

# SERIES HC25

**Dynapar™ brand**

## Shafted Encoder

### Key Features

- Optional Extended Temperature Range of  $-40^{\circ}$  to  $+85^{\circ}\text{C}$
- High 5000 PPR Resolution Available
- Industry Standard Size 25 (2.5")

IND  
Industrial Duty



CE  
EN 61326-1



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical  
**Resolution:** 3000 to 5000 PPR (pulses/revolution)  
**Accuracy:** (Worst case any edge to any other edge)  $\pm 10.8^{\circ}/\text{PPR}$   
**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:**  $90^{\circ} \pm 25^{\circ}$  electrical  
**Symmetry:**  $180^{\circ} \pm 25^{\circ}$  electrical  
**Index:**  $90^{\circ} \pm 25^{\circ}$  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:** 4.5 min. to 26 VDC max. at 80 mA max., not including output loads  
**Outputs:**  
 7272 Push-Pull: 40mA, sink or source  
 7272 Differential Line Driver: 40 mA, sink or source  
 7273 Open Collector: 40mA, sink max  
**Frequency Response:** 250 kHz  
**Noise Immunity:** Tested to EN61326-1  
**Electrical Immunity:** Reverse polarity and short circuit protected  
**Termination:** MS Connector, M12 Connector, Cable Exit  
**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:** 40 lbs. radial, 30 lbs. axial  
**Shaft Speed:** 10,000 RPM max. (See Frequency Response)  
**Starting Torque:** (max at 25 °C)  
 HC525: 1.0 oz-in;  
 HC625: 2.5 oz.-in  
**Moment of Inertia:**  $2.83 \times 10^{-4}$  oz-in-sec<sup>2</sup>  
**Housing and Cover:** Aluminum  
**Shaft Material:** Stainless Steel  
**Disc Material:** Glass  
**Weight:** 1.5 lbs

### ENVIRONMENTAL

**Operating Temperature:**  
**Standard:** 0 to  $+70^{\circ}\text{C}$ ;  
**Extended:**  $-40$  to  $+85^{\circ}\text{C}$   
**Storage Temperature:**  $-40$  to  $+90^{\circ}\text{C}$   
**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:**  
 HC525: NEMA12/IP54 (dirt tight, splashproof);  
 HC625: 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
<b>HC</b> <input type="checkbox"/> <b>25</b>	<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"/> <input type="checkbox"/>

**Ordering Information**

<b>HC525</b> Size 25 Enclosed, Shielded Bearings  <b>HC625</b> Size 25 Enclosed, with Shaft Seal	<b>3000</b> 3,000 <b>3600</b> 3,600 <b>4096</b> 4,096 <b>5000</b> 5,000	<b>0</b> Flange Mount, 3/8" Shaft <b>1</b> 2.50" Servo Mount/ 4 Hole, 2.00" BC Face Mount, 3/8" Shaft <b>2</b> Flange Mount, 1/4" Shaft <b>3</b> 2.50" Servo Mount/ 4 Hole 2.00" BC Face Mount, 1/4" Shaft <b>4</b> 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 3/8" Shaft <b>5</b> 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 1/4" Shaft <b>6</b> 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft <b>7</b> 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft <b>8</b> 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft <b>9</b> 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft	<b>7 Pin Connector or Cable</b> <b>0</b> Single Ended, no Index, Format A, Table 2 <b>1</b> Single Ended, with Index, Format A, Table 2 <b>4</b> Single Ended, with Index, Format B, Table 2 <b>6</b> Differential, no Index, Format C, Table 3 <b>A</b> Single Ended, with Index, Format C, Table 2 <b>C</b> Single Ended, no Index, Format C, Table 2 <b>G</b> Single Ended, with Index, Format D, Table 2  <b>10 Pin Connector or Cable</b> <b>2</b> Differential, no Index, Format A, Table 1 <b>3</b> Differential, with Index, Format A, Table 1 <b>5</b> Differential, with Index, Format B, Table 1 <b>B</b> Differential, with Index Format C, Table 1 <b>D</b> Differential, no Index, Format C, Table 1  <b>5 Pin M12 Connector</b> <b>H</b> Single ended, no index, Format A, Table 4 <b>J</b> Single ended, with index, Format A, Table 4 <b>K</b> Single ended, with index, Format B, Table 4 <b>L</b> Single ended, with index, Format C, Table 4 <b>M</b> Single ended, no index, Format C, Table 4 <b>N</b> Single ended, with index, Format D, Table 4  <b>8 Pin M12 Connector</b> <b>P</b> Single ended, no index, Format A, Table 5 <b>Q</b> Single ended, with index, Format A, Table 5 <b>R</b> Single ended, with index, Format B, Table 5 <b>S</b> Single ended, with index, Format C, Table 5 <b>T</b> Single ended, no index, Format C, Table 5 <b>U</b> Single ended, with index, Format D, Table 5 <b>V</b> Differential, no index, Format A, Table 6 <b>W</b> Differential, with index, Format A, Table 6 <b>X</b> Differential, with index, Format B, Table 6 <b>Y</b> Differential, with index, Format C, Table 6 <b>Z</b> Differential, no index, Format C, Table 6  See page 3 for electrical tables and page 4 for formats.	<b>0</b> 5-26V in; 5-26V Open Collector with 2.2kΩ Pull-up out <b>1</b> 5-26V in; 5-26V Open Collector out <b>2</b> 5-26V in; 5V Totem Pole out <b>3</b> 5-26V in; 5V Line Driver out <b>4</b> 5-26V in; 5-26V Line Driver out  <b>A</b> Same as "0" with extend. temp range <b>B</b> Same as "1" with extend. temp range <b>C</b> Same as "2" with extend. temp range <b>D</b> Same as "3" with extend. temp range <b>E</b> Same as "4" with extend. temp range	<b>0</b> End Mount Connector <b>1</b> Side Mount Connector  Available when Code 1 is HC525: <b>2</b> 18" Cable, Side <b>3</b> 3' Cable, Side <b>4</b> 6' Cable, Side <b>5</b> 10' Cable, Side <b>6</b> 15' Cable, Side <b>J</b> 18" Cable, End <b>K</b> 3' Cable, End <b>L</b> 6' Cable, End <b>M</b> 10' Cable, End <b>N</b> 15' Cable, End  Available when Code 1 is HC625: <b>A</b> 18" Watertight, Side <b>B</b> 3' Watertight, Side <b>C</b> 6' Watertight, Side <b>D</b> 10' Watertight, Side <b>F</b> 15' Watertight, Side <b>P</b> 18" Watertight, End <b>Q</b> 3' Watertight, End <b>R</b> 6' Watertight, End <b>S</b> 10' Watertight, End <b>T</b> 15' Watertight, End	<b>Blank</b> None Available when Code 4 is 0 thru G, and Code 6 is 0 or 1:  <b>PS</b> LED Output Indicator
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**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 MS Connector\***

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

**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

\*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.

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## 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 Dif 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.

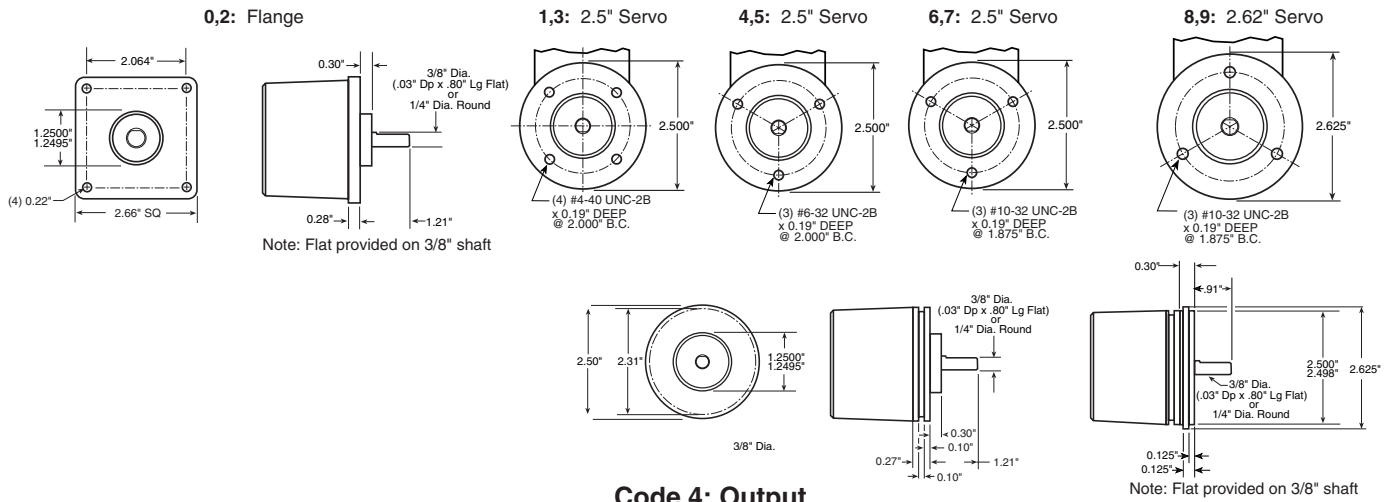
Encoder Function	Table 4 Cable # 112859-XXXX 5 Pin Single Ended		Table 5 Cable # 112860-XXXX 8 Pin Single Ended		Table 6 Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
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:

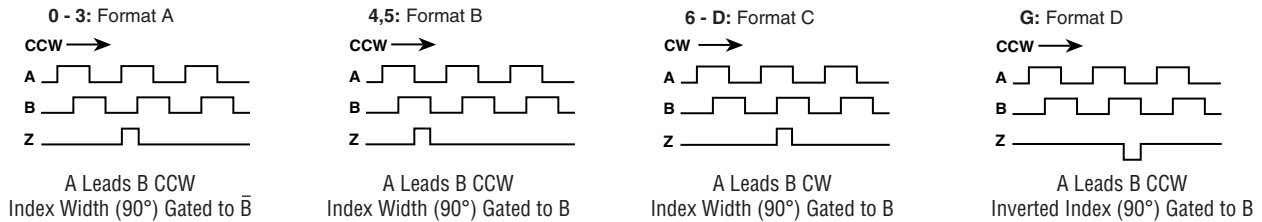
- 1) Cable Configuration (Tables 1 and 3): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 2) Cable Configuration (Table 2): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 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**

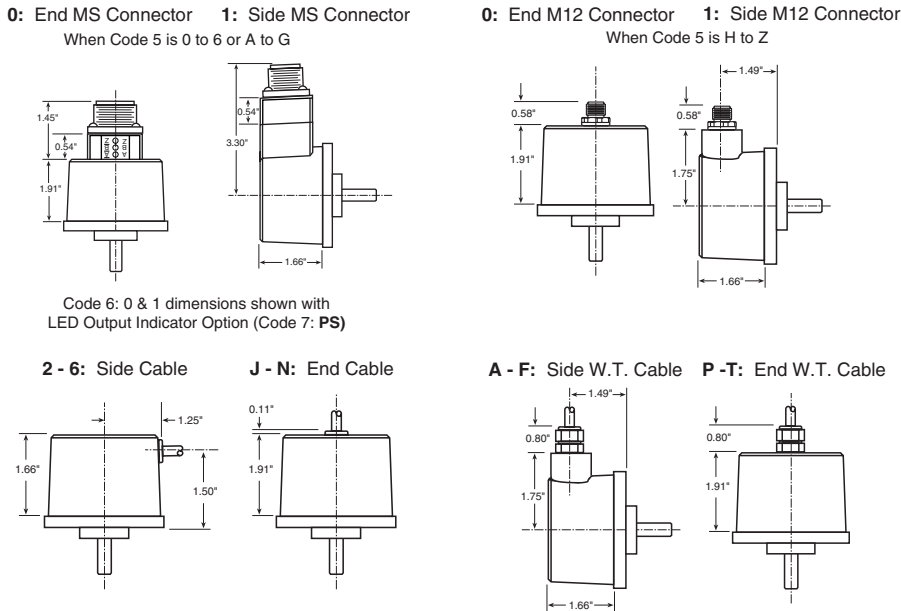
**Code 3: Mechanical**



**Code 4: Output**



**Code 6: Termination**



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