

# Hercules Encoders

## Series 1000/3000

### Hall Effect Incremental Rotary Shaft Encoders

- Enclosure: Series 1000-2.25" Cube  
Series 3000-3"x3"x1.5"  
NEMA 12/13 or NEMA 4 type Sealing  
Flush or Flanged Base
- Inherent Anti-Jitter Circuitry prevents false outputs due to machine vibration
- Internally and Externally Shielded ABEC 5 Stainless Steel Bearings
- Low Supply Current Requirement - 15 mA typical per encoder, at 24Vdc
- Operating Voltage Flexibility - 8 to 28 Vdc or 5 Vdc TTL Output
- Ideally suited for low PPR needs in dirty environments, wide temperature ranges

## Specifications

### Mechanical

Shaft Speed	6000 RPM maximum
Shaft Direction	Bidirectional
Standard Shaft Sizes (Dia.)	.2497", .3747"
Shaft Extension(s)	0.80" with .50x.05" flat
Shaft Seals	Neoprene or PTFE Options
Mounting	Refer to dimensional drawings
Bearings	ABEC 5 Shielded
Radial Loading	30 lbs. Operating
Axial Loading	15 lbs. Operating
Accuracy	±1.0° of Shaft Rotation Typical
Housing	Black Anodized Aluminum
Weight (1000)	Standard: 14 oz., Sealed: 19 oz.
Weight (3000)	Standard: 17 oz., Sealed: 26 oz.
Connector	6 Pin MS3102 or 18" Cable Out

### Electrical

Pulse Rate	10 kHz, up to 200 kHz
Outputs	NPN w/pullup; NPN open collector; PNP sourcing
Output Ratings	
Open Collector Transistor	40 Vdc maximum
Supply Voltage	8 to 28 Vdc 5 Vdc with 5V TTL output
Supply Current	15 mA maximum
Current Sinking	250 mA maximum
Output Duty Cycle	50/50 w/ ±20% typical tolerance Tighter to ±5% by spec
Rise/Fall Times	1 µsec typical, other options available

### Environmental

Operating Temp. (1000)	-20° to +70° C (-4° to +158° F)
Operating Temp. (3000)	-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 equiv. - Water-tight
(Std)	NEMA 12/13 equiv. — Dust-, Oil-Tight

### Electrical Connections

Function	6 Pin	Cable Out	Color
+V	B	D	Red
Common	A	F	Black
Channel A	D	A	Blue
Channel B	E	B	Brown
Index	C	C	White



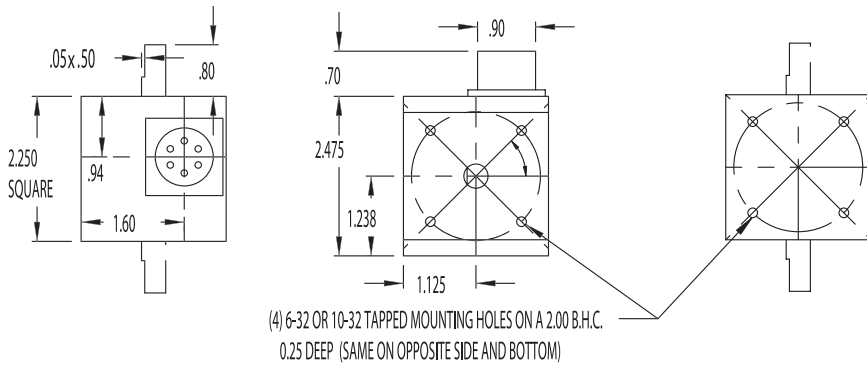
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H e r c u l e s

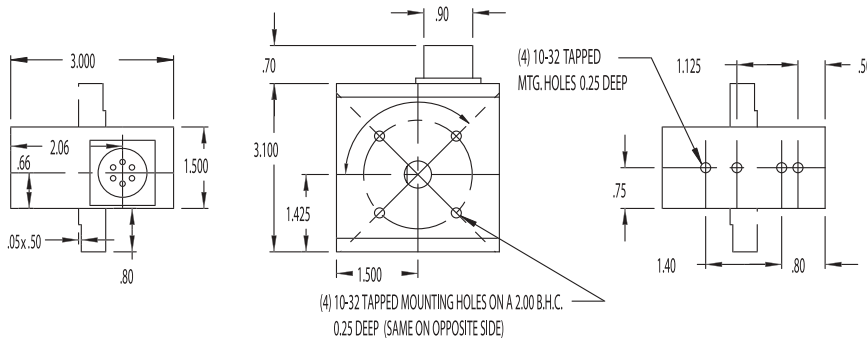
For the latest specifications visit our website  
[www.herculesencoders.com](http://www.herculesencoders.com)

# Dimensional Drawings

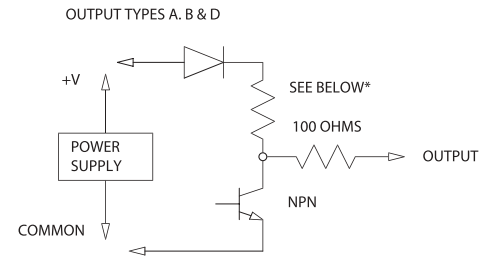
## Series 1000 Standard *call for sealed dimensions*



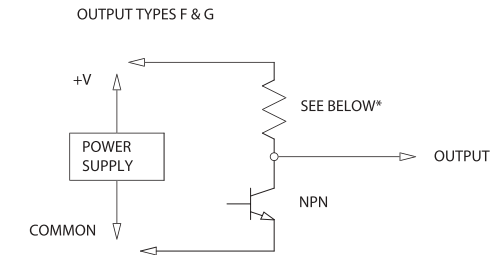
## Series 3000 Standard *call for sealed dimensions*



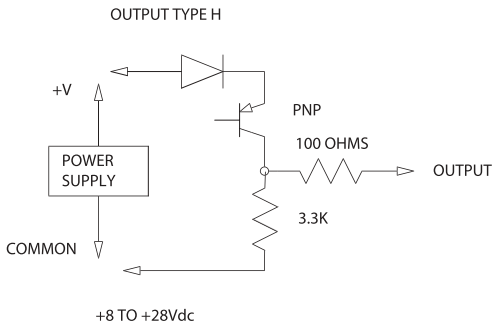
# Wire Drawings



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



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



+8 TO +28Vdc

# Ordering Information

<b>Series</b> _____	<b>1</b> _____	<b>3</b> _____	<b>2</b> _____	<b>1</b> _____	<b>A</b> _____	<b>Q</b> _____	<b>030</b> _____	<b>AQ12</b> _____
<b>Shaft Diameter</b> 1=1/4" (0.2497") 3=3/8" (0.3747)	<b>Encoder Type</b> _ = Standard Encoder S = Sealed (Elastomer) T = Sealed (PTFE)				<b>Channel Outputs</b> A = NPN w/Pullup Res. B = NPN Open Collector D = 1.5K Pullup, No Ser. R (18V Max) F = 5Vdc w/Pullup Res. G = 5Vdc Open Collector H = PNP Sourcing Outputs			
<b>Shaft Extension</b> 1=Single 2=Double	<b>Mounting Type</b> 0=6-32 BHC on Ends 1=10-32 BHC on Shaft Ends & Base 2=Flanged Base (10-32 BHC on Shaft Ends) 3=No Holes on Base (10-32 BHC on Ends)				<b>Channel Types</b> S=Single Channel Q=Quadrature Outputs I=Index Pulse			
<b>Series</b> _____	<b>3</b> _____	<b>3</b> _____	<b>1</b> _____	<b>1</b> _____	<b>A</b> _____	<b>Q</b> _____	<b>030</b> _____	<b>AQ12</b> _____
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<b>Shaft Extension</b> 1=Single 2=Double	<b>Mounting Type</b> 1=10-32 BHC on Shaft Ends & Base 2=Flanged Base (BHC on Shaft Ends) 3=No Holes on Base (BHC on Shaft Ends)				<b>Channel Types</b> S=Single Channel Q=Quadrature Outputs			
					<b>Optional Index Channel or Add. Encoder</b> (Same types of Channel Outputs) <i>Order the Secondary Channel like a Primary Channel</i>			
					<b>PPR (Pulses per Revolution)</b>			
					<b>Channel Types "S" and "Q"</b>			
					001 002 003 004			
					005 006 007 008			
					009 010 012 015			
					018 020 025 030			
					<b>Added Channel Types "S" (Square Wave)</b>			
					014 016 024			
					<b>PPR (Pulses per Revolution)</b>			
					<b>Channel Types "S" and "Q"</b>			
					001 002 003 004 005			
					006 007 008 009 010			
					012 013 014 015 016			
					018 020 024 025 030			
					050 060			
					<b>Added Channel Types "S" (Square Wave)</b>			
					026 028 032 036 040			
					048 100 120			