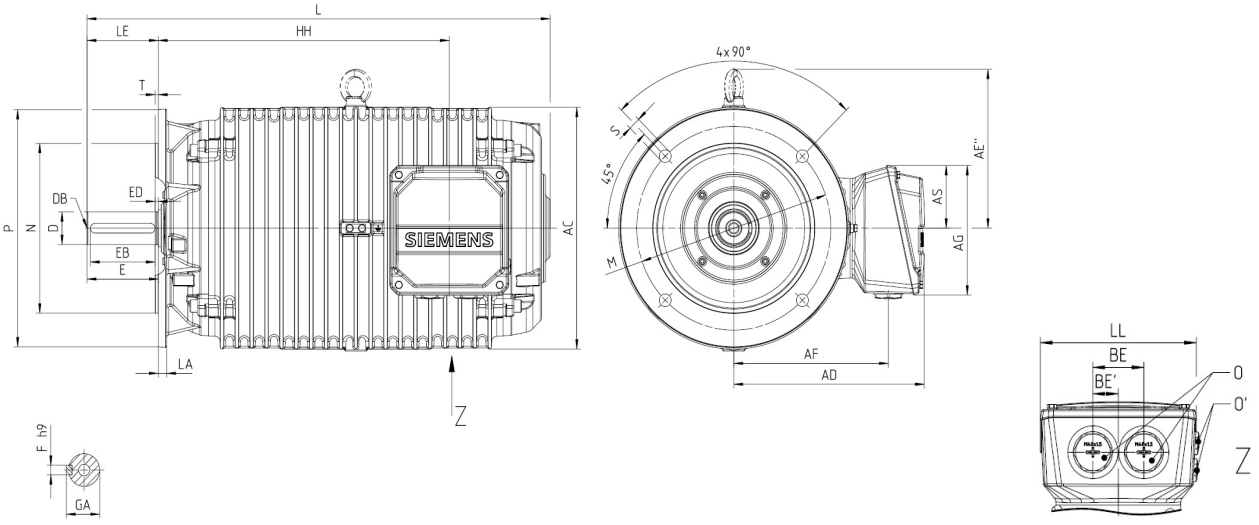
For motor			Dimension designation acc. to IEC								DE shaft extension				
Frame size	Type 1PC1423	No. of poles	H	HA	HH	K	K'	L	LL	D	DB	E	EB	ED	F
112 M	all	4	112	15	225	13	16	516	161	28	M10	60	50	5	8
132 M	all	4	132	18	292.5	13	17	614	161	38	M12	80	70	5	10
160 L	all	4	160	20	387	18	20	776	184	42	M16	110	90	10	12
180 L	all	4.6	180	25	450	18	20	835	184	48	M16	110	100	5	14
200 L	all	4.6	200	30	479	19	25	872	184	55	M20	110	100	5	16

Dimension drawings (roller table motors)

IM B3 type of construction (terminal box at the right-hand side)



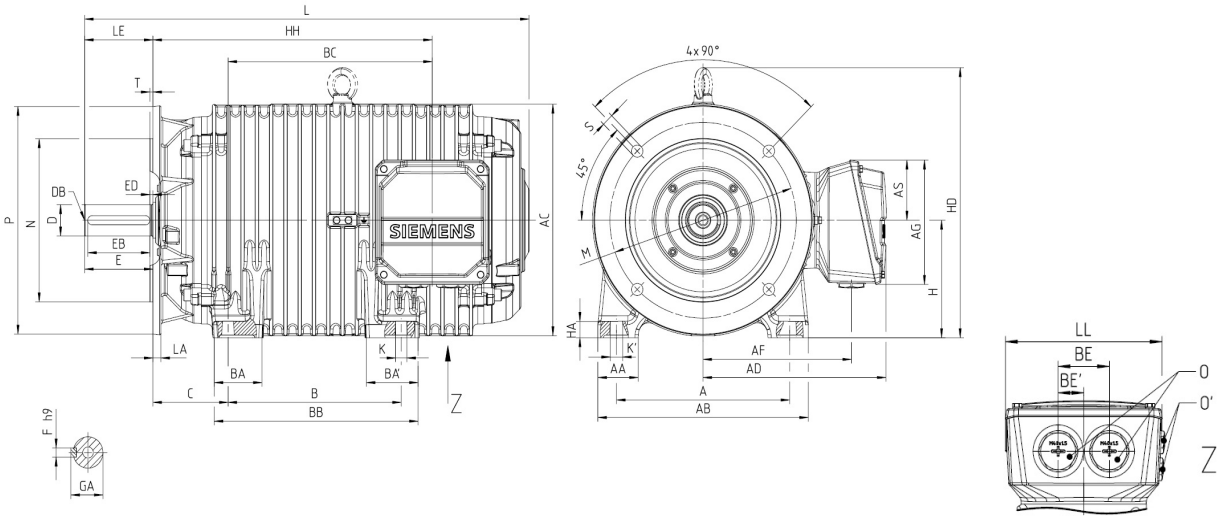
IM B5 type of construction (terminal box at the right-hand side)



For motor			Dimension designation acc. to IEC																	
Frame size	Type 1PC1423	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B	BA	BA'	BB	BC	BE	BE'	C
112 M	all	4	190	46	226	222		–		–	185	92	140 159	48	71	195	–	52	26	70
132 M	all	4	216	53	256	260	–	–	–	–	185	92	178 203	57.5	82.5	243	–	52	26	89
160 L	all	4	254	60	300	315	–	–	–	–	191	92	254	70.5	82.5	300	–	60	30	108
180 L	all	4.6	279	65	339	356	–	–	–	–	191	92	279	76.5	83	328	–	60	30	121
200 L	all	4.6	318	70	378	395	–	–	–	–	191	92	355	75	93	405	–	60	30	133

Dimension drawings (roller table motors)

IM B35 type of construction (terminal box at the right-hand side)



For motor			Dimension designation acc. to IEC								DE shaft extension				
Frame size	Type 1PC1423	No. of poles	H	HA	HH	K	K'	L	LL	D	DB	E	EB	ED	F
112 M	all	4	112	15	225	13	16	405	161	28	M10	60	50	5	8
132 M	all	4	132	18	292.5	13	17	505	161	38	M12	80	70	5	10
160 L	all	4	160	20	387	18	20	655	184	42	M16	110	90	10	12
180 L	all	4.6	180	25	450	18	20	716	184	48	M16	110	100	5	14
200 L	all	4.6	200	30	479	19	25	752	184	55	M20	110	100	5	16

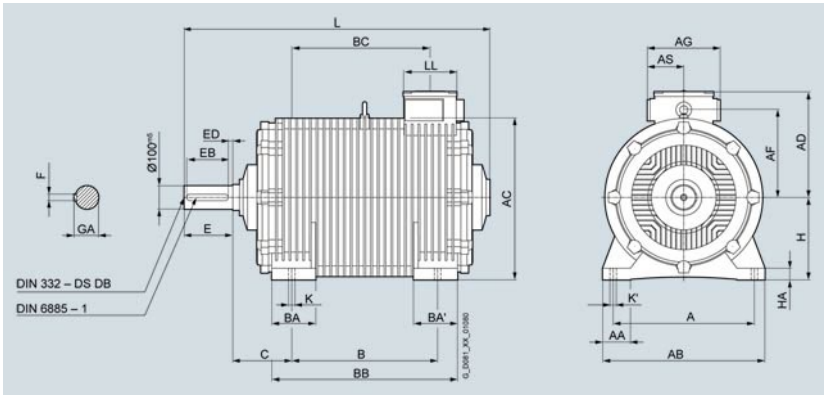
Dimensions

Roller table motors 1PC1423 – non-ventilated

Frame sizes 225 - 400

Dimension drawings (roller table motors)

IM B3 type of construction (top-mounted terminal box)



For motor			Dimension designation acc. to IEC																	
Frame size	Type 1PC1423	No. of poles	A	AA	AB	AC	AD	AD'	AF	AF'	AG	AS	B	BA	BA'	BB	BC	BE	BE'	C
225 M	all	6	356	80	440	430	325	–	255	–	174	102	356	95	95	500	348	–	–	149
250 M	all	6	406	100	490	485	345	–	275	–	254	127	450	135	135	578	413	–	–	168
280 M	all	6	457	100	550	540	400	–	320	–	314	157	500	150	150	634	440	–	–	190
315 M	all	6, 8	508	120	620	615	425	–	345	–	314	157	560	170	170	724	523	–	–	216
355	all	8	610	120	700	680	455	–	380	–	314	157	630	190	190	802	598	–	–	254
400	all	8	686	150	790	770	555	–	460	–	404	202	630	210	210	854	593	–	–	280

For motor			Dimension designation acc. to IEC								DE shaft extension					
Frame size	Type 1PC1423	No. of poles	H	HA	HH	K	K'	L	LL	D	DB	E	EB	ED	F	GA
225 M	all	6	250	34	–	19	19	816	204	60	M20	140	125	10	18	64
250 M	all	6	250	42	–	24	24	910	204	70	M20	140	125	10	20	74.5
280 M	all	6	280	42	–	24	24	999	230	75	M20	140	125	10	20	79.5
315 M	all	6, 8	315	50	–	28	28	1141	230	85	M20	170	140	25	22	90
355	all	8	355	50	–	28	28	1319	230	100	M20	210	180	20	28	106
400	all	8	400	62	–	35	35	1369	290	110	M20	210	180	20	28	116

4 Anhang

4/2 Verkaufs- und Lieferbedingungen

Appendix
Conditions of sale and delivery

1. General Provisions

By using this catalog you can purchase hard- and software products as well as services (together hereinafter referred to as “products”) described therein from Siemens Aktiengesellschaft or from Innomotics GmbH subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Note, for products purchased from any Siemens entity or Innomotics entity having a registered office outside of Germany, the respective terms and conditions of sale and delivery of the respective Siemens entity or Innomotics entity apply exclusively. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany or Innomotics GmbH, Germany. In the case of an order placed with Innomotics GmbH, the SiePortal T&C and the other terms and conditions are to be read in such a way that Siemens is to be understood as Innomotics GmbH.

1.1 For customers with a seat or registered office in European Union

For customers with a seat or registered office in European Union, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the text of the product description, these specific terms and conditions shall apply and subordinate thereto,
- for stand-alone software products and software products forming a part of a product or project, the "General Conditions for Software Products for Infrastructure & Industry Business (German law)"[1)] and/or
- for consulting services the “Allgemeine Geschäftsbedingungen für Beratungsleistungen für Infrastructure & Industry Geschäft (Deutsches Recht)"[1)] (available only in German) and/or
- for other services, the „Supplementary Terms and Conditions for Services for Infrastructure & Industry Business (German Law) (“BL”)"[1)] and/or
- for other products the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1)]. In case such products should contain Open Source Software, the conditions of which shall prevail over the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1)], the Product will be given a note as to which special conditions apply to this open source software. This shall apply mutatis mutandis for notices referring to other third-party software components.

1.2 For customers with a seat or registered office outside European Union

For customers with a seat or registered office outside European Union, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the description text, these specific terms and conditions shall apply and subordinate thereto,
- for consulting services the “Standard Terms and Conditions for Consulting Services for Infrastructure & Industry Business (Swiss Law)"[1)] and/or
- for other services the "International Terms & Conditions for Services"[1)] supplemented by "Software Licensing Conditions"[1)] and/or
- for other products the "International Terms & Conditions for Products"[1)] supplemented by "Software Licensing Conditions"[1)]

1.3 For customers with master or framework agreement

To the extent products offered are covered by an existing master or framework agreement, the terms and conditions of that agreement shall apply instead of T&C.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging. The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations. Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery. To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded. The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation. The metal factor, provided it is relevant, can be found in the respective product description. An exact explanation of the metal factor can be downloaded at: https://mall.industry.siemens.com/legal/ww/en/ terms_of_trade_en.pdf To calculate the surcharge (except in the cases of copper, dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used. To calculate the surcharge applicable to copper, the official price from two days prior to that on which the order was received or the release order was effected is used. To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a onemonth buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export. Illustrations are not binding. Insofar as there are no remarks on the individual pages of this catalog – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

4. Export Control and Sanctions Compliance

4.1 General

Customer shall comply with all applicable sanctions, embargoes and (re-)export control laws and regulations, and, in any event, with those of the European Union, the United States of America and any locally applicable jurisdiction (collectively “Export Regulations”).

4.2 Checks for Products

Prior to any transaction by customer concerning products (including hardware, documentation and technology) delivered by Innomotics, or products (including maintenance and technical support) performed by Innomotics with a third party, customer shall check and certify by appropriate measures that

- (i) the customer’s use, transfer, or distribution of such products, the brokering of contracts or the provision of other economic resources in connection with products will not be in violation of any Export Regulations, also taking into account any prohibitions to circumvent these (e.g., by undue
- diversion)
- (ii) the products are not intended or provided for prohibited or unauthorized non-civilian purposes (e.g. armaments, nuclear technology, weapons, or any other usage in the field of defense and military);
- (iii) customer has screened all direct and indirect parties involved in the receipt, use, transfer, or distribution of the products against all applicable restricted party lists of the Export Regulations concerning trading with entities, persons and organizations listed therein and
- (iv) products within the scope of items-related restrictions, as specified in the respective annexes to the Export Regulations, will not, unless permitted by the Export Regulations, be
- exported, directly or indirectly (e.g., via Eurasian Economic Union (EAEU) countries), to Russia or Belarus, or
- resold to any third party business partner that does not take a prior commitment not to export such products to Russia or Belarus.

1) The text of the Terms and Conditions of Siemens AG can be downloaded at
https://mall.industry.siemens.com/legal/ww/en/terms_of_trade_en.pdf

4.3 Non-Acceptable Use of Software and Cloud Services

Customer shall not, unless permitted by the Export Regulations or respective governmental licenses or approvals,

- download, install, access or use the products from or in any location prohibited by or subject to comprehensive sanctions or subject or to license requirements according to the Export Regulations;
- (ii) grant access to, transfer, (re-)export (including any "deemed (re-)exports"), or otherwise make available the products to any entity, person, or organization identified on a restricted party list of the Export Regulations;
- (iii) use the products for any purpose prohibited by the Export Regulations (e.g. use in connection with armaments, nucleartechnology or weapons);
- (iv) upload to a products platform any customer content unless it is non-controlled (e.g. in the EU: AL = N; in the U.S.: ECCN = N or EAR99);
- (v) facilitate any of the afore mentioned activities by any user. Customer shall provide all users with all information necessary to ensure compliance with the Export Regulations.

4.4 Semiconductor Development

Customer will not, without advance written authorization from Innomotics, use offerings for the development or production of integrated circuits at any semiconductor fabrication facility located in China meeting the criteria specified in the U.S. Export Administration Regulations, 15 C.F.R. 744.23.

4.5 Information

Upon request by Innomotics, customer shall promptly provide Innomotics with all information pertaining to users, the intended use and the location of use or the final destination (in the case of hardware, documentation and technology) of the products. Customer will notify Innomotics prior to customer disclosing any information to Innomotics that is defense-related or requires controlled or special data handling pursuant to applicable government regulations, and will use the disclosure tools and methods specified by Innomotics.

4.6 Reservation

Innomotics shall not be obligated to fulfill this agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes or other sanctions. Customer acknowledges that Innomotics may be obliged under the Export Regulations to limit or suspend access by customer and/or users to products.

5. Miscellaneous

Errors excepted and subject to change without prior notice.

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Published by
Innomotics GmbH

Innomotics GmbH
Vogelweiherstr. 1–15
90441 Nuremberg
Germany

innomotics.com/low-voltage-motors

Article-No. E86060-K5881-A101-A3-7600
V6.MKKATA.LDT.140
KG 0424 100 En
Produced in Germany

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Security information

Innomotics provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks. In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Innomotics' products and solutions constitute one element of such a concept. Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. For additional information on industrial security measures that may be implemented, please visit

www.innomotics.com/cybersecurity

Innomotics' products and solutions undergo continuous development to make them more secure. Innomotics strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

Get more information