

NEW



Extreme Duty Hollowshaft Encoder

DESCRIPTION

Even electric motors in the harshest environments require feedback to ensure smooth speed control. In the past, engineers have applied encoders and sensors designed for standard industrial environments into these extremely harsh environments, impacting system reliability and increasing life-cycle costs. NorthStar, the first name in heavy-duty encoders, has the solution.

The heavy rail proven NorthStar HSD44 series optical encoder was designed to be a survivor. This anodized aluminum encoder can survive high levels of shock and vibration, wide temperature extremes, and operating environment contaminants. The HSD44 can withstand the harshest outdoor environments and the toughest industrial applications.

The 1024 pulses-per-revolution (PPR) are provided by a rugged, stainless steel disk, which is read from a specially designed optical sensor. An enormous 0.025" sensor gap reduces sensitivity to shock, vibration, and motor bearing wear. The counter-spiral shaft-coupler provides a flexible mount that eliminates resonance throughout the operating range and will not fatigue under vibration. Electronics are condensed down to a single ASIC, reducing the likelihood of electronic component failure.

The NorthStar HSD44 is designed for end-of-motor application. Adapter plates are available for common motor styles, and custom adapter plates can be created to fit any application.

Series HSD44

- Sealed against dust, oil, grease, liquids, vapor, and mud
- Designed for high shock and vibration applications
- Electrically isolated from motor shaft
- Rugged cast-aluminum housing
- Advanced ASIC technology and optics
- Easy, hex wrench installation
- -40° C to +100° C operation
- 2 Year Warranty

APPLICATIONS:

The HSD44 is the ideal source of control feedback for motors that drive heavy electric, and hybrid-electric vehicles. It is field proven for reliable operation in severe transportation and industrial environments.

Designed for:

- Heavy Rail
- Commercial Hybrid Electric and Electric Vehicles
- Heavy-Duty Cranes
- Mining Transport
- Conveyors

INDUSTRIES

Transportation, paper, steel, mining, material handling and other industries with harsh environments where precise and reliable encoder feedback is needed.

FEATURES/BENEFITS

Mechanical and Environmental

- Highly resistant to shock and vibration
- Flexible shaft coupling
- Tough, stainless steel optical code disk
- Wide, 25 mil sensor gap
- Double shaft seal protects encoder internals from the environment

Electrical

- Electrically isolated coupling eliminates damage from induced motor shaft current
- Hi-Reliability - Single ASIC design for sensors, amplifier, and comparators reduces design complexity

Extreme Duty Hollowshaft Encoder

Series HSD44

Extreme Heavy Duty... Designed for Heavy Rail Vehicle Applications

SPECIFICATIONS*

STANDARD OPERATING CHARACTERISTICS

Code: Incremental
Resolution: 1024 PPR (pulses/revolution), Others at special order
Format: Two channel quadrature (AB) with Index (Z), and complementary outputs
Phase Sense: A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder
Quadrature Phasing: 90° ± 15° electrical
Symmetry: 180° ± 18° electrical
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pF
Electrical Immunity: 50 Meg ohm minimum encoder shaft/frame to all connector pins

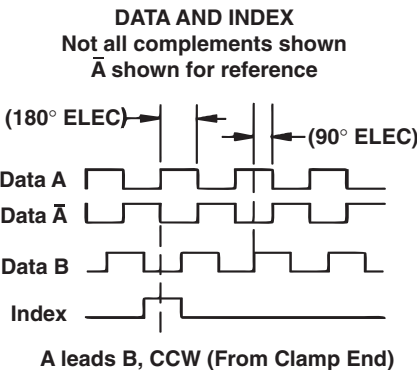
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NorthStar Brand HSD44 Data Sheet (12/07)

ELECTRICAL

Input Power: 5-30VDC, 50 mA max., not including output loads.
Outputs: 5 -30 Volts DC, TTL
Frequency Response: 125 kHz (data & index)
Termination: 18" pigtail or 18" pigtail with MS Connector. See Ordering Information
Mating Connector: 10 pin MS, style MS3106A-18-1S (MCN-N6)



MECHANICAL

Mechanical Interface: Stainless steel shaft clamp
Mating Shaft Length: 0.47" to 0.625" (11.9mm to 15.9mm)
Coupling: 16mm, flexible
Shaft Speed: 6000 RPM, max.
Bearings: 6107
Bearing life: 5 x 10⁸ revs at rated shaft Loading, 5 x 10¹¹ revs at 10% of rated shaft loading. (manufacturers' specs)
Housing Material: Aluminum Alloy, Black Anodized
Disc material: Stainless steel
Weight: 4 lbs.

ENVIRONMENTAL

Operating Temperature: -40 to 100°C
Storage temperature: -40 to 100°C
Shock & Vibration: Axial: 12G peak @ 12,000 Hz
 Vertical: 30G peak @ 12,000 Hz
 Horizontal perpendicular to axis: 10G peak @ 12,000 Hz
Humidity: 98%, non-condensing
Enclosure Rating: NEMA 66

ELECTRICAL CONNECTIONS

18" Pigtail with or without MS Connector

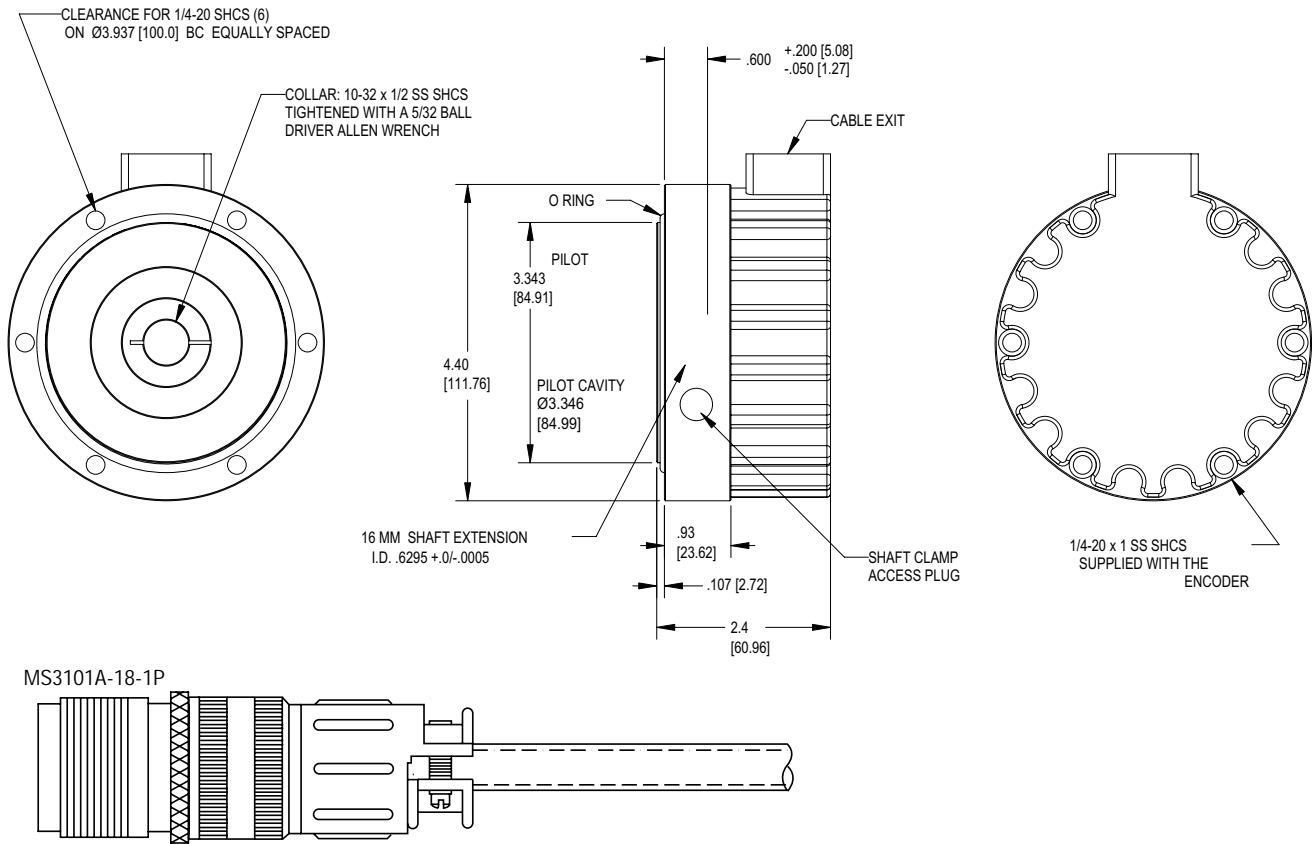
| Function | Pin | Wire Color |
|----------------|-----|------------|
| Sig. A | A | BRN |
| Sig. B | B | ORG |
| Sig. Z | C | YEL |
| Power +V | D | RED |
| Com. | F | BLK |
| Case | G | GRN |
| N/C | E | — |
| Sig. \bar{A} | H | BRN/WHT |
| Sig. \bar{B} | I | ORG/WHT |
| Sig. \bar{Z} | J | YEL/WHT |

Extreme Duty Hollowshaft Encoder

Series HSD44

Extreme Heavy Duty... Designed for Heavy Rail Vehicle Applications

DIMENSIONS (in. [mm])



Pigtail with MS Connector (K Option)

ORDERING INFORMATION

| Part Number | Description |
|---------------|--|
| HSD44T1024A3A | Extreme Heavy Duty Encoder with 18 inch pigtail wire connections |
| HSD44T1024A3K | Extreme Heavy Duty Encoder with 18 inch pigtail with 10 pin MS connector |

Accessories

| Part Number | Description |
|----------------|---------------------------------|
| HSD44ADAPTER45 | 4-1/2" NEMA Motor Adapter Plate |
| HSD44ADAPTER85 | 8-1/2" NEMA Motor Adapter Plate |

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For additional information or a full-line catalog, contact Dynapar Customer Service or visit our web site.

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