Dynapar brand Encoder

Series H20

CE

Bulletin Number: 701879-0000
Revision Level: M
Date: October 21, 2013

DYNAPAR™
1675 Delany Road
Gurnee, IL 60031-1282
Phone: 847.662.2666
Fax: 847.662.6633
WWW.DYNAPAR.COM
Application Assistance 1.800.234.8731

Technical Bulletin

DESCRIPTION

The Dynapar brand Series H20 is a rugged, reliable and economical encoder for industrial motion applications.

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 keep tough loads from disrupting internal alignment, avoiding failure.

Packaged in the industry standard 2.0" enclosure, the Series H20 offers a variety of mechanical options: servo or face mounting, 1/4" or 3/8" shafts, and several types of pilots. 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 connector or cable exit terminations.

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:
5 to 26 VDC at 80 mA max., not including output loads

Outputs:
7273 Open Collector: 30 VDC max., 40 mA sink
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. (index 75 kHz min. for extended temperature range)
Electrical Protection: Overvoltage, reverse voltage and output short circuit protected
Noise Immunity: Tested to EN61326 (Industrial) for Electro Static Discharge, Radio Frequency Interference, Electrical Fast Transients.

CONNECTIONS

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

Shaft Loading: (at 0.25" from encoder face)
Resolutions ≤1024 PPR: 80 lbs. radial, axial
Resolutions >1024 PPR: 40 lbs. radial, axial
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: 2.0 oz.-in
Moment of Inertia: 3.0×10^{-4} oz–in–sec^2
Disk Material: Glass or plastic based on PPR
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 cable exit

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.

ARE YOU AWARE THAT WE SELL DYNAPAR BRAND COUPLINGS?

Our CPL Series of flexible shaft couplings ensures long encoder life by restricting transfer of mechanical, thermal, and electrical stress.

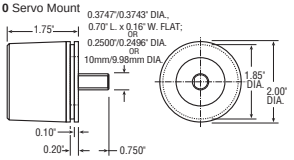
A full range of models is available. Each is designed to match specific encoders and is supplied with input-shaft size adaptors.

Contact your local Danaher Industrial Controls Sales Office or our Customer Service Department 800.873.8731 for more information.

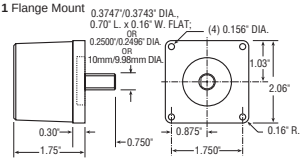
Dimensions

Code 3: Housings

0 Servo Mount

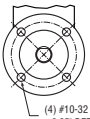


1 Flange Mount

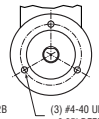


Code 5: Face Mounts

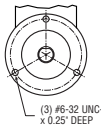
1



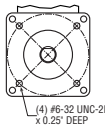
2



3

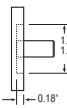


4



Code **6: Pilots**

0 Female

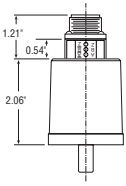


1, 2 Male

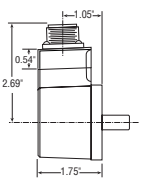
3, 4 Male

Code 8: Terminations

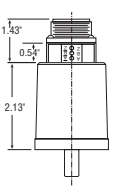
0, 2
6, 7 Pin End Conn



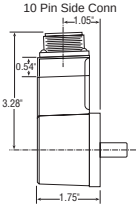
1, 3
6, 7 Pin Side Conn



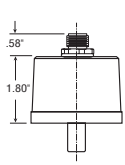
4
10 Pin End Conn



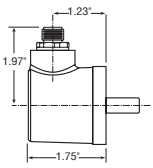
5
10 Pin Side Conn



N, Q
M12 End Conn

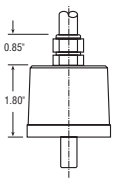


P, R
M12 Side Conn

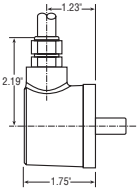


Code 8: 0-5 dimensions shown with LED Output Indicator Option (Code 9: **PS**)

6, 8, A, C, E, G
End Exit Cable



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



Models Information

Code 1: Model	Code 2: PPR	Code3:Housing	Code 4: Shaft	Code5:FaceMount	Code6:Pilot,Seal	Code7:Electrical	Code 8: Termination	Code 9: Options
H2□	□□□□	□	□	□	□	□	□	□

Ordering Information

1 Unidirectional
2 Bidirectional
3 Bidirectional with Index

0001 **0512**
0005 **0600**
0010 **0800**
0012 **0900**
0050 **1000**
0060 **1024**
0100 **1200**
0120 **1250**
0200 **1270**
0240 **1500**
0250 **1600**
0256 **1800**
0300 **1968**
0360 **2000**
0400 **2048**
0500 **2400**
2500
2540

0 Servo Mount
1 Flange Mount

0 3/8" Dia. Shaft with flat
1 1/4" Dia. Shaft, no flat
4 10mm Dia. Shaft, no flat

0 no face mount

available when Code 3 is 0:
1 (4) #10-32 @ 1.63" BC
2 (3) #4-40 @ 1.50" BC
3 (3) #6-32 @ 1.75" BC

available when Code 3 is 1:
4 (4) #6-32 @ 2.00" BC

0 1.18" Dia. Female Pilot
1 1.25" Dia. Male Pilot
2 1.25" Dia. Male Pilot with Shaft Seal
3 0.69" Dia. Male Pilot
4 0.69" Dia. Male Pilot with 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, 5-15V 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
6 18" Cable, End Exit
7 18" Cable, Side Exit
8 36" Cable, End Exit
9 36" Cable, Side Exit
A 10' Cable, End Exit
B 10' Cable, Side Exit
J 25' Cable, End 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 2 or 4:
C 18" Sealed Cbl, End Exit
D 18" Sealed Cbl, Side Exit
E 36" Sealed Cbl, End Exit
F 36" Sealed Cbl, Side Exit
G 10' Sealed Cbl, End Exit
H 10' Sealed Cbl, Side Exit
L 25' Sealed Cbl, End Exit
M 25' Sealed Cbl, Side Exit

available when Code 8 is 0 to 5:
PS LED Output Indicator

Wiring Information

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