The Dynapar brand Series F10 encoder provides high performance, cost effective feedback for stepper and servo motor applications. The F10 offers compact package dimensions and flying leads for a low-profile installation. A size 10 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.

**STANDARD OPERATING CHARACTERISTICS**

**Code:** Incremental with commutation option, Optical

**Resolution:** 1024 or 2048 PPR incremental with 6 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:** 26LC31 Differential Line Driver, sink / source 40 mA max.
- **Commutation:** Open Collector w/2.0 kΩ pull-ups, 8 mA sink max.; or 26LC31 Differential Line Driver, sink / source 40 mA max.

**Frequency Response:** 300 kHz, max.

**MECHANICAL**

- **Bore Diameter:** 6mm
- **Bore Dia. Tolerance:** +0.001”/-0.000” (+0.025 mm/-0.000 mm)
- **Dimensions:** Outside Diameter : 1.25” (31.7mm), max.; Height: 0.89” (24.1mm), max.
- **Mating Shaft Runout:** 0.002” (0.05 mm) max. (Includes shaft perpendicularity to mounting surface)
- **Mating Shaft Axial movement:** ±0.010” (±0.25 mm)
- **Mounting:** 1.030” (26.16mm) servo ring with integral flexure (size 10 pancake resolver equivalent)
- **Acceleration:** 100,000 rad/sec.² max.
- **Velocity:** 5,000 RPM continuous; 12,000 RPM peak
- **Moment of Inertia:** 2.22X10⁻⁵ in-oz-sec.² (1.6 gm-cm²)
- **Housing & Cover Material:** Housing: cast aluminum; Servo Ring: glass reinforced engineering resin; Hub: brass; Disc: 0.030” (0.76mm) thick glass
- **Weight:** 1.6 oz. (45 gm) typ.

**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
- **Humidity:** 90% (non-condensing)
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 (50 in-lbs [5 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).

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

<table>
<thead>
<tr>
<th>Cable Wire Color</th>
<th>Function*</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC</td>
<td>RED</td>
</tr>
<tr>
<td>GND</td>
<td>BLACK</td>
</tr>
<tr>
<td>A</td>
<td>BLUE/BLACK</td>
</tr>
<tr>
<td>A</td>
<td>BLUE</td>
</tr>
<tr>
<td>B</td>
<td>GREEN/BLACK</td>
</tr>
<tr>
<td>B</td>
<td>GREEN</td>
</tr>
<tr>
<td>Z</td>
<td>VIOLET/BLACK</td>
</tr>
<tr>
<td>Z</td>
<td>VIOLET</td>
</tr>
<tr>
<td>U</td>
<td>BROWN/BLACK</td>
</tr>
<tr>
<td>U</td>
<td>BROWN</td>
</tr>
<tr>
<td>V</td>
<td>GRAY/BLACK</td>
</tr>
<tr>
<td>V</td>
<td>GRAY</td>
</tr>
<tr>
<td>W</td>
<td>WHITE/BLACK</td>
</tr>
<tr>
<td>W</td>
<td>WHITE</td>
</tr>
</tbody>
</table>

* Function availability dependant on Model
### DIMENSIONS - Inches [mm]

![Dimensions Diagram]

### ORDERING

#### Ordering Information

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F10</td>
<td></td>
<td>0</td>
<td></td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>Model</th>
<th>Code 2</th>
<th>Code 3</th>
<th>Code 4</th>
<th>Code 5</th>
<th>Code 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>F10</td>
<td>1024/0</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2048/0</td>
<td></td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2048/6</td>
<td></td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

**Available when Code 2 is XXXX: 6**

- 5V in, line driver out for incremental; 5V in, open collector out for commutation

**Available when Code 2 is XXXX: 9**

- 5V in, line driver out for incremental; 5V in, line driver out for commutation

**Ordering Information**

- Size 10 Commutating Encoder
- Incremental channels only
- Servo mount 1.039 Diameter x .095 thick
- Available when Code 2 is XXXX: 3
- 5V in, line driver out incremental only
- Available when Code 2 is XXXX: 6
- 5V in, line driver out for incremental; 5V in, open collector out for commutation
- 5V in, line driver out for incremental; 5V in, line driver out for commutation
- 6mm thru bore
- 6.5" ±0.5" Twisted Pair Flying Leads

---

Application Assistance 1.800.234.8731 (847.662.2666)