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
	(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

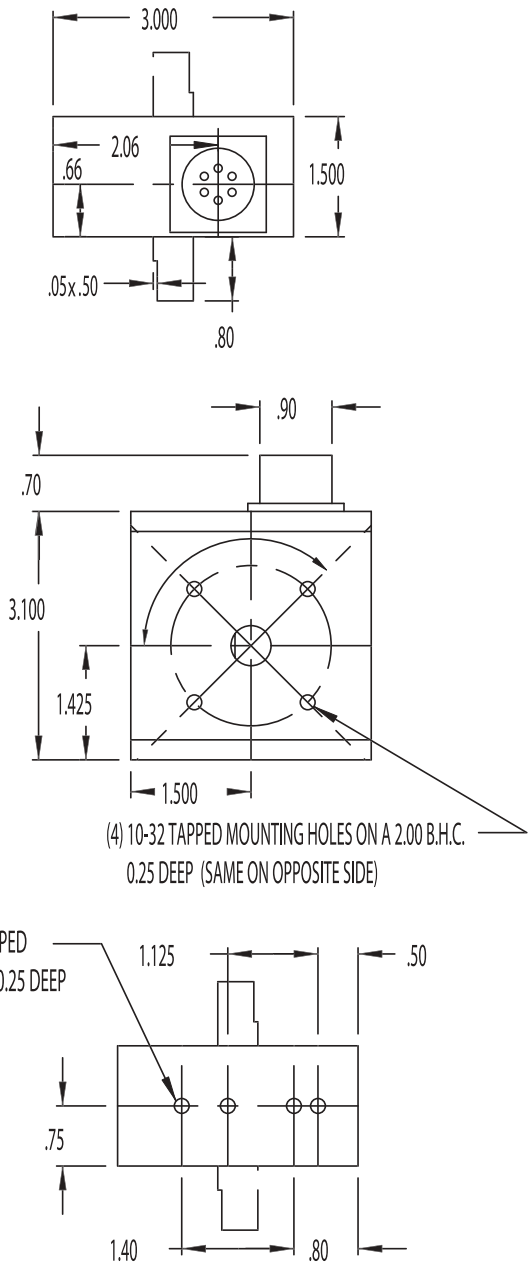
Electrical Connections

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

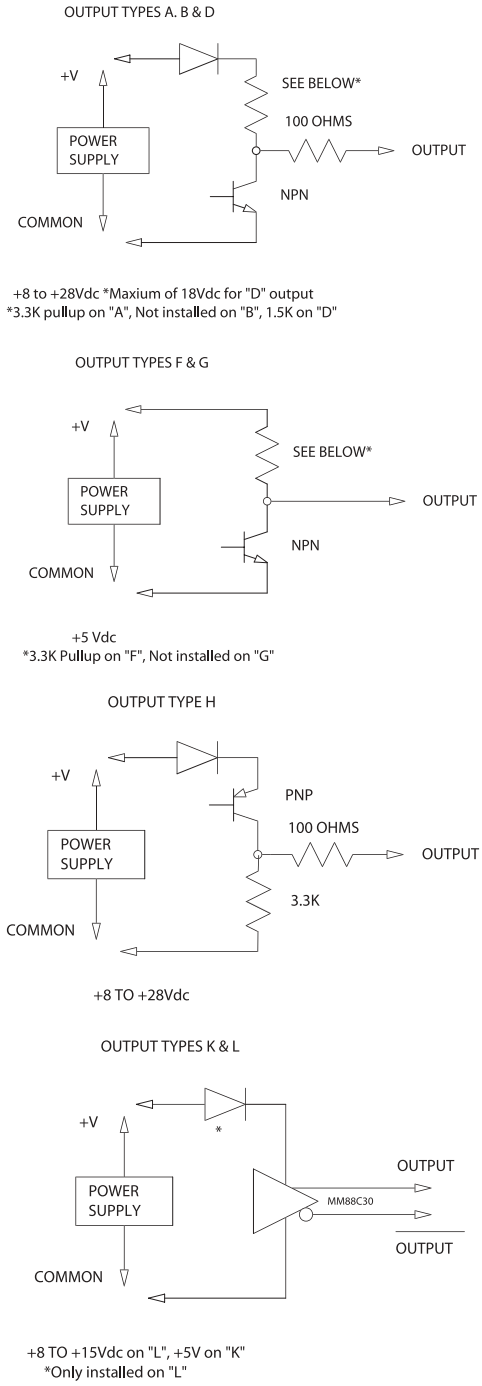
For the latest specifications visit our website
www.herculesencoders.com

Dimensional Drawings

Series 4000HR Standard *call for sealed dimensions*



Wire Drawings



Ordering Information

4 X X X _ — X X 4096

Series

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

Shaft Extension
1=Single
2=Double

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)

Channel Outputs
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

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