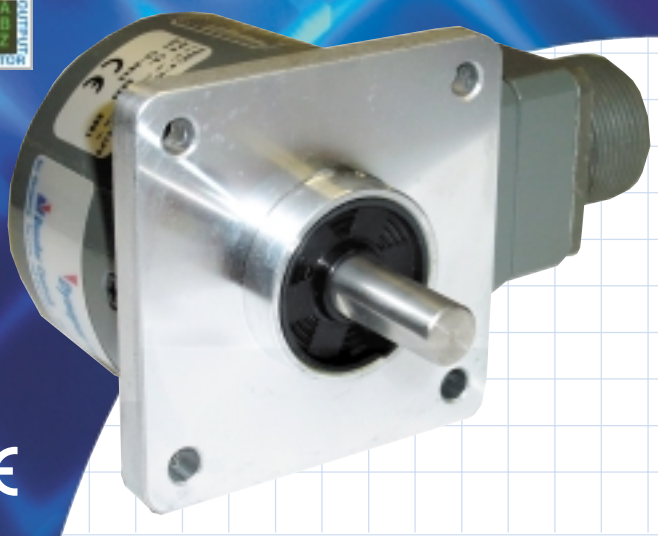
Series HA25



- ***Ultra-reliable, heavy-duty Size 25 (2.5") encoder***
- ***Complete electrical protection and noise immunity***
- ***Environmentally sealed to NEMA4/IP66***
- ***Up to 2540 PPR with optional marker pulse***

The Dynapar brand Series HA25 is a rugged, reliable and economical encoder for industrial motion applications. Protection against installation problems such as wiring errors prevents the encoder from damage, while immunity to electrical noise keeps the encoder signals intact. A NEMA4 / IP66 sealing option protects against damage from contamination.

Packaged in an industry standard 2.5" enclosure, the Series HA25 offers a variety of mechanical options: servo or face mounting, and 1/4" or 3/8" shafts. Electrical options include: resolutions to 2540 pulses/revolution; bidirectional operation with optional index; single ended open collector or push-pull outputs, or differential line drivers; and connector or cable exit terminations.

The Series HA25 utilizes the latest technology optical emitters and sensors, surface mount assembly and precisely fabricated metal components to deliver high reliability and performance in a compact and economical package.

Mechanical / Environmental Features

- Long life, 40 lb bearings
- Extended temperature range available
- Industry Standard, Size 25 Form Factor
- NEMA4 / IP66 washdown rating option

Electrical Features

- Noise Immune to ESD, RFI and electrical transients
- High current outputs
- Over-Voltage protection
- Reverse Voltage protection
- Output Short-Circuit Protection

SPECIFICATIONS

Electrical

Code: Incremental
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° ± 22.5° electrical
Symmetry: 180° ± 18° electrical
Index: 180° ± 18° electrical (gated with B low)
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf
Input Power:
4.5 min. to 26 VDC max. at 80 mA max., not including output loads
Outputs:
7273 Open Collector: 30 VDC max., 40 mA sink max.
7272 Push-Pull and Differential Line Driver: 40 mA sink or source
4469 Differential Line Driver: 100 mA, sink or source
Frequency Response: 100 kHz min.
Electrical Protection: Overvoltage, reverse voltage and output short circuit protected

Noise Immunity: Tested to EN50082-2 (Heavy Industrial) for Electro Static Discharge, Radio Frequency Interference, Electrical Fast Transients, Conducted and Magnetic Interference
Mating Connector:
7 pin, style MS3106A-16S-1S (MCN-N5);
10 pin, style MS3106A-18-1S (MCN-N6)
Cable Termination: PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)

Mechanical

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 x 10^{-4} oz–in–sec^2

Environmental

Operating Temperature:
Standard: 0 to +70 °C;
Extended: –40 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: to 98% without condensation
Enclosure Rating:
HA525: NEMA12/IP54 (dirt tight, splashproof);
HA625: NEMA4/IP66 (dust proof, washdown)

Electrical Connections

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

Pin	Function (If Used)	Wire Color Code	Cable* Accessory Color Code
A	Signal A	BRN	BRN
B	Signal B	ORN	ORN
C	Signal Z	YEL	YEL
D	Power Source	RED	RED
E	No Connection	—	—
F	Common	BLK	BLK
G	Case	GRN	GRN
H	Signal $\overline{A}$	BRN/WH	BRN/WH
I	Signal $\overline{B}$	ORN/WH	ORN/WH
J	Signal $\overline{Z}$	YEL/WH	YEL/WH

*Cable Accessory: P/N 14006350010

Table 2 – Single Ended

Pin	Function (If Used)	Wire Color Code	Cable* Accessory Color Code
A	Signal A	BRN	RED
B	Signal B	ORN	BLUE
C	Signal Z	YEL	YEL
D	Power Source	RED	WHT
E	No Connection	—	GRN
F	Common	BLK	BLK
G	Case	GRN	SHIELD

*Cable Accessory: P/N 14004310010

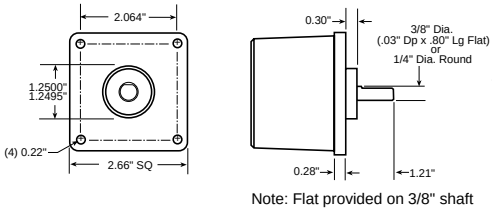
Table 3 – Differential

Pin	Function (If Used)	Cable Accessory Color Code
A	Signal A	BRN
B	Signal B	ORN
C	Signal $\overline{A}$	BRN/WHT
D	Power Source	RED
E	Signal $\overline{B}$	ORN/WHT
F	Common	BLK
G	Case	GRN

*Cable Accessory: P/N 108596

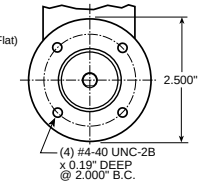
Code 3: Mechanical

0,2: Flange

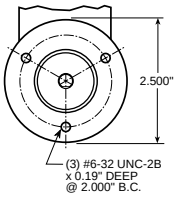


Note: Flat provided on 3/8" shaft

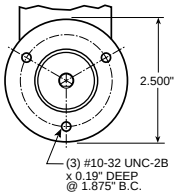
1,3: 2.5" Servo



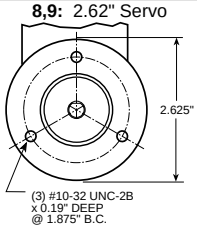
4,5: 2.5" Servo

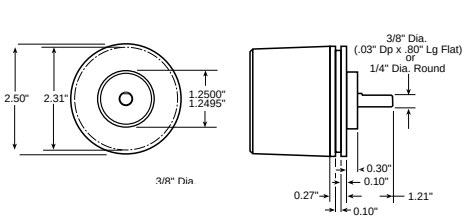


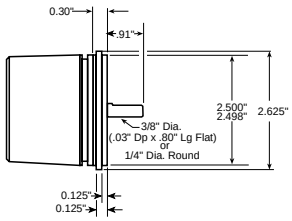
6,7: 2.5" Servo



8,9: 2.62" Servo



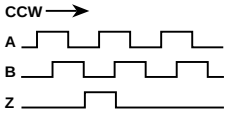




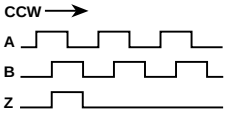
Note: Flat provided on 3/8" shaft

Code 4: Output

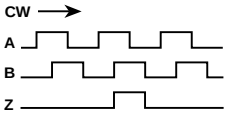
0 - 3: Format A



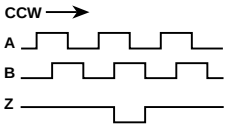
4,5: Format B



6 - D: Format C

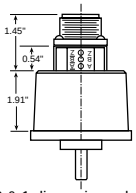


G: Format D

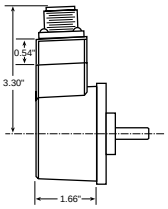


Code 6: Termination

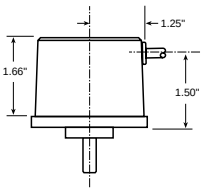
0: End Connector



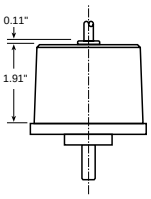
1: Side Connector



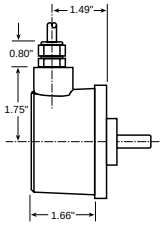
2 - 6: Side Cable



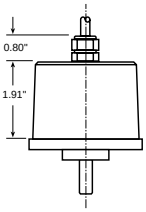
J - N: End Cable



A - F: Side W.T. Cable



P -T: End W.T. Cable



Code 6: 0 & 1 dimensions shown with LED Output Indicator Option (Code 7: **PS**)

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

For resolutions above 2540, See HC25

- **0** Flange Mount, 3/8" Shaft
- **1** 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

- **0** Single Ended, no Index, Format A, Table 2
- **1** Single Ended, with Index, Format A, Table 2
- **2** Differential, no Index, Format A, Table 1
- **3** Differential, with Index, Format A, Table 1
- **4** Single Ended, with Index, Format B, Table 2
- **5** Differential, with Index, Format B, Table 1
- **6** Differential, no Index, Format C, Table 3
- **A** Single Ended, with Index, Format C, Table 2
- **B** Differential, with Index Format C, Table 1
- **C** Single Ended, no Index, Format C, Table 2
- **D** Differential, no Index, Format C, Table 1
- **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 6 is 0 or 1:

- **PS** LED Output Indicator