LEINE LINDE

Encoders for Extreme Environments

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LEINE LINDE - Product Family

300 Miniature

The model 300 series consists of robust and extremely reliable miniature encoders, 30 mm in diameter and designed for installation in applications where limited space is at a premium.

500 Robust

"Versatile" and "modular" are catchwords that differentiate the incremental encoders in the model 500 series.

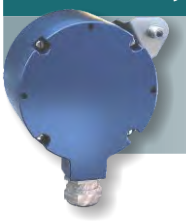
600 Industrial

Fieldbus interfaces based on Ethernet, PROFIBUS or DeviceNet are examples of communication protocols used in automation. These interfaces are available on the 600 series of absolute coded encoders.

700 Compact

The 700 series is a robust encoder with a compact design. With its short length, it is designed for filling the need for heavy duty encoders even in installations where space is limited.

800 Heavy Duty



When the most robust, maintenance-free and cost-effective encoder solution is required, the model 800 series is the first choice of most engineers. The optional ADS (Advanced Diagnostic System) is a built-in system tailored to support condition-based maintenance, guaranteeing the reliability of the application.

900 Premium

Machines are becoming more and more advanced in classic industrial applications. More complex motions need to be absolutely monitored in order to achieve full process control. The 900 series meets these increasing demands.

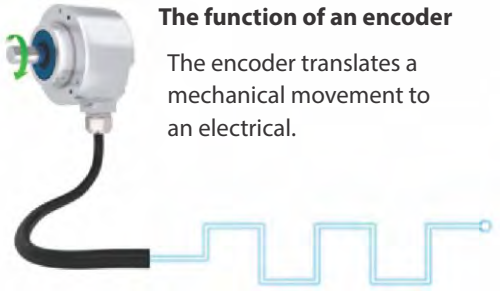
1000 Extreme

There are many examples of extreme environments within the steel industry in the terms of temperature, mechanical forces, vibrations and shocks. The 1000 series is designed with exceptional durability, suited to an exposed environment. This due to the high encapsulation level which keeps the internal parts protected from dust and liquids.

The Best of Both Worlds

An encoder operates on the threshold between mechanics and electronics, and these two worlds require completely different qualities of the encoder. On the electrical side, an encoder must offer the highest level of reliability, precision and accuracy. On the mechanical side, it must withstand powerful forces, vibrations and extreme temperatures.

In a drive system, the encoder provides the link between motor and frequency converter. This document outlines the criteria to be considered when choosing a solution optimised for both worlds.



The function of an encoder

The encoder translates a mechanical movement to an electrical.

The principle behind a drive system

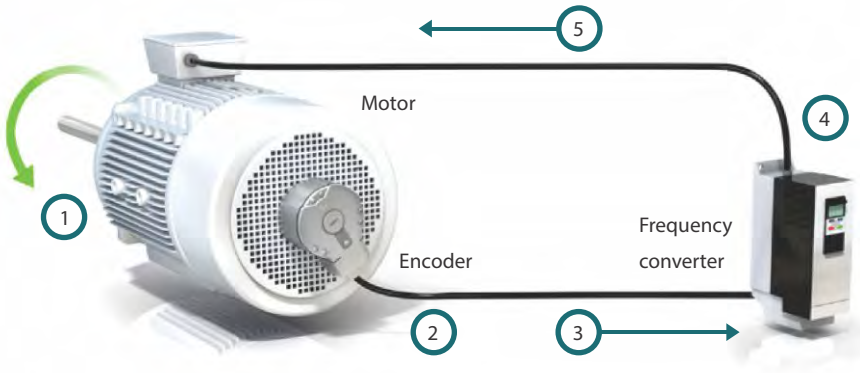
1. The motor shaft drives a load at a certain torque. Intentional speed adjustments may be required during operation; but also, unintentional changes in speed can occur, as the speed is affected by a number of factors, for instance, a variation in the load and by slip.

2. The encoder is mounted directly on the rotor and measures the real speed of the motor shaft.

3. The encoder sends a constant stream of feedback of the speed to the frequency converter.

4. The frequency converter interprets the encoder signals and calculates the necessary compensation for the speed.

5. The frequency converter regulates frequency and voltage, which control the speed of the stator's rotating magnetic field.



Inside an encoder

The internal structure of an encoder is based on a rotating disc with a large number of measurement points around its circumference.

With a pulse rate of 1,024 ppr, one revolution will provide 4,096 measurement points. This means that the encoder can detect a movement of 0.1 mechanical degrees and that an updated speed can be calculated 4,096 times during each revolution. This enables immediate compensation for deviations, so that the preferred speed can be maintained.

Electric motor

Stator – rotating magnetic field

Rotor – rotating motor shaft

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Shafts & Flanges

Flange and solid shaft

An encoder with a solid shaft is fixed to the motor with the aid of a mounting flange. The assembly is very stable and prevents the encoder moving.

Shaft rotation is transferred by means of a flexible shaft coupling that compensates for axial and radial movement of the motor shaft. This reduces wear on the encoders bearings, maximising its service life.

Leine & Linde offers a large number of industrial grade flanges, for example, clamping flange, synchro flange and euro flange, as well as several customised versions.

- Key characteristic: Stable assembly
- Fixing: Shaft coupling
- Available in the 1000, 800, 600 and 500 series

Through-going hollow shaft

This assembly is the most space-efficient axially. The encoders hollow shaft is mounted directly on to the motor shaft, meaning there are no protruding shafts or intermediate couplings taking up valuable space. A clamping ring is used to fix the encoder to the motor shaft.

Leine & Linde's 700 series is, despite its robust design, built to be axially as short as possible, making it ideal for applications where space is at a premium.

- Key characteristic: Short build length
- Fixing: Clamping ring
- Available in the 800, 700, 600 and 500 series

Blind hollow shaft

If space is limited radially, a good solution is to choose an encoder with a blind hollow shaft. This feature makes an axial output possible, which avoids adding anything to the radius. To prevent the encoder rotating with the shaft, it is fitted with a flexible stator coupling, which has also been designed to add as little as possible to the radius.

- Key characteristic: Minimal radial space
- Fixing: Clamping ring
- Available in the 600 and 500 series

Hollow shaft with axial mounting screw

A common fixing solution is to secure the encoders hollow shaft to the motor shaft using an axial screw. With a prepared mating shaft, assembly can be performed quickly and easily, during both manufacture of the motor and servicing. This solution also facilitates the process of centering the encoder to the mating shaft.

- Key characteristic: Easily accessible assembly
- Fixing: Axial screw
- Available in the 800 and 500 series

Shafts & Flanges - Expanded solutions for special requirements

Taper hollow shaft with axial mounting screw

Leine & Linde's 800 series includes an option with a taper hollow shaft. When the mounting screw passes through the hollow shaft of the encoder into the motor shaft, the cone is pressed against the motor shaft along its entire surface. This guarantees maximum friction between the shafts and ensures that the encoder is centered.

- Key characteristic: Maximum friction and centering
- Fixing: Axial screw
- Available in the 800 series

Key and keyway

In safety-critical applications there are sometimes demands for mating shafts to be connected by a keyway, which guarantees counteract slippage. Leine & Linde's shaft encoders can be supplied with a key, while hollow shaft encoders can be supplied with a keyway.

- Key characteristic: Counteracts slippage
- Fixing: Shaft coupling/axial screw
- Available in the 1000 and 800 series

Insulated shafts

A motor driven by a frequency converter can be affected by voltages passing over the motor shaft. This can lead to currents passing through the bearings of the motor or encoder, which dramatically reduces the service life of the bearings. Leine & Linde has developed several different types of shaft insulation to help overcome this problem.

- **Peek insert** – insulates the encoders hollow shaft from the motor shaft. Available in the 800, 700 and 500 series.
- **Hybrid bearings** – insulates the encoders hollow shaft from the motor shaft. Available in the 800 series.
- **Insulated shaft coupling** – solution for encoders with a solid shaft. Available in the 1000, 800 and 500 series.
- **Shaft grounding ring** – directs currents away from the motor shaft via the encoders cover. Available in the 800 series.

Flexible fixing

A hollow shaft encoder must have an attachment point that prevents it moving as the shaft rotates. It is important that the assembly be flexible, so that the encoder has a degree of freedom to move if the motor shaft moves radially or axially. If the assembly is rigid, there is a risk that the movement of the motor shaft will wear down the encoders bearings prematurely. Leine & Linde offers a number of solutions for optimised installation.

- **Torque arms** – in different lengths, insulated
- **Torque arm brackets** – several different types
- **Stator couplings** – several different types

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Electronics

Square waves

Square waves are the most common signal type for an incremental encoder. Leine & Linde's products are supplied as standard with 6 channels. Signal S00 is followed by signal S90, which is displaced 90 electrical degrees. The two inverted signals S00\ and S90\ enable differential transmission, which reduces the sensitivity of the signals to electrical interference. To check the position of the shaft, a reference pulse is produced once per revolution, Sref with its inverse Sref\.

There are several variations of electrical interface with different supply voltages and signal levels. When choosing an interface, it is necessary to take into account factors in the motor's operating environment. The exact properties of the interface is affected by frequency, cable length and temperature.

Interface	TTL	RS-422	HTL	HC-HTL
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	50 kHz	1000 kHz	300 kHz	100 kHz
Max cable length	50 m at 50 kHz	1000 m at 1000 kHz	100 m at 100 kHz	350 m at 100 kHz
Temperature	-40 .. +100 °C	-40 .. +100 °C	-40 .. +100 °C	-40 .. +80 °C
Available in	1000, 800, 700, 500	1000, 800, 700, 500	1000, 800, 700, 500	1000, 800, 700, 500

Sine waves

Sine waves are another form of output signal. The analog 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.

- Available in the 800 and 700 series

Optical transmission

Optical transmission via fibres produces signals that are unaffected by electrical interference in the environment. It also enables transmission over distances of kilometres, and the use of optical fibres reduces the system weight compared with normal cables. Optolink is available integrated into the 800 series or as an accessory gateway for other series.

- Available in the 800 series

Electronics

Absolute position encoders

Absolute position encoders are offered with serial interfaces such as SSI and EnDat or with integrated fieldbus communication of various kinds, ready for installation in an existing fieldbus system.

- Available in the 1000, 600 and 500 series

PROFIBUS PROFINET CANopen DeviceNet DRIVE-CLiQ

DRIVE-CLiQ is a registered trademark of Siemens.

Increased function and safety

Dual solutions

Two separate encoders can be integrated into one and the same cover. This solution provides added safety in the form of true redundancy, something required in critical applications where the risk of component faults must be avoided. The two outputs can also be connected to two separate systems with different functions, and there are solutions for combining an incremental and an absolute output in one and the same product.

- Available in the 1000, 800 and 500 series

ADS Online

ADS Online 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 ONLINE

- Available in the 800 series

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Connection

Cable

The encoder can be supplied with a cable pre-installed. The exact cable length is defined upon order to ensure a perfect fit for each installation.

- Available in the 1000, 800, 700, 600 and 500 series

Screw terminal

If long cable lengths are required during installation, it is a good idea to choose an encoder with terminals that allow the user to connect their own cable. This makes it easy to adjust the length of the cable on site and replace the cable if need be.

- Available in the 1000, 800 and 600 series

Connector

There is a wealth of different connectors to choose from, for example, M23 and M12. With a connector, the connection can be prepared at the factory to make on-site installation easier. It also helps to avoid incorrect connection. Connectors also make it simple to replace encoders during servicing.

- Available in the 800, 700, 600 and 500 series

Cable with connector for panel mount

A cable with a pre-installed connector simplifies the installation process when assembling the motor. The length of the cable is specified upon order to fit the exact installation where the connection is made to a panel or terminal box. There the connector is screwed securely into place, forming a tight seal with the surface to prevent penetration by moisture or dust.

Available in the 1000, 800, 700, 600 and 500 series

Axial or radial output

The direction of the encoders connection output can be selected to best suit the installation. A radial output means a shorter encoder, while an axial output is better if space around the encoder is limited.

Mating connectors

Suitable mating connectors can be ordered as accessories, with or without a pre-installed cable.

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Ruggedized Hollow Shaft Incremental Encoder - 500 Series

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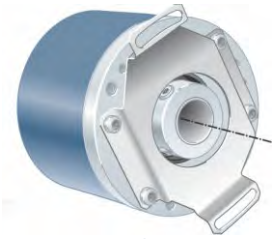

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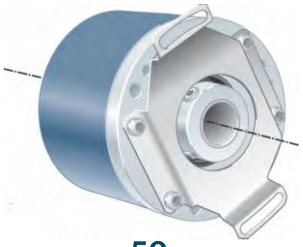

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Short description:

>> 6 short-circuit protected outputs
>> IP 67 at housing, IP 66 at shaft inlet
>> 5 Vdc or 9...30 Vdc
>> Robust housing for harsh environment
>> Shock and vibration protected

Suitable applications:

>> Standard to demanding industrial applications

General information

Encoder data	
Type	RHI 503
Operating temperature	-40°C .. +70°C
Ingress protection class	IP-67 according to IEC 60529
At shaft inlet	IP-66 according to IEC 60529
Vibration (55 to 2000Hz)	< 300 m/s² according to IEC 60068-2-6[1]
Shock (6ms)	< 2000 m/s² according to IEC 60068-2-27
Cover material	Aluminium, coated and chromated or anodized

Accuracy and resolution			
Line count	1..5000 ppr	5001 .. 10 000 ppr	
Dividing error	± 50° el	± 90° el	
Channel separation	90 ± 25° el	90 ± 45° el	
Measuring steps	4 x Line count		

Connection option

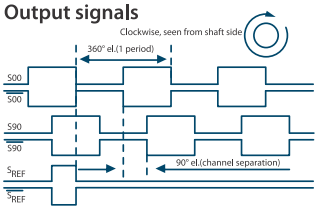
	Cable	12 pin EML
Function	**Colour**	**PIN**
S00	Yellow	5
S00 inverted	Black	6
S90	Green	8
S90 inverted	White	1
Sref	Brown	3
Sref inverted	Violet	4
+E Volt	Red	12
0 Volt	Blue	10
STATUS	Grey	7
Housing	Shield	Chassis

Electrical option

Power supply	5 V ±10%	9 - 30 V	
Polarity protected	No	Yes	
Output signals	**TTL[1]**	**HTL**	**RS-422**
Short circuit protected	Yes	Yes	Yes
Current consumption	45 mA	50 mA at 24Vdc	25 mA at 24Vdc
Max consumption	75 mA	75 mA	40 mA
Output load (max)	± 20 mA	± 40 mA	± 20 mA
Output frequency (max)	300 kHz	300 kHz	300 kHz
U_{high} at 10mA load	> 3.0 V	> +EV - 2.0 V	> 3.0 V
U_{low} at 10mA load	< 0.4 V	< 1.15 V	< 0.4 V
Cable length (max)	50m	200m @ 50 kHz	1km (TIA/EIA-422-B)
STATUS output	Yes	Yes	Yes
High level	Encoder OK	Encoder OK	Encoder OK
Low level	Warning/Failure	Warning/Failure	Warning/Failure

[1]TTL output comply to the RS-422 standard when differential transmission is used

Output signals



Ordering information (Tick your choice)

Type		RHI 503				
Flange		56, HS	57, THS	58, HS	59, THS	
Shaft		Ø8mm	Ø10mm	Ø12mm	Ø14mm	
Electronics[1]	Supply	5Vdc	9-30Vdc			
	Output	TTL	HTL	RS-422		
Connection		Cable	8 pin M12	12 pin EML	8 pin PT	6 pin MS
Connection direction	HS	Axial/Radial	Axial/Radial	Axial/Radial	Axial/Radial	Axial
	THS	Radial	Radial	Radial	Radial	
Line count		1..5000	5001..10000			

[1] Possible combinations: 5Vdc/TTL, 9-30Vdc/HTl or 9-30Vdc/RS-422
HS Hollow-shaft THS Through going hollow-shaft
Please specify line count and cable length when ordering
Ordering example: RHI 503 58 Ø10 5Vdc 1024ppr TTL 12 pin EML Radial

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Ruggedized Solid Shaft Incremental Encoder - 500 Series

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Short description:

>> 6 short-circuit protected outputs
>> IP 67 at housing, IP 66 at shaft inlet
>> 5 Vdc or 9...30 Vdc
>> Robust housing for harsh environment
>> Shock and vibration protected

Suitable applications:

>> Standard to demanding industrial applications

General information

Encoder data	
Type	RSI 503
Operating temperature	-40°C .. +70°C
Ingress protection class	IP-67 according to IEC 60529
At shaft inlet	IP-66 according to IEC 60529
Vibration (55 to 2000Hz)	< 300 m/s^2 according to IEC 60068-2-6[(1)]
Shock (6ms)	< 2000 m/s^2 according to IEC 60068-2-27
Cover material	Aluminium

Accuracy and resolution			
Line count	1..5000 ppr	5001 .. 10 000 ppr	
Dividing error	± 50° el	± 90° el	
Channel separation	90 ± 25° el	90 ± 45° el	
Measuring steps	4 x Line count		

Connection option

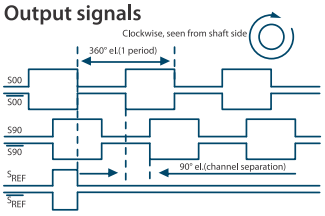
	Cable	12 pin EML
Function	**Colour**	**PIN**
S00	Yellow	5
S00 inverted	Black	6
S90	Green	8
S90 inverted	White	1
Sref	Brown	3
Sref inverted	Violet	4
+E Volt	Red	12
0 Volt	Blue	10
STATUS	Grey	7
Housing	Shield	Chassis

Electrical option

Power supply	5 V ±10%	9 - 30 V	
Polarity protected	No	Yes	
Output signals	**TTL[1]**	**HTL**	**RS-422**
Short circuit protected	Yes	Yes	Yes
Current consumption	45 mA	50 mA at 24Vdc	25 mA at 24Vdc
Max consumption	75 mA	75 mA	40 mA
Output load (max)	± 20 mA	± 40 mA	± 20 mA
Output frequency (max)	300 kHz	300 kHz	300 kHz
U_{high} at 10mA load	> 3.0 V	> +EV - 2.0 V	> 3.0 V
U_{low} at 10mA load	< 0.4 V	< 1.15 V	< 0.4 V
Cable length (max)	50m	200m @ 50 kHz	1km (TIA/EIA-422-B)
STATUS output	Yes	Yes	Yes
High level	Encoder OK	Encoder OK	Encoder OK
Low level	Warning/Failure	Warning/Failure	Warning/Failure

[1]TTL output comply to the RS-422 standard when differential transmission is used

Output signals



Ordering information (Tick your choice)

Type		RSI 503					
Flange		51, LI58	63, Synchro	61, Clamping	52, LL68		
Shaft		Ø8 round	Ø6 with face	Ø10 round	Ø10 with face		
Electronics[(1)]	Supply	5Vdc	9-30Vdc				
	Output	TTL	HTL	RS-422			
Connection		Cable	8 pin M12	12 pin EML	8 pin PT	6 pin MS	10 pin MS
Connection direction	HS	Axia²l/Radial	Axial²/Radial²	Axial²/Radial²	Axial/Radial²	Axial²	Axial/Radial²
Line count		1..5000	5001..10000				

[(1)] Possible combinations: 5Vdc/TTL, 9-30Vdc/HTL or 9-30Vdc/RS-422
[(2)] Not available on flange option -52, LL68
HS Hollow-shaft THS Through going hollow-shaft
Please specify line count and cable length when ordering
Ordering example: RSI 503 63 Ø6ro 5Vdc 1024ppr TTL 8 pin PT Axial

LEINE LINDE - Incremental Encoders - Economy Duty

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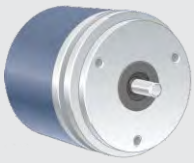
Economy Blind-Hollow Shaft Encoders with 9-30VDC operation and 1,5m Radial Cable Outlet

Part No.	Description
392911-04	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 500ppr
392911-12	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 1000ppr
392911-07	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 1024ppr
392911-52	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 2000ppr
392911-08	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 2048ppr
392911-18	RHI 503 56,HS Ø12mm 9-30Vdc HTL Cable Radial 1,5m 2500ppr

Economy Blind-Hollow Shaft Encoders with 5VDC operation and 1,5m Radial Cable Outlet

Part No.	Description
518540-17	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 500ppr
518540-08	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 1000ppr
518540-01	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 1024ppr
518540-11	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 2000ppr
518540-07	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 2048ppr
518540-14	RHI 503 56,HS Ø12mm 5Vdc TTL Cable Radial 1,5m 2500ppr



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Economy Shaft Encoders with 9-30VDC operation with 1,5m Radial Cable Outlet

Part No.	Description
515398-20	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 500ppr
515398-06	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 1000ppr
515398-50	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 1024ppr
515398-11	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 2000ppr
515398-29	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 2048ppr
515398-28	RSI 503 63,Synchro Ø6mm 9-30Vdc HTL Cable Radial 1,5m 2500ppr

Economy Shaft Encoders with 5VDC operation with 1,5m Radial Cable Outlet

Part No.	Description
513678-04	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 500ppr
513678-14	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 1000ppr
513678-07	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 1024ppr
513678-19	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 2000ppr
513678-06	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 2048ppr
513678-13	RSI 503 63,Synchro Ø6mm 5Vdc TTL Cable Radial 1,5m 2500ppr

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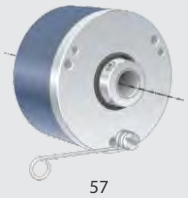
LEINE LINDE - Hollow Shaft Encoders - Industrial Duty

Through-Hollow Shaft Industrial Duty Encoders with 9-30VDC operation



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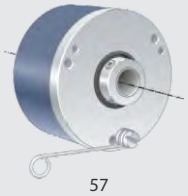
Part No.	Description
516196-29	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 100ppr
516196-26	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 360ppr
516196-15	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 500ppr
516196-18	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 1000ppr
516196-19	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 1024ppr
516196-52	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 2000ppr
516196-20	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 2048ppr
516196-17	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 2500ppr
516196-16	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 3600ppr
516196-04	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 4096ppr
516196-54	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 5000ppr
516196-49	RHI 503 57,THS Ø14mm 9-30Vdc HTL Cable Radial 5m 10,000ppr

Other Resolutions Available on Request

Through-Hollow Shaft Industrial Duty Encoders with 5VDC operation



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Part No.	Description
528958-20	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 100ppr
528958-21	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 360ppr
528958-22	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 500ppr
528958-23	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 1000ppr
528958-06	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 1024ppr
528958-24	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 2000ppr
528958-25	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 2048ppr
528958-26	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 2500ppr
528958-19	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 3600ppr
528958-09	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 4096ppr
528958-10	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 5000ppr
528958-27	RHI 503 57,THS Ø14mm 5Vdc TTL Cable Radial 5m 10,000ppr

Other Resolutions Available on Request

LEINE LINDE - Shaft Encoders - Industrial Duty

Shaft Industrial Duty Encoders with 9-30VDC operation

63

Part No.	Description
515554-27	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 100ppr
515554-11	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 360ppr
515554-08	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 500ppr
515554-33	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 1000ppr
515554-06	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 1024ppr
515554-A8	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 2000ppr
515554-54	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 2048ppr
515554-61	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 2500ppr
515554-A9	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 3600ppr
515554-82	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 4096ppr
515554-A0	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 5000ppr
515554-B0	RSI 503 63,Synchro Ø10mm round 9-30Vdc HTL Cable Radial 5m 10,000ppr

Other Resolutions Available on Request

Shaft Industrial Duty Encoders with 5VDC operation

63

Part No.	Description
514510-38	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 100ppr
514510-39	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 360ppr
514510-18	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 500ppr
514510-19	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 1000ppr
514510-08	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 1024ppr
514510-40	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 2000ppr
514510-20	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 2048ppr
514510-41	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 2500ppr
514510-42	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 3600ppr
514510-43	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 4096ppr
514510-32	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 5000ppr
514510-44	RSI 503 63,Synchro Ø10mm round 5Vdc TTL Cable Radial 5m 10,000ppr

Other Resolutions Available on Request

LEINE LINDE

LEINE LINDE - Heavy Duty Encoders

Hollow Shaft Heavy Duty Encoders

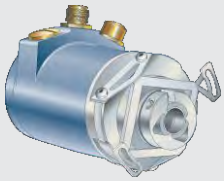
Part No.	Pulse Rate	Supply Voltage	ADS	Shaft Size
751282-09-861	1024	9-30 VDC	None	12 mm
750729-03-861	1024	9-30 VDC	None	16 mm
751282-02-861	2048	9-30 VDC	None	12 mm
750729-12-861	2048	9-30 VDC	None	16 mm
750901-01-861	2048	9-30 VDC	Yes	16 mm
750901-03-861	1024	9-30 VDC	Yes	16 mm

Shaft Heavy Duty Encoders

Part No.	Pulse Rate	Supply Voltage	ADS	Shaft Size
750728-02	1024	9-30 VDC	No	11mm With B10 Tacho Flange
750728-11	2048	9-30 VDC	No	11mm With B10 Tacho Flange
1066902-02	1024	9-30 VDC	Yes	11mm With B10 Tacho Flange
1066902-03	2048	9-30 VDC	Yes	11mm With B10 Tacho Flange

Other Resolutions Available on Request

LEINE LINDE - Absolute Encoders - Industrial Duty



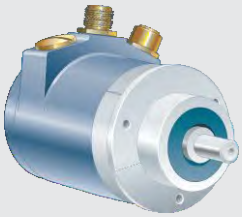
58

Profibus DP

Part No.	Description
884765-01	IHA 608 58,HS Ø12mm 9-36Vdc SPB M12 Radial 25bit
884373-01	ISA 608 61sp Ø10mm 9-36Vdc SPB M12 Radial 25bit

Profinet

Part No.	Description
810339-01	IHA 608 58,HS Ø12mm 9-36Vdc ProfiNet M12 Radial 25bit
810327-01	ISA 608 61sp Ø10mm 9-36Vdc Profinet M12 Radial 25bit



61sp

Devicenet

Part No.	Description
823669-01	IHA 608 58,HS Ø12mm 9-36Vdc SCD Cable Radial 25bit
823667-01	ISA 608 61sp Ø10mm 9-36Vdc SCD M12 Radial 25bit

SSI

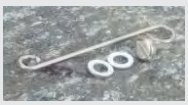
Part No.	Description
816012-01	IHA 608 58,HS Ø12mm 9-36Vdc SSG 17 pin EML Radial 25bit
821383-01	ISA 608 61sp Ø10mm 9-36Vdc SSG 17 pin EML Radial 25bit

EnDat

Part No.	Description
818634-01	IHA 608 58,HS Ø12mm 9-36Vdc SENB 17 pin EML Radial 25bit
810206-01	ISA 608 61sp Ø10mm 9-36Vdc SENB 17 pin EML Radial 25bit

LEINE LINDE

LEINE LINDE - Encoder Accessories



Accessories

Part No.	Description
01300320+01300330	Optical transmission incremental encoders • High electromagnetic disturbances. • Transmission of signals over long distances • Where galvanic insulation is required
DZ260	Speed Monitor to control overspeed, Underspeed, Standstill and Direction of Rotation
GV210	Incremental encoder switch and splitter of encoder signals
FU252	Converter frequency to Analog/Serial for speed signals
00208002	Measuring wheel with 500mm circumference and PU-Surface
00208014	Measuring wheel with 500mm circumference and burled rubber surface
00208010	Measuring wheel with 200mm circumference and PU-Surface
00208015	Measuring wheel with 200mm circumference and burled rubber surface
01209153	Spring-loaded bracket for mounting shaft encoder with synchro flange to measuring wheel
ATITORQ	For hollow shaft encoders. Isolated torque arm with adjustable bar.
01209032	For Hollow Shaft encoder. Spring loaded for industrial duty encoders.
01209140	Insulating bore reducer to reduce 12mm hollow shaft encoder to 10mm. Made from PEEK.
01209141	Insulating bore reducer to reduce 14mm hollow shaft encoder to 12mm. Made from PEEK.

Connectors

Part No.	Description
Profibus	
586299-02	Supply M12 4 pin Female A-Coded Connector
586238-01	Supply M12 4 pin Female A-Coded Connector with 5m Open Ended Cable
586281-01	Bus M12 5 pin Male B-Coded Connector
586287-01	Bus M12 5 pin Female B-Coded Connector
584398-01	Bus M12 5 pin Male B-Coded Connector with 5m Open Ended
584401-01	Bus M12 5 pin Female B-Coded Connector with 5m Open Ended
Profinet	
586299-02	Supply M12 4 pin Female A-Coded Connector
586238-01	Supply M12 4 pin Female A-Coded Connector with 5m Open Ended Cable
586243-01	Bus M12 4 pin Male D-Coded Connector
584404-01	Bus M12 4 pin Male D-Coded Connector, Male-Male 5m cable
Devicenet	
586293-01	Bus M12 5 pin Male A-Coded Connector
586299-01	Bus M12 5 pin Female A-Coded Connector
584412-01	Bus M12 5 pin Male A-Coded Connector with Open Ended Cable
584417-01	Bus M12 5 pin Female A-Coded Connector with Open Ended Cable
SSI/EnDat	
01209085	M23 17 pin Female Connector