



The bearingless torque motor

A world first

Low-speed direct drives for high torque make transmissions unnecessary and are taking over new areas, in wind power plants or as industrial drives. Losses and wear not only occur in the transmission, but also in the mechanical bearings. That is why the Linz Center of Mechatronics GmbH presents a high torque motor with integrated magnetic bearings.

ABOUT THE TORQUE MOTOR:



As a torque motor is a multi-pole electric direct drive, which develops a very high torque even at very low speeds (right up to stop). Thus no transmission is necessary - the drive unit is compact, the efficiency increases. And all that with all the benefits of magnetic bearings. Despite its special features, the bearingless torque motor can be manufactured using conventional production technology. The laminations with their tooth coil windings and the rotor with the surface-mounted permanent magnets are standard components in motor technology. The angle and position sensors are simply integrated into the stator, as the intelligence is in the control of the drive.

BEARINGLESS TECHNOLOGY:

If the mechanical bearings of a motor, such as ball or plain bearings, are replaced by magnetic bearings, this becomes a motor with a magnetic bearing. If in addition the motor and magnetic bearings are combined into a single component, this becomes a bearingless motor.

The integration of torque and bearing force generation results in extremely compact and mechanically simple drive units.

Technical Specifications

External rotor diameter	112 mm
Rated motor voltage	80 V
Rated speed	1000 rpm
Rated torque	5 Nm

BENEFITS:



- No lubricant
- No wear and contamination from abrasion
- Possible to hermetically encapsulate
- Operation in a vacuum, toxic or cryogenic environment
- Long life, low maintenance
- High torque right down to stop
- High dynamics, low mass in the drive train
- High efficiency (no requirement for a transmission)
- Good controllability of the entire system (torsionally stiff, no play - because no transmission)

APPLICATIONS:

Due to its excellent properties in addition to the bearingless torque motor's high torque density, it can be used where conventional gear motors can no longer be employed.

Long life, high efficiency and maintenance free operation makes it ideal for use as a slowly rotating generator in the energy production.

The high dynamics, maintenance-free operation and the possibility of the hermetic encapsulation of the rotor and stator make it the ideal choice for gearless positioning and compact industrial drives operating in difficult conditions or in hard to reach places.