



MAGNETIC 2000 SERIES

BEARINGLESS ENCODERS FOR LARGE SHAFTS



Low-maintenance for large shafts

Certain motors benefit from having the speed feedback sensor mounted directly on the main shaft. A bearingless sensor, mounted between the other parts in the machinery, takes up less space and requires less maintenance. The Leine & Linde 2000 series is designed to meet this demand, also for shaft dimensions around a meter, or larger.

Wider tolerance for runout

The 2000 series is suitable for heavy duty applications, where motors are exposed to powerful shocks and vibrations, subjected to heavy mechanical forces. The 2000 series accepts an air gap of up to 6 mm between the rotating ring and the fixed scanning unit, which allows for a certain runout of the motor. This is why the Leine & Linde ring offers significantly better performance than most ring products found on the market.

Commissioning made simple

Easy access for mounting and service saves commissioning time. The Leine & Linde ring can be mounted from two sides of the shaft, as it is segmented into pieces. Fix the ring to the shaft by flange mounting or by the Leine & Linde ClampFit solution. With the ClampFit solution, the ring automatically tightens around the mating shaft as the ring segments are screwed together. This enables fixing to a standard cylindrical shaft without any flange expansion prepared and makes retrofitting easy.

Various interfaces

The scanning head unit uses several market standard interfaces for incremental signals. The interface High Current HTL has been specially designed for long distance transmission. This is extra useful in the process industry, where very long cables may be needed to reach out to each encoder in the factory.

Engineered for endurance

Electronics

6 channel square wave signal for differential transmission and a reference pulse for relative position.

Available with different standard incremental interfaces.

Interface	Supply voltage
HCHTL	9-30 Vdc
HTL	9-30 Vdc
RS422	9-30 Vdc
TTL	5 Vdc

Resolution

Resolution can be specified according to the requirements of the application. Resolution is available from 1 to 16383 ppr.

Wide air gap

Between ring and scanning head a gap is allowed in order to permit thermal expansion or runout of the application's mating shaft. Radial tolerance is 0.1-3 mm and axially a ± 4 mm offset is allowed.

Extended scanning

Greater runout tolerance, up to 6 mm, is available for shaft sizes over 400 mm.

Extra scanning heads

Available for achieving redundancy and increased connectivity with multiple sources, drives, or controllers.

Mechanics

Bearingless

Designed for wear-free operation.



Segmented into pieces

The ring is segmented for easy access and commissioning.

ClampFit design

Simplifies the manner of fixing the ring to any standard cylindrical shaft. When the ring segments are screwed together, the tethers will automatically tighten the ring to the mating shaft with only radial force.



Flange mount design

Axial screw holes in the ring enable fixing to a flange expansion on the application's mating shaft.

Light-weight aluminium

Facilitates handling and transport. Anodized surface for use in salt water environments.

Inner and outer diameter

Flexible to customisations, as the scanning technology is made to compensate for almost any circumference.

Tethers

Eccentricity or thermal expansion of the mating shaft is compensated for by tethers. They ensure that the outer surface of the ring stays within optimal scanning range from the scanning head unit to give the best signal quality.

Magnetical tape

With alternating north and south poles for pulse generation.

Protective stainless steel surface

Ensures the magnetic tape is not damaged by exposure to mechanical hits.

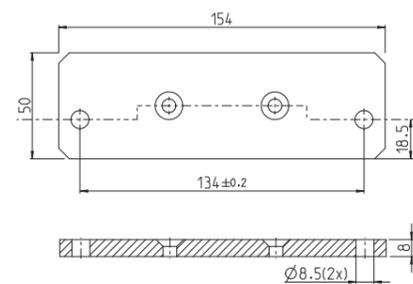
If you are interested to hear about more possibilities with our 2000 series, please contact Leine & Linde. Leine & Linde is an active partner to our customers, willing to develop or customise solutions based on your specific needs.

Mechanics

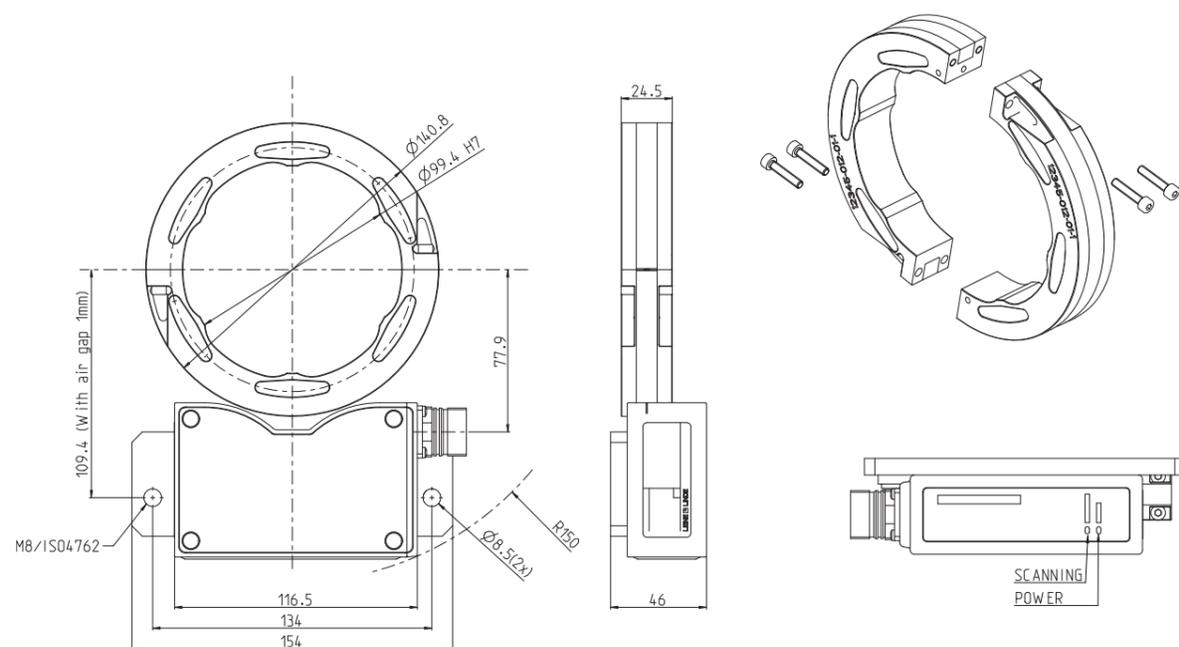
This spread offers an overview of the different mechanical variants available in the 2000 series. Other variants can be created according to the code key on page 9.

Mounting bracket

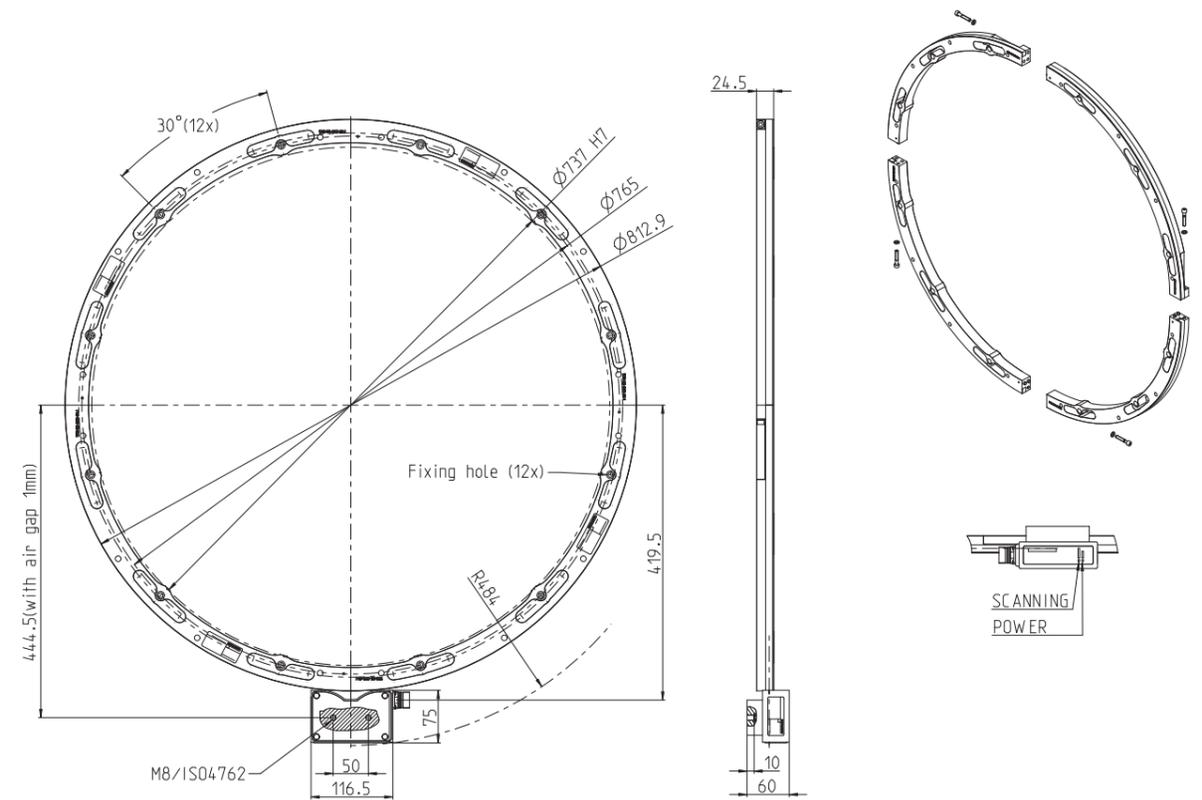
Screw mounting



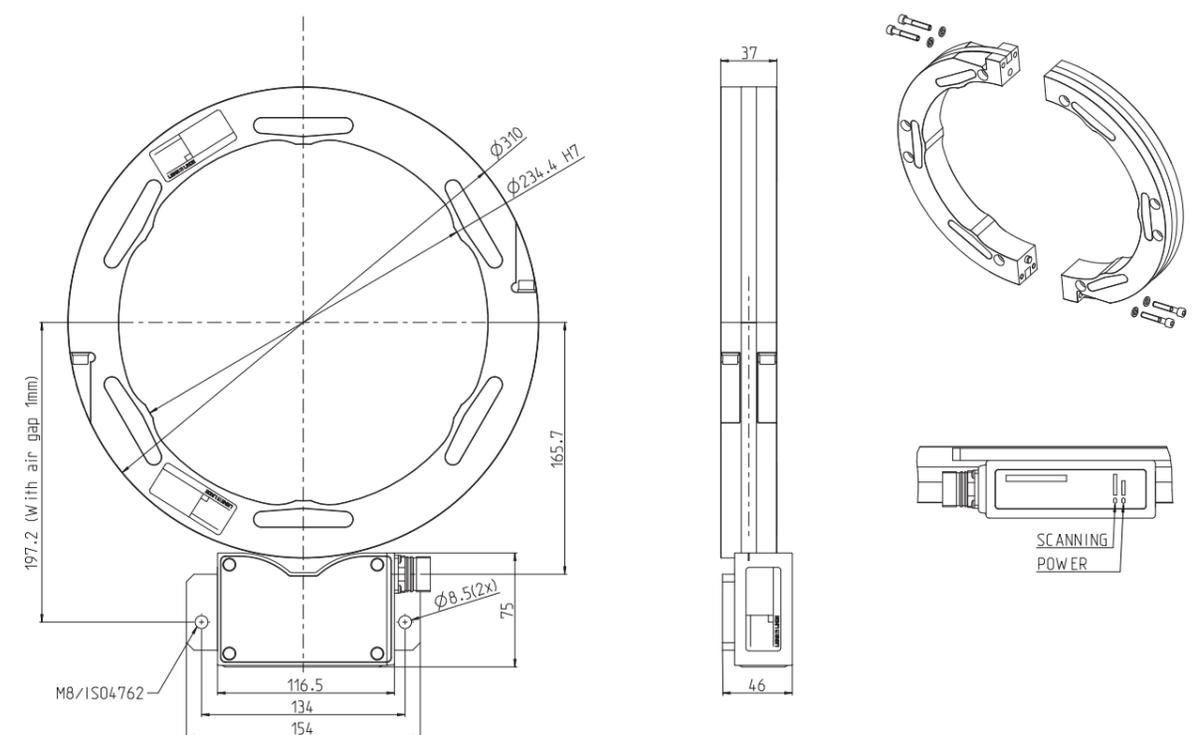
Model MRI 2302 ClampFit 100/140.8 mm with CCW 12 pin M23



Model MRI 2206 Flange mount 737/812.9 mm with CCW 12 pin M23



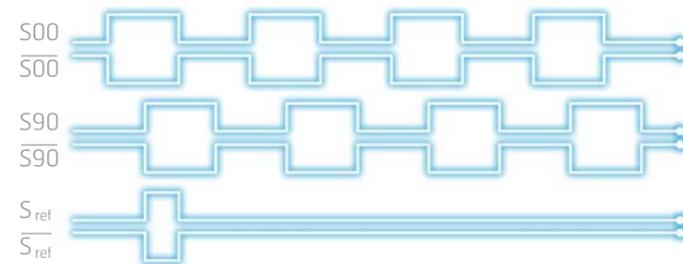
Model MRI 2302 ClampFit 235/310 mm with CCW 12 pin M23



Electronics

Code key

Square wave signals



Interface	TTL	RS422	HTL	HCHTL
Supply	5 Vdc	9-30 Vdc	9-30 Vdc	9-30 Vdc
Output signal	5 Vdc	5 Vdc	9-30 Vdc	9-30 Vdc
Suitable for	Low frequencies over short cables	High frequencies over long cables	High frequencies over medium-length cables	Medium frequencies over long cables
Max frequency	100 kHz	100 kHz	100 kHz	100 kHz
Max cable length	10 m at 100 kHz	1000 m at 100 kHz	100 m at 100 kHz	350 m at 100 kHz

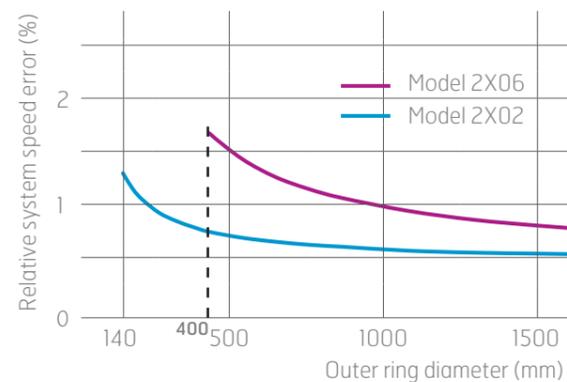
Scanning distance



Model 2X06: Air gap 0,1-6 mm (nominal 3 mm)
 Model 2X02: Air gap 0,1-3 mm (nominal 1 mm)

System accuracy

Example system accuracy for a frequency converter with 3 ms time base. Difference between model 2X02 and 2X06 calculated at fix values for rotational speed (1500 rpm) and resolution (2048 ppr).



MRI 2X0X



Assemblage

- 2 = Flange mount
- 3 = ClampFit

Embodiment

- 0 = Anodized aluminium

Scanning

- 2 = Increased accuracy
 - 6 = Extended scanning distance*
- * Min outer dimension 400 mm

Connection

- 1 = Radial 12 pin M23 connector CCW
- 2 = Cable (Pre-mounted, specify length)
- 3 = Cable 1.5 m

Electronics

- 1 = TTL (supply 5 Vdc, output 5 Vdc)
- 5 = HCHTL (supply 9-30 Vdc, output 9-30 Vdc)
- 6 = HTL (supply 9-30 Vdc, output 9-30 Vdc)
- 7 = RS422 (supply 9-30 Vdc, output 5 Vdc)

Mounting plate

- 0 = No bracket
- 1 = Screw mounting

Resolution

1-16383 ppr*

* Max 100 kHz pulse frequency

Dimension

Customised (min outer dimension 140 mm)

Performance

Technical data (based on MRI 2302 with HCHTL signals)

Encoder configuration

Type	MRI
Model	2302
Power supply	9-30 Vdc
Output signal	HCHTL
Connection type	M23 connector 12-pin
Pin layout	Counter-clockwise pinning

Mechanical data

Operating temperature	-40 °C...+80 °C
Ingress protection class [IEC 60529]	IP67
Vibration [IEC 60068-2-6]	≤ 200 m/s ²
Shock [IEC 60068227]	≤ 1500 m/s ²
Scanning axial tolerance	± 4 mm
Scanning radial tolerance	0.1-3 mm (Nominal 1 mm)
Material	Aluminium anodized
Fastening type	ClampFit
Number of segments	2-16

Electrical data

Polarity protected	Yes
Short circuit protected	Yes
Current consumption	60 mA at 24 Vdc (max. 80 mA)
Incremental output load (max)	± 40 mA
Output frequency max	100 kHz
Cable length max	350 m at 100 kHz

For other configurations please contact Leine & Linde.

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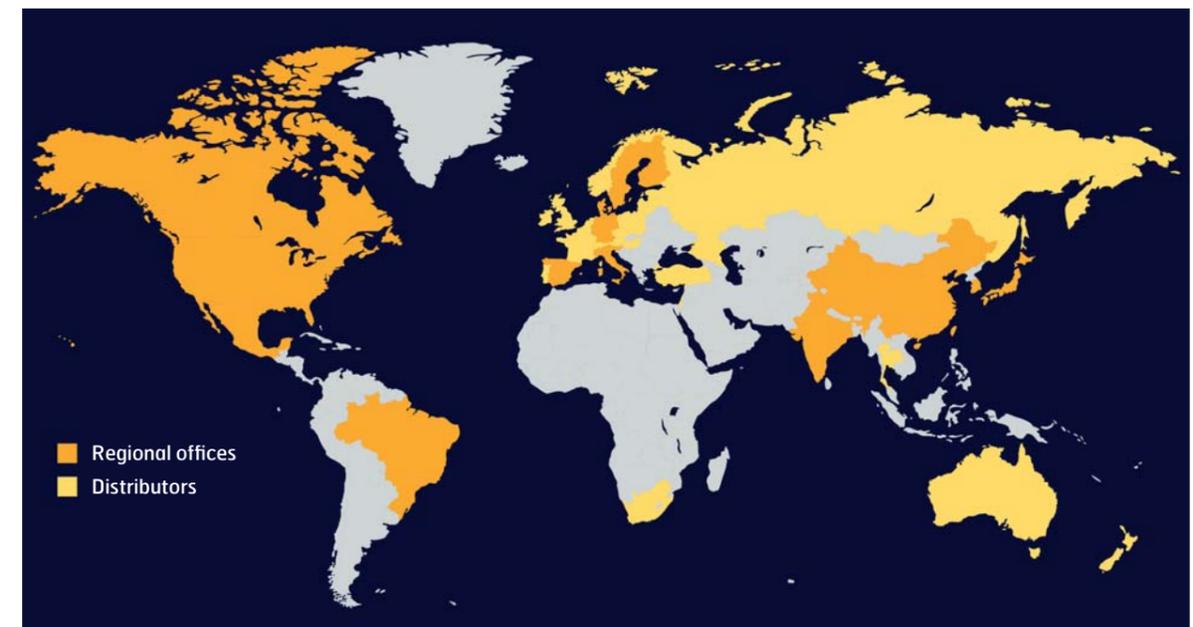
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Leine & Linde's worldwide presence. Read more at www.leinelinde.com





The best encoders are those you never have to think about. Those that simply do their job – year after year. Leine & Linde develops and manufactures customised encoder solutions for demanding environments, advanced measuring systems for accurate feedback of speed and position.

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