

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)



16

H
e
r
c
u
l
e
s

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 (1/2") 70 lbs. Operating |
| Axial Loading | (3/8") 15 lbs. Operating (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 Line Driver (5 Vdc/TTL level, 8 to 15 Vdc) 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 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 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 |

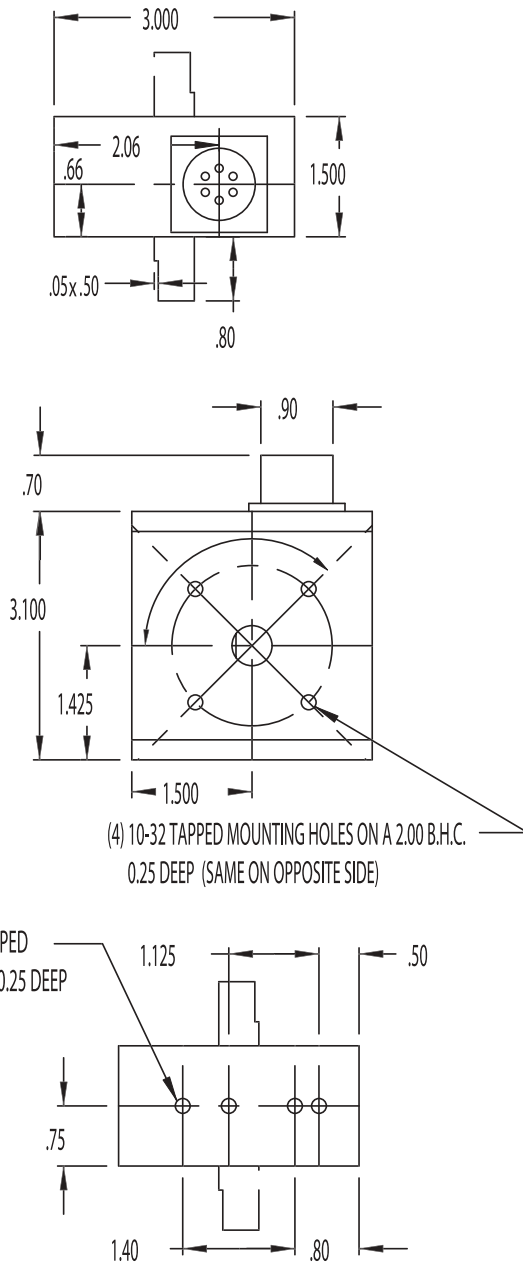
Electrical Connections

| 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
www.herculesencoders.com

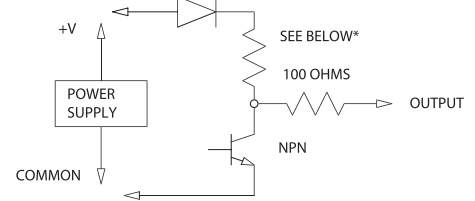
Dimensional Drawings

Series 4000HR Standard *call for sealed dimensions*



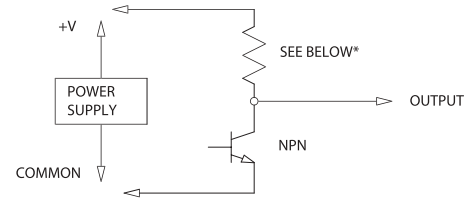
Wire Drawings

OUTPUT TYPES A, B & D



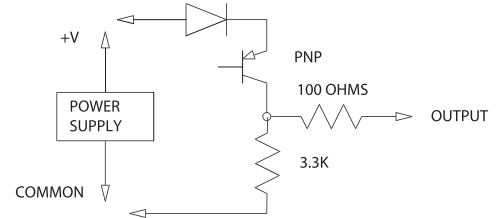
+8 to +28Vdc *Maximum of 18Vdc for "D" output
*3.3K pullup on "A", Not installed on "B", 1.5K on "D"

OUTPUT TYPES F & G



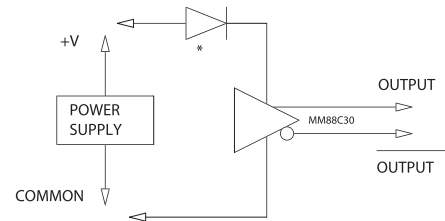
+5 Vdc
*3.3K Pullup on "F", Not installed on "G"

OUTPUT TYPE H



+8 TO +28Vdc

OUTPUT TYPES K & L



+8 TO +15Vdc on "L", +5V on "K"
*Only installed on "L"

Ordering Information

Series 4 X X X

Encoder Type
_ = Standard Encoder
S = Sealed (Elastomer)
T = Sealed (PTFE)

Mounting Type
1 = 10-32 BHC on shaft ends and base
2 = Flanged base (BHC on shaft ends)

Shaft Diameter
1 = 1/4" (0.2497")
3 = 3/8" (0.3747)
4 = 1/2" (0.4997)

Shaft Extension
1 = Single
2 = Double

Channel Outputs X X

A = NPN 3.3K Pullup
B = NPN Open Collector
D = NPN 1.5K Pullup
F = 5Vdc TTL NPN w/Pullup
G = 5Vdc TTL NPN OC
H = PNP Sourcing Output
K = 5Vdc Line Driver
L = 8 to 15 Vdc Line Driver

4096

PPR (Pulses per Revolution)

Channel Types

S = Single Output
Q = Quadrature Output
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