

# Hercules Encoders

## Series N35

### Heavy Duty Incremental Rotary Shaft Encoder

- Enclosure: N35-3.5" Dia. NEMA 4 type Sealing Servo, Flush or Flanged Mounting
- Vibration-resistant Anti-Jitter Circuitry, Shatterproof Metal Code Discs
- Shielded ABEC 5 Stainless Steel Spindle Bearings, Standard and Self-Mounting options
- Low Supply Current Requirement - 30 milliamps typical per encoder, maximum of 50 mA
- Operating Voltage Flexibility - 8 to 28 Vdc or 5 Vdc TTL 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	6000 RPM maximum
Shaft Direction	Bidirectional
Standard Shaft Sizes	.3747", .4997"
Shaft Extension(s)	Std 0.875", .50 x .05" flat
Shaft Seals	Neoprene or PTFE Options
Mounting	Refer to dimensional drawings
Bearings	ABEC 5 Spindle
Radial Loading	90 lbs. Operating
Axial Loading	45 lbs. Operating
Accuracy	±0.1° of Shaft Rotation Typical
Housing	Black Anodized Aluminum
Weight (N35)	36 oz.
Connector	6, 7, 10 Pin MS3102E or 18" Cable Out

### Electrical

Pulse Rate	15 kHz typical, up to 200 kHz available
Outputs	NPN w/ 3.3K pullup or open collector PNP sourcing Line Driver (with 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 TTL output
Supply Current, per channel	30 mA typical, 50 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 4X equiv. — Water-tight

### Electrical Connections

Function	6 Pin	7 Pin	10 Pin	Cable Out	Color
+V	B	D	D	D	Red
Common	A	F	F	F	Black
Channel A	D	A	A	A	Blue
Channel B	E	B	B	B	Brown
Channel $\bar{A}$	C	E	H	E	White
Channel $\bar{B}$	F	G	I	G	Green
Index	C or E*	C	C	C	White
Index	F	G	J	G	Green

\* C is standard; for outputs "KI" or "LI" (line driver with index), index pin is E

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

# Dimensional Drawings

## Series N35 Standard



# Wire Drawings



# Ordering Information

**Size**  
N35S=Sealed (Elastomer)  
N35T=Sealed (PTFE)

**Mounting Style**  
1=Flush mount  
2=Servo mount  
3=Flange mount

**Shaft Style**  
3=3/8" Standard Shaft  
4=1/2" Standard Shaft

**N35T**

**3 3 5**

**K Q 1000**

**KI**

**Index Channel**  
(same types as Channel Outputs)

**Connector Style**

- 1=6 Pin rear mounted
- 2= 6 Pin side mounted
- 3= 7 Pin rear mounted
- 4= 7 Pin side mounted
- 5=10 Pin rear mounted
- 6=10 Pin side mounted
- 7=Cable rear mounted
- 8=Cable side mounted

**Channel Outputs**

- (All outputs available with complementary outputs)
- A=NPN w/Pullup Res.
  - B=NPN Open Collector
  - F=5Vdc w/Pullup Res.
  - G=5Vdc Open Collector
  - H=PNP Sourcing Output
  - K=5Vdc Line Driver
  - L=8 to 15 Vdc Line Driver

**Channel Types**

- Q=Quadrature Outputs
- 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
- I=Index Pulse

**Channel Types "P" "U" & "Q"**

0025	0030	0050	0060	0064
0075	0090	0093	0096	0100
0120	0125	0128	0135	0150
0180	0186	0192	0200	0240
0250	0256	0270	0300	0360
0372	0400	0480	0500	0512
0540	0600	0720	0840	0960
1000	1024			

**If "P" or "U" add (Square Wave)**

0800	1080	1200	1440
1680	1920	2000	2048

**If "P" or "U" add (Pulsed)**

0768	1488	1600	2160	2400
2880	3360	3840	4000	4096

Consult factory for PPR not listed