

# Multi-Turn Precision Potentiometer

## Model 8140 Series



### Features:

- 7/8" diameter
- 10-turn\*
- Hybrid



### Model Styles Available

8141	1/8" Shaft, 1/4" Bushing
8143	1/8" Shaft, Servo
8144	6 mm Shaft, 3/8" Bushing
8146	1/4" Shaft, 3/8" Bushing
8148 (for heavy side load applications)	1/4" Shaft, 3/8" Bushing

### Electrical

Resistance Range	1K to 100K ohms
Standard Resistance Tolerance	±10%
Minimum Practical Resistance Tolerance	±5%
Independent Linearity <sup>2</sup>	±0.25%
Minimum Practical Independent Linearity	±0.15%
Power Rating	2.0 Watts at 70°C, derating to 0 at 125°C
Dielectric Strength	1,000 V rms
Insulation Resistance	1,000 Megohms minimum
Output Smoothness	0.05% maximum ≤ 5 Kohms, 0.03% maximum above 5 Kohms
Actual Electrical Travel	3600° nominal
End Voltage	maximum 0.2% of input voltage
Tap Tolerance (voltage tap only)	± 0.05% of input voltage
Resolution	essentially infinite
Temperature Coefficient of Resistance	± 50 ppm/°C typical
Temperature Coefficient of Output Voltage <sup>3</sup>	±10 ppm/°C typical

### Environmental

Operating Temperature Range	-40°C to +125°C dynamic, -55°C to +125°C static
Temperature Cycling	5 cycles, -40°C to +125°C, maximum 5% ΔR
Shock	6 ms Saw-tooth, 100 G's, 0.1 ms maximum discontinuity
Vibration	15 G's, 10 to 2,000 Hz, maximum 5% ΔR, 0.1 ms maximum discontinuity
Moisture Resistance	Five 24 hour cycles, maximum 5% ΔR
High Temperature Exposure	1,000 hours at 125°C, maximum 5% ΔR
Rotational Load Life (1 lb side load for 8148)	5 million shaft revolutions + 900 hours at 2.0 Watts & 70°C, maximum 5% ΔR
Ingress Protection Rating (IP Code)	IP50, IP66 available as option (feature code ES)

#### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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## Mechanical

Total Mechanical Travel		3600° +15° -0°	
Number of Gangs		2 maximum	
Weight (single gang)		0.75 oz. nominal	
Backlash		1° maximum	
		<b>8141, 8144, 8146, 8148</b>	<b>8143</b>
Static Stop Strength	maximum	48 oz.-in.	36 oz.-in.
Panel Nut Tightening Torque	maximum	25 lb.-in.	n/a
Shaft End Play	maximum	0.010"	0.005"
Shaft Runout	maximum T.I.R.	0.003"	0.002"
Pilot Diameter Runout	maximum T.I.R.	0.004"	0.002"
Lateral Runout	maximum T.I.R.	0.005"	0.004"
Shaft Radial Play	maximum	0.003"	0.002"
Start/Run Torque (per gang, ES option adds 0.5 oz.-in.)	maximum	0.8 oz.-in.	0.6 oz.-in.

<sup>1</sup> Specifications subject to change without notice.

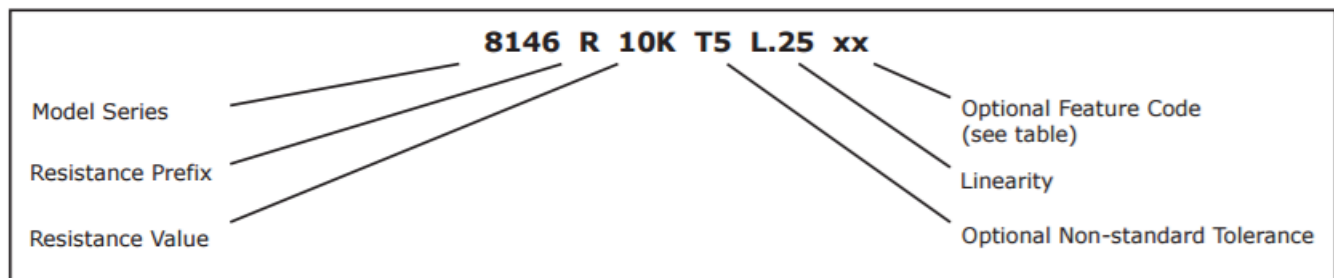
<sup>2</sup> Linearity is measured between 1% and 99% of input voltage.

<sup>3</sup> Measured with 10 VDC CW to CCW and slider at 50% of electrical travel.

\* Model available in 3 & 5 turn versions.



## Ordering Information



### FEATURE CODES

Center Tap	CT
Linearity Tape	LT
Flatted Shaft	FS
Slotted Shaft (standard on single gang 8146 without RS feature)	SS
Rear Shaft Extension (8143, 8146 single cup only)	RS
Shaft Lock (8146 only)	SL
High Torque 2-6 oz.-in. (8146 only)	HT
Additional Gang	2G
Gold Plated Solder Lug Terminals (see optional terminal configuration)	FT
Seal (IP66) 8144, 8146, or 8148 only	ES

When multiple Feature codes are used the P/N shall be in the same sequence as listed in this table (top to bottom).

#### General Note

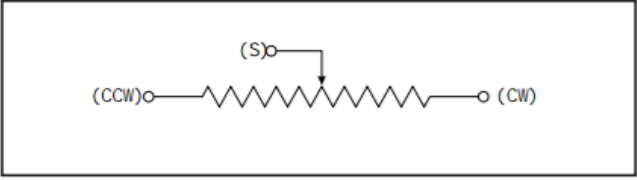
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## CIRCUIT DIAGRAM



## STANDARD RESISTANCE VALUES

1K	2K	5K	10K	20K	50K	100K
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## MATCHING TURNS COUNTING DIALS

**8141: RBJ, 2601, 2641**  
**8146: 2606, 2607, 2626, 2627, 2646, 2126, 2606S, 2607S, 2646S, 2647S, RB**

## OUTLINE DRAWINGS

**Models 8141 & 8146**  
**Bushing Mount with Sleeve Bearing**

The drawing shows a cross-section of the bushing mount with various dimensions and labels. Key features include the mounting surface, slider, and chamfered edges. Dimensions are provided in inches with tolerances.

Dim.	8141	8146
A	$\frac{.688 \pm .031}{17.475 \pm 0.787}$	$\frac{.812 \pm .031}{20.625 \pm 0.787}$
B	$\frac{.1248 \begin{smallmatrix} +.0000 \\ -.0003 \end{smallmatrix}}{3.1699 \begin{smallmatrix} +0.0000 \\ -0.0076 \end{smallmatrix}}$ Dia.	$\frac{.2500 \begin{smallmatrix} +.0000 \\ -.0005 \end{smallmatrix}}{6.3500 \begin{smallmatrix} +0.0000 \\ -0.0127 \end{smallmatrix}}$ Dia.
C	$\frac{.281 \begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}}{7.137 \begin{smallmatrix} +0.000 \\ -0.051 \end{smallmatrix}}$ Dia.	$\frac{.406 \begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}}{10.312 \begin{smallmatrix} +0.000 \\ -0.051 \end{smallmatrix}}$ Dia.
D	1/4-32 UNEF Thread	3/8-32 UNEF Thread

Slot:  $.032 \pm .005 / 0.813 \pm 0.127$  Wide X  $.032 \pm .010 - .000 / 0.813 \pm 0.254 - 0.000$  Deep (Not on Rear Shaft Models)

Chamfer  $.016 / 0.41$  Max. x  $45^\circ$

Other dimensions shown in drawing:  $1.125 \pm .031 / 28.58 \pm 0.79$ ,  $.750 \pm .016 / 19.1 \pm 0.41$ ,  $.125$  Min. /  $3.18$ ,  $.080 \pm .001 / 2.03 \pm 0.03$  Dia.,  $.062 \begin{smallmatrix} +.000 \\ -.010 \end{smallmatrix} / 1.58 \begin{smallmatrix} +0.00 \\ -.25 \end{smallmatrix}$ ,  $.312 \pm .016 / 7.93 \pm 0.41$ ,  $75^\circ$  Max.,  $.625$  R Max. /  $15.9$ ,  $.875 \pm .016 / 22.2 \pm 0.41$  Dia.

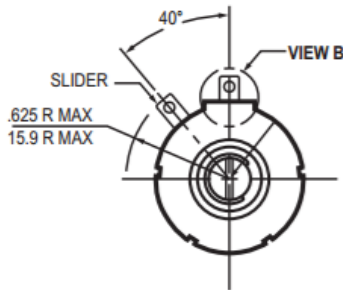
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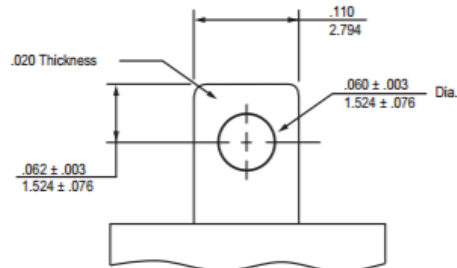
# Multi-Turn Precision Potentiometer



## Optional Terminal Configuration

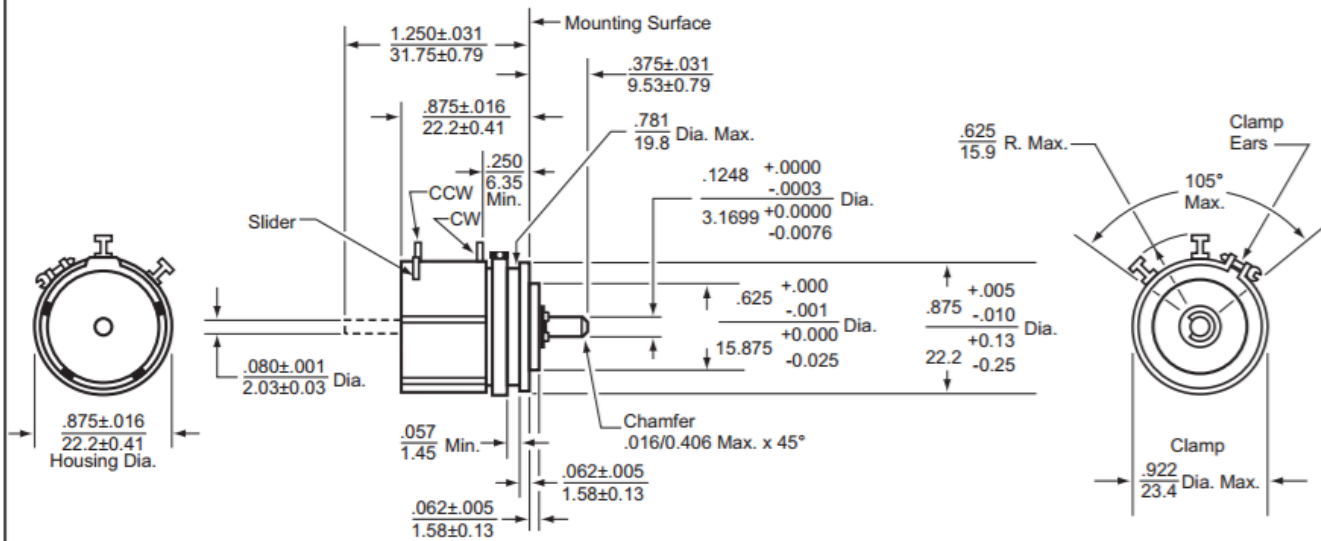


Use Special Feature Code "FT" to order.

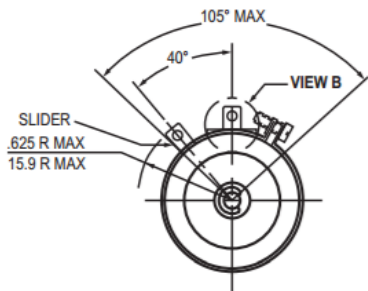


Enlarged View B

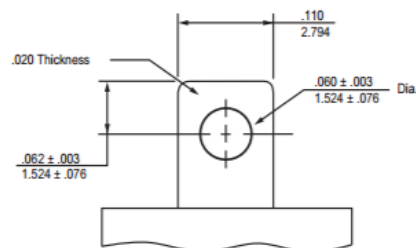
## Model 8143 Servo Mount with Ball Bearing



## Optional Terminal Configuration



Use Special Feature Code "FT" to order.



Enlarged View B

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