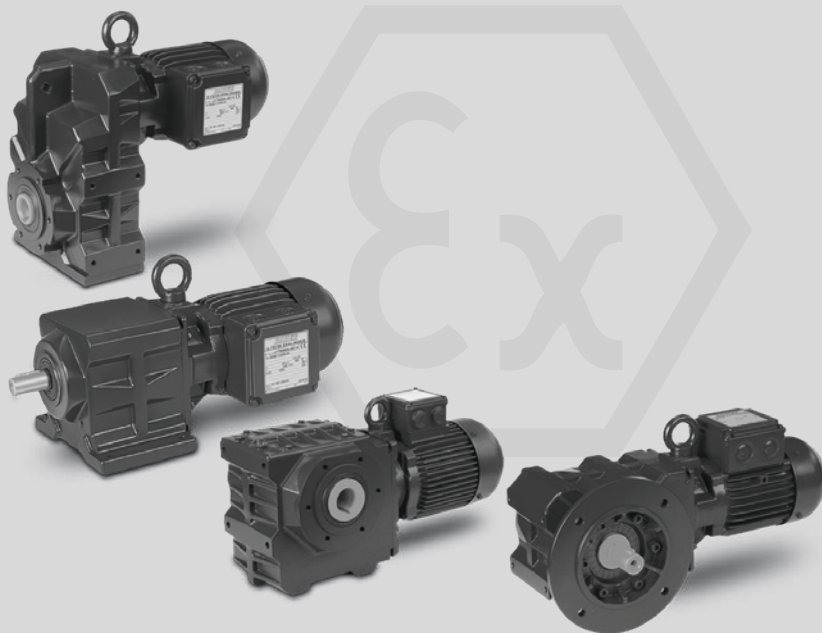


## Assembly and Operating Instruction BA 170 EN - Edition 03/23



Explosion-proof geared motors



TRANSLATION

The operating instructions are an integral part of the product. It contains important information for your safety. Make sure that the operating instructions are always available in a legible condition and complete at the assembly or installation site. Read the operating instructions carefully and observe their contents. If you have any questions, please contact Bauer Gear Motor before putting the drive into operation. Further documentation can be found on our homepage.



## TABLE OF CONTENTS

<b>GENERAL</b>	<b>4</b>
1 Requirements for personnel	4
2 Intended use	4
3 Liability and warranty	5
<b>MOTOR</b>	<b>5</b>
4 Erection, operation and maintenance	5
5 Installation	6
6 Electrical connection	7
7 Connection of mains cable and monitoring cable	8
8 Connection box	10
9 Motors with direct wiring	10
10 Motors with plug-and-socket connectors	10
11 Additional information for three-phase motors with flameproof enclosure, series DNFXD	10
11.1 Terminal box (series DNFXD)	11
11.2 Motors with terminal boxes whose power supply line is located in the separation plane between the upper and lower parts (series DNFXD)	12
11.3 Connection of mains cable and monitoring cable (series DNFXD)	13
11.4 Motors with standstill heating (series DNFXD)	14
11.5 Motors with a brake (series DNFXD)	15
11.6 Motors with a brake or tachometer mounted under the fan cover (series DNFXD)	15
11.7 Special operating conditions (series DNFXD)	15
11.8 Motors with forced cooling carried out by independently driven external fans	15
12 Electrical overload protection	16
12.1 Protective device MR	16
12.2 Motors with temperature monitoring	17
13 Motors for operation with a frequency converter	17
14 Motor with brake for zone 2 or zone 22	20
15 Duty types other than S1 (continuous duty)	20
16 Commissioning	20
<b>GEAR UNITS</b>	<b>21</b>
17 Load rating of gear unit and service factor	21
17.1 Bauer service factors for helical, shaft-mounted and bevel gear units in series BG, BF and BK	22
17.2 Bauer service factors for worm gear units in series BS	23
18 Installation	24
19 Torque arms	24
20 Shrink-fit flange coupling SSV	24
21 Protection against extreme torque shock loads (e.g. blocking)	25
22 Periodic tests, inspection, maintenance and continuous supervision	25
23 Checking roller bearings and gearwheels	26
24 Mechanically actuated clutch with BM gear units	26
25 Bogie wheel for electrical monorails with BM gear unit	26
26 Coupling attachment	26
<b>EXPLOSION PROTECTION</b>	<b>26</b>
27 Instructions for maintaining explosion protection in operation	27
28 Repair	28
29 Declarations of Conformity	32
30 Authorised service dealers with officially recognised personnel	39
31 Ratings	40



## Attention

These operating instructions supplement operating instructions  
BA200... and data sheet 122...

## GENERAL

The safety instructions are intended to protect people and property against damage and hazards which can arise from the improper use, incorrect operation, inadequate maintenance or other incorrect handling of electrical drive units in explosion hazard areas. The technical documentation is produced and administered by Bauer Gear Motor GmbH.

Compliance with the guidelines in these operating instructions for the installation, commissioning and maintenance of explosion-protected three-phase motors, as well as the general set-up regulations, is essential.

Any equipment independently attached to or fitted in the motors, such as rotary encoders, has its own operating instructions, which must also be observed.

### 1 Requirements for personnel

All necessary work on explosion-protected electric drives, including in particular planning, transport, assembly, installation, commissioning, maintenance and repair, may only be performed by skilled personnel.

The qualifications of "skilled personnel" are described as follows in EN 60079-17 / VDE 0165-10-1:


"The inspection and maintenance of installations shall be carried out only by experienced personnel, whose training has included instruction on the various types of protection and installation practices, the requirements of this standard, the relevant national regulations / company rules applicable to the installation and on the general principles of area classification. Appropriate ongoing education or training shall be undertaken by personnel on a regular basis. Evidence of the relevant experience and training should be made available.

These activities are to be checked by a technical person in a management position. This is a person providing technical management of the skilled personnel, having adequate knowledge in the field of explosion protection, having familiarity with the local conditions, having familiarity with the installation and who has overall responsibility and control of the inspection systems for the electrical equipment within hazardous areas."

### 2 Intended use

The motors may only be used in accordance with the ratings stated on the nameplate. The motors are suitable for use in explosion hazard areas according to the markings on their nameplates. The motors are intended to be installed in other machines. The use of the motors in highly charge-generating processes, such as dust clouds of conveyed material or use at a distance of less than 1m from high-voltage electrodes must be excluded. Putting them into service is not allowed until the conformity of the end product with Directive 2006/42/EC has been verified.

The version and the associated application can be seen from the marking:

 Example marking	Fundamental compliance with Directive 2014/34/EU ; execution according to standard	Use in zone:
<b>Motor</b>		
II 2G Ex eb IIC T3 Gb	EN 60079-0 / EN 60079-7	1 or 2
II 2 G Ex db eb IIC T3...T4 Gb	EN 60079-0 / EN 60079-1 (connection according to EN 60079-7)	1 or 2
II 3G Ex ec IIC T3 Gc	EN 60079-0 / EN 60079-7	2
II 2D Ex tb IIIC T160°C Db	EN 60079-0 / EN 60079-31	21 or 22
II 3D Ex tc IIIC T 160°C Dc	EN 60079-0 / EN 60079-31	22
<b>Gear unit</b>		
II 2 G Ex h IIC T1...T4 Gb	EN 80079-36 / EN 80079-37	1 or 2
II 2 D Ex h IIIC T160°C...120°C Db	EN 80079-36 / EN 80079-37	21 or 22

### 3 Liability and warranty

We accept no liability for any loss, damage, or operational problems resulting from incorrect assembly or installation, non-compliance with these operating instructions or improper repairs. Original spare parts are specifically designed and tested for these motors. We recommend obtaining spare parts and accessories exclusively from the manufacturer. We expressly point out that any spare parts or accessories not supplied by us must be approved by the manufacturer. The installation and use of products from other manufacturers may detrimentally alter the design characteristics of the motor and impair safety for people, the motor or other property (with regard to explosion protection).

The manufacturer accepts no further liability of any sort for any loss or damage resulting from the use of spare parts or accessories not approved by the manufacturer. Any alteration or modification of the motor by the user is prohibited for safety reasons and relieves the manufacturer of liability for any resulting loss or damage.

## MOTOR

### 4 Erection, operation and maintenance

The motors are intended to be used in explosion hazard areas. The following data on the nameplate characterises the motor as explosion-protected equipment:

- Type of explosion protection
- Explosion group
- Temperature class
- Device protection level

The stated device protection level classifies the motor in the zoning scheme of the production site.

Along with the provisions of DIN VDE 0100 applicable to the erection of electrical equipment not protected against explosion, the provisions for the erection of electrical systems in explosion hazard areas must be observed:

For gas explosion protection      EN 60079-14 / VDE 0165-1

For dust explosion protection      EN 60079-14 / VDE 0165-1

The following apply to testing and maintenance:

For gas explosion protection      EN 60079-17 / VDE 0165-10-1

For dust explosion protection      EN 60079-17 / VDE 0165-10-1

The following apply to repair and overhaul, taking the TRBS into account:

For gas explosion protection      EN 60079-19 / VDE 0165-20-1

Directive 1999/92/EC and its national implementation, in Germany initially as the ExeV and since 27 September 2002 as the Industrial Safety Ordinance (BetrSichV), as well as the Technical Rules for Industrial Safety (TRBS), apply to plant operators.



## 6 Electrical connection

All work may only be performed by authorised persons under conditions where no explosion hazard is present (after written approval for the work has been issued) with the machine stopped and with power switched off and locked out to prevent re-energising. This also applies to auxiliary circuits (e.g. brake circuit).  
Remove any transport locks before putting the device into service.



### Attention!

Check that power has been switched off!

Always ensure that power has been switched off before opening the terminal box. The motors operate in accordance with VDE 0530 with mains voltage variations up to  $\pm 5\%$  or frequency variations up to  $\pm 2\%$  (**voltage and frequency range A as defined in EN 60034-1**).

Ensure that the mains power matches the voltage and frequency data on the nameplate. Connect the motor according to the wiring diagram in the terminal box. Use only the original connection fittings included with the motor for this purpose.



### Attention

Check the terminal box seal for damage after opening each time. In case of damage, replace it with an original spare part.

Connect the motor, control unit, overload protection and earthing according to local installation regulations.

If unexpected start-up of the system can endanger personnel, do not use motor protection devices with automatic restart.

The provisions of EN 60079-14 as well as the general erection regulations must be observed. They stipulate overload protection by means of a motor protection switch or equivalent protective device. This includes a thermistor sensor with a trip device (for motors with temperature monitoring).

In accordance with ATEX regulations, the following additional marking or similar must be applied to the motor:

Thermistors PTC DIN 44081/82-145  
Relay function tested  II (2) G D  
 $t_A 28 \text{ s} / 20 \text{ }^\circ\text{C UN I}_M/\text{I}_N 5.0$

In addition, any special conditions stipulated on the test certificate must be observed, as can be seen by an „X“ after the test certificate number on the nameplate.

## 7 Connection of mains cable and monitoring cable

### Connection using WAGO spring terminals.

This method, certified under PTB 05 ATEX 1070 U for explosion protection types „e“ and „t“, together with the jumpers included for delta and wye connections, enables easy and reliable connection to the main and auxiliary terminals.

Observe the associated connection diagram!

		<ol style="list-style-type: none"> <li>1 Insert screwdriver until the stop</li> <li>2 Leave the screwdriver in place to hold the Cage Clamp open; insert the conductor</li> <li>3 withdraw the screwdriver – the conductor is automatically clamped</li> </ol>
		<p>Terminal block with CAGE CLAMP technology          6 terminals for the winding          1 terminal for PE          4 terminals with different size and colour (e.g. for warning and shutoff thermostors); wye jumpers W2, U2 and V2 fitted; bottom row of terminals for mains connection;</p>

Version with stud terminals	Special for „eb“	Special for „tb“ „tc“ and „ec“	Standard for „db“ and „db eb“
<p>Connection of single lead</p> <ol style="list-style-type: none"> <li>1 – Plastic base of terminal board</li> <li>2 – Square on brass stud to prevent turning</li> <li>3 – Winding lead with ring lug</li> <li>4 – Brass U or Z anti-rotation bracket (bottom) and mains lead retainer bracket (top)</li> <li>5 – Mains lead</li> <li>6 – DIN 46288 connection washer as a pressure piece and lock washer</li> </ol>			



Observe the conductor cross-section capacity ratings of the terminal clamps. If no ratings are marked on the terminals, see the following table.

Bolt thread	Rated cross-section for direct conductor connection	Rated cross-section for ring cable lug connection	Connection to torque
M5	2.5 bis 6.0 mm <sup>2</sup>	max. 6.0 mm <sup>2</sup>	2.0 Nm
M6	4.0 bis 10.0 mm <sup>2</sup>	max. 10.0 mm <sup>2</sup>	3.0 Nm
M8	4.0 bis 16.0 mm <sup>2</sup>	max. 16.0 mm <sup>2</sup>	6.0 Nm

In connection compartments with explosion protection type „increased safety“, ensure compliance with the air gaps specified in EN 60079-7 between parts at different voltages. Tighten nuts and bolts on electrically live parts to the specified torques.

Connection cables must not be installed over current-carrying parts.

Table 2

Air gap (60079-7, Table 1, +10%)	
Working voltage U	Minimum air gap
175 < U ≤ 275 V	5 mm
275 < U ≤ 440 V	6 mm
440 < U ≤ 550 V	8 mm
550 < U ≤ 700 V	10 mm
700 < U ≤ 1,100 V	14 mm

Table 3

Tightening torques for current-carrying bolts	
Thread size	Tightening torque
M4	1.2 Nm
M5	2.0 Nm
M6	3.0 Nm
M8	6.0 Nm

Auxiliary terminals for purposes such as temperature monitoring or standstill heating are located in the main connection compartment or in supplementary connection compartments, depending on the version (see wiring diagram included with motor).

Keep the wiring diagram included in the connection compartment with the drive documents in the plant.

If an external fan is provided, it must always be switched on together with the motor, and with duty type S3 or S4 it should operate continuously with the motor as much as possible. The drive must always be protected against overload and against automatic restoration of power if unintentional start-up poses a hazard.

For protection against touching electrically live parts, the terminal box must be closed again using the factory-issue seals and in compliance with the IP protection rating.

Check the terminal box seal for damage after opening each time.

In case of damage, replaced the seals with original spare parts (seal and adhesive).

The plastic entry seals provided for potential transport must be replaced by entry fittings (ATEX-approved category) and must at least correspond to the motor IP rating.

Unused entry holes must be closed off with approved entry seals (e.g. metallic) with a motor IP rating at the minimum. Additional rain protection is necessary in such case.

For motors with cast-on terminal boxes that have vertical proximal openings (facing upwards) after installation, these openings must be protected against parts falling into it, or be sealed with ATAX-compliant locking screws with a gasket in accordance with the IP rating. All locking screws must be secured with LOCTITE (e.g. 243).



#### Attention!

Cable entries and entry seals that do not meet these requirements are not permitted. The diameters of the cables and connectors used must correspond to the clamping range marked on the entry. Observe the usage instructions for the cable and conductor entries.

## 8 Connection box

To change the position of the cable and conductor entries, the compartment can be rotated in four steps of 90°. To do so, loosen the four fixing screws and turn the connection compartment to the desired position. Check the terminal box seals for damage after opening each time. In case of damage, replace the seals with original spare parts. Then retighten the fasteners to the appropriate torque for the thread size (see Table 4 below).

Table 4: Tightening torques for grade 8.8 screws

Thread size	Tightening torque
M5	6 Nm
M6	10 Nm
M8	25 Nm
M10	49 Nm
M12	85 Nm
M16	210 Nm
M20	425 Nm

## 9 Motors with direct wiring

The free end of the cable routed to the motor must be connected in accordance with the regulations applicable to the connection area. If the cable entry used on the motor has a strain relief, the cable can be fitted freely; otherwise it must be secured by a strain relief close to the entry. The maximum operating temperature at the cable entry may not exceed 90 °C.

## 10 Motors with plug-and-socket connectors

Plug-and-socket connectors are not allowed to be connected or disconnected under power when used as intended. Plug-and-socket connectors of the same or similar type arranged next to each other must be protected by mechanical coding to prevent misconnection.

For motor versions with plug-and-socket connectors (Equipment protection level „ec“ and „tc“), the locking bails on the bottom part of the housing (attachment housing) must be secured with lock plates after the cable is connected in order to prevent accidental disconnection. When the connector shell is not plugged in, the attachment housing must be closed with the factory-issue protective cap.

## 11 Additional information for three-phase motors with flameproof enclosure, series DNFXD

II 2 G Ex db IIC T3...T4 Gb or II 2 G Ex db eb IIC T3...T4 Gb

II 2 D Ex tb IIIC T160°C...T120°C Db

These motors operate in accordance with VDE 0530 with mains voltage variations up to  $\pm 10\%$  or frequency variations from  $-5\%$  to  $+3\%$  (voltage and frequency range B as defined in EN 60034-1). Ensure that the mains power matches the voltage and frequency stated on the nameplate. Connect the motor according to the wiring diagram in the terminal box.

### 11.1 Terminal box (series DNFXD)

Open the box by loosening the cover screws (Figure 1) or, with the version with a grub screw (Figure 2), by backing off the grub screw and then unscrewing the threaded cover. Close the terminal box in the same way after connecting the mains cable.

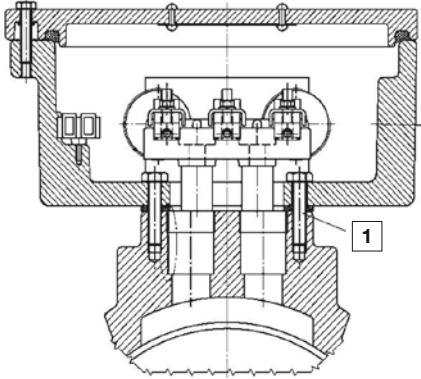


Figure 1: Terminal box with fixing screw 1

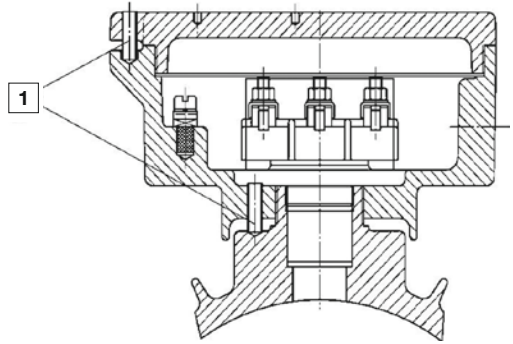


Figure 2: Terminal box with grub screw 1

To change the positions of the cable and conductor entries, the terminal box can be turned in four steps of  $90^\circ$ . To do so, either loosen the four fixing screws (Figure 1) or loosen the grub screw that prevents turning (Figure 2). The screws are secured by a thread locking compound. Turn the terminal box to the desired position. Then tighten the fasteners again to the appropriate torque for the thread size (see Table 4). Secure the screws with a low-strength thread locking compound.

The plastic entry seals provided for transport must be replaced by ATEX-approved category 2G or 2D entry fittings of the minimum motor protection type. Unused entry holes must be closed with approved entry seals.



#### Attention!

Cable entries and entry seals that do not meet these requirements are not permitted. The diameters of the cables and connectors used must correspond to the clamping range marked on the entry. Observe the usage instructions for the cable and conductor entries.

The entries included as standard are intended to be used for feeding in fixed cables.

## 11.2 Motors with terminal boxes whose power supply line is located in the separation plane between the upper and lower parts (series DNFxD)

To maintain protection type Ex e II, use only the original seals supplied with the motor. The entry seals are suitable for the cable diameters listed in Table 5 according to the type (see the marking on the entry seal). Observe the usage instructions for the entry fittings and entry seals.

Table 5: Cable diameter

Type	Cable diameter
RS-75	26 to 48 mm
RS-100	48 to 70 mm

After connecting the mains power cable, refit the upper part to close the terminal box. Peel off layers of the entry seals so that the following condition is satisfied:

By removing individual seal layers, adapt the entry seal to the cable diameter so that the gap between the entry seal and the cable enclosed by the seal is less than 1 mm.

The same number of layers should be removed from both module halves, but a difference of one layer between the two halves is permissible.

Coat the cut edges and sealing surfaces of the entry seal with the supplied grease.

With the two halves of the entry seal fitted around the cable, slide the entry seal fully into the entry opening.

Clamp the entry seal with the screws until a noticeable resistance (maximum torque 6 Nm) is felt.

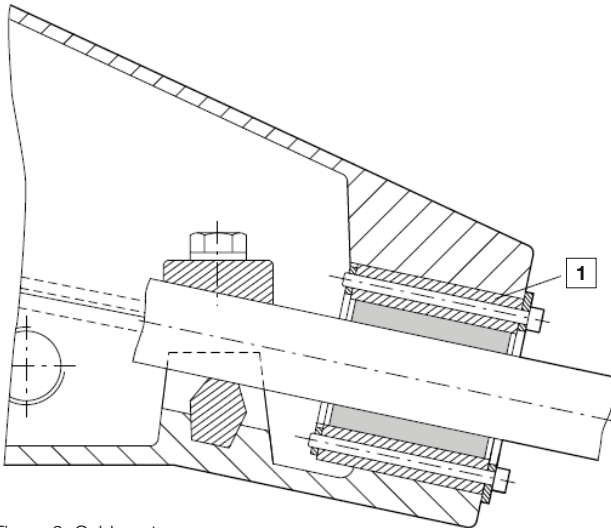


Figure 3: Cable entry

1 Maximum two cable entries, Roxtec type RS entry seals

### 11.3 Connection of mains cable and monitoring cable (series DNFXD)

The mains conductors can be connected with or without cable lugs in versions with a terminal board (Figure 4) and in versions with individual stud passthroughs (Figure 5).

Connect the mains conductors to the individual terminals according to the included wiring diagram.

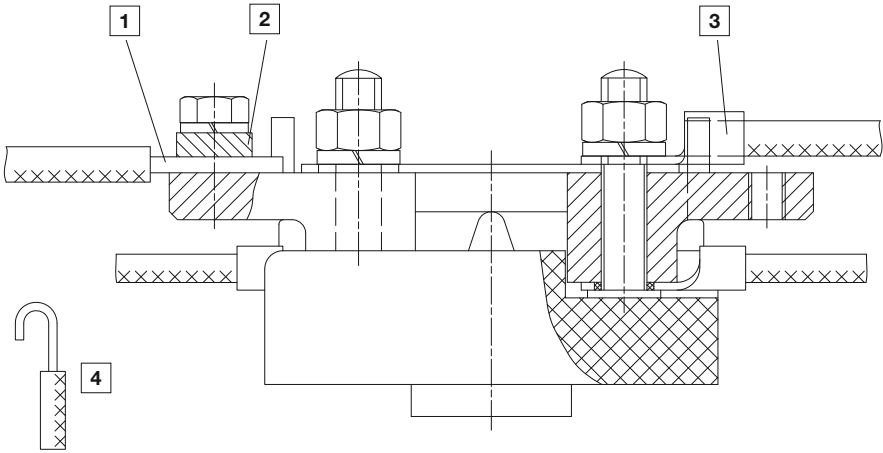


Figure 4: Connecting the conductors

- 1** Connection without cable lug
- 2** Clamping bracket
- 3** Connection with cable lug
- 4** Wire shape of solid conductor without cable lug

When connecting solid conductors without cable lugs under clamping brackets with just one screw, bend the end of the conductor as shown in shape 4.

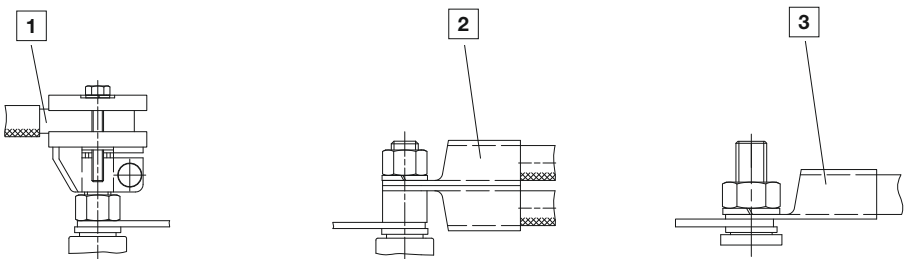


Figure 5: Stud passthrough

- 1** Connection without cable lug
- 2** Connection with two cable lugs
- 3** Connection with one cable lug

Observe the conductor cross-section capacity ratings of the terminal clamps. If no ratings are marked on the terminals, see the following table.

Table 6: Rated cross-sections

Shaft height	Rated cross-section [mm <sup>2</sup> ]
63 to 112	4
132 to 160	10
180 to 225	70
250 to 280	120
315	150/300 (depending on version)
355 or more	300

In the case of terminal boxes with explosion protection type „increased safety“, ensure compliance with the air gaps specified in EN 60079-7 (Table 2) between conductive parts at different voltages. Tighten bolts and nuts on current-carrying parts to the specified torques (Table 7).

Table 7: Tightening torques and current levels for current-carrying bolts

Thread size	Tightening torque [Nm]	Permissible continuous current [A]	
		Brass	Copper
M4	1.2	16	-
M5	2	25	-
M6	3	63	-
M8	6	100	-
M10	10	160	200
M12	15.5	250	315
M16	30	315	400
M20	52	400	630

**Auxiliary terminals for purposes such as Terminals for temperature monitoring or standstill heating are located in the main terminal box or in a supplementary terminal boxes, depending on the version. See the wiring diagram included with the motor.**

**Attention!**

Observe the ratings printed on the terminals.

Keep the wiring diagram supplied in the terminal box with the drive documents in the plant.

**11.4 Motors with standstill heating (series DNFXD)**

The ratings for standstill heating are shown on the nameplate or on an auxiliary plate. There are two options for heating, depending on the version:

- **Heating strips powered via terminals .HE1 and .HE2, or using the stator winding by applying an AC voltage to terminals U1 - V1.**

**Attention!**

Ensure that the electrical control is configured so that the motor voltage and the heater voltage cannot be applied at the same time. The heater itself is not explosion protected. It may not be energised at motor temperatures below  $-20\text{ °C}$  to heat the motor to at least  $-20\text{ °C}$ , but instead is only suitable for preventing the motor temperature from falling below  $-20\text{ °C}$  when the motor is at a standstill.

### 11.5 Motors with a brake (series DNFXD)

The mains cable connection is made in the terminal box of the motor for motors with built-in brakes and in a separate brake terminal box for motors with attached brakes. Observe the supplied connection wiring diagram and the rated voltage stated on the nameplate. The brake coil is energised by an AC connection through a silicon rectifier housed inside the flameproof enclosure. The brake torque tolerance is +30 % / -10 % after light running in. The temperature sensors fitted in the motor and in the brake must always be connected as described in the section „Motors with temperature monitoring“.

### 11.6 Motors with a brake or tachometer mounted under the fan cover (series DNFXD)

The motor fan cover must be removed in order to connect a brake or tachometer located under the cover. Unscrew any shock absorbers or lubrication fittings that may be present. Loosen the fixing screws of the cover and pull the cover off the motor.

Connect the brake or tachometer according to the supplied wiring diagram and route the cable along the shortest path through the motor fins toward the main connection box. It is advisable to slide a protective sleeve over the connection cable in the fin area to prevent abrasion.

Fit the fan cover back onto the motor, observing the positions of the drilled holes for any shock absorbers and lubrication fittings that may be present. Secure the cover with the fixing screws (see Table 3 for tightening torques).

### 11.7 Special operating conditions (series DNFXD)

Operating motors outside the generally applicable ambient temperature range ( $-20\text{ °C}$  to  $+40\text{ °C}$ ) is permissible, even without heating, if the corresponding temperature range is marked on the nameplate (e.g.  $-55\text{ °C} \leq T_{amb} \leq 60\text{ °C}$ ).

Operation below  $-20\text{ °C}$  is also permissible, even without the above-mentioned marking, if the overall temperature of the motor is always kept at or above  $-20\text{ °C}$  by a standstill heater. The ratings and temperature limit of the heater are shown on a plate affixed to the motor.

The heater may not be energised at motor temperatures below  $-20\text{ °C}$  because it is not implemented as explosion protected (see the section „Motors with standstill heating“).

### 11.8 Motors with forced cooling carried out by independently driven external fans

Ensure that the electric circuit is configured so that the main motor can only be operated when the motor for the forced cooling is running.


## 12 Electrical overload protection

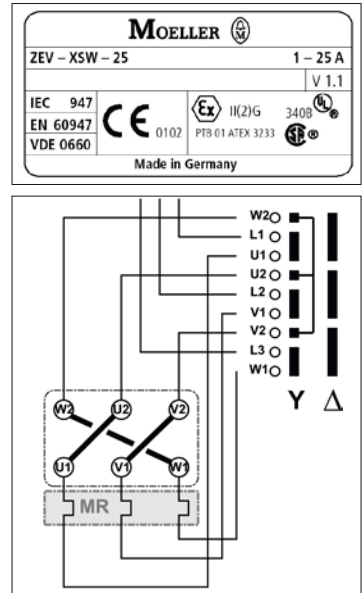
Regardless of the type of explosion protection („e“, „d“ or „t“), motors must be protected against overload by one of the two types of overload protection device described below:

### 12.1 Protective device MR

**A current-dependent, time-delayed protective device** for monitoring all three phases, set no higher than the rated current of the motor, which must trip within 2 hours at 1.2 times the set current level and must not trip within 2 hours at 1.05 times the set current level.

The following points must be observed with the MR device for all explosion protection types („e“, „d“ and „t“):

- The protective device must comply with EN 60947 and its operation must be verified by a notified body and marked  (2) G D. (2) means that the relay is mounted in the safe area; its protective function is effective in Category 2 (Zone 1) in accordance with Directive 94/9/EC Article 1 (2) and ATEX guideline 11.2.1. An example is type ZEV current sensors for an electronic motor protection relay from the firm MOELLER.
- Motor protection must also be ensured in the event of the failure of an external wire (two-wire operation), e.g. by using trip devices with phase dropout sensitivity.
- In the case of motors with pole-changing capability, separate interlocked trip devices must be provided for each motor speed level.
- In the case of Y-Δ start-up, the trip devices must be connected in series with the winding sections and set to the section current level ( $1/1.73 = 0.58$  times the rated motor current). This way the motor is protected if the switch from wye to delta does not occur.
- In the case of motors with explosion protection type „e“, an additional requirement is that when the rotor is locked, the protective device must trip within the time  $t_E$ . The current versus time characteristic present at the premises of the system operator must fulfil this condition for the combination of  $I_A/I_N$  and  $t_E$  stated on the nameplate, with a permissible deviation of  $\pm 20\%$ .
- A practical test with current injection at the time of initial testing and/or repeat testing is only necessary if so indicated by relevant operational experience (EN 60079-17 / VDE 0165-10-1).
- Motors with current-dependent, time-delayed overload protection devices are generally permissible for continuous operation with light and relatively infrequent start-up cycles that do not cause any noticeable extra heating. Motors subjected to frequency or heavy start-up cycles are only permissible in combination with suitable protective devices which ensure that the temperature limit is not exceeded. Heavy start-up conditions are present if a ... properly selected current-dependent, time-delayed overload protection device switches off the motor before it reaches its rated speed. This is generally true if the total start-up time is longer than  $1.7 t_E$  (EN 60079-14).







### Attention!

The rated power of motors, particularly in combination with gear units with four or more stages, is presently overdimensioned. In such cases the rated current is not a suitable measure of the gear unit loading and cannot be used for overload protection of the gear unit.


In some cases overloading is fundamentally impossible due to the way power is provided to the driven machine. In other cases it is a good idea to use a mechanical device, such as a slip coupling, slip hub or the like, to protect the gear unit. The decisive factor is the maximum permissible torque limit for continuous operation shown on the nameplate of the gear unit.

## 12.2 Motors with temperature monitoring

Terminals TP1–TP2 or T1–T2

These motors are equipped with PTC thermistors in accordance with DIN 44082 (triplet version).

Observe the temperature rating and trip time  $t_A$  marked on the nameplate.

Connect the thermistors to an approved trip device with the marking  II(2) GD.

Observe the ratings on the nameplate when selecting the protective device.

The trip time  $t_A$  relates to testing with a locked rotor.

It is the value to be expected at the rated voltage  $U_N$  with an ambient temperature of 20 °C and the specified relative start-up current. It is a measure of the thermal coupling between the sensors and the copper. Unless special reasons are present, it is not necessary to test the actual operation of the protective device at the time of initial testing and/or during repeat testing.

However, after winding replacement as part of an overhaul, the officially recognised authorised person is obliged to check the thermal coupling against the nominal value. A deviation of +20 % in the trip time  $t_A$  is permissible.

The maximum voltage that may be applied to the PTC sensors for continuity testing or resistance measurement is 2.5 V DC per sensor (there are normally three connected in series).

## 13 Motors for operation with a frequency converter

For protection against excessive heating due to overload, the motors are monitored by a device for direct temperature monitoring (→ "Motors with temperature monitoring") in combination with **specified settings** of the frequency converter.

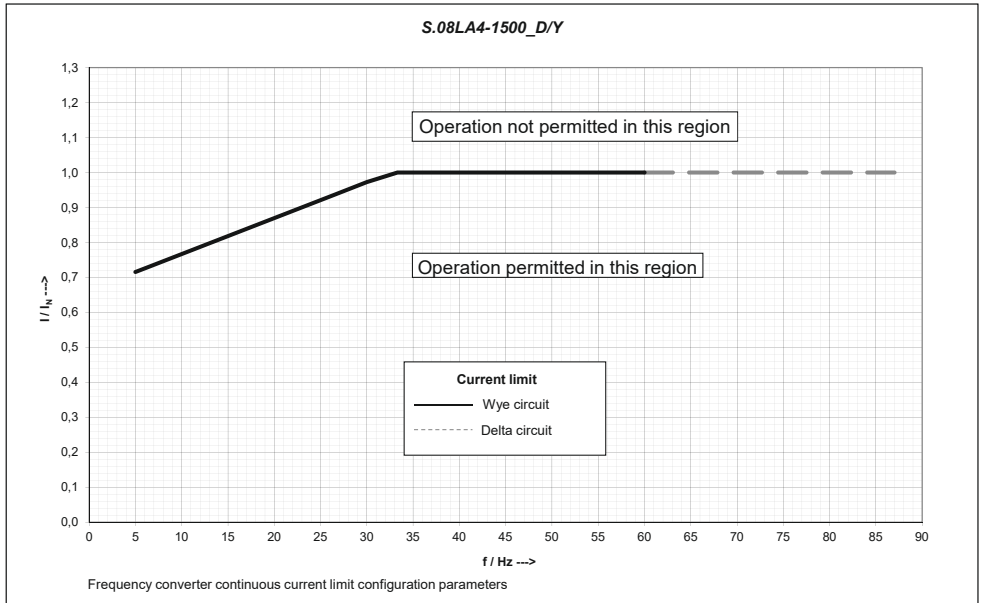
The device for direct temperature monitoring is type tested and consists of three PTC thermistors compliant with DIN 44082 type M 130 built into the winding, as well as a tripping device functionally tested for this purpose in accordance with Directive 2014/34/EU. In connection with the above-mentioned monitoring device, the following frequency converter parameters must be configured and maintained in operation:

Minimum clock frequency:	3	kHz
Short-term current limit:	1.6 x I <sub>N</sub>	
Maximum overload time:	60	s
Permissible duration of operation below $f_{min}$ :	60	s
Maximum permissible input voltage	500 V +10%, 50/60 Hz	

The maximum overload time and the permissible duration of operation below  $f_{min}$  are based on an interval of 10 minutes. All other settings must be selected according the requirements of the drive.

The powers, torques and currents as a function of frequency permissible with this duty type are stated on the nameplate or on a supplementary plate. If the supplementary plate is missing or the permissible power ratings are not stated, the data confirmed by Bauer Gear Motor is applicable.

Example: Permissible operation with type S.X.08LA4 frequency converter



When operating motors from frequency converters, observe the following permissible dielectric strength limits with regard to voltage peaks (limit values of terminals and winding insulation).

1. The clearance and creepage distances of connection terminals are designed for a rated RMS voltage of 750 V based on EN 60079-7, explosion protection with explosion protection type „e“ (increased safety). The permissible transient overvoltage for motors operating from a frequency converter is 2.15 kV phase to phase or phase to earth.
2. The dielectric strength of standard windings for rated RMS voltages 230/400 V and 500 V is 1.6 kV phase to phase or phase to earth with continuous heating corresponding to thermal class F.  
These motors can be used with frequency converters without additional sine-wave or output filters.
3. The dielectric strength of standard windings for rated RMS voltage 400/690 V is 1.6 kV phase to phase or phase to earth with continuous heating corresponding to thermal class F. These motors can be used with frequency converters in delta configuration (400 V D) without additional sine-wave or output filters.  
In wye configuration (690 V Y) an additional sine-wave or output filter is necessary.

The pulse voltage at the motor terminals must be limited to the maximum permissible pulse voltage of 1,556 V ( $2 \times \sqrt{2} \times 550$  V) by selecting a suitable frequency converter and/or using filters.

The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.  
Group operation of the motors is not permissible.

The motors may only be used with frequency converters that fulfil the requirements mentioned above under „Frequency converter settings“.

The rated current of the frequency converter must not exceed twice the rated current of the motor.

The current limiting function of the frequency converter must sense the RMS value of the motor current with a tolerance of  $\pm 5\%$  referenced to the rated motor current.

If appropriate, a supplementary plate is affixed to the motor to indicate that a connecting cable or conductors with an extended operating temperature range and a temperature limit of at least 80 °C must be used.

Motors with a built-in backstop are not allowed to be operated from a frequency converter.

Before operating a motor from a frequency converter, check the electromagnetic compatibility of the drive in accordance with the EMC Directive 89/336 EEC.

If the frequency converter output is not galvanically isolated from the mains and equipped with current limiting, the requirements of EN 50178 / VDE 0160 (electronic equipment for use in power installations) must be observed in order to protect the PE conductor against overload.



**Attention!**

**Observe all specifications of the frequency converter manufacturer.**

**Note:**

No measures for limiting the causes of the peak voltages generated by PWM frequency converters are specified in the standards for explosion-protected electrical machinery. Nevertheless, from the perspective of motor manufacturers and in the interest of increased operational reliability it is urgently advisable to apply measures to the frequency converter to reduce the additional insulation stress, such as using a moderate clock frequency, avoiding extremely short voltage rise times (very high  $dv/dt$ ), and filters or chokes at the frequency converter output. These measures are also recommended in IEC 60034-25 and in IEC/TS 60034-17.

## 14 Motor with brake for zone 2 or zone 22

See the enclosed operating manual of the brake manufacturer.

## 15 Duty types other than S1 (continuous duty)

Motors with duty types other than S1 must be protected against excessive heating due to overloading by a device for direct temperature monitoring („Motors with temperature monitoring“).

## 16 Commissioning

Before installation or commissioning, the insulation resistance must be measured by a qualified person. The resistance should be greater than 1 M $\Omega$ . If it is less than approximately 1 M $\Omega$ , the winding must be dried with the motor open in a drying oven at a temperature of approximately 80 to 100 °C with good ventilation. To safeguard potential warranty claims, consult the manufacturer in advance.

Before commissioning, if possible the mechanical connection to the driven machine should be loosened and the direction of rotation checked with no load. Shaft keys must be removed or secured so that they are not thrown free.

Check the direction of rotation and motor running with no load. If the direction of rotation needs to be changed, swap two of the mains leads.

If the direction of rotation is correct, the drive can be connected to the driven machine and switched on. Ensure that the current consumption under load over an extended period does not exceed the rated current stated on the nameplate. After the drive is first commissioned, it must be observed for at least one hour to check for unusual heating or noises. Compare the operating current with the current rating on the nameplate.

If the motor has been stored with additional grease in the roller bearings for preservation, the motor must be run for at least 30 minutes without load in order to ensure adequate grease distribution and avoid overheating of the bearings.

The settings of the protective devices required in accordance with EN 60079-14 must be configured according to the motor ratings on the nameplate. The current rating marked on the nameplate must not be exceeded under continuous load.

Do not disable protective devices, even in trial operation.

In case of doubt, switch off the machine.

## GEAR UNITS

The gear units of series BG, BF, BK, BS and BM conform to the essential requirements of Directive 2014/34/EU if the selection criteria and the provisions of these operating instructions are observed. The assessment of the explosion risks has been recorded with a notified body; it is based on the series of standards for “non-electrical equipment for use in potentially explosive atmospheres”:

Standard	Part
EN 80079-36	Basic method and requirements
EN 80079-37	Protection by constructional safety „C“ Monitoring of sources of ignition “b” for liquid immersion “k”

### 17 Load rating of gear unit and service factor

A supplementary plate with the following data relevant to explosion protection is affixed to the gear unit.

		<b>Key:</b> <b>max. <math>n_1</math>:</b> maximum permissible input shaft rpm <b>max. <math>M_2</math>:</b> maximum permissible rated torque on the output shaft <b><math>f_B</math>:</b> service factor <b>II 2 G Ex h IIC T. Gb:</b> suitable for zone 1, temperature class T.. (observe T3 or T4 in individual cases) <b>II 2 D Ex h IIIC T160°C Db:</b> suitable for zone 21, housing temperature < 160 °C
73734 Esslingen GETRIEBE / REDUCER / REDUCTEUR No.: E 99999999 - 1    A/ 169X9999    28/2017 Type BG30-11 II 2 G Ex h IIC T3 Gb / II 2 D Ex h IIIC T160°C Db $n_1$ 19,99    max. $n_1$ 1500 r/min max. $M_2$ 200 Nm $f_B$ 1,5 IM B3    1,0 L CPL 220 EN 80079-36 / -37    CE		

Each of the two limits (for  $n_1$  and  $M_2$ ) must be complied with independently.

The service factor  $f_B$  defines the general conditions, such as daily operating times, shock class, start/stop frequency, inertia factor, and significant properties of the transmission components. It is specified during the preliminary design phase for the drive in accordance with the specifications in the catalogue (printed or CD version).



#### Attention!

Compliance with the service factor is an important prerequisite for the explosion protection type constructional safety “c”.

The service factor must be determined for the actual service conditions as described in the following tables:

## 17.1 Bauer service factors for helical, shaft-mounted and bevel gear units in series BG, BF and BK

### Continuous duty without start/stop cycling $Z \leq 1$ c/h

Factor  $f_1$  for shock class and operating times

Shock class	Daily operating time $t_d$		
	$4 \text{ h} < t_d \leq 8 \text{ h}$	$8 \text{ h} < t_d \leq 16 \text{ h}$	$16 \text{ h} < t_d \leq 24 \text{ h}$
I	1.0	1.0	1.2
II	1.05	1.25	1.45
III	1.45	1.55	1.7

### Periodic duty

Factor  $f_2$  for shock class and start/stop frequency in single-shift operation  $t_d \leq 8$  h/d

Shock class	Cycle rate Cycles per hour		
	$1 \text{ c/h} < Z \leq 100 \text{ c/h}$	$100 \text{ c/h} < Z \leq 1,000 \text{ c/h}$	$1,000 \text{ c/h} < Z$
I	1,0	1.1	1.15
II	1.2	1.35	1.4
III	1.55	1.6	1.6

Factor  $f_2$  for shock class and start/stop frequency in multi-shift operation  $t_d > 8$  h/d

Shock class	Cycle rate Cycles per hour		
	$1 \text{ c/h} < Z \leq 100 \text{ c/h}$	$100 \text{ c/h} < Z \leq 1,000 \text{ c/h}$	$1,000 \text{ c/h} < Z$
I	1.3	1.45	1.5
II	1.5	1.6	1.65
III	1.75	1.8	1.8

### Net service factor $f = f_1$ or $f = f_2$

Example: Shock class II with  $Z = 100$  c/h and multi-shift operation yields the service factor  $f = f_2 = 1.5$ .

**Definition of shock class** (see also bulletin SD 3296, „Service Factors“)

#### Shock class I

Uniform load without shocks

The following conditions must be satisfied:

$$FI \leq 1.3 \quad M/M_N \leq 1$$

Additional condition specifically for periodic duty:

Shock-absorbing transmission components (e.g. highly elastic, backlash-free coupling with  $\varphi_N \geq 5^\circ$ )

#### Shock class II

Moderate shock load

At least one of the following conditions is satisfied:

$$1.3 < FI \leq 4 \quad 1 < M/M_N \leq 1.6$$

Shock-neutral transmission components (e.g. gearwheels, backlash-free elastic coupling with  $\varphi_N < 5^\circ$ , or rigid coupling)

#### Shock class III

Heavy shock load

At least one of the following conditions is satisfied:

$$FI > 4 \quad 1.6 < M/M_N \leq 2$$

Shock-amplifying transmission components (e.g. coupling with backlash or chain drive)

### Key to symbols

Z	-	Start/stop frequency (c/h)
$t_d$	-	Operating time in hours per day (h/d)
FI	-	Inertia factor
$M/M_N$	-	Ratio of shock torque to rated torque
$\varphi_N$	-	Twist angle of elastic coupling at rated torque

## 17.2 Bauer service factors for worm gear units in series BS

### Continuous duty without start/stop cycling $Z \leq 1 \text{ c/h}$

Factor  $f_1$  for shock class and operating times

Shock class	Daily operating times $t_d$					
	$t_d \leq 10 \text{ min}$	$t_d \leq 1 \text{ h}$	$1 \text{ h} < t_d \leq 4 \text{ h}$	$4 \text{ h} < t_d \leq 8 \text{ h}$	$8 \text{ h} < t_d \leq 16 \text{ h}$	$16 \text{ h} < t_d \leq 24 \text{ h}$
I	1,0	1,0	1,0	1,0	1,25	1,4
II	1,0	1,0	1,12	1,25	1,6	1,8
III	1,25	1,4	1,6	1,8	2,2	2,5

### Periodic duty

Factor  $f_2$  for shock class and start/stop frequency in single-shift operation  $t_d \leq 8 \text{ h/d}$

Shock class	Cycle rate Cycles per hour		
	$1 \text{ c/h} < Z \leq 100 \text{ c/h}$	$100 \text{ c/h} < Z \leq 1,000 \text{ c/h}$	$1,000 \text{ c/h} < Z$
I	1,25	1,4	1,6
II	1,6	1,8	2,0
III	1,8	2,0	2,2

Factor  $f_2$  for shock class and cycle rate in single-shift operation,  $t_d > 8 \text{ h/d}$

Shock class	Cycle rate Cycles per hour		
	$1 \text{ c/h} < Z \leq 100 \text{ c/h}$	$100 \text{ c/h} < Z \leq 1,000 \text{ c/h}$	$1,000 \text{ c/h} < Z$
I	1,4	1,6	1,8
II	1,8	2,0	2,2
III	1,8	2,2	2,5

### Ambient temperature

Factor  $f_3$  for elevated ambient temperature

Ambient temperature (°C)	-10 to +25	> 25	> 30	> 35	> 40
$f_3$	1.0	1.1	1.2	1.3	Enquire

### Net service factor

$$f = f_1 \text{ or } f_2$$

If both factors must be determined for mixed duty types, the higher value is applicable, subject to the condition that a factor at least equal to  $f_3$  applies for operating times longer than 1 hour.

**Definition of shock class** (see also bulletin SD 3296, „Service Factors“)

#### Shock class I

Uniform load without shocks

The following conditions must be satisfied:

$$FI \leq 1.3$$

$$M/M_N \leq 1$$

Additional condition specifically for periodic duty:

Shock-absorbing transmission components

(e.g. highly elastic, backlash-free coupling with  $\varphi_N \geq 5^\circ$ )

<b>Shock class II</b>	Moderate shock load At least one of the following conditions is satisfied: $1.3 < FI \leq 2$ $1 < M/M_N \leq 1.4$ Shock-neutral transmission components (e.g. gearwheels, backlash-free elastic coupling with $\varphi_N < 5^\circ$ , or rigid coupling)
<b>Shock class III</b>	Heavy shock load At least one of the following conditions is satisfied: $FI > 2$ $1.4 < M/M_N \leq 2$ Shock-amplifying transmission components (e.g. coupling with backlash or chain drive)

**Key to symbols**

Z	-	Start/stop frequency (c/h)
$t_d$	-	Operating time in hours per day (h/d)
FI	-	Inertia factor
$M/M_N$	-	Ratio of shock torque to rated torque
$\varphi_N$	-	Twist angle of elastic coupling at rated torque

Gear units in the BM series for monorail drives are tailored to the application concerned; a service factor is not necessary.

**18 Installation**

The unit is filled in the factory with the amount and type of lubricant most suitable for the intended installation; the mounting type (IM symbol) and oil quantity (oil can symbol) as well as the lubricant type are shown on the nameplate of the gear motor. Arbitrary modification of any of these conditions is not allowed. It can lead to dry running or increased heating of the gear unit.

The right relationship between the lubricant quantity and the mounting (mount type) can also be found in the relevant operation instructions (BA 200 .. ).

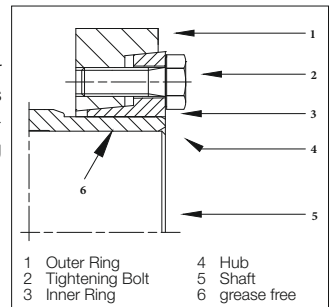
**19 Torque arms**

Observe the following mounting instructions with regard to fixing and support. The effectiveness of the rubber mounts must be checked as part of regular maintenance inspections (after every 3,000 operating hours or at most 6 months). Never brace the torque arms directly on metallic objects, since this can lead to friction heating from the unavoidable relative motion.

See the operating instructions BA 200... for detailed information regarding the arrangement of the torque arms and rubber mounts.

**20 Shrink-fit flange coupling SSV**

The shrink-fit flange coupling (SSV) between the hollow shaft of the gear unit and the driven output shaft is dimensioned to avoid slip when used as intended. To reliably avoiding friction heating that could lead to an explosion, it is essential to strictly observe the fitting instructions in the operating instructions BA 200 ...





## 21 Protection against extreme torque shock loads (e.g. blocking)

Extremely high peak torque loads can occur in special application situations where relatively stiff motion or processes that block motion can be expected. The energy necessary to overcome these torque loads must be supplied by the rotational energy of the rotor. To avoid the risk of breakage in the gear unit and the resulting risk of explosion, mechanical protective devices (explosion-proof slip couplings), or at least highly elastic shaft couplings, must be used in such cases. The electrical overload protection devices cannot provide mechanical protection for the gear unit.

## 22 Periodic tests, inspection, maintenance and continuous supervision

Continuous supervision of the motors is necessary, depending on the conditions of use.

The motor surface and the air inlet must be kept clean as part of periodic inspections. During visual inspection, check that the connection boxes and entry components are tight, the connection components have not become loose, and the fan covers are not deformed.

A practical test with current injection as part of periodic inspection is only necessary if so indicated by experience (EN 60079-17 / VDE 0165-10-1).

Particularly when equipment is used in explosion hazard areas classified as zones 21 or 22, excessive and long-term dust deposits must be avoided.

Do not operate the motors with excessively thick dust deposits, as otherwise the maximum permissible surface temperature may be exceeded. Ensure that cleaning is performed at regular intervals.

### Note:

The surface temperature of the drive indicated on the power rating plate is only applicable if the dust accumulation does not exceed a thickness of 5 mm.



### Attention!

The radial shaft seal rings fall within the scope of the approval. Only original seals may be used.

The national provisions applicable to the maintenance or overhaul of electrical equipment in explosion hazard areas must be observed. In Germany, this includes the Industrial Safety Ordinance (BetrSichV).

As part of maintenance, it is particularly necessary to check the components that are essential for the explosion protection type, such as the intactness of the entry components and seals.

Inspection at regular intervals of 3,000 operating hours or at most 6 months (or more often if necessary) must be incorporated in the inspection plan for maintaining the electrical plant in proper condition.

Item	Recommended method
Leakage	Visual inspection in the vicinity of the gear housing
Running condition	Listening or comparative vibration measurement
Fixation	Visual inspection or retightening of bolts
SSV shrink-fit flange couplings	Visual inspection or retightening of the clamp screws
Rubber mounts on torque arm	Visual inspection

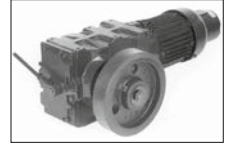
## 23 Checking roller bearings and gearwheels

The roller bearings of the motor are permanently lubricated. The roller bearings of the gear unit are lubricated by the gear lubricant. Under normal operating conditions and with the equipment used as intended and in conformance with the service factor  $f_B$ , it is sufficient to check the running condition of the gear unit (roller bearings and gearwheels) during the periodic inspections at intervals of 3,000 operating hours or at most 6 months. If there are signs of excessive wear, the components concerned must be replaced.

## 24 Mechanically actuated clutch with BM gear units

The clutch, which is actuated by a shift lever located outside the gear unit above a shift rod, must fulfil at least one of the three following conditions to reliably exclude any risk of igniting an explosion:

- The shift rod is outside the explosion hazard area
- The shift rod is made from plastic
- Actuation is interlocked by a control device



The rate of motion is less than 1 m/s

The mechanical clutch located in the gear housing does not pose an explosion hazard.

## 25 Bogie wheel for electrical monorails with BM gear unit

If the bogie wheel provided by the manufacturer of the electrical monorail has a plastic jacket, it must be made from electrostatically conductive material.

## 26 Coupling attachment

Version N:

The shrink-fit coupling is not worn and does not have any play; it does not require maintenance or testing,

Version C:

The clamp connection is not worn and does not have any play.

Tight seating of the clamp screw must be monitored as part of periodic inspection.

IEC standard motors must be installed according to the flow chart shown in BA 200...

## EXPLOSION PROTECTION

The marking, such as II 2 G Ex eb IIC T3 Gb, indicates where the motor may be used and that it has been designed, manufactured and approved in accordance with the relevant European standard necessary for operation in an explosion hazard area.



### Attention!

For this reason, the motor or gear motor may not be modified in any way and the service manuals A170... and BA200... must be observed in all cases.

If modifications or repairs to the motor are necessary, this may only be performed by the manufacturer or by repair shops or plants having the necessary knowledge and expertise. Before the motor is put back into service, compliance with the regulations must be verified by a notified body in accordance with European Directive 76/117/EEC or Directives 2014/34/EU and 99/92/EC and confirmed by marking on the motor or by the generation of a test report.

If these provisions are not fulfilled, the motor is no longer classified as explosion protected and the above-mentioned marking must be removed.

## 27 Instructions for maintaining explosion protection in operation

All contact screws or nuts in electrical connections must be securely tightened to avoid excessive contact resistance, which can lead to overheating of the contact location (see Tables 3 and 7 for tightening torques).

Exercise extreme care when connecting the mains cable. Observe the clearances and creepage distance specifications.

Check the terminal box seal for damage after opening each time. In case of damage, replace it with an original spare part.

Use the seal components properly for the cable entries and connection compartments, as well as the strain relief or entry components for the mains cable intended to prevent rotation, in order to safeguard the protection type of the connection compartments.

Replace any damaged parts immediately, using only original spare parts. Proper execution of the tasks must be checked by a notified body in accordance with the EU directives – in Germany by a recognised expert in accordance with the Industrial Safety Ordinance (BetrSichV), outside Germany in accordance with the national regulations applicable in the country concerned – and confirmed by marking on the motor or the generation of a test report.

Do not rework the surfaces of flameproof gaps. Keep these surfaces metallically clean. Protection against corrosion can be achieved by using non-hardening sealants or sealing grease. Along with standard commercial anti-corrosion greases, the following are approved sealants: Hylomar from Marston-Domsel or Admosit and Fluid-D from Teroson. Observe the manufacturer's usage instructions. This applies in particular to the gaps of covers for connection compartments with explosion protection type „flameproof enclosure“, marking Ex db IIC(B).

All screws must be tightened to the specified torque (Table 4) and must be present in the number of fixing holes provided. Damaged screws may only be replaced by screws of the same size and quality (**at least A2-70**).

The condensate discharge unit must not be unscrewed when the three-phase motor is running. A waiting period, which is specified on the motor, must be observed after the three-phase asynchronous motor has been switched off. The discharge unit must not be unscrewed until this period has expired. The motor must not be set in operation again until the discharge unit has been screwed back into place.

Monitoring devices must comply with Directive 2014/34/EU and EN 1127-1.

## 28 Repair

Repair work on explosion-protected electrical machinery may only be performed by the manufacturer or by suitably qualified specialists in a workshop equipped to perform such work. Only originally spare parts or mechanically identical standard parts (screws and roller bearings) may be used. The radial shaft seal rings fall within the scope of the approval. Only original seals may be used.

The procedures must be carried out according to the manufacturer's instructions.

Tasks related to explosion protection must be performed by the manufacturer or by a shop specialising in electrical machinery. If the tasks are not performed by the manufacturer, they must be assessed and approved by a recognised authorised person.

If the components of an item of electrical equipment that are essential for explosion protection are modified or overhauled, the equipment may only be put back into service after an approved monitoring body or an officially recognised authorised person has found that it conforms to the requirements of BetrSichV and thereby to the relevant technical regulations, and after a certificate to this effect has been issued or the equipment has been marked with a test mark (Sect. 14 BetrSichV). Outside Germany, the national regulations applicable in the country concerned must be observed.

### Painting after repair or overhaul

Repainting of explosion-protected motors can result in thicker paint coats on the machine surface. These can lead to electrostatic discharges, with the risk of explosion in the event of a discharge. The requirements of IEC/EN 60079-0, „Equipment – General Requirements“, section 7.4 and TRBS 2153 must in all cases be fulfilled by means such as:

Limiting the total paint thickness according to the explosion group to

\_ IIA or IIB: total coat thickness  $\leq 2$  mm

\_ IIC: total coat thickness  $\leq 0.2$  mm

Limiting the surface resistance of the paint or resin used to  $\leq 1$  G $\Omega$  for motors in group II or III. The provisions of EN 60079-32: „Electrostatic Hazards“ must also be observed, in particular Annex A, „Fundamentals of Static Electricity“; Annex B, „Electrostatic Discharges in Specific Situations“; and Annex C, „Flammability Properties of Substances“.

## **TRBS 1201 Part 3, „Overhaul and Testing“**

The section of „Technical Rules for Industrial Safety“ regarding the overhaul of equipment, protection systems and safety and control devices in the sense of Directive 94/9/EC –

determining the need for testing according to Sect. 14 para. 6 BetrSichV

contains important instructions for persons and firms performing overhauls. Extracts from these instructions are given below.

These brief extracts are not intended to replace careful reading of the TRBS.

### **Definition of terms**

#### **Facilities**

This includes all machines and devices, tools, aids such as lifting gear, instruments, test equipment and test devices necessary for performing overhauls in an orderly manner.

#### **Authorised person with official recognition**

An authorised staff member of a company who is recognised by the responsible public authority for performing testing after an overhaul.

#### **Significant modification**

Any modification related to one or more basic health or safety requirements (e.g. temperature) or to the integrity of an explosion protection type.

#### **Overhaul**

Restoring a device to its proper condition .... This can be done either by replacing individual parts or by overhauling the parts themselves, such that the explosion protection measures of equipment and safety and control devices, as well as the operation of protection systems and of safety and control devices, are maintained.

#### **Overhaul relevant to explosion protection**

An overhaul involving an operation on an explosion-protected device that affects protection against effective ignition sources or an operation on a protection system ... that affects its operation ..., such that the operation can only be performed with special knowledge and suitable skills with regard to this device ... and may require special facilities (tools, test equipment, etc.).

#### **Original spare part**

The term original spare part, as used in this TRBS, also includes a component that, in the application concerned, fulfils all technical requirements on the component to be replaced.



Category	Device / type of explosion protection	Type of overhaul	Testing according to Sect. 14 (6) BetrSichV necessary	Not permissible as overhaul
----------	---------------------------------------	------------------	---	-----------------------------

2	Gear unit		No	Yes	
	Constructional safety „c“	Lubricant change; interval, type and quantity according to manufacturer's data	X		
	Liquid immersion „k“	Replacement of original spare parts: - Bearings - Shaft seals	X		
		Replacement of gear wheels or shafts exclusively by original spare parts <b>from the manufacturer</b>	X		
		Replacement of gear wheels or shafts by original spare parts		X	

Original spare parts and instructions relevant to explosion protection for the production or installation of these parts should be requested from Bauer Gear Motor GmbH or an authorised dealer.

All other overhaul work with gear units can be classified as overhaul work relevant to explosion protection and may therefore only be performed by the specialists of Bauer Gear Motor GmbH or its suitably qualified dealers, due to the required specialised knowledge.

In addition to the typical overhaul tasks on gear motors listed in the table, other tasks can also be entrusted to the specialised firm, although these are classified as „significant modifications“ and therefore can only be assessed by the manufacturer or the manufacturer's authorised service shop and may only be carried out in accordance with any special measures stipulated there.

#### Examples of significant modifications to gear motors

Modification	Assessment
Mounting with the motor shaft oriented vertically instead of horizontally	Due to the higher oil level, higher power dissipation can occur in the gear unit due to churning in the gear unit. This can result in exceeding the maximum permissible temperature, particularly in the case of applications in explosion hazard areas with temperature class T4.
Powered from a frequency converter with operation at frequencies greater than 60 Hz	High power dissipation can occur in the gear unit due to churning at elevated rotational speed. This can result in exceeding the maximum permissible temperature, particularly in the case of applications in explosion hazard areas with temperature class T4.
Drive conditions with an elevated service factor (9.1)	Reclassification of the suitability of the gear unit

#### Test results and documentation

The tests performed in accordance with Sect. 14 para. 6 clauses 1 and 2 BetrSichV must be documented in accordance with Sect. 19 BetrSichV. These certificates or records must clearly show that the essential explosion protection features of the gear motor comply with the requirements of the German Industrial Safety Ordinance (BetrSichV) after the overhaul. The system operator must retain the documentation for at least the duration of the life cycle of the gear motor and provide it for inspection upon request. Annex 4 of the TRBS contains an example of a record for the testing of an electric motor after overhaul as defined in Sect. 14 para. 6 BetrSichV. A form with comparable content is available from ZVEH.

An overhaul for which testing in accordance with Sect. 14 para. 6 BetrSichV after the overhaul is not necessary according to the TRBS must be suitably documented according to the individual circumstances.

In the interest of traceability, it is recommended to mark gear motors with a permanent test mark after successful completion of testing.

## EU Declaration of Conformity


  
 A REGAL REKNORD BRAND

according to ATEX Directive 2014/34/EU  
for special gears for use in potentially explosive atmospheres  
Category 2G or 2D

Bauer Gear Motor GmbH  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 000.1200-01 Version: 02/2023

**Bauer Gear Motor GmbH**



Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

<b>gear series</b>	<b>helical gear drives BG..</b> <b>flat gears BF..</b> <b>bevel gears BK..</b> <b>worm gears BS..</b> <b>electric monorail gears BM...</b>
--------------------	--

where applicable with additional component series C-

Category: 2G or 2D

Marking:  II 2 G Ex h IIC T1...T4 Gb  
 II 2 D Ex h IIIC T160°C...120°C Db

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309.

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union, demonstrated by compliance with the following harmonised standards:

**EN 1127-1:2019**  
**EN 80079-36:2016**  
**EN 80079-37:2016**  
**EN 60529:1991 / A1:2000 / A2:2013**

In accordance with 2014/34/EU, Annex VIII, Bauer Gear Motor GmbH has deposited the necessary documents with the notified body: PTB (Physikalisch-Technische Bundesanstalt), EU Identification Number: 0102  
Document Registration Number: PTB Reg. No. 03 ATEX D005

Esslingen 10 February 2023

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)



P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.



according to ATEX Directive 2014/34/EU  
Permanent magnet three-phase synchronous motors  
with the type of protection type „e“ for Zone 2 or „t“ for Zone 22

**Bauer Gear Motor GmbH**

Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1100-18 Version: 07/2020

## Bauer Gear Motor GmbH

Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

### Permanent magnet three-phase synchronous motor series



.../S.X..S06..., .../S.XS..08..., .../S.X..S09..., .../S.X..S11..., .../S.X..S13..., .../S.X..16... und .../S.X..18...

where necessary, in conjunction with

the gear series:

helical gear drives BG., flat gears BF., bevel gears BK., worm gears BS., electric monorail gears BM..

**Category:** 3G or 3D

**Marking:**  II 3 G Ex ec IIC T1...T3 Gc or/and  
 II 3 D Ex tc IIIC T160°C...120°C Dc

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended  
for use in potentially explosive atmospheres**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards

<b>EN 60079-0:2012 + A11:2013</b>	General requirements
<b>EN 60079-7:2015</b>	Equipment protection by increased safety „e“
<b>EN 60079-31:2014</b>	Equipment dust ignition protection by enclosure „t“
<b>EN 60034-1:2010 + Cor.:2010</b>	Rotating electrical machines - Part 1: Rating and performance

Esslingen 01 July 2020

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)



P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH

according to ATEX Directive 2014/34/EU  
for three-phase motors with the type of protection „d“ or „de“  
for Zone 1 or „t“ for Zone 21

**Bauer Gear Motor GmbH**  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1300-05 Version: 07/2020

**Bauer Gear Motor GmbH**  
Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

**Three-phase squirrel cage motor series**

**DNFXD06.., DNFXD07.., DNFXD08.., DNFXD09.., DNFXD10.., DNFXD11.., DNFXD13.., DNFXD16.., DNFXD18.., DNFXD20.., DNFXD22.., DNFXD25.., DNFXD28.., DNFXD31..**



**Type examination certificates: PTB 09 ATEX 1050X; PTB 09 ATEX 1051X; PTB 09 ATEX 1052X;**  
PTB 09 ATEX 1053X; Notified Body No. 0102 PTB-Braunschweig if

where necessary, in conjunction with

**the gear series:**

**helical gear drives BG.., flat gears BF.., bevel gears BK.., worm gears BS.., electric monorail gears BM..**

**Category:** 2G or 2D

**Marking:**  II 2 G Ex db IIC T3...T4 Gb hesitate II 2 G Ex db eb IIC T3...T4 Gb and/or  
 II 2 D Ex tb IIIC T200°C...T120°C Db

with the requirements of the European Directive

DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in  
potentially explosive atmospheres.  
Published on 29 March 2014 in the Official Journal of the EU No. L 96/309

QA system in accordance with RL 2014/34/EU Appendix IV certified by TÜV Rheinland Industrie Service GmbH  
Notified under No. 0035

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards

<b>EN 60079-0:2012 + A11:2013</b>	General Requirements
<b>EN 60079-1:2014</b>	Flameproof enclosures „d“
<b>EN 60079-7:2015</b>	Increased safety „e“
<b>EN 60079-31:2014</b>	Equipment dust ignition protection by enclosure „t“
<b>EN 60034-1:2010 + Cor.:2010</b>	Rotating electrical machines - Part 1: Rating and performance

Several of the standards mentioned in the associated EC type examination certificate have already been replaced by  
new versions. The manufacturer hereby declares that the product also complies with the requirements of the new stan-  
dards based on performed tests.

Esslingen 01 July 2020  
Bauer Gear Motor GmbH

  
N. Halmuschi  
(Managing Director)

  
P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.

according to ATEX Directive 2014/34/EU  
for three-phase motors with the type of protection „d“ or „de“ for  
Zone 1 or „t“ for Zone 21

**Bauer Gear Motor GmbH**  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1300-06 Versio: 07/2020

**Bauer Gear Motor GmbH**  
Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

**three phase squirrel cage motors with built-in brake series DNFxD08..B, DNFxD09..B,  
DNFXD10..B, DNFxD11..B, DNFxD13..B**



Type examination certificates: PTB 09 ATEX 1054 X; Notified Body No. 0102 PTB-Braunschweig

where necessary, in conjunction with

**the gear series:**

**helical gear drives BG.., flat gears BF.., bevel gears BK.., worm gears BS.., electric monorail gears BM..**

**Category:** 2G or 2D

**Marking:**  II 2 G Ex d IIB+H<sub>2</sub> T3...T4 Gb respectively II 2 G Ex de IIB+H<sub>2</sub> T3..T4 Gb or/and  
 II 2 D Ex tb IIIC T200° C-T120° C Db

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended  
for use in potentially explosive atmospheres.**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309.

QA system in accordance with RL 2014/34/EU Appendix IV certified by TÜV Rheinland Industrie Service GmbH  
Notified under No. 0035

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards

<b>EN 60079-0:2012 + A11:2013</b>	General Requirements
<b>EN 60079-1:2014</b>	Flameproof enclosures „d“
<b>EN 60079-7:2015</b>	Increased safety „e“
<b>EN 60079-31:2014</b>	Equipment dust ignition protection by enclosure „t“
<b>EN 60034-1:2010 + Cor.:2010</b>	Rotating electrical machines - Part 1: Rating and performance

Several of the standards mentioned in the associated EC type examination certificate have already been replaced by  
new versions. The manufacturer hereby declares that the product also complies with the requirements of the new stan-  
dards based on performed tests.

Esslingen 01 July 2020

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)



P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.

according to ATEX Directive 2014/34/EU  
for three-phase motors with the type of protection "e"  
for Zone 1 or "t" for Zone 21

**Bauer Gear Motor GmbH**  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1200-15 Version: 07/2020

## **Bauer Gear Motor GmbH**

Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

**three-phase motor series .../D.X..06..., .../D.X..07..., .../D.X..08..., .../D.X..09..., .../D.X..11..., .../D.X..13..., .../D.X..16... und .../D.X..18...**

Type examination certificates, first supplement to:

PTB 08 ATEX 3048; PTB 08 ATEX 3049; PTB 08 ATEX 3050; PTB 08 ATEX 3051; PTB 08 ATEX 3052;

PTB 08 ATEX 3053; PTB 08 ATEX 3054; PTB 08 ATEX 3057 X;

Notified Body No. 0102 PTB-Braunschweig

**where necessary, in conjunction with**

**the gear series:**

**helical gear drives BG., flat gears BF., bevel gears BK., worm gears BS., electric monorail gears BM..**

**Category:** 2G or 2D

**Marking:** 

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended  
for use in potentially explosive atmospheres.**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309.

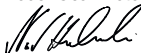
QA system in accordance with RL 2014/34/EU Appendix IV certified by TÜV Rheinland Industrie Service GmbH  
Notified under No. 0035

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards:

<b>EN 60079-0:2012 + A11:2013</b>	General requirements
<b>EN 60079-7:2015</b>	Equipment protection by increased safety "e"
<b>EN 60079-31:2014</b>	Equipment dust ignition protection by enclosure "t"
<b>EN 60034-1:2010 + Cor.:2010</b>	Rotating electrical machines - Part 1: Rating and performance

Esslingen 01 July 2020

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)



P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.

according to ATEX Directive 2014/34/EU  
for three-phase motors with the type of protection "e" for Zone  
2 or "t" for Zone 22

Bauer Gear Motor GmbH  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1100-14 Version: 07/2020

## Bauer Gear Motor GmbH

Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:



**three-phase motor series** .../D.X..04..., D.X..05..., .../D.X..06..., .../D.X..07..., .../D.X..08...,  
.../D.X..09..., .../D.X..11..., .../D.X..13..., .../D.X..16... und .../D.X..18...

where necessary, in conjunction with

the gear series:

helical gear drives BG., flat gears BF., bevel gears BK., worm gears BS., electric monorail gears BM...

**Category:** 3G or 3D

**Marking:**  II 3G Ex ec IIC T1...T3 Gc and/or  
 II 3D Ex tc IIIC T160°C...120°C Dc

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended  
for use in potentially explosive atmospheres.**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309.

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards:

<b>EN 60079-0:2012 + A11:2013</b>	General requirements
<b>EN 60079-7:2015</b>	Equipment protection by type of protection "e"
<b>EN 60079-31:2014</b>	Equipment dust ignition protection by enclosure "t"
<b>EN 60034-1:2010 + Cor.:2010</b>	Rotating electrical machines - Part 1: Rating and performance

Esslingen 01 July 2020

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)



P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.

according to ATEX Directive 2014/34/EU  
for permanent magnet three-phase synchronous motors  
with the type of protection „e“ for Zone 1 or „t“ for Zone 21

Bauer Gear Motor GmbH  
Postfach 10 02 08  
73726 Esslingen (Germany)  
Eberhard-Bauer-Str. 37  
73734 Esslingen (Germany)  
Telephone: +49 (0)711 35 18 0  
Fax: +49 (0)711 35 18 381  
Email: info@bauergears.com  
Website: www.bauergears.com

B 320.1200-16 Version: 07/2020

## Bauer Gear Motor GmbH

Eberhard-Bauer-Str. 37, 73734 Esslingen (Germany)

hereby declares on its sole responsibility conformity of the following products:

### Permanent magnet three-phase synchronous motor series

.../S.X..06..., .../S.X..08..., .../S.X..09..., .../S.X..11..., .../S.X..13..., .../S.X..16... und .../S.X..18...

Type examination certificates:

PTB 13 ATEX 3014 X; PTB 13 ATEX 3015 X; PTB 13 ATEX 3016 X; PTB 13 ATEX 3017 X;

PTB 13 ATEX 3018 X; PTB 13 ATEX 3019 X; PTB 13 ATEX 3020 X;

Notified Body No. 0102 PTB-Braunschweig

where necessary, in conjunction with

the gear series:

helical gear drives BG., flat gears BF., bevel gears BK., worm gears BS., electric monorail gears BM..

Category: 2G or 2D

Marking:  II 2 G Ex eb IIC T1...T4 Gb and/or  
 II 2 D Ex tb IIIC T 160°C...120°C Db

with the requirements of the European Directive

**DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014  
on the harmonisation of the laws of the Member States relating to equipment and protective systems intended  
for use in potentially explosive atmospheres.**

Published on 29 March 2014 in the Official Journal of the EU No. L 96/309.

QA system in accordance with RL 2014/34/EU Appendix IV certified by TÜV Rheinland Industrie Service GmbH  
Notified under No. 0035

The object of declaration as described above is in conformity with the pertinent harmonisation legislation of the Union,  
demonstrated by compliance with the following harmonised standards:

EN 60079-0:2012	General requirements
EN 60079-7:2015	Equipment protection by increased safety „e“
EN 60079-31:2014	Equipment dust ignition protection by enclosure „t“
EN 60034-1:2010 + Cor.:2010	Rotating electrical machines - Part 1: Rating and performance

Esslingen 01 July 2020

Bauer Gear Motor GmbH



N. Halmuschi  
(Managing Director)











P. Cagan  
(Quality Director)

This declaration does not constitute a guarantee of features or performance with regard to product liability.  
The technical documentation is produced and administered by Bauer Gear Motor GmbH.

### 30 Authorised service dealers with officially recognised personnel

Along with the central service department in the Esslingen plant, the following dealers with officially recognised personnel are available. These dealers are trained to service explosion-protected BAUER geared motors, and are equipped with the necessary special tools.

DE 73734	 A REGAL REKNORD BRAND AuthorisedPartner	<b>Bauer Gear Motor GmbH</b> Eberhard-Bauer-Straße 37 Esslingen / Germany	info@bauergears.com www.bauergears.com	
DE 22111	 A REGAL REKNORD BRAND AuthorisedPartner	<b>Steinen Elektromaschinenbau GmbH</b> Am Schiffbeker Berg 18 Hamburg / Germany	info@steinen.de www.steinen.de	Gear Centre
DE 30938	 A REGAL REKNORD BRAND GearCentre	<b>Steinen Elektromaschinenbau GmbH</b> Ehlbeek 21 Burgwedel / Germany	info@steinen.de www.steinen.de	Gear Centre
DE 44147	 A REGAL REKNORD BRAND AuthorisedPartner	<b>BOSS Elektromaschinen und Pumpentechnik GmbH</b> Tankweg 27 Dortmund / Germany	elektromaschinen@boss-gruppe.de www.boss-gruppe.de	Authorised Partner Sales & Service
DE 50266	 A REGAL REKNORD BRAND AuthorisedPartner	<b>Velden GmbH</b> Frechener-Str. 12 50226 Frechen / Germany	Info@velden-gmbh.de www.velden-gmbh.de	Authorised Partner Service
DE 67065	 A REGAL REKNORD BRAND GearCentre	<b>Klebs + Hartmann GmbH &amp; Co. KG</b> August-Heller-Straße 3 Ludwigshafen / Germany	e-technik@klebs-hartmann.de www.klebs-hartmann.de	Gear Centre
DE 93354	 A REGAL REKNORD BRAND AuthorisedPartner	<b>EMS-Elektromotoren GmbH</b> Gewerbgebiet Egelsee 15 Siegenburg / Germany	bauergear@ems-elektromotoren.de www.ems-elektromotoren.de	Authorised Partner Sales & Service
BE 9000	 A REGAL REKNORD BRAND GearCentre	<b>n.v. EMR s.a.</b> Kruisstraat 61C 9930 Lievegem 9930 Lievegem / Belgium	emr@nvemr.be www.nvemr.be	Gear Centre

## 31 Ratings

After successful unit testing, the drive is assigned a nameplate having the following marking:

Motor	Gear unit
<p>Affix a copy of the nameplate with the relevant data in this box.</p>	<p>Affix a copy of the nameplate with the relevant data in this box.</p>

---

Bauer does not make any representations, warranties or guarantees, expressed or implied, as to the accuracy or completeness of this manual or any statements, technical information and recommendations contained herein, or in any other documentation supplied by Bauer in connection with the use of the geared motor or gear unit (the "Product"). Before using the Product you should determine its suitability for your intended use. You bear all risk in connection with the use of the Product. You are reminded that all warranties as to merchantability and fitness for purpose are excluded from the contract under which the Product and this manual have been supplied to you. Bauer's only obligation in this respect is, at its option, to repair or replace any product proven to be defective. Neither Bauer nor any of its affiliates or any of their respective directors, officers, employees or agents shall be liable in contract, tort or in any other manner whatsoever to any person for any direct or indirect loss, damage, injury, liability, cost or expense of any nature (whether loss of profit or otherwise), including without limitation incidental, special, direct or consequential damages arising out of or in connection with the use of this manual.

---

Photos/Graphics: Bauer-Archiv

## Bauer Gear Motor GmbH

Eberhard-Bauer-Straße 37  
73734 Esslingen  
Germany  
Tel.: +49 711 3518-0  
Fax: +49 711 3518-381  
[www.bauergears.com](http://www.bauergears.com)

