Sealed Hollowshaft Encoder

Key Features

- Hollowshaft Design Eliminates Brackets and Couplings
- Electrically Isolated Shaft Design
- Compact Size for Tight Mounting Constraints

SPECIFICATIONS

INTEGRAL ENCODERS

SERIES HS20

Dynapar™ brand

Sealed Hollowshaft Encoder

Key Features

- Hollowshaft Design Eliminates Brackets and Couplings
- Electrically Isolated Shaft Design
- Compact Size for Tight Mounting Constraints

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: 50 to 2540 PPR (pulses/revolution)
Accuracy: (worst case any edge to any other edge) <1024 PPR (metal disk): ±7.5 arc-min.
≥1024 PPR (glass disk): ±2.5 arc-min.
Format: Two channel quadrature (AB) with optional Index (Z) and complementary outputs
Phase Sense: A leads B for CCW shaft rotation viewing the hub clamp end of the encoder
Quadrature Phasing: 90° ±22.5° electrical
Symmetry: 180° ±18° electrical
Index: 180°+18°/-135° electrical (gated with B low)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

ELECTRICAL

Input Power: 5 to 26 VDC at 100 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
Frequency Response: 100 kHz min. (index 75 kHz min. for extended temperature range)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity and short circuit protected
Termination: MS Connector, M12 Connector, Cable Exit
Mating Connector:
6 pin, style MS3106A-14S-6S (MCN-N4);
7 pin, style MS3106A-16S-1S (MCN-N5);
10 pin, NEMA4 style (MCN-N6N4);
10 pin, NEMA4 style (MCN-N6);
Cable w/ 5 pin M12 Connector (112859-xxxx)
Cable w/ 8 pin M12 Connector (112860-xxxx)

MECHANICAL

Bore Diameter: 6mm to 16 mm, 1/4” to 5/8”
Shaft Speed: 6000 RPM max.
Shaft Bore Tolerance: Nominal +0.0002”/+0.0008” (+0.005/+0.020 mm)
Mating Shaft Requirements: Runout: ±0.005” (±0.13mm) radial, max.
Endplay: ±0.050” (±1.27 mm) axial, max.
Length: 0.80” (20 mm), minimum
Starting Torque: 3.0 oz-in max.
Moment of Inertia: 5.1 x 10^-6 oz-in-sec²
Housing and Cover: Aluminum
Disc Material: Glass or Metal (PPR Dependent)
Weight: 10 oz. max.

ENVIRONMENTAL

Operating Temperature:
Standard: 0 to +70° C
Extended: 0 to +85° C
Storage Temperature: -40 to +85° C
Shock: 50 G’s for 11 milliseconds duration
Vibration: 5 to 2000 Hz at 2.5 G’s
Humidity: to 98% without condensation
Enclosure Rating: NEMA4/IP65 (dust proof, washdown)
### SERIES HS20

**Ordering Information**

To order, complete the model number with code numbers from the table below:

<table>
<thead>
<tr>
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<tr>
<td>HS20</td>
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</table>

**HS20**
- Size 20
- Heavy-duty, sealed hollowshaft encoder
- Metal Disk:
  - 0050
  - 0060
  - 0100
  - 0180
  - 0200
  - 0250
  - 0256
  - 0270
  - 1600
  - 1800
  - 2500
  - 2540
- Glass Disk:
  - 1200
  - 1250
  - 2048
  - 2400
  - 1600
  - 2500
  - 1800
  - 2540

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>06 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>1/4”</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>2</td>
<td>5/16”</td>
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<tr>
<td>3</td>
<td>8 mm</td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>3/8”</td>
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<tr>
<td>5</td>
<td>10 mm</td>
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</tr>
<tr>
<td>6</td>
<td>12 mm</td>
<td></td>
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<tr>
<td>7</td>
<td>1 1/2”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5/8”</td>
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<td></td>
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<tr>
<td>9</td>
<td>15 mm</td>
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<tr>
<td>A</td>
<td>16 mm</td>
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<tr>
<td>B</td>
<td>14 mm</td>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>5-26V in, 5-26V open collector out</td>
<td>0 6 pin connector</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5-26V in, 5-26V open collector out w/ 2.2kΩ pullups</td>
<td>1 7 pin connector</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5-26V in, 5-26V push-pull out</td>
<td>2 10 pin connector</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5-26V in, 5V line driver out</td>
<td>3 6 pin connector, plus mating connector</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5-26V in, 5-26V line driver out</td>
<td>4 10 pin connector, plus mating connector</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Same as ‘3’ with extended temp.</td>
<td>5 6 pin connector, plus mating connector</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Same as ‘4’ with extended temp.</td>
<td>6 7 pin connector, plus mating connector</td>
<td></td>
</tr>
</tbody>
</table>

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**Cable Assemblies with MS Connector**

- 112123-XXXX: 6 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
- 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

**Accessory Kits**

- 112096-0001: Tether Kit (clearance hole for 3/8” bolt on 5.88” diameter bolt-circle)
- 112096-0002: Tether Kit (slotted hole for bolt on 1.87” to 2.75” radius)
- 112105-0001: Protective Cover Accessory

**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

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*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
**SERIES HS20**

**ELECTRICAL CONNECTIONS**

6, 7 & 10 Pin MS Connectors and Cables - Code 7 =0 to7, A to G

Connector & mating 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>
<thead>
<tr>
<th>Encoder Function</th>
<th>Table 1</th>
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<tbody>
<tr>
<td></td>
<td><strong>Cable # 108594-XXXX 6 Pin Single Ended</strong></td>
</tr>
<tr>
<td>Signal A E</td>
<td>BRN</td>
</tr>
<tr>
<td>Signal B D</td>
<td>ORN</td>
</tr>
<tr>
<td>Signal Z* C</td>
<td>YEL</td>
</tr>
<tr>
<td>Power +V B</td>
<td>RED</td>
</tr>
<tr>
<td>N/C</td>
<td>F</td>
</tr>
<tr>
<td>Case</td>
<td>A</td>
</tr>
<tr>
<td>Signal A E</td>
<td>BRN</td>
</tr>
<tr>
<td>Signal B D</td>
<td>ORN</td>
</tr>
<tr>
<td>Signal Z* C</td>
<td>YEL</td>
</tr>
</tbody>
</table>

**NOTE:**
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) 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

<table>
<thead>
<tr>
<th>Connector pin numbers and cable assembly wire color information is provided here for reference. 5 &amp; 8 Pin M12 Accessory Cables when Code7 = H or J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encoder Function</td>
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<tr>
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</tr>
<tr>
<td>Pin</td>
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<tr>
<td>Signal A E</td>
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<td>Signal B D</td>
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<td>Signal Z* C</td>
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<tr>
<td>Power +V B</td>
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<td>N/C</td>
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<td>Case</td>
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<tr>
<td>Signal A E</td>
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<tr>
<td>Signal B D</td>
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<tr>
<td>Signal Z* C</td>
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<tr>
<td><strong>Cable # 109209-XXXX or 1400635XXXX 10 Pin Dif Line Driver w/ Index</strong></td>
</tr>
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