

# SERIES ISD25

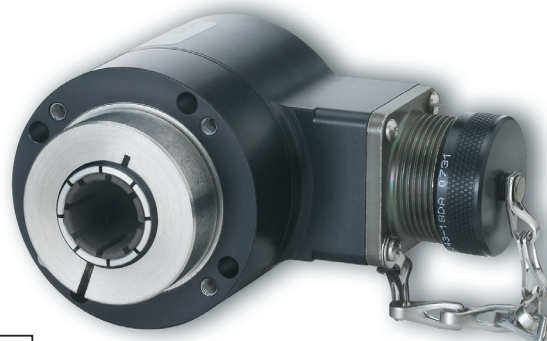
# NorthStar™ brand

## Hazardous Duty Encoder

### Key Features

- Compact Hubshaft Design with Field Replaceable Shaft Isolators
- Unbreakable Code Disc up to 3600 PPR
- ATEX, UL and IECEx Certified for Hazardous Duty Applications
- IP67 Sealing
- Anodized Aluminum, Stainless Steel, or Nickel Plated Housing

HAZ  
Hazardous Duty



IIIG  
Ex ia op is IIB T4 Ga



E116133  
Class 1, Div 1 Group C&D

## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical

**Resolution:** 1 to 3600 PPR (pulses/revolution)

**Format:** Two channel quadrature (AB) with optional Index (Z), and complementary outputs

**Phase Sense:** A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder

**Quadrature Phasing:**

For resolutions to 625 PPR:  $90^\circ \pm 15^\circ$  electrical;

For resolutions over 625 PPR:  $90^\circ \pm 30^\circ$  electrical

**Symmetry:**

For resolutions to 1024 PPR:  $180^\circ \pm 18^\circ$  electrical

For resolutions over 1024 PPR:  $180^\circ \pm 25^\circ$  electrical

**Index:** Gated to B low,  $150^\circ$  to  $330^\circ$

**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

### ELECTRICAL

**Input Power:** 5VDC, 7-26VDC

**Outputs:**

2N2222 Open Collector: 250mA, sink max

7272 Push-Pull: 40mA, sink or source

7272 Differential Line Driver: 40 mA, sink or source

7273 Open Collector: 40mA, sink max

**Frequency Response:** 125 kHz (data and index)

Noise Immunity: Tested to EN61326-1

**Electrical Immunity:** Reverse polarity and short circuit protected

**Termination:** 6, 7, or 10 pin MS Connector; 5 or 8 Pin M12 Connector; M23 Connector; Cable exit with seal

**Mating Connector:**

6 Pin MS, Style MS3106A-14S-6S (MCN-N4)

7 Pin MS, Style MS3106A-16S-1S (MCN-N5)

10 Pin MS, Style MS3106A-18-1S (MCN-N6)

10 Pin Bayonet, Style MS3116-F12-10S (MCN-B1)

10 Pin, NEMA4 Style (MCN-N6N4)

12 Pin CW M23 Connector (MCN-C1)

Cable with 5 pin M12 Connector (112859-XXXX)

Cable with 8 pin M12 Connector (112860-XXXX)

### MECHANICAL

**Bore Diameter:** 3/8", 10mm, 1/2", 5/8", 3/4". Insulated inserts provided

**Mounting Configuration:** Hubshaft, direct mount over shaft with multiple tether options available

**Shaft Speed:** 6000 RPM max.

**Starting Torque:** 6.5 in-oz. maximum (at 25°C)

**Bearings:** 61805-2RZ

**Housing and Cover:** Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel. Tether Available

**Shaft Material:** 303 stainless steel (passivated)

**Disc Material:** Aluminum

**Weight:** 20 ounces, typical

### ENVIRONMENTAL

**Operating Temperature:** -40 to 80°C

**Storage temperature:** -40 to 100°C

**Shock:** 50G's for 11msec duration

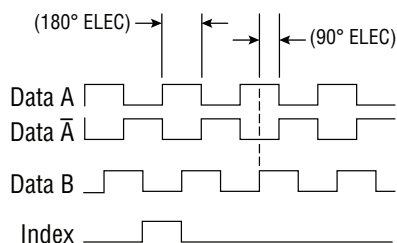
**Vibration:** 5 to 2000Hz @ 20 G's

**Humidity:** Up to 98% (non-condensing)

**Enclosure Rating:** IP67

### DATA AND INDEX

Not all complements shown  
A shown for reference



Index Width:  $150^\circ$  to  $330^\circ$  Default  
A leads B, CCW (from clamp end)

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## ORDERING INFORMATION

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Output Format	Code 5: Termination	Code 6: Options	Code 7: Special Options
<b>ISD25</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
ISD25 Hazardous Duty Encoder	0001 0500 0010 0512 0024 0600 0025 0625 0035 0720 0040 1000 0060 1024 0100 1200 0120 1250 0192 1440 0200 2000 0240 2048 0250 2500 0256 2540 0300 2600 0360 3600	<b>0</b> 6mm <b>1</b> 1/4" <b>2</b> 5/16" <b>3</b> 8mm <b>4</b> 3/8" <b>5</b> 10mm <b>6</b> 12mm <b>7</b> 1/2" <b>8</b> 5/8" <b>9</b> 15mm <b>A</b> 16mm <b>C</b> 19mm <b>D</b> 3/4"	<b>A</b> Single Ended ABZ, 7-26 in, 7-26 out push-pull (7272) <b>C</b> Single Ended ABZ, 5V in, 5V out push-pull (7272) <b>D</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector (7273) <b>E</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector (2222) <b>F</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector with 2.2kOhm pullup (2222)  Options G, H and J not available when Code 5 is 0, 5, H and Code 6 is 3, 4, 5 <b>G</b> Differential AB only, 5V in, 5V out (7272) <b>H</b> Differential AB only, 7-26 in, 7-26 out (7272) <b>J</b> Differential AB only, 7-26 in, 5V out (7272)  Options K, L and M not available when Code 5 is 0, 1, 5, 6, H and Code 6 is 3, 4, 5 <b>K</b> Differential ABZ, 5V in, 5V out (7272) <b>L</b> Differential ABZ, 7-26 in, 7-26 out (7272) <b>M</b> Differential ABZ, 7-26 in, 5V out (7272)	<b>0</b> 6 pin connector <b>1</b> 7 pin connector <b>2</b> 10 pin connector <b>3</b> 12 pin connector <b>4</b> 10 pin bayonet connector <b>5</b> 6 pin+mating connector <b>6</b> 7 pin+mating connector <b>7</b> 10 pin+mating connector <b>8</b> 12 pin+mating connector <b>9</b> 10 pin Bayonet mating connector  <b>A</b> .5m (20") cable <b>C</b> 1m (39") cable <b>D</b> 2m (79") cable <b>E</b> 3m (118") cable <b>L</b> 4m (157") cable <b>H</b> 5 pin M12 <b>J</b> 8 pin M12 <b>K</b> 1.5 ft (18") cable with inline 10pin connector <b>M</b> 5 ft (60") cable <b>N</b> 10 ft (120") cable <b>P</b> 1.5 ft (18") Cable with 10-pin Bulkhead Connector	<b>0</b> No Options** <b>1</b> Slotted Tether <b>2</b> Single Point Tether <b>3</b> No Tether**, Dual Isolated Outputs† <b>4</b> Slotted Tether, Dual Isolated Outputs† <b>5</b> Single Point Tether, Dual Isolated Outputs†  ** Tether may be required for proper encoder operation and may be supplied by the customer or ordered from below. † Simultaneous use of redundant outputs may void ATEX certification. Consult factory for details.	<b>Blank</b> None <b>01</b> Nickel Plated <b>02</b> Stainless Steel

## ACCESSORIES

### Cable Assemblies with MS Connector\*

SKU	Pins		Use with...
108594-XXXX	6 Pin MS	Connector, Cable Assembly	single ended outputs
108595-XXXX	7 Pin MS		single ended outputs
108596-XXXX	7 Pin MS		differential line driver without index outputs
114448-XXXX	10 Pin Bayonet		differential line driver with index outputs
1400635XXXX	10 Pin MS		differential line driver with index outputs
109209-XXXX	NEMA4 10 pin MS		differential line driver with index outputs

### Mating Connectors (no cable)

SKU	Pins	Style
MCN-N4	6 pin	MS3106A-14S-6S
MCN-N5	7 pin	MS3106A-16S-1S
MCN-N6	10 pin	MS3106A-18-1S
MCN-N6N4	10 pin	NEMA4
MCN-B1	10 Pin Bayonet	MS3116-F12-10S
MCN-C1	12 Pin	CW M23 Connector

### Cable Assemblies with M23 Connector\*

SKU	Pins		Use with...
115901-XXXX	12 pin M23, CW	Connector, Cable Assembly	differential line driver with index outputs

### Cable Assemblies with M12 Connector\*

SKU	Pins		Use with...
112859-XXXX	5 Pin M12	Connector, Cable Assembly	single ended outputs
112860-XXXX	8 Pin M12		single ended outputs
112860-XXXX	8 Pin M12		differential line driver outputs

\*Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace XXXX with -0020.

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## ELECTRICAL CONNECTIONS

### 6, 7 and 10 Pin MS and M23 Connectors and Cables

Connector and mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the color coding as shown in the right hand column.

Table 1

Encoder Function	Cable # 108594-XXXX 6 Pin Single Ended		Cable # 108595-XXXX 7 Pin Single Ended		Cable # 108596-XXXX 7 Pin Diff Line Driver without Index		Cable # 109209-XXXX or 1400635XXXX 10 Pin Diff Line Driver with Index*		Cable # 114448-XXXX 10 Pin Bayonet		Cable # 115901-XXXX 12 Pin (CW)		Cable Exit with Seal
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Wire Color Code
Signal A	E	BRN	A	BRN	A	BRN	A	BRN	A	BRN	5	BRN	GRN
Signal B	D	ORG	B	ORG	B	ORG	B	ORG	B	ORG	8	ORG	BLU
Signal Z*	C	YEL	C	YEL	—	—	C	YEL	C	YEL	3	YEL	ORG
Power +V	B	RED	D	RED	D	RED	D	RED	D	RED	12	RED	RED
Common	A	BLK	F	BLK	F	BLK	F	BLK	F	BLK	10	BLK	BLK
Case	—	—	G	GRN	G	GRN	GH	GRN	G	GRN	9	—	WHT
N/C-SLD	F	—	E	—	—	—	E	—	E	—	7	—	—
Signal $\bar{A}$	—	—	—	—	C	BRN/WHT	H	BRN/WHT	H	BRN/WHT	6	BRN/WHT	VIO
Signal $\bar{B}$	—	—	—	—	E	ORG/WHT	I	ORG/WHT	I	ORG/WHT	1	ORG/WHT	BRN
Signal $\bar{Z}$ *	—	—	—	—	—	—	J	YEL/WHT	J	YEL/WHT	4	YEL/WHT	YEL

### 5 and 8 Pin M12 Accessory Cables when Code 5 = H or J

Connector pin numbers and cable assembly wire color information is provided here for reference.

Table 2

Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Common	3	BLU	7	BLK	7	BLK
Signal $\bar{A}$	—	—	—	—	3	BRN/WHT
Signal $\bar{B}$	—	—	—	—	5	ORG/WHT
Signal $\bar{Z}$ *	—	—	—	—	8	YEL/WHT

\*Index not provided on all models. See ordering information.

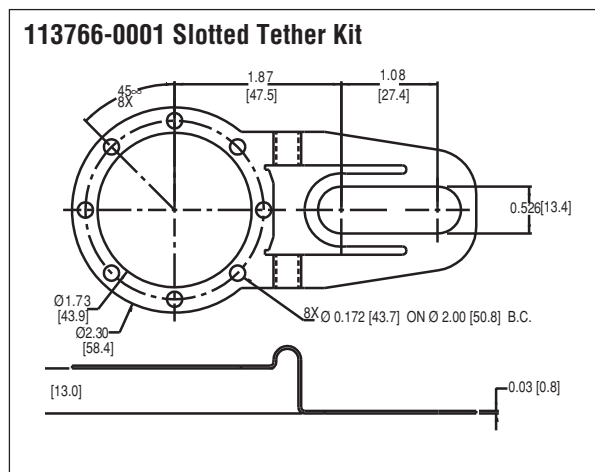
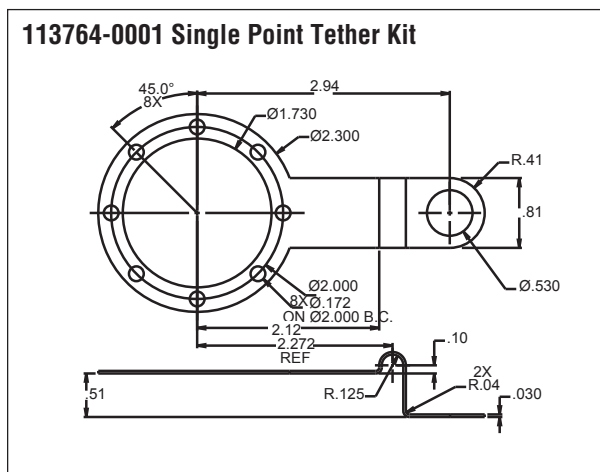
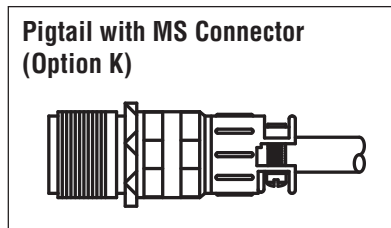
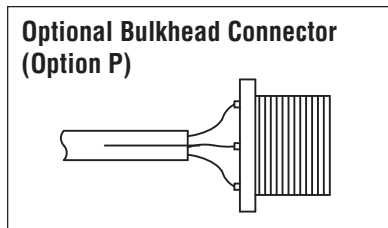
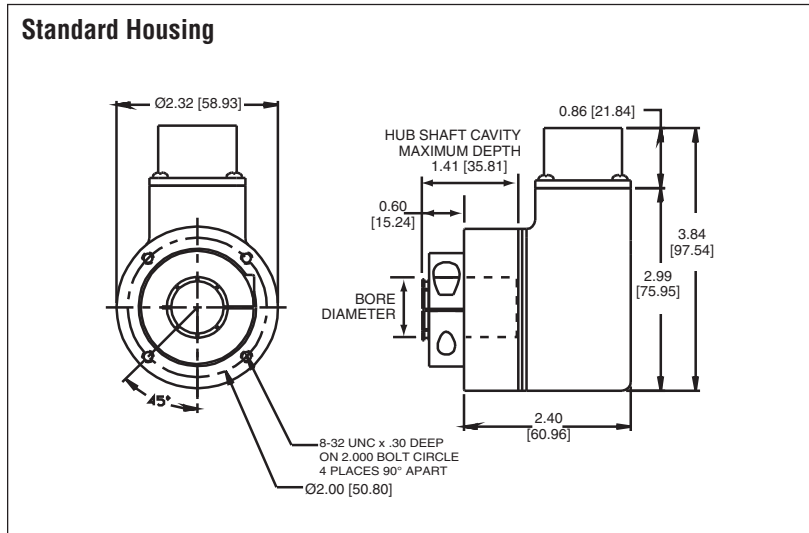
### NOTES:

- Cable Configuration (**Table 1**): PVC jacket, 105°C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)
- Cable Configuration (**Table 2**): PVC jacket, 105°C rated, overall foil shield; 24 AWG conductors, minimum
- Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020
- "MS" Type mating connectors and pre-built cables are rated NEMA 12
- "M12" Cable assemblies are rated IP67
- For watertight applications, use NEMA4 10 pin cable and connector 109209-XXXX

# SERIES ISD25

**NorthStar™ brand**

Dimensions: inch [mm]



Worldwide Brands: NorthStar™ • Dynapar™ • Hengstler™ • Harowe™

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