**Hercules Encoders**

**Series N25**

Heavy Duty Incremental Rotary Shaft Encoder

- Enclosure: N25-2.5” Dia. NEMA 4 type Sealing Servo, Flush or Flanged Mounting
- Vibration-resistant Anti-Jitter Circuitry, Shatterproof Metal Code Discs
- Shielded ABEC 5 Stainless Steel Spindle Bearings, Standard and Self-Mounting options
- Low Supply Current Requirement - 30 milliamps typical per encoder, maximum of 50 mA
- Operating Voltage Flexibility - 8 to 28 Vdc or 5 Vdc TTL Output, 5V or 8 - 15V with Line Driver
- Operating Temperature Rating designed for extremes, from -40º to +85º C (-40º to +185º F)

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### Mechanical

- **Shaft Speed**: 6000 RPM maximum
- **Shaft Direction**: Bidirectional
- **Standard Shaft Sizes**: .3747”, .4997”
- **Shaft Extension(s)**: Std 0.875”, .50 x .05” flat
- **Shaft Seals**: Neoprene or PTFE Options
- **Mounting**: Refer to dimensional drawings
- **Bearings**: .5000” ID ABEC 5 Spindle
- **Radial Loading**: 90 lbs. Operating
- **Axial Loading**: 45 lbs.Operating
- **Accuracy**: ±0.1º of Shaft Rotation Typical
- **Housing**: Black Anodized Aluminum 22 oz.
- **Weight (N25)**: 6, 7, 10 Pin MS3102E or 18” Cable Out

### Electrical

- **Pulse Rate**: 15 kHz typical, up to 200 kHz available
- **Outputs**: NPN w/ 3.3K pullup or open collector, PNP sourcing, Line Driver (with complementary outputs)

#### Output Ratings

- **Open Collector Transistor**: 40 Vdc maximum
- **Line Drivers 8-15 Vdc**: 15 Vdc maximum
- **5 Vdc TTL**: 5.5 Vdc maximum

- **Supply Voltage**: 8 to 28 Vdc
  - 5 Vdc TTL output
- **Supply Current, per channel**: 30 mA typical, 50 mA maximum
- **Current Sinking**: 250 mA maximum
- **Output Duty Cycle**: 50/50 w/ ±20% typical tolerance
  - Tighter to ±5% by spec 5-10 µsec or 25-35 µsec
- **Pulsed Outputs**: 1 µsec typical, other options available
- **Rise/Fall Times**: See Wiring Diagrams for Pin Outs

### Environmental

- **Operating Temp.**: -40º to +85º C (-40º to +185º F)
- **Shock**: 50 g’s for 11 Milliseconds
- **Vibration**: 5 to 2000 Hertz at 20 g’s
- **Humidity**: 100% Relative Humidity
- **Enclosures (Sealed)**: NEMA 4X equiv. — Water-tight

### Electrical Connections

<table>
<thead>
<tr>
<th>Function</th>
<th>6 Pin</th>
<th>7 Pin</th>
<th>10 Pin</th>
<th>Cable Out</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>+V</td>
<td>B</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>Red</td>
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<tr>
<td>Common</td>
<td>A</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>Black</td>
</tr>
<tr>
<td>Channel A</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>Blue</td>
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<tr>
<td>Channel B</td>
<td>E</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>Brown</td>
</tr>
<tr>
<td>Channel A</td>
<td>C</td>
<td>E</td>
<td>H</td>
<td>E</td>
<td>White</td>
</tr>
<tr>
<td>Channel B</td>
<td>F</td>
<td>G</td>
<td>I</td>
<td>G</td>
<td>Green</td>
</tr>
<tr>
<td>Index</td>
<td>C or E*</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>White</td>
</tr>
<tr>
<td>Index</td>
<td>F</td>
<td>G</td>
<td>J</td>
<td>G</td>
<td>Green</td>
</tr>
</tbody>
</table>

* C is standard; for outputs “KI” or “LI” (line driver with index), index pin is E

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For the latest specifications visit our website

www.herculesencoders.com
### Ordering Information

**Size**
- N25SA-Sealed (Elastomer)
- N25TA-Sealed (PTFE)

**Mounting Style**
- 1=Flush mount
- 3=Flange mount

**Shaft Style**
- 1=3/8" Standard Shaft
- 2=1/2" Standard Shaft

**Connector Style**
- 1=6 Pin rear mounted
- 2=6 Pin side mounted
- 3=7 Pin rear mounted
- 4=7 Pin side mounted
- 5=10 Pin rear mounted
- 6=10 Pin side mounted
- 7=Cable rear mounted
- 8=Cable side mounted

**Channel Outputs**
(All outputs available with complementary outputs)
- A=NPN w/Pullup Res.
- B=NPN Open Collector
- F=5Vdc w/Pullup Res.
- G=5Vdc Open Collector
- H=PNP Sourcing Output
- K=5Vdc Line Driver
- L=8 to 15 Vdc Line Driver

**Channel Types**
- Q=Quadrature Outputs
- P=1st Output CW Pulses
- 2nd Output CCW Pulses
- U=1st Output Pulse Train
- 2nd Output Logic High For CW Rotation, Low For CCW Rotation
- I=Index Pulse

**PPR**
- Channel Types “U” & “Q”
  - 0090 0093 0125 0128
  - 0180 0186 0250 0256
  - 0360 0372 0500 0512
  - 0720 1000 1024
  - If “P” or “U” add (Square Wave)
    - 1440 2000 2048
  - If “P” or “U” add (Pulsed)
    - 1488 4000 4096

**Index Channel**
(same types as Channel Outputs)

**Consult factory for PPR not listed**