LEINE LINDE

HEAVY DUTY 800 SERIES

ENCODER MODELS 841, 850, 855, 861, 862, 865

Robustness and reliability

Are you looking for the most robust, maintenance-free and cost-effective encoder? Then the 800 series is for you – it's the first choice of most engineers!

The product series has a long history of successful operation in applications within heavy industries, such as the steel, paper and wind power industries. These applications place stringent demands on robustness and reliability, and the encoder is designed thereafter. Mechanically it features a dual set of heavy duty bearings and a well-encapsulated enclosure. The electronics are designed to withstand an environment where it is exposed to powerful vibrations, electronic disturbances, etcetera.

The 800 series can also be equipped with Leine & Linde's advanced diagnostics system, ADS, for condition-based maintenance. The ADS system constantly monitors the encoder's key functions and is fully integrated into each encoder. In case an impending fault is detected a warning signal is immediately generated. This enables service that is only performed as necessary and that can be planned in ample time to avoid unforeseen breakdowns.

Quality into every detail

Robust shaft sealing verified for IP66.

Hollow shafts for fixing with an axial screw. Shaft dimensions: Ø12 mm, Ø16 mm, Ø17 mm taper.

Solid shaft Ø11 mm with key nut for fixing with a shaft coupling and a B10 Euro flange.

Dual set of heavy duty bearings for maximized lifetime in operation.

O-ring for tight sealing of the hollow shaft to its mating shaft.

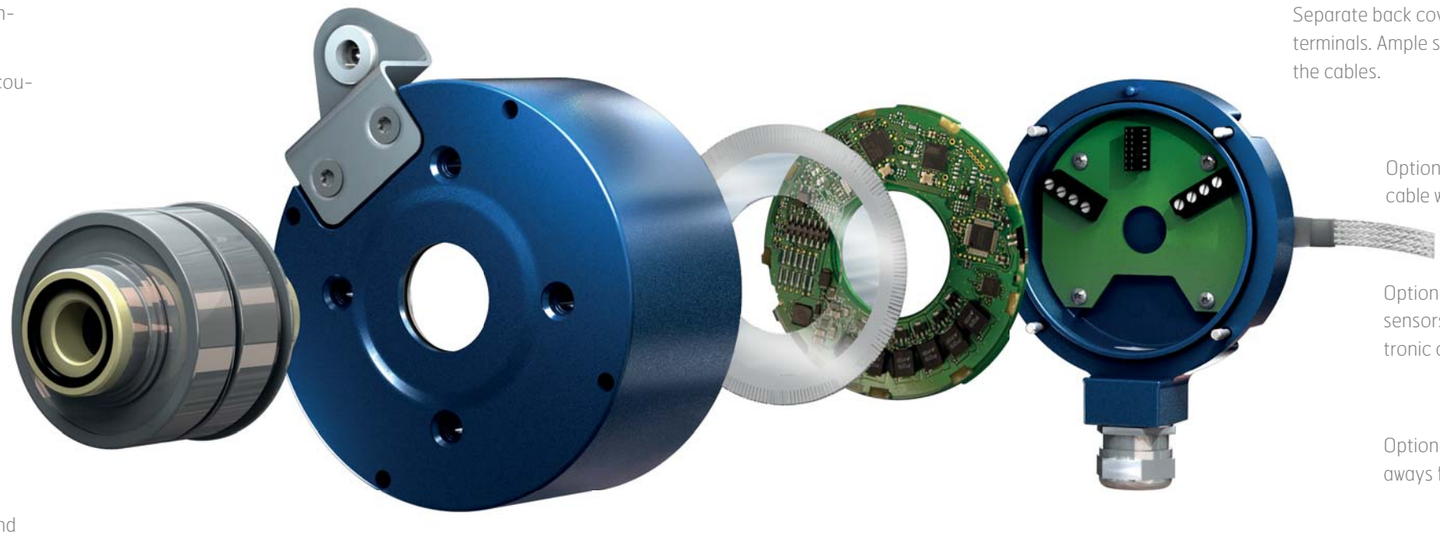
Insulated peek insert to protect the bearings from shaft currents.

Optional: Ceramic bearings for increased insulation and prolonged lifetime.

Robust cover with ingress protection class IP67 for protection against dust and liquids. Verified for use in salt water environments.

Optional: ATEX approval.

Optional: Torque bracket for fixing of a torque arm. Available with 120° or 330° orientation (clockwise seen from cable outlet).



Square wave signal output with 6 channels for differential transmission and reference pulse for relative position.

Optional: Sinusoidal 1 Vpp output.

High accuracy code discs verified for powerful shocks and vibration. Wide range of different pulse rates available from 1 to 10 000 ppr.

Robust electronics verified for high vibrations and extreme temperatures. Short-circuit protection and polarity protection as standard.

Optional: Advanced Diagnostics System – integrated system for continuous monitoring of the basic encoder function. Warning in case an impending fault is detected so that unforeseen breakdowns can be avoided.

Available with a big number of output interfaces according to market standards HTL, TTL, RS422 or 1 Vpp.

Optional: High Current HTL interface for transmission over long cables.

Separate back cover for connection of cable wires to screw terminals. Ample space for easy handling when connecting the cables.

Optional: M23 connector or pre-mounted cable with/without flying connector.

Optional: Dual outputs with redundant scanning sensors and two galvanically insulated electronic circuits.

Optional: Earthing strap to conduct currents aways from the encoder cover.

Optional: Overvoltage protection for protection against voltage peaks on the supply, for example due to lightning strokes.

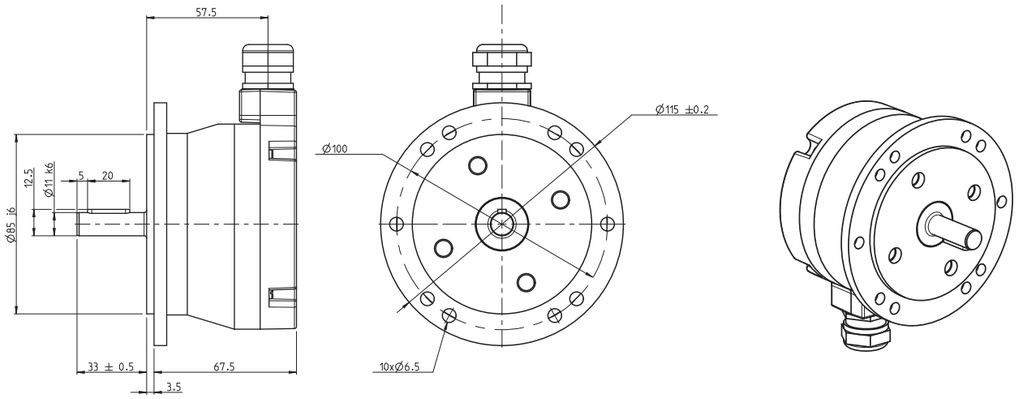
Note that some features described in this overview may only be available on certain models.

Mechanics

This page offers an overview of the different models in the 800 series. Each model is available in several different variants when it comes to shafts, flanges, resolutions, electronics and connections. Please consult the code keys on pages 11-13 for detailed overview of all options.

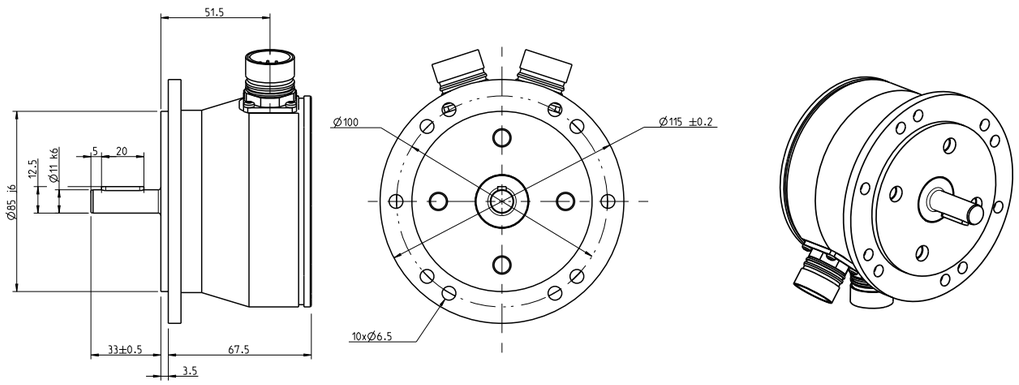
Model 850

Solid shaft encoder with B10 Euro flange.



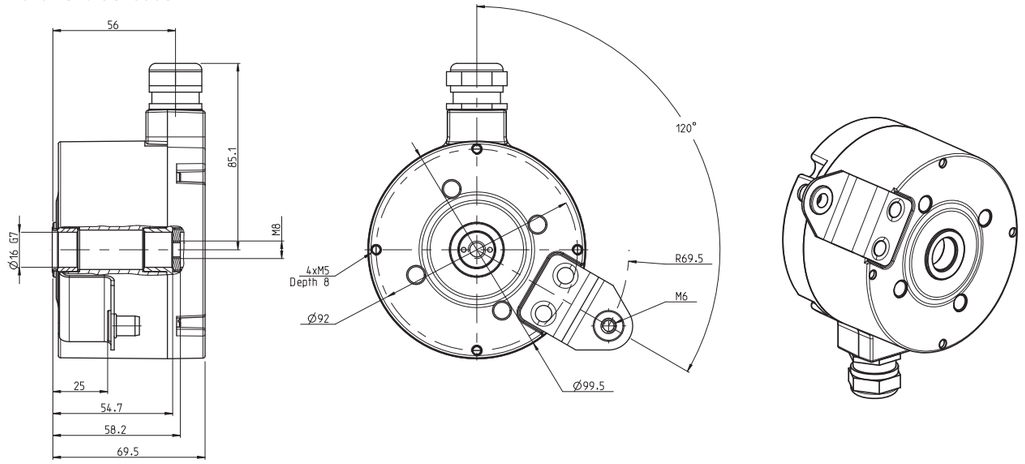
Model 855

Dual solid shaft encoder with B10 Euro flange. Redundant scanning sensors and two separate electronic circuits with galvanically insulated outputs.



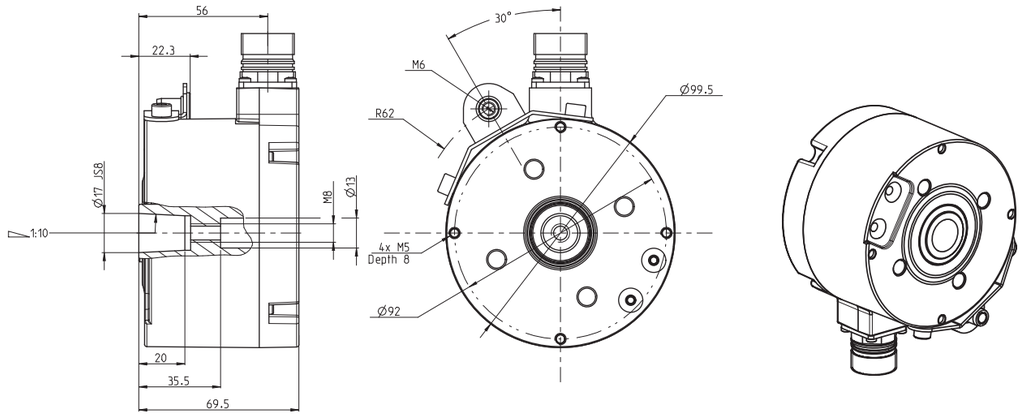
Model 861

Hollow shaft encoder.



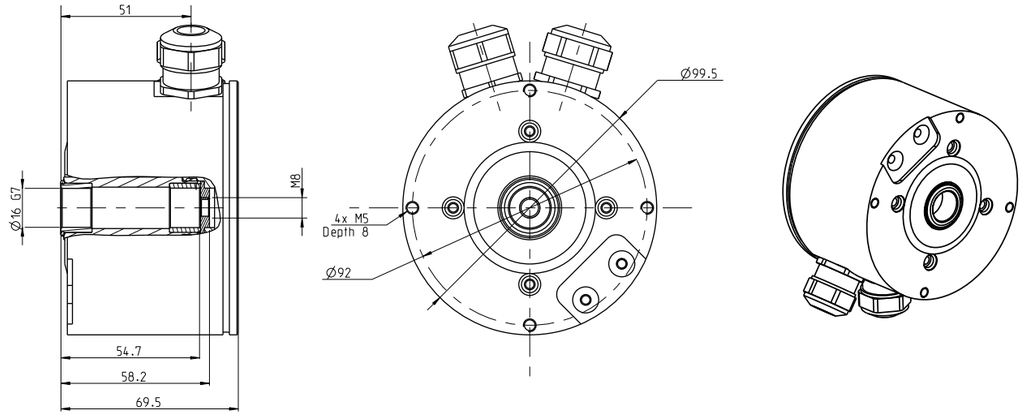
Model 862

Extra robust hollow shaft encoder with ceramic bearings for extended lifetime.



Model 865

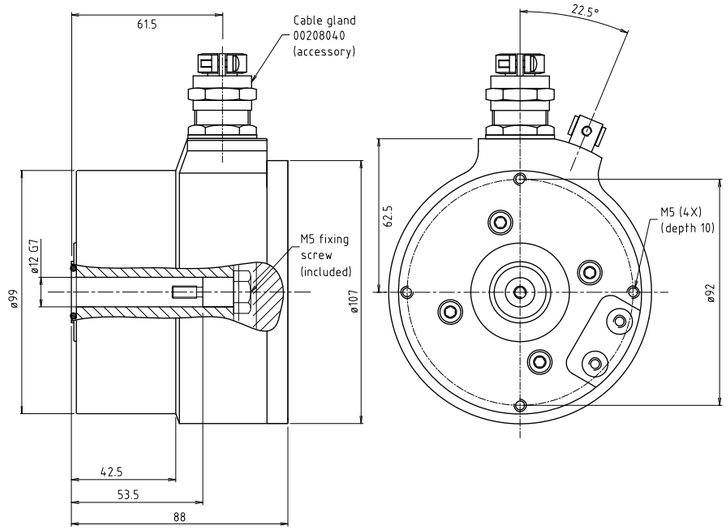
Dual hollow shaft encoder. Redundant scanning sensors and two separate electronic circuits with galvanically insulated outputs. Ceramic bearings available as special option.



Model 841

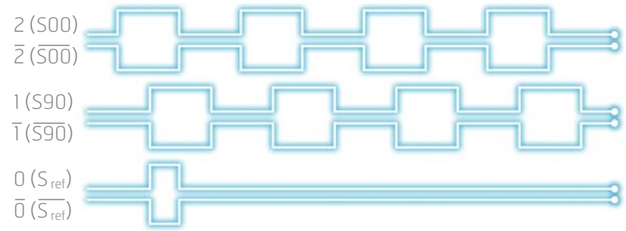
Flameproof hollow shaft encoder intended for use in potentially explosive atmospheres. Certified according to ATEX and IECEx:

- II 2 GD Ex d IIC T6 Ex tD A21 IP65 T71°C
- II 2 GD Ex d IIC T5 Ex tD A21 IP65 T91°C
- II 2 GD Ex d IIC T5 Ex tD A21 IP65 T95°C



Electronics

Square wave signals



Interface	TTL	RS 422	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	200 kHz	200 kHz	200 kHz	200 kHz
Max cable length	50 m at 50 kHz	1000 m at 200 kHz	100 m at 100 kHz	350 m at 100 kHz

Dual outputs

Two separate encoders can be combined into one and the same cover equipped with two cable outlets. This solution provides added safety in the form of redundancy, the outputs are based on two separate scanning LED:s and electronic circuits. The outputs are galvanically insulated from each other and may be connected to two separate systems for different function or for redundancy.

- Available in model 855 and 865

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 is required of extremely small movements.

- Available in model 850, 861 and 862

ADS Classic

ADS is an Advanced Diagnostic System that continuously monitors the encoder function. If the encoder is nearing the end of its life, a warning is transmitted, enabling action to be taken in good time before problems arise. This system is integrated into the encoder and is used in applications with high demands for reliability, for example, in motors for continuous operation at a paper mill.

ADS Advanced Diagnostic System by Leine & Linde

- Available in model 841, 850, 861 and 862

Digtal speed over PROFIBUS

With this option the encoder has two different connections, one with a standard incremental output and another for communication over PROFIBUS.

PROFIBUS

The standard incremental pulse output is used for connection to the inverter for direct speed control, while the additional PROFIBUS output can be connected to another system where a reference value of the speed is required. The speed is calculated internally in the encoder and is sent over the fieldbus.

- Available in model 850, 861 and 862

Code keys

850

8 5 0 - 0 [ ] 9 [ ] [ ] 6 - [ ] [ ] [ ] [ ]

Flange

0 = Euro flange B10

Functionality

0 = Standard
1 = ADS Classic

Shaft

9 = Ø11 mm solid shaft with key nut

Connection

1 = Connector M23, 12 pin CW
2 = Connector M23, 12 pin CCW
4 = Cable gland, M20 for Ø8-11 mm cables
5 = Cable gland, M20 for Ø11-14 mm cables
3 = Pre-mounted cable, 1.5 m
9 = Pre-mounted cable, xx m

Electronics

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

Resolution

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

Sinusodial 1 Vpp: 1024, 2048 ppr

Other resolutions available upon request.

855 Duo

8 5 5 - 0 [ ] 9 1 9 4 - [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Flange

0 = Euro flange B10

Electronics (output A + B)

0 = HCHTL + HTL
(supply 9-30 Vdc, output 9-30 Vdc) *
1 = HCHTL + TTL
(supply 9-30 + 5 Vdc, output 9-30 + 5 Vdc) *
2 = HTL + HTL
(supply 9-30 Vdc, output 9-30 Vdc) **
3 = TTL + TTL
(supply 5 Vdc, output 5 Vdc) **
4 = HTL + TTL
(supply 9-30 + 5 Vdc, output 9-30 + 5 Vdc) **
5 = HTL + RS422
(supply 9-30 + 9-30 Vdc, output 9-30 + 5 Vdc) **
6 = HCHTL + HCHTL
(supply 9-30 Vdc, output 9-30 Vdc) **
7 = RS422 + RS422
(supply 9-30 Vdc, output 5 Vdc) **

* Output A (HCHTL): 3 channels, output B: 6 channels
** Output A and B: 6 channels

Shaft

9 = Ø11 mm solid shaft with key nut

Connection

1 = 2 x Connector M23, 12 pin CW

Resolution

Dual 2 x 500, 600, 1000, 1024, 2000, 2048, 2500, 3072, 4096, 5000, 6000, 6350, 8192, 10000 ppr

Other resolutions available upon request.

861

8 6 1 - [ ] [ ] [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ]

Flange

0 = Standard
1 = Torque bracket 120°

Functionality

0 = Standard
1 = ADS Classic

Shaft

7 = Ø12 mm hollow shaft with insulation
8 = Ø16 mm hollow shaft with insulation

Connection

1 = Connector M23, 12 pin CW
2 = Connector M23, 12 pin CCW
4 = Cable gland, M20 for Ø8-11 mm cables
5 = Cable gland, M20 for Ø11-14 mm cables
3 = Pre-mounted cable, 1.5 m
9 = Pre-mounted cable, xx m

Electronics

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

Number of channels

5 = 3 channels (only for HCHTL)
6 = 6 channels

Resolution

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

Sinusoidal 1 Vpp: 1024, 2048 ppr

Other resolutions available upon request.

862

8 6 2 - [ ] 0 [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ]

Flange

0 = Standard
1 = Torque bracket 120°
2 = Torque bracket 330°

Shaft

7 = Ø12 mm hollow shaft with insulation up to 2.5 kV
8 = Ø16 mm hollow shaft with insulation up to 2.5 kV
9 = Ø17 mm taper hollow shaft with insulation up to 2.5 kV

Connection

1 = Connector M23, 12 pin CW
2 = Connector M23, 12 pin CCW
4 = Cable gland, M20 for Ø8-11 mm cables
5 = Cable gland, M20 for Ø11-14 mm cables
3 = Pre-mounted cable, 1.5 m
9 = Pre-mounted cable, xx m

Electronics

1 = TTL (supply 5 Vdc, output 5 Vdc)
2 = Overvoltage protected HCHTL
(supply 9-30 Vdc, output 9-30 Vdc)
3 = Overvoltage protected HTL
(supply 9-30 Vdc, output 9-30 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)
9 = Sinusoidal 1 Vpp (supply 5 Vdc, output 1 Vpp)

Functionality

4 = Standard, output with 3 channels (only for HCHTL)
5 = ADS Classic, output with 3 channels (only for HCHTL)
6 = Standard, output with 6 channels
7 = ADS Classic, output with 6 channels

Resolution

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

Sinusoidal 1 Vpp: 1024, 2048 ppr

Other resolutions available upon request.

865 Duo

8 6 5 - [ ] [ ] [ ] [ ] 9 4 - [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Flange

0 = Standard
1 = Torque bracket 120°

Electronics (output A + B)

0 = HCHTL + HTL
(supply 9-30 Vdc, output 9-30 Vdc) *
1 = HCHTL + TTL
(supply 9-30 + 5 Vdc, output 9-30 + 5 Vdc) *
2 = HTL + HTL
(supply 9-30 Vdc, output 9-30 Vdc) **
3 = TTL + TTL
(supply 5 Vdc, output 5 Vdc) **
4 = HTL + TTL
(supply 9-30 + 5 Vdc, output 9-30 + 5 Vdc) **
5 = HTL + RS422
(supply 9-30 + 9-30 Vdc, output 9-30 + 5 Vdc) **
6 = HCHTL + HCHTL
(supply 9-30 Vdc, output 9-30 Vdc) **
7 = RS422 + RS422
(supply 9-30 Vdc, output 5 Vdc) **

* Output A (HCHTL): 3 channels, output B: 6 channels
** Output A and B: 6 channels

Shaft

7 = Ø12 mm hollow shaft with insulation
8 = Ø16 mm hollow shaft with insulation

Ceramic bearings or Ø17 mm taper hollow shaft available upon request.

Connection

1 = 2 x Connector M23, 12 pin CW
2 = 2 x Connector M23, 12 pin CCW
4 = 2 x Cable gland, M20 for Ø8-11 mm cables
5 = 2 x Cable gland, M20 for Ø11-14 mm cables
3 = 2 x Pre-mounted cable, 1.5 m
9 = 2 x Pre-mounted cable, xx m

Variants with HCHTL are only available with pre-mounted cable or connector.

Resolution

Dual 2 x 500, 600, 1000, 1024, 2000, 2048, 2500, 3072, 4096, 5000, 6000, 6350, 8192, 10000 ppr

Other resolutions available upon request.

841, Ex

Ex class: Tamb = -40°C..40°C, RPM max = 4200 (T6)

(Part number,	Shaft,	Resolution,	Channels)
841900001,	Ø12 mm,	1024 ppr,	6

Ex class: Tamb = -40°C..60°C, RPM max = 4200 (T5)

(Part number,	Shaft,	Resolution,	Channels)
841910001,	Ø12 mm,	2048 ppr,	6
841910002,	Ø12 mm,	1024 ppr,	6
841910003,	Ø16 mm,	1024 ppr,	6
841910004,	Ø12 mm,	2048 ppr,	3
841910005,	Ø16 mm,	2048 ppr,	3
841910006,	Ø16 mm,	1024 ppr,	6, With ADS Classic
841910007,	Ø16 mm,	2048 ppr,	6
841910008,	Ø16 mm,	4096 ppr,	6
841910009,	Ø12 mm,	5000 ppr,	6
841910010,	Ø12 mm,	1024 ppr,	3
841910011,	Ø16 mm,	256 ppr,	3
841910012,	Ø16 mm,	1024 ppr,	6
841910014,	Ø16 mm,	1024 ppr,	6
841910015,	Ø16 mm,	600 ppr,	6, With ADS Classic
841910016,	Ø16 mm,	500 ppr,	6
841910017,	Ø16 mm,	5000 ppr,	3
841910018,	Ø16 mm,	1024 ppr,	3

Ex class: Tamb = -40°C..70°C, RPM max = 1500 (T5)

(Part number,	Shaft,	Resolution,	Channels)
841920003,	Ø16 mm,	1000 ppr,	6

All variants are with HCHTL output and terminal connection.

Accessories for Ex use	Part number
Cable gland	00208040
Cable	01209128

Performance

Technical data (based on HCHTL interface)

Operating temperature	-20..+80 °C *
Ingress protection class [IEC 60529]	IP67 (IP66 at shaft inlet)
Vibration [IEC 60068-2-6]	≤ 200 m/s²
Shock [IEC 60068227]	≤ 1500 m/s²
Cover material	Aluminum (coated or anodized)
Weight	Approx. 1300 g
Shaft load (axial/radial)	100 N / 300 N (hollow shaft), 100 N / 100 N (solid shaft)
Rotational speed max	6000 rpm
Shaft material	Stainless steel
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	± 25° el

* Available variants up to -40..+100 °C

Accessories

Mounting accessories	**Part number**
Torque arm M6	01208014
Torque arm M5	01208013
Shaft coupling 11-11 mm with keyway	46441P33P33
Mating connector M23 (CCW pin layout for CW encoder connector)	01209096
Gateways	**Part number**
CRG Overspeed	893254-xx
Speed monitor DZ260	00208070
CRG OptoLink Transmitter 9-30 Vdc supply, HTL input	01300320
CRG OptoLink Receiver 9-30 Vdc supply, HTL output	01300330
CRG OptoLink Receiver 9-30 Vdc supply, RS422 output	01300332
CRG OptoLink Receiver 5 Vdc supply, TTL output	731720-01

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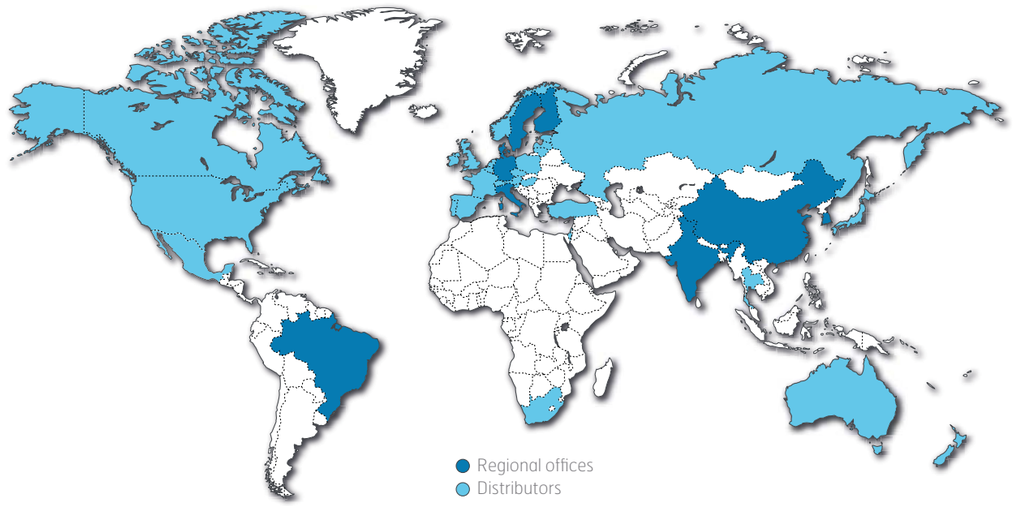

The best encoders are those you never have to think about. Those that simply do their job – year after year. Leine & Linde develops and manufactures customised encoder solutions for demanding environments, advanced measuring systems for accurate feedback of speed and position.

LEINE LINDE

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