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### Important Note

The information shown in these documents is for guidance only. No liability is accepted for any errors or omissions. The designer or user is solely responsible for the safe and proper application of the parts, assemblies or equipment described.

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## Incremental



- Single or Dual output - NAMUR available
- Well suited for DrawWorks/ oil field application
- ATEX Certification available for Intrinsically Safe application
- High Resolution Unbreakable Disk
- Industrial Duty Connector
- NEMA 4X / IP67 Rated
- Nickel or Stainless Steel Housing available
- Option: removable shaft with thread
- Option: redundant output

**HEAVY DUTY**

**NorthStar** CE

### NUMBER OF PULSES

0015 / 0032 / 0100 / 0200 / 0240 / 0250 / 0500 / 0512 / 0600 / 1000 / 1024 / 1200 / 2000 / 2048 / 4000 / 5000

### GENERAL INFORMATION

#### HARSH- DUTY OPTICAL ENCODER - DRAWWORKS

The DWD38 Harsh-Duty Optical Encoder is an Industrial Hollow Shaft design that operates reliably from -40 to +100°C. Its Hard Anodized finish exceeds IP66/IP67 and NEMA 6 enclosure requirements.

The DWD38 is a preferred choice as a DrawWorks encoder by the Oil Field industry and is also commonly used in high shock and vibration environments such as Food Processing, Material Handling and Packaging Equipment applications.

Extremely robust, the DWD38 encoder is also available in Stainless Steel to meet NEMA 4x and 6P requirements. A unique labyrinth double-sealed housing allows operation when regulatory washdown and high pressure steam or caustic chemicals are required.

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 DWD38 Harsh-Duty Optical Encoder is ideal for DrawWorks application and 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.

- DrawWorks and other Oilfield
- 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 very harsh environments.

### TECHNICAL DATA mechanical

Housing diameter	3.75"
Flange (Mounting of housing)	Synchro flange

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### TECHNICAL DATA mechanical (continued)

Protection class shaft input (EN 60529)	IP67 or NEMA 6
Protection class housing (EN 60529)	IP67 or NEMA 6
Shaft load axial / radial	Max.: 100 N / 100 N
Bearing life	max. 5 x 10 <sup>11</sup> revs.
Vibration resistance (DIN EN 60068-2-6)	200 m/s <sup>2</sup> (5 to 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	500 m/s <sup>2</sup> (11 msec)
Operating temperature	-40 °C ... +100 °C ATEX: -40 °C ... +80 °C
Storage temperature	-40 °C ... +100 °C
Material shaft	Stainless Steel
Material housing	Hard anodized Aluminum, Stainless Steel
Connection	MS, radial Cable, radial

### TECHNICAL DATA electrical

Supply voltage	DC 5 - 26 V ATEX: DC 5 V ATEX: DC 5 - 26 V
Max. current w/o load	50 mA
Code	Incremental, optical
Max. pulse frequency	125 kHz
Standard output versions	RS422: A, B, N, $\bar{A}$ , $\bar{B}$ , $\bar{N}$ NPN-O.C.: A, B, N Push-pull: A, B, N

### 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

## Incremental

### DIMENSIONED DRAWINGS

<1>                      <2>                      <3>

<1> With Convertable Shaft  
 <2> With Non-Convertible Shaft  
 <3> Redundant Version  
 <4> 10-32 UNF x .38 deep on Ø 3.000 bolt circle  
 <5> 5/8-18 UNF male thread

<6> 1"-14 UNS female internal thread O-ring sealed  
 <7> 1"-14 UNS male thread  
 <8> Removable hollow shaft extension included with encoder

Dimensions in inch [mm]

## Incremental

### ORDERING INFORMATION

Type	Format	Number of pulses	Shaft Ø	Output <sup>1,2</sup>	Connection	Housing, Tether, Options <sup>3,4,5,6</sup>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DWD38</b>	<b>1</b> Uni-directional <b>2</b> Bi-directional <b>3</b> Bi-directional with Index	<b>15 ... 5000</b>	<b>0</b> 1"-14 UNS x 5/8" - 18 UNF Threaded Shaft <b>1</b> 1"-14 UNS Threaded Shaft	<b>0</b> 5-26V in, 5-26V Open Collector out (7273) <b>2</b> 5-26V in, 5-26V Push-Pull out <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>F</b> 5-26V in, 5-26V Open Collector out (2222) <b>G</b> 5-26V in, 5-26V Open Collector out with 2.2 kΩ Pullups (2222) <b>N</b> NAMUR 15 mA Maximum	<b>1</b> 6 pin connector <b>3</b> 7 pin connector <b>5</b> 10 pin connector <b>D</b> Sealed cable, 0.45 m <b>F</b> Sealed cable, 0.15 m <b>G</b> Sealed cable, 0.25 m <b>H</b> Sealed cable, 0.38 m	<b>0</b> No Options <b>1</b> Nickel Finish Housing <b>2</b> Stainless Steel Housing <b>3</b> Redundant Outputs (Dual Connector Housing) <b>4</b> Nickel Finish Housing with Redundant Outputs <b>5</b> Stainless Steel Housing with Redundant Outputs <b>A</b> Same as "0" with ATEX Typ 1 <b>B</b> Same as "1" with ATEX Typ 1 <b>C</b> Same as "2" with ATEX Typ 1 <b>D</b> Same as "3" with ATEX Typ 1 <b>E</b> Same as "4" with ATEX Typ 1 <b>F</b> Same as "5" with ATEX Typ 1 <b>G</b> Same as "0" with ATEX Typ 2 <b>H</b> Same as "1" with ATEX Typ 2 <b>I</b> Same as "2" with ATEX Typ 2 <b>J</b> Same as "3" with ATEX Typ 2 <b>K</b> Same as "4" with ATEX Typ 2 <b>L</b> Same as "5" with ATEX Typ 2 <b>M</b> Same as "0" with ATEX Typ 3 <b>N</b> Same as "1" with ATEX Typ 3 <b>O</b> Same as "2" with ATEX Typ 3 <b>P</b> Same as "3" with ATEX Typ 3 <b>Q</b> Same as "4" with ATEX Typ 3 <b>R</b> Same as "5" with ATEX Typ 3

<sup>1</sup> Output Code "3", "4" only available with Format Code "1", "2" and Connection Code "3" to "H" or with Format Code "3" and Connection Code "5" to "H"

<sup>2</sup> Output Code "N" only available with "Number of pulses" Code "0015"

<sup>3</sup> 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.

<sup>4</sup> Housing/Tether/Options Code "G" to "L" only available with Output Code "0" to "3", "F" or "G"

<sup>5</sup> Housing/Tether/Options Code "M" to "R" only available with Output Code "4"

<sup>6</sup> Note for Housing with redundant outputs: Simultaneous use of redundant outputs may void ATEX certification. Consult us for details.