SERIES F21

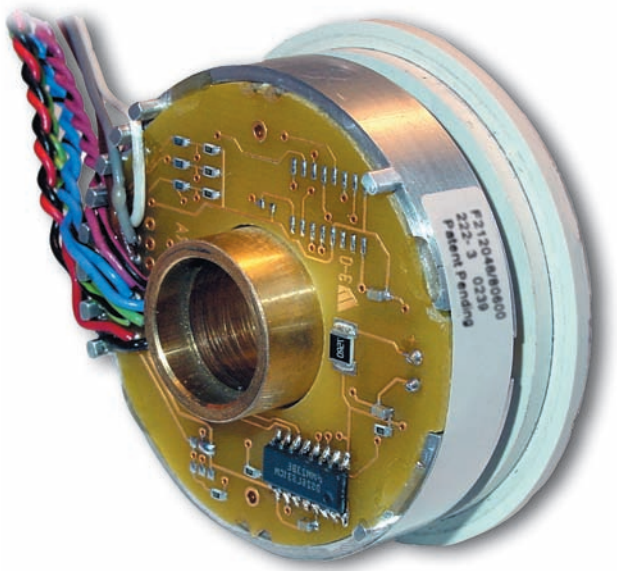
Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

- **Digital Encoder with Flex Servo Ring easily Replaces Size 21 Resolver**
- **Short Mounting Depth with Jam Nut Shaft Fixing makes Installation Easy**
- **Up to 2048PPR with Commutation Channels**

RoHS



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental with commutation option, Optical
Resolution: 1024 or 2048 PPR incremental with 8 or 10 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 :
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 rising edge.
Index Pulse Width: 90° gated A and B high

ELECTRICAL

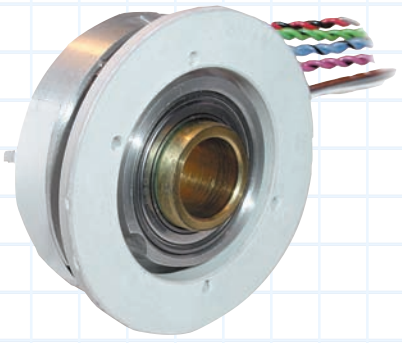
Input Power Requirements: 5±10% VDC at 100 mA max (incremental and commutation), excluding output load
Output Signals:
Incremental: 26LS31 Differential Line Driver, sink / source 40 mA max.
Commutation: Open Collector w/2.0 kΩ pull-ups, 8 mA sink max.; or 26LS31 Differential Line Driver, sink / source 40 mA max.
Frequency Response: 300 kHz, max.
Termination: Flying leads, stranded 26 AWG, twisted pair, PVC insulation, 6.5" length ±0.5"

MECHANICAL

Weight: 3.5 oz. (90 gm) typ.
Dimensions: Outside Diameter : 2.062" (52.4mm), max.; Height: 1.01" (25.65mm), max.
Material: Housing: cast-aluminum;
Servo Ring: glass reinforced engineering resin; Hub: Brass; Disk: 0.030" (0.76mm) thick glass
Moment of Inertia: $2.66X10^{-4}$ in-oz-sec.^{2} (18.8 gm-cm^2)
Bore Diameter: 0.50" (12.7mm)
Bore Dia. Tolerance: +0.001"/-0.000" (+0.025 mm/-0.000 mm)
Mating Shaft Runout: 0.002" (0.05 mm) max. (Includes shaft perpendicularity to mounting surface)
Mating Shaft Axial movement: ±0.010" (±0.25 mm), max.
Mounting: 2.047" (51.99mm) servo ring with integral flexure (size 21 pancake resolver equivalent)
Acceleration: 100,000 rad/sec.^{2} max.
Velocity: 5,000 RPM continuous; 12,000 RPM peak
Bearing Life:[(3.6×10^9) / RPM] Hours ; e.g. 605,000 hours @6,000 RPM

ENVIRONMENTAL

Operating Temperature: 0° to +120°C
Storage Temperature: 0° to +120°C
Shock: 50 Gs for 6 msec duration
Vibration: 2.5 Gs at 5 to 2000 Hz
Relative Humidity: 90% non-condensing



Servo ring mounting with integral flexure is size 21 pancake resolver equivalent

DYNAPAR™
INNOVATION - CUSTOMIZATION - DELIVERY

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

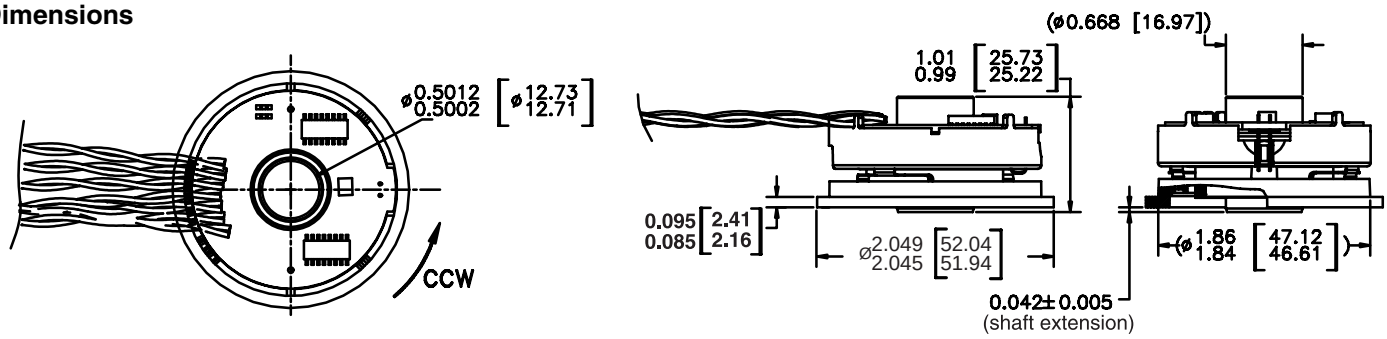
Customer Service:
Tel.: +1.800.873.8731
Fax: +1.847.662.4150
custserv@dynapar.com

Technical Support
Tel.: +1.800.234.8731
Fax: +1.847.782.5277
dynapar.techsupport@dynapar.com

Dynapar™ brand is a trademark of DYNAPAR. All rights reserved.
Specifications subject to change without notice.
Document No. 702457-0002, Rev.– ©2010 Dynapar

Dynapar™ brand SERIES F21

Dimensions

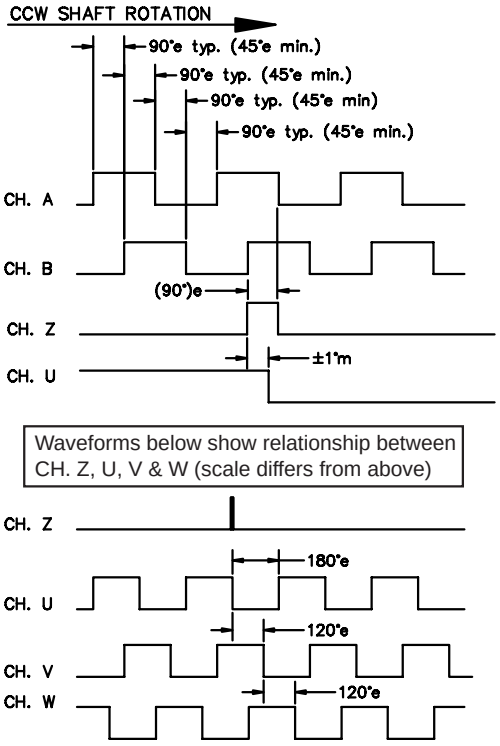


Connections

Function*	Cable Wire Color
VCC	RED
GND	BLACK
$\overline{A}$	BLUE/BLACK
A	BLUE
$\overline{B}$	GREEN/BLACK
B	GREEN
$\overline{Z}$	VIOLET/BLACK
Z	VIOLET
$\overline{U}$	BROWN/BLACK
U	BROWN
$\overline{V}$	GRAY/BLACK
V	GRAY
$\overline{W}$	WHITE/BLACK
W	WHITE

* Function availability dependant on Model

Waveforms



Waveforms below show relationship between CH. Z, U, V & W (scale differs from above)

Ordering Information

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

Code 1: Model	Code 2: PPR, Poles	Code 3: Mount	Code 4: Electrical	Code 5: Shaft/Bore	Code 6: Termination
F21	□□□□/□	**0**	□	**3**	**0**

Ordering Information

F21 Size 21 Commutating Encoder	Incremental channels only **1024/0** **2048/0** Incremental plus Commutation channels **1024/8** Note: "C"= 10 poles. **2048/8** Consult factory for **1024/C** other configurations **2048/C**	**0** Servo mount 2.047 Diameter x.090 thick	Available when Code 2 is XXXX/0 **3** 5V in, line driver out incremental only Available when Code 2 is XXXX/8 or C **6** 5V in, line driver out for incremental; 5V in, open collector out for commutation **9** 5V in, line driver out for incremental; 5V in, line driver out for commutation	**3** 1/2 in. thru bore	**0** 6.5" ±0.5" Twisted Pair Flying Leads