

### PRODUCT DESCRIPTION

SPECTEC's Non-Incendive / Increased Safety 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 N220.

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 following the details specified in the Installation Instruction Document #85047N.**

### 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

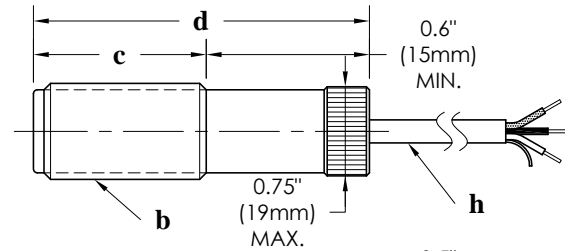
**Sensing Distance:** 0 to  $> 1.0''$   
 @  $3000\text{ Gauss}$  typical

**Connection:** Connector, See page 2

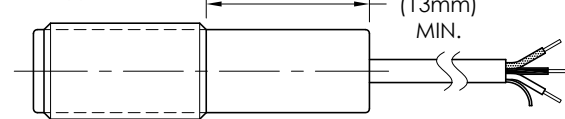
**Construction:** 300 Series Stainless Steel  
 Solid Epoxy Encapsulation

For mating connector/cable assemblies refer to respective bulletins: 3000 for MO, 3001 for B, 3004 for MC, and 3005 for MD.

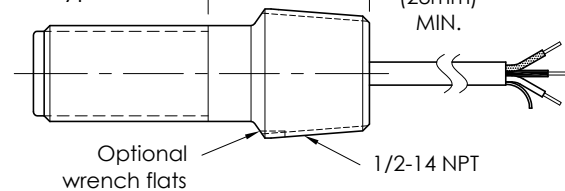
#### K shell type



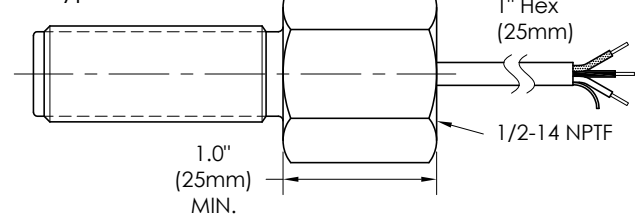
#### A shell type



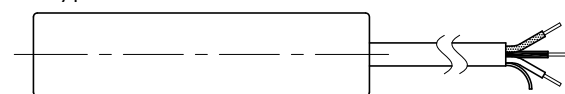
#### X shell type



#### Y shell type



#### S shell type



### CERTIFICATIONS for N221

**ATEX:** II 3 G Ex ec IIC T6...T3 Gc  
 FM08ATEX0067X

**IECEX:** Ex ec IIC T6...T3 Gc  
 IECEx FMG 16.0003X

T3 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +135^\circ\text{C}$   
 T4 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +120^\circ\text{C}$   
 T5 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +85^\circ\text{C}$   
 T6 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +65^\circ\text{C}$

**USA:** Class I, Division 2  
 GROUP ABCDEFG T6...T5  
 Class I, Zone 2, AEx nC IIC T6...T5

**Canada:** Class I, Division 2  
 GROUP ABCD T6...T5  
 Class I, Zone 2, Ex nL IIC T6...T5

T5 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +85^\circ\text{C}$   
 T6 @  $-40^\circ\text{C} \leq T_{\text{amb}} \leq +65^\circ\text{C}$

**CE:** Compliance with  
 EN55011, EN50082-2

# FEATURE SELECTION for N221-xx

SPECTEC P/N	a Shell Type	b Thread / Diameter	c Thread Length	d Overall Length	h Lead Wires	k Sensitivity
N221-xx	<b>K</b> <b>A</b> <b>H</b>	1/2-20 UNF 5/8-18 UNF 11/16-24 UNEF 3/4-16 UNF 3/4-20 UNEF M16x1.5 M18x1.5	0.75" (19mm) Minimum 13.0" (330mm) Maximum	1.25" (32mm) Minimum 14.0" (356mm) Maximum	Shielded Cable  18 to 24 AWG (depending on shell size)  PVC or TFE insulation  Red - Supply Black - Common White - Output Shield - Floating (Not connected to shell)  12" (.3m) 36" (1m) 120" (3m)  NOTE: Other lead wire lengths are available.	Standard: 5 mV/Gauss  Medium: 3.125 mV/Gauss  High: 2.5 mV/Gauss
	<b>X</b>	5/8-18 UNF 11/16-24 UNEF 3/4-16 UNF 3/4-20 UNEF	0.70" (18mm) Minimum 13.0" (330mm) Maximum	1.88" (48mm) Minimum 14.0" (356mm) Maximum		
	<b>Y</b>	5/8-18 UNF 3/4-20 UNEF	1.1" (28mm) Minimum 13.0" (330mm) Maximum	2.35" (60mm) Minimum 14.0" (356mm) Maximum		
	<b>S</b>	5/8" (15.9mm)	N/A	1.25" (32mm) Minimum 14.0" (356mm) Maximum		

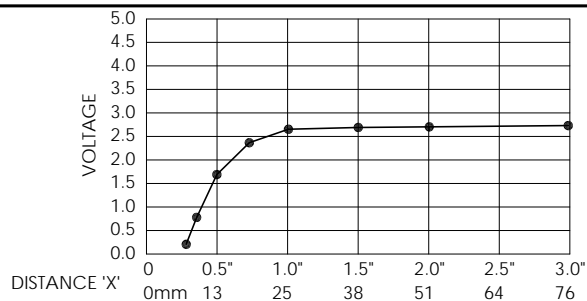
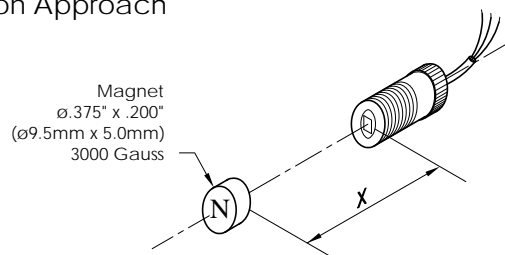
The above features give the range of products available under the certifications. Please specify your specific needs when contacting sales.

## SPECIFIC MODELS

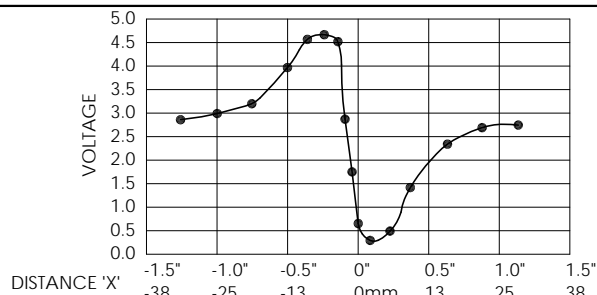
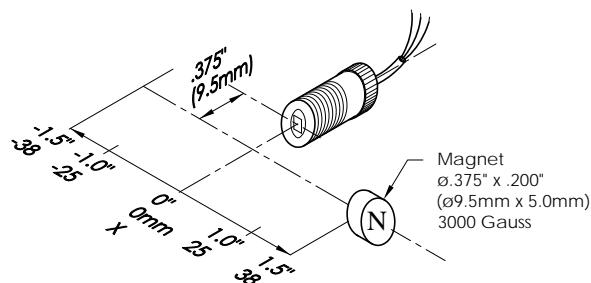
N221-01	<b>K</b>	5/8-18 UNF	1.8" (45mm)	2.5" (64mm)	36" (1m) PVC	5 mV/Gauss
N221-03	<b>A</b>	M18x1.5	2.0" (51mm)	2.5" (64mm)	10' (3m) PVC	

## TYPICAL PERFORMANCE DATA

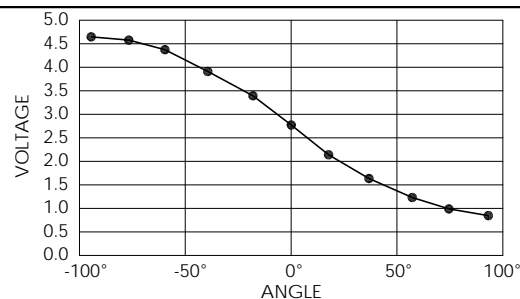
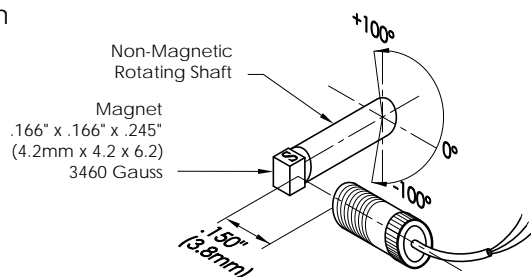
### Head-on Approach



### Fly By



### Shaft Rotation



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PAGE 2 OF 2