

INCREMENTAL ENCODERS

SERIES F10

Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

- Digital Encoder Replaces size 10 Pancake Resolver
- Up to 2048 PPR with Commutation Tracks
- Up to 120°C Temperature Range Doesn't Limit Motor Performance

SSM
Servo Small Motor

SPECIFICATIONS

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 k Ω pull-ups, 8 mA sink max.; or 26LC31 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

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

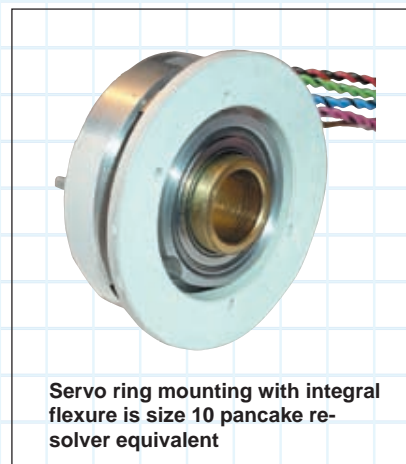
Operating Temperature: 0° to +120°C

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)



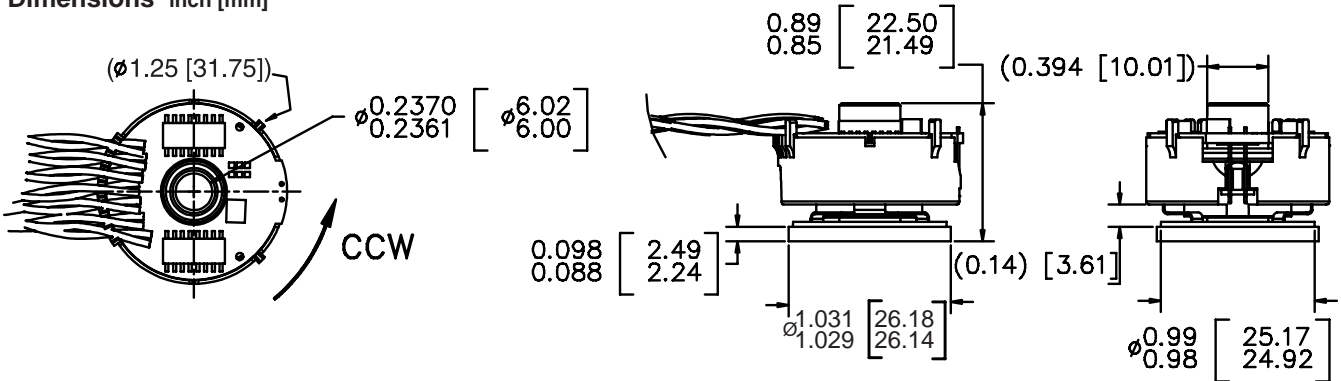
Servo ring mounting with integral flexure is size 10 pancake resolver equivalent

INCREMENTAL ENCODERS



SERIES F10

Dimensions inch [mm]

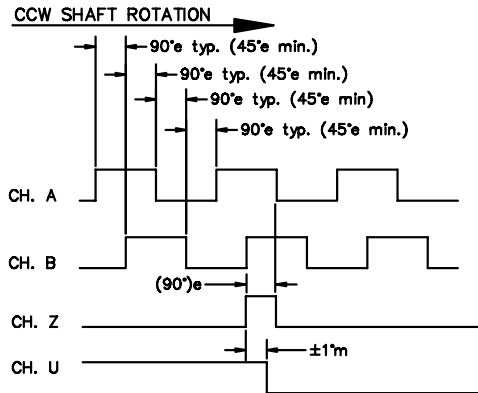


Connections

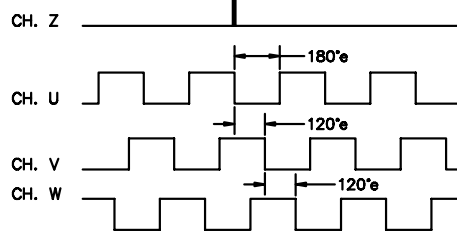
Waveforms

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

* Function availability dependant on Model



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: Bore	Code 6: Termination
F10	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> / <input type="checkbox"/>	0	<input type="checkbox"/>	4	0
Ordering Information					
F10 Size 10 Commutating Encoder	Incremental channels only 1024/0 2048/0	0 Servo mount 1.030 Diameter x .095 thick	Available when Code 2 is XXXX/0 3 5V in, line driver out incremental only	4 6mm thru bore	0 6.5" ±0.5" Twisted Pair Flying Leads
	Incremental plus Commutation channels 2048/6		Available when Code 2 is XXXX/6 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		

INCREMENTAL ENCODERS

SERIES F15

Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

- Digital Encoder with Flex Servo Ring Easily Replaces Size 15 Resolver
- Short 0.88" Mounting Depth with Jam Nut Shaft Fixing Makes Installation Easy
- Superior +/-2.5° Arc-Min Accuracy

SSM
Servo Small Motor

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: $5 \pm 10\%$ 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 k Ω pull-ups, 8 mA sink max.; or 26LC31 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

Bore Diameter: 0.375" (9.53mm)

Bore Dia. Tolerance: $+0.001/-0.000$ " ($+0.025$ mm/ -0.000 mm)

Dimensions: Outside Diameter : 1.45" (36.8mm), max.; Height: 0.87" (22.1mm), 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), 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
Moment of Inertia: 3.59×10^{-5} in-oz-sec.² (2.5 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

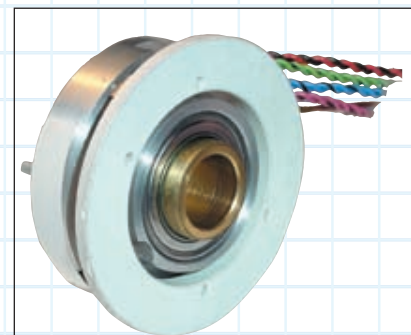
Operating Temperature: 0° to $+120^\circ\text{C}$

Storage Temperature: 0° to $+120^\circ\text{C}$

Shock: 50 Gs for 6 msec duration

Vibration: 2.5 Gs at 5 to 2000 Hz

Humidity: 90% (non-condensing)



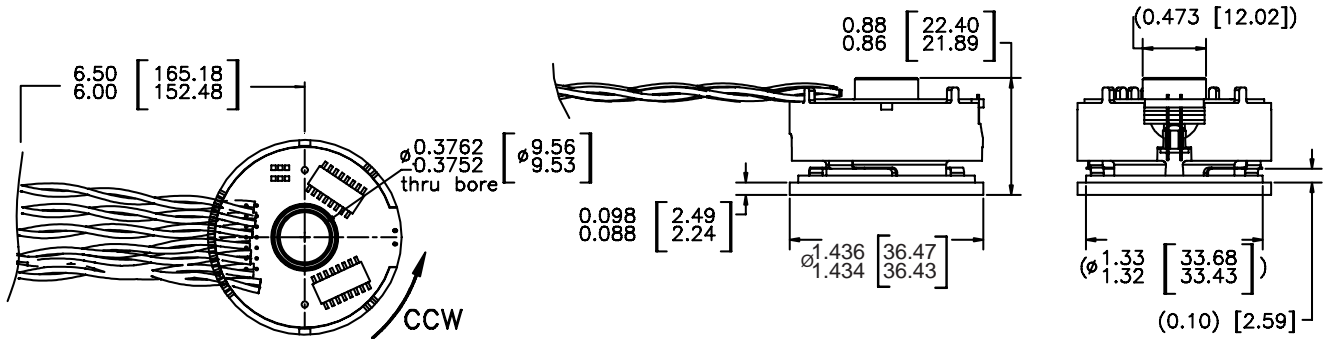
Servo ring mounting with integral flexure is size 15 pancake resolver



INCREMENTAL ENCODERS

SERIES F15

Dimensions

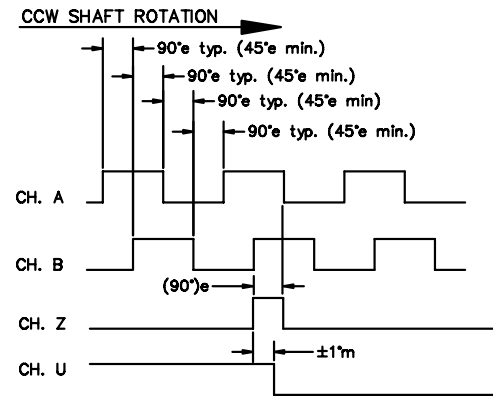


Connections

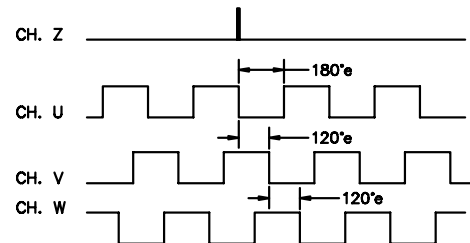
Function*	Cable Wire Color
VCC	RED
GND	BLACK
Ā	BLUE/BLACK
A	BLUE
B̄	GREEN/BLACK
B	GREEN
Z̄	VIOLET/BLACK
Z	VIOLET
Ū	BROWN/BLACK
U	BROWN
V̄	GRAY/BLACK
V	GRAY
W̄	WHITE/BLACK
W	WHITE

* 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: Bore	Code 6: Termination
F15	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ordering Information					
F15 Size 15 Commutating Encoder	Incremental channels only 1024/0 2048/0	0 Servo mount 1.435 Diameter x .095 thick	Available when Code 2 is XXXX/0 3 5V in, line driver out incremental only	1 3/8 in. thru bore	0 6.5" ±0.5" Twisted Pair Flying Leads
	Incremental plus Commutation channels 1024/6 2048/6 1024/8 2048/8		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		