INCREMENTAL ENCODERS

SERIES HDP18

NorthStar™ brand

Shaft-Less Encoder

HD Heavy Duty

Key Features

- **No Shaft, Bearings, or Seals to Wear Out**
- **Eliminates Shaft Coupling Issues**
- Completely Sealed & Encapsulated Electronics
- **Wide Sensing Envelope is Tolerant to** Misalignment
- **Incremental or Absolute Output**
- **Incredibly Small Package**
- **LED Indicators Make Installation and** Troubleshooting a Breeze

SPECIFICATIONS

MECHANICAL

Enclosure Diameter: 18mm

Enclosure Height: 47mm

Mounting: 18mm thread (standard prox thread)

Weight: 3.0 oz with mounting nuts and 6" flying lead cable

Speed: 3000 RPM max

ELECTRICAL

Input Power: 6vdc min to 30vdc max at 60mA max, not including output loads

Outputs: 7272 Push-Pull : 40mA sink or source

Electrical Protection: Overvoltage, Reverse Voltage, Output short Circuit protected

PWM Output: 10 bit Pulse Width Modulation output signal proportional to absolute position. 0 degrees =1 usec of 1025 usec period, 359.65 degrees = 1024 usec of 1025 usec period.

LED Indicators: Power, A, B, Z

ENVIRONMENTAL

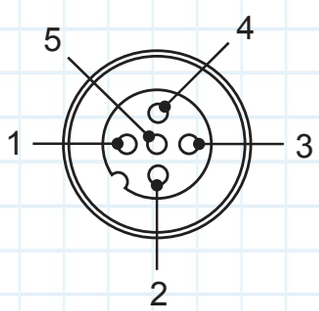
Operating Temperature: -25 to +80 degrees C (-13 to 176 degrees F)

Storage Temperature: -40 to +90 degrees C

Enclosure Rating: Connector dependent
– M12 on pigtail – IP68
– Cable with flying leads – IP68

CONNECTIONS

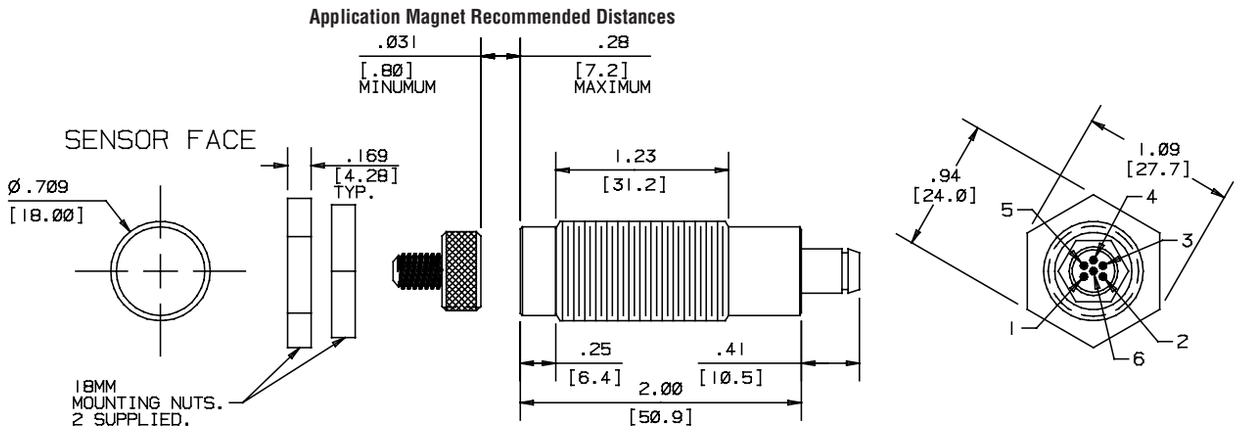
Function	5 Pin M12 On Cable	5 Conductor Cable	5 Conductor Cable
	Pin	Wire Color	Wire Color
+Vdc	1	BRN	BRN
Common	3	BLU	BLU
Data A	4	BLK	BLK
Data B	2	WHT	WHT
Data Z	5	GRY	GRY
PWM Absolute Posirion			PNK

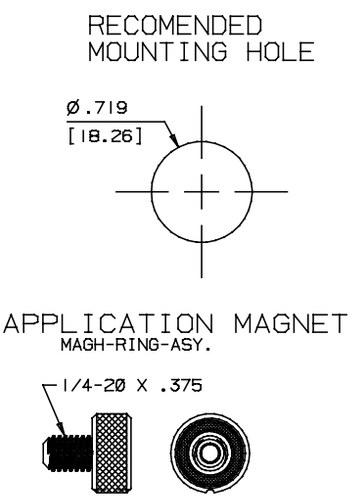


Male 5-pin M12

SERIES HDP18

DIMENSIONS inch [mm]





HDP18 TARGET MAGNETS

- Neodymium
- Distance from user magnet to face of encoder: 0.01 to 0.5 inches
- Center alignment: 0 to 0.10 inches
- Planar tilt: 30 degrees

Dual magnet, Nylon collar

1/4 Bolt Magnet with Knurl

INCREMENTAL ENCODERS

NorthStar™ brand SERIES HDP18

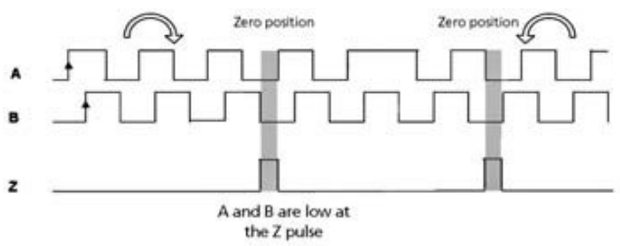
Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Resolution	Code 3: Output	Code 4: Connections	Code 5: Target Magnet
HDP18T	□□□□	□	□	□
Ordering Information				
HDP18T	**0256**	**0** Single Ended A,B,Z Push-pull (7272) Code 4 must = 7 **P** PWM 10-bit absolute output w/ Single ended A,B,Z Push-pull (7272)	**1** 5 pin M12 on pigtail **2** 5 conductor cable **7** 6 conductor cable	**0** No magnet, customer supplied **3** Dual magnet nylon collar, 1/2" bore **4** Dual magnet nylon collar, 3/4" bore **5** Dual magnet nylon collar, 1" bore **6** Dual magnet nylon collar, 1-1/2" bore **8** Dual magnet nylon collar, 5/8" bore **R** Ring magnet w/knurled alumnum bolt, 1/4-20

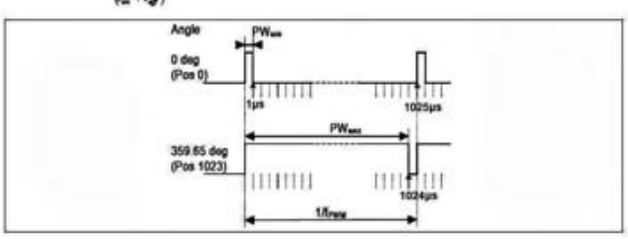
HDP18 OUTPUT FORMAT

18MM: QUADRATURE INCREMENTAL OUTPUT



PULSE WIDTH MODULATION (PWM) OUTPUT

$$Position = \frac{t_{on} \cdot 1025}{(t_{on} + t_{off})} - 1$$



INCREMENTAL ENCODERS

SERIES HDP30

NorthStar™ brand

Shaft-Less Encoder

HD Heavy Duty

Key Features

- **No Shaft, Bearings, or Seals to Wear Out**
- **Eliminates Shaft Coupling Issues**
- Completely Sealed & Encapsulated Electronics
- **Wide Sensing Envelope is Tolerant to Misalignment**
- **Incredibly Small Package**
- **Standard Proximity Sensor Form Factor**
- **LED Indicators make Installation and Troubleshooting a Breeze**
- **CAN SAE J1939 Communication Protocol**

CE RoHS

SPECIFICATIONS

MECHANICAL

Enclosure Diameter: 30mm

Enclosure Height: 31mm, 50mm with M12 connector

Mounting: 30mm thread (standard prox thread)

Weight: 1.0 oz without mounting nuts, 2.2 oz with typical mounting nuts

Speed: 3000 RPM max

ELECTRICAL

Input Power: 6vdc min to 30vdc max at 60mA max, not including output loads

Outputs: 7272 Push-Pull : 40mA sink or source

Electrical Protection: Overvoltage, Reverse Voltage, Output short Circuit protected

LED Indicators: Power, A, B, Z

ENVIRONMENTAL

Operating Temperature: -25 to +80 degrees C (-13 to 176 degrees F)

Storage Temperature: -40 to +90 degrees C

Enclosure Rating: Connector dependent
– M12 on pigtail – IP68
– Cable with flying leads – IP68

CONNECTIONS, Quadrature Output

Pin Designation	5-Pin M12	5 Conductor Cable	8-Pin M12	8 Conductor Cable
	Pin	Wire Color	Pin	Wire Color
+Vdc	1	BRN	2	BRN
Common	3	BLU	7	BLU
Data A	4	BLK	1	WHT
Data B	2	WHT	4	GRN
Data Z	5	GRY	6	GRY
Data A'			3	YLW
Data B'			5	RED
Data Z'			8	PNK

Proportional Analog Output

Pin Designation	Pin	Wire Color
+Vdc (VIN)	1	BRN
Dig. Limit Out *	2	WHT
Common/ Ground	3	BLU
Prop. VDC Output	4	BLK
Not Used	5	GRY

*Option, Consult Factory

J1939 Encoder

Pin Designation	Pin	Wire Color
+Vdc (VIN)	1	BRN
CAN High	2	WHT
Common/Ground	3	BLU
CAN Low	4	BLK
Optional Address Program Resistor	5	GRY

INCREMENTAL ENCODERS

SERIES HDP30

Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Resolution	Code 3: Output	Code 4: Connections	Code 5: Target Magnet
HDP30T	□□□□	□	□	□

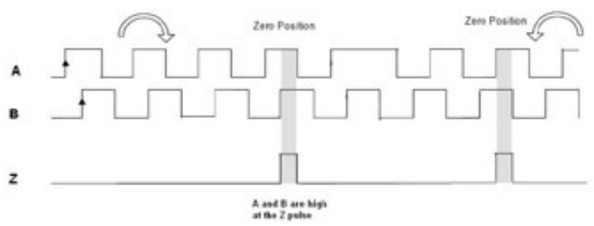
Ordering Information

HDP30T	**0008 0050 0250** **0010 0064 0256** **0016 0080 0400** **0020 0100 0500** **0025 0125 0512** **0032 0128** **0040 0200** Code 3 Must be J or P **ABSO** Other resolutions available. Contact factory for details.	**0** Single Ended A,B,Z Push-pull (7272) (Code 4 must = 0,1, or 2) **1** Differential line Driver A,B,Z (7272) (Code 4 must = 4, 5, or 6) Code 2 Must be ABSO and Code 4 must be 0 to 2 **J** CAN SAE J1939 **P** PWM 10-bit absolute output w/Single Ended A,B,Z Push-Pull (7272)	**0** 5 pin M12 **1** 5 pin M12 on pigtail **2** 5 conductor cable **4** 8 pin M12 **5** 8 pin M12 on pigtail **6** 8 conductor cable	**0** No magnet, customer supplied **3** Dual magnet nylon collar, 1/2" bore **4** Dual magnet nylon collar, 3/4" bore **5** Dual magnet nylon collar, 1" bore **6** Dual magnet nylon collar, 1-1/2" bore **8** Dual magnet nylon collar, 5/8" bore **R** Ring magnet w/knurled alumnum bolt, 1/4-20

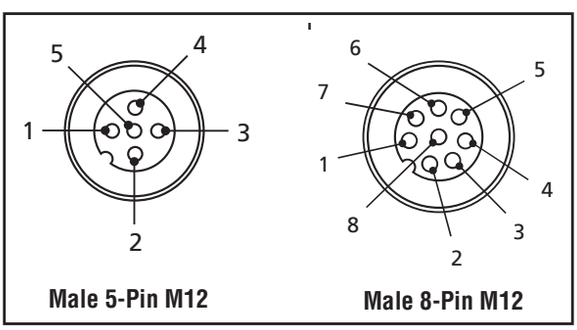
HDP30 OUTPUT FORMAT

30MM: QUADRATURE INCREMENTAL OUTPUT

30MM: QUADRATURE INCREMENTAL OUTPUT



CONNECTOR DETAIL



HDP30 TARGET MAGNETS

- Neodymium
- Distance from user magnet to face of encoder: 0.01 to 0.5 inches
- Center alignment: 0 to 0.10 inches
- Planar tilt: 30 degrees

Dual magnet, Nylon collar

1/4 Bolt Magnet with Knurl

INCREMENTAL ENCODERS

SERIES HDN58

NorthStar™ brand

Shaft-Less Encoder

HD Heavy Duty

Key Features

- **No Shaft, Bearings, or Seals to Wear Out**
- **Eliminates Shaft Coupling Issues**
- Completely Sealed & Encapsulated Electronics
- **Wide Sensing Envelope is Tolerant to Misalignment**
- **Incremental or Absolute Output**

SPECIFICATIONS

MECHANICAL
Enclosure Diameter: 58mm
Max. Speed: 3000 RPM

ELECTRICAL
Input Power: 6vdc min to 30vdc max at 60mA max, not including output loads
Outputs: 7272 Push-Pull : 40mA sink or source
Output Resolution: 8 to 2048 quadrature pulses per revolution (13 bit)
Electrical Protection: Reverse polarity, Spike, Noise, Open circuit, Short circuit
Electrical Connections: 5-pin terminal strip, 5-pin M12, 8-pin M12, cable (see Connections)
LED Indicators: Power, Channel and Index

ENVIRONMENTAL
Operating Temperature: -25 to +70 degrees C (-13 to 158 degrees F)
Humidity: 100% relative humidity
Potting Compound: Non-porous, water and chemical resistant, RoHS compliant
Shock & Vibration: Meets MIL-STD-202
Shock— half sine, 50g, 11ms Thermal Shock— -40 to +125 degrees, one hour dwell
Vibration— 10 to 500hz at 10g
Enclosure Rating: Connector dependent IP65, IP67 or IP68

CONNECTIONS

Function	5 Pin Terminal Strip	5 Pin M12	5 Conductor Cable	8 Pin M12	8 Conductor Cable
	Pin	Pin	Wire Color	Pin	Wire Color
+Vdc	1	1	BRN	2	BRN
Common	2	3	BLU	7	BLU
Data A	3	4	BLK	1	WHT
Data B	4	2	WHT	4	GRN
Data Z	5	5	GRY	6	GRY
Data $\bar{A}$				3	YLW
Data $\bar{B}$				5	RED
Data $\bar{Z}$				8	PNK

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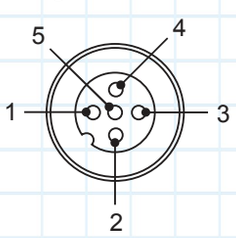
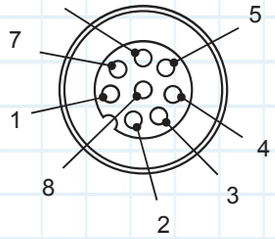


Male 5-Pin M12



Male 8-Pin M12

INCREMENTAL ENCODERS

SERIES HDN58

Ordering Information

To order, complete the model number with code numbers from the table below:

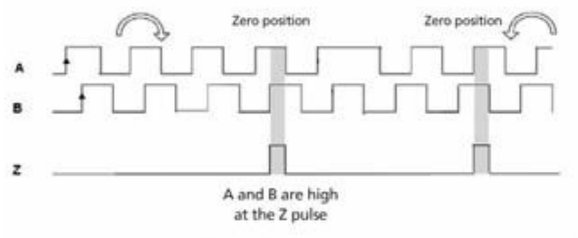
Code 1: Model	Code 2: Resolution	Code 3: Output	Code 4: Connections	Code 5: Target Magnet
HDN58	□□□□	□	□	□

Ordering Information

HDN58				
	0008 **0010** **0016** **0020** **0025** **0032** **0040** **0050** **0064** **0080** **0100** **0125** **0128** **0200** **0250** **0256** **0400** **0500** **0512**	**0** Single Ended A,B,Z Push-pull (7272) (Code 4 must = 0,1, or 2) **1** Differential line Driver A,B,Z (7272) (Code 4 must = 4, 5, or 6)	**0** 5 pin M12 **1** 5 pin M12 on pigtail **2** 5 conductor cable **4** 8 pin M12 **5** 8 pin M12 on pigtail **6** 8 conductor cable	**0** No magnet, customer supplied **3** Dual magnet nylon collar, 1/2" bore **4** Dual magnet nylon collar, 3/4" bore **5** Dual magnet nylon collar, 1" bore **6** Dual magnet nylon collar, 1-1/2" bore **8** Dual magnet nylon collar, 5/8" bore **R** Ring magnet w/knurled alumnum bolt, 1/4-20
	Code 3 Must be J **ABSO**	Code 2 must =ABSO and code 4 must =3 **2** 13 bit-Absolute 0-5VDC		
	Other resolutions available. Contact factory for details.	Code 4 must = 0 and Code 2 must = ABSO **J** CANbus J1939 Protocol		

HDN58 OUTPUT FORMAT

18MM: QUADRATURE INCREMENTAL OUTPUT



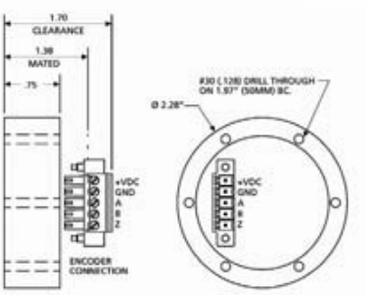
HDN58 TARGET MAGNETS

- Neodymium
- Distance from user magnet to face of encoder: 0.01 to 0.5 inches
- Center alignment: 0 to 0.10 inches
- Planar tilt: 30 degrees

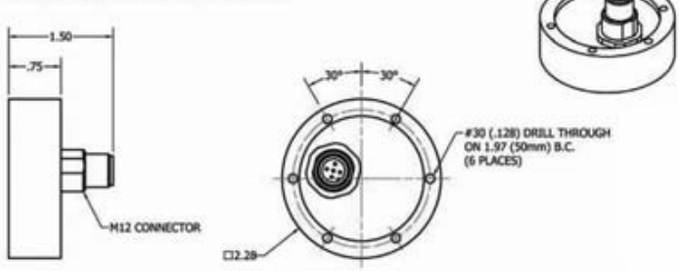
Dual magnet, Nylon collar

1/4 Bolt Magnet with Knurl

HDN58 DIMENSIONS



M12 CONNECTIONS



Notes