

### PRODUCT DESCRIPTION

SPECTEC's Intrinsically Safe digital output linear and angular position sensors are designed for installation in hazardous locations. They are offered in a wide variety of configurations as outlined on page 2. Custom sensors can also be created to meet specific needs.

For connector version refer to IS220-IS220A.

These sensors are designed to sense continuous variations in magnetic field and convert field strength to a proportional voltage. The output voltage produced for zero magnetic field is nominally 2.5V, with a standard transfer function of  $\pm 5\text{mV}/\text{Gauss}$ . Magnetic sensitivity is in one axis only. Several units can be combined to measure (X, Y, Z) magnetic field vectors.

### INSTALLATION

**CAUTION: This sensor MUST be installed with an FM approved barrier and following the details specified in the Installation Instruction Document #85047.**

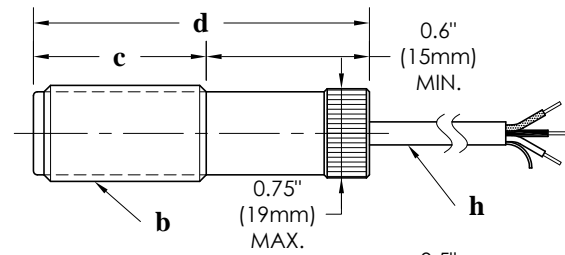
### SPECIFICATIONS

- Supply Voltage:** 8 to 30 Vdc @  $\leq 8\text{ mA}$
- Output Range:**
  - Voltage  $< 0.5\text{V}$  to  $> 4.5\text{V}$  (0.06 - 4.95V typical)
  - Current  $-1.0\text{mA}$  (source) Max.  $10.0\text{mA}$  (sink) Max.
- Quiescent Output Voltage:**  $\pm 0.075\text{V}$  (2.425 to 2.575V at zero field)  $\pm 30\text{ Gauss}$  equivalent (R Load  $\geq 1\text{m}\Omega$  for stated accuracy and output)
- Output Resistance:**  $100\ \Omega$  typical
- Frequency Range:** DC to  $\sim 30\text{ kHz}$
- Sensitivity:** See Page 2
- Sensing Distance:** 0 to  $> 1.0''$  @  $3000\text{ Gauss}$  typical
- Connection:** Lead wires/Cable, See page 2
- Construction:** 300 Series Stainless Steel  
Solid Epoxy Encapsulation

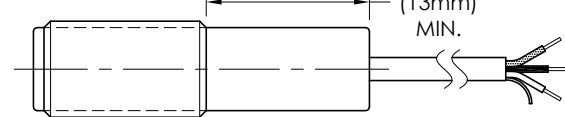
### CERTIFICATIONS for IS221

- USA:**
  - Intrinsically Safe
  - Class I, II, III, Division 1
  - GROUP ABCDEFG T6...T5
  - Class I, Zone 0, AEx ia IIC T6...T5
- Canada:**
  - Intrinsically Safe
  - Class I, Division 1
  - GROUP ABCD T6...T5
  - Class I, Zone 0, Ex ia IIC T6...T5
  - T5 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +85^\circ\text{C}$
  - T6 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +65^\circ\text{C}$

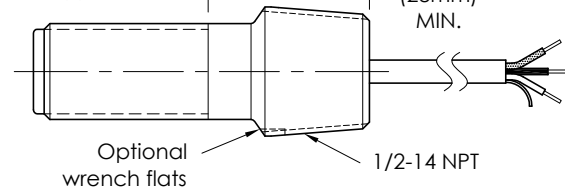
### K shell type



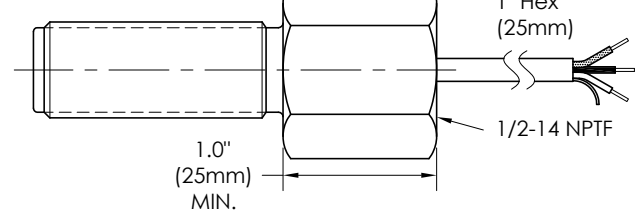
### A shell type



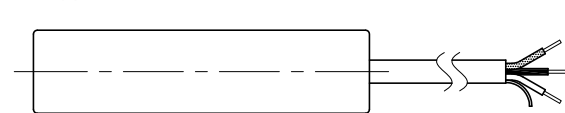
### X shell type



### Y shell type



### S shell type



### CERTIFICATIONS for IS221A

- ATEX:** II 1 G Ex ia IIC T6...T4 Ga FM08ATEX0066X
- IECEX:** Ex ia IIC T6...T4 Ga IECEx FMG 16.0003X
- T4 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +100^\circ\text{C}$
- T5 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +85^\circ\text{C}$
- T6 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +65^\circ\text{C}$
- CE:** Compliance with EN55011, EN50082-2

# FEATURE SELECTION for IS221-xx

| SPECTEC P/N                 | a Shell Type | b Thread / Diameter  | c Thread Length                                     | d Overall Length                                    | h Lead Wires  | k Sensitivity   |
|-----------------------------|--------------|--|---|---|---|---|
| IS221-xx<br>or<br>IS221A-xx | K<br>A<br>H  | 1/2-20 UNF<br>5/8-18 UNF<br>11/16-24 UNEF<br>3/4-16 UNF<br>3/4-20 UNEF<br>M16x1.5<br>M18x1.5 | 0.75" (19mm)<br>Minimum<br>13.0" (330mm)<br>Maximum | 1.25" (32mm)<br>Minimum<br>14.0" (356mm)<br>Maximum | Shielded Cable<br><br>18 to 24 AWG<br>(depending on shell size)<br><br>PVC or TFE insulation<br><br>Red - Supply<br>Black - Common<br>White - Output<br>Shield - Floating<br>(Not connected to shell)<br><br>12" (.3m)<br>36" (1m)<br>120" (3m)<br><br>NOTE: Other lead wire lengths are available. | Standard:<br>5 mV/Gauss<br><br>Medium:<br>3.125 mV/Gauss<br><br>High:<br>2.5 mV/Gauss |
|                             | X            | 5/8-18 UNF<br>11/16-24 UNEF<br>3/4-16 UNF<br>3/4-20 UNEF                                     | 0.70" (18mm)<br>Minimum<br>13.0" (330mm)<br>Maximum | 1.88" (48mm)<br>Minimum<br>14.0" (356mm)<br>Maximum |   |   |
|                             | Y            | 5/8-18 UNF<br>3/4-20 UNEF  | 1.1" (28mm)<br>Minimum<br>13.0" (330mm)<br>Maximum  | 2.35" (60mm)<br>Minimum<br>14.0" (356mm)<br>Maximum |   |   |
|                             | S            | 5/8" (15.9mm)  | N/A   | 1.25" (32mm)<br>Minimum<br>14.0" (356mm)<br>Maximum |   |   |

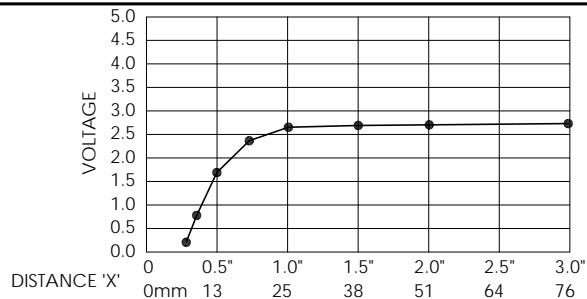
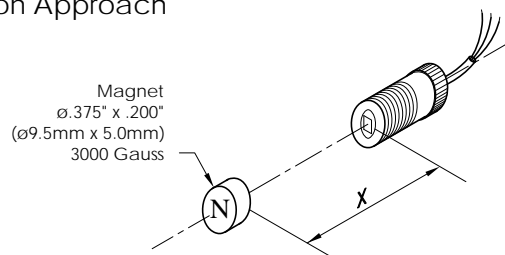
The above features give the range of products available under the certifications.  
Please specify your specific needs when contacting sales.

## SPECIFIC MODELS: (also available with ATEX & IECEx certification under the part number IS221A-xx)

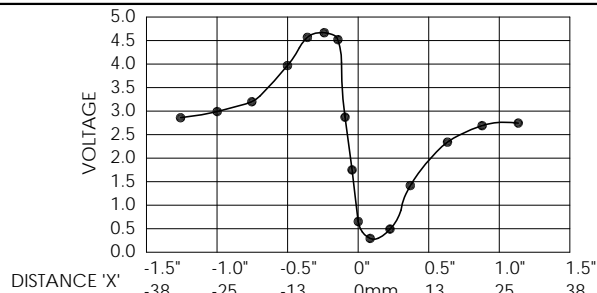
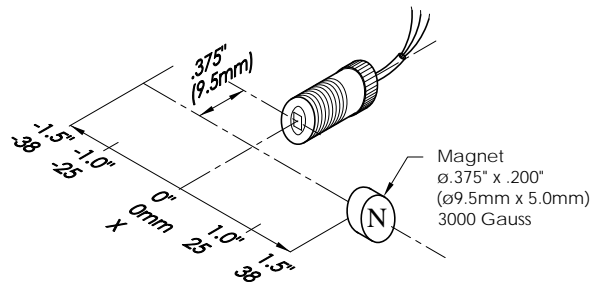
|          |   |            |             |             |              |            |
|----------|---|------------|-------------|-------------|--------------|------------|
| IS221-01 | K | 5/8-18 UNF | 1.8" (45mm) | 2.5" (64mm) | 36" (1m) PVC | 5 mV/Gauss |
| IS221-03 | A | M18x1.5    | 2.0" (51mm) | 2.5" (64mm) | 10' (3m) PVC |            |

## TYPICAL PERFORMANCE DATA

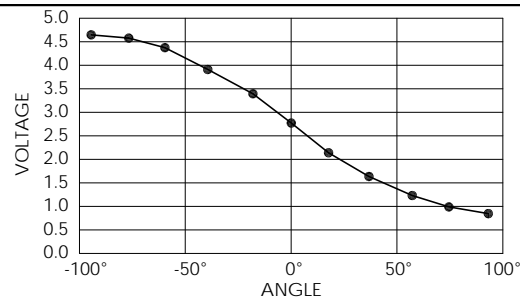
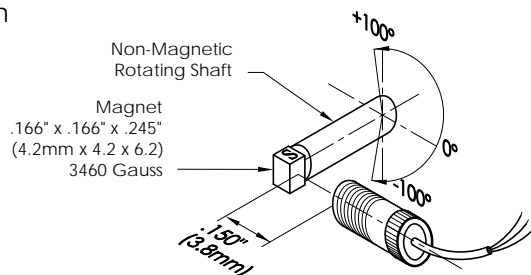
### Head-on Approach



### Fly By



### Shaft Rotation



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