SPEED SENSORS

Magnetic Speed Sensors (Active & Passive)
Hall Effect Speed Sensors, GBR (Zero Speed)
RF Pickups (Near Zero Speed)
Intrinsically Safe Speed Sensors
and other PICKUPS for:
SPEED • POSITION
PROXIMITY • ACCELERATION
TACHOMETERY • SYNCHRONIZATION
FLOW METERS • DIRECTION

Standard Temperature Range -150 to 330°F
High Temperature Speed Sensors to 1000°F
Cryogenic Sensors to -450°F

SIGNAL CONDITIONERS

Magnetic & RF Sensor Preamps
Frequency to Voltage Converters
4-20mA Converters
Speed/Flow Switches
Directional Indicators
DC Power Supplies & Enclosures
## SHORT FORM CATALOG

**PASSIVE MAGNETIC SPEED SENSORS**

Variable Reluctance Sensors - Inductive Sensors

<table>
<thead>
<tr>
<th>Output Voltage (Vpp):</th>
<th>Contact Spectec for magnetic pickup's coil resistance/inductance/output voltage specs.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Gap:</strong></td>
<td><strong>M VR Sensor:</strong> .25&quot; max depending on target mass and velocity.</td>
</tr>
<tr>
<td><strong>MI Inductive Sensor:</strong></td>
<td>1&quot; max. depending on magnetic field strength and velocity.</td>
</tr>
<tr>
<td><strong>Temp. Ranges:</strong></td>
<td><strong>2T:</strong> -100° to 250° F (-73° to 120° C)</td>
</tr>
<tr>
<td></td>
<td><strong>3T:</strong> -150° to 330° F (-101° to 165° C)</td>
</tr>
<tr>
<td></td>
<td><strong>5HT:</strong> -450° to 450° F (-270° to 232° C)</td>
</tr>
<tr>
<td></td>
<td><strong>8HT:</strong> -450° to 850° F (-270° to 454° C)</td>
</tr>
</tbody>
</table>

**NOTE:** Can be used with [PA-20 signal conditioners](#) for digital output.

### 3/16

- **Thread Size:** 10-32
- **Length (L):** 0.5" to 2.5" (13 to 64 mm)
- **Coil Type 1:** R: 100 Ohm; L: 5mH; 8Vpp
- **Temp Ranges:** 2T or 5HT

### 1/4

- **Thread Size:** 1/4-40, 1/4-28, M6x1
- **Length (L):** 0.6" to 3" (15 to 75 mm)
- **Coil Type 1:** 125 Ohm; 10 mH; 5 Vpp
- **Coil Type 2:** 250 Ohm; 10 mH; 10 Vpp
- **Temp Ranges:** 2T or 5HT

### 3/8

- **Thread Size:** 3/8-24, M10x1.25
- **Length (L):** 0.6" to 5" (15 to 130 mm)
- **Coil Type 1:** 100 Ohm; 16 mH; 25 Vpp
- **Coil Type 2:** 250 Ohm; 10 mH; 10 Vpp
- **Coil Type 3:** 650 Ohm; 160 mH; 85 Vpp
- **Coil Type 4:** 1100 Ohm; 450 mH; 110 Vpp
- **Temp Ranges:** 2T, 3T or 5HT

### 1/2

- **Thread Size:** 1/2-20, M12x1
- **Length (L):** 0.8" to 5" (20 to 130 mm)
- **Coil Type 1:** R: 140 Ohm; L: 20mH; 30Vpp
- **Coil Type 3:** R: 650 Ohm; L: 160mH; 85Vpp
- **Temp Ranges:** 2T or 5HT

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
### 5/8 M16
- **Thread Size:** 5/8-18 UNF, M16x1.5
- **Length (L):** 0.8” to 10” (20 to 250 mm)
- **Temp Ranges:** 2T, 3T or 5HT

**Coil Types:**
- **Coil Type 1:** 100 Ohm; 30 mH; 45 Vpp
- **Coil Type 2:** 230 Ohm; 90 mH; 75 Vpp
- **Coil Type 3:** 100 Ohm; 700 mH; 210 Vpp (Standard)
- **Coil Type 4:** 1500 Ohm; 800 mH; 240 Vpp
- **Coil Type 5:** 3000 Ohm; 1500 mH; 290 Vpp
- **Coil Type 6:** 5000 Ohm; 2500 mH; 330 Vpp (High Output)

### 11/16
- **Thread Size:** 11/16-24
- **Length (L):** 0.8” to 3.5” (20 to 90 mm)
- **Temp Ranges:** 2T, 3T or 5HT

**Coil Types:**
- **Coil Type 1:** 100 Ohm; 30 mH; 45 Vpp
- **Coil Type 2:** 230 Ohm; 90 mH; 75 Vpp
- **Coil Type 3:** 100 Ohm; 700 mH; 210 Vpp (Standard)
- **Coil Type 4:** 1500 Ohm; 800 mH; 240 Vpp
- **Coil Type 5:** 3000 Ohm; 1500 mH; 290 Vpp
- **Coil Type 6:** 5000 Ohm; 2500 mH; 330 Vpp (High Output)

### 3/4 M18
- **Thread Size:** 3/4-16, 3/4-20, M18x1.5
- **Length (L):** 0.8” to 10” (20 to 250 mm)
- **Temp Ranges:** 2T, 3T or 5HT

**Coil Types:**
- **Coil Type 1:** 100 Ohm; 30 mH; 45 Vpp
- **Coil Type 2:** 230 Ohm; 90 mH; 75 Vpp
- **Coil Type 3:** 100 Ohm; 700 mH; 210 Vpp (Standard)
- **Coil Type 4:** 1500 Ohm; 800 mH; 240 Vpp
- **Coil Type 5:** 3000 Ohm; 1500 mH; 290 Vpp
- **Coil Type 6:** 5000 Ohm; 2500 mH; 330 Vpp (High Output)

**5/8 11/16 3/4 M18**

**Thread Size:** 5/8-18, 11/16-24, 3/4-16, 3/4-20, M18x1.5
- **Length (L):** 3” to 10” (76 to 250 mm)
- **Temp Range:** 8HT: -450° to 850° F (-270° to 454° C)
- **Coil Type 1:** 120 Ohm
- **High Temperature Magnetic Sensor**

**Dual Output Magnetic Speed Sensors**
Available in the same housing configurations as single output models. **0021:** Connector Version **0022:** Lead Wire Version

**Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.**

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DIGISPEC Magnetic pickups produce a digital frequency output directly proportional to speed. The internal amplifier provides for constant pulse shaping, signal amplitude, logic-level output, robust signal-to-noise ratio, usable at lower RPMs and greater air gap between the sensor and the actuator.

MICROPOWER versions are available for ultra low current draw, ideal for battery applications.

A sanitary version to NEMA 6, IP65 & IP67 is also offered.

All models are also available with an internal temperature probe (RTD100 Ohm, NTC10 k Ohm).

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8-18 UNF, M16x1.5</td>
<td>2.5” to 10” (64 to 250 mm)</td>
</tr>
<tr>
<td>11/16-24</td>
<td>2.5” to 3.5” (64 to 90 mm)</td>
</tr>
<tr>
<td>3/4-16, 3/4-20, M18x1.5</td>
<td>2.5” to 10” (64 to 250 mm)</td>
</tr>
</tbody>
</table>

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
## SHORT FORM CATALOG

### DIGISPEC PREAMPS & CONVERTERS

**PA-20 For Standard Magnetic Speed Sensors**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage (Vs)</td>
<td>5 - 30 Vdc Std</td>
</tr>
<tr>
<td>Input Current</td>
<td>15 mA Std.</td>
</tr>
<tr>
<td>Pulse Out (Vo)</td>
<td>1 - 10 Vpp Std.</td>
</tr>
<tr>
<td>Temperature Ranges</td>
<td><strong>Standard:</strong> -40° to 160° F (-40° to 80° C), <strong>In Line &amp; Ultra Compact:</strong> -40° to 240° F (-40° to 120° C)</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>To 10 kHz, up to 40 kHz varies with signal level, target size, air gap &amp; sensor. <strong>Micro</strong> 1 Hz-30 kHz</td>
</tr>
</tbody>
</table>

### 4021 Pulse Amplifier
- Multi Output, Noise Canceling
- Standard and/or Opto-isolated
- Fits GUAL-16 type Explosion-proof enclosure

### 4022 Pulse Amplifier
- With Optional Output Select
- Fits Elby Explosion-proof enclosure

### 4023 Pulse Amplifier
- Fits Y1 Explosion-proof enclosure

### 4024 in-Line Pulse Amplifier
- With MS Connector

### 4026 FTC - FTV Converter
- **FTC Converter:** 4-20mA, 10-50mA
- **FTV Converter:** 0-5 Vpp, 0-10 Vpp
- Fits Y3 Explosion-proof enclosure

### 4027 Freq to Current Converter
- 4-20 mA Converter fits Elby Explosion-proof enclosure

### 4028 Freq to Voltage Converter
- 0-5 V or 0-10 V FTV Converter fits Elby Explosion-proof enclosure

### 4029 Digital Opto-Isolated Current Loop
- Fits Elby Explosion-proof enclosures

### 4033 Directional Mag Preamp
- Provides directional data from two magnetic speed pickups
- Fits Y3 Explosion-proof enclosure

### 4051 Speed Flow Switch, SS1
- For Magnetic Speed sensors, Open collector output
- Fits Elby Explosion-proof enclosure

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Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
Inductance/Resistance Options:  
- **RF4**: 4.00 Ohm, 0.36 mH  
- **RF10**: 12.00 Ohm, 1.00 mH

Air Gap:  
- **Open Face**: ≤ .160", **Closed Face**: ≤ .130

Frequency Range:  
- ≤ 5 Hz to 6000 Hz

Temperature Ranges:  
- **3T**: -150° to 330° F (-101° to 165° C)  
- **4HT**: -350° to 400° F (-157° to 204° C)  
- **5HT**: -450° to 450° F (-270° to 232° C)

**NOTE:** Must be used with PA-10

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Length (L)</th>
<th>Thread Size</th>
<th>Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 M10</td>
<td>0.5&quot; to 5&quot; (13 to 130 mm)</td>
<td>1/2-20</td>
<td>0.5&quot; to 5&quot; (13 to 130 mm)</td>
</tr>
<tr>
<td>5/8 M16</td>
<td>0.5&quot; to 10&quot; (13 to 250 mm)</td>
<td>11/16-24</td>
<td>0.5&quot; to 3.5&quot; (13 to 90 mm)</td>
</tr>
<tr>
<td>3/4 M18</td>
<td>0.5&quot; to 10&quot; (13 to 250 mm)</td>
<td>3/8-24, M10x1.25</td>
<td>0.5&quot; to 5&quot; (13 to 130 mm)</td>
</tr>
</tbody>
</table>

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
Supply Voltage (Vs): 7 - 30 Vdc @ 15 mA
Pulse Out (Vo): 0 - Vs, 0 - 5V (TTL), 0 - 10 V, Open Collector (NPN or PNP)
Frequency Range: 0.5 Hz to 5 kHz
Air Gap: 0.16” (4mm) Max., depending on target mass and velocity.
Temp. Ranges: 2TE: -40° to 220° F (-40° to 120° C)
3TE: -40° to 290° F (-40° to 145° C)

SPECTEC's RF pickups are active sensors driven by an external RF ("carrier") signal conditioner. Together they complete an oscillating circuit. The output of this circuit is amplitude modulated when a ferrous object passes by the pickup coil. This change in modulation of the carrier frequency is converted into a square wave pulse by the signal conditioner for computing and/or further processing. DIGISPEC RF pickups have good EMI protection and reverse polarity protection.

DIGISPEC RF flow meter sensors are available in open face design for greater sensitivity or closed face design for greater environmental sealing.

Custom digital RF pickup sensors or OEM replacement speed sensors available. An internal temperature probe (NTC10, RTD100 or others) is available which is positioned near the face of the sensor.

5/8
Thread Size: 5/8-18 UNF, M16x1.5
Length (L): 2.5” to 10” (64 to 250 mm)

11/16
Thread Size: 11/16-24
Length (L): 2.1” to 3.5” (54 to 90 mm)

3/4
Thread Size: 3/4-16, 3/4-20, M18x1.5
Length (L): 2.1” to 10” (54 to 250 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
PA-10
Supply Voltage (Vs): 5 - 30 Vdc Std
Input Current: ≤ 10 mA
Pulse Out (Vo): 0 - 10 Vpp Std. or 0 - 5 Vpp (Micropower)
Frequency Range: Near 0 to 5 kHz depending on target mass and air gap.
Temp. Ranges:
- 2TE: -40° to 220° F (-40° to 120° C),
- 3TE: -40° to 290° F (-40° to 145° C)

4013 Pulse Amplifier
Fits Y1 Explosion-proof enclosure

4014 in-Line Pulse Amplifier
With MS Connector

4014M

4014H

4032 Two Wire Temperature Transmitter
For use with RTDs or thermocouples
Fits Y3 Explosion-proof enclosure

4100 Universal Power Supply
For Magnetic speed sensor & RF pickup signal conditioners
Fits Y3 Explosion-proof enclosure
Supply voltage (Vs): 120 Vac 10%, 25 mA
Voltage Out (Vo): 5Vdc, 12Vdc or 24Vdc
Connections: AC primary, DC output

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
### Magnetic Actuated - Zero Speed Sensors

**Supplementary Voltage (Vs):** 4.5 - 30 Vdc @ 13 mA  
**Pulse Out (Vo):** 0 - Vs, 0 - 5V (TTL), Open Collector (NPN or PNP)  
**Frequency Range:** 0 to 25 kHz (Std), ≤ 100 kHz (Special order)  
**Air Gap:** 0.50” (12mm) Max.  
**Temp. Ranges:**  
- **2TE:** -40° to 220° F (-40° to 120° C)  
- **3TE:** -40° to 290° F (-40° to 145° C)

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 M6</td>
<td>0.8” to 3” (20 to 75 mm)</td>
</tr>
<tr>
<td>3/8 M10</td>
<td>0.8” to 5” (20 to 130 mm)</td>
</tr>
<tr>
<td>1/2</td>
<td>0.8” to 5” (20 to 130 mm)</td>
</tr>
<tr>
<td>5/8 M16</td>
<td>0.8” to 10” (20 to 250 mm)</td>
</tr>
<tr>
<td>3/4 M18</td>
<td>2.1” to 10” (54 to 250 mm)</td>
</tr>
</tbody>
</table>

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
**DIGISPEC HALL EFFECT GEAR TOOTH SENSORS**

**Gear Position Sensor - Zero Speed Sensors**

<table>
<thead>
<tr>
<th><strong>Supply Voltage (Vs):</strong></th>
<th>4.5 - 30 Vdc @ 13 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Out (Vo):</strong></td>
<td>0 - Vs, 0 - 5V (TTL), Open Collector (NPN or PNP)</td>
</tr>
<tr>
<td><strong>Frequency Range:</strong></td>
<td>0 to 25 kHz (Std), ≤ 100 kHz (Special order)</td>
</tr>
<tr>
<td><strong>Air Gap:</strong></td>
<td>0.16” (4mm) Max.</td>
</tr>
<tr>
<td><strong>Temp. Ranges:</strong></td>
<td>2TE: -40° to 220° F (-40° to 120° C)</td>
</tr>
<tr>
<td></td>
<td>3TE: -40° to 290° F (-40° to 145° C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Thread Size:</strong></th>
<th><strong>Length (L):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 M6</td>
<td>0.8” to 3” (20 to 75 mm)</td>
</tr>
<tr>
<td>3/8 M10</td>
<td>0.8” to 5” (20 to 130 mm)</td>
</tr>
<tr>
<td>1/2</td>
<td>0.8” to 5” (20 to 130 mm)</td>
</tr>
<tr>
<td>5/8 M16</td>
<td>0.8” to 10” (20 to 250 mm)</td>
</tr>
<tr>
<td>3/4 M18</td>
<td>2.1” to 10” (54 to 250 mm)</td>
</tr>
</tbody>
</table>

Available with Dual Output

Available with Dual Output and an Additional Directional Output

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
**DIGISPEC Hall Effect Dual Output Sensors** provide two digital output signals detecting speed (down to true zero speed) and direction of rotation of gear teeth and ferrous targets. Sensors are also available with LED indicators.

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Length (L)</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>0.8&quot; to 5&quot; (20 to 130 mm)</td>
<td>0147 Series - Connector</td>
</tr>
<tr>
<td>3/4</td>
<td>0.8&quot; to 5&quot; (20 to 130 mm)</td>
<td>0148 Series - Lead Wires</td>
</tr>
<tr>
<td>M18</td>
<td>0.8&quot; to 5&quot; (20 to 130 mm)</td>
<td>0149 Series - Connector</td>
</tr>
</tbody>
</table>

**Supply Voltage (Vs):** 3.5 - 30 Vdc @ 13 mA  
**Pulse Out (Vo):** 0 - Vs, 0 - 5V (TTL), Open Collector (NPN or PNP)  
**Frequency Range:** 0 to 25 kHz (Std), depending on target size and distance  
**Air Gap:** 5DP (M5): ≤ 0.16" (4mm) Max.  
24DP (M1): ≤ 0.08" (2mm) Max.  
**Temp. Ranges:**  
2TE: -40° to 220° F (-40° to 120° C)  
3TE: -49° to 300° F (-45° to 150° C)  

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
Supply Voltage (Vs): 8.5 - 30 Vdc @ 13 mA
Pulse Out (Vo): 0 - 5V (TTL), Open Collector (NPN or PNP)
Frequency Range: 0 to 25 kHz (Std), depending on target size and distance
Air Gap: 0.16” (4mm) Max. depending on target mass
Temp. Ranges: 2TE: -40° to 220° F (-40° to 120° C)
3TE: -45° to 300° F (-40° to 150° C)

DIGISPEC Hall Effect Quadrature Sensors provide two digital output signals, 90° out of phase to each other, detecting speed (down to true zero speed) and direction of rotation of gear teeth and ferrous targets.

Thread Size: 5/8-18 UNF, 11/16-24, 3/4-20, M18x1.5
Length (L): 2.1” to 5” (54 to 130 mm)

Thread Size: 3/4-16, 3/4-20
Length (L): 3.15” (79.5 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
DIGISPEC linear position sensors are designed to detect continuous variations in the magnetic field and convert field strength to a proportional voltage. The output voltage produced for zero field is nominally 2.5v, with a standard transfer function of +/- 10 mV/Gauss. Magnetic sensitivity is along one axis only. Several units can be combined to measure (X, Y, Z) magnetic field vectors.

Custom ranges, output configurations, sensitivity and packaging are available on request. Intrinsically Safe linear position sensors are also available.

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Voltage Supply (Vs)</th>
<th>Pulse Out (Vo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8-18 UNF, 3/4-16, 3/4-20, M16x1.5, M18x1.5</td>
<td>8 - 30 Vdc @ ≤ 5 mA</td>
<td>0.06 - 4.5 V typical</td>
</tr>
</tbody>
</table>

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
Intrinsically Safe VR Sensors - Inductive Sensors

Class I, Zone 0, AEx [ia] IIIC
Class I, II, III, Div 1
Group ABCDEFG

COMPLIANCE: CE: EN550011, EN50022-2

INSTALLATION:
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

5/8 M16
Thread Size: 5/8-18 UNF, M16x1.5
Length (L): 2" to 10" (45 to 250 mm)

11/16
Thread Size: 11/16-24
Length (L): 1.8" to 3.5" (45 to 90 mm)

3/4 M18
Thread Size: 3/4-16, 3/4-20, M18x1.5
Length (L): 1.8" to 10" (45 to 250 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
**Intrinsically Safe Flowmeter Sensors**

**COMPLIANCE:**
- CE: EN550011, EN50022-2
- Class I, Zone 0, AEx [ia] IIC
- CLASS I, II, III, Div 1
- Group ABCDEFG

**INSTALLATION:**
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

<table>
<thead>
<tr>
<th>Supply Voltage (Vs):</th>
<th>8 - 30 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Out (Vo):</td>
<td>0 - Vs, 0 - 5V (TTL), 0 - 10 V, Open Collector (NPN or PNP)</td>
</tr>
<tr>
<td>Frequency Range:</td>
<td>~5 Hz to 10 kHz depending on target size, distance and pickup sensitivity</td>
</tr>
<tr>
<td>Temperature Range:</td>
<td>T5: -40° to 149° F (-40° to 65° C)</td>
</tr>
<tr>
<td></td>
<td>T6: -40° to 185° F (-40° to 85° C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Thread Size: 5/8-18 UNF, M16x1.5</th>
<th>Length (L): 2.5&quot; to 10&quot; (64 to 250 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS91</td>
<td></td>
<td>IS91X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IS91Y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Thread Size: 11/16-24</th>
<th>Length (L): 2.5&quot; to 3.5&quot; (64 to 90 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS90</td>
<td></td>
<td>IS91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IS91X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Thread Size: 3/4-16, 3/4-20, M18x1.5</th>
<th>Length (L): 1.8&quot; to 10&quot; (45 to 250 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS90</td>
<td></td>
<td>IS91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IS91Y</td>
</tr>
</tbody>
</table>

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
## Instrinsically Safe Magnet Actuated - Zero Speed Sensor

### COMPLIANCE:
- CE: EN550011, EN50022-2
- Class I, Zone 0, AEx [ia] IIC
- CLASS I, II, III, Div 1
- Group ABCDEFG

### INSTALLATION:
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

### NOTE:
RF pickups must be used with Intrinsically Safe PA-10

### Inductance/Resistance Options:
- RF4: 4.00 Ohm, 0.36 mH
- RF10: 12.00 Ohm, 1.00 mH

### Air Gap:
- Open Face: ≤ .160”, Closed Face: ≤ .130

### Frequency Range:
≤ 5 Hz to 6000 Hz

### Temperature Ranges:
- T5: -40° to 149° F (-40° to 65° C)
- T6: -40° to 185° F (-40° to 85° C)

### IS70:
- Connector

### IS71:
- Lead Wire

### IS72:
- Connector with temperature probe

### IS73:
- Lead Wire with temperature probe

### Thread Size:
- 5/8-18 UNF, M16x1.5, 11/16-20
- 3/4-16, 3/4-20, M18x1.5

### Length (L):
- 1.8” to 10” (45 to 250 mm)

### Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
COMPLIANCE: CE: EN550011, EN50022-2

Class I, Zone 0, AEx [ia] IIC
CLASS I, II, III, Div 1
Group ABCDEFG

INSTALLATION:
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

Supply Voltage (Vs): 8 - 30 Vdc, Reverse polarity protected; 4.5 - 8 Vdc optional
Pulse Out (Vo): 0 - Vs Open Collector - NPN, 0 - 5V (TTL), 0 - 10 V
Frequency Range: ≤ 0.5 Hz to ≥ 5 kHz depending on target size, distance and pickup sensitivity
Temperature Range: T5: -40° to 149° F (-40° to 65° C)
T6: -40° to 185° F (-40° to 85° C)

Supply Voltage (Vs): 8 - 30 Vdc, Reverse polarity protected; 4.5 - 8 Vdc optional
Pulse Out (Vo): 0 - Vs Open Collector - NPN, 0 - 5V (TTL), 0 - 10 V
Frequency Range: ≤ 0.5 Hz to ≥ 5 kHz depending on target size, distance and pickup sensitivity
Temperature Range: T5: -40° to 149° F (-40° to 65° C)
T6: -40° to 185° F (-40° to 85° C)

5/8 Thread Size: 5/8-18 UNF, M16x1.5
Length (L): 3" to 10" (76 to 250 mm)

11/16 Thread Size: 11/16-24
Length (L): 2.8" to 3.5" (71 to 90 mm)

3/4 Thread Size: 3/4-16, 3/4-20, M18x1.5
Length (L): 2.8" to 10" (71 to 250 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
IS HALL EFFECT MAGNETIC SENSORS

Intrinsically Safe Magnet Actuated - Zero Speed Sensor

COMPLIANCE:   CE: EN550011, EN50022-2
  Class I, Zone 0, AEx [ia] IIC
  CLASS I, II, III, Div 1
  Group ABCDEFG

INSTALLATION:
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

Supply Voltage (Vs):  5 - 30 Vdc
Pulse Out (Vo):  0 - Vs, 0 - 5V (TTL), 0 - 10 V, Open Collector (NPN or PNP)
Frequency Range:  0 to 25 kHz depending on target size, distance and pickup sensitivity
Target:  Standard: Bi-polar (N & S pole) activation; Optional: Uni-polar (N or S pole) also available
Temperature Range:  T5: -40° to 149° F (-40° to 65° C)
                   T6: -40° to 185° F (-40° to 85° C))

IS159: Single Output, Lead Wire, LED indicator
IS160: Single Output, Lead Wire
IS161: Single Output, Connector
IS180: Dual Output, Connector
IS181: Dual Output, Lead Wire

5/8  Thread Size:  5/8-18 UNF, M16x1.5, 11/16-20
M16  Length (L):  1.8" to 10" (45 to 250 mm)
11/16

3/4  Thread Size:  3/4-16, 3/4-20, M18x1.5
M18  Length (L):  1.8" to 10" (45 to 250 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
**SHORT FORM CATALOG**

**IS HALL EFFECT GEAR TOOTH SENSORS**
Intrinsically Safe Gear Sensor, Zero Speed Sensor

<table>
<thead>
<tr>
<th>Compliance:</th>
<th>CE: EN550011, EN50022-2</th>
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<tbody>
<tr>
<td>FM IS</td>
<td>Class I, Zone 0, AEx [ia] IIIC</td>
</tr>
<tr>
<td></td>
<td>CLASS I, II, III, Div 1</td>
</tr>
<tr>
<td></td>
<td>Group ABCDEFG</td>
</tr>
</tbody>
</table>

**INSTALLATION:**
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

<table>
<thead>
<tr>
<th><strong>Supply Voltage (Vs):</strong></th>
<th>Standard: 5 - 30 Vdc; LED Option: 12 - 30 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Out (Vo):</strong></td>
<td>0 - Vs, 0 - 5V (TTL), 0 - 10 V, Open Collector (NPN or PNP)</td>
</tr>
<tr>
<td><strong>Frequency Range:</strong></td>
<td>0 to 25 kHz depending on target size, distance and pickup sensitivity</td>
</tr>
<tr>
<td><strong>Air Gap:</strong></td>
<td>5DP (M5): ≤ 0.16&quot; (4mm) Max.</td>
</tr>
<tr>
<td></td>
<td>24DP (M1): ≤ 0.08&quot; (2mm) Max.</td>
</tr>
<tr>
<td><strong>Temperature Range:</strong></td>
<td>T5: -40° to 149° F (-40° to 65° C)</td>
</tr>
<tr>
<td></td>
<td>T6: -40° to 185° F (-40° to 85° C)</td>
</tr>
</tbody>
</table>

| IS170:                  | Single Output, Connector |
| IS171:                  | Single Output, Lead Wire |
| IS174:                  | Dual Output, Connector   |
| IS175:                  | Dual Output, Lead Wire   |
| IS190:                  | Quadrature Output, Connector |
| IS191:                  | Quadrature Output, Lead Wire |

| Thread Size:            | 5/8-18 UNF, M16x1.5, 11/16-20 |
| Length (L):             | 1.8" to 10" (45 to 250 mm) |

| Thread Size:            | 3/4-16, 3/4-20, M18x1.5 |
| Length (L):             | 1.8" to 10" (45 to 250 mm) |

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
Intrinsically Safe Position Sensor

**COMPLIANCE:**
CE: EN550011, EN50022-2
Class I, Zone 0, AEx [ia] IIC
CLASS I, II, III, Div 1
Group ABCDEFG

**INSTALLATION:**
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

Supply Voltage (Vs):
- 8 - 30 Vdc

Pulse Out (Vo):
- 0.06 - 4.5 V typical

Air Gap:
- To > 1" @ 3000 Gauss typical

Temperature Range:
- T5: -40° to 220° F (-40° to 120° C)
- T6: -45° to 300° F (-40° to 150° C)

**Thread Size:**
**Length (L):**
- 5/8-18 UNF, M16x1.5
- 2” to 10” (78 to 250 mm)

- 3/4-20, M18x1.5
- 2” to 10” (78 to 250 mm)

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.
**COMPLIANCE:** CE: EN550011, EN50022-2  
Class I, Zone 0, AEx [ia] II C  
CLASS I, II, III, Div 1  
Group ABCDEFG

**INSTALLATION:**  
Installations must meet the requirements of intrinsically safe systems for hazardous (classified) locations and must follow details specified in FM Global control drawing 85047.

<table>
<thead>
<tr>
<th>Sensor Type</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Out (Vo):</strong></td>
<td>0 - 5 V, 0 - 10 V</td>
</tr>
<tr>
<td><strong>Temperature Range:</strong></td>
<td>T5: -40° to 220° F (-40° to 120° C)</td>
</tr>
<tr>
<td></td>
<td>T6: -45° to 300° F (-40° to 150° C)</td>
</tr>
</tbody>
</table>

**IS4022 Pulse Amplifier**  
For IS magnetic sensors with optional output selection  
Supply Voltage (Vs): 7.5 - 30 Vdc  
Freq Range: ~5 Hz to 10kHz; ~5Hz to 40 kHz at increased signal level

**IS4027 Freq to Current Converter**  
4-20 mA Converter fits Elby Explosion-proof enclosure  
Supply Voltage (Vs): 9 - 30 Vdc

**IS4028 Freq to Voltage Converter**  
0-5 V or 0-10 V FTV Converter fits Elby Explosion-proof enclosure  
Supply Voltage (Vs): 12 - 30 Vdc

Detailed specification sheets are available for each sensor listed; please contact Spectec for more information.