

SERIES DWD38

NorthStar™ brand

Harsh Duty Optical Encoder

Key Features

- Draw Works Threaded Shaft with Field Replaceable Adapters for Reduced Downtime
- Dual Isolated Outputs Available for Redundancy
- Anodized Aluminum or Stainless Steel Housing
- NAMUR Sensor Output Available
- 400G Shock and 20G Vibration Independently Validated



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 200-300 PPR 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: 5-26VDC; 50 mA max., not including output loads.
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
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)
 12 Pin CW M23 Connector (MCN-C1)

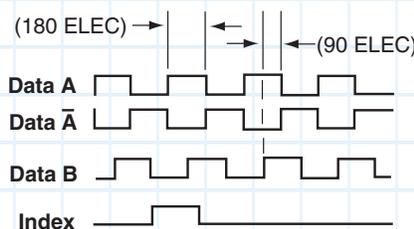
MECHANICAL

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 Sizes: 6,000 RPM max.
Starting Torque: 4.5 in-oz max (at 25°C)
Running Torque: 4.0 in-oz max (at 25°C)
Bore Loading: Up to 20 lbs axial and radial
Bore Runout: 0.0005 TIR at midpoint
Starting/Running Torque: 4.5/4.0 in-oz. maximum (at 25°C)
Bearings: 61806-ZZ
Housing and Cover: Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel
Disc Material: Mylar
Shaft Material: 300 series stainless steel
Weight: 35 ounces, typical

ENVIRONMENTAL

Operating Temperature: -40 to 100°C
Operating Temperature ATEX: -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



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	
DWD38	<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						
DWD38 Draw Works Encoder	0015	1000	0 1"-14 UNS x 5/8" - 18 UNF Threaded Shaft	0 Single Ended ABZ, 5-26VDC push-pull	0 6 pin connector	0 Aluminum Housing
	0032	1024	1 1"-14 UNS Threaded Shaft	1 Single Ended ABZ, 5-26VDC open collector (7273)	1 7 pin connector	1 Nickel Finish Housing
	0050	1200		2 Single Ended ABZ, 5-26VDC open collector (2222)	2 10 pin connector	2 Stainless Steel Housing
	0060	2000	2 1"-14 UNS x 5/8" - 18 UNF Field Replaceable Threaded Shaft	3 Single Ended ABZ, 5-26VDC open collector w/1kOhm (2222)	3 12 pin CW connector	3 Dual Isolated Outputs, Aluminum Housing
0100	2048	Options 4 & 5 not available when Code 5 is H		4 7 pin+mating connector	4 Dual Isolated Outputs, Nickel Housing	
0200	4000	4 Differential AB only, 5-26, 5-26 out (7272)		5 Differential AB only, 5-26 in, 5V out (7272)	5 10 pin+mating connector	5 Dual Isolated Outputs, Stainless Steel Housing
0240	4096		Options 6 & 7 not available when Code 5 is 0, 1, 5, 6, H		6 7 pin+mating connector	
0250	5000		6 Differential ABZ, 5-26 in, 5V out (7272)	7 Differential ABZ, 5-26 in, 5-26 out (7272)	7 10 pin+mating connector	
0500			6 Differential ABZ, 5-26 in, 5V out (7272)		A .5m (18") cable	
0512			7 Differential ABZ, 5-26 in, 5-26 out (7272)		C 1m (36") cable	
0600				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		

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

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

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)
- 12 Pin CW M23 Connector (MCN-C1)

*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 = 0 to 8, A-D or K-N

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 # 1400635XXXX **Cable # 109209-XXXX 10 Pin Dif Line Driver with 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.

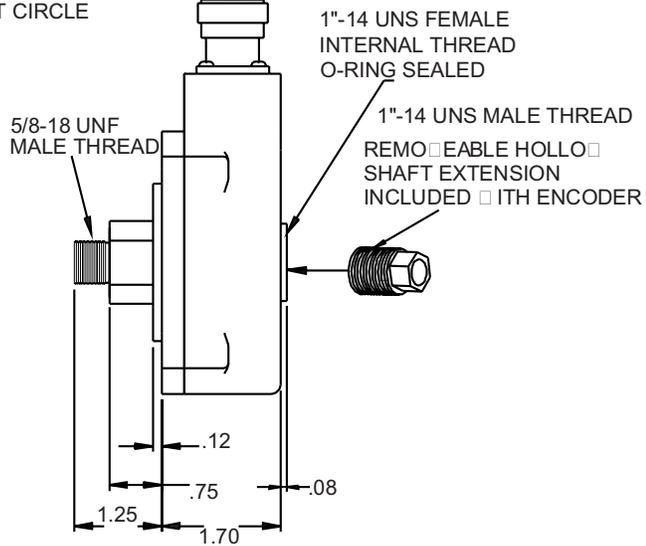
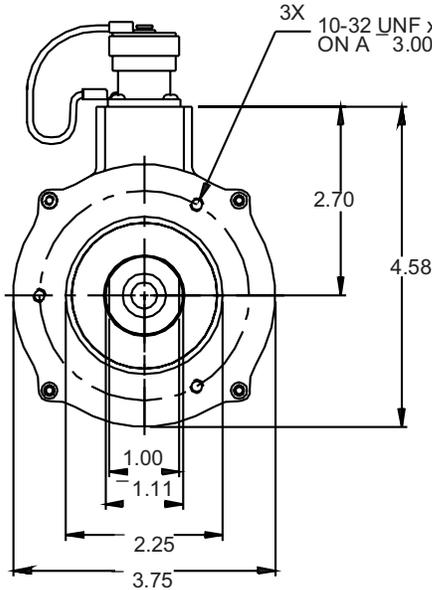
Table 2						
Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
Power +V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

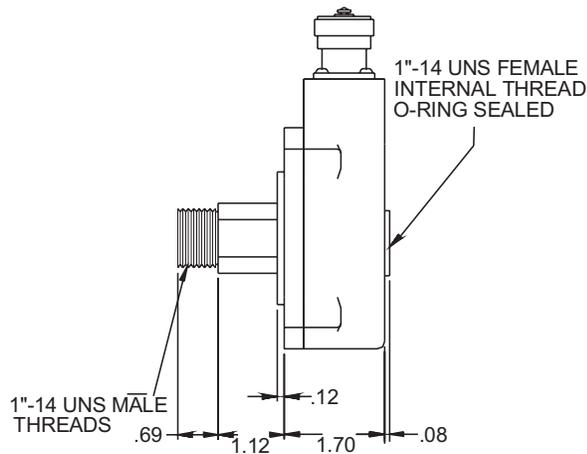
- 1) Cable Configuration (**Table 1**): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)
- 2) Cable Configuration (**Table 2**): PVC jacket, 105°C rated, overall foil shield; 24 AWG conductors, minimum
- 3) Standard cable 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 1400635XXXX or 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 Convertible Shaft



With Non-Convertible Shaft



Redundant Version

