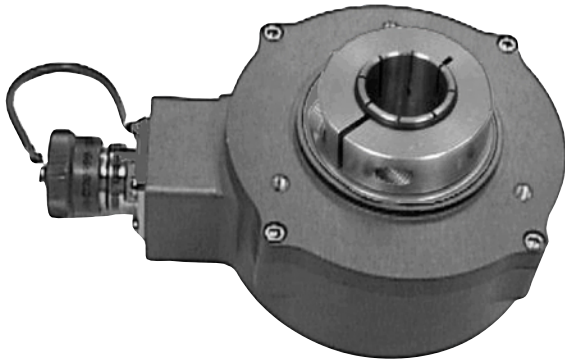


**NEW**



## Series HSD37

- *Single or Dual Output*
- *Double-Sealed Housing*
- *ATEX Certification for Intrinsically Safe Applications*
- *High Resolution Unbreakable Disk*
- *Electrically and Thermally Isolated*
- *Industrial Duty Connector*
- *NEMA 4X, 6 / IP66, 67 Rated*
- *Rugged Cast-Aluminum Housing*
- *Stainless Steel Housing Available*
- *Two Year Warranty*

### Extreme Heavy Duty Hollowshaft Encoder

#### DESCRIPTION

NorthStar's HSD37 Extreme Duty Industrial Hollowshaft Encoder accepts up to 1" diameter shafts and operates reliably from -40 to +100°C. Its Hard Anodized finish enclosure exceeds IP66/IP67 and NEMA 6 enclosure requirements.

This robust encoder features a double-sealed housing that allows application where regulatory washdown or caustic chemicals are present. Utilization of an advanced Opto ASIC with innovative packaging techniques enables the encoder to operate in high shock and vibration environments.

It is also available in an Intrinsically Safe version, certified to ATEX EEx ia IIB T4, when used with the appropriate IS Barrier.

#### APPLICATIONS:

The HSD37 extreme duty encoder features simple installation on motor or machine shafts. It is often mounted on the back of motors where encoder feedback is needed in harsh environment applications. It is ideal for use in environments that demand heavy washdown protection.

- Converting Machinery
- Material Handling
- Packaging Equipment
- Processing Equipment

#### INDUSTRIES

Chemical, Food & Beverage, Oil & Gas, Paper, Steel and any other where a precise encoder is needed to operate in harsh environments.

#### FEATURES/BENEFITS

Mechanical and Environmental

- Unbreakable code disk
- Hollowshaft mounting
- Heavy duty shaft seals
- Sealed connector

Electrical

- Cast housing maximizes noise immunity and durability
- ATEX certification available

**Extreme Heavy Duty... Meets Stringent Washdown Requirements**

**SPECIFICATIONS\***

**STANDARD OPERATING CHARACTERISTICS**

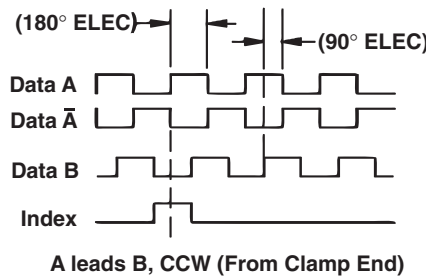
**Code:** Incremental  
**Resolution:** to 5000 PPR (pulses/revolution) See Ordering Information  
**Format:** Two channel quadrature (AB) with optional Index (Z), and complementary outputs  
**Phase Sense:** A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder  
**Quadrature Phasing:** For resolutions to 1200 PPR: 90° ± 15° electrical; For resolutions over 1250 PPR: 90° ± 30° electrical  
**Symmetry:**  
 For resolutions to 1024PPR: 180° ± 18° electrical  
 For resolutions over 1024PPR: 180° ± 25° electrical  
**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

\* Specifications are for base models with standard features only unless otherwise noted. Specifications subject to change without notice in accordance with our DBS policy of continuous improvement. All product and brand names are trademarks of their respective owners. All rights reserved.

**ELECTRICAL**

**Input Power:** 5-26VDC, 50 mA max., not including output loads. ATEX: 5VDC, 7-26VDC  
**Outputs:** ET7272, ET7273  
**Frequency Response:** 125 kHz (data & index)  
**Termination:** MS Connector; M12 Connector; cable exit w/seal. See Ordering Information  
**Mating Connector:**  
 6 pin MS, style MS3106A-14S-6S (MCN-N4);  
 7 pin MS, style MS3106A-16S-1S (MCN-N5);  
 10 pin MS, style MS3106A-18-1S (MCN-N6);  
 Cable w/ 5 pin M12 connector, p/n 112859-xxx  
 Cable w/ 8 pin M12 connector, p/n 112860-xxx

**DATA AND INDEX**  
 Not all complements shown  
 A shown for reference



**MECHANICAL**

**Shaft Material:** Stainless Steel  
**Bore Diameter:** 1.00", 0.875, 0.750", 0.625", 0.500", 16mm, 15mm, 12mm. Insulated inserts provided for bores under 1 inch (1" bore not electrically isolated)  
**Bore runout:** ±0.0005 TIR at midpoint  
**Min. Shaft Engagement:** 1.25"  
**Starting torque:** 4.5 in-oz. maximum (at 25°C)  
**Running torque:** 4.0 in-oz. maximum (at ambient)  
**Bearings:** 61806-ZZ  
**Bearing life:** 5 x 10<sup>8</sup> revs at rated shaft Loading, 5 x 10<sup>11</sup> revs at 10% of rated shaft loading. (manufacturers' specs)  
**Housing and cover:** Hard Anodized Aluminum. Also available in Stainless Steel.  
**Disc material:** Metal or mylar (unbreakable)  
**Weight:** 35 ounces, typical

**ENVIRONMENTAL**

**Operating Temperature:** -40 to 100°C  
**Operating Temperature ATEX:** -40 to 80°C  
**Storage temperature:** -40 to 100°C  
**Shock:** 50G's for 11msec duration  
**Vibration:** 5 to 2000Hz @ 20 G's  
**Humidity:** 100%  
**Enclosure Rating:** NEMA 4X, NEMA 6, IP66, IP67 (NEMA 6P upon request)  
 Note: "MS" type mating connectors and prebuilt cables are rated NEMA 12. "M12" Cable assemblies are rated IP67

**ELECTRICAL CONNECTIONS**

**6, 7 & 10 Pin MS Connectors and Cables - Code 6 = 0 to 9, A to G**

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the same color coding as shown for each output configuration.

Encoder Function	Cable #108594- <sup>*</sup> 6 Pin Single Ended		Cable #112123- <sup>*</sup> 6 Pin Dif Line Drv w/o Index		Cable #108596- <sup>*</sup> 7 Pin Dif Line Drv w/o Index		Cable #108595- <sup>*</sup> 7 Pin (If Used)		Cable #1400635- <sup>*</sup> 10 Pin w/Index (If Used)		Cable #108615- <sup>*</sup> 12 Pin CCW (If Used)		Cable #114448- <sup>*</sup> 10 Pin Bayonet	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
	Sig. A	E	BRN	E	BRN	A	BRN	A	BRN	A	BRN	5	BRN	A
Sig. B	D	ORN	D	ORN	B	ORN	B	ORN	B	ORN	8	ORN	B	ORN
Sig. Z	C	YEL	—	—	—	—	C	YEL	C	YEL	3	YEL	C	YEL
Power +V	B	RED	B	RED	D	RED	D	RED	D	RED	12	RED	D	RED
N/C	F	—	—	—	—	—	E	—	E	—	7	—	E	—
Com	A	BLK	A	BLK	F	BLK	F	BLK	F	BLK	10	BLK	F	BLK
Case	—	—	—	—	G	GRN	G	GRN	G	GRN	9	—	G	GRN
Sig. A-bar	—	—	C	BRN/WHT	C	BRN/WHT	—	—	H	BRN/WHT	6	BRN/WHT	H	BRN/WHT
Sig. B-bar	—	—	F	ORN/WHT	E	ORN/WHT	—	—	I	ORN/WHT	1	ORN/WHT	J	ORN/WHT
Sig. Z-bar	—	—	—	—	—	—	—	—	J	YEL/WHT	4	YEL/WHT	K	YEL/WHT
0V Sense	—	—	—	—	—	—	—	—	—	—	2	GRN	—	—
5V Sense	—	—	—	—	—	—	—	—	—	—	11	BLK/WHT	—	—

**5 & 8 Pin M12 Accessory Cables when Code 6 = H or J**

Connector pin numbers and cable assembly wire color information is provided here for reference.

Encoder Function	Cable # 112859- 5 Pin Single Ended		Cable # 112860- 8 Pin Single Ended		Cable # 11288 8Pin Differer	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire C
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
†Sig. Z	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig. A-bar	—	—	—	—	3	BRN/WI
Sig. B-bar	—	—	—	—	5	ORG/W
†Sig. Z-bar	—	—	—	—	8	YEL/WI

† Index not provided on all models. See ordering information  
 Cable Configuration: PVC jacket, 105 °C rated, overall foil

Note: "MS" type mating connectors and prebuilt cables are rated NEMA 12. "M12" Cable assemblies are rated IP67

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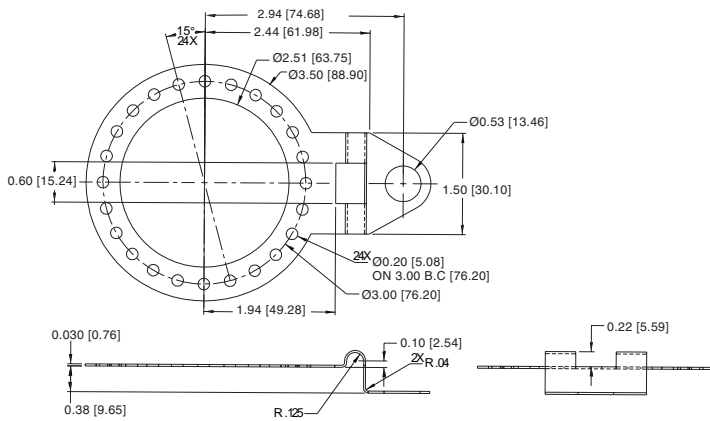
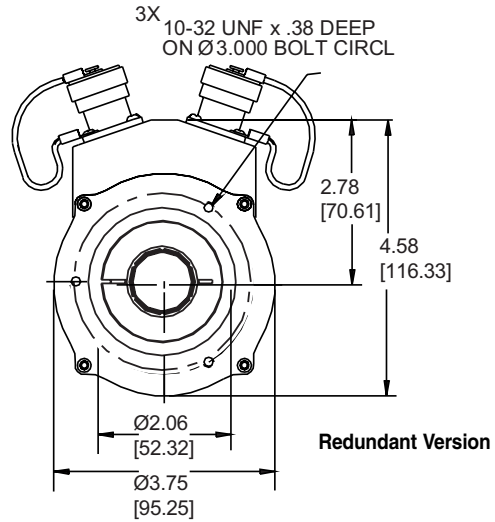
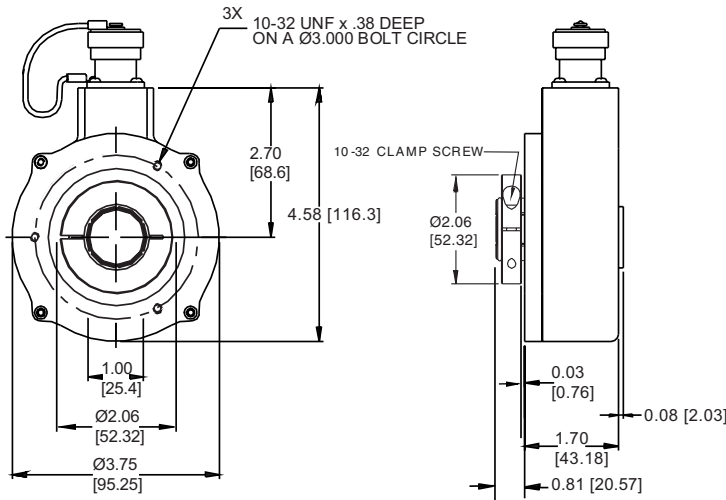
**Customer Service +1 800.873.8731 • Technical Support +1 800.234.8731**  
[www.dynapar.com](http://www.dynapar.com)

**Extreme Heavy Duty Hollowshaft Encoder**

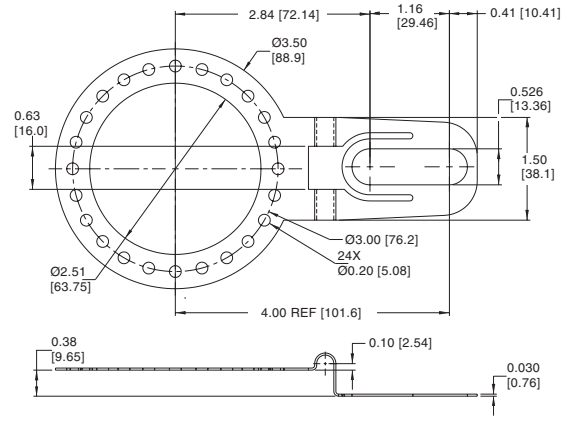
**Series HSD37**

**Extreme Heavy Duty Encoder... Meets Stringent Washdown Requirements**

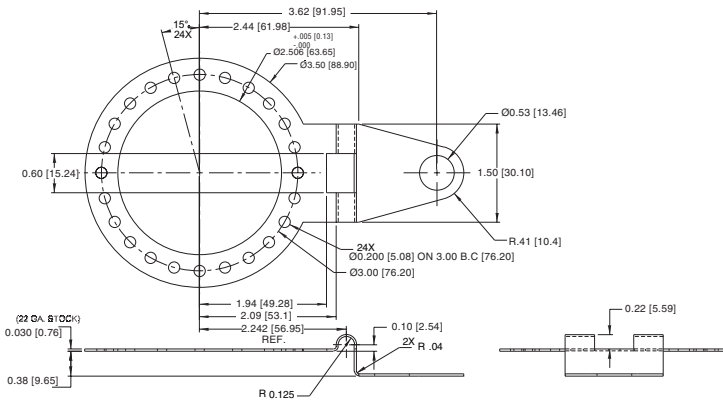
**DIMENSIONS (inches [mm])**



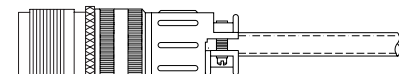
**Single Point Tether for 4-1/2" C-Face**



**Slotted Tether**



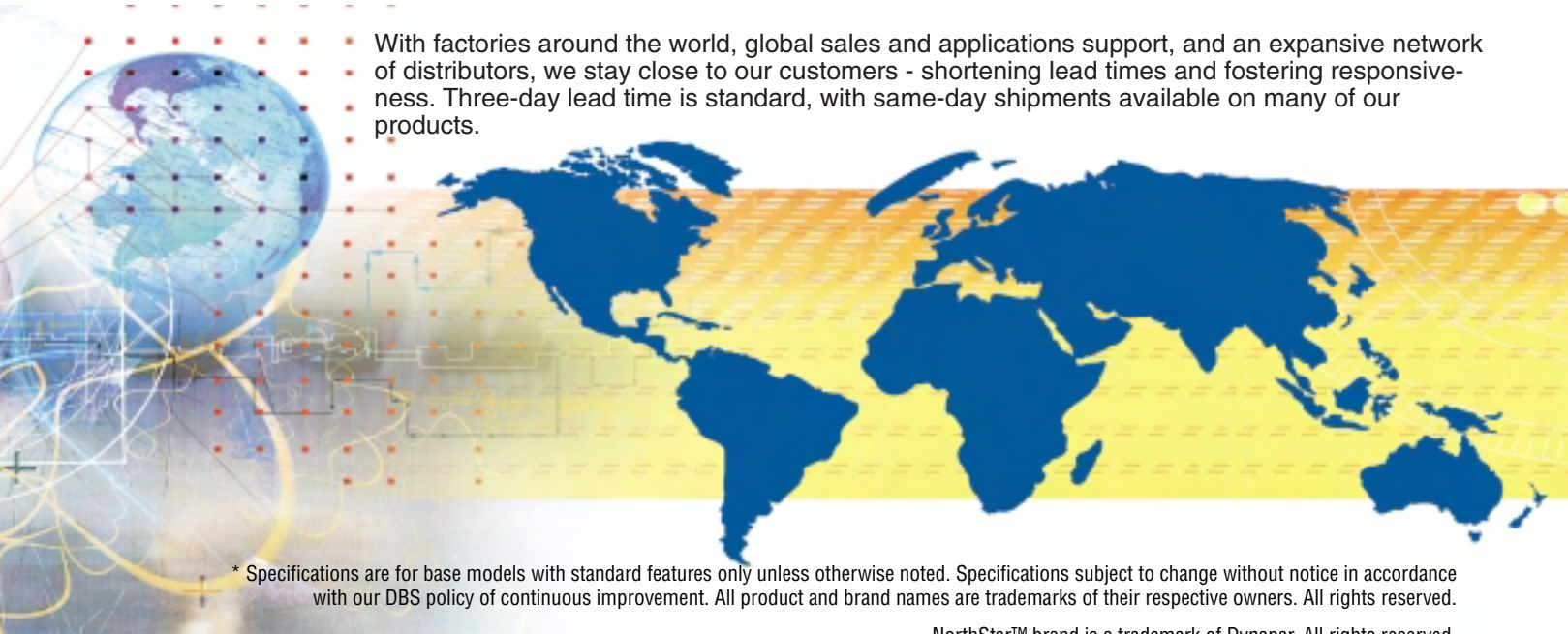
**Single Point Tether for 8-1/2" C-Face**



**Pigtail with MS Connector (K Option)**

# ORDERING INFORMATION

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Format	Code 5: Output	Code 6: Termination	Code 7: Safety	Code 8: Housing/Tether
<b>HSD37</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ordering Information							
<b>HSD37</b> Size 37 extreme heavy-duty, hollowshaft encoder	<b>0015</b> <b>0032</b> <b>0050</b> <b>0060</b> <b>0100</b> <b>0200</b> <b>0240</b> <b>0250</b> <b>0500</b> <b>0512</b> <b>0600</b> <b>1000</b> <b>1024</b> <b>1200</b> <b>2000</b> <b>2048</b> <b>4000</b> <b>4096</b> <b>5000</b>	<b>6</b> 12mm <b>9</b> 15 mm <b>7</b> 1/2" <b>8</b> 5/8" <b>A</b> 16mm <b>C</b> 3/4" <b>D</b> 20mm <b>E</b> 7/8" not electrically isolated <b>G</b> 1"	<b>0</b> single ended, unidirectional (A) <b>1</b> single ended, bidirectional (AB) <b>2</b> single ended, bidirectional with index (ABZ) available when Code 5 is 3 or 4, and Code 6 is 1, 2, 6, 7, A, J, K, L, M or N: <b>3</b> differential, bidirectional ( AĀ BB) available when Code 5 is 3 or 4 and Code 6 is 2, 7, A, J, K, L, M or N <b>4</b> differential, bidirectional with index ( AĀ BB ZĀ)	<b>0</b> 5-26V in, 5-26V Open Collector out (7273) <b>2</b> 5-26V in, 5-26V Push-Pull out available when: Code 4 is 3 or 4 <b>3</b> 5-26V in, 5-26V Differential Line Driver out (7272) <b>4</b> 5-26V in, 5V Differential Line Driver out (7272)	<b>0</b> 6 pin connector <b>1</b> 7 pin connector <b>2</b> 10 pin connector <b>5</b> 6 pin connector, plus mating connector <b>6</b> 7 pin connector, plus mating connector <b>7</b> 10 pin connector, plus mating connector <b>A</b> 18" (.5m) cable <b>J</b> 8 pin M12 connector <b>K</b> 18" (.5m) cable with 10 pin in-line connector <b>L</b> 36" (.91m) cable <b>M</b> 60" (1.52m) cable <b>N</b> 120" (3.05m) cable available when: Code 5 is 0 or 2 <b>H</b> 5 pin M12 connector	<b>0</b> No ATEX <b>1</b> ATEX Type 1* Option available when: Code 5 is 0, 2, 3 <b>2</b> ATEX Type 2* Option available when: Code 5 is 4 <b>3</b> ATEX Type 3* Option	<b>0</b> Cast Alum Housing; slotted tether <b>2</b> Stainless Housing; slotted tether <b>3</b> Redundant Outputs (Dual Connector Housing); slotted tether <b>5</b> Stainless Housing, Redundant Outputs; slotted-tether <b>C</b> Cast Alum Housing; single-point tether for 4-1/2" C-Face <b>E</b> Stainless Housing; single-point tether for 4-1/2" C-Face <b>F</b> Redundant Outputs (Dual Connector Housing); single-point tether for 4-1/2" C-Face <b>H</b> Stainless Housing, Redundant Outputs; single-point tether for 4-1/2" C-Face <b>K</b> Cast-Aluminum Housing; single-point tether for 8-1/2" C-Face <b>6</b> Same as "0" but no tether** <b>8</b> Same as "2" but no tether** <b>9</b> Same as "3" but no tether** <b>B</b> Same as "5" but no tether**
	<b>Accessory Kits:</b> <b>114190-0001:</b> Single Point Tether Kit for 4-1/2" C-Face <b>114193-0001:</b> Slotted Tether Kit <b>114079-0001:</b> Single Point Tether Kit for 8-1/2" C-Face		*Note: Available ATEX Certified Options <b>ATEX Type 1:</b> ATEX Certified; 5V in, 5V out only <b>ATEX Type 2:</b> ATEX Certified; 7-26V in, 7-26V out <b>ATEX Type 3:</b> ATEX Certified; 7-26V in, 5V out NOTE: When selecting ATEX models, ATEX voltages replace those shown in Code 5.				



With factories around the world, global sales and applications support, and an expansive network of distributors, we stay close to our customers - shortening lead times and fostering responsiveness. Three-day lead time is standard, with same-day shipments available on many of our products.

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HSD37 Data Sheet (06/09) ©2009 Dynapar

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