

SERIES HA25

Dynapar™ brand

Shafted Encoder

Key Features

- Industry Standard Size 25 (2.5")
- Wide Range of Resolutions Available
- Optional Extended Temperature Range of -40° to $+85^{\circ}\text{C}$



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical

Resolution: 1 to 2540 PPR (pulses/revolution)

Accuracy: (Worst case any edge to any other edge) ± 2.5 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 max. at 80 mA max., not including output loads

Outputs:

7273 Open Collector: 40mA, sink max

7272 Push-Pull: 40mA, sink or source

7272 Differential Line Driver: 40 mA, sink or source

4469 Differential Line Driver: 100mA, sink or source

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 Exit

Mating Connector:

7 pin, style MS3106A-16S-1S (MCN-N5);

10 pin, style MS3106A-18-1S (MCN-N6)

Cable w/ 5 pin M12 Connector (112859-xxxx)

Cable w/ 8 pin M12 Connector (112860-xxxx)

MECHANICAL

Shaft Sizes: 1/4", 3/8"

Shaft Loading: (at 0.25" from encoder face) 35 lbs. radial, 40 lbs. axial

Shaft Speed: 5,000 RPM max.

Starting Torque: (max at 25 °C)

HA525: 1.0 oz-in;

HA625: 2.5 oz.-in

Moment of Inertia: 3.0×10^{-4} oz-in-sec²

Housing and Cover: Aluminium

Shaft Material: Stainless Steel

Disc Material: Glass or Mylar (PPR Dependant)

Weight: 1.5 lbs

ENVIRONMENTAL

Operating Temperature:

Standard: 0 to +70 °C;

Extended: 0 to +85 °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:

HA525: NEMA12/IP54 (dirt tight, splashproof);

HA625: 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
HA	25					

Ordering Information						
HA525 Size 25 Enclosed, Shielded Bearings, Glass Disk HA625 Size 25 Enclosed, with Shaft Seal, Glass Disk	0001 0600 0005 0625 0010 0635 0012 0720 0050 0800 0060 0900 0100 1000 0120 1024 0150 1200 0180 1250 0200 1270 0240 1500 0250 1600 0256 1800 0300 1968 0360 2000 0400 2048 0500 2400 0512 2500 2540	0 Flange Mount, 3/8" Shaft	7 Pin MS 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 Pullup 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 HA525: 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 HA625: 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 2 Flange Mount, 1/4" 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 MS 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

Mating Connectors (no cable)

- 7 pin, style MS3106A-16S-1S (MCN-N5)
- 10 pin, style MS3106A-18-1S (MCN-N6)

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.

SERIES HA25



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 Accessory: P/N 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 Accessory: P/N 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 Accessory: P/N 108596-XXXX	
	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.

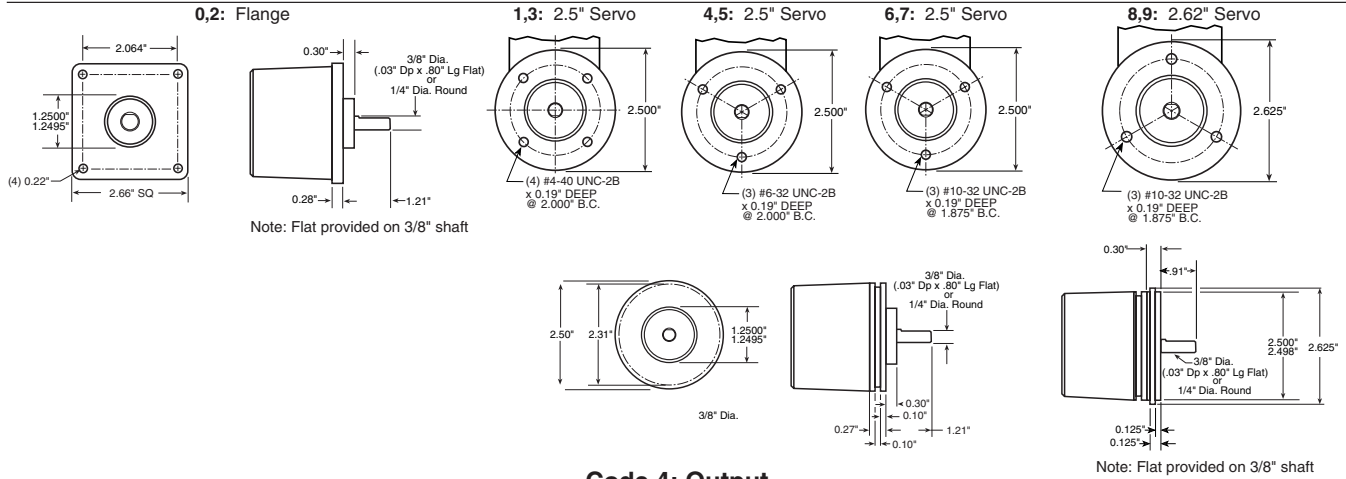
Encoder Function	Table 4		Table 5		Table 6	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN BLU	2	RED	2	RED
Com	3	—	7	BLK	7	BLK
Signal \bar{A}	—	—	—	—	3	BRN/WHT
Signal \bar{B}	—	—	—	—	5	ORG/WHT
Signal \bar{Z} *	—	—	—	—	8	YEL/WHT

NOTES:

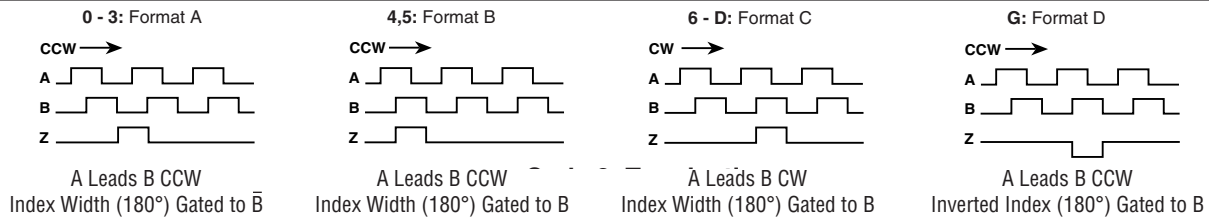
- 1) Cable Configuration (Tables 1 and 3): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 2) Cable Configuration (Table 2): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 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 1400635XXXX.
- 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

