

# Hercules Encoders

## Series 4000HR

### Heavy Duty Incremental Rotary Shaft Encoder

- Enclosure: Slimline - 3"x 3" x 1 1/2" Space-Saver
- NEMA 12/13 or NEMA 4 type Sealing - Flush or Flanged Base Styles
- Inherently Anti-Jitter Circuitry, Shatterproof Code Disks
- Internally and Externally shielded ABEC 5 Stainless Steel Bearings, Mounted Internally
- Low Supply Current Requirement - 50 milliamps typical per encoder, maximum of 80 mA
- Operating Voltage Flexibility - 8 to 28 Vdc or 5 Vdc Output, 5V or 8-15V with Line Driver
- Operating Temperature Rating designed for extremes, from -40° to +85°C (-40° to +185°F)

## Specifications

### Mechanical

|                             |  |
|-----------------------------|--|
| Shaft Speed                 | 1500 RPM maximum                                     |
| Shaft Direction             | Bidirectional  |
| Standard Shaft Sizes (Dia.) | .2497", .3747", .4997"                               |
| Shaft Extension(s)          | 0.80" with .50 x .05" flat                           |
| Shaft Seals                 | Neoprene or PTFE Options                             |
| Mounting                    | Refer to dimensional drawings                        |
| Bearings                    | ABEC 5 Shielded                                      |
| Radial Loading              | (3/8") 30 lbs. Operating<br>(1/2") 70 lbs. Operating |
| Axial Loading               | (3/8") 15 lbs. Operating<br>(1/2") 35 lbs. Operating |
| Accuracy                    | +0.1° of Shaft Rotation Typical                      |
| Housing                     | Black Anodized Aluminum                              |
| Weight                      | Standard: 17 oz, Sealed: 26 oz                       |
| Connector                   | 6 Pin MS3102 or 18" Cable Out                        |

### Electrical

|                                  |  |
|----------------------------------|--|
| Pulse Rate                       | 10 kHz , up to 125 kHz   |
| Outputs                          | NPN w/ pullup; NPN open collector; PNP sourcing<br>Line Driver (5 Vdc/TTL level, 8 to 15 Vdc)<br>All line drivers have 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<br>5 Vdc with 5V TTL level output  |
| Supply Current                   | 50 mA typical, 80 mA maximum   |
| Current Sinking                  | 250 mA maximum   |
| Output Duty Cycle                | 50/50 w/ ±20% typical tolerance<br>Tighter to ±5% by spec  |
| Pulsed Outputs                   | 5-10 µsec or 25-35 µsec  |
| Rise/Fall Times                  | 1 µsec typical, other options available  |
| See Wiring Diagrams for Pin Outs |  |

### Environmental

|                     |                                      |
|---------------------|--------------------------------------|
| Operating Temp.     | -40° to + 85° C (-40° to + 185° F)   |
| Shock               | 50 g's for 11 Milliseconds           |
| Vibration           | 5 to 2000 Hertz at 20 g's            |
| Humidity            | 100% Relative Humidity               |
| Enclosures (Sealed) | NEMA 4 type — Water-tight            |
| (Std)               | NEMA 12/13 equiv. — Dust-, Oil-Tight |

### Electrical Connections

| Function          | Pin | Color |
|-------------------|-----|-------|
| +V                | B   | Red   |
| Common            | A   | Black |
| Channel A         | D   | Blue  |
| Channel B         | E   | Brown |
| Channel $\bar{A}$ | C   | White |
| Channel $\bar{B}$ | F   | Green |

For the latest specifications visit our website  
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