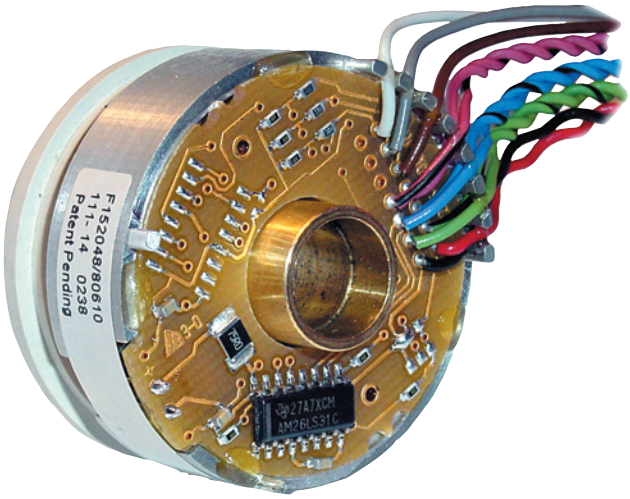
Series F15 Technical Bulletin



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DESCRIPTION

The Dynapar brand Series F15 encoder provides high performance, cost effective feedback for stepper and servo motor applications. The F15 offers compact package dimensions and flying leads for a low-profile installation. A size 15 servo ring allows easy mounting and replacement of pancake resolvers with high tolerance to motor shaft movement and 360 degrees of adjustment to align the signal outputs to the shaft position.

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental with commutation option, Optical
Resolution: 1024 or 2048 PPR incremental with 6 or 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 : 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

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: 1.6 oz. (45 gm) typ.
Dimensions: Outside Diameter : 1.45" (36.8mm), max.; Height: 0.87" (22.1mm), max.
Material: Housing: cast-aluminum; Servo Ring: glass reinforced engineering resin; Hub: Brass; Disk: 0.030" (0.76mm) thick glass
Moment of Inertia: $3.59X10^{-5}$ in-oz-sec.^{2} (2.5 gm-cm^2)
Bore Diameter: 0.375" (9.53mm)
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: 1.435" (36.45mm) servo ring with integral flexure (size 15 pancake resolver equivalent)
Acceleration: 100,000 rad/sec.^{2} max.
Velocity: 5,000 RPM continuous; 12,000 RPM peak
Bearing Life:[(3.6 X 10^9) / RPM] Hours ; e.g. 605,000 hours @6,000 RPM

ENVIRONMENTAL

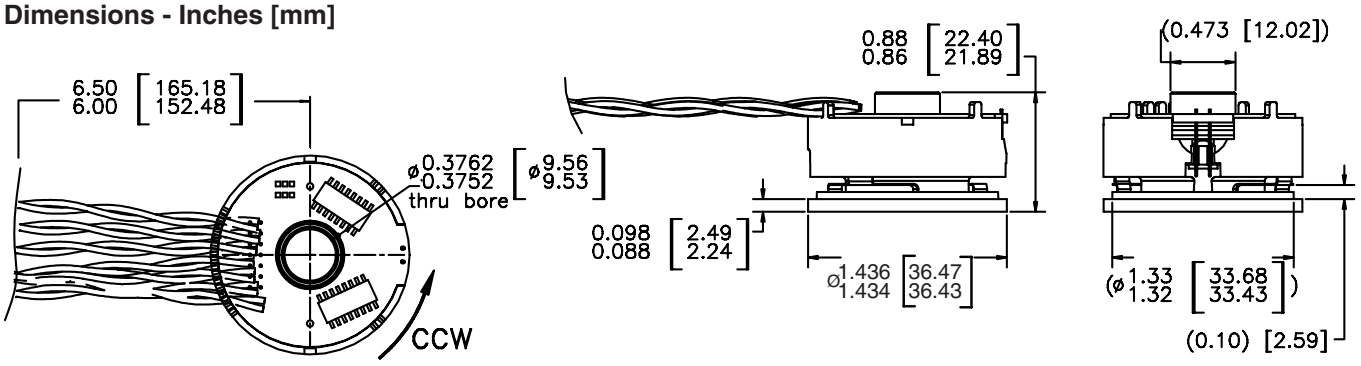
Operating Temperature: 0° to +120°C
Storage Temperature: 0° to +120°C
Shock: 50 Gs for 6 msec duration
Vibration: 2.5 Gs at 5 to 2000 Hz
Relative Humidity: 90% non-condensing

Ordering Information

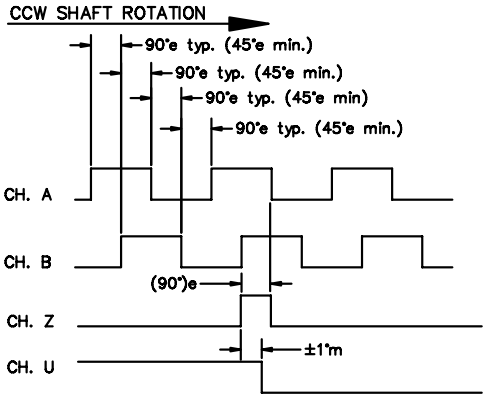
To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR, Poles	Code 3: Mount	Code 4: Electrical	Code 5: Shaft/Bore	Code 6: Termination
F15	□□□□/□	**0**	□	**1**	**0**
Ordering Information					
F15 Size 15 Commutating Encoder	Incremental channels only **1024/0** **2048/0** Incremental plus Commutation channels **1024/6** **2048/6** **1024/8** **2048/8** Consult factory for other configurations	**0** Servo mount 1.435 Diameter x .095 thick	Available when Code 2 is XXXX/0 **3** 5V in, line driver out incremental only Available when Code 2 is XXXX/6 or 8 **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	**1** 3/8 in. thru bore	**0** 6.5" ±0.5" Twisted Pair Flying Leads

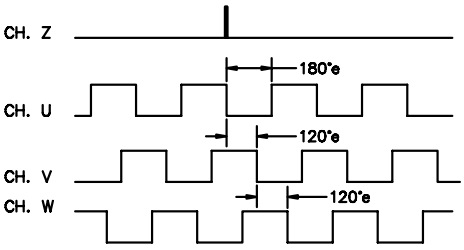
Dimensions - Inches [mm]



Waveforms



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



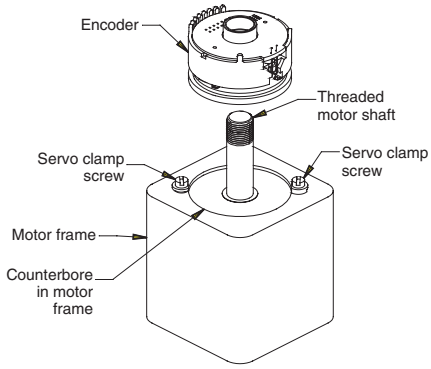
Electrical Connections

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

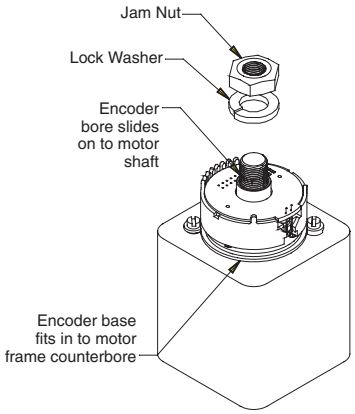
INSTALLATION INSTRUCTIONS (See figures Below)

1) Slide encoder onto motor shaft an allow base ring to seat onto motor housing.



2) Install washer and jam nut and tighten (250 in-lbs [28 N-m] max.).

3) Attach wire leads to drive termination (See Electrical Connections, left).



4) Adjust commutation signals by rotating encoder housing.

5) Tighten servo clamp screws onto base ring (torque depends on clamp screw used).