**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

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**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"

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**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-cm²)  
**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 10⁹) / RPM] Hours ; e.g. 605,000 hours @ 6,000 RPM

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**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

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

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**F15 Size 15 Commuting 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

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INSTALLATION INSTRUCTIONS (See figures Below)

1) Slide encoder onto motor shaft and 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).