INDUSTRIAL 600 SERIES
ABSOLUTE POSITION ENCODERS
When the need of a small encoder for harsh environments is of importance, the absolute inductive 600 series is the right choice. It is built to meet the requirements in environments where vibrations, moisture, interference, heat and cold are common. Depending on the application the encoder is available with either anodized aluminum or stainless steel enclosure. Moreover, the encoder is equipped with robust bearings, which makes it one of the most robust Ø58 mm encoder on the market and provides a long encoder service life.

Resolution up to a total of 31 bit multiturn
With the 600 series absolute encoder it is possible to get exact positioning since each position within the revolution of the encoder is made up of a unique code, allowing the shaft’s exact position to be read directly on start-up. The total resolution for a 31 bit encoder is equivalent to 524,288 unique positions on each individual revolution, multiplied by 4096 distinguishable revolutions.

Stainless steel for increased robustness
As an option, the 600 series has variants that comply to ATEX for usage within the zone 2/22. The inductive 600 series in stainless steel has a high resistance to corrosion and is therefore suitable in demanding environments such as those common within marine and offshore applications or where aggressive liquids are used.
Robustness in its essence

Sustainable
Market leading vibration and shaft load resistance.

Encapsulation
Ingress protection class IP67 for protection against dust and liquids. Verified for use in salt water environments.

Resolution
High singleturn and multiturn resolution versions of the encoder available.

Shaft and flange
- Hollow shaft, either blind or through-going for fixing with a stator coupling. Shaft dimension: Ø12 mm.
- Solid shaft, either round or face for fixing with a flange of either synchro or clamping type. Shaft dimensions: Ø6 mm, Ø10 mm and Ø12 mm.

Material
- Anodized aluminium or
- Stainless steel A4, AISI 316L/EN 1.4404

Explosion-protection (optional)
- II 3 G Ex e IIC T4 Ge X
- II 3 D Ex tc IIIC T135C Dc X

Connection
- M23 or M12 connectors
- Cable glands or premounted cable

Note that some features described in this overview may only be available in certain combinations. Please refer to page 10 for more details.
Modularity

The 600 series features a robust and compact design with connection through cable glands, M12 or M23 connectors. This spread offers an overview of the different mechanical variants available in the 600 series. Other variants can be created according to the code key on page 10.

| ISA 608 with synchro flange and pre-mounted cable |

| ISA 638 with clamping flange and 3 x M12 connector |

| IHA 608 with stator coupling and M23 connector |

| IHA 608 with stator coupling and 3 x cable gland |
## Interfaces

### PROFIBUS

The 600 series supports the encoder profiles 3.062 (DVP0) and 3.162 version 4.1 (DVP2) which contains functions such as preset, scaling and code sequence. The encoder profile DVP2 also adds isochronous data exchange and slave-to-slave functions.

### PROFINET

PROFINET can in general be described as Ethernet-based PROFIBUS DP communication and contains functions such as preset, scaling, code sequence, slave-to-slave and isochronous data exchange.

### CANopen

The 600 series CANopen encoder supports encoder profile DS-406 version 3.2 and is certified by the CIA (CAN In Automation) organization. Apart from the standard encoder functionality such as positioning, scaling and presetting commands, the encoder supports speed and acceleration read out as well as PDO mapping and LSS service.

### DeviceNet

The 600 series also features support for DeviceNet protocol and the encoder functionality has been tested in compliance with the ODVA conformance test. The DeviceNet encoder supports profile revision 2 with the supported functionalities code sequence, preset, velocity and scaling.

### EtherCAT

With no underlying subsystems EtherCAT has a fast Industrial Ethernet technology and is therefore suitable in applications where cycle time down to 31.25 μs is required. The encoder interface supports CANopen over EtherCAT according to CiA 301 and the device profile CiA 406. With objects for position value, speed, and acceleration, the encoder provides a wide usability for fast EtherCAT control systems.

### EtherNet/IP

EtherNet/IP is an Industrial Ethernet network that combines standard Ethernet technologies with Common Industrial Protocol, CIP. The EtherNet/IP encoders support the device profile 0x22 with available features such as preset, velocity, speed and acceleration limits, code sequence and scaling.

### DRIVE-CLiQ

DRIVE-CLiQ is an Ethernet-based protocol from Siemens. With a speed of 100 Mbit/s and a cycle time of 31.25 μs, DRIVE-CLiQ has the performance required for the most demanding applications. Components with DRIVE-CLiQ are automatically configured with each other since every component has an electronic label. The encoders are supplied with specially adapted connectors, with power supply and data in the same connector.

### SSI

Synchronous Serial Interface is a digital point-to-point interface. It provides unidirectional communication at speeds up to 10 MHz by the use of only four wires.

### EnDat 2.2

The EnDat 2.2 interface is a digital, bidirectional interface for encoders. It is capable of transmitting position values from absolute encoders, as well as reading and updating information stored in the encoder.
**Inductive 600 series**

<table>
<thead>
<tr>
<th>Shaft/Flange Options</th>
<th>Code Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid shaft (S)</td>
<td>0, 1, 2, 3</td>
</tr>
<tr>
<td>Hollow shaft (H)</td>
<td>4, 5, 6, 7</td>
</tr>
</tbody>
</table>

**Material**
- 0 = Anodized aluminium
- 3 = Stainless steel (A4)

**Resolution**
- Singleturn 13 bit: 71 = Singleturn 13 bit
- Singleturn 19 bit: 79 = Singleturn 19 bit
- Multiturn 12 bit: 80 = Multi-turn 12 bit
- Multi-turn 18 bit: 81 = Multi-turn 18 bit

**Electronics and Connection**
- SSI Binary: 09 = SSI Binary
- SSI Gray: 12 = SSI Gray
- EnDat 2.2: 15 = EnDat 2.2
- PROFIBUS: 18 = PROFIBUS
- PROFINET: 20 = PROFINET
- CANopen: 22 = CANopen
- DeviceNet: 23 = DeviceNet
- DeviceNet: 24 = DeviceNet
- DRIVE-CLiQ: 25 = DRIVE-CLiQ
- EtherCAT: 26 = EtherCAT
- EtherCAT/IP: 27 = EtherCAT/IP

**Other options**
- Blind hollow shaft: 4 = Blind hollow shaft 12 mm
- Through-going hollow shaft: 5 = Through-going hollow shaft Ø12 mm
- Keyway: 6 = Solid shaft Ø12 mm with keyway acc. Ti DIN 6885

**Performance**

**Technical data** (based on IHA 608 PROFIBUS)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-40 to +70 °C (+100 °C for SSI and EnDat)</td>
</tr>
<tr>
<td>Ingress protection class</td>
<td>IP67</td>
</tr>
<tr>
<td>Vibration, IEC 60068-2-6</td>
<td>&lt; 300 m/s²</td>
</tr>
<tr>
<td>Shock, IEC 60068-2-27</td>
<td>&lt; 2000 m/s²</td>
</tr>
<tr>
<td>Cover material</td>
<td>Anodized aluminium</td>
</tr>
<tr>
<td>Weight</td>
<td>340 g</td>
</tr>
<tr>
<td>Shaft load (axial / radial)</td>
<td>100 N / 140 N</td>
</tr>
<tr>
<td>Rotational speed max</td>
<td>12000 rpm</td>
</tr>
<tr>
<td>Shaft material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Power supply</td>
<td>9-36 Vdc</td>
</tr>
<tr>
<td>Polarity protected</td>
<td>Yes</td>
</tr>
<tr>
<td>Output signal</td>
<td>PROFIBUS DP</td>
</tr>
<tr>
<td>Supported profile</td>
<td>Profile 3.062 (DVP0) and 3.162 (DVP2)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>95 mA at 2.4 Vdc</td>
</tr>
<tr>
<td>Max. current consumption</td>
<td>150 mA at 2.4 Vdc</td>
</tr>
</tbody>
</table>

**Encoder variants** of the 600 series comply with the ATEX directive 2014/34/EU:
- EX II 3 G Ex ec II C T4 Gc X
- EX II 3 D Ex tc III C T135C Dc X

**Accessories**

We have a wide range of accessories, from different variants of cables for the right connectivity to couplings suitable for your application.

**Gateways**

For use in applications where the need of a gateway is necessary for handling signals due to distance, surroundings or other disturbances, for connection with EnDat encoder.

- CRG PROFIBUS: Robust DIN-rail-mounted gateway between EnDat and PROFIBUS.
- CRG PROFINET: Robust DIN-rail-mounted gateway between EnDat and PROFINET.
- CRG CANopen: Robust DIN-rail-mounted gateway between EnDat and CANopen.
- CRG DeviceNet: Robust DIN-rail-mounted gateway between EnDat and DeviceNet.
- CRG EtherCAT/IP: Robust DIN-rail-mounted gateway between EnDat and EtherCAT/IP.

For further information regarding our gateways and for our total range of the accessories, please visit our website www.leinelinde.com or contact your nearest Leine & Linde office.
Other solutions

1. **Encoders with additional 1 Vpp signals, 512 ppr**
   The optical absolute encoder with additional 1 Vpp has an output of analogue sinusoidal signals of 512 ppr, which makes it possible to use the encoder in safety-critical applications where detection of extremely small movements is required.

2. **Encoders with additional square wave signals**
   Leine & Linde offers absolute encoders with additional incremental square wave signals, such as HTL and RS422.

3. **Programmable SSI**
   The SSI programmable 600 series encoder contains the following programmable parameters that can be set via PC software: preset, code sequence, code type, data format and scaling parameters.

For more information about our encoder series please visit our webpage, www.leinelinde.com. Datasheets for our encoders are to be found in the product finder at the webpage or contact your nearest Leine & Linde office for further information.

Through local presence we support our customers, wherever they are, with a high level of availability and service.

Call us at +46-(0)152 - 265 00.
Contact us

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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