Operating manual for motors in “eb” increased safety ignition protection type

Size (Sz.) 56 to 225

Series: EeEA 56...
EeDA 56 - 112
EeDG 90 - 225

Issue: 05 - 05/25 Art. no.: 118628

Three-phase motors

in “eb” increased safety ignition protection type

Single-phase motors

in “eb” increased safety ignition protection type with capacitor in “qb” powder filling

Ex marking:

CE 0123 Ex **II 2G Ex eb IIC T1, T2, T3 or T4 Gb**

CE 0123 Ex **II 2G Ex eb qb IIC T1, T2, T3 or T4 Gb**

in accordance with Directive 2014/34/EU (ATEX)

in accordance with the standards EN IEC 60079-0: 2018
EN IEC 60079-7: 2015 + A1: 2018
EN 60079-5: 2015

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1 General information

Note	
	**The safety instructions contained in this operating manual must be observed!** Special designs and structural variants may differ from the basic type in terms of technical details. If there are any uncertainties, we strongly advise you to contact EMOD Motoren GmbH. Always state the motor type and motor number.

1.1 Area of application

The motors can be used in accordance with the protection class stamped on the rating plate, the type of construction intended by the manufacturer according to the catalogue or the customer's information. When using custom motors, the information in the quote and order confirmation also applies.

1.2 Explanation of the labels used

Symbol	Meaning
Danger	Indicates an immediate danger to life and health. Results in death or serious injury if not prevented.
Warning	Indicates a possible danger to life and health. May result in death or serious injury if not prevented
Caution	Indicates a possible danger to life and health. May result in slight or minor injuries if not prevented.
Note	Indicates a potentially harmful situation. The system or things in the surrounding area may be damaged if not prevented.
	Warning of a danger (general). The type of danger is specified by the accompanying warning text.
	Warning of dangerous electrical voltage and its effect.
	Warning of hot surface.
	Warning of suspended load.
	Warning of explosive atmosphere.

1.3 List of safety and installation notes

Caution

Electric motors have dangerous, live and rotating parts. All work during connection, commissioning, maintenance and disposal may only be carried out by qualified professionals. (Observe EN 50110-1 and IEC 60364) Before beginning any work, any in particular before opening covers, the drive must be isolated according to regulations. In addition to the main circuit, any auxiliary circuits which may be present must be taken into account here.

Compliance with the 5 safety rules:

- Isolate
- Secure against being switched on again
- Establish the absence of voltage
- Earth and short-circuit
- Cover or block off adjacent live parts

The measures specified above may only be withdrawn after the work has been completed and the drive is fully installed. Improper conduct may result in injuries and property damage. The applicable national, local and system-specific provisions and requirements must be observed and complied with.

Warning

The proper and safe operation of the products assumes proper transportation, proper storage, positioning and installation, and careful operation and maintenance.

Caution

The surfaces of the motors may be ≥ 55 °C during operation! The hot surfaces should not be touched.

Note

Products with a weight of ≥ 20 kg should only be moved and lifted with appropriate lifting devices.

1.4 Limitation of liability

All information and instructions in this manual have been put together taking the applicable standards and regulations, the state of the art and our many years of knowledge and experience into account.

The manufacturer assumes no liability for damage resulting from:

- Failure to observe the manual
- Improper use
- Use of untrained personnel
- Unauthorised modifications
- Technical modifications
- Use of unapproved spare parts

The obligations agreed in the supply contract, the general terms and conditions, as well as the manufacturer's delivery conditions, and the applicable statutory provisions at the time of signing of the contract apply.

We reserve the right to make technical changes within the context of the performance characteristics and further development.

1.5 Safety

⚠ Warning	
	**Installation, commissioning and maintenance may only be carried out by personnel with suitable training and qualifications.**

In this respect, special attention should be paid to:

- the technical data and information concerning the proper use (commissioning, environmental and operational conditions), which are stated in the catalogue, the operation manual, the rating plates and the additional product documentation,
- the relevant construction and accident prevention regulations,
- the correct use of tools, lifting and transport devices,
- the implementation of protection measures against unintentional contact when installed to prevent endangerment of persons due to moving parts,
- the use of personal protective equipment.

1.6 Information

1.6.1 Explosive areas

What areas are to be considered as explosive within the meaning of the general regulations and provisions must be left exclusively up to the operator or, in case of doubt over determination, to the competent supervisory authority. The construction of motors with increased safety complies with EN 60034 and the standards and regulations in accordance with EN IEC 60079-0, EN IEC 60079-7 and EN 60079-5. They are intended for use in areas in which there is a risk of explosion resulting from the mixture of air with gases, steam or fog under the normal climate conditions set out below:

- Temperature -20 °C to +40 °C
- Pressure 0.8 bar to 1.1 bar and
- Air with normal oxygen content. Usually 21%

The ignition protection type and maximum surface temperature are specified on the rating plate or in the documentation.

1.6.2 Device group II category 2G (EPL Gb)

Machines of the "eb" increased safety ignition protection type with / without built-in capacitor in "qb" powder filling ignition protection type fall into this category. They may be used in zone 1 and zone 2 (see table).

Zone 0	Zone 1	Zone 2
Category 1G	Category 1G + 2G	Category 1G + 2G + 3G
EPL Ga	EPL Ga + Gb	EPL Ga + Gb + Gc

Note	
	**Motors in the “eb” increased safety ignition protection type may only be operated on a frequency inverted if a combined type examination certificate (motor – frequency inverter) is available.**

2 Transportation and storage

⚠ Warning	
	**Danger due to heavy loads** severe injuries and property damage possible ► Products with a weight of ≥20 kg should only be moved and lifted with appropriate lifting devices ► Only use the intended lifting eyes for transportation of the fully assembled drive unit ► Do not lift the complete drive unit at the motor transport eyes

2.1 Transportation

The motors must be inspected for transport damage upon receipt. Any possible damage should be documented in detail in writing.

Motors with cylindrical roller bearings are protected against bearing damage by transport protection. The transport protection must be removed before raising of the transfer elements and commissioning.

2.2 Storage

The storage location should be as dry, clean, stable in temperature and free from vibrations as possible.

So that the lubrication film in the motor bearings and the sealing systems is not stripped off, the motor shaft should be turned a few times by hand, e.g. at monthly intervals, during long storage periods.

The motor rolling bearings should be re-greased or replaced if the period between delivery and commissioning is more than 4 years. In unfavourable storage conditions, this period is significantly reduced.

3 Installation and commissioning

⚠ Danger	
	**Installations and work may only be carried out with the device deenergised (separated from the mains) and the motor shut down.** Death, cardiac arrhythmia ► Observe the 5 safety rules, see chapter List of safety and installation notes on page 6

3.1 Positioning

3.1.1 Location

The motors should be positioned and/or installed to be easily accessible, with ambient and/or coolant temperatures of between -20 °C and 40 °C.

After consultation with the manufacturer, special designs with ambient and/or coolant temperatures of between to + 65 °C are also possible. Ambient and/coolant temperatures with differ from the standard are indicated separately on the rating plate.

The cooling air must be able to flow in and out unhindered and may not be immediately sucked in again. The air inlets and outlets as well as the ducts between the cooling fins must be kept free from dirt.

The motor series is also intended for attachment to or installation in machines, among other things. Additional heating introduced by this (e.g. with flange mounting) must be taken into account during installation.

Without additional thermal testing by the manufacturer, the surface temperature of the attached machine may not exceed 40 °C.

3.1.2 Installation with the shaft end pointing down

For installation with the shaft ends pointing up and down, care must be taken to ensure that no water can get into the upper bearing. For vertical arrangement of the motors with the shaft end pointing down, e.g. types of construction IM V5, IM V1 and IM V18, foreign objects are prevented from falling into the motor fan cover by a standard protective roof. The cooling air flow is not impeded by the cover.

3.2 Mountings for motors

Foot-mounting motors must be positioned and mounted on an even, vibration-free surface. All mounting feet must lie flat; place thin sheets underneath for levelling if necessary.

For flange motors, care must be taken to ensure the axial run-out of the counterflange. Axial run-out errors may result in bearing damage and/or the failure of sealing systems.

3.3 Condensation drain holes

Care must be taken to ensure that the available condensation drain holes are located at the lowest point of the motor after installation and are kept free from dirt.

Closed condensation drain holes (if present) should be opened from time to time and closed again before each start-up.

Note	
	**For Ex motors, the condensation drain holes must generally be closed so that the stated IP protection class is maintained.**

Note	
	**If these holes have to remain open during operation, then proof that the IP protection class is maintained must be provided.**

3.4 Balancing

⚠ Danger	
	**Rotating parts** Severe injuries ► Secure feather keys against being ejected

The balancing type is indicated on the shaft end face of the motor shafts in accordance with DIN ISO 8821:

- Balancing with a half key “H”
- Balancing with a full key “F”

Observe the appropriate balancing type when installing the drive element!

3.5 Insulation resistance check

⚠ Danger	
	**While measuring the insulation resistance and immediately afterwards, the terminals may have dangerous voltages and may not be touched!** Death, cardiac arrhythmia ► Observe the 5 safety rules, see chapter List of safety and installation notes on page 6

⚠ Caution	
	**The connection terminals must be immediately discharged after measurement in order to prevent spark discharge!**

Before commissioning of the motor, or after a longer storage period or downtime (more than 6 months), the insulation resistance of the winding should be checked. Check the winding against mass by means of an insulation resistance measuring device (max. DC voltage 500 V). If the minimum insulation resistance at a winding temperature of 25 °C is smaller than 30 MΩ, or smaller than 1 MΩ at a winding temperature of 75 °C, the motor winding should be dried until the required minimum insulation resistance is reached. The winding temperature should not exceed 80 °C in this regard! Loosen the bearing plate, so that an air exchange can be carried out with closed motors. After the winding has been dried out, the bearing needs to be serviced (see corresponding chapter!).

3.6 Electrical connection

The mains voltage and frequency must correspond to the data on the rating plate. Voltage deviations of ±5% and/or frequency deviations of ±2% are permissible as described in section A in accordance with EN 60034-1. Please observe the permissible deviations when connecting the motors.

A connection diagram is enclosed with each motor upon delivery. Connection of the motor and the control system, as well as overload protection and earthing, must be carried out in accordance with the VDE and installation regulations as well as the EVU provisions.

The direction of rotation of the shaft end on the output side must be checked before initial operation. Reversal of the direction of rotation is possible by swapping any two voltage phases. (Three-phase motor)

The direction of rotation of the shaft end on the output side must be checked before initial operation. Reversal of the direction of rotation must be carried out in accordance with the attached connection diagram. (Single-phase motor)

The cable entry parts intended for strain relief or as anti-rotation protection for the supply lines must be used properly. Inlet openings, which are not required, must be sealed with certified plugs or cable and lead entries (KLE) in accordance with Directive 2014/34/EU in order to maintain the IP protection class. In their as-delivered state, the Ex motors are provided with no cable glands, all metric cable entries are furnished with sealing plugs certified in accordance with Directive 2014/34/EU.

When connecting the motor, please ensure that only cable and lead entries certified in accordance with Directive 2014/34/EU are used and that the manufacturers' specifications are observed.

The cable glands must be equipped with integrated strain relief approved for ignition protection with increased safety type Ex eb, correspond to Equipment Group II and at least belong to category 2G.

Care must be taken to ensure that the protection class of the motor is always maintained (see rating plate).

The temperature range must at least correspond to the motor temperature (-20°C ... +40°C); if the ambient temperature is higher, this must be observed accordingly. (See rating plate).

Please ensure that the outer diameter of the connector cable falls within the clamping range of the cable gland.

When connecting the motor, the regulations for the construction of electrical systems in explosive areas in accordance with the standard EN 60079-14 must be observed (e.g. automatic restart after motor standstill).

Frame size	Lead entries	Connection	max. connectable leads
56–71	2 x M16 x 1.5 mm² or 2 x M20 x 1.5 mm²	6 x M4	2.5/4.0 mm²
80–112	2 x M25 x 1.5 mm²	6 x M4	4.0/6.0 mm²
112–132	2 x M25 x 1.5 mm² and 1 x M16 x 1.5 mm²	6 x M4	4.0/6.0 mm²
160–180	2 x M40 x 1.5 mm² and 1 x M16 x 1.5 mm²	6 x M4	10/16 mm²
200–225	2 x M50 x 1.5 mm² and 1 x M16 x 1.5 mm²	6 x M4	25/35 mm²

3.7 Standstill heating

The motors can optionally be delivered with a self-limiting standstill heating system. During connection, care must be taken to ensure that the standstill heating system is only in operation when the motor is not switched on, otherwise the introduction of additional heat may exceed the certified temperature class.

3.8 Commissioning

⚠ Caution

The surface of the drive may reach high temperatures during operation.

Danger of burns

► Secure hot surfaces against operation or unintentional contact. To this end, attach covers or warning according to the regulations.

► Allow the motor to cool sufficiently before commencing any work.

Installation of the transmission elements

Only use appropriate tools and devices for fitting and removing the transmission elements. No pressure or impacts may be transmitted to the motor bearings.

Alignment during coupling operation

During coupling operation, the shafts must be axially and radially aligned against each other. Adjustment of the air between the coupling halves must be done in accordance with the coupling manufacturer's specifications.

Use only couplings which are flexible in terms of centre offset, angle, length and torsion. Rigid couplings are not permitted and may only be used in exceptional cases after consultation with the manufacturer.

If the transmission is constructed using belts, care must be taken to ensure that these cannot pick up a static electricity charge

Before commissioning, the following at a minimum must be checked:

- The runners can be turned without scraping,
- The motor is properly aligned and installed,
- The drive elements have the correct settings,
- All electrical connections, connection elements and mounting screws are properly tightened and implemented,

- Additional devices which are present (e.g. brakes) are functional,
- The coolant supply is not restricted,
- Measures have been taken to protect against contact with moving and live parts.

Maximum surface temperatures in accordance with VDMA/ZVEI 24263:2011-02 (increased safety ignition protection type)

Temperature class T3

Number of pole pairs	max. shaft temperature	max. flange temperature
2-pole	60 °C	60 °C
4-pole	75 °C	75 °C

Framework conditions:

- maximum permissible temperatures at the shaft end and motor flange
- no inverter operation
- self-cooled
- Frame size 63 to 200
- Motors in accordance with DIN EN 50347
- Ambient temperature – 20 °C to 40 °C

4 Maintenance

⚠ Danger

Installations and work may only be carried out with the device deenergised (separated from the mains) and the motor shut down.

Death, cardiac arrhythmia

► Observe the 5 safety rules, see chapter List of safety and installation notes on page 6

4.1 Inspection

Depending on the level of the contamination, the entire surfaces of the motors should be cleaned.

In most cases, the first inspection should be carried out after approx. 500 operating hours, after 1 year at the latest. Follow-up inspections should be carried out within appropriate intervals based on application conditions, for instance re-lubrication or re-greasing, however at least once a year.

Accumulating dust should also be removed every now and then.

During inspection, it should be checked whether

- the technical data is observed in accordance with the rating plate,
- there are no leaks (oil, grease, water),
- the operating noises of the bearings as well as the smooth running of the motor have not deteriorated,
- all mounting screws for electrical and mechanical connections are tight,
- the connection of cable screws on the terminal box is fixed properly. If the cable screws are loose, the strain relief (if present) should be loosened and then, the cable screw should be tightened until the cable can no longer move. Tightening the cable screw too firmly will cause constrictions in the cable and should absolutely be prevented. After successful tightening, the strain relief (if present) should be refastened.
- the alignment of the motor is within the approved tolerances during coupling operation.
- any accumulated dust is removed.

4.2 Bearings

4.2.1 Bearings General

Utilising the maximum accepted load specified in our technical list, the nominal durability of the bearings (L10h) amounts to up to 20,000 operating hours.

L10h = nominal durability with 90% reliability (equivalent to 10% probability of failure) not including the lubrication effect in the calculation.

For permanent lubrication, the grease service life is attuned to the bearing durability. External influences reducing the grease service life are for example: dirt, moisture, abrupt or increased load, external temperature effects and vibrations. An exact evaluation of such reduction factors is virtually impossible. We therefore recommend to service the bearings after 3 years or after 5 years at the latest.

High speeds and the resulting increased vibrations, e.g. operation at the frequency inverter, alter smooth running and lead to increased strain on bearings and lubricant.

As a result, grease service life and bearing durability are reduced.

Bearings, which are not shielded by the bearing manufacturer, must be relubricated (in time) according to grease service life, so that the nominal bearing durability is not reached or exceeded.

4.2.2 Bearings with permanent lubrication

For motors with lifetime lubricated bearings and a speed up to 3600 min-1, the bearings should be renewed after 20.000 operating hours. We recommend to replace the bearing after 3 years or after 5 years at the latest.

Lubricants see page 18.

Mixing different grease types must be avoided!

4.2.3 Bearings with re-lubrication

For motors with a relubrication device, the relubrication interval, grease quantity and grease quality are specified on an additional label on the motor.

The prescribed lubrication intervals are shorter under extreme loads and/or at increased temperatures. If the number of operating hours specified on the lubrication plate is not reached within 3 years, then relubrication should be carried out early. Relubricate only when the rotor is rotating and the speed is reduced (e.g. 25 Hz) so that the old grease is displaced from the bearing and the bearing is not damaged.

Lubricants on page 18

Mixing different grease types must be avoided!

Caution

When relubricating the bearings, the grease discharge screws (if available) on the bearing plate DS and OS must be opened!

Cleaning intervals

The regular removal of used grease is necessary to avoid negatively affecting the expected bearing service life.

Note	
	It must be ensured that the running tracks of the bearing and the rolling elements are not damaged during the cleaning process. Do not use metal tools as aids. Make sure there is no dust or dirt near the rolling element or in the rolling element! This causes a drastic shortening in service life!

For further instructions, see chapter Repair

4.3 Repair

Spare parts lists and regular drawings do not contain the types and dimensions of the parts. Therefore, the type and dimensions of the concerned parts should be determined during disassembly and they should be marked for assembly.

4.3.1 Bearing replacement

Disassemble the motor to the required extent. Remove the rolling bearings with a suitable device and remove any contamination from the bearing positions!

Heat the new rolling bearing to approx. 80 °C and mount it.

Fill approx. 50% of the free spaces in the bearing, as well as of the grease chambers in the bearing plate or bearing cover, with grease of an approved quality level.

Before assembly, the sealing elements (for instance shaft seals) should be checked for functionality and damage and replaced if they no longer function properly.

5 Additional information for brake motors

Note	
	**After attachment of the motors, the proper functioning of the brakes must be checked!**

Note	
	**Motors with manual release:** The manual release is intended for emergency use only and must not be used to maintain provisional operation. Never use the manual release to release the brake during commissioning and normal operation!

5.1 General

The attached brake is a safety brake which brakes through spring force with the voltage switched off. The brake is ventilated using electromagnets.

5.2 Connection

The brake system is connected to a separate terminal box for the attached brake, according to the respective circuit diagram enclosed or in the motor terminal box. The supply voltage to be established is specified on an additional label on the brake.

⚠ Warning	
	**The motor may not start against the closed brake! Implement the connection such that the brake is first ventilated and only then is the motor switched on. Brake sizes and motor sizes are coordinated. This coordination may not be changed without approval be the motor manufacturer. Declaration of conformity and operating manual for the spring-loaded brake are attached.**

5.3 Maintenance

The attached spring-loaded single-disc brakes are almost maintenance-free apart from replacement of the friction discs when worn out and inspection of the electrical safety cord (microswitch and thermal switch). If the maximum air gap is exceeded, the brake response time increases significantly and/or the brake no longer ventilates with unfavourable strain ratios. The maintenance cycle for brake inspection must be integrated into the maintenance cycle for inspection of the motor.

(see the brake manufacturers operating and maintenance instructions)

5.4 Reverse running locks and roller free-wheel constructions as options

The reverse running lock is used in order to prevent uncontrolled reverse running of a system and/or rotational movement against the operating direction of the motor in the event of possible power failures or in the event of drive motor damage.

The reverse running lock can be installed in addition to bearings on the drive and/or non-drive side. The installation dimensions recommended by the manufacturer are observed

It may not be used as protection against start-up in the wrong direction of rotation. The operating manual contains a corresponding note.

6 Operating modes

Unless certified otherwise, the motors may only be used for continuous operation (S1) and normal, not frequently recurring start-ups during which no significant start-up heating occurs. If “eb” ignition protection type motors are used for heavy starting > 1.7 × $t_{E,}$ they must be protected by a start-up monitoring system in accordance with the information in the type examination certificate.

6.1 Motor protection with a current-dependent delayed protection device

The motors must be protected at all poles against inadmissible heating as a result of overloading using bimetal motor protection switches. Provisions must also be made so that the operation of a three-phase motor is prevented in the event of loss of a phase. These protective devices must be designed such that they monitor the rated current and switch off the braked motor within the time $t_{E.}$ den festgebremsten Motor abschalten. To this end, there must be tripping curves for the associated tripping device or relay which show the tripping time as a function of the starting current ratio I_A / $I_{N.}$ darstellen. The curves should show the tripping times starting from a cold state in an ambient temperature of 20 °C at least as a function of 3 to 8 times the rated current. The protective devices must comply with the specified tripping times with a tolerance of ±20%.

When selecting the current-dependent tripping device, care should be taken to ensure that it has phase failure detection and imbalance detection. The use of a tripping device which is certified in accordance with Directive 2014/34/EU is recommended.

For pole-changing motors, care must be taken to ensure that a device to protect against overloading is provided for every speed. The circuit breakers must be locked such that it is not possible to switch to a different speed when a breaker is tripped.

6.2 Motor protection with PTC thermistor

Motors with “eb” increased safety ignition protection type which are certified for operation on frequency inverters may only be operated within the limit values specified according to the data sheet and/or rating plate. In particular, this means monitoring of the continuous current depending on the frequency. Only frequency inverters which meet the requirements specified in the type examination certificate may be used. Evaluation of the PTC thermistor installed must be done using a tripping unit with Ex marking Ex II (2)G [Ex eb Gb] which meets the requirements of Directive 2014/34/EU. The specified speed and/or frequency may not be exceeded under any circumstances. The max. permissible pulse voltage may not exceed the specifications in the data sheet. Where applicable, the use of filters or throttles between the inverter and the motor is required.

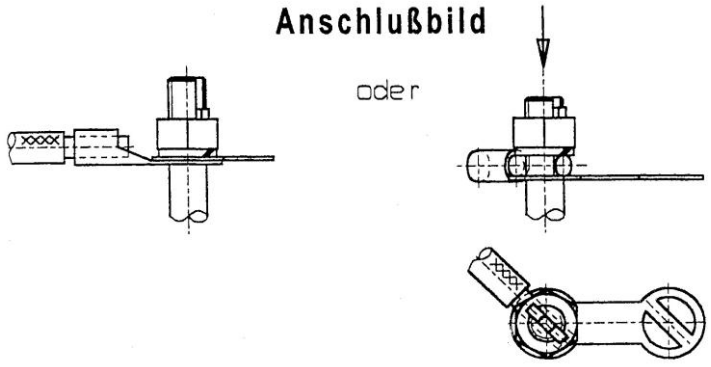
Furthermore, care must be taken to ensure that the attached motor voltage matches the specifications on the rating plate (pay attention to a voltage drop in the connection like and in filters and throttles where applicable). If the terminal voltage at the motor is lower than specified on the rating plate or in the data sheet owing to the voltage drops, then the base frequency must be set to a lower value in accordance with a linear voltage/frequency allocation. The speed control range thus becomes smaller.

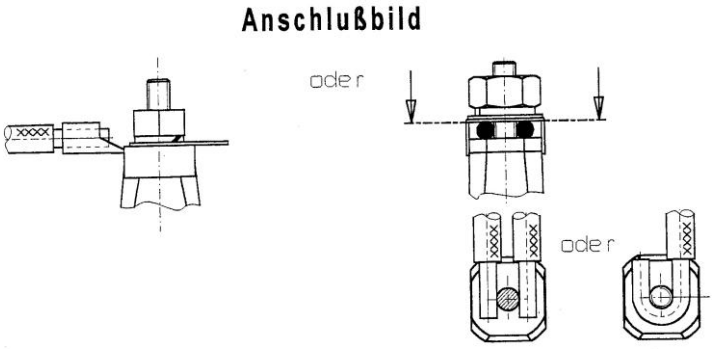
6.3 Motor connection

The supply line must be inserted properly into the line entry so that twisting is prevented and tension relief is ensured.

Motors for explosive areas must be equipped with suitable terminals and lock washers. Furthermore, the minimum air gap must be observed when connecting the cable. Connect the protective conductors to the protective conductor terminal located in the interior of the terminal box or, if the earth conductor is laid separately, to the external earth terminal in a U shape or with a cable lug with good conductivity. The screw connections for electrical connections are tightened with a defined torque in accordance with the table below.

Thread	Tightening torque
M4	1.2 Nm
M5	2.0 Nm
M6	3.0 Nm
M8	6.0 Nm
M10	10.0 Nm





6.4 Repairs

Caution

In order to maintain the explosion protection, repairs which affect the ignition protection type may only be carried out by the manufacturer themselves, an official recognised expert or an Ex-accredited company. Consult the manufacturer where necessary.

6.5 Paintwork

In order to prevent the build-up of static electricity charges during normal use, maintenance and cleaning work, the paintwork applied including primer may not exceed the max. value of 0.20 mm specified in the standard EN IEC 60079-0 for the available equipment in subgroup IIB, provided that no static electricity charges can occur and be stored.

This ensures that any static electricity charges which may occur are dissipated by the coat of paint via the housing, which has potential equalisation.

The proper connection of the potential equalisation connection to the earth is a prerequisite.

If, for various reasons, a coating thickness of more than 0.20 mm is required, then an anti-static paint which reduces the surface resistance must be used.

7 Single-phase motor

The single-phase motors are equipped with a operating capacitor. Owing to the low starting torque, only empty and/or unloading starting is possible. The capacitor cable attached to the motor is not suitable for use as a carrying or transport aid. A type examination certificate in accordance with RL 2014/34/EU is available for the attached operating capacitor. The Ex motor capacitor is a capacitor in “qb” powder filling ignition protection type installed in an aluminium cup.

Capacity tolerance:	±5%
Protection class:	IP 64
Coolant temperature:	-20 °C to +50 °C
Explosion protection:	II 2G Ex qb IIC T6 Gb

Electrical data:

Original operating capacitors must always be used for replacement.

8 Spare parts

For spare parts orders, the motor type and motor number (details can be found on the rating plate) must always be specified in addition to the exact part designation.

With the exception of standardised commercially available and equivalent parts, e.g. ball bearings, only original parts may be used.

This applies in particular for seals and terminals.

9 Final decommissioning (disassembly, recycling, disposal)

Always disassemble motors in such a way that environmentally-friendly recycling and disposal of the motor components is possible.

When recycling and disposing of the disassembled motor components, always observe the legal regulations and provisions applicable at the time of the final decommissioning!

10 Appendix

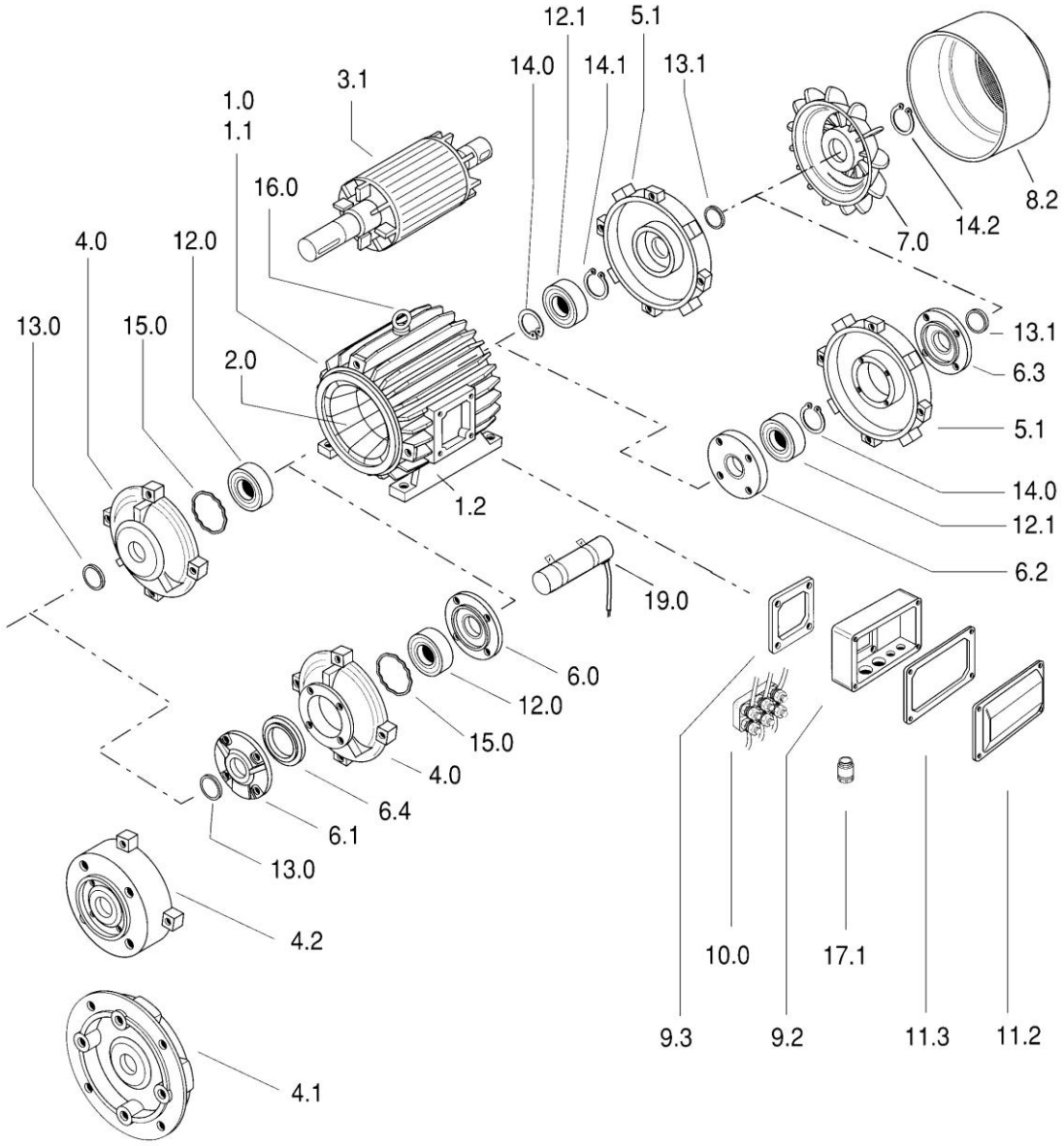
Operating conditions	Insulation class	Roller bearing grease / area of application
Normal	F	High-temperature and long-term lubricant -40 °C to +180 °C
High temperatures, extreme operating conditions	H	High-temperature and long-term lubricant -20 °C to +180 °C
Low temperatures	F	Low-temperature lubricant -50 °C to +150 °C

Table 1: Lubricants

Part no.	Designation
1.0	Housing (IMB3)
1.1	Housing without feet (IMB5 / IMB14)
1.2	Motor feet
2.0	Stator package with winding
3.1	Rotor with shaft
4.0	Bearing plate DE side (IMB3)
4.1	Flange bearing plate (IMB5)
4.2	Flange bearing plate (IMB14)
5.1	Bearing plate NDE side
6.0	Bearing cover ASi
6.1	Bearing cover ASa
6.2	Bearing cover BSi
6.3	Bearing cover BSa
6.4	Centrifugal disc
7.0	Fan
8.2	Fan cover
9.2	Terminal box frame
9.3	Terminal box frame sealing
10.0	Terminal board, complete
11.2	Terminal box cover
11.3	Terminal box cover sealing
12.0	Rolling bearing DE side
12.1	Rolling bearing NDE side
13.0	Shaft seal ring
13.1	Shaft seal ring
14.0	Securing ring (rolling bearing)
14.1	Securing ring (rolling bearing)
14.2	Securing ring (fan)
15.0	Spring plate
16.0	Ring bolt
17.1	Cable screw
19.0	Capacitor (single-phase motors)

2 :Spare parts list

Order example:	Frame size:	160L
	Motor no.:	3574507
	Part:	3.1 rotor with shaft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1.0
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12.0
13.0
15.0
2.0
13.1
6.3
5.1
1.2
14.0
12.1
6.2
19.0
6.0
12.0
15.0
4.0
6.4
6.1
13.0
4.2
4.1
10.0
17.1
9.3
9.2
11.3
11.2

11 Declaration of conformity

EC Declaration of conformity

(in accordance with Appendix VII to EC Directive 2014/34/EU)

Document no./month/year	:	EN_821_56-225_II2GExe(d,q)IICT1-T4_10_07.24			
Manufacturer	:	EMOD Motoren GmbH	**Address**	:	Zur Kuppe 1 D-36364 Bad Salzschlirf
Product description	:	Three-phase motors	**Ignition protection type**	:	“eb” increased safety
Type (frame size)	:	EeD...56./... to EeD...225./...	See rating plate for detailed information		
Product description	:	Single-phase motors	**Ignition protection type**	:	“eb” increased safety with capacitor in “qb” powder filling
Type (frame size)	:	EeE...56./...	See rating plate for detailed information		
Product description	:	Three-phase / single-phase motors	**Ignition protection type**	:	“eb” increased safety with capacitor in “qb” powder filling and in brake in “db” pressurised encapsulation
Type (frame size)	:	Ee...56./... to Ee...225./...	See rating plate for detailed information		

The designated product is in compliance with the stipulations set forth in the following European directives:

RL2014/34/EU (ATEX) **RL2006/42/EG** **RL2014/30/EU (EMV)** **RL2011/65/EU (RoHS)**

The designated products have been developed and produced in compliance with the following standards:

EN 60034-1: 2010 + Cor.: 2010	EN IEC 60034-5: 2020	EN 60034-6: 1993
EN 60034-7: 1993 + A1: 2001	EN 60034-8: 2007 + A1: 2014	EN 60034-9: 2005 + A1: 2007
EN 60034-12: 2017	EN IEC 60034-14: 2018	EN 60529: 1991 + A1: 2000 + A2: 2013
EN 50347: 2001	EN IEC 60079-0: 2018	EN 60079-1: 2014
EN 60079-5: 2015	EN IEC 60079-7: 2015 + A1: 2018	EN IEC 61000-6-1: 2019
EN IEC 61000-6-2: 2019	EN IEC 61000-6-3: 2021	EN IEC 61000-6-4: 2019
EN 60204-1: 2018		

Ex marking for three-phase motors:

CE 0123 Ex **II 2G Ex eb IIC T1 - T4 Gb**

CE 0123 Ex **II 2G Ex eb db IIC T1 - T4 Gb** with attached brake

Ex marking for single-phase motors:

For attachment of a powder-filled capacitor with suitable approval and marking:

CE 0123 Ex **II 2G Ex eb qb IIC T1 - T4 Gb**

CE 0123 Ex **II 2G Ex eb db qb IIC T1 - T4 Gb** with attached brake

The designated product is intended for installation in a machine for use in potentially explosive atmospheres. It is prohibited to put it into service until it has been established that the machine into which these product is to be incorporated complies with the provisions of Directives 2014/34/EU and 2006/42/EC.

Issuer:	Place, date:	Management:
EMOD Motoren GmbH	Bad Salzschlirf, 24.07.2024	**Roland Odenwald**

For a list of the EC Type Examination certificates associated with this EC Declaration of conformity, see reverse.

This declaration certifies compliance with the above-mentioned directives and standards, but is no assurance of characteristics in the sense of the product liability.

The safety instructions in the operating manual supplied must be observed.

Conformity assessment body for EC Type Examination certificates

Physikalisch-**T**echnische-**B**undesanstalt
Bundesalle 100
36116 Braunschweig / Germany
Identification number: 0102

Conformity assessment body for product quality assurance in accordance with Appendix VII for electrical equipment in accordance with Directive 2014/34/EU

TÜV Süd Product Service GmbH
Ridlerstrasse 65
80339 Munich / Germany
Identification number: 0123

List of the associated EC Type Examination certificates:

EC type examination certificate	Type	Data sheet
PTB 03 ATEX 3004 issue 1	EeEA 56L/2a	1 - 3
PTB 02 ATEX 3114 issue 1	EeDA 56L/...	1 - 9
PTB 02 ATEX 3128 issue 1	EeDA 63S/... and EeDA 63L/...	1 - 16
PTB 02 ATEX 3169 issue 1	EeDA 71S/... and EeDA 71L/...	1 - 19
PTB 02 ATEX 3115 issue 1	EeDA 80S/... and EeDA 80L/...	1 - 23
PTB 06 ATEX 3026 issue 1	EeDA 80S/...	1
PTB 02 ATEX 3173 issue 1	EeDA/G 90S/... and EeDA/G 90L/...	1 - 25
PTB 03 ATEX 3007 issue 1	EeDA/G 100L/...	1 - 20
PTB 06 ATEX 3025 X issue 1	EeDA/G 100L/...	1
PTB 03 ATEX 3009 issue 1	EeDA/G 112M/...	1 - 11
PTB 03 ATEX 3022 issue 1	EeDG 132S/... and EeDG 132M/...	1 - 28
PTB 03 ATEX 3039 issue 1	EeDG 160M/... and EeDG 160L/...	1 - 16
PTB 03 ATEX 3062 issue 1	EeDG 180M/... and EeDG 180L/...	1 - 5
PTB 03 ATEX 3098 issue 1	EeDG 200LK/... and EeDG 200L/...	1 - 4
PTB 03 ATEX 3112 issue 1	EeDG 225S/... and EeDG 225M/...	1 - 2
PTB 18 ATEX 3015 X issue 0	EeDAF 90S/2T	1