

### PATENTED NON-CONTACT TECHNOLOGY

Joral true non-contact position sensors utilize patented technology developed in-house by Joral, LLC. Rare earth magnets take the place of physical shaft coupling for true non-contact installation. Proven in mobile hydraulics Joral non-contact position sensing enables fast installation, extreme tolerances, and exceptional durability.

- True non-contact technology for extreme installation tolerances
- Watertight, totally encapsulated electronics (IP69K)
- Rugged-duty, bullet-proof hardware
- Standard housings as well as application specific pages (*standard housings 18mm, 30mm, 38mm, 58mm*)
- LED indicators provide live feedback for power and output

### NON-CONTACT GENERAL OPERATION

A magnetic coupling is made between an *internal rotating magnet* (built into the position sensor) and an *external rotating magnet* (mounted on the application).

The non-contact sensor's *internal rotating magnet* couples with the *external rotating magnet* installed on the application.

The *external rotating magnet* (mounted on the application) and the *internal rotating magnet* (built into the encoder) magnetically couple and track as if they were physically connected.

### AT-A-GLANCE SPECIFICATIONS

**Installation Tolerances:**

<b>GAP</b>	0.5" (12mm) between application magnet and encoder
<b>AXIAL</b>	0.10" (2.5mm) center alignment
<b>PLANAR</b>	30° tilt

**Connection options include but not limited to:** M12, M12 Pigtail, M8, Terminal Block, Flying Lead Cable, and various Deutsch connectors.

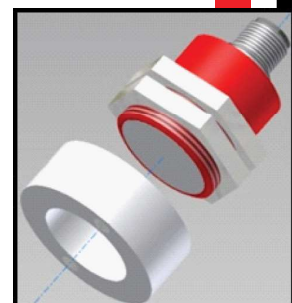
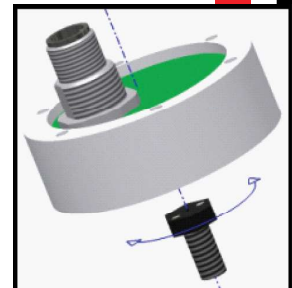
**Available Incremental Outputs:**

- Quadrature Single Ended
- Quadrature Differential
- Step and Direction
- J1939 CAN Bus

**Available Absolute Position Outputs:**

- SSI (Synchronous serial interface)
- Analog or Current Output
- PWM (Pulse width modulation)
- J1939 CAN Bus
- Modicon MODBUS

**ZERO POWER Multi-turn Capable** Contact Joral for available Zero Power options



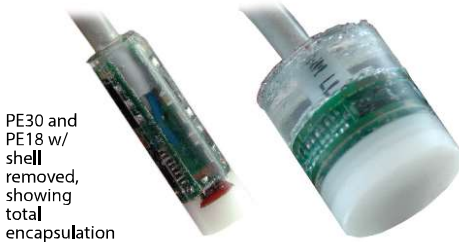
### TRUE NON-CONTACT POSITION SENSING

Joral true non-contact position sensors compensate for variations in distance, tilt, and off-center positioning of the magnet.

- Tolerances of 0.5" (12mm) gap, 30° tilt, and 0.1" (2.5mm) axial
- True non-contact limits mechanical wear
- Magnetic coupling makes for flexible installation



HP58 showing sensor internal magnet and application magnet



PE30 and PE18 w/ shell removed, showing total encapsulation

### TOTALLY ENCAPSULATED ELECTRONICS

Automotive grade transparent potting compound protects electronic components and ensures a complete seal from external forces.

- Protection from shock, vibration, and direct impact
- IP69K protection for total moisture resistance
- Clear compound allows for LED indicators to be viewed

### STANDARD PACKAGING STYLES

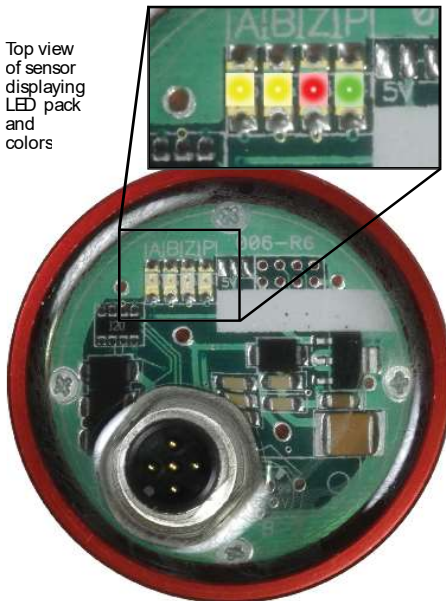
Joral non-contact sensors available in prox-style and puck-style housings; 18mm & 30mm housings make for compact rotary position sensing.

- Small, standard, and convenient housing options
- Standard diameter and thread patterns
- Uses standard prox mounting hardware



PE18 ProxEncoder™ non-contact rotary position sensor displaying compact proximity sensor housing

Top view of sensor displaying LED pack and colors



### LED INDICATORS FOR LIVE FEEDBACK

LED indicators allow for constant monitoring of the sensor's operation.

- Power LED displays the status of sensor's power connections
- Channel and index LEDs relay the status of encoder output
- LEDs make for simple in-field troubleshooting and diagnostics

### RUGGED-DUTY HARDWARE

Additional protection from electrical surges and mis-wiring are built into Joral non-contact rotary position sensors.

- Surge protectors for every input/output
- Reverse voltage protection provided against mis-wiring
- Internal auto-resettable fuse for extreme protection



## STANDARD OPERATING CHARACTERISTICS

ENCODER OUTPUT	RESOLUTION	CHARACTERISTICS
<b>Quadrature Single Ended</b> Incremental Output	<b>8 to 2048 PPR</b> - Standard Resolutions: 8, 10, 16, 20, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048	<b>Format:</b> Two channel quadrature A and B outputs with index pulse Z <b>Driver:</b> 7272 push-pull driver
<b>Quadrature Differential</b> Incremental Output	<b>8 to 2048 PPR</b> - Standard Resolutions: 8, 10, 16, 20, 32, 40, 50, 64, 80, 100, 125, 128, 200, 250, 256, 400, 500, 512, 1024, 2048	<b>Format:</b> Two channel quadrature A and B outputs with index pulse Z and complementary outputs A', B', and Z' <b>Driver:</b> 7272 push-pull driver
<b>Step and Direction</b> Incremental Output	<b>16 to 512 PPR</b> - Standard Resolutions: 16, 32, 64, 128, 256, 512	<b>Format:</b> One channel STEP output and one channel DIRECTION output with Index pulse Z <b>Driver:</b> 7272 push-pull driver
<b>SSI Absolute Position Output</b> Absolute Output	<b>8192 Positions</b> 0.0439 degrees per position	<b>Format:</b> Clock and data output <b>Driver:</b> Differential Output
<b>PWM Absolute Position Output</b> Absolute Output	<b>1024 or 2048 Positions</b>	<b>Format:</b> Pulse Width Modulation in 1 μsec increments <b>Driver:</b> 7272 push-pull driver
<b>Analog Voltage Absolute Position</b> Absolute Output	<b>0 to 5 VDC</b> -OR <b>4 to 20 mA</b> 10 bit internal resolution	<b>Format:</b> Output Voltage/Current proportional to 0-360 degrees <b>Output Loading:</b> 10mA max
<b>J1939 CAN Bus</b> Absolute or Incremental Output	<b>1000 or 8192 Positions</b> - see J1939 output pages for message information	<b>Format:</b> Standard SAE J1939 CAN Bus - One message for status, one message for settings

## ELECTRICAL SPECIFICATIONS

<b>Input Power</b>	6 to 30 VDC at approximately 60mA max, not including output loads
<b>Electrical Protection</b>	Over-voltage, Reverse-voltage, Output short-circuit protected
<b>LED Indicators</b>	Power and output channel status
<b>Connection Types</b>	M8, M12, M12 on pigtail, Terminal block, Flying lead cable, Deutsch - 4 or 6 pin

## ENVIRONMENTAL SPECIFICATIONS

<b>Operating Temperature</b>	-30 to +80 degrees C
<b>Storage Temperature</b>	-40 to +100 degrees C
<b>Humidity</b>	100%
<b>Vibration</b>	5 to 3000 Hz, 20g
<b>Shock</b>	400g 6msec (MIL STD 202)
<b>Sensor Sealing</b>	IP69K (connector dependent) <b>**Terminal block not IP rated**</b>

## MECHANICAL SPECIFICATIONS

<b>Housing Diameter</b>	18mm, 30mm, 38mm, and 58mm			
<b>Housing Material</b>	Aluminum, Stainless Steel, or Delrin™			
<b>Max Speed</b>	3000 RPM			
MODEL	HOUSING DIAMETER	WEIGHT	HEIGHT	HEIGHT w/ M12
PE18	18mm	1 oz	1.87 inches (47.5mm)	N/A
PE30	30mm	1.5 oz	1.2 inches (30.5mm)	1.75 inches (44.5mm)
HP38	38mm	1.3 oz	0.69 inches (17.5mm)	N/A
HP58	58mm	2 oz	0.75 inches (19.1mm)	1.5 inches (38.1mm)

