**Integral Coupling Encoder**

**Key Features**

- **High 5000 PPR Resolution Available**
- **Integral Coupling and Flange Provide Thermal and Electrical Isolation**
- **Field Replaceable Coupling**

**SPECIFICATIONS**

**STANDARD OPERATING CHARACTERISTICS**

- **Code:** Incremental, Optical
- **Resolution:** 3000 to 5000 PPR (pulses/revolutions)
- **Accuracy:** (worst case any edge to any other edge) ±10.8°/PPR
- **Format:** Two channel quadrature (AB) with optional Index (Z) and complementary outputs
- **Phase Sense:** A leads B for CW or CCW shaft rotation as viewed from the shaft end of the encoder; see Ordering Information
- **Quadrature Phasing:** 90° ± 25° electrical
- **Symmetry:** 180° ± 25° electrical
- **Index:** 90° ± 25° 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:** 4.5 min. to 26 VDC max. at 80 mA max., not including output loads
- **Outputs:** 7273 Open Collector: 40mA, sink max
- **7272 Push-Pull:** 40mA, sink or source
- **7272 Differential Line Driver:** 40 mA, sink or source
- **Frequency Response:** 250 kHz min.
- **Noise Immunity:** Tested to EN61326-1
- **Electrical Immunity:** Reverse polarity and short circuit protected
- **Termination:** MS Connector, M12 Connector, Cable Exit
- **Mating Connector:** 7 pin, style MS3106A-16S-1S (MCN-N5); 10 pin, style MS3106A-18S-1S (MCN-N6); 10 pin, NEM4A style (MCN-N6N4); Cable w/ 5 pin M12 Connector (112859-XXXX); Cable w/ 8 pin M12 Connector (112860-XXXX)

**MECHANICAL**

- **Shafts Coupling:** accepts 1/4”, 3/8” and 1/2” motor or machinery shafts
- **Mating Shaft Lengths:** Typically: 0.5” max. available into the coupling as measured from the A/B mounting surface. 1.3” max available into the coupling as measured from the C mounting surface.
- **Shafts Alignment:** 0.002” max. TIR runout; 0.005” max. radial offset; 3” max. angular shaft speed.
- **Shaft Speed:** 10,000 RPM max.
- **Starting Torque:** (max at 25 °C) 1.0 oz-in
- **Moment of Inertia:** 4.3 x 10^4 oz–in–sec^2
- **Shaft Material:** Stainless Steel
- **Housing and Cover:** Aluminum
- **Shaft Material:** Stainless Steel
- **Disc Material:** Glass
- **Weight:** 1.5 lbs

**ENVIRONMENTAL**

- **Operating Temperature:** Standard: 0 to +70 °C, Extended: –40 to +85 °C
- **Storage Temperature:** –40 to +90 °C
- **Shock:** 50 G’s for 11 milliseconds duration
- **Vibration:** 5 to 2000 Hz at 20 G’s
- **Humidity:** Up to 98% without condensation
- **Enclosure Rating:** NEMA12/IP54 (dirt tight, splashproof)
## Ordering Information

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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<tbody>
<tr>
<td>HC526</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### HC526
- **Size 25 Enclosed with Integral Coupling and Flange Adapter**
  - 3000
  - 3600
  - 4096
  - 5000

### 7 Pin Connector or Cable
- **0** Single Ended, no Index, Format A, Table 1
- **1** Single Ended, with Index, Format A, Table 1
- **4** Single Ended, with Index, Format B, Table 1
- **A** Single Ended, with Index, Format C, Table 1
- **C** Single Ended, no Index, Format C, Table 1
- **G** Single Ended, with Index, Format D, Table 1

### 10 Pin Connector or Cable
- **2** Differential, no Index, Format A, Table 2
- **3** Differential, with Index, Format A, Table 2
- **5** Differential, with Index, Format B, Table 2
- **B** Differential, with Index Format C, Table 2
- **D** Differential, no Index, Format C, Table 2

### 5 Pin M12 Connector
- **H** Single ended, no index, Format A, Table 4
- **J** Single ended, with index, Format A, Table 4
- **K** Single ended, with index, Format B, Table 4
- **L** Single ended, with index, Format C, Table 4
- **M** Single ended, no index, Format C, Table 4
- **N** Single ended, with index, Format D, Table 4

### 8 Pin M12 Connector
- **P** Single ended, no index, Format A, Table 5
- **Q** Single ended, with index, Format A, Table 5
- **R** Single ended, with index, Format B, Table 5
- **S** Single ended, with index, Format C, Table 5
- **T** Single ended, no index, Format C, Table 5
- **U** Single ended, with index, Format D, Table 5
- **V** Differential, no index, Format A, Table 6
- **W** Differential, with index, Format A, Table 6
- **X** Differential, with index, Format B, Table 6
- **Y** Differential, with index, Format C, Table 6
- **Z** Differential, no index, Format C, Table 6

See page 3 for electrical tables and page 4 for formats.

### Options
- **PS** LED Output Indicator

### Cable Assemblies with MS Connector*
- 1400431XXXX 7 Pin MS, Cable Assy. For Use with Single Ended w/Index Outputs
- 1400535XXXX 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

### Mating Connectors (no cable)
- MCN-NS 7 pin, style MS3106A-16S-1S
- MCN-N6 10 pin, style MS3106A-18-1S
- MCN-N6N4 10 pin, NEMA4 style

### Flexible Couplings
- CPLX1250375 Flexible Coupling 3/8"; 1/4", 3/8", 1/2"

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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.*
ELECTRICAL CONNECTIONS

Prewired Cable or Accessory Cables with 7 or 10 Pin MS Connector - when Code 4= 0 to 5, or A, B, C, D or G

Note: Wire color codes are referenced here for models that are specified with pre-wired cable. Connector/ cables are described in the Encoder Accessories section of this catalog and color-coding information is provided here for reference.

### Table 1 – Single Ended

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color Code</th>
<th>Cable Accessory Color Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal A</td>
<td>A</td>
<td>BRN</td>
</tr>
<tr>
<td>Signal B</td>
<td>B</td>
<td>ORN</td>
</tr>
<tr>
<td>Signal Z*</td>
<td>C</td>
<td>YEL</td>
</tr>
<tr>
<td>Power Source</td>
<td>D</td>
<td>RED</td>
</tr>
<tr>
<td>No Connection</td>
<td>E</td>
<td>—</td>
</tr>
<tr>
<td>Common</td>
<td>F</td>
<td>BLK</td>
</tr>
<tr>
<td>Case</td>
<td>G</td>
<td>GRN</td>
</tr>
</tbody>
</table>

### Table 2 – Differential

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color Code</th>
<th>Cable Accessory Color Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal A</td>
<td>A</td>
<td>BRN</td>
</tr>
<tr>
<td>Signal B</td>
<td>B</td>
<td>ORN</td>
</tr>
<tr>
<td>Signal Z*</td>
<td>C</td>
<td>YEL</td>
</tr>
<tr>
<td>Power Source</td>
<td>D</td>
<td>RED</td>
</tr>
<tr>
<td>N/C</td>
<td>E</td>
<td>—</td>
</tr>
<tr>
<td>Common</td>
<td>F</td>
<td>BLK</td>
</tr>
<tr>
<td>Case</td>
<td>G</td>
<td>GRN</td>
</tr>
<tr>
<td>Signal A</td>
<td>H</td>
<td>BRN/WHT</td>
</tr>
<tr>
<td>Signal B</td>
<td>I</td>
<td>ORN/WHT</td>
</tr>
<tr>
<td>Signal Z*</td>
<td>J</td>
<td>YEL/WHT</td>
</tr>
</tbody>
</table>

### 5 & 8 Pin M12 Accessory Cables - when Code 4= H to Z

Connector pin numbers and cable assembly wire color information is provided here for reference.

### Table 4

<table>
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<tr>
<th>Pin</th>
<th>Wire Color Code</th>
<th>Pin</th>
<th>Wire Color Code</th>
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</thead>
<tbody>
<tr>
<td>Signal A</td>
<td>4</td>
<td>BLK</td>
<td>1</td>
</tr>
<tr>
<td>Signal B</td>
<td>2</td>
<td>WHT</td>
<td>4</td>
</tr>
<tr>
<td>Signal Z*</td>
<td>5</td>
<td>GRY</td>
<td>6</td>
</tr>
<tr>
<td>Power +V</td>
<td>1</td>
<td>BRN BLU</td>
<td>2</td>
</tr>
<tr>
<td>Com</td>
<td>3</td>
<td>—</td>
<td>7</td>
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### Table 5

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color Code</th>
<th>Pin</th>
<th>Wire Color Code</th>
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<tr>
<td>Signal A</td>
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<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Signal B</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Signal Z*</td>
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### Table 6

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color Code</th>
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<tbody>
<tr>
<td>3</td>
<td>BRN/WHT</td>
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</tbody>
</table>

NOTES:

1) Cable Configuration (Table 1): Cable Configuration: PVC jacket, 105°C rated, overall foil shield; 22 AWG conductors, minimum
2) Cable Configuration (Table 2): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
3) Cable Configuration (Tables 4, 5 and 6): PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum
4) 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
5) * Index not provided on all models. See ordering information.
6) ** For watertight applications, use NEMA 4 10 pin cable & connector 109209-XXXX
7) “MS” Type mating connectors and pre-build cables are rated NEMA 12
8) “M12” Cable assemblies are rated IP67
### DIMENSIONS

#### Code 3: Mechanical

- **A**: Flange with Pilot
- **B**: Flange without Pilot
- **C**: NEMA 42 Flange

**Mating shaft lengths**: Typically: 0.5" max. available into the coupling as measured from the A/B mounting surface. 1.3" max. available into the coupling as measured from the C mounting surface.

#### Code 4: Output

- **0 - 3**: Format A
  - A Leads B CCW
  - Index Width (180°) Gated to B
- **4 - 5**: Format B
  - A Leads B CCW
  - Index Width (180°) Gated to B
- **6 - D**: Format C
  - A Leads B CW
  - Index Width (180°) Gated to B
- **G**: Format D
  - A Leads B CCW
  - Inverted Index (180°) Gated to B

#### Code 6: Termination

- **0**: End MS Connector
  - When Code 5 is 0 to 5 or A to G
- **1**: Side MS Connector
  - When Code 5 is 0 to 5 or A to G
- **2 - A**: Side Cable
  - When Code 5 is H to Z