

SERIES ISW38

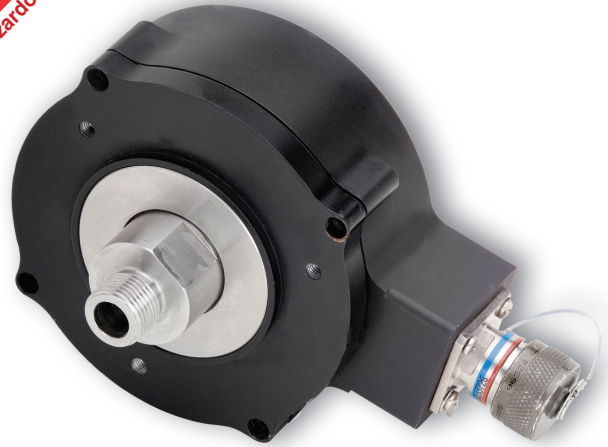
NorthStar™ brand

Hazardous Duty Encoder

Key Features

- Draw Works Threaded Shaft with Field Replaceable Adapters for Reduced Downtime
- ATEX and CSA Certified for Hazardous Duty Applications
- Dual Isolated Outputs Available for Redundancy
- Anodized Aluminum or Stainless Steel Housing
- NAMUR Sensor Output Available

HAZ
Hazardous Duty



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 200 to 300 PPR and 1200 PPR and above: 90° ±30° electrical; all other resolutions: 90° ±15°

Symmetry:

For resolutions 200-300PPR and above 1024 PPR: 180° ±25° electrical; all other resolutions: 180° ±18°

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

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 & index)

Noise Immunity: Tested to EN61326-1

Electrical Immunity: Reverse polarity and short circuit protected

Termination: 6, 7, or 10 pin MS Connector;

M23 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, NEMA4 style (MCN-N6N4)

12 pin CW, M23 Connector (MCN-C1)

Cable w/ 5 pin M12 Connector (112859-XXXX)

Cable w/ 8 pin M12 Connector (112860-XXXX)

MECHANICAL

Shaft Sizes:

1"-14 UNS x 5/8" - 18 UNF Threaded Shaft;

1"-14 UNS Threaded Shaft;

1"-14 UNS x 5/8" - 18 UNF Field Replaceable Threaded Shaft

Shaft Speed: 6000 RPM max

Bore Loading: Up to 20 lbs axial and radial

Bore Runout: 0.0005 TIR at midpoint

Starting Torque: 4.5 in-oz. max (at 25°C)

Running Torque: 4.0 in-oz. max (at 25°C)

Bearings: 61806-ZZ

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

Shaft Material: 300 series stainless steel

Disc Material: Mylar

Weight: 35 ounces, typical

ENVIRONMENTAL

Operating Temperature: -40 to 80°C

Storage temperature: -40 to 100°C

Shock: 400g for 6msec duration

Vibration: 5 to 3000Hz @ 20g

Humidity: Up to 98% (non-condensing)

Enclosure Rating: IP67

DATA AND INDEX

Not all complements shown
A shown for reference

(180° ELEC) → ← (90° ELEC)

Data A

Data \bar{A}

Data B

Index

Index Width: 150° to 330°

A leads B, CCW (From Shaft End)

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
ISW38	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ordering Information

ISW38 Hazardous Duty Encoder	0015 1000	0 1"-14 UNS x 5/8" - 18 UNF Threaded Shaft	A Single Ended ABZ, 7-26V in, 7-26V out push-pull (7272)	0 6 pin connector 1 7 pin connector 2 10 pin connector 3 12 pin connector 5 6 pin+mating connector 6 7 pin+mating connector 7 10 pin+mating connector 8 12 pin+mating connector A .5m (18") cable C 1m (36") cable D 2m (72") cable H 5 pin M12 connector J 8 pin M12 connector K 1.5 ft (18") cable w/ in line 10pin connector M 5 ft (60") cable N 10 ft (120") cable	0 Aluminum Housing 1 Nickel Finish Housing 2 Stainless Steel Housing 3 Dual Isolated Outputs, Aluminum Housing † 4 Dual Isolated Outputs, Nickel Housing † 5 Dual Isolated Outputs, Stainless Steel Housing †	
	0032 1024		C Single Ended ABZ, 5V in, 5V out push-pull (7272)			
	0050 1200		D Single Ended ABZ, 7-26V in, 5V out push-pull (7273)			
	0060 2000		E Single Ended ABZ, 7-26V in, 7-26V out Open Collector (7273)			
	0100 2048	1 1"-14 UNS Threaded Shaft	F Single Ended ABZ, 7-26V in, 7-26V out Open Collector (2222)			
	0200 4000		G Single Ended ABZ, 7-26V in, 7-26V out Open Collector w/ 1kOhm (2222)			
	0240 4096		2 1"-14 UNS x 5/8" - 18 UNF Field Replace- able Threaded Shaft	<i>Options H, J & K not available when Code 5 is H</i>		
	0250 5000			H Differential AB only, 5V in, 5V out (7272)		
	0500	J Differential AB only, 7-26 in, 7-26 out (7272)				
	0512		K Differential AB only, 7-26 in, 5V out (7272)			
	0600		<i>Options L, M, P not available when Code 5 is 0, 1, 5, 6, H</i>			
			L Differential ABZ, 5V in, 5V out (7272)			
			M Differential ABZ, 7-26 in, 7-26 out (7272)			
			P Differential ABZ, 7-26 in, 5V out (7272)			
			<i>Option N available only when Code 2 is 0015)</i>			
			N Namur output, 15mA max			

Accessories:

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
1400635XXXX	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

Cable Assemblies with M23 Connector*

115901-XXXX	12 pin M23, Cable Assy. For Use with Differential Line Driver with Index Outputs, CW
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Cable Assemblies with M12 Connector*

112859-XXXX	5 Pin M12, Cable Assy. For Use with Single Ended Outputs
112860-XXXX	8 Pin M12, Cable Assy. For Use with Single Ended Outputs
112860-XXXX	8 Pin M12, Cable Assy. For Use with 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)

MCN-N4	6 pin, style MS3106A-14S-6S
MCN-N5	7 pin, style MS3106A-16S-1S
MCN-N6	10 pin, style MS3106A-18-1S
MCN-N6N4	10 pin, NEMA4 style
MCN-C1	12 Pin CW M23 Connector

SERIES ISW38



ELECTRICAL CONNECTIONS

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

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 w/o Index		**Cable # 109209-XXXX or 1400635XXXX 10 Pin Dif Line Driver w/ Index		Cable # 115901-XXXX 12 Pin Differential Line Driver with Index		Cable Exit with Seal
	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	5	BRN	GRN
Signal B	D	ORN	B	ORG	B	ORG	B	ORG	8	ORG	BLU
Signal Z*	C	YEL	C	YEL	—	—	C	YEL	3	YEL	ORG
Power +V	B	RED	D	RED	D	RED	D	RED	12	RED	RED
Com	A	BLK	F	BLK	F	BLK	F	BLK	10	BLK	BLK
Case	—	GRN	G	GRN	G	GRN	G	GRN	9	—	WHT
N/C-Shield	F	—	E	—	—	—	E	—	7	—	—
Signal \bar{A}	—	—	—	—	C	BRN/WHT	H	BRN/WHT	6	BRN/WHT	VIO
Signal \bar{B}	—	—	—	—	E	ORG/WHT	I	ORG/WHT	1	ORG/WHT	BRN
Signal \bar{Z} *	—	—	—	—	—	—	J	YEL/WHT	4	YEL/WHT	YEL

5 & 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.

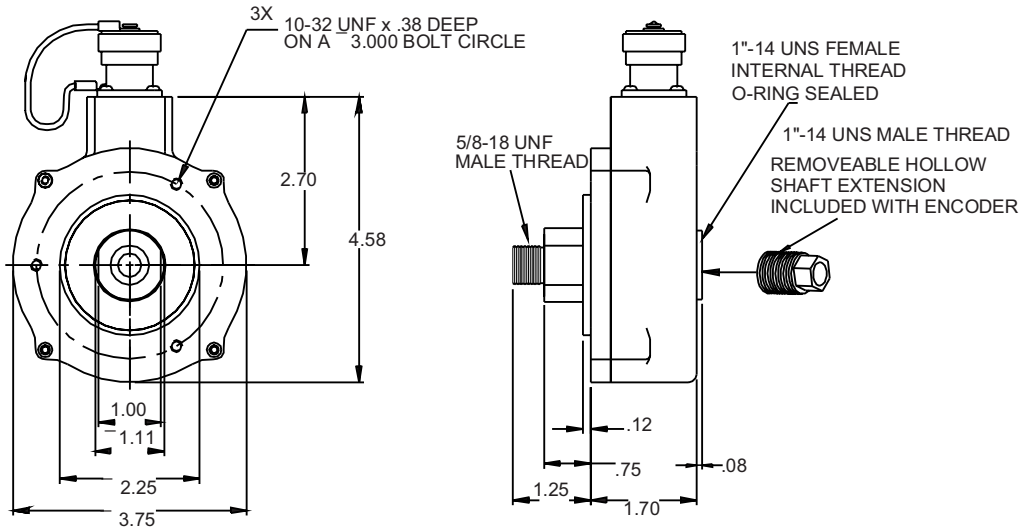
Table 2						
Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
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:

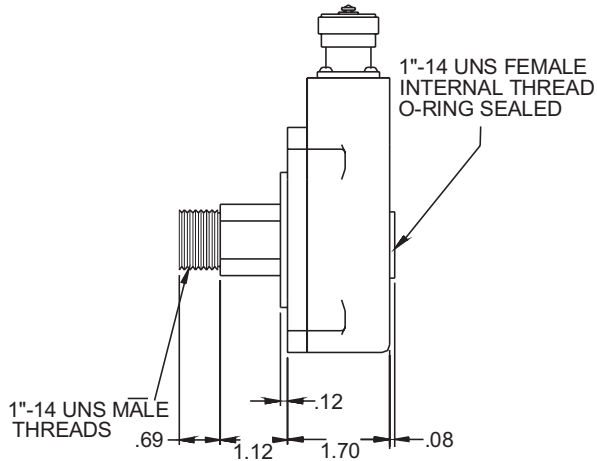
- 1) Cable Configuration (**Table 1**): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)
- 2) Cable Configuration (**Table 2**): PVC jacket, 105°C rated, overall foil shield; 24 AWG conductors, minimum
- 3) Standard cable 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 109209-XXXX.
- 6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 7) "M12" Cable assemblies are rated IP67

DIMENSIONS inches [mm]

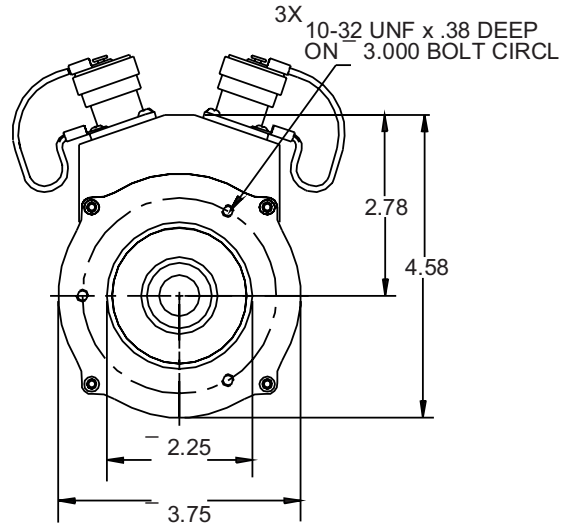
With Convertable Shaft



With Non-Convertible Shaft



Redundant Version



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