

Инкрементные энкодеры HD20, HD25

Технические характеристики

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Incremental



NUMBER OF PULSES

- Single or Dual output
- ATEX Certification available for Intrinsically Safe application
- High Resolution Unbreakable Disk
- Industrial Duty Connector
- NEMA 4X / IP67 Rated
- Nickel or Stainless Steel Housing available

HEAVY DUTY NorthStar™ CE

0001 / 0024 / 0025 / 0035 / 0040 / 0060 / 0100 / 0120 / 0192 / 0200 / 0240 / 0250 / 0256 / 0300 / 0360 / 0500 / 0512 / 0600 / 0625 / 0720 / 1000 / 1024 / 1200 / 1250 / 1440 / 2000 / 2048 / 2500 / 2540 / 3600

GENERAL INFORMATION

HARSH-DUTY OPTICAL ENCODER

The HD20 Harsh-Duty Optical Encoder is a compact heavy-duty encoder designed to exceed IP66/IP67 and NEMA 6 enclosure requirements. It is also available in stainless steel that exceeds NEMA 4X and NEMA 6P requirements and is ideal for stringent wash down environments, including those where high pressure steam or caustic chemicals are needed to meet regulatory requirements.

The HD20 features max. 440N Axial and Radial Bearings, -40° to +100°C temperature range and unique labyrinth double-sealed housing, and optional dual "redundant" outputs and is covered by a two-year warranty (one year for bearings). NorthStar's traditional quality, reliability and value are built-in to every HD20 encoder.

Also available in this series, is an Intrinsically Safe version certified to ATEX EEx ia IIB T4 when used with the appropriate IS Barrier. Accessory barriers can be supplied with the encoder.

APPLICATIONS

The HD20 Harsh-Duty Optical Encoder is ideal for machine applications with corrosive environments that demand heavy washdown protection. This compact, special-duty encoder is designed to exceed IP66/IP67 and NEMA 6 enclosure requirements with a PPR range through 3600. ATEX certification is also available for intrinsically safe applications.

- Converting Machinery
- Material Handling
- Packaging Equipment
- Pickling 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.

TECHNICAL DATA
mechanical

Housing diameter	52.3 mm
Shaft diameter	9.52 mm / 10 mm (Solid shaft)
Flange (Mounting of housing)	Square flange
Protection class shaft input (EN 60529)	NEMA 4X or IP67
Protection class housing (EN 60529)	NEMA 4X or IP67

Incremental

TECHNICAL DATA

mechanical (continued)

Shaft load axial / radial	max.: 440 N / 440 N
Max. speed	max. 6000 rpm
Bearing life	max. 5 x 10 ¹¹ revs.
Starting torque typ.	< 1.76 Ncm
Vibration resistance (DIN EN 60068-2-6)	200 m/s ² (5 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	500 m/s ² (11 ms)
Operating temperature	-40 °C ... +100 °C ATEX: -40 °C ... +80 °C
Material shaft	Stainless Steel
Material housing	Hard anodized Aluminum, Nickel
Weight	approx. 430 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
Current w/o load typ.	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

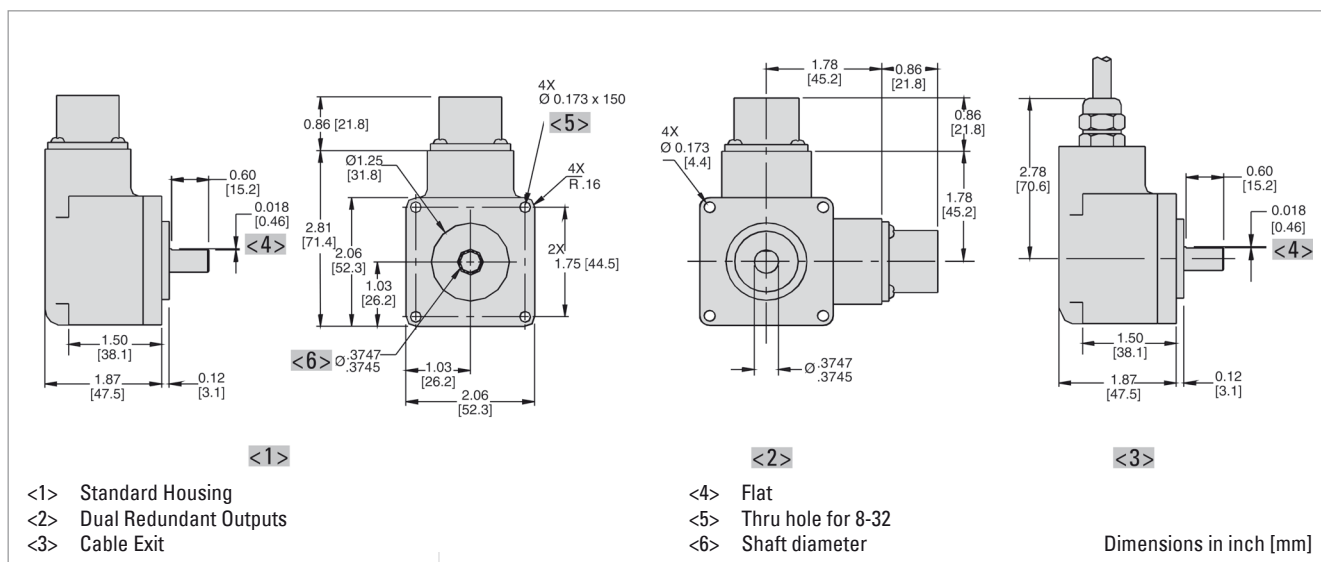
6, 7 & 10 Pin MS connector /
Cable

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 Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	brown	A	brown	A	brown	A	brown	green
Sig. B	D	orange	B	orange	B	orange	B	orange	blue
Sig. Z	C	yellow	C	yellow	--	--	C	yellow	orange
Power +V	B	red	D	red	D	red	D	red	red
Com	A	black	F	black	F	black	F	black	black
Case	--	--	G	green	G	green	G	green	white
N/C	F	--	E	--	--	--	E	--	--
Sig. $\bar{A}$	--	--	--	--	C	brown/white	H	brown/white	violet
Sig. $\bar{B}$	--	--	--	--	E	orange/white	I	orange/white	brown
Sig. $\bar{Z}$	--	--	--	--	--	--	J	yellow/white	yellow

Heavy Duty Incremental

HD 20

DIMENSIONED DRAWINGS



Heavy Duty Incremental

HD 20

ORDERING INFORMATION

Type	Format	Number of pulses	Shaft Ø	Output ⁶	Connection ¹	Housing, Tether, Options ^{2,3,4,5}
☐	☐	☐	☐	☐	☐	☐
HD20	3 Bidirectional with Index	1 ... 3600	0 9.52 mm (3/8") Solid shaft, with flat 4 10 mm Solid shaft, no flat	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)	3 7 pin connector 5 10 pin connector D Sealed cable, 0.45 m E Sealed cable, 0.9 m F Sealed cable, 1.8 m G Sealed cable, 3.0 m H Sealed cable, 4.5 m	0 No Options 1 Nickel Finish Housing 2 Stainless Steel Housing 3 Redundant Outputs (Dual Connector Housing) 4 Nickel Finish Housing with Redundant Outputs 5 Stainless Steel Housing with Redundant Outputs A Same as "0" with ATEX Typ 1 B Same as "1" with ATEX Typ 1 C Same as "2" with ATEX Typ 1 D Same as "3" with ATEX Typ 1 E Same as "4" with ATEX Typ 1 F Same as "5" with ATEX Typ 1 G Same as "0" with ATEX Typ 2 H Same as "1" with ATEX Typ 2 I Same as "2" with ATEX Typ 2 J Same as "3" with ATEX Typ 2 K Same as "4" with ATEX Typ 2 L Same as "5" with ATEX Typ 2 M Same as "0" with ATEX Typ 3 N Same as "1" with ATEX Typ 3 O Same as "2" with ATEX Typ 3 P Same as "3" with ATEX Typ 3 Q Same as "4" with ATEX Typ 3 R Same as "5" with ATEX Typ 3

¹ Connection Code "3" only available with Output Code "2"

² Available ATEX certified options:

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

Note: When selecting ATEX models, ATEX voltages replace those shown in Output Code.

³ Housing/Tether/Options Code "G" to "L" only available with Output Code "2" and "3"

⁴ Housing/Tether/Options Code "M" to "R" only available with Output Code "4"

⁵ Note for Housing with redundant outputs: Simultaneous use of redundant outputs may void ATEX certification. Consult us for details.

⁶ Open Collector Output on request

Incremental



- Single or Dual output
- Optional high current line driver
- ATEX Certification available for Intrinsically Safe application
- High Resolution Unbreakable Disk
- Industrial Duty Connector
- NEMA 4X / IP67 Rated
- Nickel or Stainless Steel Housing available

HEAVY DUTY **NorthStar™** **CE**

NUMBER OF PULSES

0001 / 0025 / 0035 / 0040 / 0050 / 0060 / 0100 / 0120 / 0192 / 0200 / 0240 / 0250 / 0256 / 0300 / 0360 / 0500 / 0512 / 0600 / 0625 / 0720 / 0900 / 1000 / 1024 / 1200 / 1250 / 1440 / 1524 / 1600 / 1800 / 2000 / 2048 / 2500 / 2540 / 3000 / 3048 / 3600 / 4096 / 5000

GENERAL INFORMATION

HARSH-DUTY OPTICAL ENCODER

The HD25 Harsh-Duty Optical Encoder is a compact heavy-duty encoder designed to exceed IP66/IP67 and NEMA 6 enclosure requirements. It is also available in stainless steel that exceeds NEMA 4X and NEMA 6P requirements and is ideal for stringent wash down environments, including those where high pressure steam or caustic chemicals are needed to meet regulatory requirements.

The HD25 features max. 440N Axial and Radial Bearings, -40° to +100°C temperature range and unique labyrinth double-sealed housing, and optional dual "redundant" outputs and is covered by a two-year warranty (one year for bearings). NorthStar's traditional quality, reliability and value are built-in to every HD25 encoder.

Also available in this series, is an Intrinsically Safe version certified to ATEX EEx ia IIB T4 when used with the appropriate IS Barrier. Accessory barriers can be supplied with the encoder.

APPLICATIONS

The HD25 Harsh-Duty Optical Encoder is ideal for machine applications with corrosive environments that demand heavy washdown protection. This compact, special-duty encoder is designed to exceed IP66/IP67 and NEMA 6 enclosure requirements with a PPR range through 5000. ATEX certification is also available for intrinsically safe applications.

- Converting Machinery
- Material Handling
- Packaging Equipment
- Pickling 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.

TECHNICAL DATA
mechanical

Housing diameter	67.3 mm
Shaft diameter	$\frac{3}{8}$ " / 10 mm (Solid shaft)
Flange (Mounting of housing)	Square flange
Protection class shaft input (EN 60529)	NEMA 4X or IP67

Incremental

TECHNICAL DATA

mechanical (continued)

Protection class housing (EN 60529)	NEMA 4X or IP67
Shaft load axial / radial	max.: 440 N / 440 N
Max. speed	max. 6000 rpm
Bearing life	max. 5 x 10 ¹¹ revs.
Starting torque typ.	< 1.76 Ncm
Vibration resistance (DIN EN 60068-2-6)	200 m/s ² (5 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	500 m/s ² (11 msec)
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. 430 g
Connection	MS, radial M12 connector, radial

TECHNICAL DATA

electrical

Supply voltage	DC 5 - 26 V ATEX: DC 5 V ATEX: DC 7 - 26 V
Current w/o load typ.	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 Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	brown	A	brown	A	brown	A	brown	green
Sig. B	D	orange	B	orange	B	orange	B	orange	blue
Sig. Z	C	yellow	C	yellow	--	--	C	yellow	orange
Power +V	B	red	D	red	D	red	D	red	red
Com	A	black	F	black	F	black	F	black	black
Case	--	--	G	green	G	green	G	green	white
N/C	F	--	E	--	--	--	E	--	--
Sig. $\bar{A}$	--	--	--	--	C	brown/white	H	brown/white	violet
Sig. $\bar{B}$	--	--	--	--	E	orange/white	I	orange/white	brown
Sig. $\bar{Z}$	--	--	--	--	--	--	J	yellow/white	yellow

Technical drawings of the 10-32 UNF 2B x 0.38 inch deep cable gland showing four views: front, top, side, and rear. The drawings include dimensions in inches and millimeters. Callouts <1> through <6> identify specific features: <1> Standard Housing, <2> Dual Redundant Outputs, <3> Cable Exit, <4> Flat, <5> Shaft diameter, and <6> 10-32 UNF 2B x 0.38 inch deep on 1.875 inch bolt circle.

Dimensions (inches [mm]):

- Front View: 0.54 [13.7], 0.30 [7.6], 0.86 [21.8], 1.95 [49.5], 1.54 [39.1], 1.91 [48.5], 0.91 max. [23], 0.70 x 0.018 [17.8 x 0.46], 0.37 [9.5], 0.25 [31.8], 2.064 [52.4] 2X, 4x R0.21 [5.3], 4x Ø0.22 [5.6].
- Top View: 2.65 [67.3] 2X, 1.95 [49.5], 1.95 [49.5], Ø0.37 [9.5], 4x R0.21 [5.3], 4x Ø0.22 [5.6].
- Side View: 2.95 [74.9], 0.70 [17.8], 1.54 [39.1], 1.91 [48.5], 0.30 [7.6], 0.18 [4.6].
- Rear View: 0.54 [13.7], 0.30 [7.6], 0.86 [21.8], 1.95 [49.5], 1.54 [39.1], 1.91 [48.5], 0.91 max. [23], 0.70 x 0.018 [17.8 x 0.46], 0.37 [9.5], 0.25 [31.8], 2.064 [52.4] 2X, 4x R0.21 [5.3], 4x Ø0.22 [5.6].

Callouts:

- <1> Standard Housing
- <2> Dual Redundant Outputs
- <3> Cable Exit
- <4> Flat
- <5> Shaft diameter
- <6> 10-32 UNF 2B x 0.38" deep on 1.875" bolt circle

Dimensions in inch [mm]

Heavy Duty

Incremental

HD 25

ORDERING INFORMATION

Type	Format	Number of pulses	Shaft Ø ⁷	Output ⁶	Connection ¹	Housing, Tether, Options ^{2,3,4,5}
☐	☐	☐	☐	☐	☐	☐
HD25	3 Bidirectional with Index	1 ... 5000	0 9.52 mm (3/8") 4 10 mm 6 12 mm	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) 6 5-15V in, 5-15V Differential Line Driver out (4469)	3 7 pin connector 5 10 pin connector D Sealed cable, 0.45 m E Sealed cable, 0.9 m F Sealed cable, 1.8 m G Sealed cable, 3.0 m H Sealed cable, 4.5 m P Sealed cable, 5.0 m	0 No Options 1 Nickel Finish Housing 2 Stainless Steel Housing 3 Redundant Outputs (Dual Connector Housing) 4 Nickel Finish Housing with Redundant Outputs 5 Stainless Steel Housing with Redundant Outputs A Same as "0" with ATEX Typ 1 B Same as "1" with ATEX Typ 1 C Same as "2" with ATEX Typ 1 D Same as "3" with ATEX Typ 1 E Same as "4" with ATEX Typ 1 F Same as "5" with ATEX Typ 1 G Same as "0" with ATEX Typ 2 H Same as "1" with ATEX Typ 2 I Same as "2" with ATEX Typ 2 J Same as "3" with ATEX Typ 2 K Same as "4" with ATEX Typ 2 L Same as "5" with ATEX Typ 2 M Same as "0" with ATEX Typ 3 N Same as "1" with ATEX Typ 3 O Same as "2" with ATEX Typ 3 P Same as "3" with ATEX Typ 3 Q Same as "4" with ATEX Typ 3 R Same as "5" with ATEX Typ 3

¹ Output Code "3" only available with Format Code "2"

² Available ATEX certified options:

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

Note: When selecting ATEX models, ATEX voltages replace those shown in Output Code.

³ Housing/Tether/Options Code "G" to "L" only available with Output Code "2" and "3"

⁴ Housing/Tether/Options Code "M" to "R" only available with Output Code "4"

⁵ Note for Housing with redundant outputs: Simultaneous use of redundant outputs may void ATEX certification. Consult us for details.

⁶ Open Collector Output on request

⁷ Shaft options 9.52 mm and 10 mm with flat



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