## HEAVY DUTY

# **SERIES HD20**

## Harsh Duty Optical Encoder

### **Key Features**

10 pin, style MS3106A-18-1S (MCN-N6) 10 pin, NEMA 4 style (MCN-N6N4)

- Size 20 Heavy-Duty Encoder with Single or Dual Isolated Outputs
- Unbreakable Code Disc up to 3600 PPR
- Special Housing and Seals for IP67 Rating
- Anodized Aluminum, Stainless Steel, or Nickel Plated Housing

# NorthStar<sup>™</sup> brand







#### **SPECIFICATIONS** STANDARD OPERATING CHARACTERISTICS **ENVIRONMENTAL** MECHANICAL Code: Incremental, Optical Operating Temperature: -40 to 100°C Shaft Size: 10mm, 3/8" Resolution: 1 to 3600 PPR (pulses/revolution) Storage Temperature: -40 to 100°C Shaft Speed: 6000 RPM, maximum Format: Two channel guadrature (AB) with Shaft Loading: Up to 100 lbs axial and radial Shock: 50G's for 11msec duration optional Index (Z), and complementary outputs **Phase Sense:** A leads B for CCW shaft rotation Starting Torque: 2.5 in-oz. maximum (at 25°C) Bearings: 5200 ZZ double row Vibration: 5 to 2000Hz @ 20 G's Humidity: Up to 98% (non-condensing) viewing the shaft clamp end of the encoder Bearing life: 5 x 10<sup>8</sup> revs at rated shaft Loading, Enclosure Rating: IP67 Quadrature Phasing: For resolutions to 625 PPR: 5 x 10<sup>11</sup> revs at 10% of rated shaft loading. $90^{\circ} \pm 15^{\circ}$ electrical; For resolutions over 625 PPR: $90^{\circ} \pm 30^{\circ}$ electrical (manufacturers' specs) Housing and Cover: Hard Anodized Aluminum. Symmetry: Also available in Electroless Nickel finish and For resolutions to 1024 PPR: 180° ±18° electrical Stainless Steel For resolutions over 1024 PPR: 180° ±25° electrical Shaft Material: 303 stainless steel (passivated) Index: 150° to 330° A leads B, CCW (From Shaft Disc Material: Plastic End) Weight: 14 ounces, typical Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf ELECTRICAL DATA AND INDEX Not all complements shown Input Power: 5-26VDC; 50 mA max., not includ-Ā shown for reference ing output loads. Outputs: 2N2222 Open Collector: 250mA, sink max (180° ELEC) → (90° ELEC) 7272 Push-Pull: 40mA, sink or source 7272 Differential Line Driver: 40 mA, sink or Data A source 7273 Open Collector: 40mA, sink max Data Ā L Frequency Response: 125 kHz (data & index) Noise Immunity: Tested to EN61326-1 Data B Electrical Immunity: Reverse polarity and short circuit protected Index Termination: 6, 7, or 10 pin MS Connector; Cable Index Width: 150° to 330° exit w/seal A leads B, CCW (From Shaft End) Mating Connector: 6 pin. style MS3106A-14S-6S (MCN-N4): 7 pin, style MS3106A-16S-1S (MCN-N5);

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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								
HD20													
Ordering Information													
Size 20 Heavy Duty Encoder 1 Unidirectional 2 Bidirectional 3 Bidirectional with Index	0001       0500         0010       0512         0024       0600         0025       0625         0035       0720         0040       1000         0060       1024         0100       1200         0120       1250         0192       1440         0200       2000         0240       2048         0250       2500         0256       2540         0300       2600         0360       3600	<ul> <li>0 3/8" Dia. Shaft with flat</li> <li>4 10mm Dia. Shaft, no flat</li> </ul>	<ul> <li>0 5-26V in, 5-26V Open Collector out (7273)</li> <li>2 5-26V in, 5-26V Push-Pull out (7272)</li> <li>F 5-26V in, 5-26V Open Collector out (2222)</li> <li>G 5-26V in, 5-26V Open Collector out with 2.2 kΩ Pullups (2222)</li> <li>Available when: Code 1 is 1,2 and Code 5 is 3 through H, or Code 1 is 3 and Code 5 is 5 through H:</li> <li>3 5-26V in, 5-26V Differential Line Driver out (7272)</li> <li>4 5-26V in, 5V Differential Line Driver out (7272)</li> </ul>	<ol> <li>6 Pin Connector</li> <li>7 Pin Connector</li> <li>10 Pin Connector</li> <li>18" Sealed Cable</li> <li>3' Sealed Cable</li> <li>6' Sealed Cable</li> <li>10' Sealed Cable</li> <li>H 15' Sealed Cable</li> </ol>	<ul> <li>0 No Options</li> <li>1 Nickel Finish Housing</li> <li>2 Stainless Steel Housing</li> <li>Available when: Code 4 is 0, 2</li> <li>3 Redundant Outputs (Dual Connector Housing).</li> <li>4 Nickel Finish Housing with Redundant Outputs.</li> <li>5 Stainless Steel Housing with Redundant Outputs.</li> </ul>								

#### 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

 $\label{eq:constraint} \textbf{1400635XXXX} \quad \textbf{10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs}$ 

**109209-XXXX** NEMA4 10 pin MS, Cable Assy. For use with Differential Line Driver with Index Outputs

\*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)

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)

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### **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.

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				
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code	Wire Color Code			
Signal A	E	BRN	А	BRN	А	BRN	А	BRN	GRN			
Signal B	D	ORN	В	ORG	В	ORG	В	ORG	BLU			
Signal Z*	C	YEL	С	YEL	—	—	С	YEL	ORG			
Power +V	В	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 A	—	—	_	—	С	BRN/WHT	Н	BRN/WHT	VIO			
Signal B	—	—	—	—	E	ORG/WHT	I	ORG/WHT	BRN			
Signal Z*	—	—	—	—	—	—	J	YEL/WHT	YEL			

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)

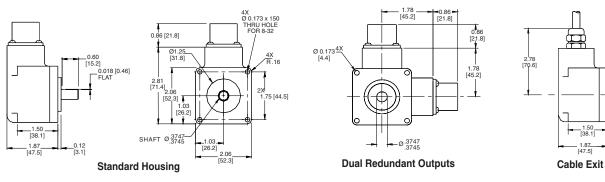
2) Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020

3) \*Index not provided on all models. See ordering information.

4) \*\*For watertight applications, use NEMA4 10 pin cable & connector 1400635XXXX.

5) "MS" Type mating connectors and pre-build cables are rated NEMA 12

### DIMENSIONS



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



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