

# SERIES HC20

**Dynapar™ brand**

## For Stepper & Small Servo Motors

### Key Features

- Economical Servomotor Feedback with New Phased Array ASIC
- High 120°C Operating Temperature Won't Limit Motor Performance
- Up to 2500PPR Direct-Read with Commutation Channels



**NEW!**



## SPECIFICATIONS

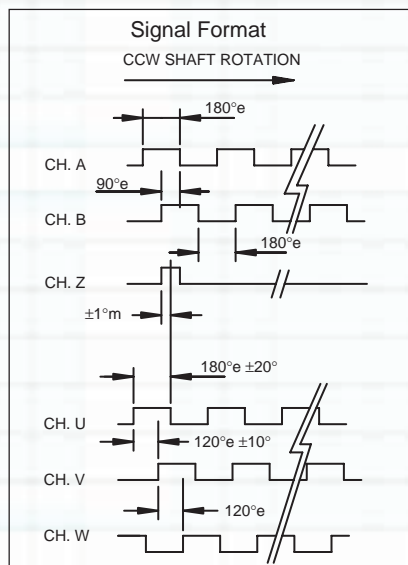
### STANDARD OPERATING CHARACTERISTICS

- Code:** Incremental  
**Resolution:** 500 to 2500 PPR  
**Commutation:** 4/6/8 pole  
**Format:** Two channel quadrature (AB) with optional Index (Z) and complementary outputs  
**Phase Sense:** Phasing for CCW rotation of motor shaft (viewing from encoder cover side): A leads B by 90° ± 22.5° electrical, and U leads V leads W by 120°  
**Accuracy:**  
 • Incremental: 40 arc-sec. max. edge to any edge;  
 • Commutation: ±6 arc minutes max.  
**Index:** 90° electrical (gated A and B high)  
**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pF  
**Connection:**

Pin	Signal	Color
1	Vcc	Red
2	U	Brown
3	GND	Black
4	V	Gray
5	A	Blue
6	W	White
7	Ā	Blue/Black
8	N.C.	—
9	B	Green
10	Ū	Brown/Black
11	B̄	Green/Black
12	V̄	Gray/Black
13	Z	Violet
14	W̄	White/Black
15	Z̄	Violet/Black
16	N.C.	—

### ELECTRICAL

- Supply Voltage:** DC 5V ±10% (SELV)  
**Max. Current (w/o load):**  
 • Incremental: 150mA  
 • Incremental + Commutation: 175mA  
**Max. Output Frequency:**  
 • 250 kHz (up to 1024 ppr)  
 • 500 kHz (> 1024 ppr)  
**Signal Level:**  
 • NPN: Open Collector  
 • Differential Line Driver: RS 422  
**Output Current:** RS422: ±40 mA (26LS31); NPN O.C.: 16mA (2k. int. pull up)  
**Connection:** Axial or Raidal cable available



### MECHANICAL

- Weight:** 120g typical  
**Dimensions:**  
 • Outside Diameter with Cover: 50 mm  
 • Mounting Depth: 36mm  
**Material:**  
 • Bearing Housing: Aluminium;  
 • Cover: Aluminium;  
 • Shaft: Brass: 699477-0001  
**Shaft Style (dependant on model):**  
 • Blind Hole Shaft: 8.00mm dia; 20mm depth  
 • Hollow Shaft: 6.00 or 8.00mm dia  
 • Taper Shaft: 9.00mm dia. nominal; 2.8624°+0.2289/- 0 Taper  
**Mating Shaft Runout:** ±0.2mm max. (Includes shaft perpendicularity to mounting surface)  
**Mating Shaft Axial Movement:** max. ±0.8mm.  
**Max. Velocity:** RPM= (Frequency/PPR) x 60 or 2000 min<sup>-1</sup>, whichever is less

### ENVIRONMENTAL

- Operating Temperature:** 0...+120°C  
**Storage Temperature:** -40...+120°C  
**Shock Resistance:** 1000 m/s<sup>2</sup> (6 ms)  
**Vibration Resistance:** 25 m/s<sup>2</sup> (5...2000 Hz)  
**Protection Class:** IP51 (cable must be oriented downwards)

### Ordering Information

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

Code 1: Model	Code 2: PPR Incremental <sup>2</sup>	Code 3: Poles Commutation <sup>2</sup>	Code 4: Mounting	Code 5: Electrical <sup>1</sup>	Code 6: Shaft	Code 7: Connection																																																		
<b>HC20</b>	□□□□	□	□	□	□	□																																																		
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<b>HC20</b> Compact Hollowshaft Encoder	<b>0500 2000</b> <b>0512 2048</b> <b>1000 2500</b> <b>1024</b>	<b>0</b> None <b>4</b> 4 Pole <b>6</b> 6 Pole <b>8</b> 8 Pole	<b>0</b> No tether <b>Tether</b> <b>1</b> 1.575" (40mm) TK <b>2</b> 2.166" (55mm) TK	incremental only, <math>\leq 2048/0</math> (ppr/poles) <b>0</b> $U_{inc} = DC 5V$ ; output <sub>inc</sub> = NPN-O.C. incremental only without commutation <b>2</b> $U_{inc} = DC 5-26V$ ; output <sub>inc</sub> = RS 422 <b>3</b> $U_{inc} = DC 5V$ ; output <sub>inc</sub> = RS 422 incremental plus commutation signals <b>6</b> $U_{inc} = DC 5V$ ; output <sub>inc</sub> = RS 422 $U_{com} = DC 5V$ ; output <sub>com</sub> = NPN-O.C. <b>9</b> $U_{inc} = DC 5V$ ; output <sub>inc</sub> = RS 422 $U_{com} = DC 5V$ ; output <sub>com</sub> = RS 422	<b>0</b> Taper shaft(Ø9,1:10) <b>1</b> Blind vertical shaft Ø6 <b>2</b> Blind vertical shaft Ø8 <b>3</b> Hollow shaft Ø6 <b>4</b> Hollow shaft Ø8	<b>Axial plug</b> <b>1</b> 1 Ft. cable <b>2</b> 2 Ft. cable <b>3</b> 3 Ft. cable <b>4</b> 4 Ft. cable <b>5</b> 5 Ft. cable <b>6</b> 6 Ft. cable <b>7</b> 7 Ft. cable <b>8</b> 8 Ft. cable																																																		
	<b>Radial plug</b> <b>A</b> 1 Ft. cable <b>B</b> 2 Ft. cable <b>C</b> 3 Ft. cable <b>D</b> 4 Ft. cable <b>E</b> 5 Ft. cable <b>F</b> 6 Ft. cable <b>G</b> 7 Ft. cable <b>H</b> 8 Ft. cable																																																							
<table border="1" style="width: 100%;"> <thead> <tr> <th colspan="5">Available Combinations (PPR/Poles)</th> </tr> <tr> <th></th> <th colspan="4">Number of Poles</th> </tr> <tr> <th>Incremental PPR</th> <th>0</th> <th>4</th> <th>6</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>0500</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>0512</td> <td></td> <td></td> <td></td> <td>x</td> </tr> <tr> <td>1000</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>1024</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>2000</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>2048</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>2500</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> </tbody> </table>							Available Combinations (PPR/Poles)						Number of Poles				Incremental PPR	0	4	6	8	0500	x	x	x	x	0512				x	1000	x	x	x	x	1024	x	x	x	x	2000	x	x	x	x	2048	x	x	x	x	2500	x	x	x	x
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1  $U_{inc}$ : Supply voltage incremental,  $U_{com}$ : Supply voltage commutation (only if commutation is selected); 2 See available combinations (pulses/poles)

### Dimensions (mm)

