

# Инкрементальный энкодер для опасных зон ISD25

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Казахстан +(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: [drx@nt-rt.ru](mailto:drx@nt-rt.ru) || сайт: <https://dynapar.nt-rt.ru/>

# SERIES ISD25

**NorthStar™ brand**

## Hazardous Duty Encoder

### Key Features

- Class I, Division 1 and Zone 0 Certified
- ATEX, UL and IECEx Certified for Hazardous Duty Applications
- Unbreakable Code Disc up to 9,000 PPR
- 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 9,000 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:**  $90^\circ \pm 30^\circ$  electrical

**Symmetry:**  $180^\circ \pm 25^\circ$  electrical

**Index:**  $180^\circ$  default gated to B low

**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:** 200 kHz (data and index)

**Noise Immunity:** Tested to EN61326-1

**Electrical Immunity:** Reverse polarity (All models); Short circuit protection (7272 and 7273 line drivers only)

**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

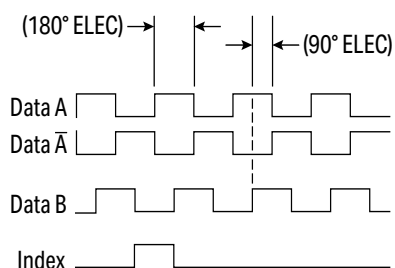
**Vibration:** 5 to 2000Hz @ 20 G's

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

**Enclosure Rating:** IP67

#### STANDARD DATA AND INDEX

Not all complements shown  
A shown for reference



Index Width:  $180^\circ$  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:<br>Model                   | Code 2:<br>PPR                                                                                                                                                                   | Code 3:<br>Bore Size                                                                                                                                                                                                     | Code 4:<br>Output Format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Code 5:<br>Termination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Code 6:<br>Options                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Code 7:<br>Special Options                                                |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>ISD25</b>                       | <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>                                                                                              | <input type="text"/>                                                                                                                                                                                                     | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="text"/> <input type="text"/>                                 |
| ISD25<br>Hazardous<br>Duty Encoder | Enter Custom PPR<br>from 0001 to 9000<br>Examples:<br><b>0001</b> = 1 PPR<br><b>0256</b> = 256 PPR<br><b>1024</b> = 1024 PPR<br><b>8192</b> = 8192 PPR<br><b>9000</b> = 9000 PPR | <b>0</b> 6mm<br><b>1</b> 1/4"<br><b>2</b> 5/16"<br><b>3</b> 8mm<br><b>4</b> 3/8"<br><b>5</b> 10mm<br><b>6</b> 12mm<br><b>7</b> 1/2"<br><b>8</b> 5/8"<br><b>9</b> 15mm<br><b>A</b> 16mm<br><b>C</b> 19mm<br><b>D</b> 3/4" | <b>A</b> Single Ended ABZ, 7-26VDC in, 7-26V out push-pull (7272)<br><b>C</b> Single Ended ABZ, 5VDC in, 5V out push-pull (7272)<br><b>D</b> Single Ended ABZ, 7-26VDC in, 7-26V out Open Collector (7273)<br><br>Options E and F not available when code 6 is 3, 4, 5<br><b>E</b> Single Ended ABZ, 7-26VDC in, 7-26V out Open Collector (2222)<br><b>F</b> Single Ended ABZ, 7-26VDC in, 7-26V out Open Collector with 2.2kOhm pullup (2222)<br><br>Options G, H and J not available when Code 5 is 0, 5, H<br><b>G</b> Differential AB only, 5VDC in, 5V out (7272)<br><b>H</b> Differential AB only, 7-26VDC in, 7-26V out (7272)<br><b>J</b> Differential AB only, 7-26VDC in, 5V out (7272)<br><br>Options K, L and M not available when Code 5 is 0, 1, 5, 6, H<br><b>K</b> Differential ABZ, 5VDC in, 5V out (7272)<br><b>L</b> Differential ABZ, 7-26VDC in, 7-26V out (7272)<br><b>M</b> Differential ABZ, 7-26VDC in, 5V out (7272) | <b>0</b> 6 pin connector<br><b>1</b> 7 pin connector<br><b>2</b> 10 pin connector<br><b>3</b> 12 pin connector<br><b>4</b> 10 pin bayonet connector<br><b>5</b> 6 pin+mating connector<br><b>6</b> 7 pin+mating connector<br><b>7</b> 10 pin+mating connector<br><b>8</b> 12 pin+mating connector<br><b>9</b> 10 pin Bayonet mating connector<br><b>A</b> .5m (20") cable<br><b>C</b> 1m (39") cable<br><b>D</b> 2m (79") cable<br><b>E</b> 3m (118") cable<br><b>L</b> 4m (157") cable<br><b>H</b> 5 pin M12<br><b>J</b> 8 pin M12<br><b>K</b> 1.5 ft (18") cable with inline 10pin connector<br><b>M</b> 5 ft (60") cable<br><b>N</b> 10 ft (120") cable<br><b>P</b> 1.5 ft (18") Cable with 10-pin Bulkhead Connector | <b>0</b> No Options*<br><b>1</b> Slotted Tether<br><b>2</b> Single Point Tether<br><b>3</b> No Tether*, Dual Isolated Outputs†<br><b>4</b> Slotted Tether, Dual Isolated Outputs†<br><b>5</b> Single Point Tether, Dual Isolated Outputs†<br><br>* Tether may be required for proper encoder operation and may be supplied by the customer or ordered from below.<br>† Simultaneous use of redundant outputs will void ATEX certification and is not allowed. Consult factory for details. | <b>Blank</b> None<br><b>01</b> Nickel Plated<br><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    |

| 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 |

**Note:** 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.

| 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 |

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**NorthStar™ brand**

## 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 #<br>108594-XXXX<br>6 Pin Single Ended |            | Cable #<br>108595-XXXX<br>7 Pin Single Ended |            | Cable #<br>108596-XXXX<br>7 Pin Diff Line Driver<br>without Index |            | Cable #<br>109209-XXXX*<br>or 1400635XXXX<br>10 Pin Diff Line<br>Driver with Index |            | Cable #<br>114448-XXXX<br>10 Pin Bayonet |            | Cable #<br>115901-XXXX<br>12 Pin (CW) |            | Cable Exit<br>with Seal |
|                       | Pin                                          | Wire Color | Pin                                          | Wire Color | Pin                                                               | Wire Color | Pin                                                                                | Wire Color | Pin                                      | Wire Color | Pin                                   | Wire Color | Wire Color              |
| 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 <sup>†</sup> | 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        | G                                                                                  | GRN        | G                                        | GRN        | 9                                     | —          | WHT                     |
| N/C                   | F                                            | —          | E                                            | —          | —                                                                 | —          | E                                                                                  | —          | E                                        | —          | 7                                     | —          | —                       |
| Sig. $\bar{A}$        | —                                            | —          | —                                            | —          | C                                                                 | BRN/WHT    | H                                                                                  | BRN/WHT    | H                                        | BRN/WHT    | 6                                     | BRN/WHT    | VIO                     |
| Sig. $\bar{B}$        | —                                            | —          | —                                            | —          | E                                                                 | ORG/WHT    | I                                                                                  | ORG/WHT    | J                                        | ORG/WHT    | 1                                     | ORG/WHT    | BRN                     |
| Sig. $\bar{Z}^†$      | —                                            | —          | —                                            | —          | —                                                                 | —          | J                                                                                  | YEL/WHT    | K                                        | 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 #<br>112859-XXXX<br>5 Pin Single Ended |            | Cable #<br>112860-XXXX<br>8 Pin Single Ended |            | Cable #<br>112860-XXXX<br>8 Pin Differential |            |
|                       | Pin                                          | Wire Color | Pin                                          | Wire Color | Pin                                          | Wire Color |
| Signal A              | 4                                            | BLK        | 1                                            | BRN        | 1                                            | BRN        |
| Signal B              | 2                                            | WHT        | 4                                            | ORG        | 4                                            | ORG        |
| Signal Z <sup>†</sup> | 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    |

#### 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-build cables are rated NEMA 12

"M12" Cable assemblies are rated IP67

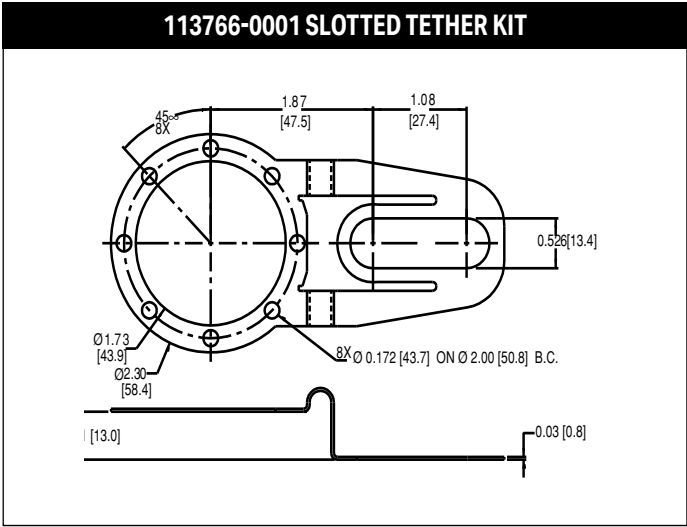
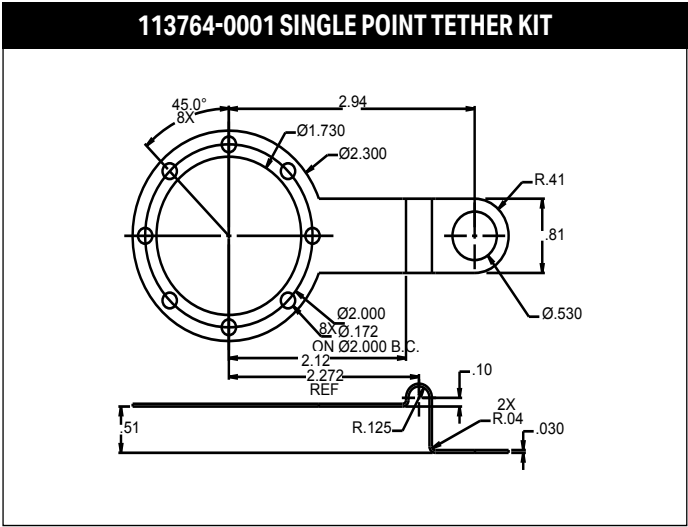
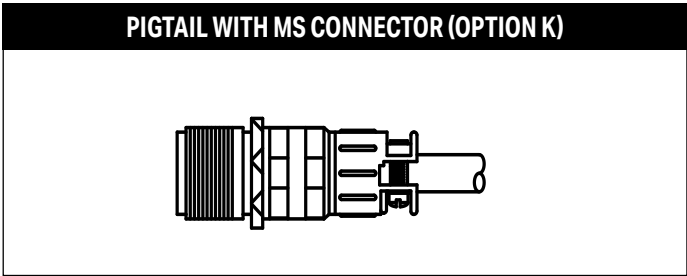
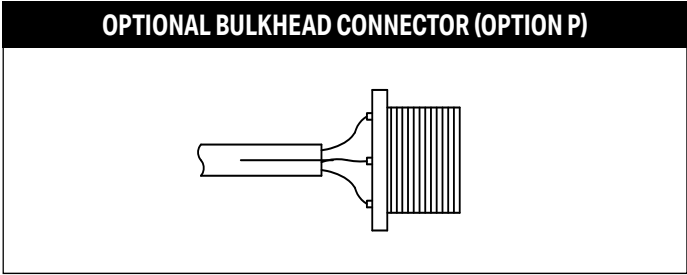
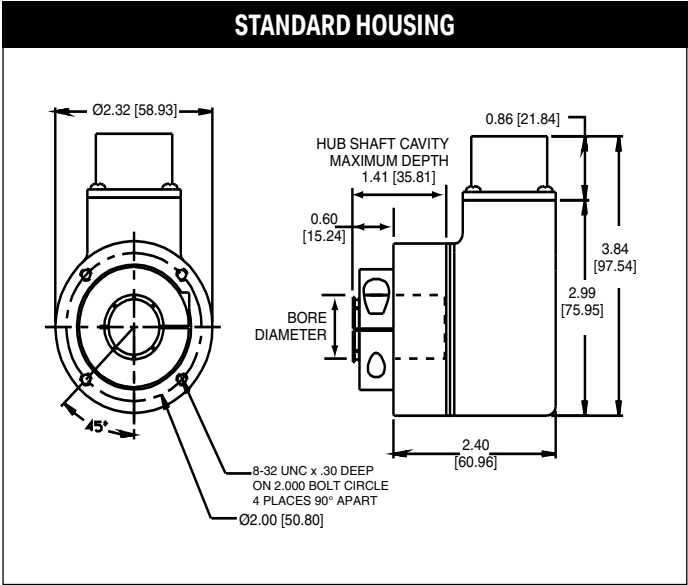
\*For watertight applications, use NEMA 4 10 pin cable and connector 109209-XXXX

<sup>†</sup> Index not provided on all models. See ordering information

SERIES ISD25

NorthStar™ brand

Dimensions: inch [mm]



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Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: [drx@nt-rt.ru](mailto:drx@nt-rt.ru) || сайт: <https://dynapar.nt-rt.ru/>