

**Caution!** In addition to these instructions and specifications, which belong to the product documentation, documentation such as the commissioning and maintenance instructions, diagram/connecting diagram, the TAM 00697 for safety-related applications, as well as the instructions for mounting parts (e. g. brakes, encoder, drive) **must be heeded and stored.**

### 1. General

Electrical motors have rotating parts and parts which may be live even at standstill, as well as possibly hot surfaces.

All work for transport, connection, commissioning and periodic maintenance shall be carried out by **qualified, responsible technical personnel** (heed the EN 50110-1/VDE 0105; IEC 60364). Improper conduct can cause serious **personal injuries and damages to property.**

The **applicable national, local and system-specific requirements** shall be taken into account.

The **safety information** in the documentation as well as the **warning and indicator signs** affixed on the motor must be heeded.

### 2. Intended use

These motors are intended for **commercial installations.**

They comply with the harmonized standard of the **EN 60034 series.** Their use in **hazardous areas** is **prohibited**, unless they are **expressly** intended for such use (observe additional instructions).

The motors are rated for ambient temperatures of **+ 0 °C to + 40 °C** and altitude of site of **≤ 1000 m** above sea level. Any deviating information on the rating plates must be heeded **without fail.** Conditions on site must conform to **all** data provided on the rating plate.

DC motors are **electrical equipment** acc. to the low voltage directive EC article 1. **Commissioning** is prohibited until conformity of the end product with this directive has been established (refer to **EN 60204-1**).

DC motors meet the requirements of the **low voltage directive EC** (for further information see the respective declaration of conformity). The proper use of the machine/machinery must comply with the protection requirements of the **EMC directive EC.** The proper installation (e. g. separation of signal lines and power cables, **screened** lines and cables, sufficient grounding, measures against bearing currents etc.) is the responsibility of the erector of the installation and the system provider. **EMC instructions** of the **power converter-, encoder- and brake-manufacturer** must be considered!

### 3. Transport, storage

On motors with **cylindrical roller** bearings the armature of the **transport safety must be blocked**, at the shaft end to prevent transport damages. Immediately report **damages** detected upon delivery to the transporting company - if required, **do not commission.** Lifting devices, transport and load suspending devices must comply with the regulations. The regulations in the respective countries must be adhered to during transport. Remove any **transport bracing** prior to commissioning. When storing the motors, ensure an environment that is **dry, free of dust** and has **low-vibration** ( $V_{\text{eff}} \leq 0.2 \text{ mm/s}$ ; danger of bearing damage at standstill). Suitable corrosion protections have to be taken because the packaging is only designed for transport. To avoid **frost damages** on water-cooled-systems at ambient temperatures **< 3 °C** the **cooling water must be drained!**

### 4. Installation

Ensure that the supporting surface is even, has good foot or flange mounting and the alignment is exact in cases of direct coupling. Avoid resonances with rotational frequency and double mains frequency which may be caused by the assembly. **Check the direction of rotation** when disconnect (refer to Section 5). Remove drive elements (belt pulley, coupling etc.) using **only** suitable devices (e. g. heating) and cover with a **protection** against accidental contact. Avoid excessive loads (e. g. belt tensions) (refer to catalog, technical specifications).

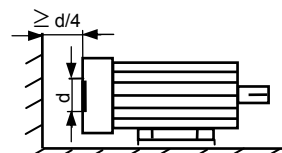
The **balance** is indicated on the shaft end face or on the rating plate (**H** = half-, **F** = full key). When installing the drive elements, watch the balance! In case of half-key design, remove the **protruding visible** fitted key part.

For models with shaft ends pointing downward, a canopy is recommended; for models with shaft ends pointing upward,

measures are needed to protect against ingress of water into the bearing.

Do not obstruct **motor ventilation!** Exhaust air, also from neighboring units, must not be directly drawn in again. Chemically polluted air or dust-containing cooling air or low-load operation for a prolonged period of time may negatively affect the commutation and brush life.

Consultation with the motor manufacturer is essential in the case of **outdoor installation.**



### 5. Electrical connection and commissioning

All work may only be performed by **qualified** technical personnel while the motor is in **standstill** and **disconnected** from the power and secured **against unauthorized restart.**

**Check zero-potential!**

This also applies to auxiliary power circuits (e. g. stationary heating installation, brake, ventilator). Exceeding of tolerances according to EN 60034-1 - voltage  $\pm 5 \%$ , frequency  $\pm 2 \%$ , waveform, symmetry - leads to elevated temperatures and affects the electromagnetic compatibility. Heed the rating plate markings as well as to the connection diagram in the terminal box.

The connection must be established in a manner that will provide a **permanent and safe** electrical connection (no loose wire ends). Use correct cable terminals. Establish safe **protective conductor connection.** Maintain **clearances** between live, uninsulated parts and earth.

**No** loose parts, dirt or moisture may be in the terminal box. After the connection has been established, close the terminal **box dust** and **water-tight.**

For connection and installation of **accessories** (e. g. encoders, pulse generators, brakes, temperature sensors, air-flow monitors...), strictly follow the **respective information.** In case of doubt, consult the machine manufacturer. On motors with **brakes**, check the **functionality prior to commissioning.**

Never operate a motor without the necessary protective devices. The motor must not be installed in the hazard area of other installations. It must not have any damages and commissioning a damaged machine must be avoided.

Before commissioning, measure insulation resistance. In case of values **< 1 M $\Omega$**  dry winding.

### 6. Operation

During operation, the **vibration severities according to DIN ISO 10816** must be heeded in the area of the bearings in coupled state.

Operation **without excitation** (and, by analogy, **also the no-load operation of a series-wound motor**) can lead to **dangerous overspeeds** and must be prevented by interlocking.

In case of deviations from the normal operation - e. g. **increased temperatures, noise, vibrations** - the motor must be switched off in case of doubt. Determine the cause, if required consult with the manufacturer. For the test run without the drive elements, **secure the lock key** and do not by-pass or switch off the protective devices.

In case of heavy dirt deposits, periodically clean air channels and consult the manufacturer for a separate protection measure.

Replace bearings or change grease according to manufacturer's instructions or lubrication plate. Regrease bearing assembly with **relubricating device** while the motor is in operation. Heed the instructions on lubrication plate! The function of the brake and the encoder has to be controlled during the operation continuously.

### 7. Maintenance and servicing

Always heed the information of the **products commissioning and maintenance instructions** when performing inspection or maintenance work. After the exchange or repairing of the brake the necessary braking torque must be ensured.

### 8. Decommissioning and Disposal

The motor must be disposed off in accordance to national and local regulations during normal material process.