

Operating Instruction

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Translation

Torque Motors

Safety information

Our safety instructions must always be followed when performing installation, connection, adjustment or maintenance work.

Application

Torque motors are special drives designed to exert torque through a limited movement or in a stalled position. They act as a spring with a constant spring force and an infinitely large spring travel.

Torque motors with a winding designed for permanent stalled operation across the full voltage (rating plate designation $t_k = \infty$) withstand the starting current continuously without endangering the winding insulation.

When designed for intermittent operation (for example 25 % duty cycle) or short-time duty (for example $t_k = 10$ minutes) it will be necessary to maintain the agreed operation method indicated on the rating plate.

Torque motors having a "rectangular torque characteristic" (type designation DW .../...) develop an almost constant torque at all imposed speeds between rest and approximately 80 % of the synchronous speed (n_{sy}) specified on the rating plate.

Torque motors having a "triangle torque characteristic" (type designation DWL .../...) develop the starting torque M_A specified on the rating plate when the unit is stalled. The torque drops to zero at approximately n_{syn} if other speeds are superimposed.

Installation

Torque motors protected in accordance with IP65 and complying with EN 60529 are totally enclosed, dust-proof and hose water-proof.

Torque motors units installed outdoors should be provided with several durable coats of paint as a protection against corrosion the condition of this paint finish being inspected and repaired as necessary at regular intervals, depending on external influences.

The paint work should be matched to the other components. Paints based on synthetic resin have been found most suitable for this application.

Electrical connection

An electrician must connect the motor following the information on the rating plate and the connection diagram in the terminal box. The electrical and mechanical safety regulations must also be observed. Unless otherwise specified, the torque motor in D/Y-Schaltung (e. g.: 400/690 V) is connected for the higher of the two specified nominal voltages. The unit must be reconnected on the terminal board from star to delta to ensure that it corresponds with the mains voltage (690 V).

Two main leads must be interchanged if the unit operates in the wrong direction of rotation.

Proper sealing must be ensured when the terminal box is closed. If necessary, the jointing surfaces will have to be regreased. Blind plugs should be screwed into unused cable entry holes.

Switching off

Owing to the high stray inductance of torque motors they develop a relatively high induced voltage on being switched off which – depending on the type of installation and the cut-off speed of the contactor – might be a danger for rectifiers connected parallel to the main lines.

Type series DW(L) ...rotary field magnets with normal nominal voltages are therefore supplied with three protective capacitors in the terminal box. If the motor is supplied without these capacitors, e.g. windings with high phase voltage, or if the mains or leads pose a problem, e.g. if the lead is very long, it is advisable to attach either suitably adjusted varistors or 3 metallised paper capacitors of approx. 0,5 mF with the necessary nominal voltage to the outside of the magnet. A solution with RC capacitors is supplied ready for installation by MURRELEKTRONIK GmbH, 71570 Oppenweiler under the name "Motor faults".

When ordering this, please request a connection diagram.

Caution

If the rotary field magnet is operated on a frequency converter **without** an output filter, the varistors in the motor terminal box must be disconnected.

Winding protection

The Temperature of the motor frame may rise to relatively high values since torque motors are generally unventilated. When designed for continuous stalled operation, the winding will withstand the maximum possible current (starting current) without any dangerous temperature rise.

It is therefore not possible and not necessary to protect the unit against "overloading" by means of thermal overload relay. The winding of units designed for short-time or intermittent duty may be endangered if the agreed duty cycle period is exceeded. The control circuit must be wired in accordance with the attached circuit diagram if the winding is protected by thermostats or thermistors.

Bearing lubrication

The maintenance intervals for the rolling bearings vary in accordance with rotational speed, ambient temperature, loading etc.

With smaller and middle sized gear units, the input components/motor components are designed with enclosed ball bearings.

An input speed of 1500 rpm results in a lubrication interval of 10 000 operating hours. The lubricant change is to be carried out here when the bearings are replaced in the context of maintenance/monitoring of the rotary shaft seals. Cleaning and lubrication of the bearings is not recommended due to the risk of contamination.