

LEINE  LINDE



# COMPACT 700 SERIES

ENCODERS FOR DRIVES





# Robustness in tight spaces

The 700 series is designed to fit in tight spaces without compromising on robustness. With its short build length, it is perfect for installations where space is limited.

## Compact and robust

The 700 series has large hollow shafts up to 30 mm, which means that it can often be mounted directly on the motor's shaft without an intermediate adapter for shaft reduction. This reduces the total build length and, at the same time, facilitates assembly. Like all Leine Linde products, the sensor is designed for tough challenges. Mechanically, it has a dual set of heavy-duty bearings and a well-encapsulated enclosure. Electronically, it is built for reliability in harsh environments where it is exposed to vibration and electrical interference.

## Modularity

Our innovative products and solutions can always be tailored for your specific requirements. We have a wide range of electrical interfaces to choose from, where signals can consist of square waves, sine waves, or even be optical with the help of a gateway for OptoLink transmission. On the mechanical side, there are a multitude of different shaft variants that cover the market's standards for both inch- and millimetre-based dimensions.

## DNV's Marine Type Approval

The 700 series is tested and complies with DNV class rules for ships, offshore units, high-speed vessels, and light craft. Thanks to its increased resistance to salt air, salt water, high vibrations, and EMC (Electro-magnetic Compatibility), the 700 series is suitable for use in marine equipment, such as engines in ships.



# Certified for marine applications

DNV (Det Norske Veritas) is the world's leading classification society and a recognised advisor for the maritime industry. DNV has tested Leine Linde's 700 series\* and approved their use for ships, offshore units, high-speed vessels, and light craft. For example, the encoders are suitable for use in machinery spaces, control rooms, pump rooms, holds, and more.

## Simplified documentation process

The DNV certificate guarantees the reliability and quality of the product, which means you do not need to do any additional testing or evaluation. This simplifies the validation and documentation process from the motor for motor manufacturers to the commissioning for ship manufacturers and operators.

## What is DNV Marine Type Approval?

The DNV Marine Type Approval is a well-known accreditation for the maritime business, defining standards for ships and offshore units. The certification ensures that the components comply with several standards, also known as class rules, that state requirements within quality and environmental performance.

Among the certification classes are temperature, vibration, humidity, IP protection, and EMC (Electromagnetic Compatibility). The approval process includes a variety of tests within the classes, for example salt spray tests.

## Location classes and status for the 700 series:

Temperature: D

Humidity: B

Vibration: B/C

EMC: A

Enclosure C

\*Contact your local Leine Linde office for details on specific configurations with Marine type approval.





# Modularity

## Resolution

Incremental pulses per revolution:

- |           |            |            |             |
|-----------|------------|------------|-------------|
| • 10 ppr  | • 400 ppr  | • 1024 ppr | • 3072 ppr  |
| • 50 ppr  | • 500 ppr  | • 1200 ppr | • 4000 ppr  |
| • 100 ppr | • 512 ppr  | • 1250 ppr | • 4096 ppr  |
| • 150 ppr | • 600 ppr  | • 1800 ppr | • 4800 ppr  |
| • 200 ppr | • 720 ppr  | • 2000 ppr | • 5000 ppr  |
| • 256 ppr | • 800 ppr  | • 2048 ppr | • 6350 ppr  |
| • 300 ppr | • 900 ppr  | • 2400 ppr | • 8192 ppr  |
| • 360 ppr | • 1000 ppr | • 2500 ppr | • 10000 ppr |

## Flange

- Torque bracket (120°)
- Tether arm (with insulation)

## Connection

- M23 connector 12 pin (CCW)
- MS connector 10 pin
- MS connector 7 pin
- Cable (free length)

## Shaft

Through-going hollow shafts with insulation:

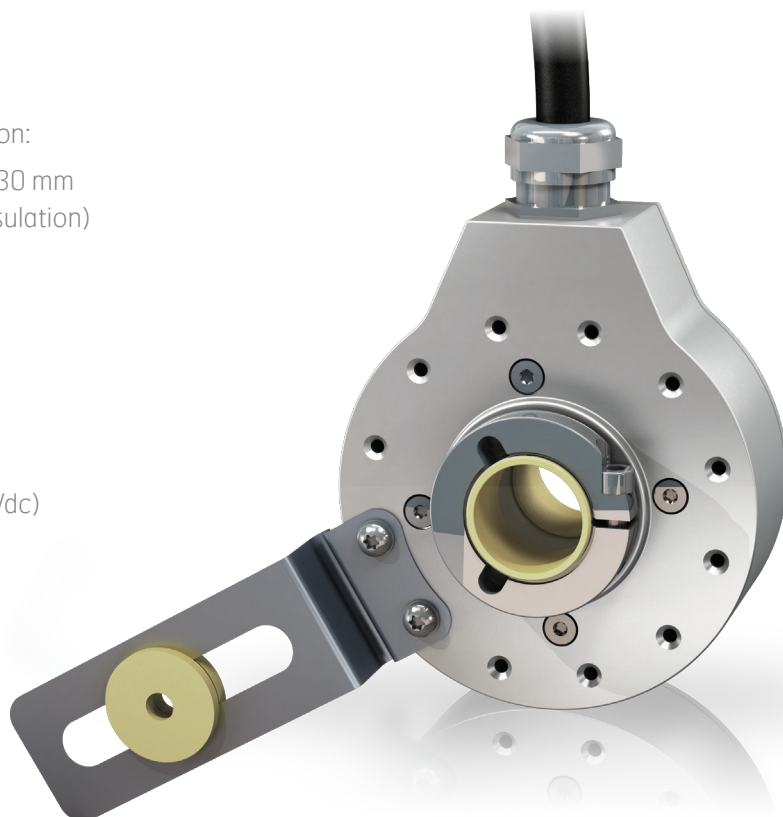
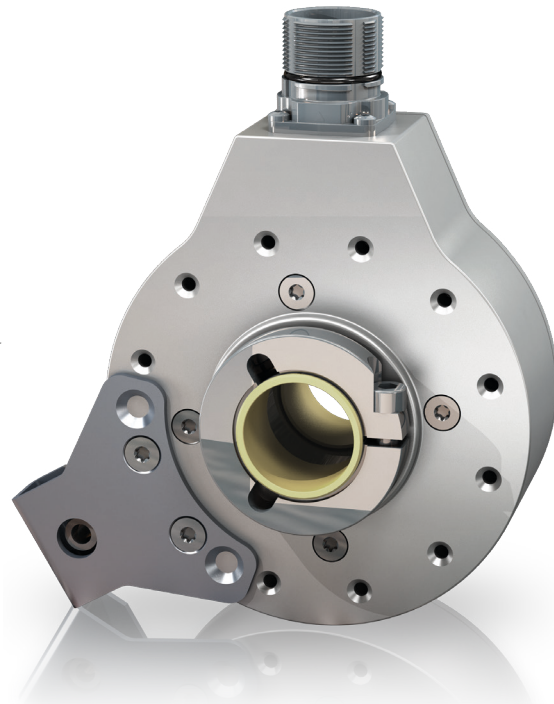
- |          |  |
|----------|--|
| • Ø25 mm | • Optional Ø30 mm (without insulation) |
| • Ø20 mm |  |
| • Ø16 mm | • Ø1 inch                              |
| • Ø14 mm | • Ø5/8 inch                            |
| • Ø12 mm | • Ø3/4 inch                            |

## Electronics

Output interfaces (supply voltage):

- |                    |                    |
|--------------------|--------------------|
| • HTL (5-30 Vdc)   | • RS422 (9-30 Vdc) |
| • HCHTL (9-30 Vdc) | • 1 Vpp (5 Vdc)    |
| • TTL (5 Vdc)      |                    |

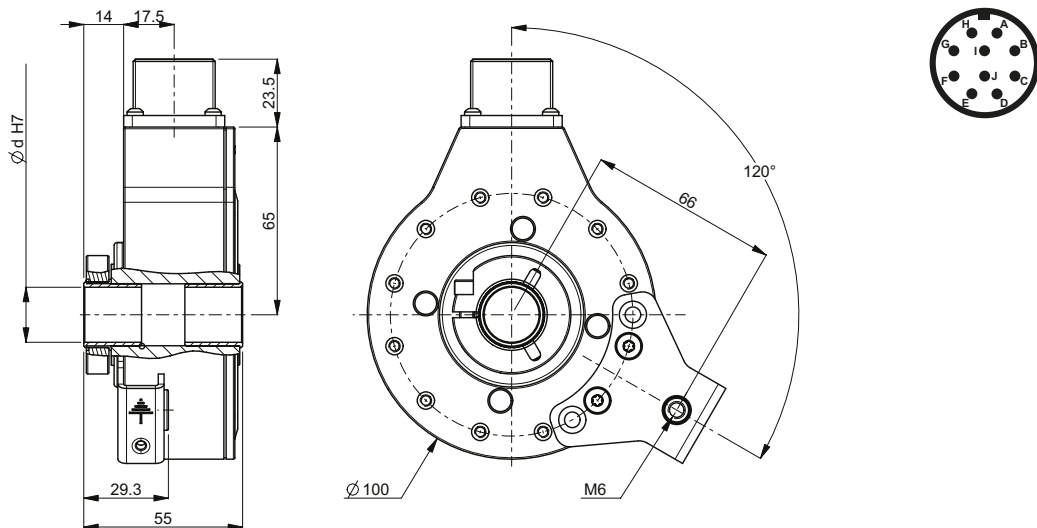
Both enclosure with anodized aluminium and stainless steel (grade A2) can be ordered with marine approval.



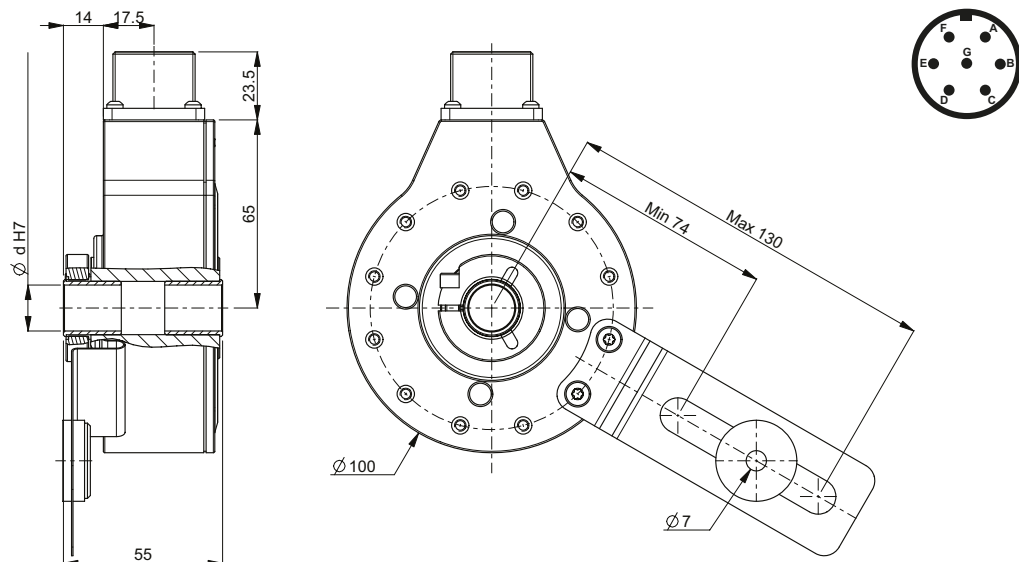
# Mechanics

This page offers an overview of the different mechanical variants available in the 700 series. Other variants can be created according to the code key on page 9.

## Model CHI 703 with torque bracket and 10 pin MS connector

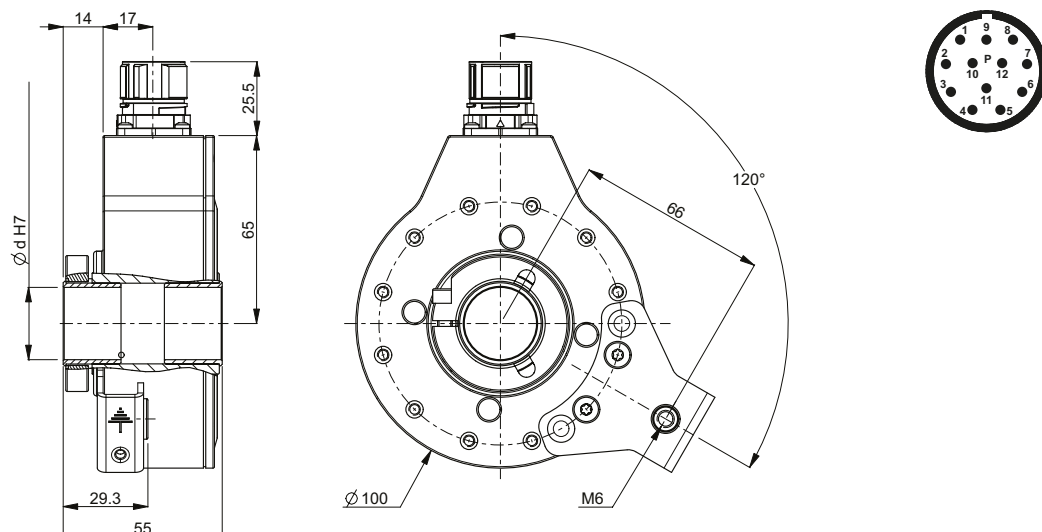


## Model CHI 703 with tether arm and 7 pin MS connector

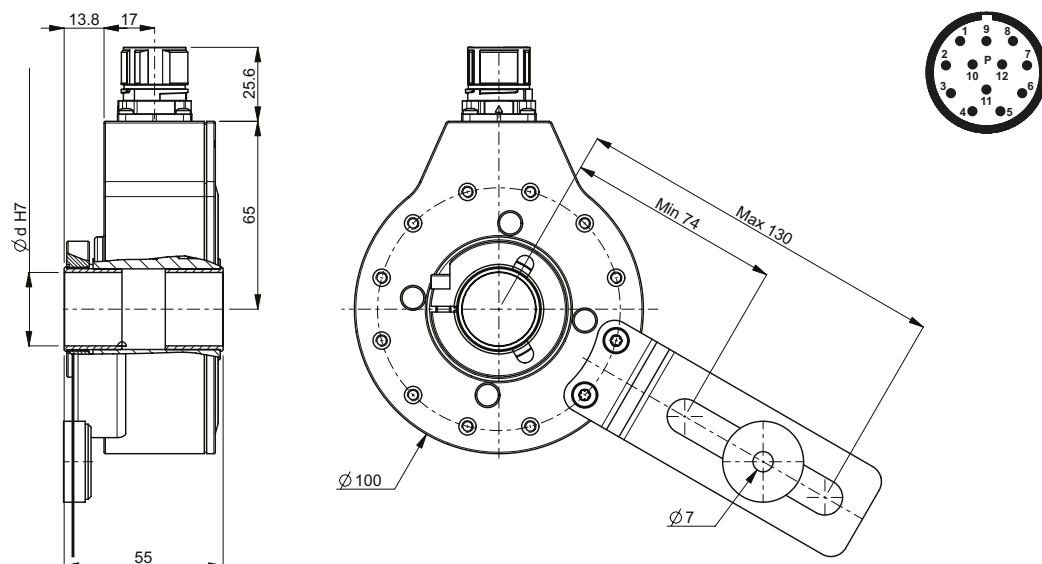




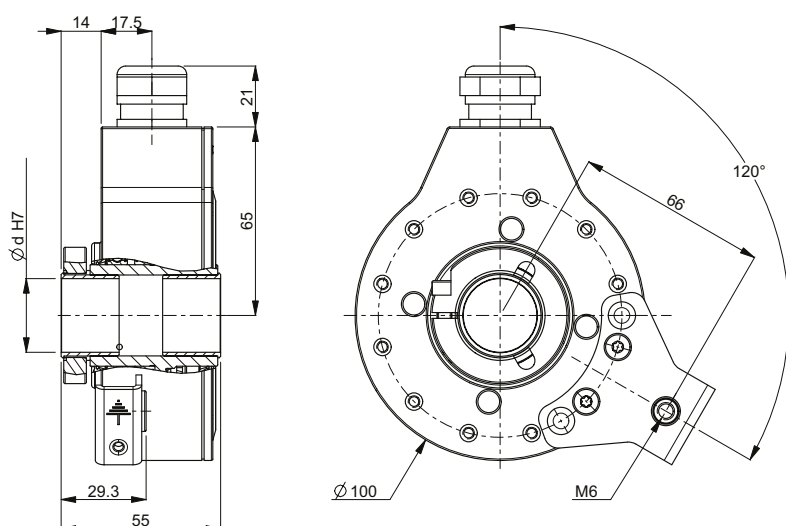
## Model CHI 703/733 with torque bracket and 12 pin M23 connector



## Model CHI 703/733 with tether arm and 12 pin M23 connector

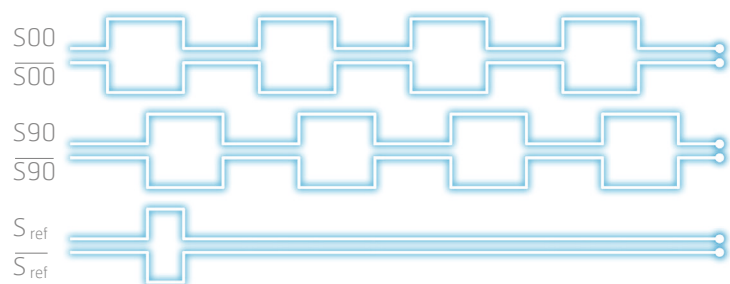


## Model CHI 703/733 with torque bracket and cable



# Electronics

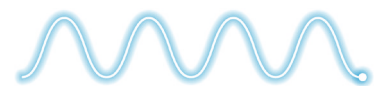
## Square wave signals



Interface	TTL	RS422	HTL	HCHTL
Supply	5 Vdc	9-30 Vdc	5-30 Vdc	9-30 Vdc
Output signal	5 Vdc	5 Vdc	5-30 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	200 kHz	200 kHz	200 kHz	200 kHz
Max cable length	50 m at 50 kHz	1000 m (TIA/EIA-422-B)	100 m at 100 kHz	350 m at 100 kHz

## Sine wave signals

Sine waves are an alternative form of output signal. The analogue signal produces a unique amplitude for each position on the wave, allowing interpolation and very high resolutions. The interface 1 Vpp is often used in safety-critical applications where detection are required of extremely small movements.





# Code key

## CHI 703

C H I 7 3 - - - - - - - - - -

### Model

703 = Anodized aluminium  
733 = Stainless steel (A2)

### Shaft

12 = Ø12 mm through-going hollow shaft  
14 = Ø14 mm through-going hollow shaft  
15 = Ø15 mm through-going hollow shaft  
16 = Ø16 mm through-going hollow shaft  
20 = Ø20 mm through-going hollow shaft  
25 = Ø25 mm through-going hollow shaft  
01 = Ø1 inch through-going hollow shaft  
58 = Ø5/8 inch through-going hollow shaft  
34 = Ø3/4 inch through-going hollow shaft

### Flange

0 = Without torque bracket  
2 = Torque bracket 120°  
9 = Tether arm with insulation

### Electronics

1 = TTL (supply 5 Vdc, output 5 Vdc)  
5 = HC-HTL (supply 9-30 Vdc, output 9-30 Vdc)  
6 = HTL (supply 5-30 Vdc, output 5-30 Vdc)  
7 = RS422 (supply 9-30 Vdc, output 5 Vdc)  
8 = Sinusoidal 1 Vpp (supply 9-30 Vdc, output 1 Vpp)  
9 = Sinusoidal 1 Vpp (supply 5 Vdc, output 1 Vpp)

### Other features

0 = Standard features  
1 = Marine type approval (DNV)

### Connection

2 = M23 connector 12 pin (CCW)  
7 = MS connector 7 pin \*  
8 = MS connector 10 pin (imperial pinning like RSI 505) \*  
9 = Cable (specify length upon order) \*

### Resolution

10, 50, 100, 150, 200, 256, 300, 360, 400, 500, 512, 600, 720, 800, 900, 1000, 1024, 1200, 1250, 1500  
1800, 2000, 2048, 2400, 2500, 3000, 3072, 4000, 4096, 4800, 5000, 6000, 6350, 8192, 10000 ppr  
Sinusoidal 1 Vpp: 1024, 2048, 5000 ppr  
Other resolutions available upon request.

\* Not possible with  
Marine type approval  
(Other features = 1)

# Performance

## Technical data (based on HCHTL interface)

Operating temperature	-40...+85 °C *
Ingress protection class [IEC 60529]	IP67 (IP66 at shaft inlet)
Vibration [IEC 60068-2-6]	≤ 200 m/s <sup>2</sup>
Shock [IEC 60068227]	≤ 1500 m/s <sup>2</sup>
Cover material	Aluminum (anodized)
Weight	Approx. 1000 g
Shaft load (axial / radial)	50 N / 100 N
Rotational speed max	6000 rpm
Shaft material	Stainless steel with insulated peek insert
Short circuit protected	Yes
Polarity protected	Yes
Current consumption	60 mA at 24 Vdc (max. 80 mA)
Output load	± 40 mA
Output frequency max	200 kHz
Cable length max	350 m at 100 kHz
Channel separation	90° el ± 25° el
Dividing error	± 50° el

\* Available variants up to +100 °C

## Accessories

Mounting accessories	Part number
Torque arm M6	1254632-XX (specify length upon order)
Mating connector 7 pin MS	1322220-01
Mating connector 10 pin MS	1110488-01 & 1110488-02
Mating connector M23 (CW pin layout for CCW encoder connector)	1321968-01
Marine cable (2 m or 5 m) with 12pM23 CW connector	1421667-XX
Marine cable (2 m or 5 m) with 12pM23 CW stainless steel connector	1421789-XX
Gateways and modules	Part number
Overspeed module, programmable, 0-6000 rpm	1088408-01
CRG OptoLink Transmitter, 9-30 Vdc supply, HTL input	1345262-01
CRG OptoLink Receiver, 9-30 Vdc supply, HTL output	1202450-01
CRG OptoLink Receiver, 9-30 Vdc supply, RS422 output	1203454-01
DMI Converter, HTL or RS422 input, HTL and/or RS422 output signals	1110494-01



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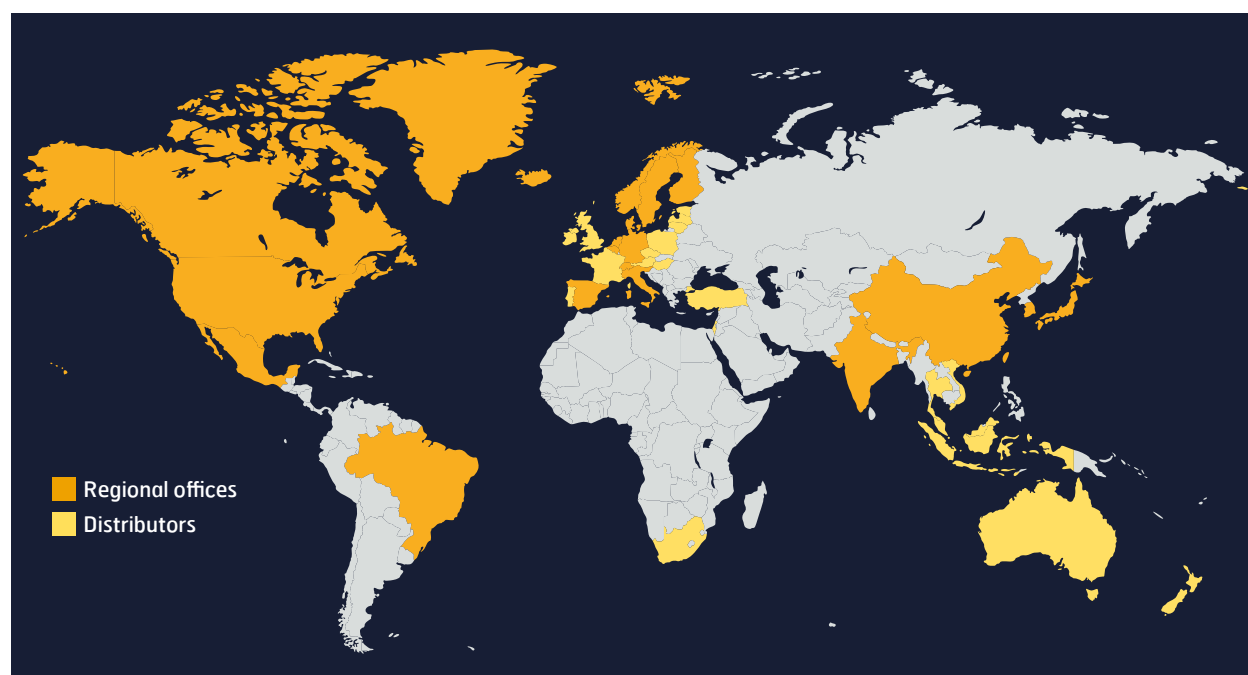
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The best encoders and sensors are those you never have to think about! Those that simply do their job – year after year. Leine Linde develops and manufactures customized encoder and sensor solutions for demanding environments, advanced measuring systems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

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