Incremental

- Single or Dual output
- ATEX Certfication available for Intrinsically Safe application
- High Resolution Unbreakable Disk
- Industrial Duty Connector
- NEMA 4X, 6 / IP66, 67 Rated
- Nickel or Stainless Steel Housing available

HEAVY DUTY

NorthStar CE

NUMBER OF PULSES

0001 / 0024 / 0035 / 0040 / 0050 / 0060 / 0100 / 0120 / 0192 / 0200 / 0240 / 0250 / 0256 / 0300 / 0360 / 0500 / 0512 / 0600 / 0625 / 0720 / 1000 / 1024 / 1200 / 1250 / 1440 / 2000 / 2048 / 2500 / 2540 / 3000 / 3600

GENERAL INFORMATION

HARSH-DUTY OPTICAL HUB SHAFT ENCODER

NorthStar's HSD25 Harsh-Duty Optical Hub Shaft Encoder accepts up to 0.75" diameter shafts and operates reliably from –40 to +100°C. The hard anodized finish encoder exceeds IP66/IP67 and NEMA 6 enclosure requirements.

This robust encoder is also available in Stainless Steel to meet NEMA 4x and 6P requirements and its sealed housing allows the Encoder to be operated when regulatory washdown and high pressure steam or caustic chemicals are required. Utilization of an advanced Opto ASIC with innovative packaging techniques enables the encoder to operate in high shock and vibration environments.

The HSD25 is also available in an Intrinsically Safe version certified to ATEX EEx ia IIB T4 when used with the appropriate IS barrier.

APPLICATIONS

The HSD25 Harsh-Duty Optical Encoder features simple installation on motor or machine hub shafts. It is often mounted on the back of motors where encoder feedback is needed in harsh environment applications. Available housing options make it ideal use in corrosive environments that demand heavy washdown protection. ATEX certification is also available for intrinsically safe applications.

- Converting Machinery
- Material Handling
- Packaging Equipment
- Oil Field Exploration
- Processing Equipment

INDUSTRIES

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

TECHNICAL DATA
mechanical

Housing diameter	58.93 mm
Shaft diameter	3/8" / 10 mm / 12.7 mm / 5/8" / 3/4" (Hubshaft)
Flange (Mounting of housing)	Tether
Mounting of shaft	Front clamping ring
Protection class shaft input (EN 60529)	NEMA 4X or NEMA 6 IP66 or IP67

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TECHNICAL DATA
mechanical (continued)

Protection class housing (EN 60529)	NEMA 4X or NEMA 6 IP66 or IP67
Bearing life	max. 5 x 10^{11} revs.
Torque	< 1.76 Ncm
Vibration resistance (DIN EN 60068-2-6)	200 m/s² (5 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	500 m/s² (11 sec)
Operating temperature	-40 °C ... +100 °C ATEX: -40 °C ... +80 °C
Material shaft	Stainless Steel
Material housing	Hard anodized Aluminum, Nickel, Stainless Steel
Weight	approx. 600 g
Connection	MS, radial M12-connector, radial Cable, radial

TECHNICAL DATA
electrical

Supply voltage	DC 5 - 26 V ATEX: DC 5 V ATEX: DC 7 - 26 V
Max. current w/o load	50 mA
Code	Incremental, optical
Max. pulse frequency	125 kHz
Phasing	Incremental signals (A leads B): A leads B by 90° for ccw shaft rotation viewing the shaft clamp end of the encoder
Pulse shape	Square wave

ELECTRICAL CONNECTIONS
6, 7 & 10 Pin MS connector / Cable

Encoder Function	Cable 6 Pin Single Ended		Cable 7 Pin Single Ended		Cable 7 Pin Dif Line Drv w/o Idx		Cable 10 Pin Dif Line Drv w/ Idx		Cable 12 Pin CCW		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	brown	A	brown	A	brown	A	brown	5	brown	green
Sig. B	D	orange	B	orange	B	orange	B	orange	8	orange	blue
Sig. Z	C	yellow	C	yellow	--	--	C	yellow	3	yellow	orange
Power +V	B	red	D	red	D	red	D	red	12	red	red
Com	A	black	F	black	F	black	F	black	10	black	black
Case	--	--	G	green	G	green	G	green	9	--	white
N/C	F	--	E	--	--	--	E	--	7	--	--
Sig. $\overline{A}$	--	--	--	--	C	brown/white	H	brown/white	6	brown/white	violet
Sig. $\overline{B}$	--	--	--	--	E	orange/white	I	orange/white	1	orange/white	brown
Sig. $\overline{Z}$	--	--	--	--	--	--	J	yellow/white	4	yellow/white	yellow
0 Volt Sense	--	--	--	--	--	--	--	--	2	green	--
5 Volt Sense	--	--	--	--	--	--	--	--	11	black/white	--

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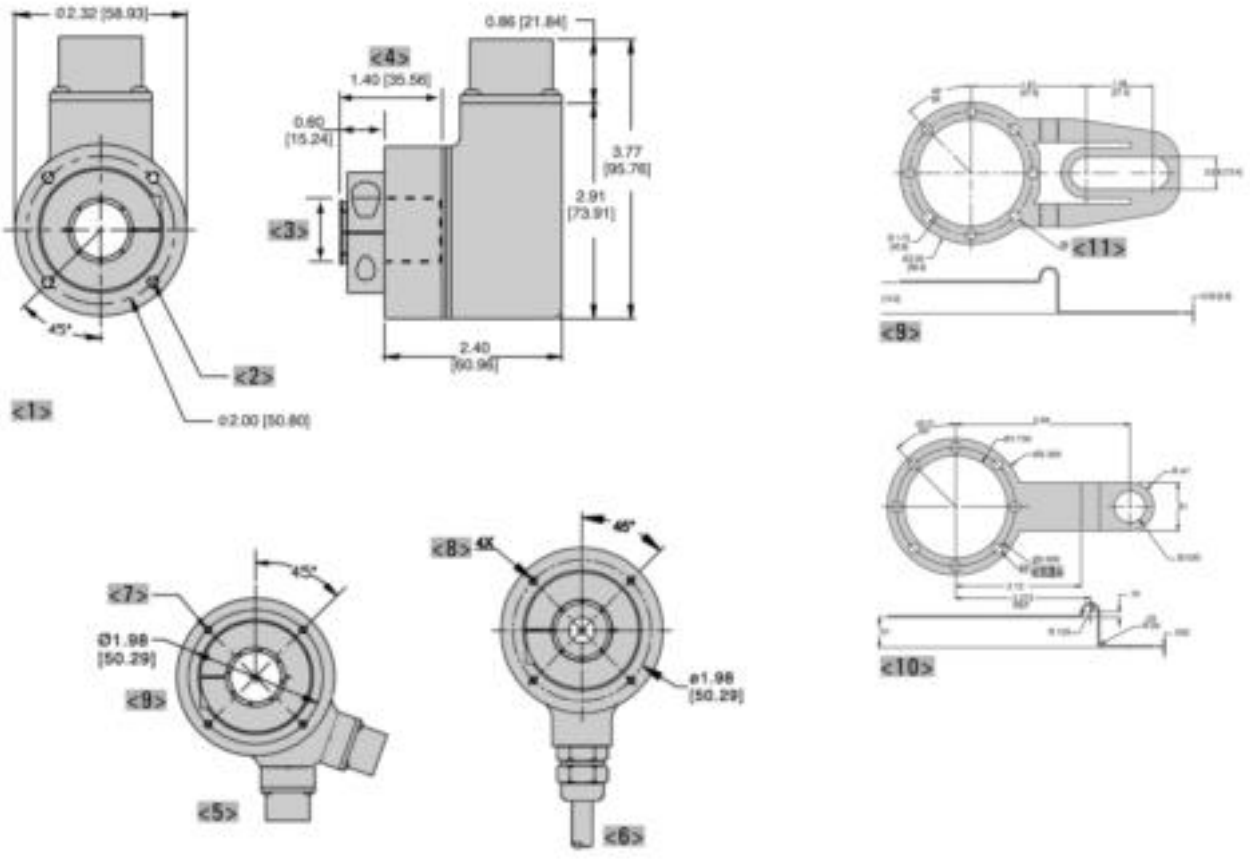
ELECTRICAL CONNECTIONS
5 & 8 Pin M12 Accessory Cable

Encoder Function	Cable 5 Pin Single Ended		Cable 8 Pin Single Ended		Cable 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	black	1	brown	1	brown
Sig. B	2	white	4	orange	4	orange
Sig. Z	5	grey	6	yellow	6	yellow
Power +V	1	brown	2	red	2	red
Com	3	blue	7	black	7	black
Sig. $\overline{A}$					3	brown/white
Sig. $\overline{B}$					5	orange/white
Sig. $\overline{Z}$					8	yellow/white

DIMENSIONED DRAWINGS



<1> Standard Housing
<2> 8-32 UNC x .28 deep on 2.000 bolt circel 4 places 90° apart
<3> Bore diameter
<4> Hub shaft cavity maximum depth
<5> Dual Redundant Outputs
<6> Cable Exit
<7> 4-40 x .25 deep 4 places - 90° apart
<8> 4-40 x .25 deep 90° apart
<9> Slotted Tether
◘ Single Point Tether
◘Ø 0.172 [43.7] ON Ø 2.00 [50.8] B.C.

Dimensions in inch [mm]

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ORDERING INFORMATION

Type	Number of pulses	Shaft Ø	Format [2 4]	Output	Connection	Safety [1 3]	Housing, Tether, Options
☐	☐	☐	☐	☐	☐	☐	☐
HSD25	**1 ... 3600**	**4** 9.52 mm (3/8") **5** 10 mm **7** 12.7 mm (1/2") **8** 5/8" **C** 3/4"	**0** single ended, undirectional (A) **1** single ended, bidirectional (AB) **2** single ended, bidirectional with index (ABZ) **3** differential, bidirectional (A¬A B¬B) **4** differential, bidirectional with index (A¬A B¬B Z¬Z) **5** Dual isolated differential, bidirectional w/index (A¬A B¬B Z¬Z)	**0** 5-26V in, 5-26V Open Collector out (7273) **2** 5-26V in, 5-26V Push-Pull out **3** 5-26V in, 5-26V Differential Line Driver out (7272) **4** 5-26V in, 5V Differential Line Driver out (7272) **F** 5-26V in, 5-26V Open Collector out (2222) **G** 5-26V in, 5-26V Open Collector out with 2.2 kΩ Pullups (2222)	**0** 6 pin connector **1** 7 pin connector **2** 10 pin connector **3** 12 pin connector **5** 6 pin connector plus mating connector **6** 7 pin connector plus mating connector **7** 10 pin connector plus mating connector **8** 12 pin connector plus mating connector **A** Cable 0,5 m **B** Cable 1 m **C** Cable 2 m **D** Cable 3m **F** 0.3 m cable with 10 pin connector plus mating connector **G** Cable, 0.3 m **H** M12 connector, 5 pole **J** M12 connector, 8 pole	**0** No ATEX **1** ATEX Type 1 Option **2** ATEX Type 2 Option **3** ATEX Type 3 Option	**0** Cast Aluminum Housing, Slotted Tether **1** Nickel Housing, slotted tether **2** Stainless Housing, slotted tether **3** Redundant Outputs (Dual Connector Housing), slotted tether **4** Nickel Housing, Redundant Outputs, slotted tether **5** Stainless Housing, Redundant Outputs, slotted-tether **C** Cast Aluminum Housing, Single-Point Tether Included (NEMA 4.5" C-face) **D** Nickel Housing, single-point tether **E** Stainless Housing, single-point tether **F** Redundant Outputs (Dual Connector Housing), single-point tether **G** Nickel Housing, Redundant Outputs, single-point tether **H** Stainless Housing, Redundant Outputs, single-point tether **6** Same as "0" but no tether **7** Same as "1" but no tether **8** Same as "2" but no tether **9** Same as "3" but no tether **A** Same as "4" but no tether **B** Same as "5" but no tether

[1] ATEX Type 1: 5 V in, 5 V out
ATEX Type 2: 7-26V in, 7-26V out
ATEX Type 3: 7-26V in, 5V out

[2] Format Code "3" only available with Output Code "3" or "4" resp. Housing/ Tether Code "0", "1", "2" or "6", "7", "8"

[3] Safety Code "2" only available with Output Code "4"

[4] Format Code "4" and Code "5" only available with Output Code "3" or "4" resp. Connection Code "A" to "G" and Housing/ Tether Code "0", "1", "2" or "6", "7", "8"