Dynapar brand Encoder Series H25

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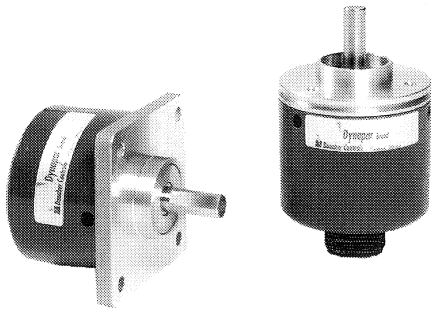

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Manufactured by:
Danaher Controls
1675 Delany Road
Gurnee, IL 60031-1282
Phone: 847.662.2666
Fax: 847.662.6633
Application Assistance 1.800.234.8731

Technical Bulletin

The Dynapar brand Series H25 is a rugged, reliable and economical encoder for industrial motion applications. Models with resolutions of 1024 or less are available with an unbreakable metal code disk that meets the demands of the most severe shock and vibration generating processes; and a long life 80 pound (352 N.) bearing that keeps tough loads from disrupting internal alignment, avoiding failure due to the disk "crashes" so typical in competitive encoders. 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 H25 offers a variety of mechanical options: servo or face mounting, and 1/4" or 3/8" shafts. Electrical options include: resolutions from 1 to 2540 pulses/revolution; bidirectional operation with optional index; single ended open collector or push-pull outputs, or differential line drivers; and a connector or cable exit terminations.

The Series H25 utilizes the latest technology optical emitters and sensors, surface mount assembly and precisely fabricated metal components to deliver a high reliability and performance in a compact and economical package.

Mechanical / Environmental Features

- Unbreakable, metal code disk and long life 80# bearing available
- 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
Pulses per Revolution: HR_25: 1 to 1024; HA_25: 1 to 2540; consult factory for other available PPRs
Output Signal: Two channel quadrature with optional zero reference
Phasing Sense: A leads B for CCW or CW rotation as viewed from the shaft end of the encoder - see ordering information
Quadrature Phasing: 90° ± 22.5°
Symmetry: 180° ± 18°
Zero Reference: 180° ± 18° (Gated with B)
Input: Differential Line Driver and Push-Pull: 5 to 26 VDC at 80mA max. plus load; Open Collector: 5 to 26VDC at 135mA max. plus load
Outputs: Open Collector: 40mA sink at 0.5 VDC max.; Push-Pull and Differential Line Driver: 40mA sink/source
Frequency Response: 100kHz Data, Index
Electrical Protection: Over-voltage, reverse voltage and short-circuit protected
Noise Immunity: Tested to IEC801 level 3 for Electro Static Discharge, Radio Frequency Interference and Electrical Fast Transients
Connector: 7 pin, style MS3102E-16S-1P
10 pin, style MS3102E-18-1P
Cable: PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG plus 2 twisted pairs 24 AWG
Mating Connector:
7 pin, style MS3106A-16S-1S (Dynapar No. MCN-N5);
10 pin, style MS3106A-18-1S (Dynapar No. MCN-N6)

Mechanical

Shaft Loading: HR_25: 80 pounds; HA_25: 40 pounds axial and 35 pounds radial at 0.25" from face
Starting Torque: (max. at 25 °C) w/o shaft seal: 1.0 oz-in; w/ shaft seal: 2.5 oz-in
Shaft Runout: 0.001" max. TIR
Moment of Inertia: 3.0 x 10^{-4} oz–in–sec^2
Shaft Speed: HR_25: 10,000 RPM max.; HA_25: 5,000 RPM max.

Environmental

Operating Temperature: Standard: 0° to +70 °C; Extended: –40 to +85 °C
Storage Temperature Range: -40° to +90°C
Shock: 50 G's for 11 milliseconds duration
Vibration: 5 to 2000 Hz @ 20 G's
Humidity: to 98% without condensation
Enclosure Rating:
Series H_525: NEMA12 / IP54
Series H_625: NEMA4 / IP66

Electrical Connections

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

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 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		GRN

*Cable A[illegible]: P/N 108596

IMPORTANT ENCODER INSTALLATION INFORMATION

Mounting the Encoder: The encoder should be mounted such that its shaft is in close as possible alignment with the axis of the driving machine or motor shaft. The two shafts should then be joined using a suitable, instrument grade, flexible shaft coupling.

CAUTION: Rigidly coupling the encoder shaft to the driving shaft will cause failure of the encoder's or driving shaft's bearings.

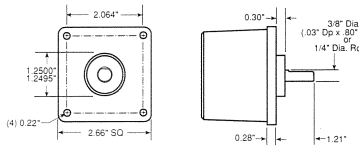
Important Wiring Instructions: Use of shielded cable is recommended for all encoder installations. The shield should be connected to signal-ground at the receiving device only. ***Connecting the shield at both ends can cause grounding problems that degrade system performance.*** If possible, run the encoder cable through a dedicated conduit (not shared with other wiring). Use of conduit will protect the cable from physical damage and provide a degree of electrical isolation. Do not run the cable in close proximity to other conductors that carry current to heavy loads such as motors, motor starters, contactors, solenoids, etc. This practice can induce electrical transients in the encoder cable, potentially interfering with reliable data transmission.

Refer to Electrical Connections table for wiring information. To avoid possible damage, do not connect or disconnect the encoder connector or wiring while power is applied to the system.

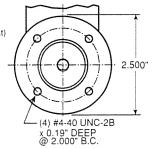
CAUTION: Unused encoder signal wires must be individually insulated and under no circumstances be in contact with ground, voltage sources, or other signal lines.

Code 3: Mechanical

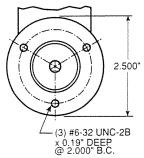
0,2: Flange



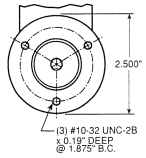
1,3: 2.5" Servo



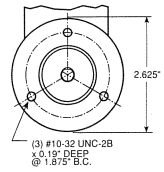
4,5: 2.5" Servo

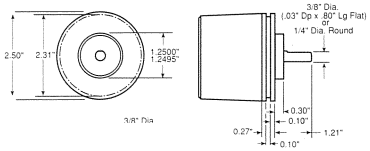


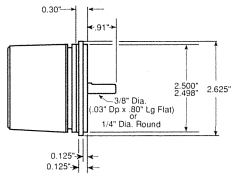
6,7: 2.5" Servo



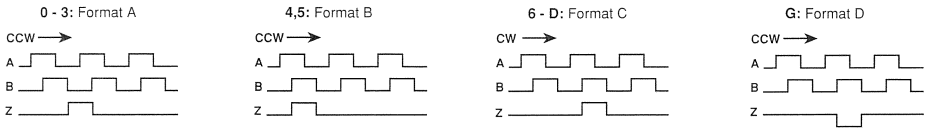
8,9: 2.62" Servo



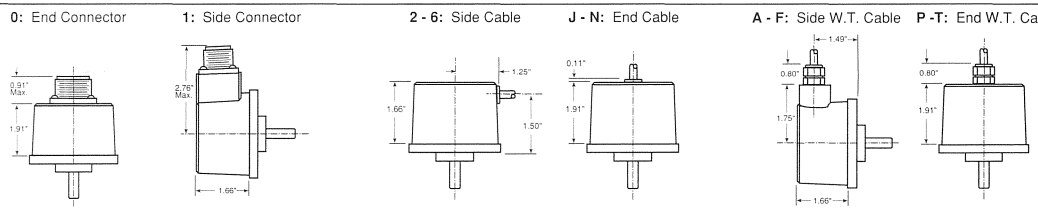




Code 4: Output



Code 6: Termination



Code 1: Model	Code 2: Pulses/Rev	Code 3: Mechanical	Code 4: Output	Code 5: Electrical	Code 6: Termination
H□□25	□□□□	□	□	□	□

Ordering Information

Code 1: Model

HR525	Size 25 Enclosed, Shielded Bearings, Metal Disk
HR625	Size 25 Enclosed, with Shaft Seal, Metal Disk
HA525	Size 25 Enclosed, Shielded Bearings, Glass Disk
HA625	Size 25 Enclosed, with Shaft Seal, Glass Disk

Code 2: Pulses/Rev

0001	**0300**
0005	**0344**
0010	**0360**
0012	**0400**
0050	**0500**
0060	**0512**
0100	**0600**
0120	**0625**
0150	**0635**
0180	**0720**
0200	**0800**
0240	**0900**
0250	**1000**
0256	**1024**

Available when Code 1 is HA_25:

1200	**1968**
1250	**2000**
1270	**2048**
1500	**2400**
1600	**2500**
1800	**2540**

For Resolutions above 40, see Series 525/625

Code 3: Mechanical

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

Code 4: Output

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

Code 5: Electrical

0	5-26VDC in; 5-26V 7406 Open Collector with 2.2kΩ Pullup out
1	5-26VDC in; 5-26V 7406 Open Collector out
2	5-26VDC in; 5 V 7404 TTL Totem Pole out
3	5-26VDC in; 5 V Line Driver out
4	5-26VDC in; 5-26 V Line Driver out
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

Code 6: Termination

0	End Mount Connector
1	Side Mount Connector
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 H_625

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