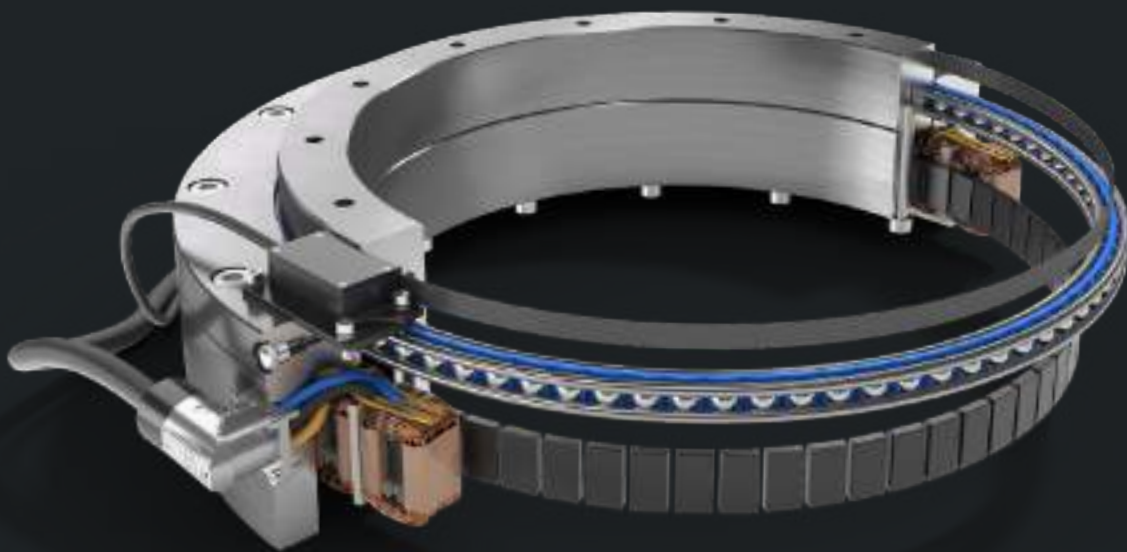


Highly dynamic and efficient:
bearing assembly with torque motor



Content

	Site
1. Introduction	3
1.1. Definition of direct drive	
1.2. Components: bearing assembly with direct drive	
2. Comparison: Conventional drive vs. direct drive	4
3. Functionality of direct drive	5
4. Design examples of bearing assemblies with direct drive	6
5. Measuring systems	7
6. Application examples	8
7. FAQ	10

1. Introduction

Movement through direct drive

1.1. Definition direct drive

In a direct drive, the motor and driven component are directly connected. There is no need for intermediate elements for power transmission such as gears, shafts or belts. Changes in motor speed have a direct effect on the driven component in rotary applications. Direct drives are suitable for rotary and linear movements. This info sheet is intended to deal with the use in rotary applications.

1.2. Components: bearing assembly with direct drive

In a bearing assembly with direct drive, all components are integrated into the bearing housing. Essentially these are:

- Ball bearing consisting of raceways, rolling elements and cage
- Rotor with magnets
- Stator with winding coils
- Enclosing housing with connector for motor cable and threaded holes for mounting the adjacent construction.

Only the control system is required externally. Further drive elements are not necessary.



2. Comparison: Conventional drives vs. direct drive



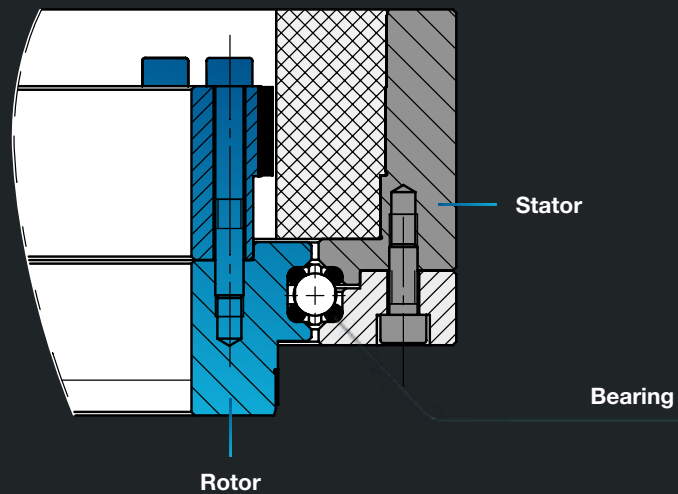
Features	Worm gear	Pinion drive	Toothed belt	Direct drive
Rotation speed	+	++	++	+++
Installation space	+	++	++	+++
Torque	+++	++	+	+++
Maintenance	+	+	+	+++
Wear / Durability	+	+	+	+++
Cleanliness	+	+	++	+++
Precision	+++	++	+	+++
Costs	+	++	+++	+

3. Functionality of direct drive (Torque-Motor)

Torque motors are integrated directly into bearing assemblies. The customer receives a completely ready-to-install system. Due to the direct control, it is not only possible to generate a rotary motion, but also to position extremely precisely or to execute defined cycle steps.

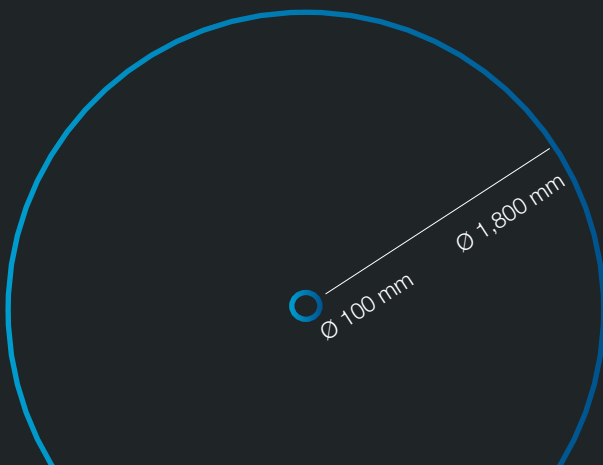
Bearing assemblies with integrated direct drives are characterized by maximum energy efficiency. The moving masses are significantly lower and power loss due to factors such as friction and backlash is minimized.

The coils of the torque motor are integrated in the stator and the magnets are mounted on the rotor.



Available diameters

Franke direct drive bearing assemblies are available in diameters from 100 mm to 1,800 mm.

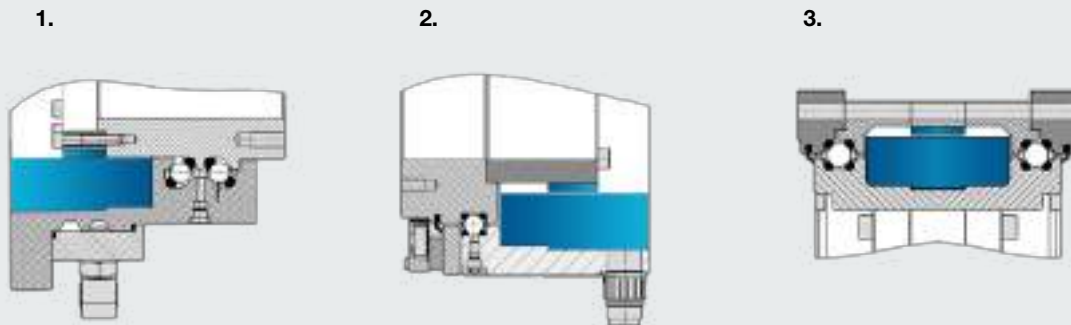


4. Design example: bearing assemblies with direct drive

When using a wire race bearing for the bearing arrangement, the basic advantages inherent in the principle of the wire race bearing system come into play:

- free design of the enclosing housing parts
- free choice of materials for the housing parts (e.g. steel, stainless steel, aluminum, plastic)

Examples of integration of bearing and drive in a common housing:



1. Franke-Torque with water cooling, KKØ 300mm
2. Franke-Torque in steel version, KKØ 150mm
3. Franke-Torque in aluminum version, KKØ 350mm



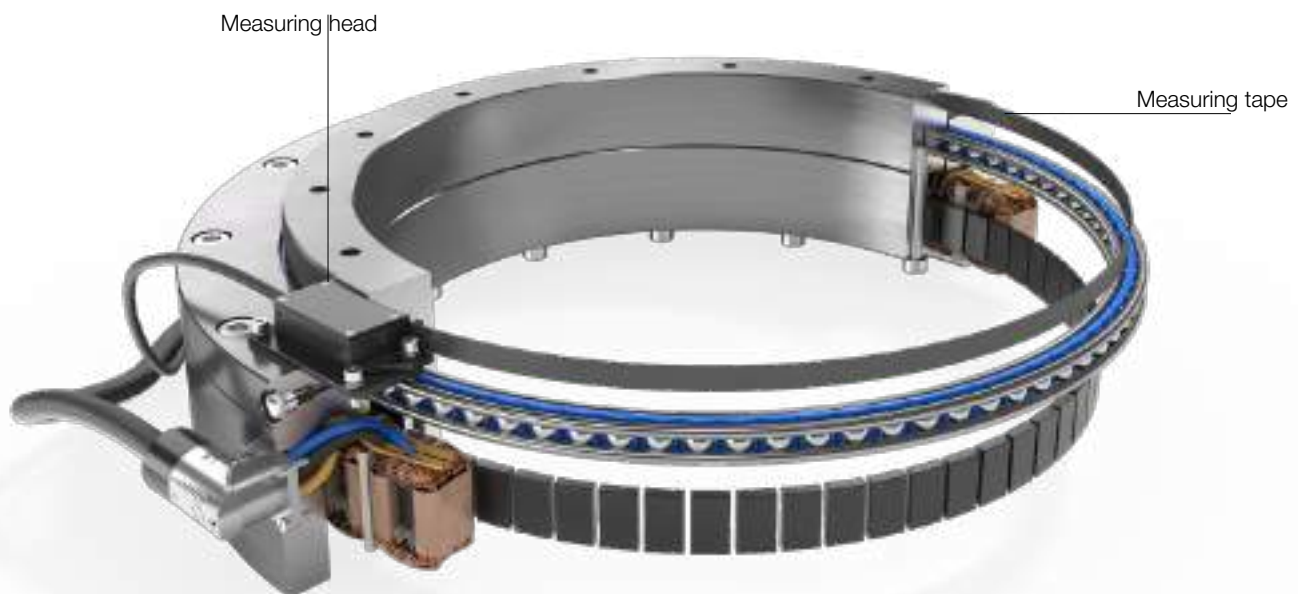
5. Measuring systems: As individual as your application

All available measuring systems usable

All measuring systems available on the market can be integrated into the bearing assembly. Very robust inductive measuring systems are used as standard. They are available as incremental or absolute systems in various accuracy classes. The following interfaces are available:

- Inkrementelle Systeme: TTL, 1Vss,
- Absolute Systeme: EnDat 22; Fanuc, BiSS, SSI – 1Vpp.

The (closed) measuring tape is attached directly to the rotor and the measuring head is screwed to the stator. It is also conceivable to attach a measuring system to the continuing construction. For larger quantities, any diameter is available.



6. Application examples: Performance for many industries

Bearing assemblies with direct drives are suitable for numerous applications in many industries. Advantages result from the high performance of the direct drives in the areas of energy efficiency, dynamics and precision.

The use of integrated wire race bearings enables further advantages such as weight savings, robustness and high center clearance to be realized.



1. Computer tomograph

Bearing assemblies with direct drive ensure high precision in the main bearing of computer tomographs..



2. Filling line

The bearing assembly with direct drive is made of stainless steel and fitted with special seals. This gives the complete system consisting of bearing and drive the best possible protection against environmental influences and cleaning agents.

Since no gears need to be lubricated, the drive is particularly clean.



3. Measurement of pipeline tubes

Due to its large center clearance, the bearing assembly with Direkt drive allows ideal placement of the measuring optics. No further elements are required to drive the bearing.



FAQ

Design / Operating conditions

1. What diameters are feasible?

Diameters from 100 to 1800mm are possible.

2. What operating temperatures are permissible?

Up to approx. 120° C.

Motorization

3. How is thermal overload prevented?

Various sensors are available for integration: PTC (PTC thermistor) / KTY (temperature sensor) / triplet switch (bimetallic switch).

4. What is the advantage of water cooling?

The nominal torque is doubled. This reduces the size.

5. How does the motor react in the event of a power failure?

Motor and bearing assembly run out slowly. Optional: Brake system for quick stop or controller with safety function.

6. How are the cables of the motor assembled?

The cables are assembled with and without connectors according to the customer's requirements.

7. What IP protection class can be achieved?

Due to the nature of the bearings, a protection class of IP41 can be achieved.

8. Are NFPA / UL standards met?

It is possible to equip the insulation system of the motor with UL listed materials.

9. What documentation is supplied?

General information, safety instructions, connection diagrams and installation and maintenance instructions.

Controller / measuring system

10. Which controllers can be used?

Any controller can be used, e.g. Elmo, BoschRexroth, Kollmorgen, Siemens, Keba...

11. Which measuring systems are suitable?


Any measuring system can be used.

12. How are the measuring systems attached?

The measuring tape is attached directly to the rotor and the measuring head to the stator. Alternatively, it is possible to attach the measuring system to the continuing construction.

13. What are the limitations of measuring systems

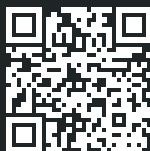
Since the measuring tape is a closed ring, only certain diameters are available here, which must be taken into account in the design. For larger quantities, any diameter is feasible - but with one-time additional costs.

A black and white photograph of a man in a dark suit and light shirt, standing in a factory. He is holding a large, circular metal bearing assembly in front of him. In the foreground, there are several large, cylindrical metal components. The background is a blurred industrial environment with various machinery and equipment.

„If you have any questions about our LTD type bearing assemblies, I will be happy to help you.“

Dipl.-Ing. (BA) Peter Niemeyer, team leader constructikon and development
Phone. +49 73661 920-172, p.niemeyer@franke-gmbh.de

Franke GmbH
Obere Bahnstraße 64
73431 Aalen
Phone +49 7361 920-0
Fax +49 7361 920-120
info@franke-gmbh.de



www.franke-gmbh.com

