Series H20 Hub Shaft

- *Simple installation on motor or machine with hub shaft and flexible spring mount*
- *Ultra-reliable design using long-life bearing*
- *Available unbreakable code disk*
- *Complete electrical protection and noise immunity tested to EN50082-2*
- *Available with environmental sealing to NEMA4 / IP66*
- *Economical solution for medium resolution applications*

APPLICATION/INDUSTRY

The Dynapar brand Series H20 Hub Shaft encoder is a rugged, reliable and economical encoder for direct coupling to motors or machine shafts.

DESCRIPTION

The flexible mount and integral hub shaft reduces cost, simplifies installation and reduces the overall depth by eliminating the traditional flange adapter and flexible coupling. Models with resolutions of 1024 or less are equipped with an unbreakable code disk that meets the demands of the most severe shock and vibration generating processes; use of long life bearings maintains 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.

The Series H20 Hub Shaft encoder is available with 3/8" or 5/8" I.D. hub shafts. Electrical options include: resolutions from 1 to 2540 pulses/revolution; unidirectional or 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 H20 utilize 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.

FEATURES AND BENEFITS

Mechanical / Environmental Features

- Integral hub shaft and flexible spring mount
- Unbreakable, code disk and long life 80 lb. bearing option
- Extended temperature range available
- 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

STANDARD OPERATING CHARACTERISTICS

Code: Incremental
Resolution: 1 to 2540 PPR (pulses/revolution)
Accuracy: (worst case any edge to any other edge) ≤1024 PPR (metal disk): ±7.5 arc-min.
>1024 PPR (glass disk): ±2.5 arc-min.
Format: Two channel quadrature (AB) with optional Index (Z) and complementary outputs
Phase Sense: A leads B for CCW shaft rotation as viewed from the shaft end of the encoder
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

ELECTRICAL

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:
6 pin, style MS3106A-14S-6S (MCN-N4);
7 pin, style MS3106A-16S-1S (MCN-N5);
10 pin, style MS3106A-18-1S (MCN-N6)
5 pin, style M12: Cable with connector available
8 pin, style M12: Cable with connector available

MECHANICAL

Mating Shaft Requirements:
Length: 0.38" min., 0.50" max.
Runout: 0.010" max. TIR
Endplay: ±0.025" max.
Shaft Speed:
Resolutions ≤1024 PPR: 10,000 RPM max.
Resolutions >1024 PPR: 5,000 RPM max.
Starting Torque: (max at 25 °C)
without shaft seal: 1.0 oz-in;
with shaft seal: 3.0 oz.-in
Moment of Inertia: 3.0×10^{-4} oz–in–sec^2
Weight: 10 oz. max.

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: NEMA12/IP54 (dirt tight, splashproof); NEMA4/IP66 (dust proof, washdown) when ordered with shaft seal and either MS connector or watertight cale exit

ELECTRICAL CONNECTIONS

Series H20 Hub Shaft

6, 7 & 10 Pin MS Connectors and Cables - Code 8= 0 to 9, B to M

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. H20 models with direct cable exit carry the same color coding as shown for each output configuration.

Encoder Function	Cable # 108594-6 Pin Single Ended		Cable # 108595-7 Pin Single Ended		Cable # 108596-7 Pin Dif Line Drv w/o Idx		Cable # 1400635-10 Pin Dif Line Drv w/ Idx	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN
Sig. B	D	ORN	B	ORG	B	ORG	B	ORG
Sig. Z	C	YEL	C	YEL	—	—	C	YEL
Power +V	B	RED	D	RED	D	RED	D	RED
Com	A	BLK	F	BLK	F	BLK	F	BLK
Case	—	—	G	GRN	G	GRN	G	GRN
N/C	F	—	E	—	—	—	E	—
Sig. $\overline{A}$	—	—	—	—	C	BRN/WHT	H	BRN/WHT
Sig. $\overline{B}$	—	—	—	—	E	ORG/WHT	I	ORG/WHT
Sig. $\overline{Z}$	—	—	—	—	—	—	J	YEL/WHT

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

5 & 8 Pin M12 Accessory Cables when Code 8= N to R

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

Encoder Function	Cable # 112859-5 Pin Single Ended		Cable # 112860-8 Pin Single Ended		Cable # 112860-8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
***Sig. Z**	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig. $\overline{A}$	–	–	–	–	3	BRN/WHT
Sig. $\overline{B}$	–	–	–	–	5	ORG/WHT
***Sig. $\overline{Z}$**	–	–	–	–	8	YEL/WHT

* Index not provided on all models. See ordering information

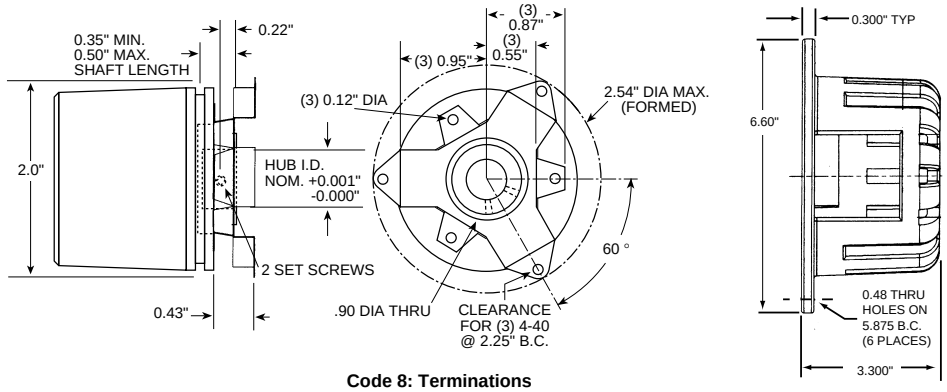
Cable Configuration: PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

See "Accessories" Section for Connectors and Cable Assemblies Ordering Information

DIMENSIONS

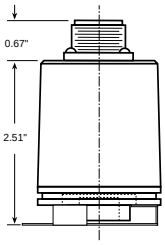
Series H20 Hub Shaft

Codes 3-5: Housing, Shafts, Face Mount

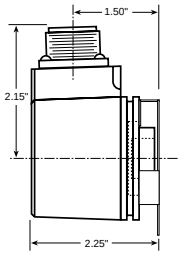


Code 8: Terminations

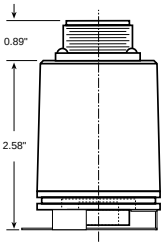
0, 2
6, 7 Pin End MS Conn



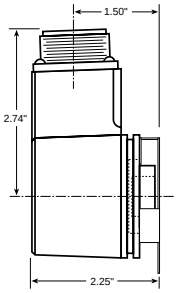
1, 3
6, 7 Pin Side MS Conn



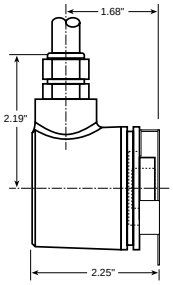
4
10 Pin End MS Conn



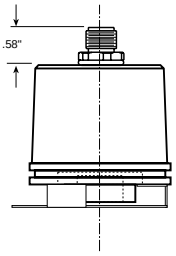
5
10 Pin Side MS Conn



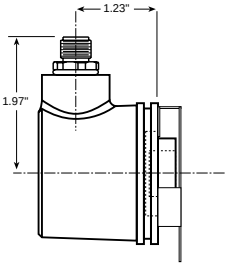
7, 9, B, D, F, H
Side Exit Cable



N, Q
End M12 Conn



P, R
Side M12 Conn



MOTOR MOUNT

ORDERING INFORMATION

Series H20 Hub Shaft

Code 1: Model	Code 2: PPR	Code 3: Housing	Code 4: Shaft	Code 5: Face Mount	Code 6: Shaft Seal	Code 7: Electrical	Code 8: Termination	Code 9: Options
H2□	□□□□	0	□	2	□	□	□	□

Ordering Information

1 Unidirectional (Channel A only)

2 Bidirectional (Channels A and B)

3 Bidirectional with Index (Channels A, B and Z)

0001 **0005** **0010** **0012** **0050** **0060** **0086** **0100** **0120** **0125** **0180** **0200** **0240** **0250** **0254** **0256** **0300** **0360** **0400**

0500 **0512** **0600** **0800** **0900** **1000** **1024** **1200** **1250** **1270** **1500** **1600** **1800** **1968** **2000** **2048** **2400** **2500** **2540**

0 Servo Mount

C Same as "0" above includes protective cover kit for mounting on 4 1/2" C-face

F Same as "0" above includes protective cover kit for mounting on fan cover

2 5/8" Dia. Hub Shaft and flex coupling

3 3/8" Dia. Hub Shaft and flex coupling

5 1/2" Dia. Hub Shaft and flex coupling

6 1/4" Dia. Hub Shaft and flex coupling

2 (3) #4-40 @ 1.50" BC

0 no Shaft Seal

5 Shaft Seal

0 5-26V in, 5-26V Open Collector out

1 5-26V in, 5-26V Open Collector out with 2.2 kΩ Pullups

2 5-26V in, 5-26V Push-Pull 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

available when: Code 1 is 1 or 2 and Code 8 is 2 through M, Q or R; or Code 1 is 3 and Code 8 is 4 thru M, Q or R:

3 5-26V in, 5-26V Differential Line Driver out (7272)

4 5-26V in, 5V Differential Line Driver out (7272)

5 5-26V in, 5 V Differential Line Driver out (4469)

6 5-15V in, 5-15 V Differential Line Driver out (4469)

D Same as "**3**" with extend. temp range

E Same as "**4**" with extend. temp range

0 6 Pin Conn, End Mount

1 6 Pin Conn, Side Mount

2 7 Pin Conn, End Mount

3 7 Pin Conn, Side Mount

4 10 Pin Conn, End Mount

5 10 Pin Conn, Side Mount

7 18" Cable, Side Exit

9 36" Cable, Side Exit

B 10' Cable, Side Exit

K 25' Cable, Side Exit

N 5 Pin M12 Connector, End Mount

P 5 Pin M12 Connector, Side Mount

Q 8 Pin M12 Connector, End Mount

R 8 Pin M12 Connector, Side Mount

available when Code 6 is 5:

D 18" Sealed Cbl, Side Exit

F 36" Sealed Cbl, Side Exit

H 10' Sealed Cbl, Side Exit

M 25' Sealed Cbl., Side Exit

available when Code 8 is 0 to 5:

PS LED Output Indicator Option

109296-0001	Replacement flexible mount for Series H20 Hub Shaft