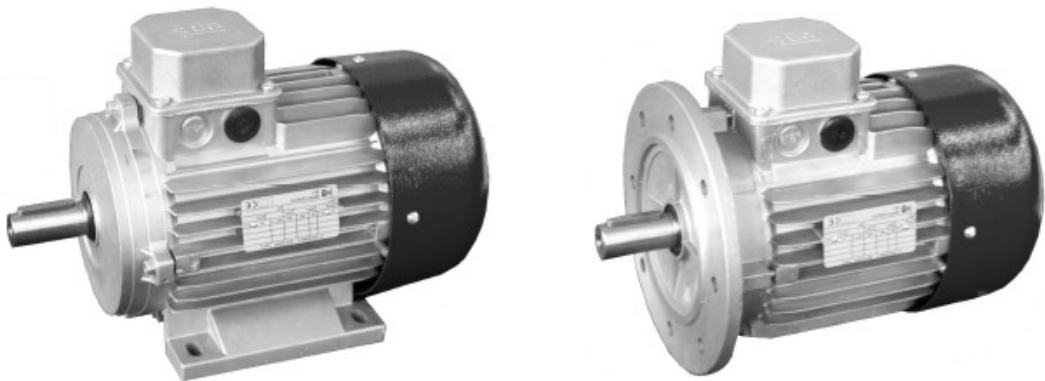




# Operating and maintenance instructions

## Standard three-phase motors SM/I



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### **Storage and transport**

The motors are to be protected against mechanical damages and, if possible, they are to be stored in closed and dry rooms only. In case of short-term outdoor storage they have to be protected against all harmful environmental influences. Never transport or store the motors on the fan cowl. During transportation the motors should be kept from any damage.

### **Mounting of transmission components**

When pulling a transmission component (clutch, pinion or belt pulley) onto the shaft it is absolutely necessary to use a pull-on device or to warm up the component to be pulled on. To prevent shaft, bearings and other parts from damages the transmission components must never be driven onto the shaft by hammer blows.

### **Balancing**

All the components attached to the shaft end are to be balanced dynamically. On the part of the manufacturer the rotors are balanced with half key.

### **Installation**

If possible, the motors are to be installed free from vibration. In the case of direct coupling the motor has to be accurately aligned to the driven machine. The axles of both machines must be in line and no stresses should occur.

### **Ventilation**

Vent holes and cooling fins are to be kept free and the required minimum distances must be observed. It is to be avoided that the heated up cooling air is taken in again. In case of installation in the open, the motors are to be protected against direct environmental influences (rain, snow and ice, freezing of the fan).

### **Commissioning - Prerequisites**

- All operations have to be carried out by skilled staff with the motor in dead state.
- The power supply data (voltage and frequency) have to correspond with the data on the motor's rating plate. Permissible voltage tolerance(DIN VDE 0530):  
for design voltage  $\pm 10\%$   
for design voltage range  $\pm 5\%$
- **Wiring diagram: See page 4.**
- The dimensions of the connection cables are to be adapted to the rated motor currents

### **Overload protection**

In case of direct starting, the motors are to be provided with triple-pole motor protection switches. An additional motor protection switch is also recommended for star/delta starting. For motors with PTC-thermistors a corresponding tripping device is required. For motors with bi-metal thermistors it is recommended to switch off the motor through a contactor (auxiliary circuit) in case of overload.

### **Testing the rotation direction**

The motor's direction of rotation has to be checked before coupling the machine. If necessary, the rotation direction can be altered by changing the connections of two phases.

### **Terminal box**

Wiring diagram: See page 4.

Before closing the terminal box check whether

- all terminal box connections are tightened;
- the inside is clean and free from any particles;
- unused cable entries are closed and threaded plugs are tightened;
- the packing in the terminal box lid is inserted correctly and all packing surfaces are in good condition according the class of protection.

### Switching the motor on/off

Before switching the motor on, during motor operation and when switching it off it should be checked whether all safety regulations are followed. When switching the motor on, the current consumption under load should be observed in order to detect possible overloads immediately.

### Insulation test

Before starting a new motor and after long periods of inactivity or storage, the insulation resistance of the windings has to be measured.

The resistance should be higher than 5 MΩ at 25 °C ambient temperature.

If this value cannot be obtained, the winding is damp and must be dried by a skilled company.

### Maintenance

The motor as well as possible accessories should always be kept clean, free from dust traces, oil or other grime.

As a good rule it is recommended to periodically check whether

- the motor operates without any vibrations or anomalous noises,
- the tension of a possible driving belt is correct,
- the inlet of the ventilation circuit is not obstructed causing overheating of the windings.

### Bearings

<i>frame size</i>	<i>driving end</i>	<i>non-driving end</i>
AY 56	6201.2ZR	6201.2ZR
AY 63	6202.2ZR	6201.2ZR
AY 71	6203.2ZR	6202.2ZR
AY 80	6204.2ZR	6203.2ZR
AY 90	6205.2ZR	6204.2ZR
AY 100	6206.2ZR	6206.2ZR
AY 112	6306.2ZR	6306.2ZR
AY 132	6308.2ZR	6308.2ZR
GAE 160 M	6309.2ZR	6308.2ZR
GAE 160 L	6309.2ZR	6309.2ZR
ACM 180	6311.ZZ.C3	6211.ZZ.C3
ACM 200	6312.ZZ.C3	6212.ZZ.C3
ACM 225	6313.ZZ.C3 2 poles 6313.ZZ.C3 4; 6; 8 poles	6313.ZZ.C3 2 poles 6312.ZZ.C3 4; 6; 8 poles
ACM 250	6313.ZZ.C3 2-pole 6314.ZZ.C3 4; 6; 8 poles	6313.ZZ.C3 2 poles 6313.ZZ.C3 4; 6; 8 poles
ACM 280	6314.ZZ.C3 2 poles 6317.ZZ.C3 4; 6; 8 poles	6314.ZZ.C3 2 poles 6314.ZZ.C3 4; 6; 8 poles
ACM 315	6316.ZZ.C3 2 poles NU 319 4; 6; 8 poles	6316.ZZ.C3 2 poles 6319.ZZ.C3 4; 6; 8 poles

All motors are fitted with high-quality, lifetime-lubricated bearings. The nominal rating life of the bearings used in horizontal mounted motors without any axial load is 40 000 working hours, for power take-off via shaft coupling. Under use of maximal load the lifetime of the bearings is minimum 20 000 working hours.

### Wiring diagram

If the motor shall be started without a delta-star-operating-switch, there are two possibilities to connect the wires: Delta-connection or star-connection.

Normally there are two voltages specified on the nameplate of the motor.

Motor with voltage 230/400V on the nameplate:

For operating at 230V: Use delta-connection.

For operating at 400V: Use star-connection.

Motor with voltage 400/690V on the nameplate:

For operating at 400V: Use delta-connection.

For operating at 690V: Use star-connection.

To reverse the direction of rotation, two wires must be interchanged:

For example: Wire L1 with wire L2.

### Wiring diagram for standard three-phase motors (one-speed squirrel-cage motor)

