

SERIES ISD37

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



II1G
Ex ia op is IIB T4 Ga

E116133
Class 1, Div 1 Group C&D

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical

Resolution: Up to 9,000 PPR (pulses/revolution)
See Ordering Information

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° 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, 7-26 VDC

Outputs:
7272 Push-Pull: 40mA, sink or source
7272 Differential Line Driver: 40 mA, sink or source
2N2222 Open Collector: 250mA, 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: MS Connector; M12 Connector; M23 Connector; cable exit w/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: 1.00", 0.875", 0.750", 0.625", 0.500", 16mm, 15mm, 12mm. Insulated inserts provided for bores under 1 inch (1" bore not electrically isolated for stainless shaft option)

Mounting Configuration: Hollow Bore, direct mount over shaft with multiple tether options available

Bore Runout: ± 0.0005 TIR at midpoint

Shaft Speed: 6000 RPM max.

Min. Shaft Engagement: 1.60" (Recommended)

Starting Torque: 4.5 in-oz. maximum (at ambient)

Running Torque: 4.0 in-oz. maximum (at ambient)

Bearings: 61806-ZZ

Housing and Cover: Hard Anodized Aluminum. Also available in Stainless Steel.

Shaft Material: Stainless Steel (Anodized 6061 aluminum for 1" isolated bore option)

Disc Material: Aluminum

Weight: 35 ounces, typical

ENVIRONMENTAL

Operating Temperature: -40 to 80°C

Storage Temperature: -40 to 100°C

Shock: 400g for 6ms duration

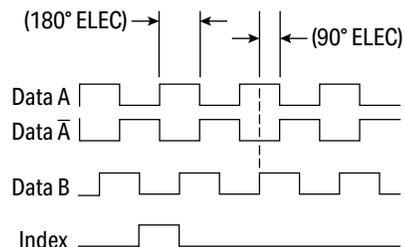
Vibration: 5 to 3000Hz @ 20g

Humidity: Up to 98% (non-condensing)

Enclosure Rating: IP67

STANDARD DATA AND INDEX

Not all complements shown
 \bar{A} shown for reference



Index Width: 180° 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: Shaft	Code 4: Output Format	Code 5: Termination	Code 6: Options	Code 7: Special Options	
ISD37	<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"/>	
ISD37 Hazardous Duty Encoder	Enter Custom PPR from 0001 to 9000 Examples: 0001 = 1 PPR 0256 = 256 PPR 1024 = 1024 PPR 8192 = 8192 PPR 9000 = 9000 PPR	Electrically Isolated (Stainless Steel Shaft, Non-Metallic Insert)	A Single Ended ABZ, 7-26VDC in, 7-26V out push-pull (7272) C Single Ended ABZ, 5VDC in, 5V out push-pull (7272) D Single Ended ABZ, 7-26VDC in, 5V out push-pull (7272) E Single Ended ABZ, 7-26VDC in, 7-26V out Open Collector (2222) F Single Ended ABZ, 7-26VDC in, 7-26V out Open Collector with 1kOhm (2222)	0 6 pin connector 1 7 pin connector 2 10 pin connector 3 12 pin connector 4 10 pin Bayonet connector 5 6 pin+mating connector 6 7 pin+mating connector 7 10 pin+mating connector 8 12 pin+mating connector 9 10 pin Bayonet+mating connector A .5m (20") cable C 1m (39") cable D 2m (79") cable H 5 pin M12 connector J 8 pin M12 connector K 1.5 ft (18") cable with inline 10pin connector M 5 ft (60") cable N 10 ft (120") cable P 1.5 ft (18") Cable with 10-pin Bulkhead Connector	0 No Options* 1 Slotted Tether 2 Single Point 4.5" C-Face Tether 3 Single Point 8.5" C-Face Tether 4 Dual Isolated Outputs†, No Tether* 5 Dual Isolated Outputs†, Slotted Tether 6 Dual Isolated Outputs†, 4.5" C-Face Tether 7 Dual Isolated Outputs†, 8.5" C-Face Tether A Swivel Rod Tether C Metric Swivel Rod Tether D Dual Isolated Outputs†, Swivel Rod Tether E Dual Isolated Outputs†, Metric Swivel Rod Tether	Blank None 01 Nickel Plated 02 Stainless Steel	
		Electrically Isolated (Anodized Aluminum Shaft)	Options G, H and J not available when Code 5 is H G Differential AB only, 5VDC in, 5V out (7272) H Differential AB only, 7-26VDC in, 7-26V out (7272) J Differential AB only, 7-26VDC in, 5V out (7272)	Options K, L, M not available when Code 5 is 0, 1, 5, 6, H K Differential ABZ, 5VDC in, 5V out (7272) L Differential ABZ, 7-26VDC in, 7-26V out (7272) M Differential ABZ, 7-26VDC in, 5V out (7272)	Available when Code 6 is 0, 1, 2, 3, A, C T Terminal box with conduit entry		*Tether may be required for proper encoder operation and may be supplied by the customer or ordered from below. †Simultaneous use of redundant outputs will void ATEX certification and is not allowed. Consult factory for details.
		Not Electrically Isolated (Stainless Steel Shaft)					

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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

Tether Kits

SKU	Description
114573-0001	Tether Kit, 4.5" C-face single point with 3/8" bolt
114574-0001	Tether Kit for standard AC motor fan covers w/T-Bolt
114575-0001	Tether Kit, 8.5" C-Face single point with 1/2" bolt

The following Cover Kits are not compatible when Code 5 is T (Terminal Box with Conduit)

SKU	Description
114591-0001	Cover Kit, 56 C-face
114592-0001	Cover Kit, fan cover
114575-0001	Dual Cover Kit, 56 C-Face
114594-0001	Dual Cover Kit, Fan Cover

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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	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 [†]	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	—	—
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	Pin	Wire Color	Pin	Wire Color
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

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 NEMA4 10 pin cable and connector 109209-XXXX

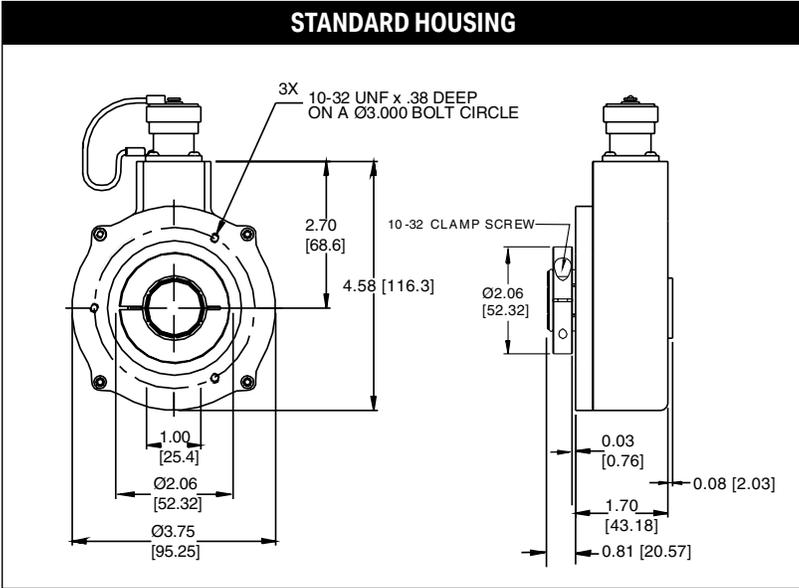
[†] Index not provided on all models. See ordering information

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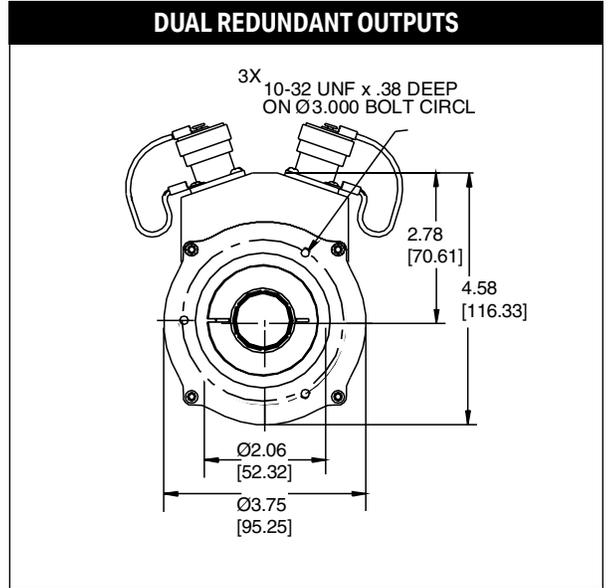
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Dimensions: inch [mm]

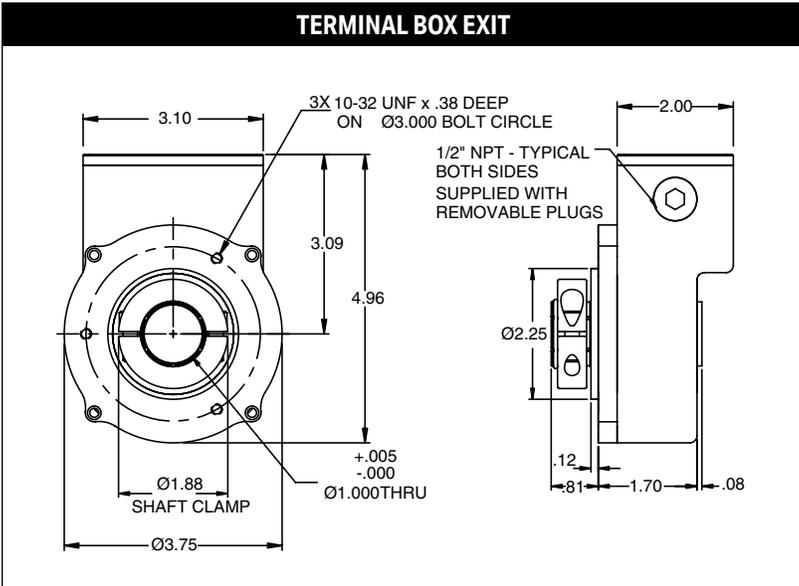
STANDARD HOUSING



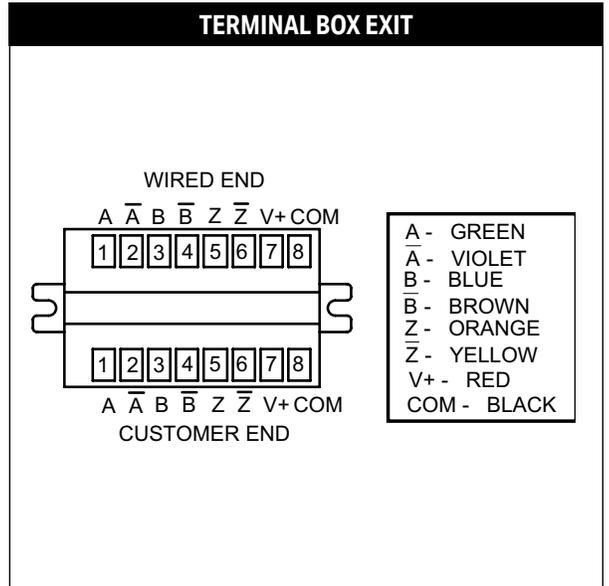
DUAL REDUNDANT OUTPUTS



TERMINAL BOX EXIT



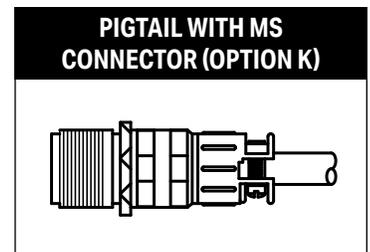
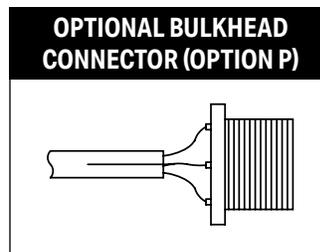
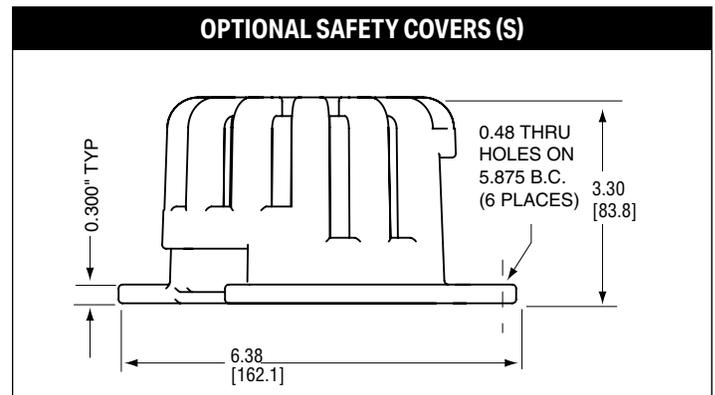
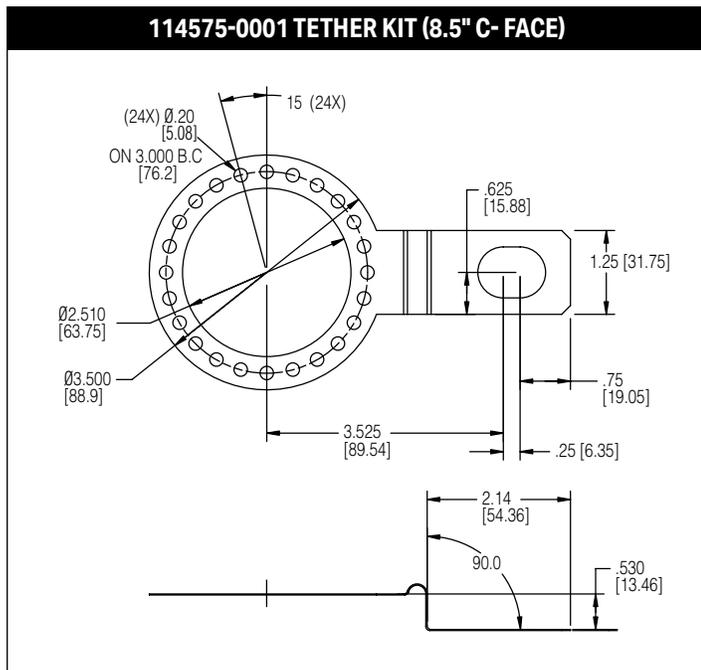
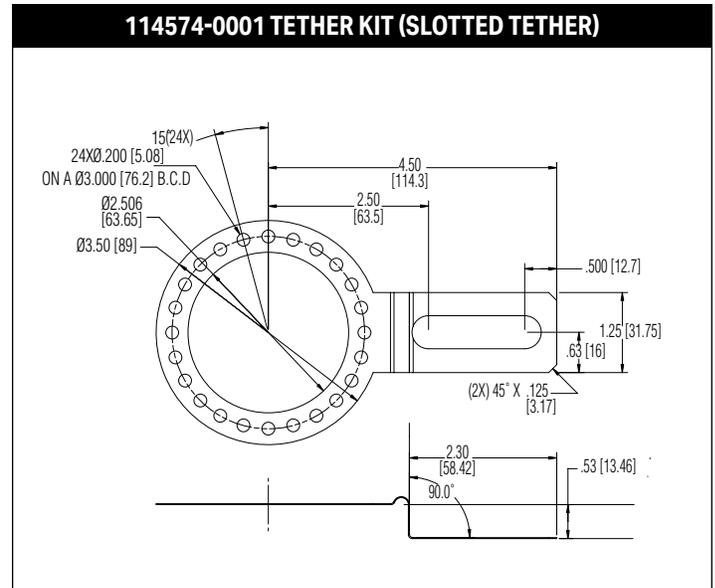
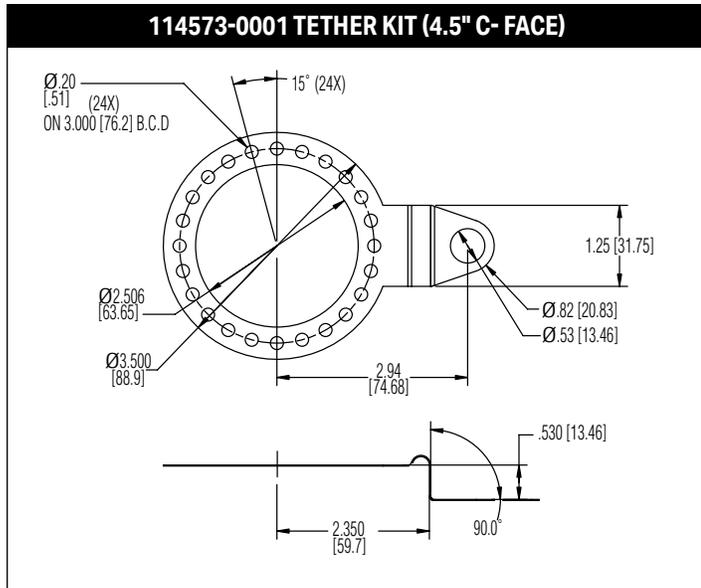
TERMINAL BOX EXIT



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Dimensions: inch [mm]



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

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