

# SERIES DWD38

NorthStar™ brand

## Harsh Duty Optical Encoder

### Key Features

- Draw Works Threaded Shaft with Field Replaceable Adapters for Reduced Downtime
- ATEX Certification Available for Intrinsically Safe Requirements
- Dual Isolated Outputs Available for Redundancy
- Anodized Aluminum or Stainless Steel Housing
- NAMUR Sensor Output Available



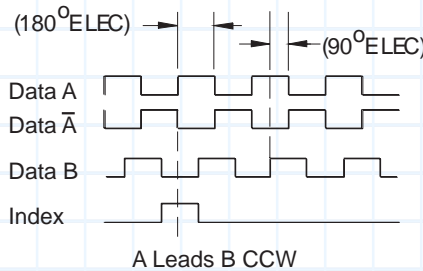
## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental  
**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 1200 PPR: 90° ± 15° electrical; For resolutions over 1250 PPR: 90° ± 30° electrical  
**Symmetry:**  
 For resolutions to 1024PPR: 180° ± 18° electrical  
 For resolutions over 1024PPR: 180° ± 25° electrical  
**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pF

### DATA AND INDEX

Not all complements shown.  
 A shown for reference



### ELECTRICAL

**Input Power:** 5-26VDC; 50 mA max., not including output loads. ATEX: 5VDC, 5-26VDC  
**Outputs:** 2N2222, ET7272, ET7273  
**Frequency Response:** 125 kHz (data & index)  
**Termination:** 6, 7, or 10 pin MS Connector; 18" 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 (604505 & 604506)

### 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 Material:** 300 series stainless steel  
**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  
**Bearing life:** 5 x 10<sup>8</sup> revs at rated shaft Loading,  
 5 x 10<sup>11</sup> revs at 10% of rated shaft loading. (manufacturers' specs)  
**Housing and cover:** Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel.  
**Disc material:** Metal or plastic  
**Weight:** 35 ounces, typical

### ELECTRICAL CONNECTIONS

#### 6, 7 & 10 Pin MS 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.

Encoder Function	Cable #108594-6 Pin Single Ended		Cable #108595-7 Pin Single Ended		Cable #108596-7 Pin Dif Line Drv w/o Idx		Cable #1400635- or 109209- (NEMA4) 10 Pin Dif Line Drv w/Idx		Cable Exit with Seal Wire Color
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN	GRN
Sig. B	D	ORG	B	ORG	B	ORG	B	ORG	BLU
Sig. 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	—	—
Sig. A	—	—	—	—	C	BRN/WHT	H	BRN/WHT	VIO
Sig. B	—	—	—	—	E	ORG/WHT	I	ORG/WHT	BRN
Sig. Z	—	—	—	—	—	—	J	YEL/WHT	YEL

Note: "MS" type mating connectors and prebuilt cables are rated NEMA 12.  
 For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.

### 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:** 100%  
**Enclosure Rating:** IP67

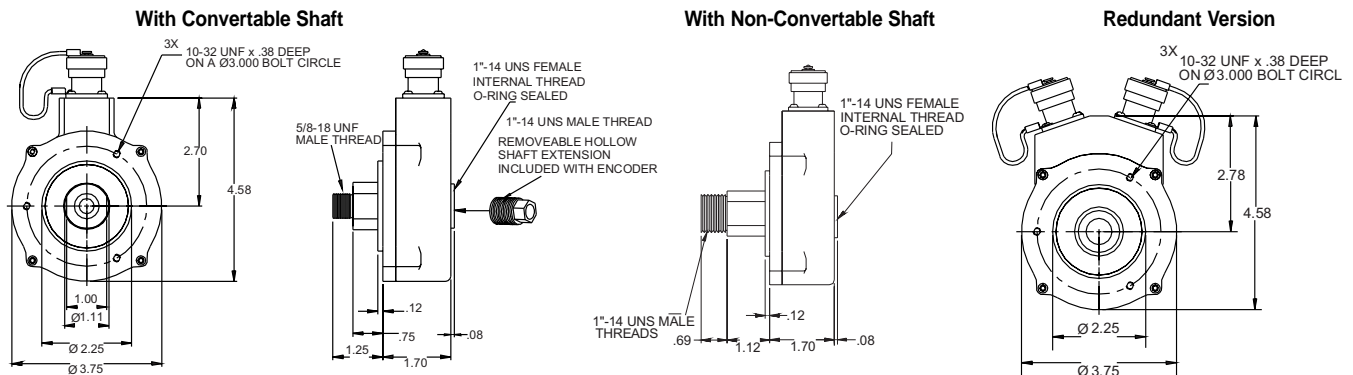
**Ordering Information**

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
□□□ <b>38</b>	□□□□	□	□	□	□

Ordering Information						
<b>DWD38</b> Draw Works Encoder  <b>ISW38</b> ATEX Intrinsically Safe	<b>0015</b> <b>0032</b> <b>0050</b> <b>0060</b> <b>0100</b> <b>0200</b> <b>0240</b> <b>0250</b> <b>0500</b> <b>0512</b>	<b>0600</b> <b>1000</b> <b>1024</b> <b>1200</b> <b>2000</b> <b>2048</b> <b>4000</b> <b>4096</b> <b>5000</b> <b>5000</b>	<b>0</b> 1"-14 UNS x 5/8" - 18 UNF Threaded Shaft  <b>1</b> 1"-14 UNS Threaded Shaft  <b>2</b> 1"-14 UNS x 5/8" - 18 UNF Field Replaceable Threaded Shaft	<b>0</b> Single Ended ABZ, 5-26VDC push-pull <b>1</b> Single Ended ABZ, 5-26VDC open collector (7273) <b>2</b> Single Ended ABZ, 5-26VDC open collector (2222) <b>3</b> Single Ended ABZ, 5-26VDC open collector w/1k0hm (2222)  <i>Options 4 &amp; 5 not available when Code 5 is H</i> <b>4</b> Differential AB only, 5-26, 5-26 out (7272) <b>5</b> Differential AB only, 5-26 in, 5V out (7272)  <i>Options 6 &amp; 7 not available when Code 5 is 0, 1, 5, 6, H</i> <b>6</b> Differential ABZ, 5-26 in, 5V out (7272) <b>7</b> Differential ABZ, 5-26 in, 5-26 out (7272)	<b>0</b> 6 pin connector <b>1</b> 7 pin connector <b>2</b> 10 pin connector <b>5</b> 6 pin+mating connector <b>6</b> 7 pin+mating connector <b>7</b> 10 pin+mating connector <b>8</b> 12 CW pin+mating connector <b>A</b> .5m (18") cable <b>C</b> 1m (36") cable <b>D</b> 2m (72") cable <b>H</b> 5 pin M12 connector <b>J</b> 8 pin M12 connector <b>K</b> 1.5 ft (18") cable w/ in line 10pin connector <b>M</b> 5 ft (60") cable <b>N</b> 10 ft (120") cable	<b>0</b> Aluminum housing <b>1</b> Nickel finish housing <b>2</b> Stainless Steel housing <b>3</b> Dual Isolated Outputs, Aluminum Housing <b>4</b> Dual Isolated Outputs, Nickel Housing <b>5</b> Dual Isolated Outputs, Stainless Steel Housing
	<b>Note:</b> <b>10 foot Cable Assemblies with MS Connector</b> <b>108594-0010</b> 6 Pin MS, Cable Assy. For Use with Single Ended Outputs <b>108595-0010</b> 7 Pin MS, Cable Assy. For Use with Single Ended Outputs <b>108596-0010</b> 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs <b>1400635-0010</b> 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs <b>109209-0010</b> NEMA4 10 pin MS, Cable Assy. For use with differential line driver with index outputs  <b>Mating Connectors (no cable)</b> 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 (604505 & 604506)			<b>Following options are only available when Code 1 is ISW38</b> <b>A</b> Single Ended ABZ, 7-26V in, 7-26V out push-pull (7272) <b>C</b> Single Ended ABZ, 5V in, 5V out push-pull (7272) <b>D</b> Single Ended ABZ, 7-26V in, 5V out push-pull (7272) <b>E</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector (7273) <b>F</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector (2222) <b>G</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector w/ 1k0hm (2222)  <i>Options H, J &amp; K not available when Code 5 is H</i> <b>H</b> Differential AB only, 5V in, 5V out (7272) <b>J</b> Differential AB only, 7-26 in, 7-26 out (7272) <b>K</b> Differential AB only, 7-26 in, 5V out (7272)  <i>Options L, M, P not available when Code 5 is 0, 1, 5, 6, H</i> <b>L</b> Differential ABZ, 5V in, 5V out (7272) <b>M</b> Differential ABZ, 7-26 in, 7-26 out (7272) <b>P</b> Differential ABZ, 7-26 in, 5V out (7272) <b>N</b> Namur output, 15mA max  † NOTE: Simultaneous use of redundant outputs may void ATEX certification. Consult factory for details.		

**DIMENSIONS inches [mm]**



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