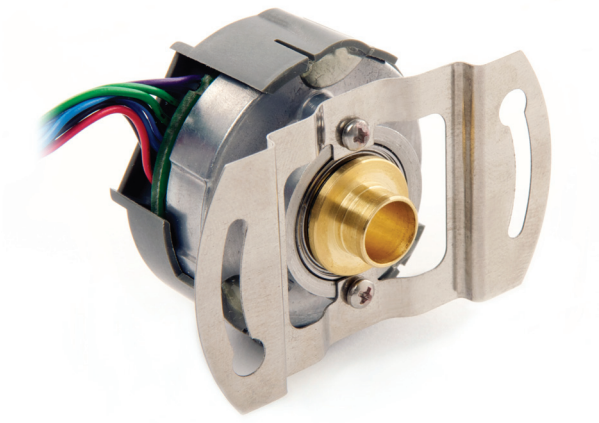
SERIES F14

Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

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



Product shown with optional flex tether

RoHS

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental with commutation option, Optical
Resolution: 1000 - 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±10% VDC at 150 mA max (incremental only); 175 mA max. (incremental and commutation), excluding output load
Output Signals:
Incremental: 26LC31 Differential Line Driver, sink / source 40 mA max.
Commutation: Open Collector Commutation 30 mA sink max. (2.0 kΩ pull-ups in encoder)
Frequency Response:
PPR ≤ 1000: 250 kHz; PPR > 1000: 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

Bore Diameters: 1/4", 6mm, 8mm standard
Bore Dia. Tolerance: +0.001"/-0.000" (+0.025 mm/-0.000 mm)
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)
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: ±0.060" (±1.52 mm)
Mounting Configuration: 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:
±15° 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
Moment of Inertia: 8.2X10^{-5} in-oz sec.^{2} (5.8 gm-cm^2)
Housing & Cover Material: Bearing housing: aluminum; Cover: high temperature, glass filled polymer;
Hub: Brass; Disk: 0.030" thick glass; Cover Finish: RAL 7010 (dark grey)
Weight: 1.6 oz. (45gm) typ.

ENVIRONMENTAL

Operating Temperature: 0° to +120°C
Storage Temperature: -40° to +120°C
Shock: 100 Gs for 6 msec duration
Vibration: 2.5 Gs at 5 to 2000 Hz
Humidity: 90% (non-condensing)
Enclosure Rating: NEMA 1 / IP40 (for models with cover)

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

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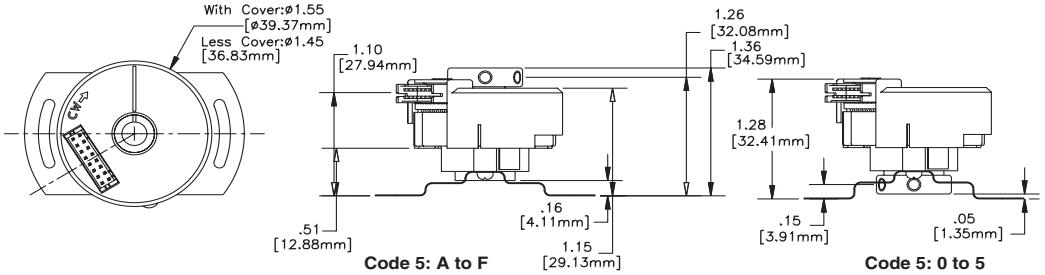
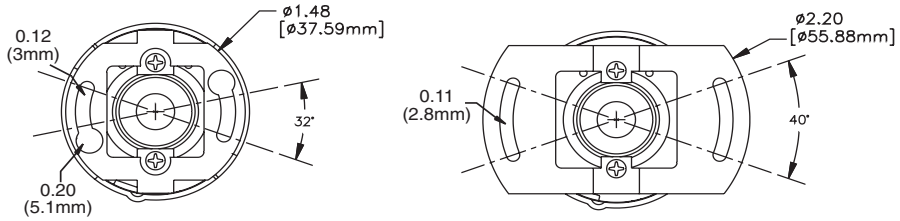
Dimensions



Code 5: A to F
Outside Collar

Code 5: 0 to 5
Inside Collar

Code 3: Tethers



1: 1.142" (29mm)BC

3: 1.811" (46mm) BC

Electrical Connections

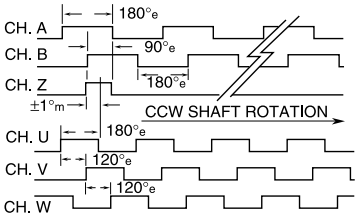
Pin	Function*	Cable Wire Color
1	VCC	RED
2	U	Brown
3	GND	BLACK
4	V	GRAY
5	A	BLUE
6	W	WHITE
7	$\bar{A}$	BLUE/BLACK
8	NONE	NONE
9	B	GREEN
10	$\bar{U}$	BROWN/BLACK
11	$\bar{B}$	GREEN/BLACK
12	$\bar{V}$	GRAY/BLACK
13	Z	VIOLET
14	$\bar{W}$	WHITE/BLACK
15	$\bar{Z}$	VIOLET/BLACK
16	NONE	NONE

* Function availability dependant on Model

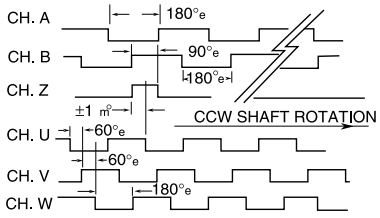
Mating Cable Assembly:
Incremental only, 111752-000x
Incremental + Comm., 111753-000x
x= length in feet

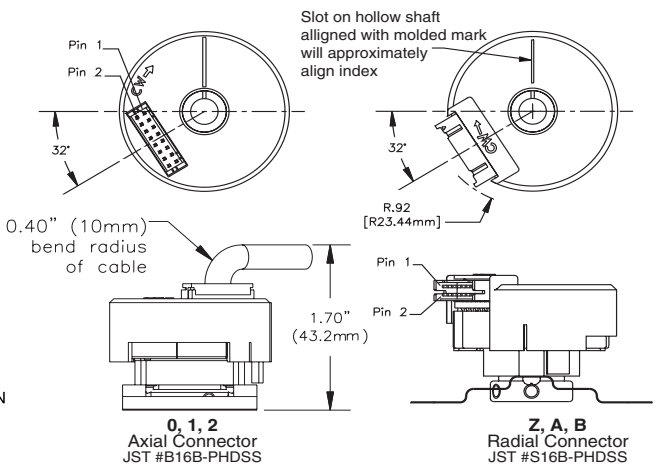
Output Waveforms

Signal Format A



Signal Format B





0, 1, 2
Axial Connector
JST #B16B-PHDSS

Z, A, B
Radial Connector
JST #S16B-PHDSS

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: Bore	Code 6: Termination
F14	□□□□/□	□	□	□	□

Ordering Information

F14 Size 14 Commutating Encoder

Incremental channels only

1000/0	**2500/0**
2000/0	**4096/0**
2048/0	**5000/0**

Incremental plus Commutation channels

1000/†	**2500/†**
2000/†	**4096/†**
2048/†	**5000/†**

† Available with 4, 6 or 8 pole.
e.g. 1000/6 is 1000PPR with 6 poles

Code 3: Tether

- **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

Code 4: Electrical

Available when Code 2 is ≤ 1024/0
- **0** 5V in, open collector out incremental only - Formzat 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

Code 5: Bore

Inside Collar:
- **0** 1/4 in.
- **4** 6 mm
- **5** 8 mm

Outside Collar:
- **A** 1/4 in.
- **E** 6 mm
- **F** 8 mm

Code 6: Termination

Code: Connector/Cable Axial	Code: Connector/Cable Radial	Code: Wire Pigtail	Length
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.

CONNECTION OPTIONS

You may choose an integral connector mounted in axial or radial position. Available with or without mating connector/cable.

Alternativly, a direct-solder pigtail cable is offered.