

Operating instructions for alternating-current motors

1. Installation

1.1 General

The motor must be mounted on a solid and vibration-free base in an easily accessible location. The machine room must be as dust-free as possible and be provided with protection against humidity. The room temperature must not exceed 40 °C. Cooling air must have free access to the motor from all sides. Any motor cover plates are to be refitted in the original positions. Couplings or belt pulleys are to be pressed on to the shaft ends (impacts damage the bearings).

1.2 Direct coupling

The motor shaft and the driven shaft are to be accurately aligned. The axial and radial forces applied to the end of the motor shaft by the driven shaft must not exceed the maximum.

1.3 Belt drive

The motor is to be mounted on slide rails or in some other way that allows adjustment of belt tension. Belt pulleys are to be aligned, and the motor and the driven shaft must be parallel to one another. Belts must not be over-tensioned as this will quickly lead to bearing damage. In particular, V-belts must not be so highly tensioned that they contact the bottom of the grooves; belts must be slack enough to be able to be deflected by hand pressure applied between the pulley wheels. Belts should be endlessly glued to prevent impacts on the bearings.

2. Connection

2.1 General

Connection to the mains supply must be carried out by a trained electrician. The details on the motor name plate must be checked to ensure that the terminal block connection (e.g. star or delta) complies with the available mains voltage. Any starting devices such as relays and capacitors are to be connected according to the circuit diagram.

2.2 Motor protection

We recommend the use of motor protector units as cutout devices. Fusible cut-outs only protect the supply cable (short-circuit protection), not the motor. Only a correctly adjusted motor protector unit guarantees protection of the motor against overload and single-phasing. The correct current level for setting the motor protection unit is stated on the motor name plate. Where fitted, additional protective devices such as, e.g. thermal protection elements, are to be connected as shown in the circuit diagram. With PTC thermistors, ensure that these are only supplied with the voltages for which they are designed.

3. Commissioning and operation

3.1 Lubrication

grease nipples prior to introducing grease. Stop introducing new grease when no more grease can be pressed in, or when clean grease emerges from the bearing, but at the latest after eight years operation for eight hours per day or 20,000 running hours, when the bearings, grease chambers and grease channels must be washed out as described above. The bearings, the grease chamber at the inlet to the grease channel, and the grease channel itself are to be completely filled with new grease. The chamber between the roller bearings and the grease slinger is to be 2/3 filled with grease. On motors with a used grease chamber, this must be free of grease.

The roller bearings of our motors are usually lubricated with Aseol-Litea 806-12. If this grease is not available, Shell-Alvania 3 or an equivalent lithium-soap based grease can also be used. Mixtures of greases with different bases are not permissible. For motors with relubrication facility, the grease quality is stated in the lubricating instructions.

4.2 General cleaning

Depending on operating conditions, the motor is to be cleaned monthly or yearly when at rest. Particular attention is to be paid to keeping the cooling air channels and the surface of enclosed motors free of dirt and dust. When cleaning, take care that dirt does not enter the bearings.

4.3 Spare parts

When ordering spare parts, always quote their exact designation (or submit sample) and also the type and serial number of the motor (both are given on the name plate).

4.4 Faults

The charts below permit the localisation and rectification of the most frequently occurring faults on alternating-current motors by local specialists. Please contact our factory in case of doubt.

Electrical faults	Incorrect connection Δ instead of λ ; λ instead of Δ	Poor contact at a connection	Loss of a phase	Connecting lead cross-section too small	Overload	Stator winding short	Mains supply voltage too low	Winding — core short-circuit
Motor does not start off-load or runs at insufficient speed			●				●	
Stator winding too hot in places						●		
Motor speed falls when loaded	●	●	●	●	●		●	
No current in one phase			●					
Large temperature rise in stator winding causing protection unit to trip out	●		●		●		●	
Motor hums			●			●		
Protection unit trips out immediately on switching on								●

Mechanical faults	Too much grease in bearing	Sealing ring pressing onto shaft	Foreign body in bearing	Insufficient bearing play	Excessive bearing play	Defect on running surfaces	Assembly defect, bearing mis-aligned	Lubrication fault	Poor sealing	Poor alignment, excessive belt tension
Bearing too hot	●	●	●	●				●		●
Bearing knocking			●		●	●	●			
Bearing singing				●						
Bearing worn			●			●	●	●	●	●

5. Storage

If motors are not to be installed immediately on receipt at their destination, they must be stored in a dry and dust-free room. Particular attention to this must be made in the case of early delivery to new buildings, due to the presence of trapped moisture, hazards from building rubble, concrete splashes and other unforeseeable events.

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