

Precision, Long-life Compact 12mm Size Optical Encoder

Features

- Package Size (12 X 14 X 7 mm)
- 3 Million life cycles (No detent)
- 1 Million life cycles (With detent)
- Durable Metal Shaft & Bushing
- Optional momentary switch
- Multiple options for terminations, resolution, cables, voltage
- RoHS Compliant



Electrical and Mechanical Specifications

Encoder:

Operating Voltage

5.0 ± 0.25 VDC
3.3 ± 0.125 VDC

Supply Current

5.0 VDC @ 30mA maximum
3.3 VDC @ 24mA maximum

Output Code

2-Bit Quadrature
Channel A leads channel B by 90°
electrically during clockwise rotation
of the shaft

Minimum Sink Current

2.0 mA for 5.0 VDC
1.0 mA for 3.3 VDC

Power Consumption

150 mW maximum for 5.0 VDC
80 mW maximum for 3.3 VDC

Rotational Torque

Running: 20 ± 10 gf-cm
Detent: 140 ± 50 gf-cm (24 Detents)
100 ± 50 gf-cm (32 Detents)

Detent Options

0, 24, 32

Resolution

6, 8 Pulses per Revolution

Rotational Life (@30 RPM)

3 Million cycles (No detent)
1 Million cycles (With detent)

Temperature Range

Operating: - 40°C to 85°C
Storage: - 55°C to 100°C

Push-Pull Strength of Shaft

20 kg minimum for 10 seconds

Terminal Pull-out Strength

6 kg minimum for 10 seconds

Solder Heat Resistance

350°C for 5 seconds

Mechanical Vibration

15G, (MIL-STD-883F-2004)

Mechanical Shock

100G, (MIL-STD-883F-2004)

Special

Consult CTS for custom features not
listed

Electrical and Mechanical Specifications (continued)

Optional Momentary Switch:

Switch Contact Resistance

10 Ω maximum

Switch Rating

5 VDC @ 10 mA

Switch Travel

0.5 ± 0.25 mm

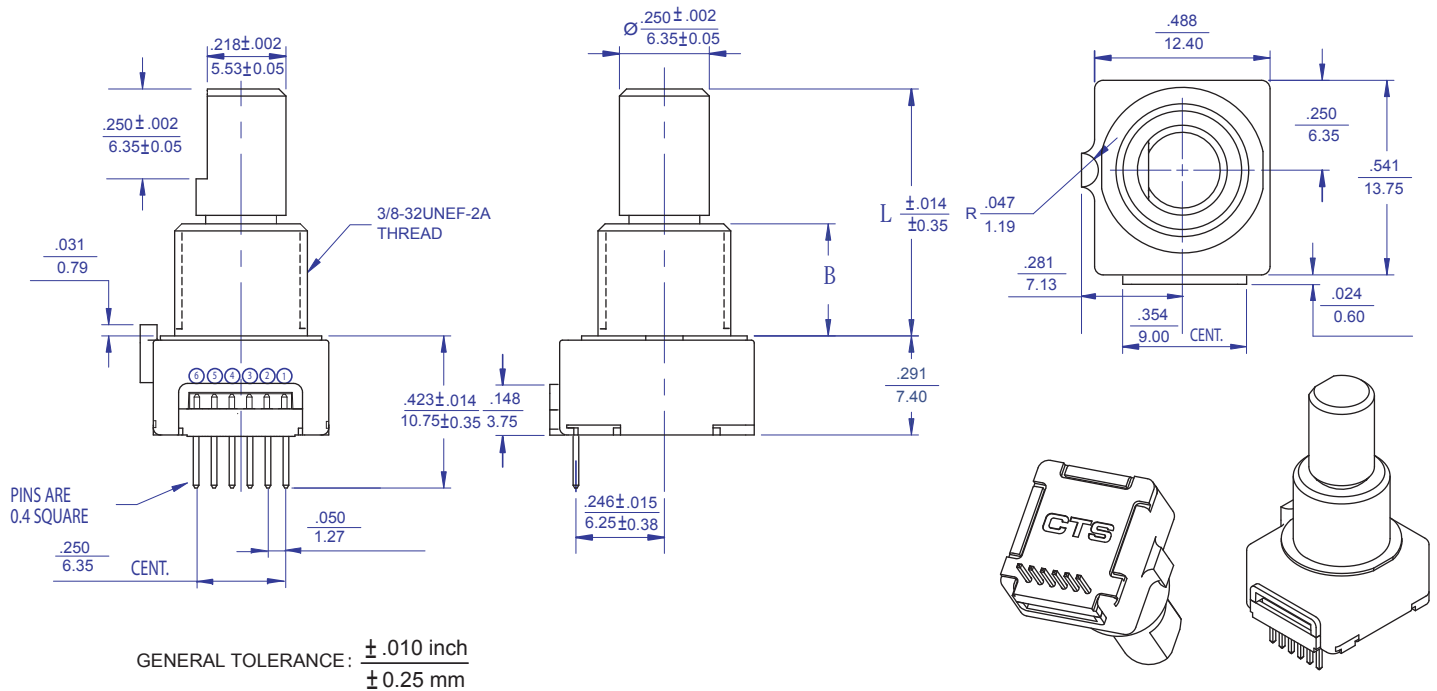
Actuation Force

510 ± 110 grams

Switch Life

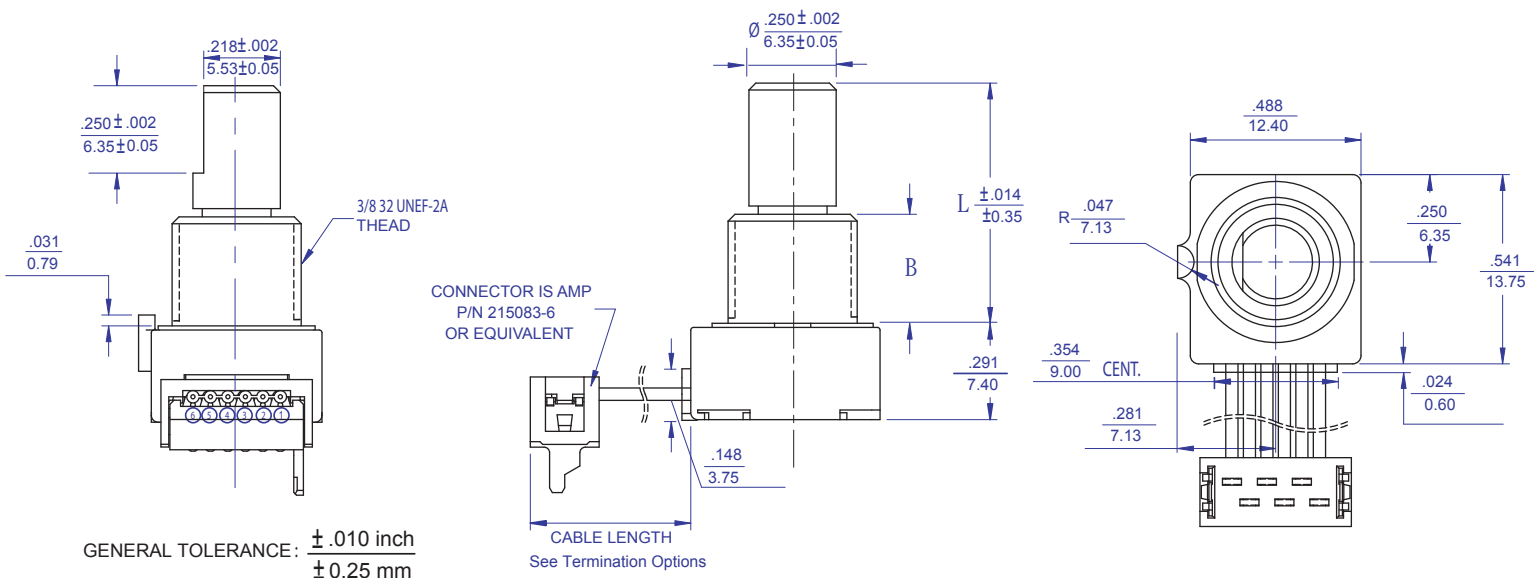
Standard: 1 Million actuations minimum
Special: Consult CTS for custom life requirements.

TYPE 291V 2-Bit Encoder With Momentary Switch, Shaft Perpendicular to PC Board



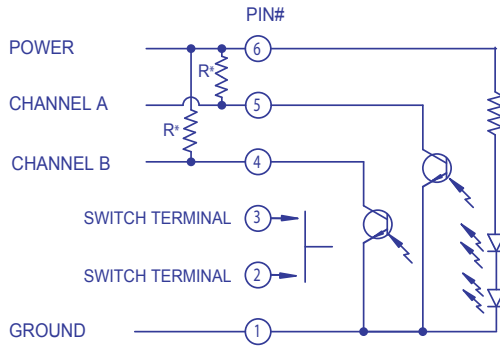
DIMENSION: $\frac{\text{inch}}{\text{mm}}$

TYPE 291C 2-Bit Encoder With Momentary Switch, Cable, and Connector

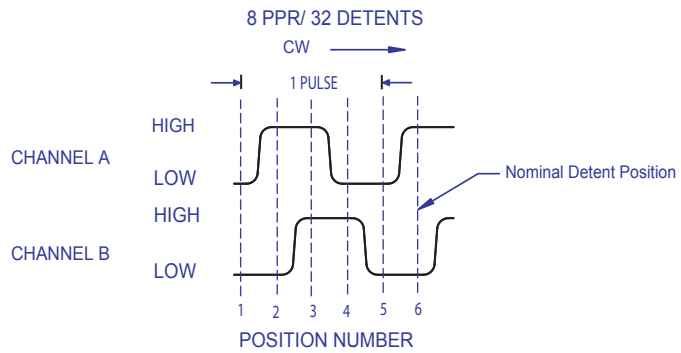


ELECTRIC CIRCUITRY AND WAVEFORM

Standard Quadrature 2-Bit Code

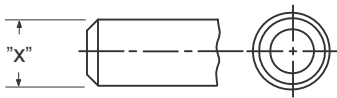


* External pull-up resistors required for operation(2.2K ohm)



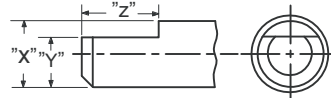
1. 8 PPR/32 detents is shown
2. Code repeats every 4 positions
3. Channel A Leads Channel B in CW direction and lags in CCW direction

Shaft Trim



R - ROUND

	X
Imperial Shaft	.250"
Metric Shaft	6.35



F - FLATTED

	X	Y	Z
Imperial Shaft	.250"	.218"	.250"
Metric Shaft	6.35	5.53	6.35

DIMENSION: $\frac{\text{inch}}{\text{mm}}$

Ordering Information

291

V1

0

22

F

832

A

B

TERMINATION

- V1** - .050" Pitch Center Pins Form to Rear with .144 length
 - C4** - .050" Pitch Center 4" Ribbon Cable with Connector
 - C5** - .050" Pitch Center 5" Ribbon Cable with Connector
 - C6** - .050" Pitch Center 6" Ribbon Cable with Connector
- Connector is AMP P/N 215083-6 or Equivalent

"B" BUSHING LENGTH

mm	inch
D - 9.53mm	2 - .250"
	3 - .375"
	0 - .312"
M9X.75P	3/8-32 UNEF-2A

SHAFT TRIM

- R** - ROUND
- F** - FLATTED

"L" SHAFT LENGTH

mm	inch
A5 - 15mm	20 - .625"
B0 - 20mm	22 - .688"
B5 - 25mm	24 - .750"
C0 - 30mm	28 - .875"
	32 - 1.000"
ALL 6.35mm Dia.	ALL .250" Dia.

OPERATING VOLTAGE

- A** - 5.0V
- B** - 3.3V

SWITCH

- A** - NONE
- B** - MOMENTARY

OUTPUT COMBINATION

- 832** - 8PPR, 32-DETENTS
- 624** - 6PPR, 24-DETENTS
- 800** - 8PPR, NO DETENTS
- 600** - 6PPR, NO DETENTS