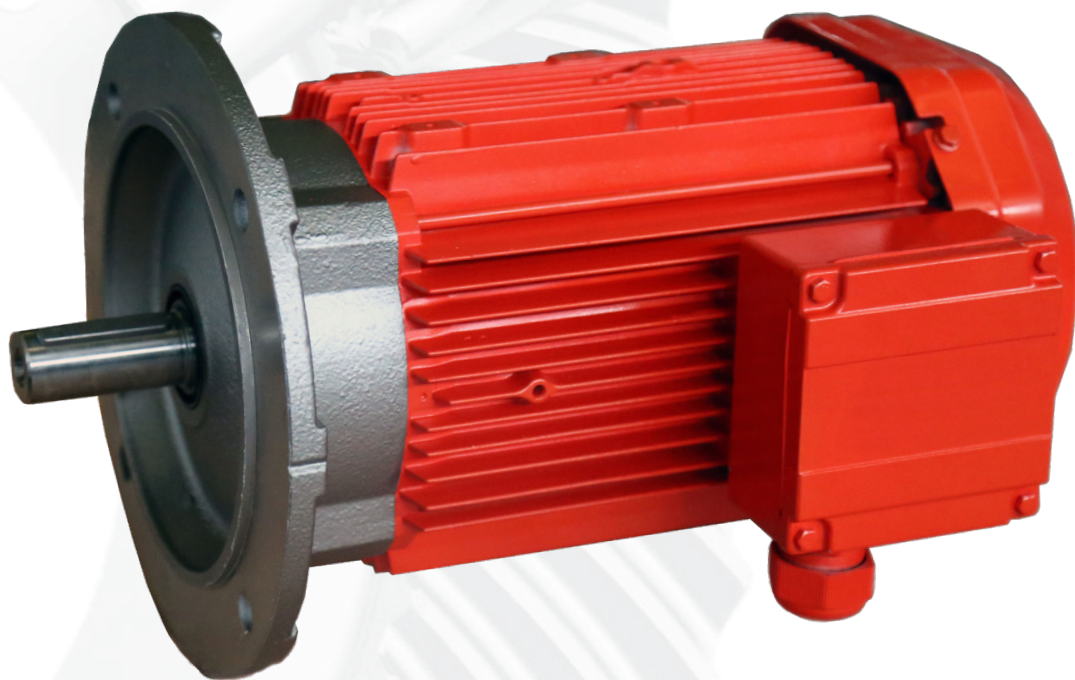


# EURONORM

DRIVE SYSTEMS



MANUAL THREE PHASE MOTORS

## INSTALLATION AND MAINTENANCE SETTINGS

### 1. Scope

These instructions refer to Euronorm three phase motors intended to be installed or assembled with a machine to which the Machinery Directive 2006/42/EC applies. The motors are intended for use in relatively dry environments with an ambient temperature between minus 20°C and plus 40°C to a maximum height of 1,000 meters. For standard motors, the information on the nameplate is based on these values. The maximum voltage deviation allowed according to VDE0530 is 5% at rated power and speed.

Euronorm Motors comply, inter alia, with the following directives and standards: IEC 34-1, IEC 72, EN 50081-1, EN 50081-2, 2006/95 and EG ISO 8821.

### 2. Limitation

These instructions are not intended for installation and maintenance of ATEX motors. For detailed design and motor-specific information (torque, radial load of axles, dimensions, weights, etc.) refer to the relevant sales information or to the Euronorm sales department.

### 3. Safety

Electric motors have rotating and live parts and can become hot. Transport, installation, connection, commissioning, operation and maintenance must only be carried out by qualified personnel who are familiar with all relevant safety regulations and installation guidelines. Repair and service work on the motors may only be carried out if the installation is electrically disconnected and the motor and the machine being driven have come to a complete standstill and, if applicable, have cooled down sufficiently. Do not forget any auxiliary circuits such as stationery heating or PTC connections. If necessary, secure rotating parts to prevent damage to persons or property.

### 4. Control

Before ordering, check that the motor is suitable for the intended application in terms of IP class, power or other matters relevant to the application. Upon receipt, check that the motor corresponds to the order using the nameplate.

### 5. Transport and storage

Observe the following points when transporting and storing the motor:

- Check the motor for shipping damage prior to installation.
- Always use the eyebolt for lifting the motors size 112 or larger.

The eyebolts are only suitable for lifting the motor without accessories such as base plate, gearbox and similar items. Unless otherwise stated, do not lift the motor with an eye bolt in the motor shaft.

- Make sure that the motors are always sufficiently protected during transport and storage.
- If the motors are to be stored for a longer period of time, they must be protected against dust, moisture and other harmful influences.
- Never store the motors resting on their fan guard.

## 6. Mechanical Installation

Make sure that the motor can be properly fastened and that the supporting structural parts are suitable for absorbing both the static and dynamic load of the motor.

Mounting surfaces must be clean, flat and parallel. Make sure that the motor is positioned so that it is free from the surrounding structure and that free access of fresh cooling air to the motor is and remains possible. The distance from the air inlet to a wall should be at least  $\frac{1}{4}$  of the fan guard diameter. In the case of a vertical motor installation with the shaft facing downwards, the ventilation opening shall be protected by a rain cover or similar device without obstructing the free access of ventilation air. In a vertical motor installation with the shaft facing upwards, the output shaft must be protected against the ingress of liquids.

Make sure that any holes in the motor are pointing downwards even after installation.

The surface temperature of electric motors can rise above 80°C, so it may be necessary to provide the motor with a touch guard.

Prior to installation, remove any rotor lock and seal the threaded hole with the supplied plug. Check whether the shaft can now rotate freely (this is not possible with motors with a brake).

One of the main factors in realising the design life and rated performance of the motor is the careful alignment of the motor with the machine to be driven, both radially and axially. A slight misalignment can damage the motor bearings, so pay special attention to the installation and preferably use a dial to check this. It is recommended that the alignment be checked additionally under a static load with the operating load, and if the operating temperatures are higher, the check should also be carried out at this higher temperature. Also refer to the coupling manufacturer's instructions for any further requirements.

To prevent bearing damage during operation of the motor with components such as couplings or pulleys, check the radial and axial forces occurring. For this reason, make sure that a belt drive uses the correct size belt pulley and belt tension.

The feet and/or mounting flange of the motor must be on the mounting surface over their entire surface, otherwise damage to the motor can occur when tightening the mounting bolts. If during the installation of the motor it appears that with a correctly aligned shaft there is space under (one of) the motor feet (B3 - B3/B5 version), this space must be filled with steel shims.

Use bolts with a diameter corresponding to the mounting holes. Make sure that the motor is properly centred and tighten the mounting bolts so that the spring washers under the bolt heads are flush. Tightening the mounting bolts too tightly can cause damage to the motor.

### Note

For flange motors with a B14 flange, the threaded-in length is limited to 2.5 times the bolt diameter; using longer bolts can damage the stator insulation.

The motors are dynamically balanced with a half key on the motor shaft, therefore the coupling parts to be mounted must be balanced without a key. To facilitate mounting the coupling on the shaft, the shaft must be cleaned thoroughly, and preservatives removed. It is recommended to heat the coupling to 60-80°C to facilitate installation. Use the threaded hole in the motor shaft to push the coupling onto the shaft, and when disassembling the coupling, use a pulley puller to remove it again.

**Warning** - The use of a hammer when installing coupling parts is prohibited!

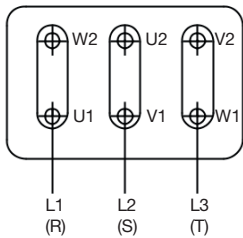
## 7. Electrical protection

The motors must be protected against short circuits, phase losses and overloads by means of a fuse, thermal relay or electronic protection circuit suitable for the specified motor power.

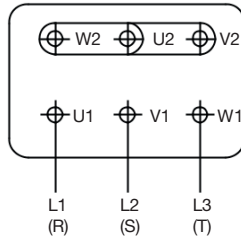
## 8. Electrical installation

The cabling to be used must be suitable for the rated motor power, and proper electrical connections and proper insulation or air distance must be ensured where necessary.

The standard terminal box has six power points and an earth point. The terminals are marked in accordance with standard EN 60034-8. The connections can be made as below:



**TRIANGLE**



**STAR**



**STAR/TRIANGLE**

## 9. Which connection

The lower voltage value refers to the Triangle connection, and the higher voltage value to the Star connection. The connection method must be determined on the basis of the local mains voltage and the information on the motor plate.

### Example:

A 230/400 motor can only be connected to a 400 V supply voltage in Star. A Star/Triangle connection is possible with motors that would normally be connected in Triangle. For a Star/Triangle connection, all connection strips in the terminal box must be removed and the six power points must each be connected to the starter switch. This method of connection is only suitable for applications with a low voltage and low starting torque (fans, centrifugal pumps, etc.). The motor must not be used for long periods in the starting position (star connection).

Usually motors up to the following power ratings are wound in Star connection:

2 and 4 pole motors up to and including 3kW

6 pole motors up to and including 2.2 kW

8 pole motors up to and including 1.5 kW

Larger powers are usually wound into a 400 V Triangle connection.

## 10. Earthing

In accordance with VDE0530, all motors must be earthed at the earthing point in the terminal box.

## 11. Commissioning

Before starting the motor for the first time (but also after a prolonged standstill after installation) and especially after prolonged storage, the following checks must be carried out:

Inspect the lubricant in the motor bearings and the bearings themselves and lubricate/replace if necessary.

Check the insulation resistance to earth and between phases. If the resistance at 25°C and 500 V is lower is then the table values, the motor should be dried at approx. 80°C and remeasured. If the motor still does not meet afterwards you are still not requested to contact the technical service of Euronorm.

Rated power Pn in kW	Insulation resistance in relation to the nominal voltage in kΩ/V
1 < Pn < 10	6,3
10 < Pn < 100	4
100 < Pn	2,5

During and immediately after the inspection, the terminals have a dangerous voltage and avoid contact with the terminals.

If the above checks have been successfully performed, perform the following checks:

- Check that all safety requirements are met.
- Check the data on the nameplate again.
- Check that the connection voltage corresponds to the values on the type plate.
- Check the electrical safety devices.
- Check that the electrical connections are secure, even if they are not in use.
- Check the retaining screws.
- Check the direction of the motor rotation and change the phases if necessary.
- Check that, if the motor brake is fitted, that it is working correctly.
- Check whether any installed standstill heating and whether PTC contacts are correctly connected and functioning.
- Make sure that the terminal box is securely fastened, clean and dry.
- Make sure that the gasket between the cover and terminal box is present and intact and that the unused cable entries are sealed and the used cable entries are watertight and pointing downwards as much as possible.
- Then apply the lid.

## 12. Important notes

The motors should only be operated by qualified personnel. Make sure that the motor is connected electrically and mechanically correctly. The standard direction of the rotation of the motors is clockwise as viewed from the motor shaft. If the motor is connected incorrectly, the direction of rotation may deviate and present a danger to persons and property. For this reason, the direction of rotation of the motor should be checked before mounting the motor.

### Warning

Always remove the possibly present key during test runs without mounted coupling parts. Failure to do so may result in injury and damage!

## 13. Maintenance

Maintenance and repair work on the motors and their systems may only be carried out by qualified personnel, and only if the system has been electrically disconnected and the motor and the machine being driven have come to a complete standstill and have cooled down sufficiently.

## 14. Minor maintenance

Regularly blow the cooling fins, the cooling fan and in particular the space between the fan and the motor housing with an air hose to prevent that the motor does not cool sufficiently.

After the first 100 hours of operation, check all connections (both mechanical and electrical) for reliability and correct if necessary.

If the motor has been out of service for a long period of time, it should be put back into service as if it were a new motor. For the applicable instructions, see chapter 11. "Commissioning".

## 15. Maintenance and lubrication

Motors are supplied with both open and closed motor bearings depending on the type of motor. Under normal operating conditions with continuous operation, open motor bearings of 4 or more pole motors must be lubricated every 20,000 operating hours, for 2 pole motors this must be done every 10,000 hours. Under exceptional conditions such as high humidity or ambient temperatures above 40°C, the lubrication interval must be reduced proportionally.

### Recommended lubricants:

Shell Alvania EP2, Mobil Polyrex EM, Klüber staburags NBU 8 EP or equivalent.

Before re-greasing the bearings, they must be thoroughly cleaned.

The grease volume during relubrication is approx. 50% to 75% of the free volume in the bearing.

The weight of grease can also be calculated indicatively using the formula:

Bearing outer diameter (mm) x bearing width (mm) x 0.005 = amount of grease in grams

### Beware!

An excess of lubricant will increase the operating temperature and shorten the life of the motor and bearings.

In case of doubt the bearing must be replaced.

## 16. Sound and vibration values

The indicative noise level of the motors is given in the table below. The maximum RMS values for vibration speed is 2.8 mm/s for 2 pole motors, and 1.8 mm/s for other motors.

### Indicative noise level in dB (A)

Size	160	180	200	225	250
2 poles	71	77	80	81	81
4 poles	-	-	70	71	71

### Comments:

- 1) Noise level is without load on the motor
- 2) Values (-) not indicated are less than 70 dB (A)

## 17. Spare parts

When ordering spare parts for the motor, in addition to the information on the nameplate, the year of manufacture must also be stated to our sales or technical department. This is very important for the delivery of the right parts.

## 18. Disposal

At the end of its life, the motor will have to be disposed of. Ensure that this disposal is carried out in accordance with the locally applicable regulations, taking into account that special regulations may apply to the disposal of lubricants and preservatives.

## 19. Warranty and repair

If the motor is installed and used correctly, unless otherwise agreed, a warranty of 1 year after delivery applies.

The supplier/manufacturer is not liable for damage caused by incorrect installation or use. Removing parts or dismantling the motor automatically invalidates this warranty. Unless otherwise agreed, repairs within the warranty period will have to be carried out by the technical service of Euronorm. The motor must be delivered free of charge to one of the Euronorm locations.

It is also possible to have all repairs carried out by our technical service or by our service department. The normal rates will be charged and sent on request. We reserve the right to change or supplement these instructions without notice. Please contact our sales or technical department for questions that are not answered in this manual.



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