

# SERIES H20

**Dynapar™ brand**

## Shafted Encoder

### Key Features

- Reliable Dual-Row Bearing Design
- IP66 Sealing Option
- Optional Unbreakable Code Disc

IND  
Industrial Duty



CE  
EN 61326-1



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical

**Resolution:** 1 to 2540 PPR (pulses/revolution)

**Accuracy:** (worst case any edge to any other edge)  
<1024 PPR (metal disk):  $\pm 7.5$  arc-min.

$\geq 1024$  PPR (glass disk):  $\pm 2.5$  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:**  $90^\circ \pm 22.5^\circ$  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 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:

6 pin, style MS3106A-14S-6S (MCN-N4);

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

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

10 pin, NEMA4 style (MCN-N6N4)

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

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

### MECHANICAL

**Shaft Sizes:** 10mm, 1/4" or 3/8"

**Shaft Loading:** (at 0.25" from encoder face)

Resolutions  $\leq 1024$  PPR: 80 lbs. radial, axial

Resolutions  $> 1024$  PPR: 40 lbs. radial, axial

#### Shaft Speed:

Resolutions  $\leq 1024$  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:**  $3.0 \times 10^{-4}$  oz-in-sec<sup>2</sup>

**Housing and Cover:** Aluminum

**Shaft Material:** Stainless Steel

**Disk Material:** Glass or plastic (PPR Dependant)

**Weight:** 10 oz. max.

### 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:** NEMA12/IP54 (dirt tight, splashproof); NEMA4/IP66 (dust proof, wash-down) when ordered with shaft seal and either M12 connector or watertight cable exit

## Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Housing	Code 4: Shaft	Code 5: Face Mount	Code 6: Pilot, Seal	Code 7: Electrical	Code 8: Termination	Code 9: Options
<b>H2</b> □ □ □ □ □ □ □ □ □ □								
Ordering Information								
<b>1</b> Unidirectional <b>2</b> Bidirectional <b>3</b> Bidirectional with Index	<b>0001 0600</b> <b>0005 0800</b> <b>0010 0900</b> <b>0012 1000</b> <b>0050 1024</b> <b>0060 1200</b> <b>0100 1250</b> <b>0120 1270</b> <b>0200 1500</b> <b>0240 1600</b> <b>0250 1800</b> <b>0256 1968</b> <b>0300 2000</b> <b>0360 2048</b> <b>0400 2400</b> <b>0500 2500</b> <b>0512 2540</b>	<b>0</b> Servo Mount <b>1</b> Flange Mount	<b>0</b> 3/8" Dia. Shaft with flat <b>1</b> 1/4" Dia. Shaft, no flat <b>4</b> 10mm Dia. Shaft, no flat	<b>0</b> no face mount available when Code 3 is 0: <b>1</b> (4) #10-32 @ 1.63" BC <b>2</b> (3) #4-40 @ 1.50" BC <b>3</b> (3) #6-32 @ 1.75" BC available when Code 3 is 1: <b>4</b> (4) #6-32 @ 2.00" BC	<b>0</b> 1.18" Dia. Female Pilot <b>1</b> 1.25" Dia. Male Pilot <b>2</b> 1.25" Dia. Male Pilot with Shaft Seal <b>3</b> 0.69" Dia. Male Pilot <b>4</b> 0.69" Dia. Male Pilot with Shaft Seal	<b>0</b> 5-26V in, 5-26V Open Collector out <b>1</b> 5-26V in, 5-26V Open Collector out with 2.2 kΩ Pullups <b>2</b> 5-26V in, 5-26V Push-Pull out <b>A</b> Same as "0" with extend. temp range <b>B</b> Same as "1" with extend. temp range <b>C</b> 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: <b>3</b> 5-26V in, 5-26V Differential Line Driver out (7272) <b>4</b> 5-26V in, 5V Differential Line Driver out (7272) <b>5</b> 5-26V in, 5V Differential Line Driver out (4469) <b>6</b> 5-15V in, 5-15V Differential Line Driver out (4469) <b>D</b> Same as "3" with extend. temp range <b>E</b> Same as "4" with extend. temp range	<b>0</b> 6 Pin Conn, End Mount <b>1</b> 6 Pin Conn, Side Mount <b>2</b> 7 Pin Conn, End Mount <b>3</b> 7 Pin Conn, Side Mount <b>4</b> 10 Pin Conn, End Mount <b>5</b> 10 Pin Conn, Side Mount <b>6</b> 18" Cable, End Exit <b>7</b> 18" Cable, Side Exit <b>8</b> 36" Cable, End Exit <b>9</b> 36" Cable, Side Exit <b>A</b> 10' Cable, End Exit <b>B</b> 10' Cable, Side Exit <b>J</b> 25' Cable, End Exit <b>K</b> 25' Cable, Side Exit <b>N</b> 5 Pin M12 Connector, End Mount <b>P</b> 5 Pin M12 Connector, Side Mount <b>Q</b> 8 Pin M12 Connector, End Mount <b>R</b> 8 Pin M12 Connector, Side Mount available when Code 6 is 2 or 4: <b>C</b> 18" Sealed Cbl, End Exit <b>D</b> 18" Sealed Cbl, Side Exit <b>E</b> 36" Sealed Cbl, End Exit <b>F</b> 36" Sealed Cbl, Side Exit <b>G</b> 10' Sealed Cbl, End Exit <b>H</b> 10' Sealed Cbl, Side Exit <b>L</b> 25' Sealed Cbl, End Exit <b>M</b> 25' Sealed Cbl, Side Exit	available when Code 8 is 0 to 5: <b>PS</b> LED Output Indicator

### Cable Assemblies with MS Connector\*

- 108594-XXXX** 6 Pin MS, Cable Assy. For Use with Single Ended Outputs
- 108595-XXXX** 7 Pin MS, Cable Assy. For Use with Single Ended 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
- 109209-XXXX** NEMA4 10 pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

### 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

### Mating Connectors (no cable)

- MCN-N4** 6 pin, style MS3106A-14S-6S
- MCN-N5** 7 pin, style MS3106A-16S-1S
- MCN-N6** 10 pin, style MS3106A-18-1S
- MCN-N6N4** 10 pin, NEMA4 style

\*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 H20



## CONNECTIONS

### 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. Models with direct cable exit carry the color coding as shown in the right hand column.

Table 1									
Encoder Function	Cable # 108594-XXXX 6 Pin Single Ended		Cable # 108595-XXXX 7 Pin Single Ended		Cable # 108596-XXXX 7 Pin Dif Line Driver w/o Index		**Cable # 109209-XXXX or 1400635XXXX 10 Pin Dif Line Driver w/ Index		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN	BRN
Sig. B	D	ORN	B	ORG	B	ORG	B	ORG	ORG
Sig. Z*	C	YEL	C	YEL	—	—	C	YEL	YEL
Power +V	B	RED	D	RED	D	RED	D	RED	RED
Com	A	BLK	F	BLK	F	BLK	F	BLK	BLK
Case	—	—	G	GRN	G	GRN	G	GRN	GRN
N/C	F	—	E	—	—	—	E	—	—
Sig. A	—	—	—	—	C	BRN/WHT	H	BRN/WHT	BRN/WHT
Sig. B	—	—	—	—	E	ORG/WHT	I	ORG/WHT	ORG/WHT
Sig. Z*	—	—	—	—	—	—	J	YEL/WHT	YEL/WHT

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

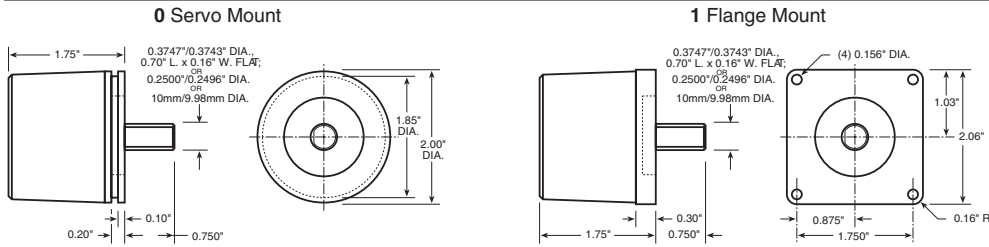
Connector pin numbers and cable assembly wire color information is provided here for reference.

Table 2						
Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 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. A	—	—	—	—	3	BRN/WHT
Sig. B	—	—	—	—	5	ORG/WHT
Sig. Z*	—	—	—	—	8	YEL/WHT

- 1) Cable Configuration (**Table 1**): 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; 24 AWG conductors, minimum
- 3) 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
- 4) \*Index not provided on all models. See ordering information.
- 5) \*\*For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX
- 6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 7) "M12" Cable assemblies are rated IP67

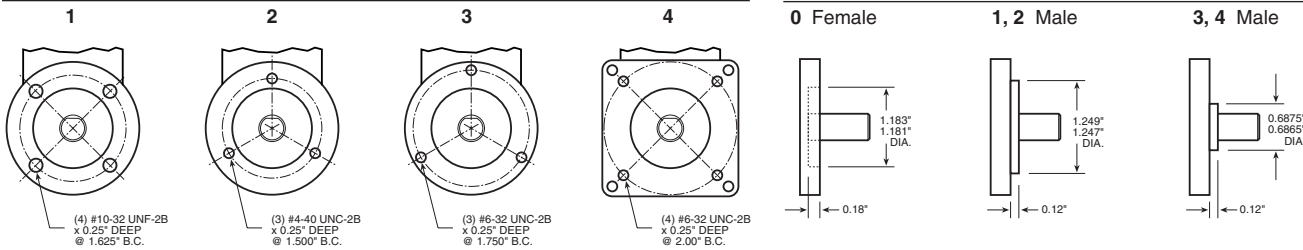
**DIMENSIONS**

**Code 3: Housings**

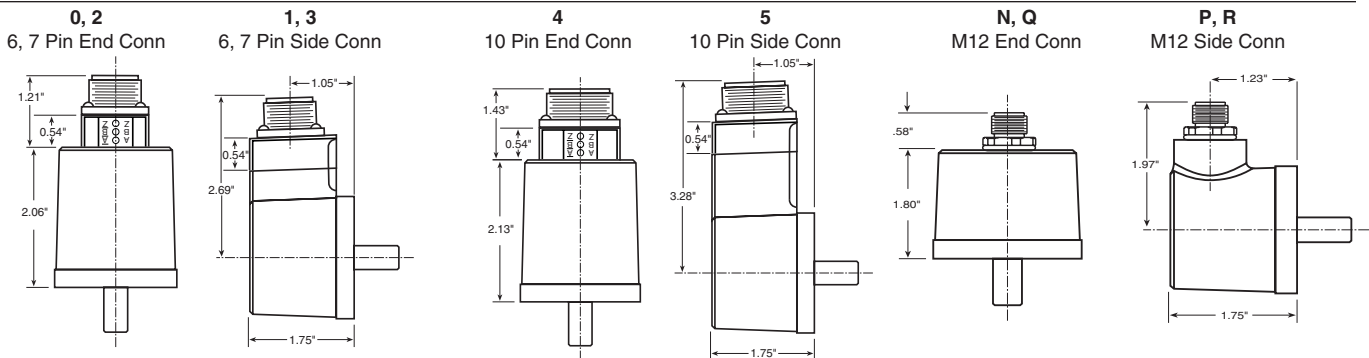


**Code 5: Face Mounts**

**Code 6: Pilots**



**Code 8: Terminations**



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

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

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

