

HAZARDOUS SERIES HD25 *NorthStar™ brand*

Hazardous Duty Encoder

Key Features

- Size 25 Encoder with Single or Dual Isolated Outputs
- ATEX and CSA Certified for Hazardous Duty Applications
- Unbreakable Code Disc up to 5000 PPR
- Special Housing and Seals for IP67 Rating
- Anodized Aluminum, Stainless Steel, or Nickel Plated Housing



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: 1 to 5000 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° ± 15° electrical; For resolutions over 625 PPR: 90° ± 30° electrical
Symmetry:
 For resolutions to 1024 PPR: 180° ± 18° electrical
 For resolutions over 1024 PPR: 180° ± 25° electrical
Index: 150° to 330° A Leads B, CCW (From Shaft End)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

MECHANICAL

Shaft Sizes: 10mm, 12mm, 3/8"
Shaft Speed: 6,000 RPM, maximum
Shaft Loading: Up to 100 lbs axial and radial
Starting Torque: 2.5 in-oz. maximum (at 25°C)
Bearings: 5200 ZZ double row
Bearing life: 5 x 10⁸ revs at rated shaft Loading, 5 x 10¹¹ revs at 10% of rated shaft loading. (manufacturers' specs)
Housing and Cover: Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel.
Shaft Material: 303 stainless steel (passivated)
Disc Material: Plastic
Weight: 14 ounces, typical

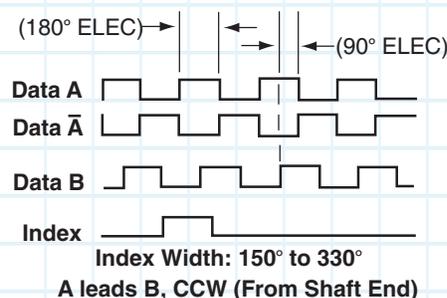
ENVIRONMENTAL

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

ELECTRICAL

Input Power: 5VDC, 5-15VDC, 7-26VDC
Outputs:
 7272 Push-Pull: 40mA, sink or source
 7272 Differential Line Driver: 40 mA, sink or source
 7273 Open Collector: 40mA, sink max
 2N2222 Open Collector: 250mA, sink max
 4469 Differential Line Driver: 100mA, sink or source
Frequency Response: 125 kHz (data & index)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity and short circuit protected
Termination: 6, 7, or 10 pin MS Connector
 Cable exit w/seal
Mating Connector:
 6 pin, style MS3106A-14S-6S (MCN-N4);
 7 pin, style MS3106A-16S-1S (MCN-N5);
 10 pin, style MS3106A-18-1S (MCN-N6)
 10 pin, NEMA 4 style (MCN-N6N4)

DATA AND INDEX Not all complements shown A̅ shown for reference



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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: Shaft | Code 4: Electrical | Code 5: Termination | Code 6: Options |
|---------------|-------------|---------------|--------------------|---------------------|-----------------|
| HD25 □ | □□□□ | □ | □ | □ | □ |

| Ordering Information | | | | | | |
|--------------------------------------|---|---|---|---|--|--|
| Size 25 Hazardous Duty Encoder | 0001 0024 0025 0035 0040 0050 0060 0100 0120 0192 0200 0240 0250 0256 0300 0360 0500 0512 0600 | 0625 0720 0900 1000 1024 1200 1250 1440 1524 1600 1800 2000 2048 2500 2540 2600 3600 4096 5000 | 0 3/8" Dia. Shaft with flat 4 10mm Dia. Shaft, with flat 6 12mm Dia. Shaft 7 3/8" Dia Shaft w/ Flat, 4 Hole 2.00" BC | 0 Open Collector out (7273) 2 Push-Pull out (7272) F Open Collector out (2222) G Open Collector out with 2.2 kΩ Pullups (2222) Available when: Code 1 is 1, 2 and Code 5 is 3,5 or A through P, or Code 1 is 3 and code 5 is 5 or A through P: 3 Differential Line Driver Out (7272) 6 Differential Line Driver Out (4469) *Note: Available ATEX Certi- fied Options ATEX Type 1: ATEX Certified; 5V in, 5V out only ATEX Type 2: ATEX Certified; 7-26V in, 7-26V out ATEX Type 3: ATEX Certified; 7-26V in, 5V out ATEX Type 4: ATEX Certified; 5-15V in, 5-15V out | 1 6 Pin Connector 3 7 Pin Connector 5 10 Pin Connector 9 5 Pin M12 Connector A 8 Pin M12 Connector D 18" Sealed Cable E 3' Sealed Cable F 6' Sealed Cable G 10' Sealed Cable H 15' Sealed Cable P 5m Sealed Cable | A No Options w/ ATEX Type 1 B Nickel Finish Housing w/ ATEX Type 1 C Stainless Steel Housing w/ ATEX Type 1 G Same as "A" w/ ATEX Type 2 H Same as "B" w/ ATEX Type 2 I Same as "C" w/ ATEX Type 2 Available when Code 4 is 0, 2 D Redundant Outputs (Dual Connector Housing) w/ ATEX Type 1. <i>See †NOTE</i> E Nickel Finish Housing, Redundant Outputs w/ ATEX Type 1. <i>See †NOTE</i> F Stainless Steel Housing, Redundant Outputs w/ ATEX Type 1. <i>See †NOTE</i> J Same as "D" w/ ATEX Type 2. <i>See †NOTE</i> K Same as "E" w/ ATEX Type 2. <i>See †NOTE</i> L Same as "F" w/ ATEX Type 2. <i>See †NOTE</i> M Same as "A" w/ ATEX Type 3 N Same as "B" w/ ATEX Type 3 O Same as "C" w/ ATEX Type 3 P Same as "D" w/ ATEX Type 3. <i>See †NOTE</i> Q Same as "E" w/ ATEX Type 3. <i>See †NOTE</i> R Same as "F" w/ ATEX Type 3. <i>See †NOTE</i> Available when Code 4 is 6: S Same as "A", w/ATEX Type 4 T Same as "B", w/ATEX Type 4 U Same as "C", w/ATEX Type 4 † NOTE: Simultaneous use of redundant outputs may void ATEX certification. Consult factory for details. |

Cable Assemblies with MS Connector

- 108594-XXXX** 6 Pin MS, Cable Assy. For Use with Single Ended Outputs
- 108595-XXXX** 7 Pin MS, Cable Assy. For Use with Single Ended Outputs
- 108596-XXXX** 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
- 1400635XXX** 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs
- 109209-XXXX** NEMA4 10 pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

Mating Connectors (no cable)

- 6 pin, style MS3106A-14S-6S (MCN-N4)
- 7 pin, style MS3106A-16S-1S (MCN-N5)
- 10 pin, style MS3106A-18-1S (MCN-N6)
- 10 pin, NEMA 4 style (MCN-N6N4)

*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.

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ELECTRICAL CONNECTIONS

6, 7 & 10 Pin MS Connectors and Cables - When Code 5 = 1, 3, 5, or D-P

Connector & 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 Dif Line Driver without Index | | ** Cable # 1400635XXXX ** Cable # 109209-XXXX 10 Pin Dif Line Driver with Index | | Cable Exit with Seal |
| | 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 | GRN |
| Signal B | D | ORN | B | ORG | B | ORG | B | ORG | BLU |
| Signal Z* | C | YEL | C | YEL | — | — | C | YEL | ORG |
| Power +V | B | RED | D | RED | D | RED | D | RED | RED |
| Com | A | BLK | F | BLK | F | BLK | F | BLK | BLK |
| Case | — | — | G | GRN | G | GRN | G | GRN | WHT |
| N/C | F | — | E | — | — | — | E | — | — |
| Signal \bar{A} | — | — | — | — | C | BRN/WHT | H | BRN/WHT | VIO |
| Signal \bar{B} | — | — | — | — | E | ORG/WHT | I | ORG/WHT | BRN |
| Signal \bar{Z} * | — | — | — | — | — | — | J | YEL/WHT | YEL |

5 & 8 Pin M12 Accessory Cables when - When Code 5 = 9 or A

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

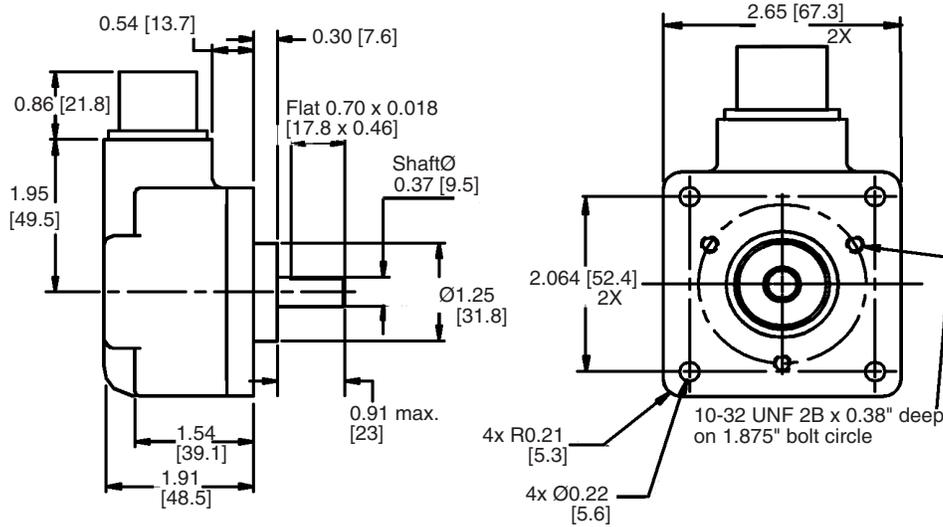
| Table 2 | | | | | | |
|--------------------|---|-----------------|---|-----------------|---|-----------------|
| Encoder Function | Cable # 112859-XXXX 5 Pin Single Ended | | Cable # 112860-XXXX 8 Pin Single Ended | | Cable # 112860-XXXX 8 Pin Differential | |
| | Pin | Wire Color Code | Pin | Wire 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 |
| Com | 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:

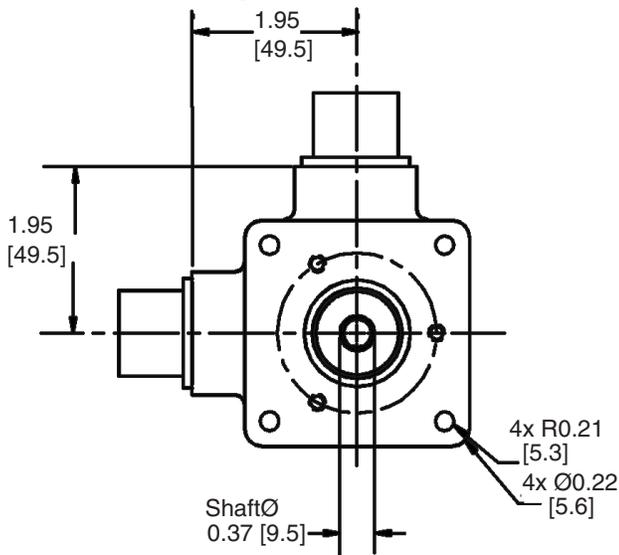
- 1) Cable Configuration (**Table 1**): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 2) Cable Configuration (**Table 2**): PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum
- 3) Standard cable 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
- 4) *Index not provided on all models. See ordering information.
- 5) **For watertight applications, use NEMA4 10 pin cable & connector 1400635XXXX.
- 6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 7) "M12" Cable assemblies are rated IP67

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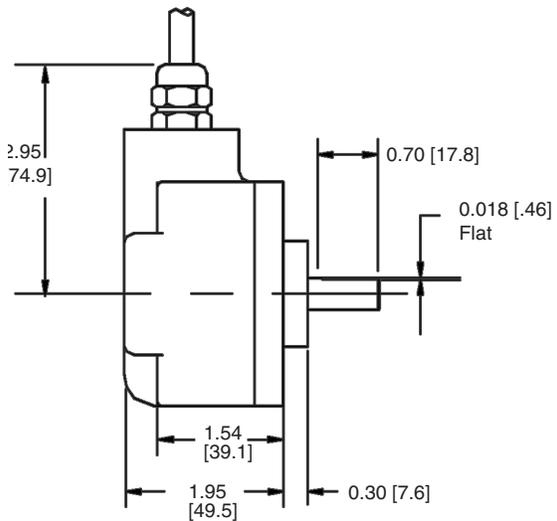
DIMENSIONS inches [mm]



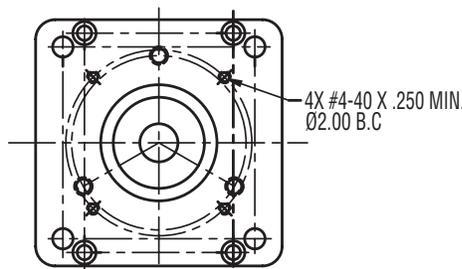
Standard Housing



Dual Redundant Outputs



Cable Exit



With 4 Hole 2.00" BC



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