ERCI Series

Single Turn Hall Effect - Incremental

P3 AMERICA
PRECISION SENSORS & JOYSTICKS

- A,B,Z Channels
- From 2 up to 1024 pulses per revolution
- TTL or Open Collector
- Shock and Vibration Proof
- Alternative to Optical Encoders

A magnet rotates over the sensor IC with 4 Hall sensors for angular determination and converts the magnetic field into a measurable Hall voltage. Sine and cosine voltages are generated to determine the angles. Two seperate sine/digital converters provide A,B,Z incremental signals

Electrical Data		
Output signal	**TTL**	**Open Collector**
Supply voltage	5 VDC ±10%	5VDC ±10% or 9..30 VDC
Pulses	Any pulse from 2 to128, or 256, 512, 1024	
Resolution	12 bit (4096 steps)	
Limit frequency	500 kHz	
Power consumption (no load)	≤ 30 mA	
Insulation voltage	1000 VAC @ 50 Hz, 1 min.	
Insulation resistance	2 Mohm @ 500 VDC, 1 min.	

Mechanical and Environmental Data	
Maximum radial load	1 N
Life expectancy	> 10M turns (brass bearing) / > 15M turns (polymer bearing)
Bearing	Sleeve (Polymer bearing optional)
Maximum rotational speed Standard With Polymer Bearing	 800 rpm 3000 rpm
Starting torque @ ambient temperature:	0.5 ~ 1Ncm
Operating temperature	-40ºC..+85ºC
Storage temperature	-40ºC..+90ºC
Protection grade (electronics / cable)	IP65 (IEC 60529)
Vibration (IEC 68-2-6, Test Fc)	±1.5mm / 20 g / 10..2000 Hz, 16 frequency cycles (3x4 h)
Shock (IEC 68-2-27, Test Ea)	50 g / 11 ms / half sine (3x6 shocks)

Material	
Standard Bearing	Sleeve - Brass
Polymer Bearing (optional)	Polymer
Housing	Nylon 66 Glass Filled Reinforced
Shaft	Stainless Steel
Cable	5 Core Flat Cable 0.15m (AWG28)

Note: Customers should test and verify device performance in any given application. Shaft modifications are possible, please consult us. Specifications subject to change without notice.

P3 America, Inc.
7696 183A Toll Rd.
Unit 7B
Leander TX 78641

Phone: (512) 337-7336
sales@p3america.com
www.p3america.com

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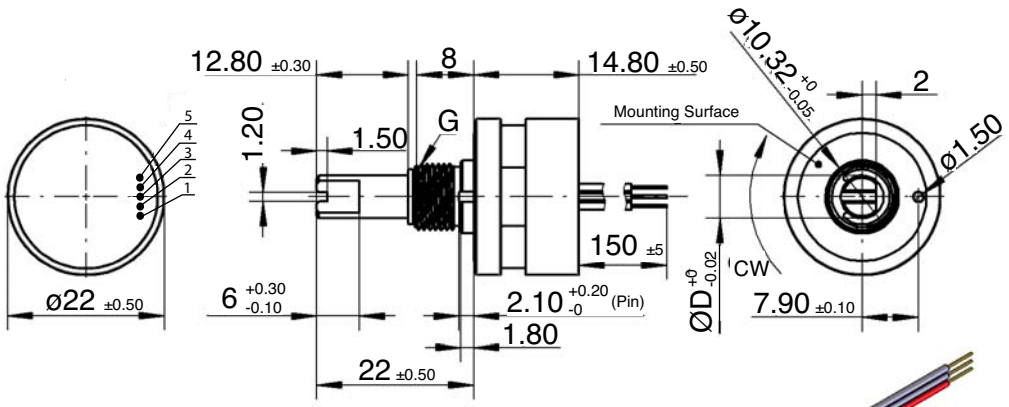
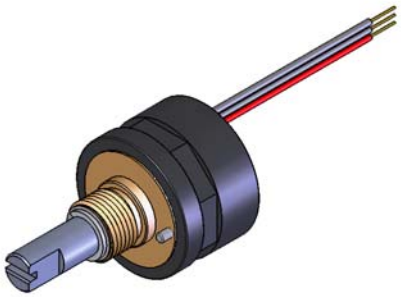
Dimensions (mm)

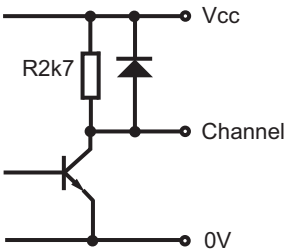




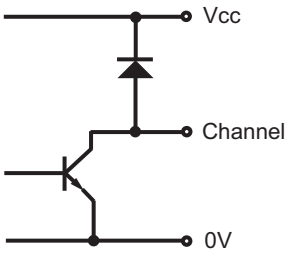
Cable assignment	
VSUP (red)	1
Z	2
B	3
A	4
GND	5

Bushing	Dimension D	Dimension G
ERC 1	**6mm**	**M10**
ERC 3	**1/4”**	**3/8 - 32**

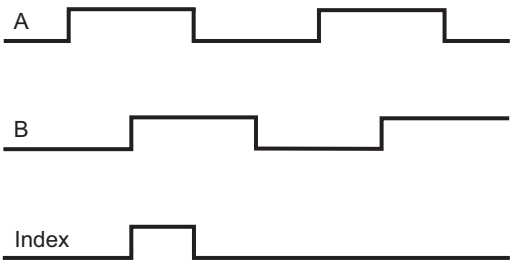
Option TTL:
Voltage Output



Option OC:
Open Collector



Signal Characteristics (CW)



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Electrical Output Characteristic Options For Incremental Versions

Overview

Modern Hall IC's in combination with special magnets and RISC processors provide intelligent customizing of output signals and interfacing. This allows for rotary sensors capable of not only replacing precision potentiometers but also optoelectronic incremental and absolute encoders. The ERC series of rotary sensors are divided into three groups: analog types with absolute analog outputs (voltage, mA or PWM), incremental output and absolute SPI or SSI output. Because of a wide variety of mechanical and electrical options it is possible to use them in almost any automation and control application where rotary angular sensing is required. Regardless of the wide vairety of existing technical features, the price is relatively low.

Incremental Output:

The ERCI series are angular position sensors with an integrated signal conditiong unit which generates constant amplitude sine and cosine voltages used for angular calculation. The maximum resolution is 4096 angular measurements per revolution (0.1°). Like in standard optical incremental encoders, a rising and falling edge at channel A and channel B is available. Thus the rotational direction can be detected. The quadrature signal consists of 2 wave signals out of phase. The Z channel enables the counter to be reset to zero with the function of of a non true power on absolute encoder.

Number of Pulses & Direction (CW/CCW).

Unlike optical encoders, any pulse between 2 and 128 pulses can befactory set. Above 128 pulses the following pulses are available: 256, 512 and 1024. The default direction of rotation is CW, however, CCW can be specified during the order process.

Direction of Rotation (CW/CCW)

The default direction of rotation is CW. It is possible to program this to a CCW operation. This option must be specified during the ordering process.

Start Up Performance

In the default version, when the sensor is switched on, first the output A-B pulses are received only if the shaft rotates. After reaching the Z pulse, it is used for resetting the counter (identical to optical encoders). With this option specified (Start Up Performance), when the sensor is switched on, the A and B output pulses are received automatically until the Z pulse is reached, then the counter can be reset without rotating the shaft. From this point, the A, B and Z outputs are received corresponding to the shaft rotation.

Z Pulse

A counter which is connected to the sensor is reset once per revolution by the Z pulse. Withing one rotation a simulation of non true power on encoder is possible. In the basic type, the counter is reset manually.

Z ero Point Programming

It is possible to position the Z Pulse in line with the marking on the shaft and bushing. Also, any offset to this marking is possible.

Inverted Signal

Channels A and B can be inverted or not inverted independent of each other. The basic type is not inverted.

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