

2000 SERIES

Bearing-less encoders for large shafts



Some motors require a speed feedback sensor mounted on the main shaft between other parts in the machinery. Here the shaft dimensions may be large – sometimes around a meter – which means that a standard optical encoder is not suitable. Therefore Leine & Linde has developed a new series of bearing-less encoder rings, the 2000 series. It has several features specially designed to meet the demands found in heavy industries.

One feature that makes the 2000 series extra suitable for heavy duty applications is the tolerated air gap between the rotating ring and the fix scanning unit. In heavy duty applications the motor often handles heavy mechanics and may be exposed to powerful shocks and vibrations, something that will result in a certain runout of the shaft. With an accepted air gap of up to 6 mm the 2000 series offers several times better performance than most ring products found on the market.

The Leine & Linde ring is segmented into pieces, something that facilitates commissioning and service. As the ring is often mounted on a shaft between other parts in the machinery it may be difficult to access it, both when first mounting it and when performing service. With a

segmented ring the pieces may be mounted from two sides of the shaft and screwed together.

Fixing the ring to the shaft can be made through flange mounting with axial screws or by Leine & Linde's ClampFit solution for simplified commissioning. With ClampFit the ring segments are screwed together in a way that automatically tightens the ring around the mating shaft. This saves commissioning time and enables fixing to a standard cylindrical shaft without any flange expansion prepared.

The speed pickup unit is available with several market standard interfaces for incremental signals. The interfaces High Current HTL and Optolink have been specially designed for long distance transmission, something that makes them extra suitable for installations in the process industry where very long cables may be needed in order to reach out to each encoder in the factory.

If you are interested to hear about more possibilities with our 2000 series, please contact us. We are an active partner to our customers, willing to develop or customize solutions based on your specific needs.

Ring segmented into pieces makes commissioning and service more easy. It also facilitates transport and storage.

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.

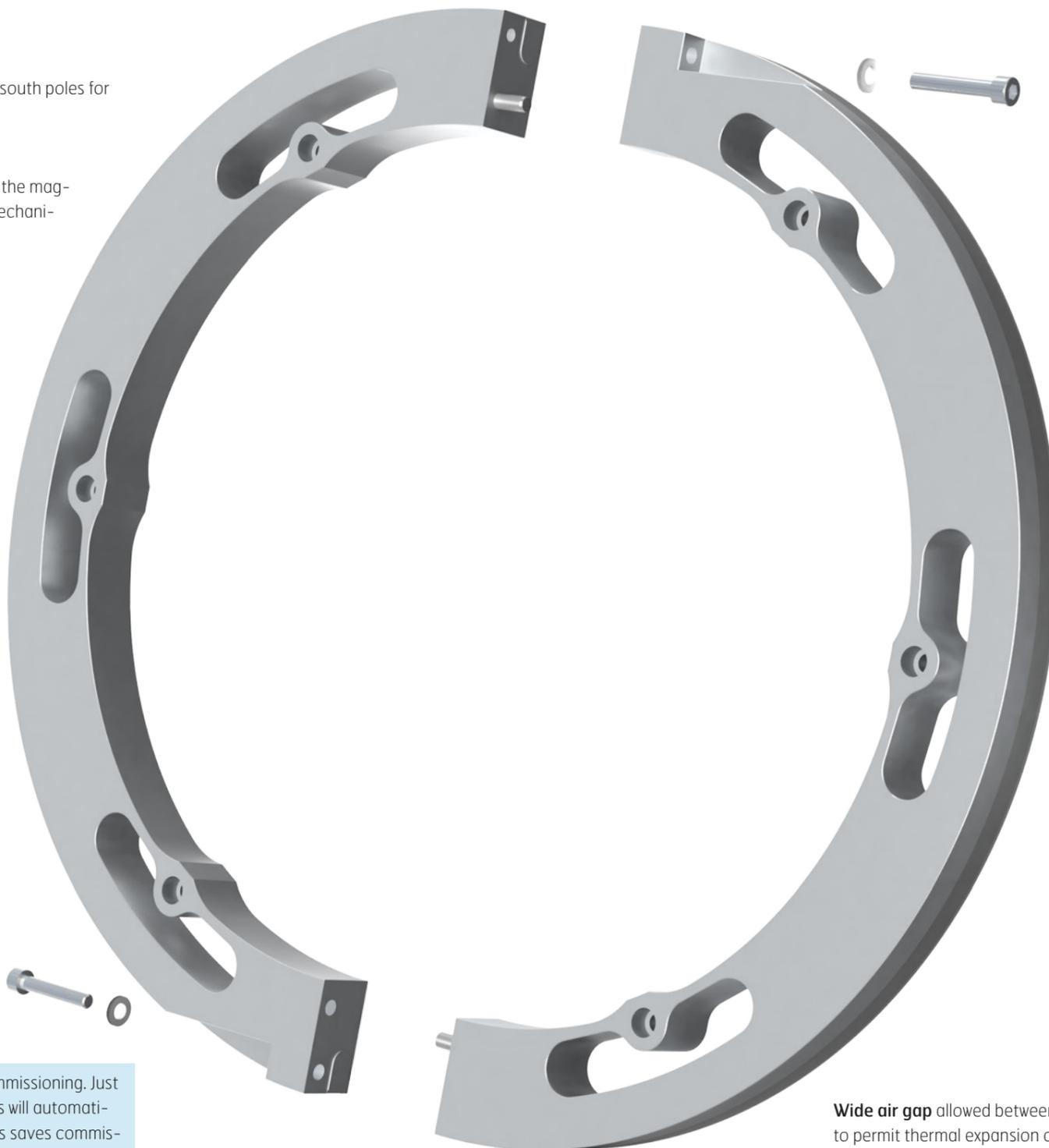
Tethers compensate for excentricity or thermal expansion of the mating shaft and ensure that the outer surface of the ring stays on the optimal scanning distance from the pickup unit to give the best signal quality.

Inner and outer diameter flexible to customizations, as the scanning technology is made to compensate for almost any circumference.

Resolution free of choice.

Flange mount design with axial screw holes in the ring for fixing to a flange expansion on the application's mating shaft.

Optional: ClampFit design for simplified commissioning. Just screw the segments together and the tethers will automatically tighten the ring to the mating shaft. This saves commissioning time and enables fixing to a standard cylindrical shaft without any flange expansion prepared.



Light-weight aluminium facilitates handling and transport. Anodized surface for use in salt water environments.

Optional: Stainless steel available upon request.

Bearing-less design for wear-free operation

Connector M23
Cable with free length



Incremental signals with market standard interfaces like HTL, TTL and RS422.

Optional: For long distance transmission two interfaces have been specially designed, namely High Current HTL and Optolink. They are extra suitable in installations where very long cables are needed to reach out to each encoder.

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

Optional: Programmable reference pulse for zeroreset of start position after installation is made.

Dual scanning sensors and intelligent logic in order to compensate for splits in the segmented ring.

The power supply is indicated by an LED.

The signal quality based on the current mechanical installation is indicated by an LED.

Optional: Overvoltage protection

Adapter plate with possible customization to fit to the application's mechanics.

Wide air gap allowed between ring and pickup unit 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.

Optional: Extended scanning distance up to 6 mm air gap.

Models



Mechanical

- 2 = Flange mount (fixing with axial screws)
- 3 = ClampFit (friction fitting to shaft)

Electrical

- 2 = Increased accuracy
- 6 = Extended scanning distance

Options

- Shaft diameter: Customized
- Outer ring diameter: Customized (min 140 mm)
- Resolution: 1-16383 ppr (max 100 kHz pulse frequency)
- Electronics: HC-HTL, RS422, Optolink, TTL
- Connection: M23 (12 pin CCW), cable (pre-mounted, free length)

Technical data

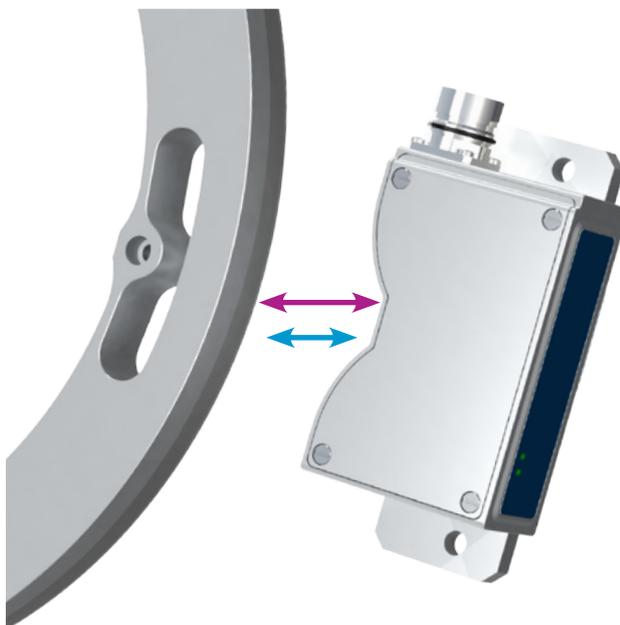
Mechanical

Operating temperature	-40 °C..+80 °C
Vibration [IEC 60068-2-6]	200 m/s ²
Shock [IEC 60068-2-27]	1500 m/s ²
Ingress protection class	IP67
Material (ring and pickup)	Anodized aluminium
Weight (pickup)	600 g
Scanning, axial tolerance	±4 mm

Electrical based on HC-HTL interface

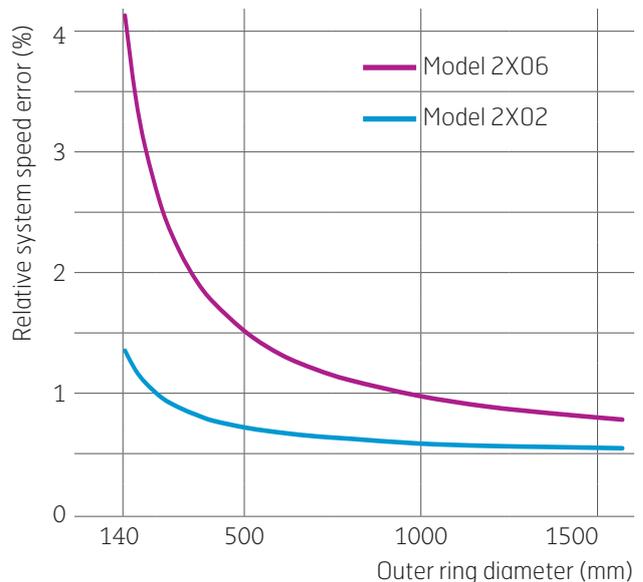
Short circuit protected	Yes
Polarity protected	Yes
Current consumption	60 mA at 24 Vdc (max 80 mA)
Max output load	±40 mA
Max output frequency	100 kHz
Max cable length	350 m at 100 kHz

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).