

SERIES F14

Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

- Easy to install non-marring hollowshaft design with flex tether
- Up to 5000PPR for smooth low-speed motor control
- Up to 120C temperature range doesn't limit motor performance



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental with commutation option, Optical
Resolution: 200, 400, 500, 1000, 1024, 2000, 2048, 2500, 4096, 5000 PPR incremental with 4, 6 and 8 pole commutation channels
Accuracy: Incremental: ± 2.5 arc-mins. max. edge to any edge; Commutation: ± 6 arc-mins. max.
Phasing for CCW rotation of motor shaft (viewing encoder cover): A leads B by 90° and U leads V leads W by 120° .
Minimum edge separation A to B is 45° .
Index to U channel: ± 1 mech. index pulse center to U channel edge.
Index Pulse Width: 90° gated A and B high; (180° gated B high gating options available - consult factory)

ELECTRICAL

Input Power Requirements: $5 \pm 10\%$ VDC at 150 mA max (incremental only); 175 mA max. (incremental and commutation), excluding output load
Output Signals:
 Line Driver: sink / source 40 mA max.,
 Open Collector Incremental (≤ 1024 PPR): 16 mA sink max.
 Open Collector Commutation: 30 mA sink max. (2.0 k Ω pull-ups in encoder)

Frequency Response:

PPR ≤ 1024 : 250 kHz; PPR > 1024 : 500 kHz
Termination: 16 pin, fully shielded, 2mm pitch, double row header. Accessory mating cable assembly available: 26 AWG twisted pair, jacketed and shielded with copper drain wire

MECHANICAL

Weight: 1.6 oz. (45gm) typ.
Dimensions: Outside Diameter with cover: 1.55" (39.8mm), without cover 1.45" (36.8mm); Outside collar height 1.36" (34.6mm), inside collar height 1.28" (32.4mm)
Material: Bearing housing: aluminum; Cover: high temperature, glass filled polymer; Hub: Brass; Disk: 0.030" thick glass
Finish: Cover: RAL 7010 (dark grey)
Moment of Inertia: 8.2×10^{-5} in-oz sec.² (5.8 gm-cm²)
Hub Diameters: 1/4", 6mm, 8mm standard
Bore Dia. Tolerance: $+0.001" / -0.000"$ ($+0.025$ mm/ -0.000 mm)
Mating Shaft Length: 1.35" (34.3 mm) minimum for outside shaft collar. 0.50 inch minimum for inside shaft collar
Mating Shaft Runout: 0.002" (0.05 mm) max. (Includes shaft perpendicularity to mounting surface)
Mating Shaft Axial movement: $\pm 0.060"$ (± 1.52 mm)

Mounting: Two standard configurations are available for tethers. A choice of U.S. or Metric screws are included. Mounting holes should be 0.01" (0.254 mm) true position to shaft for best encoder operation.

Shaft clamp: 2 #6-32 set screws in collar around hub shaft (will not mar shaft)

Electrical/Mechanical Alignment Range: $\pm 15^\circ$ mechanical typical (see tether options)

Acceleration: 100,000 rad/sec.² max.

Max. Velocity: RPM = (Frequency / PPR) x 60; or 12,000 RPM, whichever is less;

Bearing Life: $[(1.4 \times 10^9) / \text{RPM}]$ Hours ; e.g. 230,000 hours @ 6,000 RPM

(Based on bearing manufacturer's suggested calculation for 6801ZZ with 44N equivalent dynamic load - including preload and tether reaction loads - at 6000 RPM continuous with adequate lubrication)

ENVIRONMENTAL

Operating Temperature: 0° to $+120^\circ\text{C}$

Storage Temperature: -40° to $+120^\circ\text{C}$

Shock: 100 Gs for 6 msec duration

Vibration: 2.5 Gs at 5 to 2000 Hz

Relative Humidity: 90% non-condensing

Enclosure Rating: NEMA 1 / IP40 (for models with cover)



Satellite Locations:

- **North America:** North Carolina, South Carolina, Connecticut, Massachusetts, New York, Canada, British Virgin Islands
- **West Indies:** St. Kitts • **Europe:** United Kingdom, Italy, France, Germany, Spain, Slovakia
- **South America:** Brazil • **Asia:** China, Japan, Korea, Singapore

Worldwide Brands: NorthStar™ • Acuro™ • Dynapar™ • Hengstler™ • Harowe™

Headquarters: 1675 Delany Road • Gurnee, IL 60031-1282 • USA • Phone: 1.847.662.2666 • Fax: 1.847.662.6633

Customer Service:

Tel.: +1.800.873.8731

Fax: +1.847.662.4150

custserv@dynapar.com

Technical Support

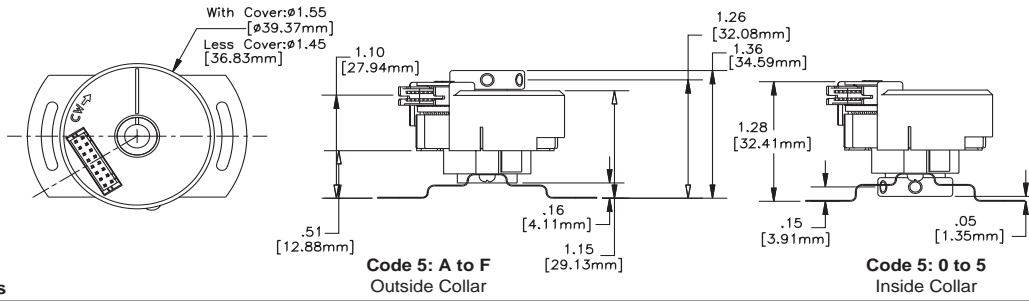
Tel.: +1.800.234.8731

Fax: +1.847.782.5277

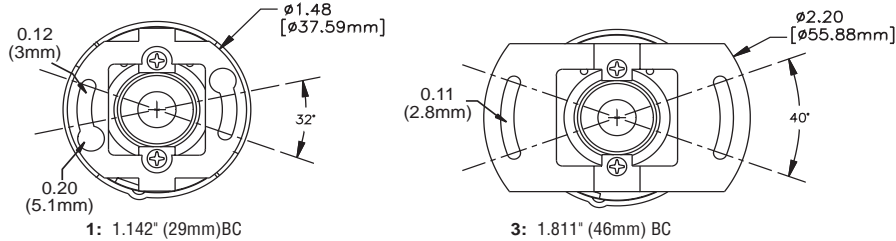
dynapar.techsupport@dynapar.com

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Dimensions



Code 3: Tethers

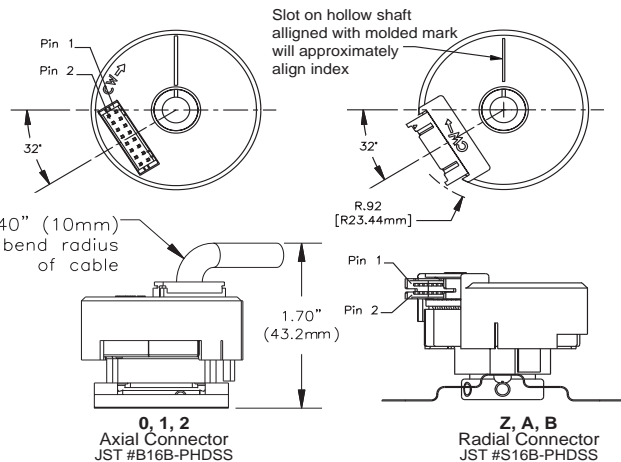
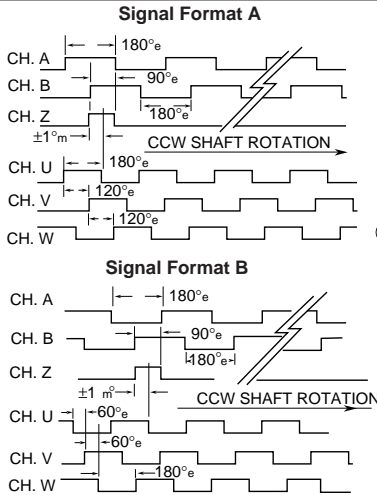


Electrical Connections

Pin	Function*	Cable Wire Color
1	VCC	RED
2	U	Brown
3	GND	BLACK
4	V	GRAY
5	A	BLUE
6	W	WHITE
7	A	BLUE/BLACK
8	NONE	NONE
9	B	GREEN
10	U	BROWN/BLACK
11	B	GREEN/BLACK
12	V	GRAY/BLACK
13	Z	VIOLET
14	W	WHITE/BLACK
15	Z	VIOLET/BLACK
16	NONE	NONE

* Function availability dependant on Model
Mating Cable Assembly:
 Incremental only, 111752-000x
 Incremental + Comm., 111753-000x
 x= length in feet

Output Waveforms



Ordering Information

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

Code 1: Model	Code 2: PPR, Poles	Code 3: Tether	Code 4: Electrical	Code 5: Shaft/Bore	Code 6: Termination
F14	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Ordering Information																																																	
F14	Size 14 Commutating Encoder	Incremental channels only	0 No Tether 1 2 #2 on 1.181" Diameter 3 2 #4 on 1.811" Diameter 6 2 M2.5 on 30 mm Diameter 8 2 M3 on 46 mm Diameter	Available when Code 2 is ≤ 1024/0 0 5V in, open collector out incremental only - Format A C 5V in, open collector out incremental only - Format B Available when Code 2 is XXXX/0 3 5V in, line driver out incremental only - Format A D 5V in, line driver out incremental only - Format B Available when Code 2 is XXXX/4, XXXX/6, or XXXX/8 6 5V in, line driver out incr.; 5V in, open collector out comm. Format A E 5V in, line driver out incr.; 5V in, open collector out comm. - Format B 9 5V in, line driver out incr.; 5V in, line driver out comm. Format A F 5V in, line driver out incr.; 5V in, line driver out comm. - Format B	Inside Collar: 0 1/4 in. 4 6 mm 5 8 mm Outside Collar: A 1/4 in. E 6 mm F 8 mm	<table border="1"> <thead> <tr> <th colspan="3">Code</th> <th rowspan="2">Length</th> </tr> <tr> <th>Connector/Cable</th> <th>Wire</th> <th></th> </tr> </thead> <tbody> <tr><td>0</td><td>Z</td><td>N/A</td><td>None</td></tr> <tr><td>1</td><td>A</td><td>J</td><td>1 Ft.</td></tr> <tr><td>2</td><td>B</td><td>K</td><td>2 Ft.</td></tr> <tr><td>3</td><td>C</td><td>L</td><td>3 Ft.</td></tr> <tr><td>4</td><td>D</td><td>M</td><td>4 Ft.</td></tr> <tr><td>5</td><td>E</td><td>N</td><td>5 Ft.</td></tr> <tr><td>6</td><td>F</td><td>P</td><td>6 Ft.</td></tr> <tr><td>7</td><td>G</td><td>Q</td><td>7 Ft.</td></tr> <tr><td>8</td><td>H</td><td>R</td><td>8 Ft.</td></tr> </tbody> </table>	Code			Length	Connector/Cable	Wire		0	Z	N/A	None	1	A	J	1 Ft.	2	B	K	2 Ft.	3	C	L	3 Ft.	4	D	M	4 Ft.	5	E	N	5 Ft.	6	F	P	6 Ft.	7	G	Q	7 Ft.	8	H	R	8 Ft.
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† Available with 4, 6 or 8 pole.
 e.g. 1000/6 is 1000PPR with 6 poles