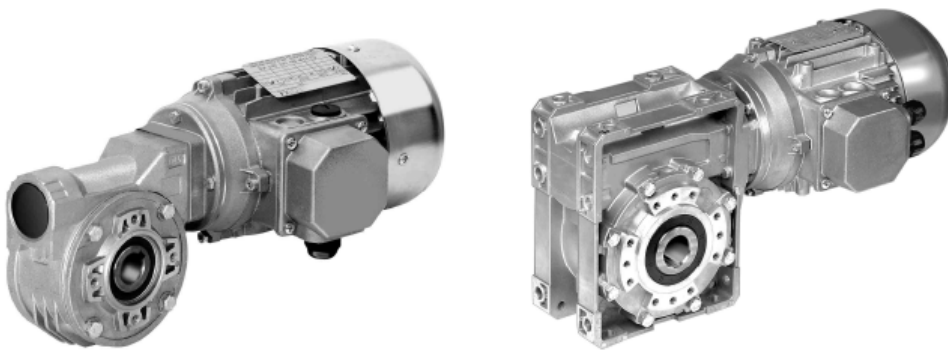




Operating and maintenance instructions

Worm geared motors

HMD / I and HMD / II



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Storage and transport

The geared 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 geared motors on the fan cowl.

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.

Installation

The geared motors are to be installed mostly free from vibration. In the case of direct coupling the geared motor has to be accurately aligned to the driven machine. The axles of geared motor's output shaft and shaft of driven machine must be in line and no stresses should occur.

Mounting position

The gearboxes are delivered without ventilation. Ventilation is not required.

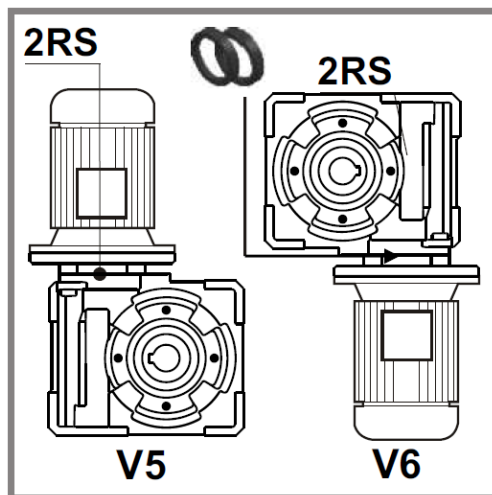
The gearboxes are delivered with oil quantity, which fits for any mounting position.

But mounting positions V5 and V6 are **not** recommended for continuous operating.

For these mounting positions at continuous operating, special versions are required:

V5 (worm shaft vertical, motor on top of gearbox): The gearbox must have a 2RS-ball bearing at the motor side.

V6 (worm shaft vertical, motor below gearbox): The gearbox must have a 2RS-ball bearing at the top end and two shaft seals at the motor side (Mounting position V6 is not recommended for use with 2-pole-motors).



For mounting position V5 or V6 at continuous operating, special versions are required.

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 M Ω 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 gearboxes have a synthetic oil filling for lifetime and are maintenance-free.

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.

Accessories

Accessories have own product numbers and have to be ordered separately.

Output shaft push-in type: The basic gearbox can be supplied with a push-in type output shaft (single sided, to be used left and right, or double sided).

Foot mountings: The geared motors HMD / I are supplied **without** foot mounting.

The foot mounting can however easily be screwed on, if a foot mounting is required. The position of the foot can be changed for different mounting positions. The geared motors HMD / II have several mounting holes and need no foot mountings.

Output flange: If an output-side flange mounting is required, this flange can easily be mounted by the customer.

Mounting of accessories: For operating with many starts / stops or rotation reverses, the mounting screws are to be fixed with medium strength or maximum strength thread locking.

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)

