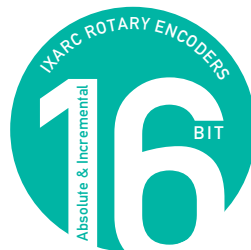




THE POSITION AND MOTION SENSORS SPECIALIST



**Magnetic Durability Meets Optical Performance**

PRECISE, ROBUST, AND COMPACT  
IXARC ROTARY ENCODERS



**IXARC High Resolution**

Meeting the high performance of an optical encoder, but providing smaller size and significantly higher durability, IXARC high resolution magnetic encoders can replace optical encoders in many applications, even in dynamic situations like motor feedback.

**No Battery – No Maintenance**

Another feature that makes IXARC magnetic encoder a reliable solution for critical environments is its battery-free design. It promises a longer lifetime since batteries are the most common cause of limited durability for such devices.

**Features**

- Contact-Free Measurement
- Incremental and SSI Interfaces
- Realtime 16 bit Resolution
- 12 bit Accuracy
- Flexible Scaling Functionality
- Up to IP69K Rated
- Salt Water Resistant
- Compact Size Down to 36 mm Diameter

**Incremental Interface**

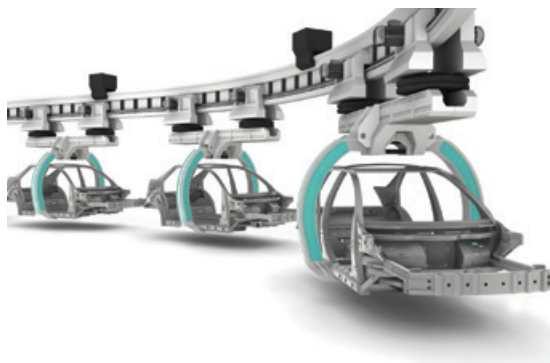
IXARC magnetic encoders provide an incremental interface with A, B, Z, and inverted signals available as HTL (Push-Pull) or TTL (RS422). Customers can choose any integer pulse count up to 16384 pulses per revolution.

**Flexible Configuration**

Compared to the previous generation of magnetic encoders, IXARC high resolution offers full control of the signal-processing. Depending on the application it is possible to adjust all relevant parameters without any costly changes to the hardware.

**Applications**

- Dynamic Motor Feedback
- Material Handling
- Wind Energy
- Medical Equipment
- Packaging
- Lift
- Construction Machinery
- Marine



## TECHNOLOGY IXARC ROTARY ENCODERS



### Singleturn Measurement Technology

The key element of the magnetic sensor is a Hall-Effect based sensor system that determines the angular position of the shaft according to the direction of a permanent magnet's magnetic field. The permanent magnet is attached to the shaft, and its magnetic field penetrates the Hall sensor.

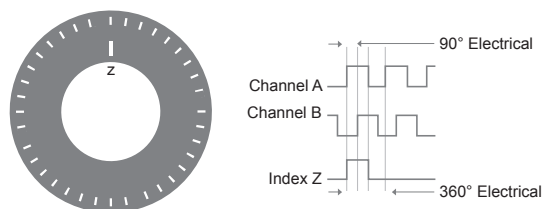
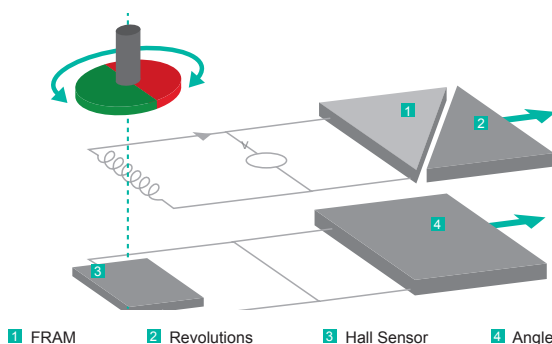
### Signal Processing is the Key to High Performance

The technological leap that pushes POSITAL's IXARC magnetic encoders to the performance level of optical systems is based on a new generation of these sensor systems. A custom Hall sensor in combination with complex signal processing by means of a powerful 32 bit microprocessor results in a considerably better resolution and accuracy in combination with latency times of only a few microseconds. POSITAL has also implemented an incremental interface, and is now able to cover the complete range of encoder solutions.



### Multiturn Measurement Technology

The Hall-Effect based sensor system is the singleturn stage of the absolute encoders. However, it does not enable the encoder to count revolutions if the external power supply is disconnected. POSITAL solves this problem by means of an energy harvesting system based on the Wiegand-Effect which requires no batteries or gears. Using batteries brings about a lot of disadvantages, since they have a limited lifespan, a considerable weight, and contain harmful substances. Gear units bring weaknesses of their own being large, complex, costly and vulnerable to shock and vibration. Regardless of the rotational speed, even at near-zero, the energy harvesting system generates short, powerful voltage pulses which supply sufficient power to the counting electronics in absolute encoders. Thus, the revolution counter is independent of any external power supply. This principle, which has proven itself since 2005, enables maintenance-free reliable measurement of absolute positions even in demanding environments for years to come.



PRODUCT OVERVIEW  
IXARC ROTARY ENCODERS

**Magnetic High Resolution Encoders with SSI Interfaces**



<b>Highlights</b>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; SSI, Ø 42 mm</li> <li>&gt; 300 N Shaft Load</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; SSI, Ø 36 mm</li> <li>&gt; IP69K</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; SSI</li> <li>&gt; IP67</li> </ul>
<b>Protection Class</b>	IP69K	IP69K	Up to IP67
<b>Communication Interface</b>	SSI	SSI	SSI
<b>Technology</b>	Magnetic	Magnetic	Magnetic
<b>Revolutions (Turns)</b>	Up to 65536	Up to 65536	Up to 65536
<b>Resolution</b>	Up to 16 bit (0.005°)	Up to 16 bit (0.005°)	Up to 16 bit (0.005°)
<b>Accuracy (INL)</b>	±0.1°	±0.1°	±0.1°
<b>Flange Size</b>	Ø 42 [1.65]	Ø 36 [1.42]	Ø 36 [1.42]
<b>in mm [in]</b>			Ø 58 [2.28]
<b>Flange Design</b>	Synchro	Synchro	All
<b>Shaft Diameters</b>	Ø 10 [0.39]	Ø 10 [0.39]	Ø 6 to 15
<b>in mm [in]</b>			[0.24 to 0.59]
<b>Material Flange / Housing</b>	Stainless Steel (V4A) / Stainless Steel (V4A)	Aluminum / Steel	Aluminum / Steel
<b>RPM /</b>	Max. 6000 /	Max. 6000 /	Max. 12000 /
<b>Radial Shaft Load in N</b>	300	180	110
<b>Shock /</b>	300 g /	300 g /	100 g /
<b>Vibration<sup>1)</sup></b>	30 g	30 g	10 g
<b>Temperature</b>	-40 to +85	-40 to +85	-40 to +85
<b>in°C [°F] /</b>	[-40 to +185] /	[-40 to +185] /	[-40 to +185] /
<b>Humidity</b>	98 %	98 %	98 %
<b>Connection Type</b>	Connector / Cable Gland	Connector / Cable Gland	Connector / Cable Gland
<b>Supply Voltage</b>	4.75 to 30 V	4.75 to 30 V	4.75 to 30 V
<b>Certificate</b>	CE	CE	CE
<b>Type Key</b>	UCD-S_ _-G10G- _ _ _	UCD-S_ _-D10D- _ _ _	UCD-S _

1) Based on (EN 60068-2-27) / (EN 60068-2-6)

Please refer to the product finder on our website for all possible combinations.

PRODUCT OVERVIEW  
IXARC ROTARY ENCODERS

Magnetic High Resolution Encoders with Incremental Interfaces



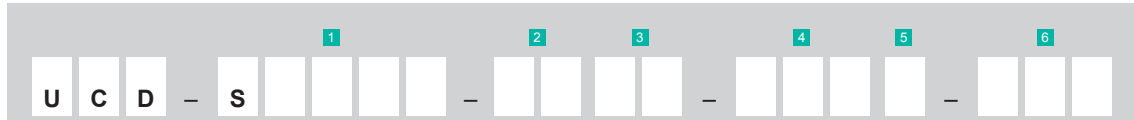
<b>Highlights</b>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; Incremental, Ø 42 mm</li> <li>&gt; 300 N Shaft Load</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; Incremental, Ø 36 mm</li> <li>&gt; IP69K</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Magnetic</li> <li>&gt; Incremental</li> <li>&gt; IP67</li> </ul>
<b>Protection Class</b>	IP69K	IP69K	Up to IP67
<b>Communication Interface</b>	Incremental	Incremental	Incremental
<b>Technology</b>	Magnetic	Magnetic	Magnetic
<b>Output Driver</b>	RS 422 (TTL), Push-Pull (HTL)	RS 422 (TTL), Push-Pull (HTL)	RS 422 (TTL), Push-Pull (HTL)
<b>Pulses per Revolution</b>	Up to 16384	Up to 16384	Up to 16384
<b>Accuracy (INL)</b>	±0.1°	±0.1°	±0.1°
<b>Accuracy (DNL)</b>	±0.003°	±0.003°	±0.003°
<b>Flange Size</b>	Ø 42 [1.65]	Ø 36 [1.42]	Ø 36 [1.42]
<b>in mm [in]</b>			Ø 58 [2.28]
<b>Flange Design</b>	Synchro	Synchro	All
<b>Shaft Diameters</b>	Ø 10 [0.39]	Ø 10 [0.39]	Ø 6 to 15
<b>in mm [in]</b>			[0.24 to 0.59]
<b>Material Flange / Housing</b>	Stainless Steel (V4A) / Stainless Steel (V4A)	Aluminum / Steel	Aluminum / Steel
<b>RPM /</b>	Max. 6000 /	Max. 6000 /	Max. 12000 /
<b>Radial Shaft Load in N</b>	300	180	110
<b>Shock /</b>	300 g /	300 g /	100 g /
<b>Vibration<sup>1)</sup></b>	30 g	30 g	10 g
<b>Temperature</b>	-40 to +85	-40 to +85	-40 to +85
<b>in°C [°F] /</b>	[-40 to +185] /	[-40 to +185] /	[-40 to +185] /
<b>Humidity</b>	98 %	98 %	98 %
<b>Connection Type</b>	Connector / Cable Gland	Connector / Cable Gland	Connector / Cable Gland
<b>Supply Voltage</b>	8 to 30 V (RS422, TTL) 4.75 to 5.5 V (RS422, TTL) 4.75 to 30 V (Push-Pull, HTL)	8 to 30 V (RS422, TTL) 4.75 to 5.5 V (RS422, TTL) 4.75 to 30 V (Push-Pull, HTL)	8 to 30 V (RS422, TTL) 4.75 to 5.5 V (RS422, TTL) 4.75 to 30 V (Push-Pull, HTL)
<b>Certificate</b>	CE	CE	CE
<b>Type Key</b>	UCD-L_-G10G-_-_-	UCD-L_-D10D-_-_-	UCD-I_-

1) Based on (EN 60068-2-27) / (EN 60068-2-6)

Please refer to the product finder on our website for all possible combinations.

## PRODUCT SELECTION GUIDE IXARC ROTARY ENCODERS

### Magnetic High Resolution Encoders with SSI Interfaces



#### 1 Communication Interface

**S101B** SSI Binary  
**S101G** SSI Gray  
**SLF1B** SSI Direct Binary

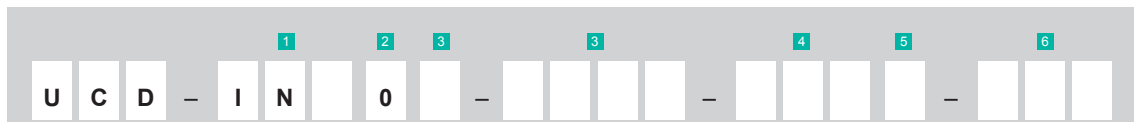
#### 2 Revolution

**00** Singleturn  
**12** Multiturn: 12 bit (4096 rev)  
**14** Multiturn: 14 bit (16384 rev)  
**16** Multiturn: 16 bit (65536 rev)  
**18** Multiturn: 18 bit (262144 rev)

#### 3 Resolution

**12** 12 bit (4096 Steps / 0.088°)  
**13** 13 bit (8192 Steps / 0.044°)  
**14** 14 bit (16384 Steps / 0.022°)  
**16** 16 bit (65536 Steps / 0.005°)

### Magnetic High Resolution Encoders with Incremental Interfaces



#### 1 Communication Interface

**INR** Incremental RS422 (TTL) w. Supply Voltage 8 to 30 V  
**INS** Incremental RS422 (TTL) w. Supply Voltage 4.75 to 5.5 V  
**INH** Incremental Push-Pull (HTL) w. Supply Voltage 4.75 to 30 V

#### 2 Pin Assignment

**0** POSITAL Standard

#### 3 Pulses per Revolution

**X-XXXX**

#### 4 Mechanical Design<sup>1)</sup>

See next page for details

#### 5 Protection Class<sup>1)</sup>

**A** IP54  
**0** IP54 to IP65  
**S** IP54 to IP67  
 (Only Clamping Flange)  
**D** IP54 to IP69K  
**G** IP54 to IP69K  
 (Stainless Steel)

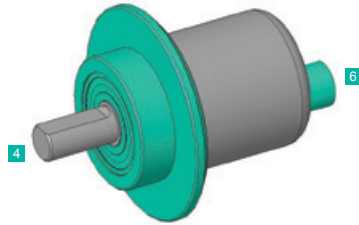
#### 6 Connection Type<sup>1)</sup>

**CAW** Cable: Axial 1 m  
**2AW** Cable: Axial 2 m  
**5AW** Cable: Axial 5 m  
**AAW** Cable: Axial 10 m  
**CRW** Cable: Radial 1 m  
**2RW** Cable: Radial 2 m  
**5RW** Cable: Radial 5 m  
**ARW** Cable: Radial 10 m  
**PAM** Connector: Axial M12 (5 pin)  
**PAQ** Connector: Axial M12 (8 pin)  
**PAL** Connector: Axial M23 (12 pin)  
**PAP** Connector: Axial M23 (16 pin)  
**PRM** Connector: Radial M12 (5 pin)  
**PRQ** Connector: Radial M12 (8 pin)  
**PRL** Connector: Radial M23 (12 pin)  
**PRP** Connector: Axial M23 (16 pin)

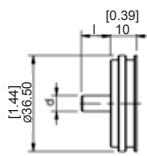
<sup>1)</sup> This customer views are used for both type keys.

PRODUCT SELECTION GUIDE  
IXARC ROTARY ENCODERS

Mechanical Design **4** and Connection Type **6**

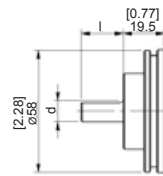


**4** Synchro Flange (R) **Ø 36**



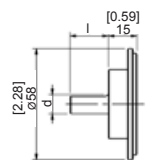
Type	d	l	Housing
R06	6	10	Type 1
R10	10	12	Type 1

**4** Clamp Flange (L) **Ø 58**



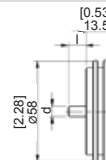
Type	d	l	Housing
L06	6	10	Type 3
L10	10	20	Type 3
L12	12	20	Type 3

**4** Clamp Flange (M) **Ø 58**



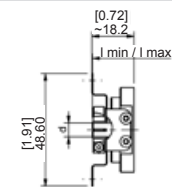
Type	d	l	Housing
M06	6	10	Type 1
M10	10	20	Type 1
M12	12	20	Type 1

**4** Synchro Flange (Y) **Ø 58**



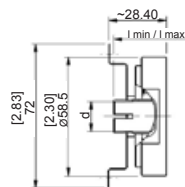
Type	d	l	Housing
Y06	6	10	Type 3
Y10	10	20	Type 3
Y12	12	20	Type 3

**4** Blind Hollow Flange (V) **Ø 36 / Ø 42**



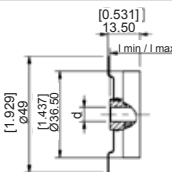
Type	d	l <sub>min/max</sub>	Housing
V06	6	12/18	Type 1
V08	8	12/18	Type 1
V10	10	12/18	Type 1
V12	12	12/18	Type 1

**4** Blind Hollow Flange (H) **Ø 58**



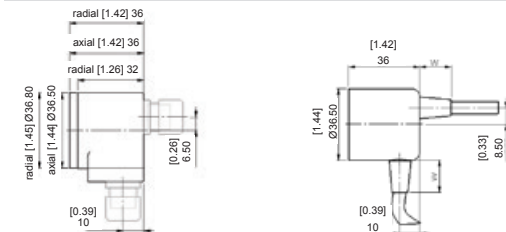
Type	d	l <sub>min/max</sub>	Housing
H06	6	15/30	Type 3
H08	8	15/30	Type 3
H12	12	15/30	Type 3
H14	14	15/30	Type 3
H15	15	15/30	Type 3

**4** Blind Hollow Flange (A06) **Ø 36**

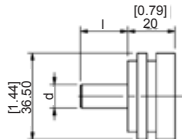


Type	d	l <sub>min/max</sub>	Housing
A06	6	11/14	Type 1

**6** Housing Type 1 **Ø 36**

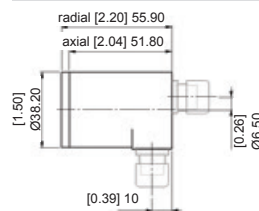


**4** Synchro HD Flange (D10D) **Ø 36**

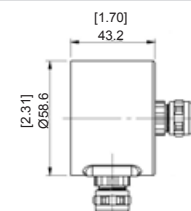


Type	d	l	Housing
D10D	10	20	Type 2

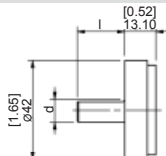
**6** Housing Type 2 **Ø 42**



**6** Housing Type 3 **Ø 58**



**4** Synchro Stainless Steel Flange (G10G) **Ø 42**



Type	d	l	Housing
G10G	10	20	See Product Finder

All measurement in mm [in]



### FRABA Group

FRABA is a group of enterprises focused on providing advanced products for the motion control and industrial automation markets. POSITAL has been a leading manufacturer of absolute rotary encoders for over 50 years and recently has expanded its business to inclination and linear sensors. Other FRABA Group subsidiaries include VITECTOR which focuses on protection sensors to guard doors and production machine covers.

### History

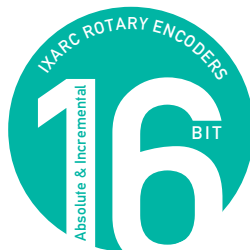
FRABA was founded by Franz Baumgartner in 1918. Until the 1960s, FRABA's main products were mechanical relays. In 1963 FRABA started selling "brush" absolute encoders and in 1973 one of the first non-contact, optical absolute rotary encoders was manufactured in the offices of FRABA in Cologne. Today, FRABA companies specialize in innovative products that use advanced technologies to deliver exceptional performance and value.

### Service

Absolute rotary encoders and absolute inclinometers are sophisticated devices that can help solve a wide range of technical problems. However, realizing the full potential of these products may require specialized knowledge when selecting the device configuration and programming the operating parameters. To ensure that customers get what they need, POSITAL's product officers in Germany, the US and Asia have direct responsibility for customer support. In addition, a growing global network of sales partners is providing expert guidance with knowledge about the local requirements.

### Production

POSITAL products are manufactured in advanced production facilities. The computer-guided semi-automated production system tracks each device from order, through assembly and testing, to final delivery. Even with thousands of unique configurations available, standard products are ready to ship within five working days of receiving an order.



[www.posital.com](http://www.posital.com)