

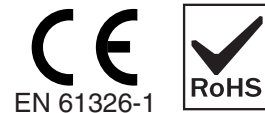
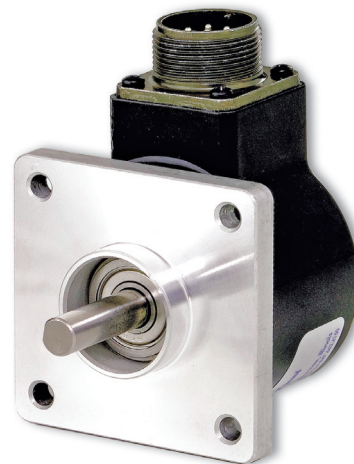
SERIES HR25

Shafted Encoder

Key Features

- Reliable Dual Row Bearing Design
- Unbreakable Code Disc
- Industry Standard Size 25 (2.5")

IND
Industrial Duty



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: 1 to 1024 PPR (pulses/revolution)
Accuracy: (Worst case any edge to any other edge) ± 7.5 arc-min.
Format: Two channel quadrature (AB) with optional Index (Z) and complementary outputs
Phase Sense: A leads B for CW or CCW shaft rotation as viewed from the shaft end of the encoder; see Ordering Information
Quadrature Phasing: $90^\circ \pm 22.5^\circ$ electrical
Symmetry: $180^\circ \pm 18^\circ$ electrical
Index: $180^\circ \pm 18^\circ$ electrical (gated with B low)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

ELECTRICAL

Input Power: 5 to 26 VDC at 80 mA max., not including output loads
Outputs:
 4469 Differential Line Driver: 100mA, sink or source
 7272 Push-Pull: 40mA, sink or source
 7272 Differential Line Driver: 40 mA, sink or source
 7273 Open Collector: 40mA, sink max
Frequency Response: 100 kHz min. (index 75 kHz min. for extended temperature range)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity and short circuit protected
Termination: MS Connector, M12 Connector, Cable Exits
Mating Connector:
 7 pin, style MS3106A-16S-1S (MCN-N5);
 10 pin, style MS3106A-18-1S (MCN-N6)
 10 pin, NEMA4 style (MCN-N6N4)
 Cable w/ 5 pin M12 Connector (112859-XXXX)
 Cable w/ 8 pin M12 Connector (112860-XXXX)

MECHANICAL

Shaft Sizes: 1/4" or 3/8"
Shaft Loading: (at 0.25" from encoder face) 80 lbs. radial, 80 lbs. axial
Shaft Speed: 10,000 RPM max.
Shaft Runout: 0.001" max. TIR
Moment of Inertia: 3.0×10^{-4} oz-in-sec²
Housing and Cover: Aluminum
Shaft Material: Stainless Steel
Disc Material: Mylar
Weight: 1.5 lbs

ENVIRONMENTAL

Operating Temperature:
Standard: 0 to +70 °C;
Extended: 0 to +85 °C (consult factory for low temperature operation to -40 °C)
Storage Temperature: -40 to +90 °C
Shock: 50 G's for 11 milliseconds duration
Vibration: 5 to 2000 Hz at 20 G's
Humidity: Up to 98% (non-condensing)
Enclosure Rating:
 HR525: NEMA12/IP54 (dirt tight, splashproof);
 HR625: NEMA4/IP66 (dust proof, washdown)

Ordering Information

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

| Code 1: Model | Code 2: PPR | Code 3: Mechanical | Code 4: Output | Code 5: Electrical | Code 6: Termination | Code 7: Options |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|
| HR <input type="checkbox"/> 25 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> |

| Ordering Information | | | | | | |
|--|---|---|---|---|---|--|
| HR525 Size 25 Enclosed, Shielded Bearings HR625 Size 25 Enclosed, with Shaft Seal | 0001 0250 0010 0300 0012 0360 0050 0400 0060 0500 0086 0600 0100 0800 0120 1000 0200 1024 0240 | 0 Flange Mount, 3/8" Shaft | 7 Pin Connector or Cable 0 Single Ended, no Index, Format A, Table 2 1 Single Ended, with Index, Format A, Table 2 4 Single Ended, with Index, Format B, Table 2 6 Differential, no Index, Format C, Table 3 A Single Ended, with Index, Format C, Table 2 C Single Ended, no Index, Format C, Table 2 G Single Ended, with Index, Format D, Table 2 | 0 5-26V in; 5-26V Open Collector with 2.2kΩ Pull-up out 1 5-26V in; 5-26V Open Collector out 2 5-26V in; 5V Totem Pole out 3 5-26V in; 5V Line Driver out (7272) 4 5-26V in; 5-26V Line Driver out (7272) 5 5-26V in, 5V Differential Line Driver out (4469) 6 5-15V in, 5-15V Differential Line Driver out (4469) A Same as "0" with extend. temp range B Same as "1" with extend. temp range C Same as "2" with extend. temp range D Same as "3" with extend. temp range E Same as "4" with extend. temp range | 0 End Mount Connector 1 Side Mount Connector Available when Code 1 is HR525: 2 18" Cable, Side 3 3' Cable, Side 4 6' Cable, Side 5 10' Cable, Side 6 15' Cable, Side J 18" Cable, End K 3' Cable, End L 6' Cable, End M 10' Cable, End N 15' Cable, End Available when Code 1 is HR625: A 18" Watertight, Side B 3' Watertight, Side C 6' Watertight, Side D 10' Watertight, Side F 15' Watertight, Side P 18" Watertight, End Q 3' Watertight, End R 6' Watertight, End S 10' Watertight, End T 15' Watertight, End | Available when Code 4 is 0 thru G, and Code 6 is 0 or 1: PS LED Output Indicator |
| | | 2 2.50" Servo Mount/ 4 Hole, 2.00" BC Face Mount, 3/8" Shaft 3 2.50" Servo Mount/ 4 Hole 2.00" BC Face Mount, 1/4" Shaft 4 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 3/8" Shaft 5 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 1/4" Shaft 6 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft 7 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft 8 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft 9 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft | 10 Pin Connector or Cable 2 Differential, no Index, Format A, Table 1 3 Differential, with Index, Format A, Table 1 5 Differential, with Index, Format B, Table 1 B Differential, with Index Format C, Table 1 D Differential, no Index, Format C, Table 1 5 Pin M12 Connector H Single ended, no index, Format A, Table 4 J Single ended, with index, Format A, Table 4 K Single ended, with index, Format B, Table 4 L Single ended, with index, Format C, Table 4 M Single ended, no index, Format C, Table 4 N Single ended, with index, Format D, Table 4 8 Pin M12 Connector P Single ended, no index, Format A, Table 5 Q Single ended, with index, Format A, Table 5 R Single ended, with index, Format B, Table 5 S Single ended, with index, Format C, Table 5 T Single ended, no index, Format C, Table 5 U Single ended, with index, Format D, Table 5 V Differential, no index, Format A, Table 6 W Differential, with index, Format A, Table 6 X Differential, with index, Format B, Table 6 Y Differential, with index, Format C, Table 6 Z Differential, no index, Format C, Table 6 See page 3 for electrical tables and page 4 for formats. | | | |

Cable Assemblies with MS Connector

- 1400431XXXX** 7 Pin MS, Cable Assy. For Use with Single Ended w/Index Outputs
- 108596-XXXX** 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
- 1400635XXXX** 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs
- 109209-XXXX** NEMA4 10 pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

Cable Assemblies with M12 Connector

- 112859-XXXX** 5 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-XXXX** 8 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-XXXX** 8 Pin M12, Cable Assy. For Use with Differential Line Driver Outputs

Mating Connectors (no cable)

- MCN-N5** 7 pin, style MS3106A-16S-1S
- MCN-N6** 10 pin, style MS3106A-18-1S
- MCN-N6N4** 10 pin, NEMA4 style

*Note: Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace XXXX with -0020.



SERIES HR25

ELECTRICAL CONNECTIONS

Prewired Cable or Accessory Cables with 7 or 10 Pin MS Connector - when Code 4= 0 to 6, or A, B, C, D or G

Note: Wire color codes are referenced here for models that are specified with pre-wired cable. Connector/cables are described in the Encoder Accessories section of this catalog and color-coding information is provided here for reference.

| Table 1 – Differential | | | |
|------------------------|--|-----------------|----------------------------|
| Encoder Function | **Cable # 109209-XXXX or 1400635XXXX 10 Pin Differential Line Driver w/ Index | | |
| | Pin | Wire Color Code | Cable Accessory Color Code |
| Signal A | A | BRN | BRN |
| Signal B | B | ORN | ORG |
| Signal Z* | C | YEL | YEL |
| Power Source | D | RED | RED |
| N/C | E | — | — |
| Common | F | BLK | BLK |
| Case | G | GRN | GRN |
| Signal \bar{A} | H | BRN/WHT | BRN/WHT |
| Signal \bar{B} | I | ORN/WHT | ORN/WHT |
| Signal \bar{Z} | J | YEL/WHT | YEL/WHT |

| Table 2 – Single Ended | | | |
|------------------------|--|-----------------|----------------------------|
| Encoder Function | Cable # 1400431XXXX 7 Pin Single Ended w/ Index Outputs | | |
| | Pin | Wire Color Code | Cable Accessory Color Code |
| Signal A | A | BRN | RED |
| Signal B | B | ORN | BLUE |
| Signal Z* | C | YEL | YEL |
| Power Source | D | RED | WHT |
| No Connection | E | — | GRN |
| Common | F | BLK | BLK |
| Case | G | GRN | SHIELD |

| Table 3 – Differential | | |
|------------------------|--|----------------------------|
| Encoder Function | Cable # 108596-XXXX 7 Pin Dif Line Driver w/o Index | |
| | Pin | Cable Accessory Color Code |
| Signal A | A | RED |
| Signal B | B | BLUE |
| Signal \bar{A} | C | YEL |
| Power Source | D | WHT |
| Signal \bar{B} | E | GRN |
| Common | F | BLK |
| Case | G | SHIELD |

5 & 8 Pin M12 Accessory Cables - when Code 4= H to Z

Connector pin numbers and cable assembly wire color information is provided here for reference.

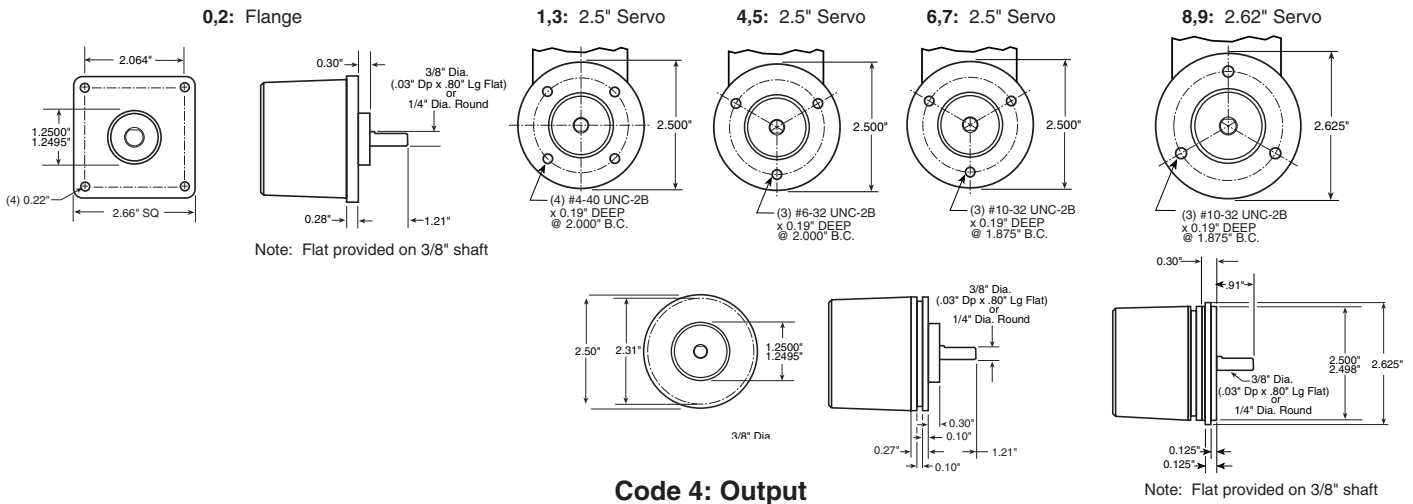
| Encoder Function | Table 4 Cable # 112859-XXXX 5 Pin Single Ended | | Table 5 Cable # 112860-XXXX 8 Pin Single Ended | | Table 6 Cable # 112860-XXXX 8 Pin Differential | |
|--------------------|--|-----------------|--|-----------------|--|-----------------|
| | Pin | Wire Color Code | Pin | Wire Color Code | Pin | Wire Color Code |
| Signal A | 4 | BLK | 1 | BRN | 1 | BRN |
| Signal B | 2 | WHT | 4 | ORG | 4 | ORG |
| Signal Z* | 5 | GRY | 6 | YEL | 6 | YEL |
| Power +V | 1 | BRN BLU | 2 | RED | 2 | RED |
| Com | 3 | — | 7 | BLK | 7 | BLK |
| Signal \bar{A} | — | — | — | — | 3 | BRN/WHT |
| Signal \bar{B} | — | — | — | — | 5 | ORG/WHT |
| Signal \bar{Z} * | — | — | — | — | 8 | YEL/WHT |

NOTES:

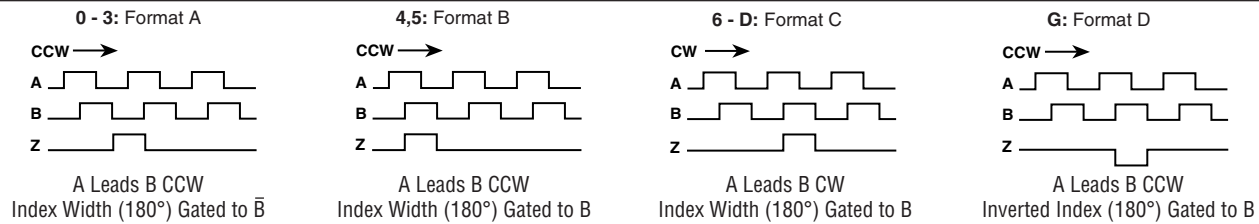
- 1) Cable Configuration (Tables 1 and 3): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 2) Cable Configuration (Table 2): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 3) Cable Configuration (Tables 4, 5 and 6): PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum
- 4) Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020
- 5) * Index not provided on all models. See ordering information.
- 6) **For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.
- 7) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 8) "M12" Cable assemblies are rated IP67

DIMENSIONS

Code 3: Mechanical



Code 4: Output



Code 6: Termination

