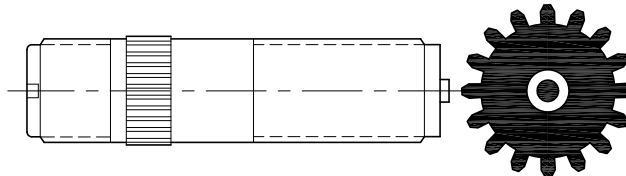


# **SPECTEC** *for INNOVATIVE SENSOR SOLUTIONS*

*Standard & Custom Sensors, Signal Conditioners  
and Interface Electronics*



## ***SPEED SENSORS***

*MAGNETIC (Active & Passive)  
HALL, GMR (Zero Speed)  
RF (Near Zero Speed)  
and other*

### ***PICKUPS***

*for:*

***SPEED • POSITION  
PROXIMITY • ACCELERATION  
TACHOMETRY • SYNCHRONIZATION  
FLOW METERS • DIRECTION***

*STANDARD TEMP. to 330° F  
HIGH TEMP. to 1000° F  
CRYOGENICS to -450° F*

## ***SIGNAL CONDITIONERS***

***MAGNETIC & RF PREAMPS  
FTC/FTV CONVERTERS  
SPEED/FLOW SWITCHES  
DIRECTIONAL INDICATORS  
POWER SUPPLIES & ENCLOSURES***

# **SPECTEC**

THUNDERBIRD INTERNATIONAL CORPORATION

P.O. Box 360 • Emigrant, MT 59027

406-333-4967 • FAX: 406-333-4259

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

ISO 9001 Registered

**Typical usage:** Speed sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.)  
Produces an analog signal with the voltage and frequency proportional to the speed.  
Inductive (MI) type sensors for magnetic targets are available in 5/8 and larger housing styles.

**Output Voltage (Vpp):** See below. Determined against 20 DP gear at a velocity of 1000 IPS with an air gap of 0.005".

**Air Gap:** **M VRS Type:** .005 to .015" Typical, .25" max. depending on target mass and velocity.  
**MI Inductive Type:** 1" max. depending on magnetic field strength and velocity.

**Temp. Ranges:** **2T:** -100° to 250° F (-73° to 120° C)  
**3T:** -150° to 330° F (-101° to 165° C)  
**5HT:** -450° to 450° F (-270° to 232° C)  
**8HT:** -450° to 850° F (-270° to 454° C) (see bottom of next page)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

**3/16"** Thread Length: .65 - 2.5" (17-64mm)  
**M5** Coil Type 1: 100 Ohm; 16mH; 6Vpp  
Temp Ranges: 3T or 5HT

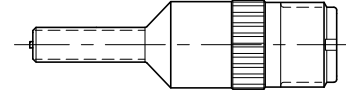
**0002** 10-32 UNF  
**0002M** M5 x 0.5  
**0002S** ø3/16 (4.7mm)



**1/4"** Thread Length: 1.0 - 3.0" (25-76mm)  
**M6** Coil Type 1: 100 Ohm; 10 mH; 6 Vpp  
Coil Type 2: 160 Ohm; 14 mH; 12 Vpp  
**M8** Temp Ranges: 3T or 5HT

**0004A** 1/4-40 UNS  
**0004AB** 1/4-28 UNF  
**0004AM** M6 x 0.75  
**0004AM8** M8 x 1.0  
**0004S** ø1/4 (6.4mm)  
**0004S8** ø5/16 (8 mm)

**0005** 1/4-40 UNS  
**0005B** 1/4-28 UNF  
**0005M** M6 x 0.75



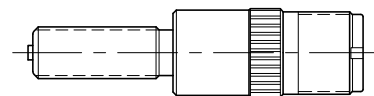
**0004** 1/4-40 UNS  
**0004B** 1/4-28 UNF  
**0004M** M6 x 0.75  
**0004H** 1/4-40 UNS  
**0004HB** 1/4-28 UNF  
**0004HM** M6 x 0.75



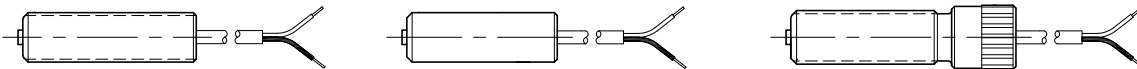
**3/8"** Thread Length: .8 - 5.0" (20-127mm)  
**M10** Coil Type 1: 100 Ohm; 10 mH; 25 Vpp  
Coil Type 2: 230 Ohm; 40 mH; 70 Vpp  
Coil Type 3: 650 Ohm; 120 mH; 85 Vpp  
Temp Ranges: 2T, 3T, or 5HT

**0008** 3/8-24 UNEF  
**0008M** M10 x 1.25  
**0008M1** M10 x 1.0  
**0008S** ø3/8 (9.5mm)

**0009** 3/8-24 UNEF  
**0009M** M10 x 1.25



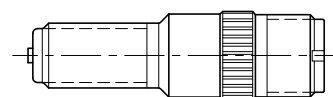
**0007** 3/8-24 UNEF  
**0007M** M10 x 1.25



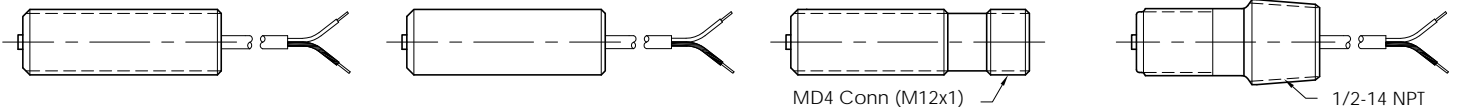
**1/2"** Thread Length: 1.0 - 6.0" (25-152mm)  
**M12** Coil Type 1: 140 Ohm; 20 mH; 30 Vpp  
Coil Type 3: 650 Ohm; 160 mH; 85 Vpp  
Coil Type 5: 1800 Ohm; 800 mH; 230 Vpp  
Temp Ranges: 2T, 3T, or 5HT

**0010A** 1/2-20 UNF  
**0010B** 1/2-32 UN  
**0010M** M12 x 1.0  
**0010S** ø1/2 (13mm)

**0011** 1/2-20 UNF  
**0011M** M12 x 1.0



**0011MD** M12 x 1.0  
**0010X** 1/2-20 UNF



CONTINUED...

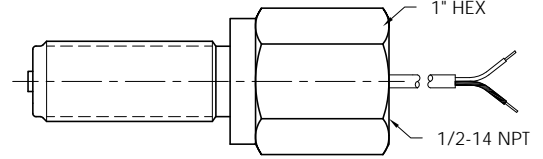
Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

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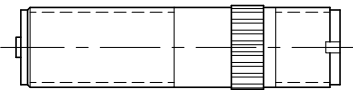
**5/8"**  
**M16**

Thread Length: .8 - 10.0" (20-250mm)  
Coil Type 1: 70 Ohm; 25mH; 40Vpp (Power)  
Coil Type 2: 150 Ohm; 85mH; 50Vpp  
Coil Type 3: 230 Ohm; 120mH; 70Vpp  
Coil Type 4: 1100 Ohm; 450mH; 180Vpp (Standard)  
Coil Type 5: 1500 Ohm; 800mH; 230Vpp  
Coil Type 6: 3000 Ohm; 1500mH; 290Vpp (High Output)  
Coil Type 7: 5000 Ohm; 2500mH; 330Vpp  
Temp Ranges: 2T, 3T, or 5HT

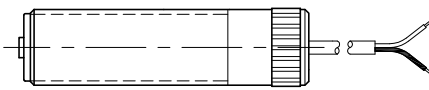
**0019Y** 5/8-18 UNF



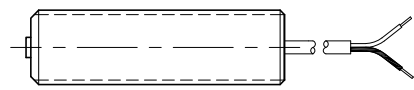
**0015** 5/8-18 UNF  
**0015M** M16 x 1.5  
**0015M1** M16 x 1.0



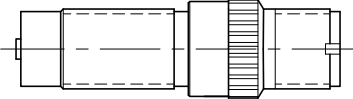
**0017** 5/8-18 UNF  
**0017M** M16 x 1.5  
**0017M1** M16 x 1.0



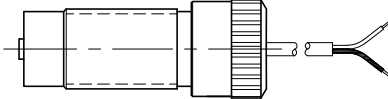
**0019** 5/8-18 UNF  
**0019M** M16 x 1.5  
**0019M1** M16 x 1.0



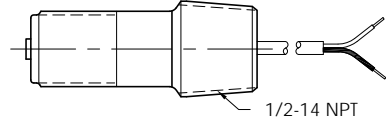
**0014** 5/8-18 UNF



**0018B** 5/8-18 UNF



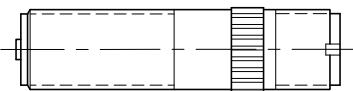
**0019X** 5/8-18 UNF



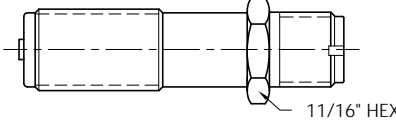
**11/16"**

Thread Length: .8 - 3.5" (20-89mm)  
Coil Types: 4 through 7 (see above)  
Temp Ranges: 2T, 3T, or 5HT

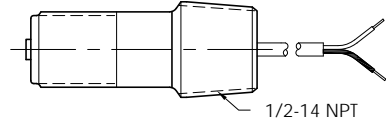
**0026** 11/16-24 UNEF



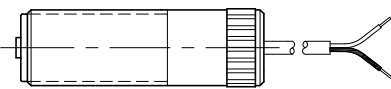
**0026H** 11/16-24 UNEF



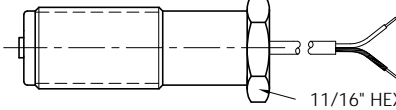
**0033** 11/16-24 UNEF



**0027** 11/16-24 UNEF



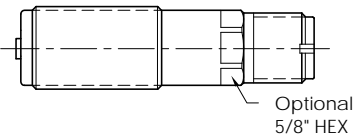
**0027H** 11/16-24 UNEF



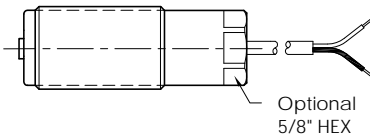
**3/4"**  
**M18**

Thread Length: .9 - 10.0" (23-250mm)  
Coil Types: 1 through 7 (see above)  
Temp Ranges: 2T, 3T, or 5HT

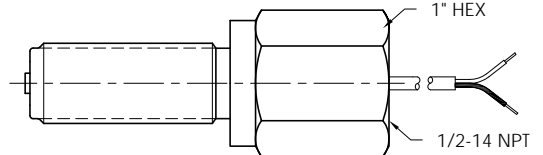
**0030** 3/4-16 UNF  
**0030B** 3/4-20 UNEF  
**0030M** M18 x 1.5  
**0030M1** M18 x 1.0



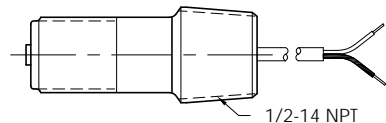
**0029** 3/4-16 UNF  
**0029B** 3/4-20 UNEF  
**0029M** M18 x 1.5  
**0029M1** M18 x 1.0



**0038** 3/4-16 UNF  
**0038B** 3/4-20 UNEF



**0035** 3/4-16 UNF  
**0035B** 3/4-20 UNEF



**8HT**  
**HIGH TEMP**

Temp Range: -450° to 850° F (-270° to 454° C)  
Available in the same housing configurations shown on this page.

**0024** Connector versions  
**0025** Lead Wire versions

**DUAL**  
**OUTPUT**

Two coils inside the same housing.  
Available in the same housing configurations and temperature ranges shown on this page.

**0021** Connector versions  
**0022** Lead Wire versions

**Typical usage:** Speed sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.)  
Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 3.5 - 30 Vdc @ 20 mA  
**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP

**Frequency Range:** 0 - 30 kHz (Std.), 100 kHz (Spcl)

**Air Gap:** 0.03" Typical, 0.50" Max. depending on target mass and velocity.

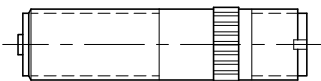
**Temp. Ranges:** **2TE:** -40° to 240° F (-40° to 120° C)  
**3TE:** -49° to 284° F (-45° to 140° C)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

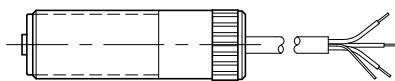
**5/8"** Thread Length: 1.25 - 10.0" (32-250mm)  
Temp Ranges: 2TE or 3TE

### M16

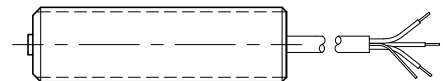
**0090** 5/8-18 UNF  
**0090M** M16 x 1.5  
**0090M1** M16 x 1.0



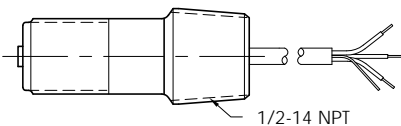
**0091** 5/8-18 UNF  
**0091M** M16 x 1.5  
**0091M1** M16 x 1.0



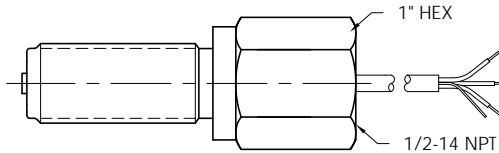
**0091A** 5/8-18 UNF  
**0091AM** M16 x 1.5  
**0091AM1** M16 x 1.0



**0091X** 5/8-18 UNF

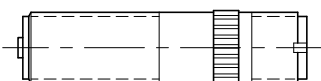


**0091Y** 5/8-18 UNF



**11/16"** Thread Length: 1.1 - 3.5" (28-89mm)  
Temp Ranges: 2TE or 3TE

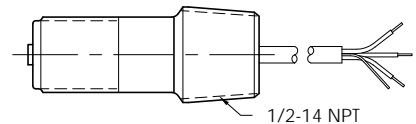
**0092** 11/16-24 UNEF



**0093** 11/16-24 UNEF



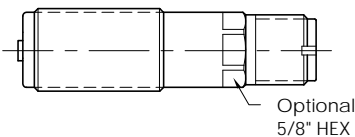
**0093X** 11/16-24 UNEF



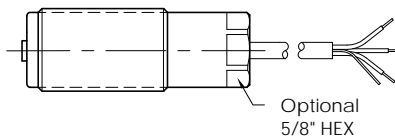
**3/4"** Thread Length: 1.0 - 10.0" (25-250mm)  
Temp Ranges: 2TE or 3TE

### M18

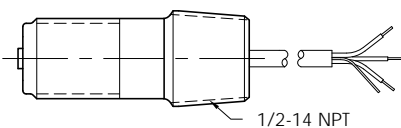
**0094** 3/4-16 UNF  
**0094B** 3/4-20 UNEF  
**0094M** M18 x 1.5  
**0094M1** M18 x 1.0



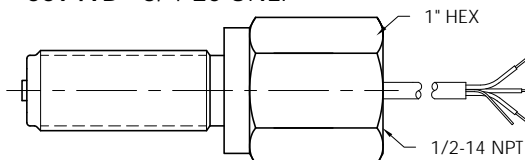
**0094L** 3/4-16 UNF  
**0094LB** 3/4-20 UNEF  
**0094LM** M18 x 1.5  
**0094LM1** M18 x 1.0



**0094X** 3/4-16 UNF  
**0094XB** 3/4-20 UNEF



**0094Y** 3/4-16 UNF  
**0094YB** 3/4-20 UNEF



**Typical usage:** Amplification of signal from passive magnetic (VRS) sensors.  
Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** See below

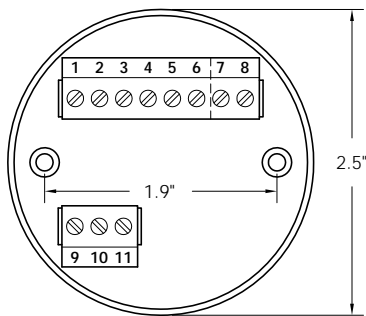
**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP Typically, See product specific sheet

**Temp. Range:** See below

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

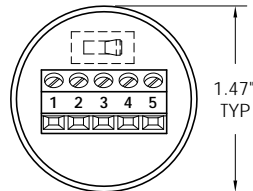
#### 4021

Pulse Amplifier  
Multi-output, Noise Canceling  
Standard and/or Opto-isolated  
Supply Voltage: 6 - 36 VDC  
Temp Range: -40° to 185° F (-40° to 85° C)  
Fits in Crouse-Hinds GUAL16 or similar enclosure



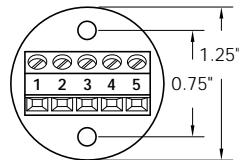
#### 4022

Pulse Amplifier  
with optional output selection  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Appleton ELBY or similar enclosure  
(adapter available for Crouse-Hinds GUAL16)



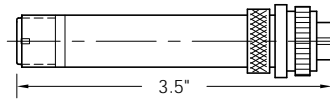
#### 4023

Pulse Amplifier  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Killark Y-1 or similar enclosure



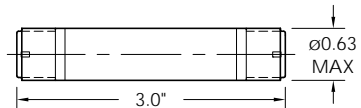
#### 4024

In-line Pulse Amplifier  
with MS Connectors for direct connection to sensor  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 248° F (-40° to 120° C)



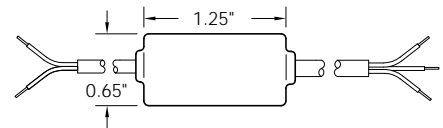
#### 4024M

In-line Pulse Amplifier  
with MS Connectors for connection to sensor with intermediate cable  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 248° F (-40° to 120° C)



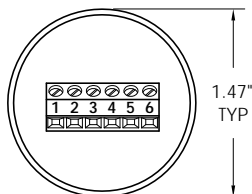
#### 4024H

Ultra Compact In-line Pulse Amplifier  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 248° F (-40° to 120° C)



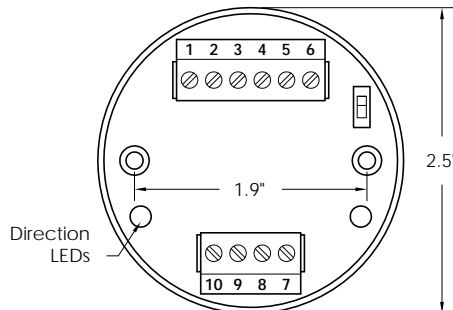
#### 4029

Digital Opto-Isolated Current Loop  
4-20 mA  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Appleton ELBY or similar enclosure  
(adapter available for Crouse-Hinds GUAL16)



#### 4033

Directional Preamp  
Provides speed and directional data from two mag pickups  
Supply Voltage: 7.5 - 30 VDC  
Temp Range: -40° to 185° F (-40° to 85° C)  
Fits in Crouse-Hinds GUAL16 or similar enclosure



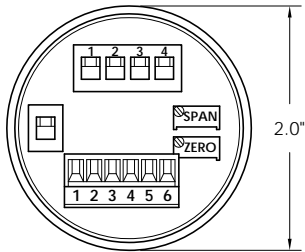
**Typical usage:** Signal conversion from passive magnetic (VRS) sensors.  
Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** See below  
**Output (Vo):** Output type varies based on product, See below  
**Temp. Range:** See below

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

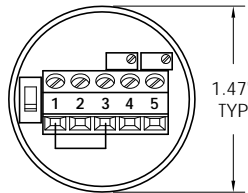
#### 4026

Frequency to Current / Voltage Converter  
4-20 mA, 10-50 mA, 0-5V, 0-10V  
Supply Voltage: 9 - 38 VDC  
Temp Range: -40° to 160° F (-40° to 70° C)  
Fits in Killark Y-3 or similar enclosure



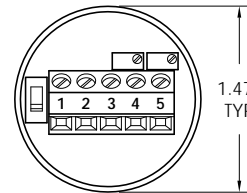
#### 4027

Frequency to Current Converter  
4-20 mA  
Supply Voltage: 9 - 36 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Appleton ELBY or similar enclosure  
(adapter available for Crouse-Hinds GUAL16)



#### 4028

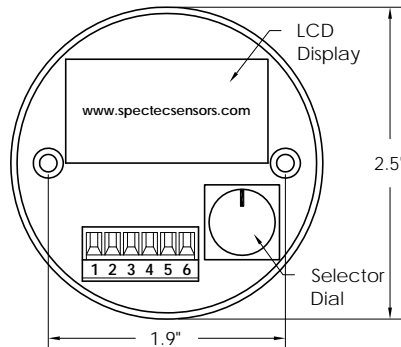
Frequency to Voltage Converter  
0-5V or 0-10V  
Supply Voltage: 8 - 36 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Appleton ELBY or similar enclosure  
(adapter available for Crouse-Hinds GUAL16)



#### 4057

User selectable K-factor scalar, frequency divider or multiplier, and frequency to voltage or current converter.

Supply Voltage: 11 - 26 VDC  
Temp Range: -40° to 170° F (-40° to 70° C)  
Fits in Crouse-Hinds GUAL16 or similar enclosure

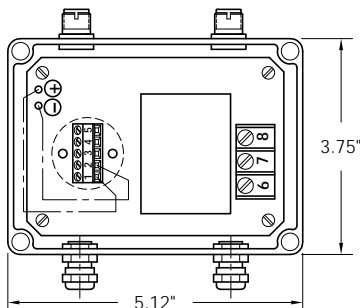


## POWER SUPPLY, SPEED SWITCH, & TEMPERATURE TRANSMITTER

### Accessories

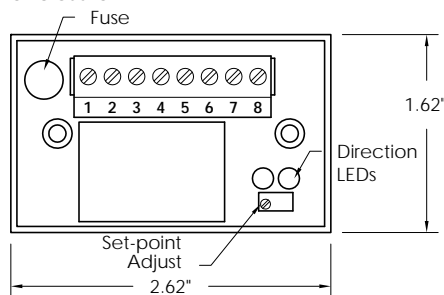
#### 4100

Universal Power Supply  
Provides a 5V, 12V, or 24V DC power supply from 120V or 240V AC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Provided with or without NEMA type enclosure or external connectors



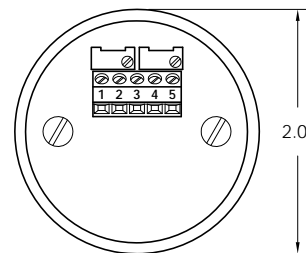
#### 4052

Programmable Speed/Flow Switch  
Provides a relay output for controlling devices based on input frequency  
Supply Voltage: 6 - 36 VDC  
Temp Range: -40° to 185° F (-40° to 85° C)  
Fits in Crouse-Hinds GUAL16 or similar enclosure



#### 4032

Temperature to Current Transmitter  
4-20 mA Output  
Supply Voltage: 6.5 - 32 VDC  
Temp Range: -40° to 185° F (-40° to 85° C)  
Fits in Killark Y-3 or similar enclosure





**Typical usage:** Low speed sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.) with no magnetic drag. A RF sensor and matched RF signal conditioner must be used together. Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** See below

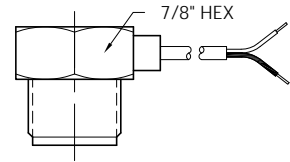
**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

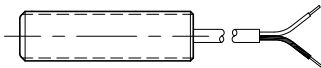
Thread Length: .5 - 6.0" (13-152mm)  
Resistance / Inductance: **RF4:** 4.0 Ohm, 0.36 mH or **RF10:** 12.0 Ohm, 1.00 mH  
Air Gap: Typically up to .130" for harsh environments, (.160" for epoxy sealed high-sensitivity version)  
Temp. Ranges: **3T:** -150° to 330° F (-101° to 165° C)  
**4HT:** -250° to 400° F (-157° to 204° C)  
**5HT:** -450° to 450° F (-270° to 232° C)  
**8HT:** -450° to 750° F (-270° to 399° C)

**RF-H90**  
5/8-18 UNF  
11/16-24 UNEF

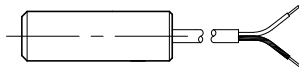
Custom made types are available



**RF-A**  
3/8-24 UNEF M10 x 1.0  
1/2-20 UNEF M12 x 1.0



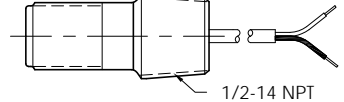
**RF-S**  
ø3/8 (9.5mm)  
ø1/2 (13mm)



**RF-K**  
1/2-20 UNF 5/8-18 UNF  
11/16-24 UNEF 3/4-16 UNF  
M18 x 1.5

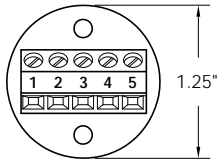


**RF-X**  
1/2-20 UNF 5/8-18 UNF  
11/16-24 UNEF 3/4-16 UNF



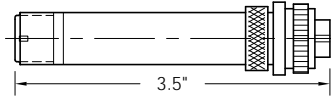
### 4013

RF Preamplifier  
Supply Voltage: 11.5 - 30 VDC  
Temp Range: -40° to 221° F (-40° to 105° C)  
Fits in Killark Y-1 or similar enclosure



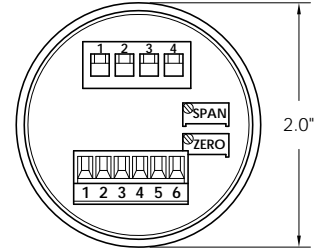
### 4014

In-line RF Preamplifier with MS Connectors for direct connection to sensor  
Supply Voltage: 11.5 - 30 VDC  
Temp Range: -40° to 284° F (-40° to 140° C)



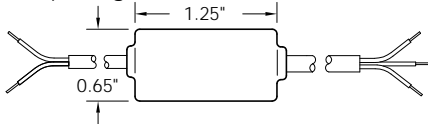
### 4016

Frequency to Current / Voltage Converter  
4-20 mA, 10-50 mA, 0-5V, 0-10V  
Supply Voltage: 12 - 30 VDC  
Temp Range: -40° to 160° F (-40° to 70° C)  
Fits in Killark Y-3 or similar enclosure



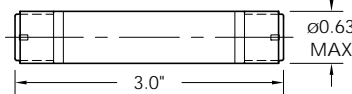
### 4014H

Ultra Compact In-line RF Preamplifier  
Supply Voltage: 11.5 - 30 VDC  
Temp Range: -40° to 284° F (-40° to 140° C)



### 4014M

In-line RF Preamplifier with MS Connectors for connection to sensor with intermediate cable  
Supply Voltage: 11.5 - 30 VDC  
Temp Range: -40° to 284° F (-40° to 140° C)



## DIGISPEC RF NEAR ZERO SPEED SENSORS

### No Magnetic Drag, With Integral Amplifier

**Typical usage:** Low speed sensing of a ferrous target (gear tooth, blade tip, etc.) with no magnetic drag. Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 7 - 30 Vdc @ 10 mA

**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP

**Frequency Range:** 0.5 - 5000 Hz

**Air Gap:** 0.160" Typical depending on target mass and velocity

**Temp. Ranges:** **2TE:** -40° to 240° F (-40° to 120° C) or **3TE:** -49° to 284° F (-45° to 140° C)

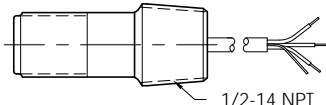
Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Thread Length: 1.25 - 8.0" (32-203mm)

**0096** 5/8-18 UNF  
**0097** 11/16-24 UNEF



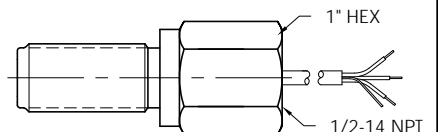
**0095X** 5/8-18 UNF  
**0098X** 11/16-24 UNEF



**0095** 5/8-18 UNF  
**0098** 11/16-24 UNEF



**0095Y** 5/8-18 UNF



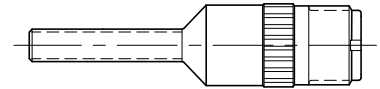
**Typical usage:** Speed or Position sensing of a magnet or magnetic field.  
Activation options include Uni-polar (south pole only), Omni-polar (both poles), and latching Bi-polar (south pole activate, north pole de-activate).  
Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 4.0 - 30 Vdc @ 18 mA  
**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP  
**Frequency Range:** 0 - 20 kHz (Standard, for precision position applications), up to 100 kHz (for high speed only)  
**Air Gap:** 0.16" Typical, 0.50" Max. depending on target mass and velocity.  
**Temp. Ranges:** **2TE:** -40° to 221° F (-40° to 105° C)  
**3TE:** -40° to 300° F (-40° to 150° C)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

**1/4"** Thread Length: 1.0 - 3.0" (25-76mm)  
**M6** Temp Ranges: 2TE or 3TE  
**M8**

**0155** 1/4-40 UNS  
**0155B** 1/4-28 UNF  
**0155M** M6 x 0.75

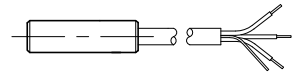
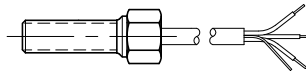
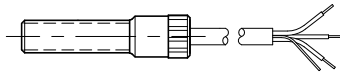
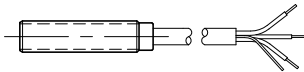


**0155A** 1/4-40 UNS  
**0155AB** 1/4-28 UNF  
**0155AM** M6 x 0.75  
**0155AM8** M8 x 1.0

**0155K** 1/4-40 UNS  
**0155KB** 1/4-28 UNF  
**0155KM** M6 x 0.75

**0155H** 1/4-40 UNS  
**0155HB** 1/4-28 UNF  
**0155HM** M6 x 0.75

**0155S** ø1/4 (6.4mm)  
**0155S8** ø5/16 (8.0mm)



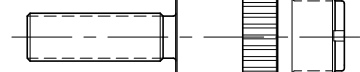
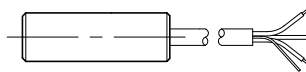
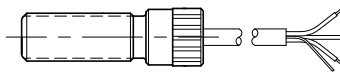
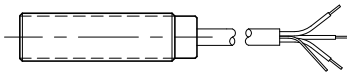
**3/8"** Thread Length: 0.8 - 6.0" (20-152mm)  
**M10** Temp Ranges: 2TE or 3TE

**0156A** 3/8-24 UNEF  
**0156M** M10 x 1.25  
**0156M1** M10 x 1.0

**0156K** 3/8-24 UNEF

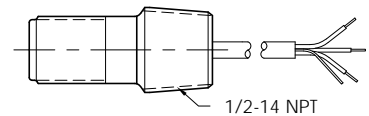
**0156S** ø3/8 (9.5mm)

**0156** 3/8-24 UNEF  
**0156MK** M10 x 1.25



**1/2"** Thread Length: 1.0 - 6.0" (25-152mm)  
**M12** Temp Ranges: 2TE or 3TE

**0158X** 1/2-20 UNF



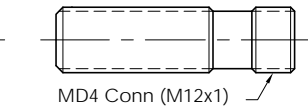
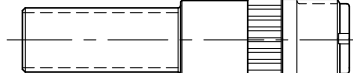
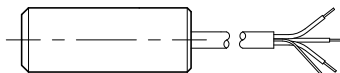
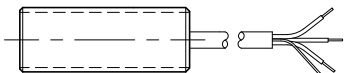
Available with dual output

**0158A** 1/2-20 UNF  
**0158B** 1/2-32 UN  
**0158M** M12 x 1.0

**0158S** ø1/2 (12.7mm)

**0158** 1/2-20 UNF  
**0158MK** M12 x 1.0

**0158MD** M12x1.0

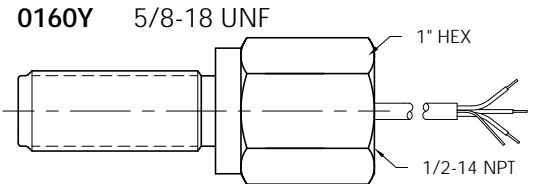
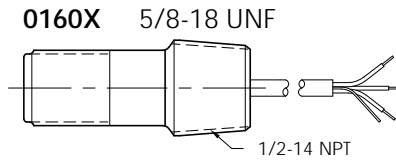




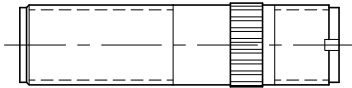
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**5/8"** Thread Length: 1.1 - 6.0" (28-152mm)  
**M16** Temp Ranges: 2TE or 3TE

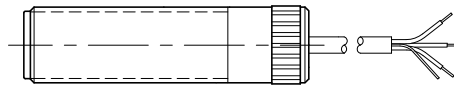
Available with dual output



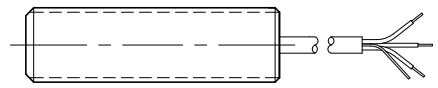
**0161** 5/8-18 UNF  
**0161M** M16 x 1.5  
**0161M1** M16 x 1.0



**0160** 5/8-18 UNF  
**0160M** M16 x 1.5  
**0160M1** M16 x 1.0



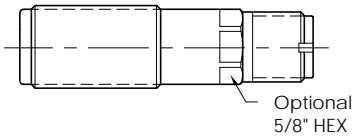
**0160A** 5/8-18 UNF  
**0160AM** M16 x 1.5  
**0160AM1** M16 x 1.0



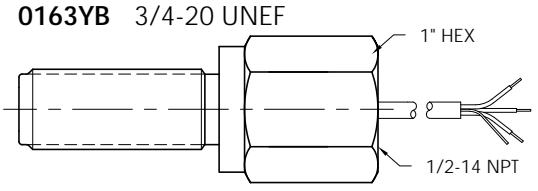
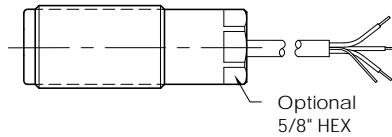
**3/4"** Thread Length: 1.0 - 6.0" (25-152mm)  
**M18** Temp Ranges: 2TE or 3TE

Available with dual output

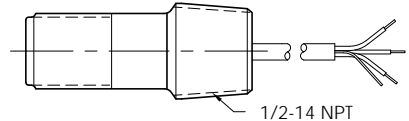
**0162** 3/4-16 UNF  
**0162B** 3/4-20 UNEF  
**0162M** M18 x 1.5  
**0162M1** M18 x 1.0



**0163** 3/4-16 UNF  
**0163B** 3/4-20 UNEF  
**0163M** M18 x 1.5  
**0163M1** M18 x 1.0



**0163X** 3/4-16 UNF  
**0163XB** 3/4-20 UNEF



## DIGISPEC LINEAR/ANGULAR POSITION SENSORS

Magnet Actuated

**Typical usage:** Position, Rotation, or Angle sensing of a magnet or magnetic field.  
Senses continuous variations in a magnetic field and produces a constant voltage proportional to the field strength.

**Supply Voltage (Vs):** 8.0 - 30 Vdc @ 5 mA  
**Signal Output (Vo):** 0.06 - 4.95 V Typical (2.5 V at zero field strength)  
**Input Sensitivity:** 5 mV / Gauss standard  
**Frequency Range:** 0 - 30 kHz  
**Air Gap:** Depends on field strength (up to 1.0" @ 3000 Gauss)  
**Temp. Ranges:** **2TE:** -40° to 221° F (-40° to 105° C)  
**3TE:** -40° to 300° F (-40° to 150° C)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

**5/8"** Thread Length: 1.0 - 6.0" (25-152mm)  
**3/4"** Temp Ranges: 2TE or 3TE

**M16**  
**M18** Available in the same housing configurations shown on this page.

**0220** Connector versions  
**0221** Lead Wire versions

**Typical usage:** Speed or Position sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.)  
Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 4.0 - 30 Vdc @ 18 mA  
**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, OC, NPN/PNP

**Frequency Range:** 0 - 20 kHz

**Air Gap:** 0.050" Typical, 0.25" Max. depending on target mass and velocity.

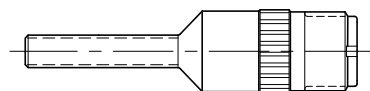
**Temp. Ranges:** **2TE:** -40° to 221° F (-40° to 105° C)

**3TE:** -40° to 300° F (-40° to 150° C)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

**1/4"** Thread Length: 1.0 - 3.0" (25-76mm)  
**M6** Temp Ranges: 2TE or 3TE  
**M8**

**0165** 1/4-40 UNS  
**0165B** 1/4-28 UNF  
**0165M** M6 x 0.75

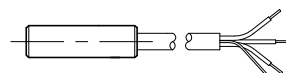
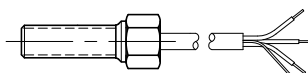
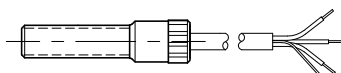
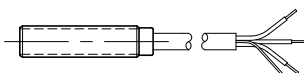


**0165A** 1/4-40 UNS  
**0165AB** 1/4-28 UNF  
**0165AM** M6 x 0.75  
**0165AM8** M8 x 1.0

**0165K** 1/4-40 UNS  
**0165KB** 1/4-28 UNF  
**0165KM** M6 x 0.75

**0165H** 1/4-40 UNS  
**0165HB** 1/4-28 UNF  
**0165HM** M6 x 0.75

**0165S** ø1/4 (6.4mm)  
**0165S8** ø5/16 (8.0mm)



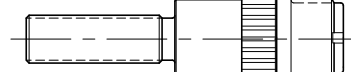
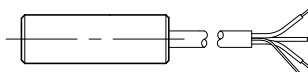
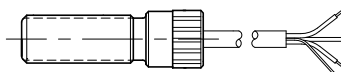
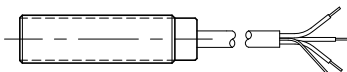
**3/8"** Thread Length: 0.8 - 6.0" (20-152mm)  
**M10** Temp Ranges: 2TE or 3TE

**0167A** 3/8-24 UNEF  
**0167M** M10 x 1.25  
**0167M1** M10 x 1.0

**0167** 3/8-24 UNEF

**0167S** ø3/8 (9.5mm)

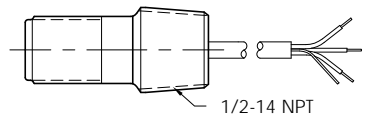
**0166** 3/8-24 UNEF  
**0166M** M10 x 1.25



**1/2"** Thread Length: 1.0 - 6.0" (25-152mm)  
**M12** Temp Ranges: 2TE or 3TE

**0168X** 1/2-20 UNF

Available with dual output

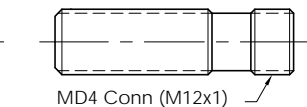
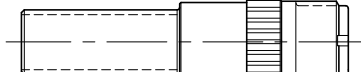
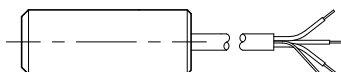
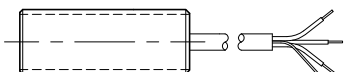


**0168A** 1/2-20 UNF  
**0168B** 1/2-32 UN  
**0168M** M12 x 1.0

**0168S** ø1/2 (12.7mm)

**0168** 1/2-20 UNF  
**0168MK** M12 x 1.0

**0168MD** M12x1.0

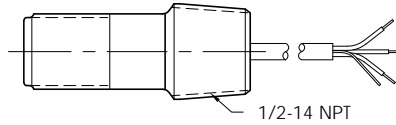


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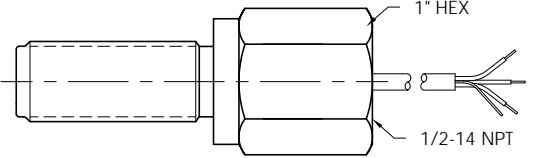
**5/8"** Thread Length: 1.1 - 6.0" (28-152mm)  
**M16** Temp Ranges: 2TE or 3TE

Available with dual output

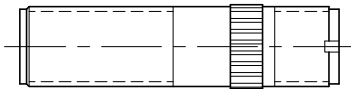
**0170X** 5/8-18 UNF



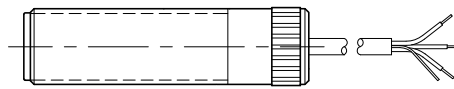
**0170Y** 5/8-18 UNF



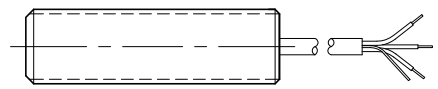
**0169** 5/8-18 UNF  
**0169M** M16 x 1.5  
**0169M1** M16 x 1.0



**0170** 5/8-18 UNF  
**0170M** M16 x 1.5  
**0170M1** M16 x 1.0



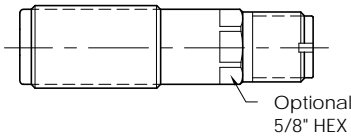
**0170A** 5/8-18 UNF  
**0170AM** M16 x 1.5  
**0170AM1** M16 x 1.0



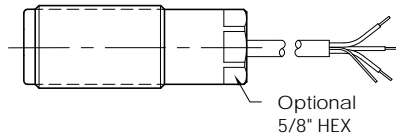
**3/4"** Thread Length: 1.0 - 6.0" (25-152mm)  
**M18** Temp Ranges: 2TE or 3TE

Available with dual output

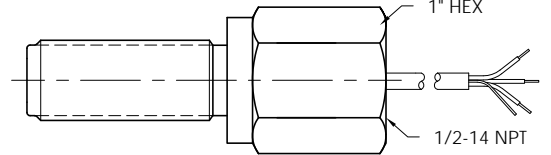
**0171** 3/4-16 UNF  
**0171B** 3/4-20 UNEF  
**0171M** M18 x 1.5  
**0171M1** M18 x 1.0



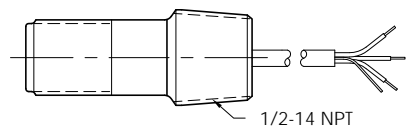
**0172** 3/4-16 UNF  
**0172B** 3/4-20 UNEF  
**0172M** M18 x 1.5  
**0172M1** M18 x 1.0



**0172YB** 3/4-20 UNEF



**0172X** 3/4-16 UNF  
**0172XB** 3/4-20 UNEF



## DIRECTIONAL HHFQ ZERO SPEED SENSORS

Ferrous Target / Gear Actuated

**Typical usage:** Speed, Position, or Direction sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.) Produces two digital square wave signals with the frequency proportional to the speed. Also produces a logic high or low direction signal.

**Supply Voltage (Vs):** 5.0 - 30 Vdc @ 15 mA

**Signal Output (Vo):** 0 - Vs, 0 - 5V(TTL), OC, PNP

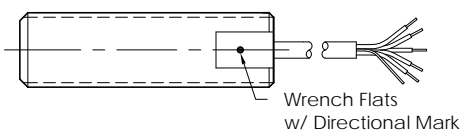
**Frequency Range:** 0 - 20 kHz

**Air Gap:** 0.050" Typical, 0.25" Max. depending on target mass and velocity.

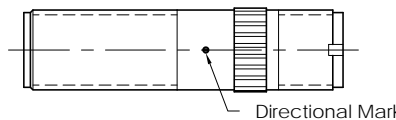
Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

**5/8", 3/4"** Thread Length: 1.7 - 8.0" (43-203mm)  
**M16, M18** Temp Range: -40° to 255° F (-40° to 125° C)

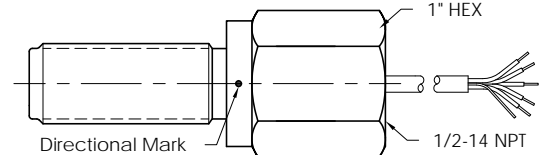
**0170Q** 5/8-18 UNF  
**0170QM** M16 x 1.5  
**0170QM1** M16 x 1.0  
**0172Q** 3/4-16 UNF  
**0172QB** 3/4-20 UNEF  
**0172QM** M18 x 1.5  
**0172QM1** M18 x 1.0



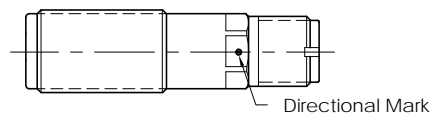
**0169Q** 5/8-18 UNF  
**0169QM** M16 x 1.5  
**0169QM1** M16 x 1.0



**0170QY** 5/8-18 UNF  
**0172QBY** 3/4-20 UNEF



**0171Q** 3/4-16 UNF  
**0171QB** 3/4-20 UNEF  
**0171QM** M18 x 1.5  
**0171QM1** M18 x 1.0



**Typical usage:** Speed sensing of a ferrous target (gear tooth, blade tip, etc.) in a hazardous environment. Produces an analog signal with the voltage and frequency proportional to the speed.

**Output Voltage (Vpp):** Limited to approximately 1 Vpp by internal diode network

**Air Gap:** .005 to .015" Typical, .25" max. depending on target mass and velocity.

**Temp. Class & Range:** T5: -40° to 185° F (-40° to 85° C) T6: -40° to 149° F (-40° to 65° C)

**Certifications:** IS40 / IS41: Intrinsically Safe (Class I, Div 1 / Class I, Zone 0) for US and Canada

IS40A / IS41A: ATEX Intrinsically Safe (Group II, Category 1G) for European Union

N40 / N41: Non-Incendive / Limited Energy (Class I, Div 2 / Class I, Zone 2) for US and Canada and ATEX Limited Energy (Group II, Category 3G) for European Union

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

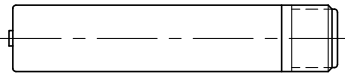
Please also see Installation Document 85045 or 85045N for requirements and certification details.

1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

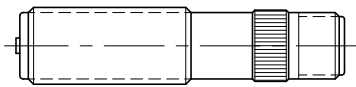
M12 M16 M18

S type (Other custom made types are available)

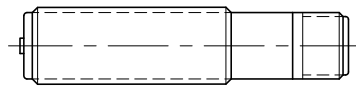


IS40, IS40A, or N40

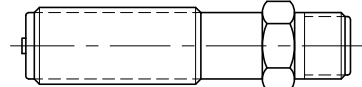
K type



A type

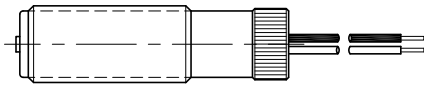


H type

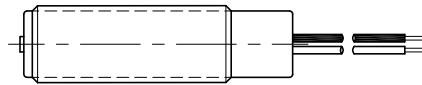


IS41, IS41A, or N41

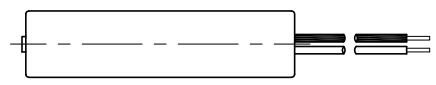
K type



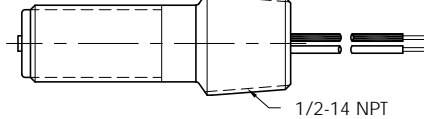
A type



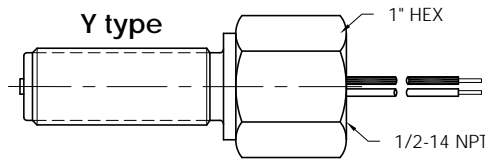
S type (Other custom made types are available)



X type



Y type



## INTRINSICALLY SAFE AND NON-INCENDIVE

### Preamplifier for Passive Magnetic Speed Sensors

**Certifications:** Similar to those shown above for IS40, etc. (see spec-sheet for details)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85049 / 85051 or 85049N / 85051N for requirements and certification details.

#### IS4021, IS4021A or N4021

Pulse Amplifier

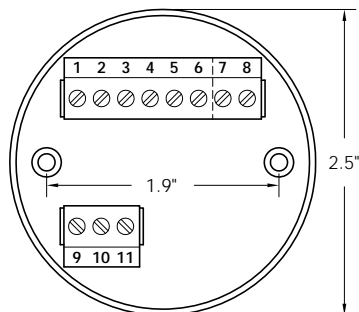
Multi-output, Noise Canceling

Supply Voltage: 7.5 - 30 VDC

Temp Class & Range:

T6: -40° to 60°C

Fits in Crouse-Hinds GUAL16 or similar enclosure



#### IS4033, IS4033A or N4033

Directional Preamp

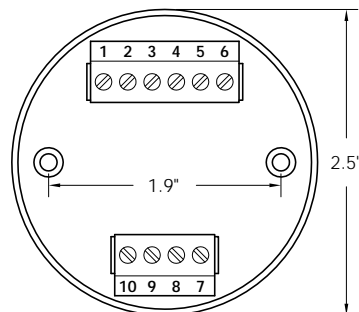
Speed and directional data

Supply Voltage: 7.5 - 30 VDC

Temp Class & Range:

T6: -40° to 60°C

Fits in Crouse-Hinds GUAL16 or similar enclosure



#### IS4027, IS4027A, or N4027

Frequency to Current

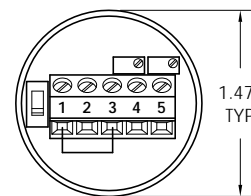
Converter 4-20 mA

Supply Voltage: 9 - 30 VDC

Temp Class & Range:

T6: -40° to 60°C

Fits in Appleton ELBY or similar enclosure (adapter available for Crouse-Hinds GUAL16)



#### IS4028, IS4028A, or N4028

Frequency to Voltage

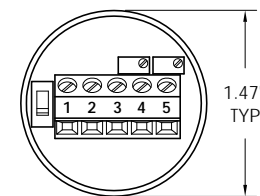
Converter 0-5V or 0-10V

Supply Voltage: 12 - 30 VDC

Temp Class & Range:

T6: -40° to 60°C

Fits in Appleton ELBY or similar enclosure (adapter available for Crouse-Hinds GUAL16)



Single channel preamplifier for use in hazardous environments can be found under IS4022, IS4022A, or N4022.

**Typical usage:** Speed sensing of a ferrous target (gear tooth, blade tip, etc.) in a hazardous environment. Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 8 - 30 Vdc @ 15 mA      **Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, 0 - Vs OC

**Frequency Range:** 5 Hz - 10 kHz

**Air Gap:** .005 to .015" Typical, .25" max. depending on target mass and velocity.

**Temp. Class & Range:** **T5:** -40° to 185° F (-40° to 85° C)      **T6:** -40° to 149° F (-40° to 65° C)

**Certifications:** **IS90 / IS91:** Intrinsically Safe (Class I, Div 1 / Class I, Zone 0) for US and Canada

**IS90A / IS91A:** ATEX Intrinsically Safe (Group II, Category 1G) for European Union

**N90 / N91:** Non-Incendive / Limited Energy (Class I, Div 2 / Class I, Zone 2) for US and Canada and ATEX Limited Energy (Group II, Category 3G) for European Union

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

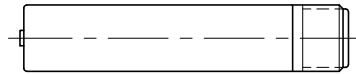
Please also see Installation Document 85047 or 85047N for requirements and certification details.

1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

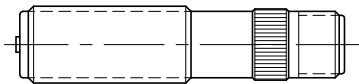
M12 M16 M18

**S type** (Other custom made types are available)



**IS90, IS90A, or N90**

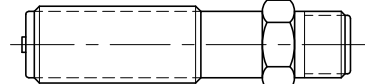
**K type**



**A type**

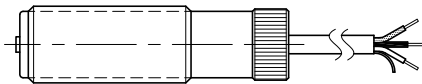


**H type**

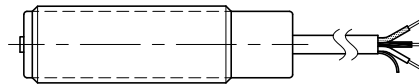


**IS91, IS91A, or N91**

**K type**

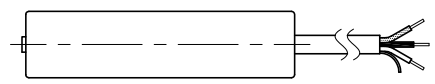


**A type**

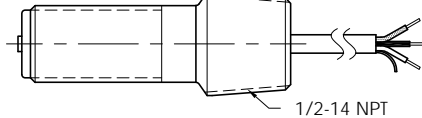


**S type**

(Other custom made types are available)

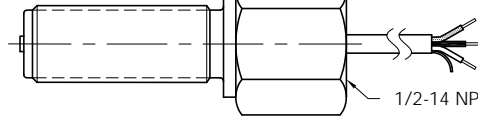


**X type**



1/2-14 NPT

**Y type**



1" HEX

1/2-14 NPT

## INTRINSICALLY SAFE AND NON-INCENDIVE

### Digispec RF Near Zero Speed Sensors

**Typical usage:** Low speed sensing of a ferrous target (gear tooth, blade tip, etc.) with no magnetic drag. Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 8 - 30 Vdc @ 15 mA      **Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, 0 - Vs OC

**Frequency Range:** 0.5 - 5000 Hz

**Air Gap:** 0.160" Typical depending on target mass and velocity

**Temp. Class & Range:** **T5:** -40° to 185° F (-40° to 85° C)      **T6:** -40° to 149° F (-40° to 65° C)

**Certifications:** Similar to those shown above for IS90, etc. (see spec-sheet for details)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85047 or 85047N for requirements and certification details.

1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

M12 M16 M18

Available in the same housing configurations shown above.

**IS100, IS100A, or N100 Connector Version**

**IS101, IS101A, or N101 Lead Wire Version**

RF sensors without the preamplifier for use in hazardous environments can be found under IS70, IS71, and variants.



**Typical usage:** Speed or Position sensing of a magnet or magnetic field in a hazardous environment. Several activation options are available (Uni-polar, Omni-polar, etc).

Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 5 - 30 Vdc @ 15 mA     **Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, 0 - Vs OC, NPN/PNP  
**Frequency Range:** 0 - 20 kHz (Standard, for precision position applications), up to 100 kHz (for high speed only)

**Air Gap:** 0.16" Typical, 0.50" Max. depending on target mass and velocity.

**Temp. Class & Range:** **T5:** -40° to 185° F (-40° to 85° C)     **T6:** -40° to 149° F (-40° to 65° C)

**Certifications:** **IS160 / IS161:** Intrinsically Safe (Class I, Div 1 / Class I, Zone 0) for US and Canada

**IS160A / IS161A:** ATEX Intrinsically Safe (Group II, Category 1G) for European Union

**N160 / N161:** Non-Incendive / Limited Energy (Class I, Div 2 / Class I, Zone 2) for US and Canada and ATEX Limited Energy (Group II, Category 3G) for European Union

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85047 / 85048 or 85047N / 85048N for requirements and certification details.

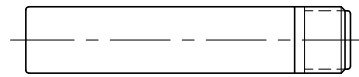
1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

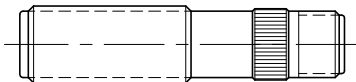
M12 M16 M18

**IS160, IS160A, or N160 Single Output**  
**IS164, IS164A, or N164 Dual Output**  
**IS180, IS180A, or N180 Dual Output w/ Direction**

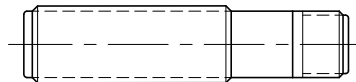
**S type** (Other custom made types are available)



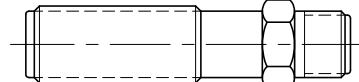
**K type**



**A type**

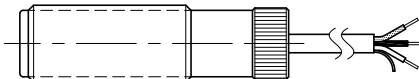


**H type**

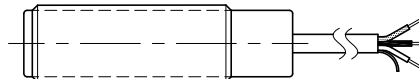


**IS161, IS161A, or N161 Single Output**  
**IS165, IS165A, or N165 Dual Output**  
**IS181, IS181A, or N181 Dual Output w/ Direction**

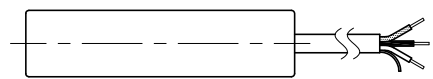
**K type**



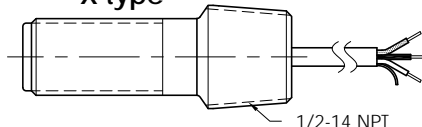
**A type**



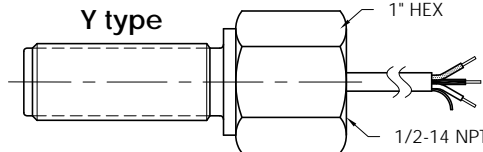
**S type** (Other custom made types are available)



**X type**



**Y type**



## INTRINSICALLY SAFE AND NON-INCENDIVE

### Digispec Linear / Angular Position Sensors

**Typical usage:** Position, Rotation, or Angle sensing of a magnet or magnetic field in a hazardous environment. Senses continuous variations in a magnetic field and produces a constant voltage proportional to the field strength.

**Supply Voltage (Vs):** 8 - 30 Vdc @ 8 mA     **Signal Out (Vo):** 0.06 - 4.95 V Typical (2.5 V at zero field strength)

**Frequency Range:** 0 - 30 kHz     **Air Gap:** Depends on field strength (up to 1.0" @ 3000 Gauss)

**Temp. Class & Range:** **T5:** -40° to 185° F (-40° to 85° C)     **T6:** -40° to 149° F (-40° to 65° C)

**Certifications:** Similar to those shown above for IS160, etc. (see spec-sheet for details)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85047 or 85047N for requirements and certification details.

1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

M12 M16 M18

**IS220, IS220A, or N220 Connector Version**  
**IS221, IS221A, or N221 Lead Wire Version**

Available in the same housing configurations shown above.

**Typical usage:** Speed or Position sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc) in a hazardous environment. Produces a digital square wave signal with the frequency proportional to the speed.

**Supply Voltage (Vs):** 5 - 30 Vdc @ 15 mA

**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, 0 - Vs OC, NPN/PNP

**Frequency Range:** 0 - 20 kHz

**Air Gap:** 0.050" Typical, 0.25" Max. depending on target mass and velocity.

**Temp. Class & Range:** T5: -40° to 185° F (-40° to 85° C) T6: -40° to 149° F (-40° to 65° C)

**Certifications:** IS170 / IS171: Intrinsically Safe (Class I, Div 1 / Class I, Zone 0) for US and Canada

IS170A / IS171A: ATEX Intrinsically Safe (Group II, Category 1G) for European Union

N170 / N171: Non-Incendive / Limited Energy (Class I, Div 2 / Class I, Zone 2) for US and Canada and ATEX Limited Energy (Group II, Category 3G) for European Union

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85047 / 85048 or 85047N / 85048N for requirements and certification details.

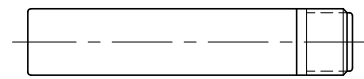
1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

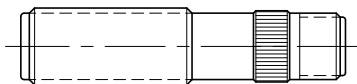
M12 M16 M18

IS170, IS170A, or N170 Single Output  
IS174, IS174A, or N174 Dual Output

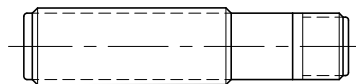
S type (Other custom made types are available)



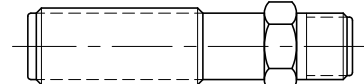
K type



A type

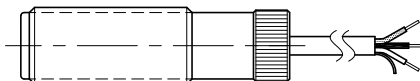


H type

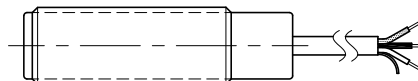


IS171, IS171A, or N171 Single Output  
IS175, IS175A, or N175 Dual Output

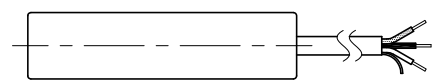
K type



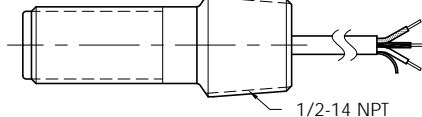
A type



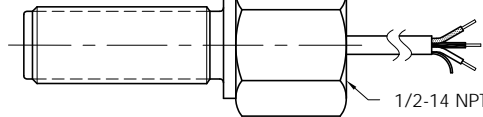
S type (Other custom made types are available)



X type



Y type



## INTRINSICALLY SAFE AND NON-INCENDIVE

### Digispec Gear Actuated Directional Hall Effect Zero Speed Sensors

**Typical usage:** Speed, Position, or Direction sensing of a ferrous target (gear tooth, blade tip, bolt head, keyway, etc.) in an hazardous environment. Produces two digital square wave signals with the frequency proportional to the speed and a logic high or low direction signal.

**Supply Voltage (Vs):** 5 - 30 Vdc @ 15 mA

**Pulse Out (Vo):** 0 - Vs, 0 - 5V(TTL), 0 - 10V, 0 - Vs OC, NPN/PNP

**Frequency Range:** 0 - 20 kHz

**Air Gap:** 0.050" Typical, 0.25" Max. depending on target mass and velocity.

**Temp. Class & Range:** T5: -40° to 185° F (-40° to 85° C) T6: -40° to 149° F (-40° to 65° C)

**Certifications:** Similar to those shown above for IS170, etc. (see spec-sheet for details)

Please contact [info@spectecsensors.com](mailto:info@spectecsensors.com) for detailed spec-sheets on each sensor family listed.

Please also see Installation Document 85048 or 85048N for requirements and certification details.

1/2" 5/8" Thread Length: .75 - 13.0" (19-330mm)

11/16" 3/4"

M12 M16 M18

IS190, IS190A, or N190 Connector Version  
IS191, IS191A, or N191 Lead Wire Version

Available in the same housing configurations shown above.