

NEW



Series HSD38

- *Double-Sealed Housing*
- *High Resolution Unbreakable Disk*
- *Electrically and Thermally Isolated*
- *Industrial Duty Connector*
- *NEMA 4X, 6 / IP66, 67 Rated*
- *Rugged Cast-Aluminum Housing*
- *Two Year Warranty*

Extreme Heavy Duty Hollowshaft Encoder

DESCRIPTION

NorthStar's HSD38 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 and high pressure steam 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.

APPLICATIONS:

The HSD38 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, 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

Extreme Heavy Duty... Meets Stringent Washdown Requirements

SPECIFICATIONS*

STANDARD OPERATING CHARACTERISTICS

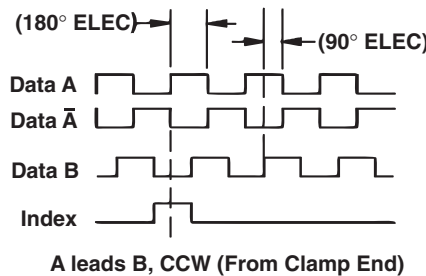
Code: Incremental
Resolution: to 5000 PPR (pulses/revolution) See Ordering Information
Format: Two channel quadrature (AB) with optional Index (Z), and complementary outputs
Phase Sense: A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder
Quadrature Phasing: For resolutions to 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.
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: 6061-T6 Aluminum
Bore Diameter: 1.00", 0.875", 0.750", 0.625", 0.500", 16mm, 15mm, 12mm. Insulated inserts provided for bores under 1 inch (1 inch bore not electrically isolated)
Bore runout: ±0.0005 TIR at midpoint
Min. Shaft Engagement: 1.25"
Starting torque: 4.0 in-oz. maximum (at 25°C)
Running torque: 3.0 in-oz. maximum (at ambient)
Bearings: 61806-ZZ
Bearing life: 5 x 10⁸ revs at rated shaft Loading, 5 x 10¹¹ revs at 10% of rated shaft loading. (manufacturers' specs)
Housing and cover: Hard Anodized Aluminum.
Disc material: Metal or mylar (unbreakable)
Weight: 26 ounces, typical

ENVIRONMENTAL

Operating Temperature: -40 to 100°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

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. HSD37 models with direct cable exit carry the color coding as shown in the right hand column.

Encoder Function	Cable # 108594-6 Pin Single Ended		Cable # 108595-7 Pin Single Ended		Cable # 108596-7 Pin Dif Line Driver with Index		Cable # 1400635-10 Pin Dif Line Driver with Index		Bayonet Connector 10 Pin Dif Line Driver with Index		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin		Wire Color
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN	A		GREEN
Sig. B	D	ORN	B	ORG	B	ORG	B	ORG	B		BLUE
Sig. Z	C	YEL	C	YEL	—	—	C	YEL	C		ORANGE
Power +V	B	RED	D	RED	D	RED	D	RED	D		RED
Com	A	BLK	F	BLK	F	BLK	F	BLK	F		BLACK
Case	—	—	G	GRN	G	GRN	G	GRN	G		WHITE
N/C-Shield	F	—	E	—	—	—	E	—	E		—
Sig. A-bar	—	—	—	—	C	BRN/WHT	H	BRN/WHT	H		VIOLET
Sig. B-bar	—	—	—	—	E	ORG/WHT	I	ORG/WHT	J		BROWN
Sig. Z-bar	—	—	—	—	—	—	J	YEL/WHT	K		YELLOW

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

5 & 8 Pin M12 Accessory Cables when Code 8=N to R

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 # 112860-8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
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/WHT
Sig. B-bar	—	—	—	—	5	ORG/WHT
*Sig. Z-bar	—	—	—	—	8	YEL/WHT

* Index not provided on all models. See ordering information
Cable Configuration: PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

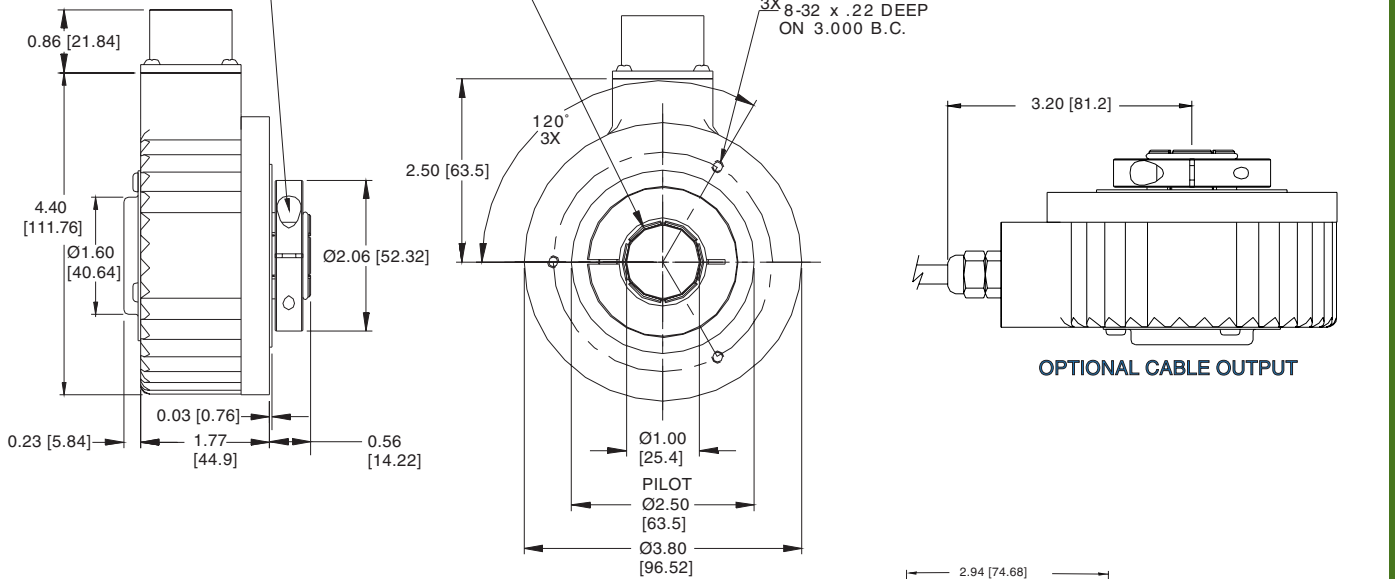
Extreme Heavy Duty Encoder... Meets Stringent Washdown Requirements

DIMENSIONS

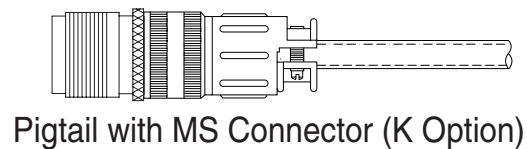
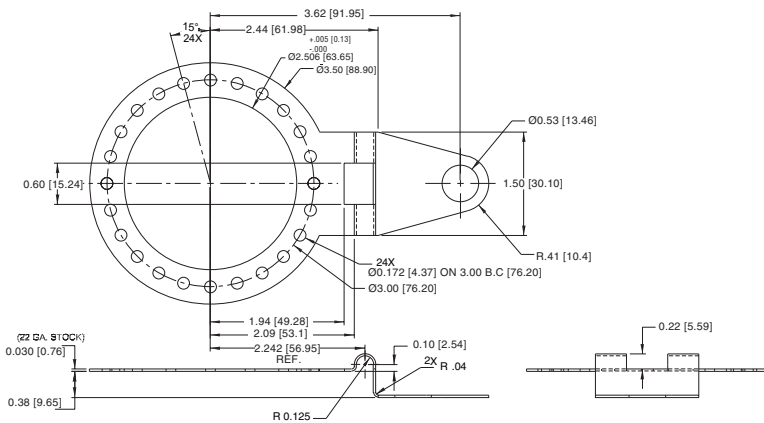
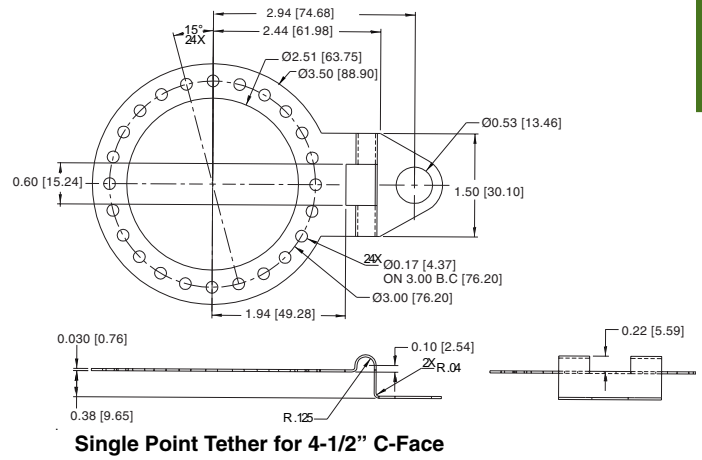
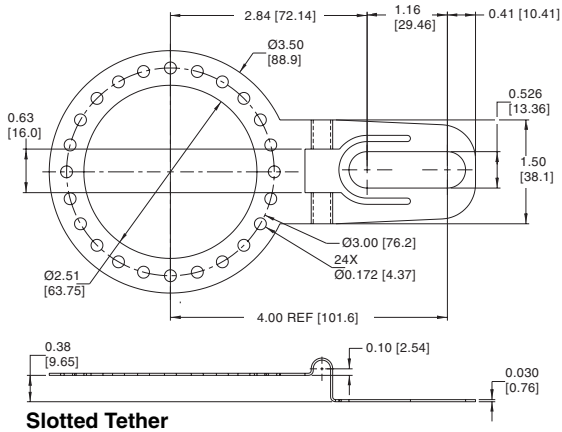
10-32 CLAMP SCREW
TORQUE TO 50 - 55 IN/LBS
WITH LOCTITE ON THREADS

1.000 I.D. COMPLETELY THRU THE SHAFT
FOR Ø 1.000, +0.00, -.003 SHAFT

3X 8-32 x .22 DEEP
ON 3.000 B.C.



OPTIONAL CABLE OUTPUT



Encoders

ORDERING INFORMATION

Code 1: Model	Code 2: PPR	Code 3: Bore Size	Code 4: Format	Code 5: Output	Code 6: Termination	Code 7: Options	Code 8: Housing
HSD38	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ordering Information							
HSD38 Size 38 extreme heavy-duty, hollowshaft encoder	0015 0032 0050 0060 0100 0200 0240 0250 0500 0512 0600 1000 1024 1200 2000 2048 4000 4096 5000	6 12mm 9 15 mm 7 1/2" 8 5/8" A 16mm C 3/4" D 20mm E 7/8" not electrically isolated: G 1"	0 single ended, unidirectional (A) 1 single ended, bidirectional (AB) 2 single ended, bidirectional with index (ABZ) available when Code 5 is 3 or 4 and Code 6 is 1, 2, 4, 6, 7, 8, A, G, J or K: 3 differential, bidirectional (AA BB) available when Code 5 is 3 or 4 and Code 6 is 2, 4, 8, 7, A, G, J or K 4 differential, bidirectional with index (AA BB ZZ)	0 5-26V in, 5-26V Open Collector out (7273) 2 5-26V in, 5-26V Push-Pull out available when: Code 4 is 3 or 4 3 5-26V in, 5-26V Differential Line Driver out (7272) 4 5-26V in, 5V Differential Line Driver out (7272)	0 6 pin connector 1 7 pin connector 2 10 pin connector 4 10 pin Bayonet connector 5 6 pin connector, plus mating connector 6 7 pin connector, plus mating connector 7 10 pin connector, plus mating connector 8 10 pin Bayonet connector plus mating connector A 18" (.5m) cable B 36" (1m) cable C 72" (2m) cable G 13" (.3m) cable J 8 pin M12 connector K 18" (.5m) cable with 10 pin in-line connector available when: Code 5 is 0 or 2 H 5 pin M12 connector	0 No Option 1 Internally Isolated 1" bore	0 Cast Aluminum Housing, Slotted Tether Included 6 Cast Aluminum Housing, No Tether C Cast Aluminum Housing, Single-Point Tether Included (NEMA 4.5" C-face) D Same as "0" with Cover Kit E Same as "C" with Cover Kit K Cast Aluminum Housing, Single-Point Tether Included (NEMA 8-1/2" C-face) N Same as "K" with Cover Kit

Accessory Kits:

- 113760-0001, Single Point Tether Kit for 4-1/2" C-Face
- 113762-0001, Slotted Tether Kit
- 113768-0001, Single Point Tether Kit for 8-1/2" C-Face
- 113310-0001, Bore Insert Kit, assortment of adapters allowing accommodation of all shaft sizes shown above in code 3

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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