

# Digispec Magnetic Speed Sensor

## IS90 & IS91 Bulletin

### PRODUCT DESCRIPTION

Intrinsically Safe digital output magnetic 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. Versions with ATEX, UKEX, & IECEx certification are available under part numbers IS90A & IS91A. 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

<b>Supply Voltage:</b>	8 to 30 Vdc @ ≤15 mA
<b>Output Voltage:</b>	See page 2 (25 mA maximum current sinking)
<b>Frequency Range:</b>	Standard: ~5 Hz to 25 kHz Noise Canceling: ~5 Hz to 5 kHz
<b>Sensitivity:</b>	See page 2
<b>Rise/Fall Time:</b>	.04 / .18 μs Nominal
<b>Air Gap:</b>	5DP: ~.070" Max. 48DP: ~.015" Max depending on surface velocity
<b>Magnetization:</b>	Standard: 700 - 1200 Gauss Low: Specify (300 Gauss typ.)
<b>Pole Piece:</b>	Flush or extended, See page 2
<b>Connection:</b>	Connector or lead wires, See page 2
<b>Construction:</b>	300 Series Stainless Steel Solid Epoxy Encapsulation

### CERTIFICATIONS for IS90 & IS91

**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 IS90A & IS91A

ATEX & UKEX:



CE:



IECEx:



II 1 G Ex ia IIC T6...T4 Ga  
FM08ATEX0066X  
FM22UKEX0108X

Compliance with  
EN55011, EN50082-2

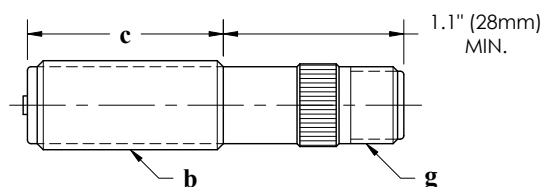
Ex ia IIC T6...T4 Ga  
IECEx FMG 16.0003X

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



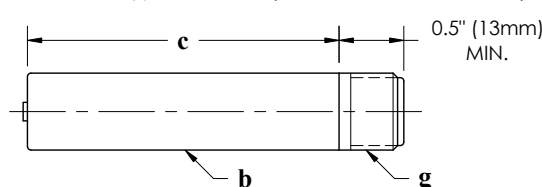
### IS90

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



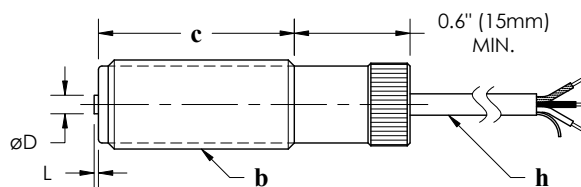
### IS90

S shell type, smooth (custom units available)



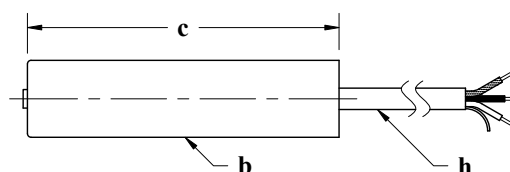
### IS91

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



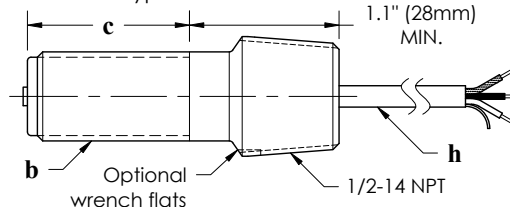
### IS91

S shell type, smooth (custom units available)



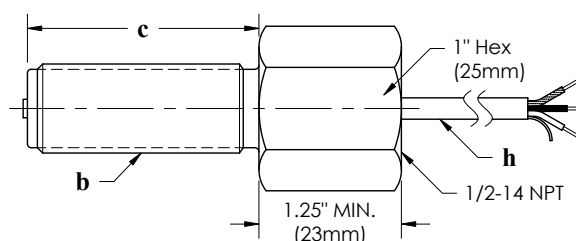
### IS91

X shell type

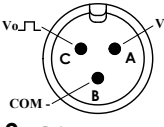
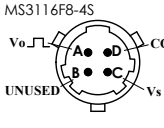
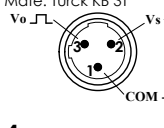
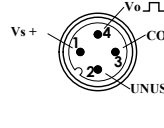


### IS91

Y shell type



**FEATURE SELECTION for IS90-abcfgjk and IS91-abcfhjk**

P/N	a Shell Type	b Thread / Diameter	c Thread Length	f Pole Piece	Connection Type		j Output Signal	k Sensitivity
					g Connector (IS90 Only)	h Lead Wires (IS91 Only)		
<b>IS90-</b> (Connector Version)  <b>or</b>  <b>IS91-</b> (Lead Wire Version)	<b>K</b> <b>A</b> <b>H</b>	<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> - FP <b>2</b> - EP62 <b>3</b> - EP93 <b>4</b> - EP106 <b>5</b> - EP125 <b>6</b> - EP188 <b>7</b> - EP250 <b>8</b> - CP10 <b>9</b> - CP45 <b>A</b> - FPS <b>B</b> - EPS106 <b>C</b> - EPS125	<b>1</b> - MO3 Mate: Amphenol MS3106A10SL-3S  <b>2</b> - B4 Mate: Amphenol MS3116F8-4S  <b>3</b> - MC3 Mate: Turck KB 3T  <b>4</b> - MD4 Mate: Turck RK 4.4T 	<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)  Lengths of 36" (1m) and longer use 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, please ground to instrumentation)  NOTE: Other lead wire lengths are available.	<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>1</b> - 12 mV <b>2</b> - 30 mV
	<b>S</b>	<b>2</b> - Ø5/8" (15.9mm)	Same as above	For details see below.				
	<b>X</b> (IS91 only)	<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>Y</b> (IS91 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)					

**Pole Piece details:**

FP - Flush pole Ø.130"

EP106 - Extended pole Ø.106" x .030" long, number after 'EP' describes diameter

(all Extended pole options are .030" long except EP125 is .070" long)

CP45 - Chisel pole, .045" chisel edge x .03 long

Pole types FPS, EPS106, &amp; EPS125 have a stainless steel face on the sensing end.

**Variants:****IS90A-abcfgjk** ATEX, UKEX, & IECEx Certification - can be used in conjunction with other variants**IS90-abcfgjk-300G** The magnetization level for low magnetic drag sensors is designated as a suffix to the part number. This example designates a gauss level of 300. The standard magnetic level does not require a suffix.**P/N Examples:****IS90-K345132** K shell type, 11/16-24 x 2.5" thread, EP125 pole piece, MO3 connector, 0-Vs NPN output, 30mV sensitivity**IS91A-Y231312** ATEX certification, Y shell type, 5/8-18 x 2.0" thread, FP pole piece, 120" leads, 0-5V output, 30 mV sensitivity**Please Note:** Some combinations of options are not possible, please contact sales with any questions.

Noise Canceling output options are only available with thread lengths of 2.0" or longer (2.5" or longer for 'S' shell type)

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

IS90-01 → IS90-K221132

IS90-04 → IS90-K224132

IS90-07 → IS90-K221211

IS90-02 → IS90-K221142

IS90-05 → IS90-K221112

IS90-41 → IS90-K315111

IS90-03 → IS90-K224122

IS90-06 → IS90-K25A122

IS91-01 → IS91-K224412