

### PRODUCT DESCRIPTION

SPECTEC's Intrinsically Safe zero speed sensors are designed for installation in hazardous locations. They are offered in a wide variety of configurations as outlined on page 2. These sensors are actuated by gear teeth and other ferrous targets. Variations with dual sensors or directional output are also available. Versions with ATEX & IECEx certification are available under part numbers IS170A & IS171A. Custom sensors can also be created to meet specific needs.

### 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:** 5 to 30 Vdc @ ≤15 mA
- Output Voltage:** See page 2  
(25 mA maximum current sinking)
- Frequency Range:** 0 Hz to ~20 kHz
- Rise/Fall Time:** .04 / .18 μs Nominal
- Air Gap:** 5DP: ≤ .160"  
48DP: ≤ .025"
- Magnetization:** 700 -1600 Gauss
- Direction signal: (as applicable)** Forward - Logic 1, High (e.g. 5V)  
(target rotating toward alignment mark)  
Reverse - Logic 0, Low (e.g. 0.06V max)  
(target rotating away from alignment mark)
- Connection:** Connector or lead wires, See page 2
- Construction:** 300 Series Stainless Steel  
Solid Epoxy Encapsulation

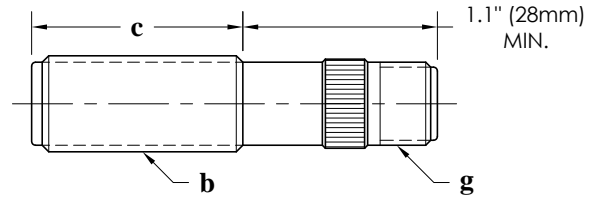
### CERTIFICATIONS for IS170 & IS171

- 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°C ≤ T<sub>amb</sub> ≤ +85°C  
T6 @ -40°C ≤ T<sub>amb</sub> ≤ +65°C

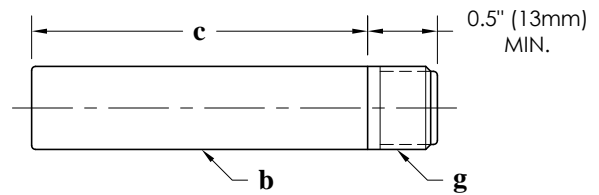
### CERTIFICATIONS for IS170A & IS171A

- ATEX:** II 1 G Ex ia IIC T6...T4 Ga  
FM08ATEX0066X
- IECEx:** Ex ia IIC T6...T4 Ga  
IECEx FMG 16.0003X  
T4 @ -40°C ≤ T<sub>amb</sub> ≤ +100°C  
T5 @ -40°C ≤ T<sub>amb</sub> ≤ +85°C  
T6 @ -40°C ≤ T<sub>amb</sub> ≤ +65°C
- CE:** Compliance with  
EN55011, EN50082-2

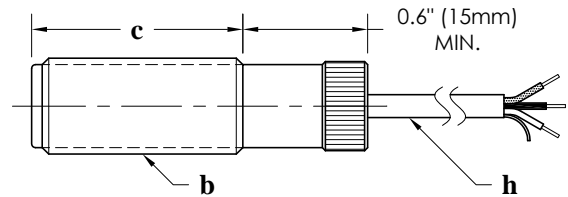
- IS170** K shell type, knurled (shown below)  
A shell type, all-thread (knurl removed)  
H shell type, hex (knurl replaced by hex)



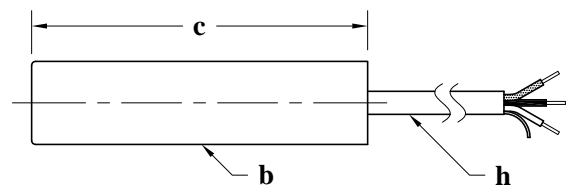
- IS170** S shell type, smooth (custom units available)



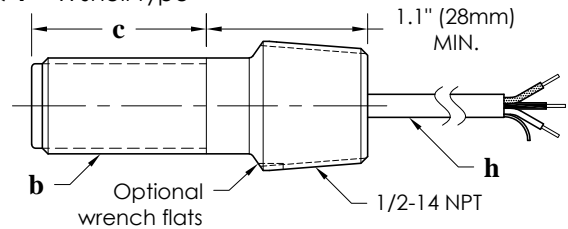
- IS171** K shell type, knurled (shown below)  
A shell type, all-thread (knurl removed)  
H shell type, hex (knurl replaced by hex)



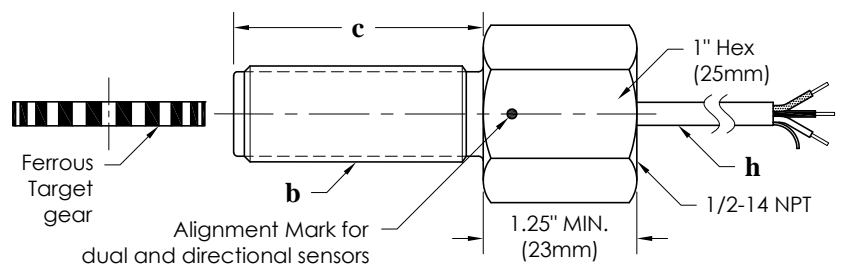
- IS171** S shell type, smooth (custom units available)



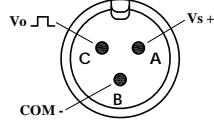
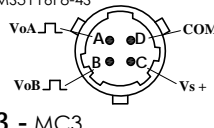
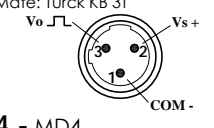
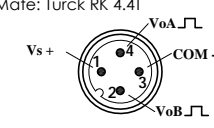
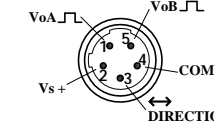
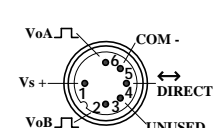
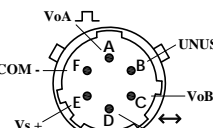
- IS171** X shell type



- IS171** Y shell type



# FEATURE SELECTION for IS170-abcgj and IS171-abchj

SPECTEC P/N	a Shell Type	b Thread / Diameter	c Thread Length	Connection Type		j Output Signal	
				g Connector (IS170 Only)	h Lead Wires (IS171 Only)		
<b>IS170-</b> (Connector Version)  <b>or</b>  <b>IS171-</b> (Lead Wire Version)	<b>K</b> <b>A</b> <b>H</b>	<b>0</b> - 3/8-24 UNF <b>1</b> - 1/2-20 UNF <b>2</b> - 5/8-18 UNF <b>3</b> - 11/16-24 UNEF <b>4</b> - 3/4-16 UNF <b>5</b> - 3/4-20 UNEF <b>6</b> - M12x1 <b>7</b> - M16x1.5 <b>8</b> - M18x1 <b>9</b> - M18x1.5	<b>0</b> - 0.75" (19mm) <b>1</b> - 1.0" to 1.3" (25-33mm) <b>2</b> - 1.5" to 1.8" (38-45mm) <b>3</b> - 2.0" (51mm) <b>4</b> - 2.5" (64mm) <b>5</b> - 3.0" to 3.5" (76-89mm) <b>6</b> - 4.0" (101mm) <b>7</b> - 6.0" (152mm) <b>8</b> - 8.0" (203mm) <b>9</b> - 10.0" (254mm)	<b>1</b> - MO3 Mate: Amphenol MS3106A10SL-3S 	<b>1</b> - 12" (.3m) <b>2</b> - 36" (1m) <b>3</b> - 120" (3m) <b>4</b> - 198" (5m) <b>5</b> - 396" (10m)	<b>Standard Hall Sensor (HF, HHF, HHFQ)</b> <b>1</b> - 0-5V, NPN(TTL) <b>2</b> - 0-10V, NPN <b>3</b> - 0-Vs, NPN <b>4</b> - 0-Vs, NPN OC <b>5</b> - 0-Vs, PNP OC <b>6</b> - 0-Vs, NPN/PNP  <b>Differential Hall Sensor (HFd, HHFd, HHFdQ)</b> <b>A</b> - 0-5V, NPN(TTL) <b>B</b> - 0-10V, NPN <b>C</b> - 0-Vs, NPN <b>D</b> - 0-Vs, NPN OC <b>E</b> - 0-Vs, PNP OC <b>F</b> - 0-Vs, NPN/PNP	
		<b>S</b>	<b>0</b> - ø3/8" (9.5mm) <b>1</b> - ø1/2" (12.7mm) <b>2</b> - ø5/8" (15.9mm)	Same as above	<b>2</b> - B4 Mate: Amphenol MS3116F8-4S 		Lengths of 36" (1m) and longer use shielded cable  18 to 24 AWG (depending on shell size)  PVC or TFE insulation
		<b>X</b> (IS171 only)	<b>1</b> - 1/2-20 UNF <b>2</b> - 5/8-18 UNF <b>3</b> - 11/16-24 UNEF <b>4</b> - 3/4-16 UNF <b>5</b> - 3/4-20 UNEF	<b>0</b> - 0.7" (18mm) <b>1</b> - 1.3" (33mm) <b>4</b> - 2.5" (64mm) <b>7</b> - 6.0" (152mm) <b>8</b> - 8.0" (203mm)	<b>3</b> - MC3 Mate: Turck KB 3T 		Red - Supply Black - Common White - Output A Yellow - Output B Green - Direction Shield - Floating (Not connected to shell, please ground to instrumentation)
		<b>Y</b> (IS171 only)	<b>2</b> - 5/8-18 UNF <b>5</b> - 3/4-20 UNEF <b>7</b> - M16x1.5 <b>8</b> - M18x1 <b>9</b> - M18x1.5	<b>1</b> - 1.1" (28mm) <b>3</b> - 2.0" (51mm) <b>5</b> - 3.0" (76mm) <b>6</b> - 4.0" (101mm) <b>7</b> - 6.0" (152mm) <b>8</b> - 8.0" (203mm) <b>9</b> - 10.0" (254mm)	<b>4</b> - MD4 Mate: Turck RK 4.4T 		NOTE: Other lead wire lengths are available.
				<b>5</b> - MC5 Mate: Turck KB 5T 	<b>6</b> - MD6 Mate: Turck RK 6T 	<b>7</b> - B6 Mate: Amphenol MS3116F10-6S 	

**Variants:**  
**IS170-abcgjD** Dual Sensor (HHF) - with quadrature output for manual sensing of direction  
**IS170-abcgjQ** Directional Sensor (HHFQ) - with quadrature and directional output when properly aligned  
**IS170A-abcgj** ATEX & IECEx Certification - can be used in conjunction with variants above

**P/N Examples:**  
**IS170-K3412** K shell type, 11/16-24 x 2.5" thread, MO3 connector, 0-10V output  
**IS171A-Y2321** ATEX certification, Y shell type, 5/8-18 x 2.0" thread, 36" leads, 0-5V output

**Please Note:** Some combinations of options are not possible, please contact sales with any questions.  
 For Dual Sensor (HHF), thread size must be 1/2-20 or M12x1 or larger  
 For Directional Sensor (HHFQ), thread size must be 5/8-18 or M16x1.5 or larger, thread length must be 2.0" or longer  
 Some output options are only available with thread lengths of 1.5" or longer (2.0" or longer for 'A' and 'S' shell type)

**Old P/N to New P/N correlations:**

IS170-01 → IS170-K2213	IS171-01 → IS171-A2333	IS171-18 → IS171-Y5333	IS175-04 → IS171-Y5334D
IS170-02 → IS170-K2214	IS171-02 → IS171-K2541	IS171-80 → IS171-K1243	IS190-03 → IS170-S2471Q
IS170-03 → IS170-K0615	IS171-03 → IS171-Y2634	IS174-03 → IS170-K2523D	
IS170-90 → IS170-S1434	IS171-17 → IS171-Y2334	IS175-03 → IS171-A5333D	

**SPECIALTY MODELS:** (also available with ATEX & IECEx certification under the part number IS170A-xx or IS171A-xx)

IS171-90 (was IS191-90)	S	Customer specific shell	-	Lead Wires 120" (3m)	0-Vs, NPN w/ 5k pull-up & directional output
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