

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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Technical drawing of a square mounting plate. The main view is a square with a side length of 2.250. It features a central circular hole with a diameter of .94. The plate has a thickness of .05 x .50. The mounting holes are located at a distance of 1.60 from the edges. The detail view shows a square with a side length of 1.125, a central hole with a diameter of .90, and four mounting holes with a diameter of .070. The mounting holes are located at a distance of 1.238 from the edges. The detail view also shows the mounting holes are 6-32 or 10-32 tapped mounting holes on a 2.00 B.H.C. 0.25 DEEP (SAME ON OPPOSITE SIDE AND BOTTOM).

(4) 10-32 TAPPED MOUNTING HOLES ON A 2.00 B.H.C. (2.05 DEEP) (SAME ON OPPOSITE SIDE)

OUTPUT TYPES A, B & D

+V

POWER SUPPLY

COMMON

SEE BELOW*

100 OHMS

OUTPUT

NPN

+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

+V

POWER SUPPLY

COMMON

SEE BELOW*

OUTPUT

NPN

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

OUTPUT TYPE H

+V

POWER SUPPLY

COMMON

PNP

100 OHMS

3.3K

OUTPUT

+8 TO +28Vdc

The diagram illustrates the pinout and channel configurations for the 10-32 BHC Encoder. It is divided into two main sections: a 10-pin version and a 12-pin version.

10-Pin Version:

- Series:** 1, 3, 2, 1, -
- Shaft Diameter:** 1=1/4" (0.2497"), 3=3/8" (0.3747)
- Shaft Extension:** 1=Single, 2=Double
- Encoder Type:** _=Standard Encoder, S=Sealed (Elastomer), T=Sealed (PTFE)
- Mounting Type:** 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)
- Channel Outputs:** 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
- Channel Types:** S=Single Channel, Q=Quadrature Outputs, I=Index Pulse
- Optional Index Channel or Add. Encoder:** (Same types of Channel Outputs)
Order the Secondary Channel like a Primary Channel
- Channel Configurations:**
 - PPR (Pulses per Revolution):** 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 012, 015, 018, 020, 025, 030
 - Channel Types "S" and "Q":** 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 012, 015, 018, 020, 025, 030
 - Added Channel Types "S" (Square Wave):** 014, 016, 024

12-Pin Version:

- Series:** 3, 3, 1, 1, -
- Shaft Diameter:** 1=1/4" (0.2497"), 3=3/8" (0.3747)
- 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 & Base, 2=Flanged Base (BHC on Shaft Ends), 3=No Holes on Base (BHC on Shaft Ends)
- Channel Outputs:** 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
- Channel Types:** S=Single Channel, Q=Quadrature Outputs
- Channel Configurations:**
 - PPR (Pulses per Revolution):** 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 012, 013, 014, 015, 016, 018, 020, 024, 025, 030
 - Channel Types "S" and "Q":** 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 012, 013, 014, 015, 016, 018, 020, 024, 025, 030
 - Added Channel Types "S" (Square Wave):** 026, 028, 032, 036, 040, 048, 100, 120