



Edition

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READ ME

# SIMOTICS XP

Low-voltage motors

1MB.... Shaft heights 63 ... 450  
Safety instructions



# SIEMENS

## Low-voltage motors SIMOTICS XP

### Safety instructions 1MB.... Shaft heights 63...450

Readme

## Important re-branding note

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### Note

The following pages contain the Siemens logo and the Siemens legal information. Please note that since July 1st, 2023 the Siemens Businesses **Large Drives Applications** and **Low Voltage Motors** are part of **Innomotics GmbH**, Germany. All rights to and product information on the following pages have been transferred from Siemens to Innomotics.

The re-branding of the document will take place in due course.

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## Technical questions or additional information



If you have any technical queries or you require additional information, please contact Technical Support (<https://support.industry.siemens.com/cs/de/en/sc/4868>).

Please have the following data ready:

- Type
- Serial number

You can find this data on the rating plate.

## Contact person



If you wish to request on-site service or order spare parts, please contact your local office. They will establish the contact to the responsible service center. You can find your contact person in the relevant contact database:

[www.siemens.com/yourcontact](http://www.siemens.com/yourcontact) ([www.siemens.com/yourcontact](http://www.siemens.com/yourcontact))



You can find the associated operating instructions in the Internet: Low-voltage motors  
(<https://support.industry.siemens.com/cs/ww/en/ps/13309/man>)

## Siemens Product Configurator

The Siemens Product Configurator supports you in configuring the optimum drive technology products for a number of applications – starting with gearboxes, motors, converters as well as the associated options and components and ending with controllers, software licenses and connection systems.

The Siemens Product Configurator can be used on the internet without any installation. The Siemens Product Configurator is available through the Siemens Industry Mall at the following address: Siemens Product Configurator ([www.siemens.com/spc](http://www.siemens.com/spc))

# General safety instructions

To ensure your own personal safety as well as to avoid material damage, always comply with the safety-relevant instructions when carrying out any work. Also carefully comply with the 5 safety rules according to EN 50110-1 "Working in a no-voltage state" in the specified sequence.

## 5 safety rules

1. Disconnect the system.  
Also disconnect the auxiliary circuits, for example, anti-condensation heating.
  2. Secure against reconnection.
  3. Verify absence of operating voltage.
  4. Ground and short-circuit.
  5. Provide protection against adjacent live parts.
- To energize the system, apply the measures in reverse order.

## Qualified personnel

Ensure that only qualified personnel work at the machine or close to the machine.

## **Danger as a result of stationary parts under voltage (live parts)**

Live parts represent a hazard. Touch protection against active (live) parts is no longer guaranteed if covers are removed. The minimum air and creepage distances may be fallen below (violated) when coming close to active parts. Touching or coming close can result in death, serious injury or material damage.

- Carefully ensure that all of the covers are closed while operational.
- First switch off and disconnect the machine if you must remove covers. Carefully comply with the "5 safety rules" (Page 2).
- In operation, the terminal box must always be kept closed. It is only permissible to open the terminal box when the motor is stationary and in a no voltage condition.

## **Risk of injury due to rotating parts**

Rotating parts are dangerous. Touch protection against rotating parts is no longer guaranteed if covers are removed. Touching rotating parts can cause sparking with subsequent ignition of an explosive atmosphere resulting in death, serious injury or material damage.

- Carefully ensure that all of the covers are closed while operational.
- First switch off and disconnect the machine if you must remove covers. Carefully comply with the "5 safety rules (Page 2)".
- Only remove the covers when the rotating parts have come to a complete standstill.

## **Risk of burn injuries as a result of hot surfaces**

Individual machine parts can become hot in operation. Burns can result when coming into contact with these parts.

- Never touch machine parts during operation.
- Allow the machine to cool down before starting work.
- Check the temperature of parts before touching them. If required, wear suitable protective equipment.

## **Risk of explosion as a result of increased surface temperature**

Components within the motor may be hotter than the maximum permissible surface temperature for the enclosure. For machines in type of protection Ex d or Ex t, an atmosphere can be ignited and can cause an explosion. This can result in death, serious injury or material damage.

- Do not open the motor in an explosive atmosphere when it is still at normal operating temperature.
- Allow the machine to cool down before opening it.

## **Faults in operation**

Any changes with respect to the normal condition can indicate that the machine is not functioning correctly.

- Higher power consumption, temperatures or vibration levels.
- Unusual noise or smells.
- Monitoring devices respond.

These changes can cause faults which can result in eventual or immediate death, serious injury or material damage.

- Immediately inform the service personnel.
- If you are in doubt, immediately switch off the machine, carefully observing the system-specific safety conditions.

## **Damage caused by condensation**

Humidity in the air can condense for intermittent duty or load fluctuations. Condensate can collect. Moisture can have a negative impact on the winding insulation or result in damage, such as corrosion.

- Ensure that any condensation can freely flow away.
- Only switch on the anti-condensation heating (if equipped) after the machine has been switched off. Carefully comply with the data on the anti-condensation heating plate.

## **Hazardous substances**

Chemical substances required for the setup, operation and maintenance of machines can present a health risk. Poisoning, skin damage, cauterization of the respiratory tract, and other health damage may result.

- Carefully comply with the information in these operating instructions and the product information supplied by the manufacturer.
- Observe the relevant safety regulations and wear the personal protective equipment specified.

## **Substances that can be easily ignited and are flammable**

Chemical substances required for the setup, operation and maintenance of machines may be flammable. Burns and other damage to health and material may result.

- Carefully comply with the information in these operating instructions and the product information supplied by the manufacturer.
- Observe the relevant safety regulations and wear the personal protective equipment specified.

# Description

## Special conditions for explosion-protected machines

Only use explosion-protected machines in appropriate areas in accordance with directive 1999/92/EC.

The basic requirements relating to electrical systems and their operation in hazardous areas are described, for instance, in EU Directive 1999/92/EC as well as in IEC / EN 60079-14. Electrical systems in hazardous areas must be mounted, installed and operated by the responsible persons in accordance with the applicable rules and regulations.

**CNEX 17 ATEX 0004X, IECEX CNEX 17.0004X, 2020312301002069, 2020312301002070, 2020312301002071, 2020312301002072, 2020312301002079, 2020312301002080, 2020312301002081, RU C-DE.AA81.B.00156-19, EPS 21 UKEX 1 249 X, P508995/1 ... /14:**

For SH71 to SH355, the ambient temperature range is limited to -40 °C ... +60 °C. For ambient temperatures above +40 °C up to +60 °C derating can be applied (between -4 % and -18 %) to avoid the thermal temperature limit from being exceeded. The derating must ensure that the maximum permissible internal and external temperatures are not exceeded. For absolute operating temperatures exceeding +70 °C at the supply point or +80 °C at the branching point of the conductors, a note must be attached to the motor stating that heat-resistant cables must be used. Efficiency class IE3 is only guaranteed for motor types 1MB\*\*53\*\*\* and 1MB\*\*57\*\*\* (with reduced starting currents of 700 %). Efficiency class IE3 for motor type 1MB\*\*56\*\*\* (with reduced starting current 600 %) is not guaranteed in all cases. It is only permissible to use motor type 1MB\*\*56\*\*\*, when it is in full compliance with the local regulations of the country of use. When repairing flameproof gaps, the design data specified by the manufacturer must be carefully complied with. A repair, where the values listed in Tables 1 and 2 of EN 60079-1 are maintained, is not permissible. Monitoring the motor winding and bearing temperatures using PT100 senses in Ex ib circuits is only permissible for motors marked with Ex db IIA/IIIB/IIIC T4-T6 Gb in shaft heights 315 and 355. These Ex ib circuits must be connected in auxiliary terminal boxes (Ex db) to external, intrinsically safe ("ib") circuits in which suitably certified Ex ib devices are used. The terminal boxes for the motors must be suitable ATEX/IECEX/CCC-Ex/IEAC-Ex-certified terminal boxes in type of protection flameproof enclosure "db", in type of protection increased safety "eb" or suitable terminal boxes in the type of protection increased safety "eb" covered by third party test reports. The suitability of these terminal boxes must have been verified by routine temperature measurements associated with the intended motor type and whose IP rating is at least equal to the IP rating of the motor, suitable for the conditions of use and correctly and professionally installed. For duty types other than S1, the motor temperature must be monitored using resistance thermometers or PTC thermistors in the stator windings. These thermometers must be connected to suitable trip units, whose function has been carefully checked. The converter supply of the motor is only permissible using a voltage-source DC link converter with pulse width modulation. The converter parameters listed in the manufacturer's operating instructions must be unconditionally complied with. Motors fed from converters can have a thermal utilization of F/F up to 110 % of the rated power at a maximum ambient temperature

of +40 °C. Although optional anti-condensation heating elements and heating systems can be installed in flameproof motor enclosures, they must not be switched on when the motor is running. For motor frame sizes FS225 - FS355, external fan systems can be used instead of the plug-on fan. The suitability of the combination of motor and separately driven fan system must be confirmed by taking the appropriate temperature measurements, carried out under the supervision of a certification body. An alternative low-noise axial fan, which complies with the requirements of IEC/EN/GB/Gost standards applicable for the motor can be optionally installed on 2-pole motors, frame sizes FS160 - FS355. The suitability of the combination of motor and low noise axial fan must be confirmed by taking the appropriate temperature measurements, carried out under the supervision of a certification body. Alternatively, motors can be equipped with non-standard shaft ends. The suitability of the combination of motor and non-standard shaft ends must be confirmed by a certification body. Only use motor cover screws with a minimum yield strength of 450 N/mm<sup>2</sup>. All electrical connections must be tightened with the tightening torques specified in the manufacturer's instructions.

**BVS 20 ATEX E 051 X, BVS 20 ATEX E 062 X, BVS 20 ATEX E 066 X, BVS 20 ATEX E 067 X, BVS 20 ATEX E 070 X, BVS 20 ATEX E 071 X, BVS 20 ATEX E 072 X, BVS 20 ATEX E 073 X, BVS 20 ATEX E 084 X, BVS 20 ATEX E 085 X, BVS 20 ATEX E 088 X, BVS 20 ATEX E 092 X, BVS 20 ATEX E 093 X, BVS 20 ATEX E 100 X, IECEx BVS 20.0040X, IECEx BVS 20.0050X, IECEx BVS 20.0054X, IECEx BVS 20.0055X, IECEx BVS 20.0057X, IECEx BVS 20.0058X, IECEx BVS 20.0059X, IECEx BVS 20.0060X, IECEx BVS 20.0068X, IECEx BVS 20.0069X, IECEx BVS 20.0071X, IECEx BVS 20.0074X, IECEx BVS 20.0075X, IECEx BVS 20.0080X, 2022312301004023 ... 029, RU C-DE.AX58.B.02301-22, EPS 21 UKEX 1 235 X ... 248 X:**

The lengths of the flameproof gaps of this equipment are sometimes longer and the widths of the flameproof gaps are sometimes smaller than those specified in Table 2 of EN 60079-1:2014. The manufacturer should be contacted for information on the dimensions. Screws with a yield strength of 450 N/mm<sup>2</sup> or higher must be used. If the rotating electrical machine is not self-ventilated, then either safe reliable operation of external cooling must be guaranteed, or the machine must be monitored using integrated temperature sensors together with a suitable trip unit. It is only permissible that the motor is fed from a voltage-source DC link converter with pulse width modulation, strictly maintaining the parameters listed in Section 15.3.1.2 (ATEX) / 1.2 (IECEx). Before commissioning, it must be carefully ensured that when fed from a converter, no inadmissibly high overvoltages occur at the motor terminals. The maximum permissible peak voltages are 1500 Vpk (standard) and 2200 Vpk (optional). Motor variants with an operating temperature exceeding 70 °C at the cable glands or exceeding 80 °C at the branching point of the conductors must be marked using an additional information plate.

**EPS 18 ATEX 1 202 X, EPS 18 ATEX 1 203 X, IECEx EPS 18.0104X, RU C-DE.AA81.B.00156-19, EPS 21 UKEX 1 250 X, EPS 21 UKEX 1 255 X, EPS 21 UKEX 1 303 X:**

It is not permissible to operate groups of motors connected to a converter. The rated converter current may correspond as a maximum to twice the rated motor current. It is only permissible to operate the motor with a SINAMICS converter or a converter that is comparable. When commissioning the system, with reference to the rated voltage (UN) of the winding insulation, carefully ensure that no converter-related overvoltages with a peak value exceeding  $(1.1 * \sqrt{2} * UN)$  occur at the terminals of



the electric motor. If anti-condensation heating is used, then an interlock circuit must ensure that the anti-condensation heating can only be operated when the motor is shut down. Once the motor has been shut down, the anti-condensation heating may only be switched on after a specified wait time has elapsed. The information provided in the Operating Instructions must be strictly complied with. If the three-phase motor is cooled using a separately driven fan, then it must be strictly ensured that the motor can only be operated when the separately drive fan is switched on. It is only permissible to use these motors if they are in full compliance with local regulations (e.g. energy efficiency, product safety) in the country of use.

**DMT 01 ATEX E 014X, RU C-DE.AЖ58.B.02301-22, EPS 21 UKEX 1 310 X:**

It is not permissible that the motors are operated in environments where excessively thick layers of dust exist. When installing motors with the free shaft stub facing upwards, the mounting method must prevent foreign bodies from falling into vent holes. For motors with a fixed connecting cable: The free end of the cable must be connected according to valid regulations for electrical installations. If the three-phase motor is cooled using a separately driven fan, then it must be strictly ensured that the motor can only be operated when the cooling is switched on. Before commissioning, it must be carefully ensured that when fed from a converter, no inadmissibly high overvoltages occur at the motor terminals. The clearances and creepage distances in the terminal box do not permit overvoltages as a result of converter operation with a periodic peak value of more than: 1500 V for rated voltages  $\leq$  500 V. The motor insulation system may mean that it is necessary to further limit periodically occurring overvoltages.

**BVS 14 ATEX E 081 X, BVS 14 ATEX E 082 X, IECEx BVS 14.0052X, 2020312301002068, RU C-DE.AA81.B.00156-19, EPS 21 UKEX 1 301 X, EPS 21 UKEX 1 303 X:**



It is only permissible that the motor is fed from a voltage-source DC link converter with pulse width modulation when the parameters listed in Section 15.3 (ATEX) /"parameters" (IECEx) are strictly maintained. Before commissioning, it must be carefully ensured that when fed from a converter, no inadmissibly high overvoltages occur at the motor terminals. The clearances and creepage distances in the terminal box do not permit overvoltages as a result of converter operation with a periodic peak value of more than 1500 V for rated voltages  $\leq$  1000 V. The motor insulation system may mean that it is necessary to further limit periodically occurring overvoltages. If the motor is operated with a plastic fan, a circumferential velocity of less than 50 m/s must be strictly maintained.

## Rating plate

The rating plate shows the identification data and the most important technical data. The data on the rating plate and the contractual agreements define the limits of proper and intended use.

# Marking

Table 1 For applications in Zone 1 - IEC/EN/BS/GOST 60079-10-1, GB3836.14

CE	1026		II 2G Ex eb IIB T. Gb	FTZU 18 ATEX 0016 ... 0019, PTB 20 ATEX 3006
			II 2G Ex eb IIC T. Gb	FTZU 18 ATEX 0016 ... 0019, PTB 18 ATEX 3005 ... 3013, PTB 20 ATEX 3006
			II 2G Ex db eb IIA T. Gb II 2G Ex db eb IIB T. Gb II 2G Ex db IIA T. Gb II 2G Ex db IIB T. Gb	BVS 20 ATEX E 051 X, ... 062 X, ... 066 X, ... 067 X, ... 070 X ... ... 073 X, ... 084 X, ... 085 X, ... 088 X, ... 092 X, ... 093 X, ... 100 X, CNEX17 ATEX 0004 X
			II 2G Ex db eb IIC T. Gb II 2G Ex db IIC T. Gb	CNEX 17 ATEX 0004 X
			II 2G Ex db ib IIA T. Gb II 2G Ex db ib IIB T. Gb II 2G Ex db ib IIC T. Gb	CNEX 17 ATEX 0004 X
			II 2G Ex db ib IIA T. Gb	CNEX 17 ATEX 0004 X
			II 2G Ex db ib IIB T. Gb	
			II 2G Ex db ib IIC T. Gb	
Ex eb IIB T. Gb			IECEX FTZU 18.0024 ... 0027	
Ex eb IIC T. Gb			IECEX FTZU 18.0024 ... 0027, IECEX PTB 19.0001 ... 0009	
Ex db eb IIA T. Gb Ex db eb IIB T. Gb Ex db IIA T. Gb Ex db IIB T. Gb			IECEX BVS 20.0040X, ... 0050X, ... 0054X, ... 0055X, ... 0057X ... ... 0060X, ... 0068X, ... 0069X, ... 0071X, ... 0074X, ... 0075X, ... 0080X, IECEX CNEX 17.0004X	
Ex db eb IIC T. Gb Ex db IIC T. Gb			IECEX CNEX 17.0004X	
Ex db ib IIA T. Gb Ex db ib IIB T. Gb Ex db ib IIC T. Gb			IECEX CNEX 17.0004X	
UK CA	8507		II 2G Ex eb IIB T. Gb	EPS 21 UKEX 1 254, EPS 22 UKEX 1 047 ... 050
			II 2G Ex eb IIC T. Gb	EPS 21 UKEX 1 254, EPS 21 UKEX 1 273 ... 281, EPS 22 UKEX 1 047 ... 050





		II 2G Ex db eb IIA T. Gb II 2G Ex db eb IIB T. Gb II 2G Ex db IIA T. Gb II 2G Ex db IIB T. Gb	EPS 21 UKEX 1 235 X ... 249 X
		II 2G Ex db eb IIC T. Gb II 2G Ex db IIC T. Gb	EPS 21 UKEX 1 249 X
	1Ex e IIB T. Gb X 1Ex e IIC T. Gb X 1Ex db e IIB T. Gb X 1Ex db IIB T. Gb X		EAЭC RU C-DE.AA87.B.00156/19, EAЭC RU C-DE.AЖ58.B.02274/22
	1Ex db e IIA T. Gb X 1Ex db IIA T. Gb X		EAЭC RU C-DE.AЖ58.B.02274/22
	1Ex db e IIC T. Gb X 1Ex db IIC T. Gb X		EAЭC RU C-DE.AA87.B.00156/19
	Ex db eb IIA T. Gb Ex db IIA T. Gb Ex db eb IIB T. Gb Ex db IIB T. Gb		2020312301002069 ... 072, 2020312301002079 ... 081 2022312301004023 ... 029
	Ex db eb IIC T. Gb Ex db IIC T. Gb		2020312301002069 ... 072, 2020312301002079 ... 081
	Ex db ib IIA T. Gb Ex db ib IIB T. Gb Ex db ib IIC T. Gb		

Table 2 For applications in Zone 2 - IEC/EN/BS/GOST 60079-10-1, GB12476.14

		II 3G Ex ec IIA T. Gc	BVS 14 ATEX E 081 X, EPS 18 ATEX 1 202 X, PTB 12 ATEX 3014, PTB 12 ATEX 3016
		II 3G Ex ec IIB T. Gc II 3G Ex ec IIC T. Gc	BVS 14 ATEX E 081 X, EPS 18 ATEX 1 202 X, FTZU 13 ATEX 0040, FTZU 13 ATEX 0055, FTZU 15 ATEX 0084, PTB 12 ATEX 3014, PTB 12 ATEX 3016
Ex ec IIA T. Gc		IECEX EPS 18.0104X, IECEX PTB 17.0009	
Ex ec IIB T. Gc		IECEX EPS 18.0104X, IECEX FTZU 13.0029, IECEX FTZU 13.0031, IECEX FTZU 15.0034, IECEX PTB 17.0009	
Ex ec IIC T. Gc		IECEX BVS 14.0052X, IECEX FTZU 13.0029, IECEX FTZU 13.0031, IECEX FTZU 15.0034, IECEX EPS 18.0104X, IECEX PTB 17.0009	







		II 3G Ex ec IIA T. Gc	EPS 21 UKEX 1 255 X, ... 303 X, ... 304, ... 305
		II 3G Ex ec IIB T. Gc II 3G Ex ec IIC T. Gc	EPS 21 UKEX 1 255 X, ... 256, ... 257, ... 258, ... 303 X, ... 304, ... 305
	2Ex nA IIB T. Gc X 2Ex nA IIC T. Gc X		EAЭC RU C-DE.AA87.B.00156/19
	Ex ec IIB T. Gc Ex ec IIC T. Gc		2020312301002066 ... 068, 2020312301002073 ... 076, 2020312301002087 ... 089

Table 3 For applications in Zone 21 - IEC/EN/BS/GOST 60079-10-2, GB12476.3

	1026		II 2D Ex tb IIIA T... °C Db II 2D Ex tb IIIB T... °C Db	BVS 14 ATEX E 082 X, BVS 20 ATEX E 051 X, ... 062 X, ... 066 X, ... 067 X, ... 070 X ... ... 073 X, ... 084 X, ... 085 X, ... 088 X, ... 092 X, ... 093 X, ... 100 X, CNEX 17 ATEX 0004 X, PTB 12 ATEX 3018, EPS 18 ATEX 1 203 X
			II 2D Ex tb IIIC T... °C Db	BVS 14 ATEX E 082 X, BVS 20 ATEX E 051 X, ... 062 X, ... 066 X, ... 067 X, ... 070 X ... ... 073 X, ... 084 X, ... 085 X, ... 088 X, ... 092 X, ... 093 X, ... 100 X, CNEX 17 ATEX 0004 X, DMT 01 ATEX E 014 X, EPS 18 ATEX 1 203 X, FTZU 13 ATEX 0039, FTZU 13 ATEX 0054, FTZU 15 ATEX 0083, FTZU 18 ATEX 0016 ... 0019, PTB 12 ATEX 3018, PTB 18 ATEX 3005 ... 3013
Ex tb IIIA T... °C Db Ex tb IIIB T... °C Db			IECEx BVS 20.0040X, ... 0050X, ... 0054X, ... 0055X, ... 0057X ... ... 0060X, ... 0068X, ... 0069X, ... 0071X, ... 0074X, ... 0075X, ... 0080X, IECEx CNEX 17.0004X, IECEx EPS 18.0104X, IECEx PTB 17.0010	










Ex tb IIIC T... °C Db		IECEx BVS 14.0052X, IECEx BVS 20.0040X, ... 0050X, ... 0054X, ... 0055X, ... 0057X ... 0060X, ... 0068X, ... 0069X, ... 0071X, ... 0074X, ... 0075X, ... 0080X, IECEx CNEX 17.0004X, IECEx EPS 18.0104X, IECEx FTZU 13.0027, IECEx FTZU 13.0030, IECEx FTZU 15.0033, IECEx FTZU 18.0024 ... 0027, IECEx PTB 17.0010, IECEx PTB 19.0001 ... 0009		
	8507		II 2D Ex tb IIIA T... °C Db II 2D Ex tb IIIB T... °C Db	EPS 21 UKEX 1 235 X ... 250 X, ... 301 X, ... 302
			II 2D Ex tb IIIC T... °C Db	EPS 21 UKEX 1 235 X ... 250 X, ... 251, ... 252, ... 253, ... 273 ... 281, ... 301 X, ... 302, ... 310 X, EPS 22 UKEX 1 047 ... 050
	0843	II 2D Ex tb IIIA T... °C Db II 2D Ex tb IIIB T... °C Db II 2D Ex tb IIIC T... °C Db	EPS 21 UKEX 1 250 X	
	Ex tb IIIA T... °C Db X Ex tb IIIB T... °C Db X		EAЭC RU C-DE.AЖ58.B.02274/22	
	Ex tb IIIC T... °C Db X		EAЭC RU C-DE.AA87.B.00156/19, EAЭC RU C-DE.AЖ58.B.02274/22	
	Ex tb IIIA T... °C Db Ex tb IIIB T... °C Db Ex tb IIIC T... °C Db		2020312301002066 ... 072, 2020312301002077 ... 086 2022312301004023 ... 029	

Table 4 For applications in Zone 22 - IEC/EN/BS/GOST 60079-10-2, GB12476.3

		II 3D Ex tc IIIA T... °C Dc II 3D Ex tc IIIC T... °C Dc	BVS 14 ATEX E 081 X, BVS 20 ATEX E 051 X, ... 062 X, ... 066 X, ... 067 X, ... 070 X ... 073 X, ... 084 X, ... 085 X, ... 088 X, ... 092 X, ... 093 X, ... 100 X, EPS 18 ATEX 1 202 X, PTB 12 ATEX 3016
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		II 3D Ex tc IIIB T... °C Dc	BVS 14 ATEX E 081 X, BVS 20 ATEX E 051 X, ... 062 X, ... 066 X, ... 067 X, ... 070 X ... ... 073 X, ... 084 X, ... 085 X, ... 088 X, ... 092 X, ... 093 X, ... 100 X, EPS 18 ATEX 1 202 X, FTZU 13 ATEX 0040, ... 0055, FTZU 15 ATEX 0084, PTB 12 ATEX 3016
		Ex tc IIIA T... °C Dc Ex tc IIIC T... °C Dc	IECEX BVS 20.0040X, ... 0050X, ... 0054X, ... 0055X, ... 0057X ... .. 0060X, ... 0068X, ... 0069X, ... 0071X, ... 0074X, ... 0075X, ... 0080X, IECEX CNEX 17.0004X, IECEX EPS 18.0104X, IECEX PTB 17.0009
		Ex tc IIIB T... °C Dc	IECEX BVS 14.0052X, IECEX BVS 20.0040X, ... 0050X, ... 0054X, ... 0055X, ... 0057X ... .. 0060X, ... 0068X, ... 0069X, ... 0071X, ... 0074X, ... 0075X, ... 0080X, IECEX CNEX 17.0004X, IECEX EPS 18.0104X, IECEX FTZU 13.0029, ... 0031, IECEX FTZU 15.0034, IECEX PTB 17.0009
UK CA		II 3D Ex tc IIIA T... °C Dc II 3D Ex tc IIIC T... °C Dc	EPS 21 UKEX 1 235 X ... 248 X, ... 255 X, ... 303 X, ... 304
		II 3D Ex tc IIIB T... °C Dc	EPS 21 UKEX 1 235 X ... 248 X, ... 255 X, ... 256, ... 257, ... 258, ... 303 X, ... 304
		Ex tc IIIA T... °C Dc X	EAЭC RU C-DE.AЖ58.B.02274/22
		Ex tc IIIB T... °C Dc X	EAЭC RU C-DE.AA87.B.00156/19, EAЭC RU C-DE.AЖ58.B.02274/22
		Ex tc IIIC T... °C Dc X	EAЭC RU C-DE.AЖ58.B.02274/22
		Ex tc IIIA T... °C Dc	2020312301002066 ... 076,
		Ex tc IIIB T... °C Dc	2020312301002079 ... 089
		Ex tc IIIC T... °C Dc	2022312301004023 ... 029

**Note**

If the certificate number ends with an "X", then strictly comply with the information in Chapter "Special conditions explosion-proof machines".

# Preparing for use, transport and storage

## Preconditions for safe lifting and transporting

If you do not transport or lift the machine in a position appropriate for its construction, the machine can tip, slip into the lifting equipment or fall down. This can result in death, serious injury or material damage.

- Use only the load carrying device on the stator frame for lifting.
- Use the load carrying device appropriate for the machine position.
- Only use suitable rope guiding or spreading devices.

## Center of gravity not centered

If the center of gravity of a load is not located centrally between the attachment points, the machine can tip over or slip out of the lifting equipment and fall when it is being transported or lifted. This can result in death, serious injury or material damage.

- Comply with the handling instructions on the machine when transporting it.
- Be aware of the possibility of different loads on the sling ropes or lifting straps and the carrying capacity of the lifting equipment.
- Always take account of the center of gravity when transporting or lifting the machine. If the center of gravity is not located centrally between the attachment points, then position the hoisting hook above the center of gravity.

## Risk of dropping and swinging when transported suspended

If you transport the motor suspended from cables or ropes, the cables or ropes can break, e.g. as a result of damage. Further, if not adequately attached, the motor can swing. This can result in death, serious injury or material damage.

- Use additional, suitable lifting equipment for transport and during installation.
- Two cables alone must be able to carry the complete load.
- Prevent the lifting equipment from sliding by appropriately securing it.
- When using two-cable lifting equipment, ensure that the maximum angle of inclination is  $\leq 45^\circ$  according to ISO 3266 (DIN 580).
- Align the eyebolts so that the cables used for lifting are aligned with the planes of the eyebolts.

## Toppling over or motor slippage

The motor can slide or topple over if it is not correctly lifted or transported. This can result in death, serious injury or material damage.

- Use all the lifting eyes on the machine.
- When using the lifting eyes on the machine, do not attach any additional loads or weight. The lifting eyes are only designed for the weight of the machine itself.
- Any eyes that are screwed in must be tightly fastened.
- Eyebolts must be screwed in right up to their supporting surface.
- Comply with the permissible eyebolt loads.
- When necessary, use suitably dimensioned lifting equipment, for example hoisting straps (EN1492-1) and load restraints (EN12195-2).

### **Risk of explosion due to damaged sealing materials**

Storing machines at temperatures that do not fall within the specified limits can damage the material of the seals and cause them to no longer seal correctly. The certified type of protection of the machine can no longer be complied with.

As a result, a potentially explosive gaseous atmosphere can enter the machine and be ignited during commissioning. Explosions can occur. This can result in death, serious injury or material damage.

- Do not store the machine in conditions that lie outside the specified temperature limits.

### **Overheating and failure of the machine**

Explosion, material damage, injury or death can occur if you do not carefully observe the following points.

- Do not obstruct ventilation.
- Prevent the air expelled by neighboring equipment from being immediately sucked in again.
- For machines with a vertical type construction with air entry from above, prevent the ingress of foreign bodies and water in the air entry openings (standard IEC / EN 60079-0).
- If the shaft extension is facing upwards, liquid must be prevented from entering by moving along the shaft.

## **Mounting**

### **Injury and material damage caused by inappropriate fastening material**

If screws of an incorrect property class have been selected or if they have been fastened to an incorrect tightening torque, they may break or become loose. This will cause the machine to move, which could damage the bearings. The rotor could smash into the machine enclosure and machine parts could be flung out of place. This can result in death, serious injury or material damage.

- Comply with the required property classes for screwed connections.
- Tighten the screwed connections to the specified tightening torques.

### **Injury and material damage caused by incorrect machine alignment**

If the machine has not been properly aligned, this will mean the fastening parts are subjected to stress/distortion. Screws may become loose or break, the machine will move, machine parts could be flung out of place. This can result in death, serious injury or material damage.

- Carefully align the machine to the driven machine.



## Material damage caused by improper handling

Mounting parts such as temperature sensors or speed sensors are attached to the machine and could be ripped off or destroyed as a result of improper handling. This could lead to machine malfunctions, extending even to total loss of the machine.

- Use suitable steps when carrying out installation work on the machine.
- Do not stand on cables or attachments during installation. Do not use attachments as steps.

## Risk of explosion due to bearing damage or shaft damage

Large output masses and their centers of gravity outside the shaft extensions can lead to resonance in operation. This can result in damage to the bearings and shaft. In an explosive atmosphere, there is a risk of explosion. Death, serious injury, or material damage can result.

- Ensure that the permissible loads for the forces on the shaft extension are adhered to in accordance with the catalog data or configuration data.

You can obtain the permissible values for axial and radial forces by contacting the Service Center or referring to the machine catalog.

# Electrical connection

## Risk of explosion by fixing elements becoming loose

If you use fixing elements made from the wrong material or apply the wrong tightening torque, this could impair current transfer or cause connecting parts to become loose. Fastening elements can work loosely, so that the minimum air clearances are no longer maintained. Sparking formation may occur, in an explosive atmosphere it can lead to an explosion. This could result in death, serious injury or material damage to the machine or even in failure, which could in turn lead to indirect material damage of the plant or system.

- Tighten the screwed connections to the specified tightening torques.
- Only use the fixing accessories provided or only the original spare parts from Siemens.
- Always carefully check the fastenings when carrying out service work.

## Damage to the terminal box

Material damage can occur if work is not professionally carried out in the terminal box. You must observe the following to avoid damaging the terminal box:

- Ensure that the components inside the terminal box are not damaged.
- It must be ensured that there are no foreign bodies, dirt or moisture in the terminal box.
- Close the terminal box using the original seal so that it is dust tight and water tight.
- Use O-rings or suitable flat gaskets to seal entries in the terminal box (DIN 42925) and other open entries.

- Please observe the tightening torques for cable glands and other screws.

Only use sealing plugs, cable glands and conductor glands or thread adapters that are suitable, certified and marked for use in the respective explosion protection type and degree of protection (IEC / EN 60079-14) or the appropriate country regulations.

## Maintenance

### **Risk of explosion as a result of unauthorized, unprofessional repair**

Corrective maintenance work is only permissible within the scope of the work described in the operating instructions. Otherwise an explosion can occur in an explosive atmosphere. This can result in death, serious injury or material damage.

- For repairs to go beyond this scope, please contact the Service Center.

### **Risk of explosion as a result of increased surface temperature**

Components within the motor may be hotter than the maximum permissible surface temperature for the enclosure. For machines in type of protection Ex d or Ex t, an atmosphere can be ignited and can cause an explosion. This can result in death, serious injury or material damage.

- Do not open the motor in an explosive atmosphere when it is still at normal operating temperature.
- Allow the machine to cool down before opening it.

### **Explosion hazard caused by incorrect painting**

The paint coat can become electrostatically charged where there is a thick coat. Electrostatic discharges can occur. There is a risk of explosion if potentially explosive mixtures are also present at this moment. This can result in death, serious injury or material damage.

## Operation

### **Forced ventilation (optional): Cooling method IC 416 in accordance with EN / IEC 60034-6**

#### **Explosion hazard if the temperature class is exceeded**

If a force-ventilated machine is operated without a separately driven fan, the temperature class or the maximum surface temperature of the machine can be exceeded.

In an explosive atmosphere, there is a risk of an explosion. This can result in death, serious injury or material damage.

- Install an interlock circuit that prevents the machine from being switched on if the separately driven fan is not switched on/is not operational.

- Do not commission the machine without a separately driven fan.
- Always use PTC thermistor monitoring when operating force-ventilated machines with a converter. Trip units according to Directive 2014/34/EU ("Explosion Protection Directive") or according to country regulations are always necessary when using PTC thermistor monitoring.

Protect explosion-protected machines against overload according to IEC / EN 60079-14, Section "Rotating electrical machines".

Use a motor circuit breaker, directly monitor the winding temperature or use equipment to provide the same functionality corresponding to the explosion type of protection.

For pole-changing motors, in addition to the circuit breaker, use temperature sensors in the windings.

### **Ex d and Ex t**

#### Line supply

- Set the protective device (e.g. circuit breaker) to the rated current (see the rating plate).
- Or protect the machine using the certified temperature monitoring specified on the supplementary plate .

#### Converter

- Always operate explosion-protected machines fed from converters with temperature sensors that directly monitor the temperature.

### **Machine overheating**

Operating explosion-protected machines at the converter without using the appropriate protective equipment can result in death or severe injury.

Always use PTC thermistor monitoring when operating explosion-protected machines at the converter. Trip units according to Directive 2014/34/EU ("Explosion Protection Directive") or according to country regulations are always necessary when using PTC thermistor monitoring.

## More information

Siemens:

[www.siemens.com/simotics/...](http://www.siemens.com/simotics/)

Industry Online Support (Service and Support):

[www.siemens.com/online-support](http://www.siemens.com/online-support)

IndustryMall:

[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

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