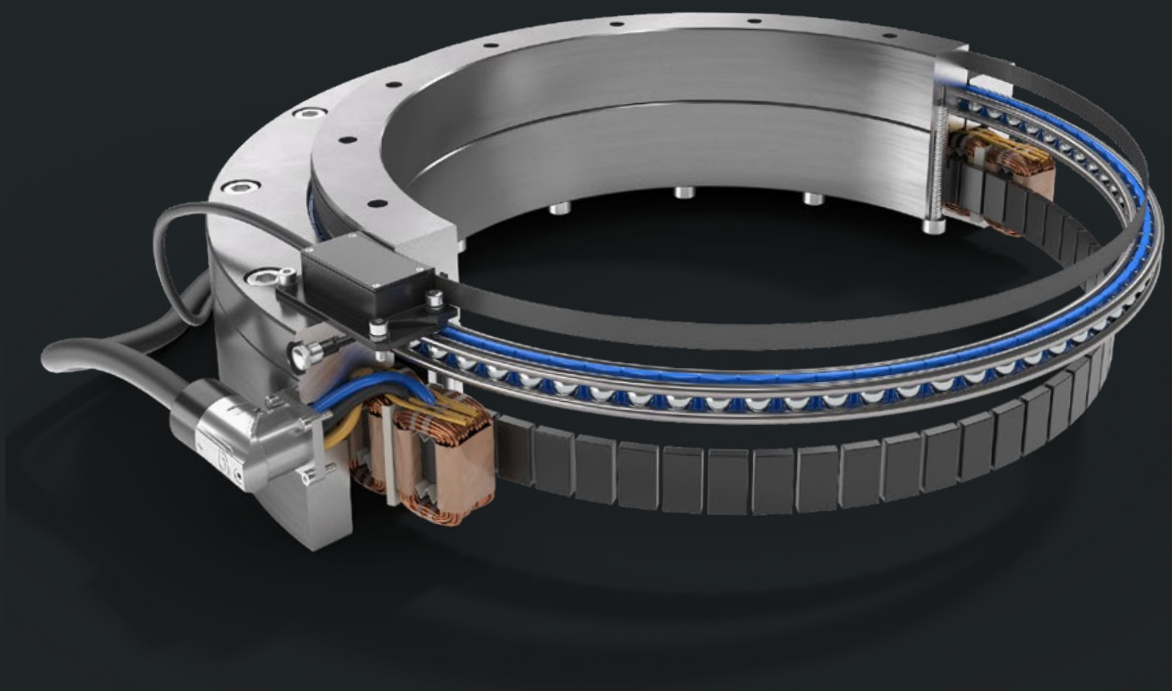
Innovation in Motion

Franke

Super compact and super individual: Franke Bearing Assemblies with Torque-Motor LTD



Franke-Torque: Lightweight Bearing Assembly with Direct Drive

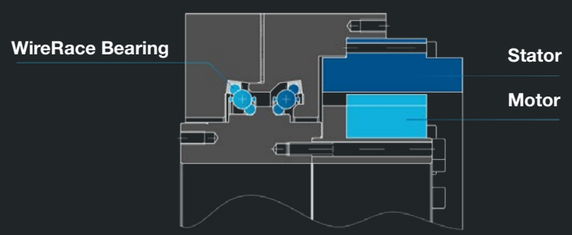
Why bearings with direct drive?

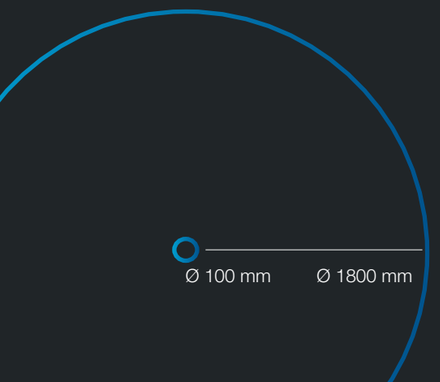
Franke wire race bearings with integrated direct drive are characterized by highest energy efficiency. The integration of the drive motor into the bearing makes it possible to dispense with components such as gears and drive pinions and thus with complex lubrication circuits. The moving masses are therefore significantly lower and the loss of performance due to factors such as friction and play is minimized.

Functionality of Franke roller bearings with direct drive

Torque motors are integrated directly into Franke bearing assemblies. The customer receives a completely ready to install system. This makes it possible not only to generate a rotational movement, but also to position or execute definable cycle steps.

The torque motor has a high torque at a defined speed range. The distance between the stator and rotor (air gap) is decisive for the magnitude of the torque. The preloaded Franke bearing assembly guarantees a constant air gap. A measuring system can be used to determine the motor position.





Available Diameters
Franke bearings with direct drive are available in diameters from 100 mm to 1,800 mm.

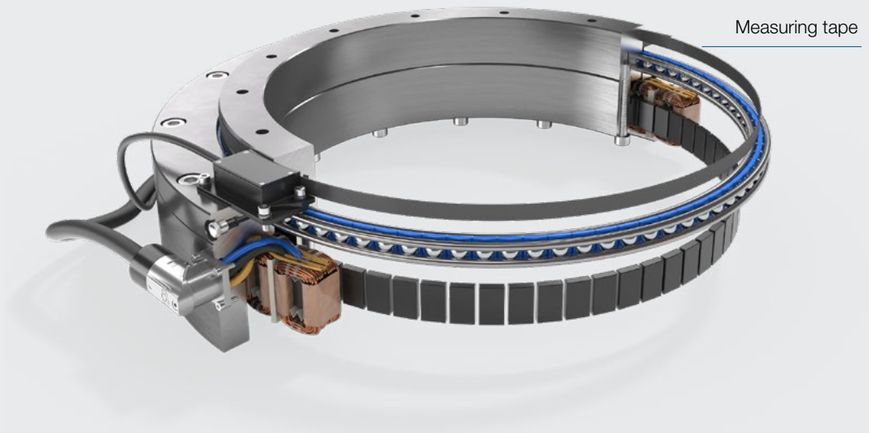
Measuring Systems: As individual as your application

All available measuring systems can be used

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:

- Incremental systems: TTL, 1Vpp,
- Absolute systems: 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 customer's further construction. Since the measuring tape is a closed ring, only certain diameters are available here, which must be taken into account during the design. For larger quantities, any diameter is available, but this may result in additional costs.



Super compakt und Super individual: Design examples

Franke bearing assemblies with integrated direct drive (torque motor) are characterized by high dynamics, maximum energy efficiency and a compact installation space combined with center-free design.

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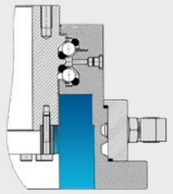

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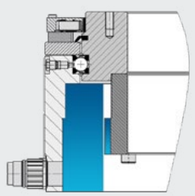

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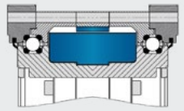


1. Franke-Torque in aluminum version. KKØ 290mm, nominal torque 55 NM, maximum torque 246 Nm.
2. Franke-Torque in steel version with water cooling. KKØ 300mm, nominal torque 163 Nm, maximum torque 328 Nm.
3. Franke-Torque in aluminum version. KKØ 360mm, nominal torque 12 Nm, maximum torque 40 Nm.

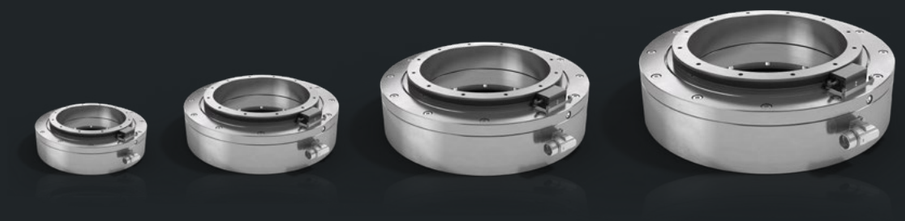
Basis-Data

- Housing steel or aluminium
- KKØ: 100 - 1800 mm
- Incremental measuring systems
- Absolute measuring systems

THe Advantages

- Compact design
- Large centre clearance
- Free choice of components
- Four standard sizes from stock
- Customised solutions

Standard programme: Steel version, available from stock



LTD 100 LTD 215 LTD 320 LTD 385

Technical Data

Material	C45N (optionally aluminium)
Operating temperature	-10 °C to +80 °C
Mounting position	Any
Lubricant	With bearing grease via grease nipple
Options	Absolute measuring system, axial cable outlet, control units incl. cables, water-cooling

Power comparison			**LTD-0100**	**LTD-0215**	**LTD-0320**	**LTD-0385**
Nominal Data (free air convection)						
Nominal Torque	TNomAC	Nm	4,5	26,4	77	118
Nominal Current	INomAC	Arms	1,8	3,1	4,3	4,3
Nominal Speed	nNomAC	rpm	2140	640	299	193
Nominal Power	PNomAC	W	1005	1770	2409	2386
Winding Losses1	PVDAC	W	54	131	230	309
Total Losses2	PDAC	W	96	179	295	357
Holding Torque	THAC	Nm	3,2	18,7	54	83
Holding Current	IHAC	Arms	1,2	2,2	3	3
Peak Torque	TPeak	Nm	16	105	329	522
Peak Current	IPeak	Arms	7	12,8	21,6	21,7
Speed at Peak Torque	nPeak	rpm	1130	320	126	74
Peak Power	PPeak	W	1897	3526	4343	4049
Winding Losses1	PPeak	W	863	2236	5886	7876
Total Losses2	PDPeak	W	877	2253	5904	7889

FAQ

Type / conditions of use

1. Which diameters can be realized with direct drives?
Diameters from 100 to 2000mm are possible.

2. Up to which temperatures can LD Drive bearings be used?
Up to 120° C.

Motorization

3. How are the motors protected against thermal overload?
There are several sensors available that can be integrated into the motor:
PTC thermistor (standard) / KTY / Twilling switch (bimetal switch)

4. What advantage does a motor with water cooling offer?
The nominal torque is doubled. This reduces the size of the system.

5. How does the motor react in the event of a power failure?
Motor and bearing are slowing down. Optional: braking system for fast stop or controller with safety function.

6. How are the cables of the motor assembled?
The cables are assembled according to customer requirements with or without plug.

7. Which IP protection class do the direct drives achieve?
Due to the nature of the wire race bearings, a protection class of IP41 can be achieved.

8. Are NFPA or UL standards met for the US market?
It is possible to equip the motor insulation system with UL listed materials.

9. Which documentation is included with the motors?
General notes, safety instructions, connection diagrams and installation/maintenance manual.

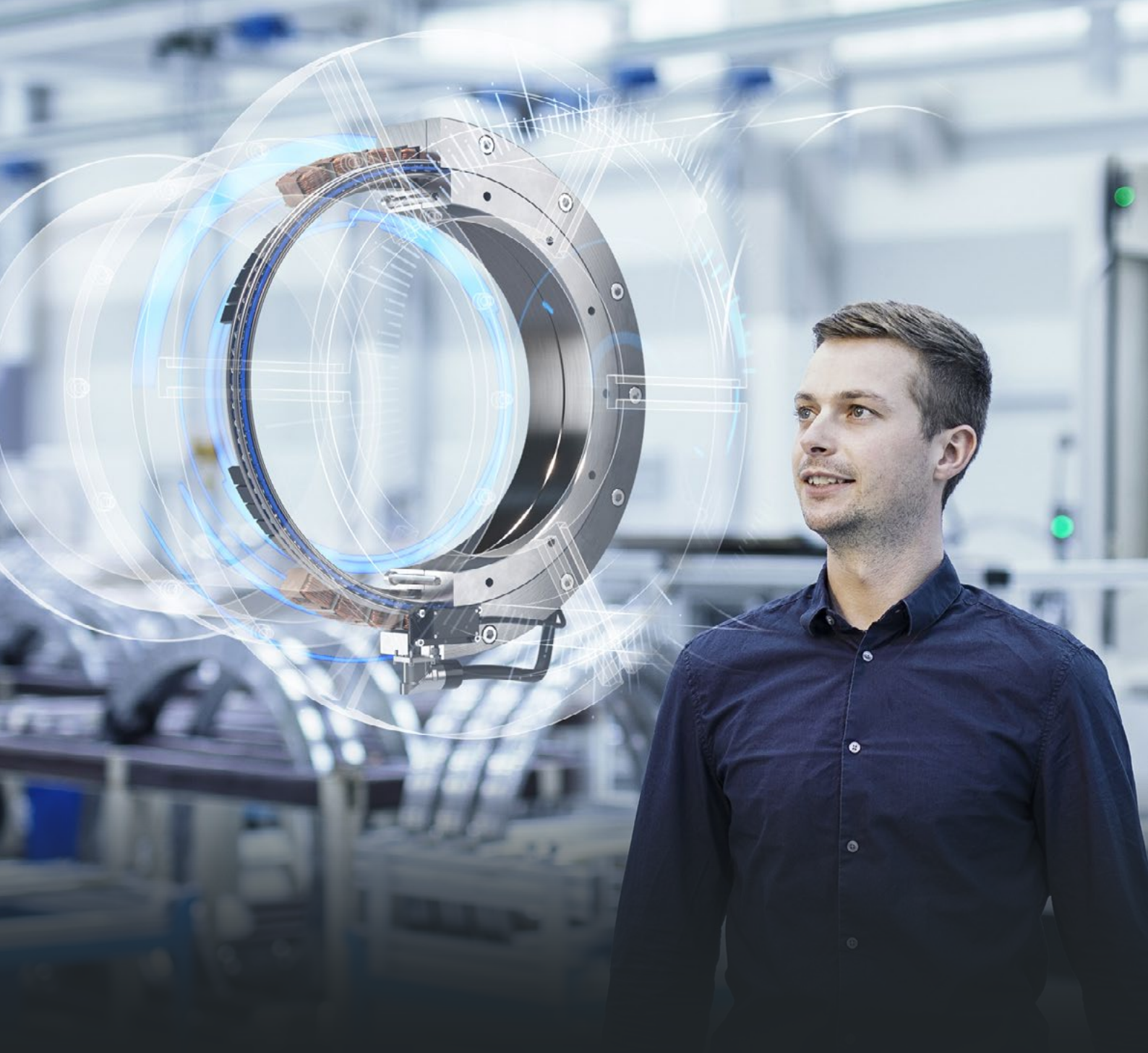
Controller / measuring system

10. Which controllers can be used with torque motors?
Each controller can be used, e.g. Elmo, BoschRexroth, Kollmorgen, Siemens, ...

11. Which measuring systems can be used?
Every measuring system can be used.

12. How are the measuring systems fixed?
The measuring tape is mounted directly on the rotor and the measuring head on the stator. Alternatively, it is possible to attach the measuring system to the mating structure.

13. What restrictions are there with the 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.



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