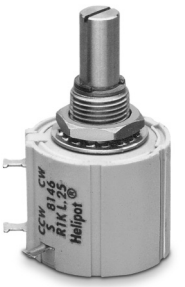
# Model 8140 Series

## 7/8" Diameter
## 10 Turn* Hybrid
## Precision Potentiometer / Position Sensor



## 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[1]

| | |
|---|---|
| Resistance Range | 1K to 100K ohms |
| Standard Resistance Tolerance | ±10% |
| Minimum Practical Resistance Tolerance | ±10% |
| Independent Linearity[2] | ±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[3] | ±10 ppm/°C typical |

## MECHANICAL

| | | | |
|---|---|---|---|
| Total Mechanical Travel | | | 3600° +15° -0° |
| Number of Gangs | | | 2 maximum |
| Weight (single gang) | | | 0.75 oz. nominal |
| Backlash | | | 1° maximum |
| | | **8141, 8144, 8146, 8148** | **8143** |
| Static Stop Strength | maximum | 60 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. |

*[1] Specifications subject to change without notice.*
*[2] Linearity is measured between 1% and 99% of input voltage.*
*[3] Measured with 10 VDC CW to CCW and slider at 50% of electrical travel.*
** Model available in 3 & 5 turn versions.*

Pb RoHS 2 compliant

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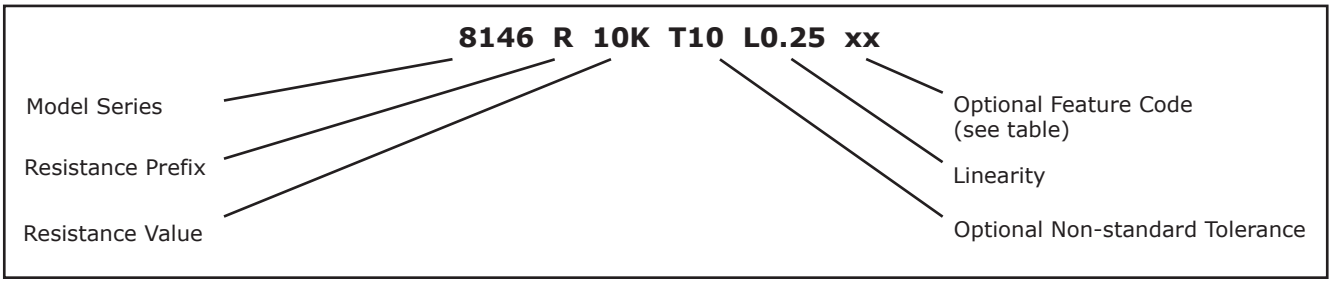
## ENVIRONMENTAL (MIL-PRF-39023)

| | |
|---|---|
| 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) |

## ORDERING INFORMATION

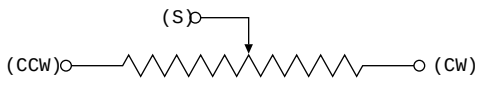



## FEATURE CODES

| | |
|---|---|
| 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 (8141, 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 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).

## CIRCUIT DIAGRAM




## STANDARD RESISTANCE VALUES

| 1K | 2K | 5K | 10K | 20K | 50K | 100K |
|---|---|---|---|---|---|---|

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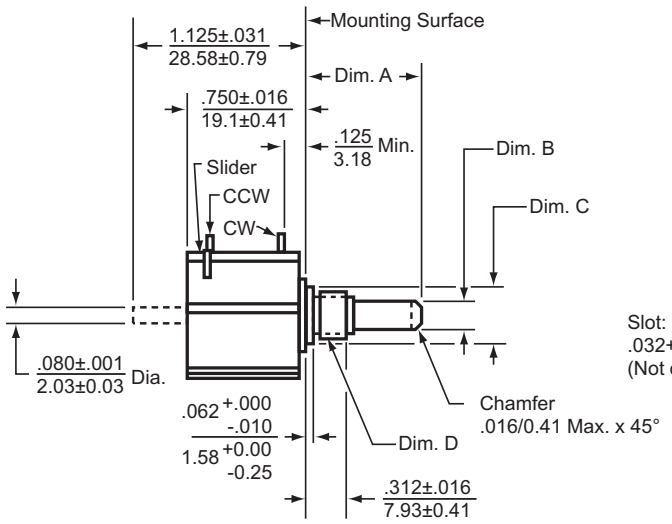
## MATCHING TURNS COUNTING DIALS

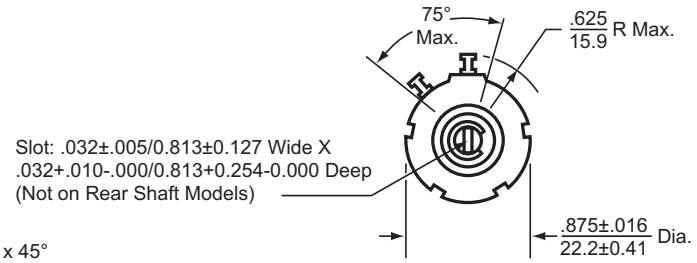
**8141: RBJ, 2601, 2641**
**8146: 2606, 2607, 2626, 2627, 2646, 2126, 2606S, 2607S, 2646S, 2647S, RB**

## OUTLINE DRAWINGS

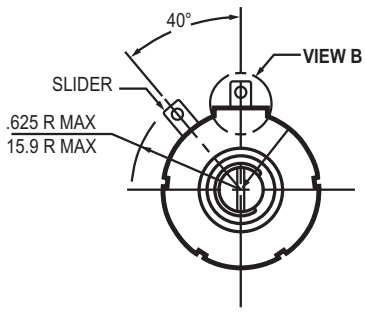
### Models 8141 & 8146
### Bushing Mount with Sleeve Bearing

| Dim. | 8141 | 8146 |
|---|---|---|
| A | .688±.031 / 17.475±0.787 | .812±.031 / 20.625±0.787 |
| B | .1248 +.0000 -.0003 / 3.1699 +0.0000 -0.0076 Dia. | .2500 +.0000 -.0005 / 6.3500 +0.0000 -0.0127 Dia. |
| C | .281 +.000 -.002 / 7.137 +0.000 -0.051 Dia. | .406 +.000 -.002 / 10.312 +0.000 -0.051 Dia. |
| D | 1/4-32 UNEF Thread | 3/8-32 UNEF Thread |

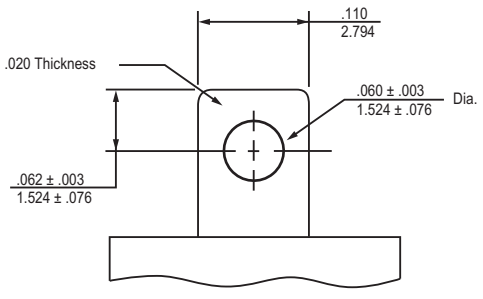



### Optional Terminal Configuration




**Use Special Feature Code "FT" to order.**

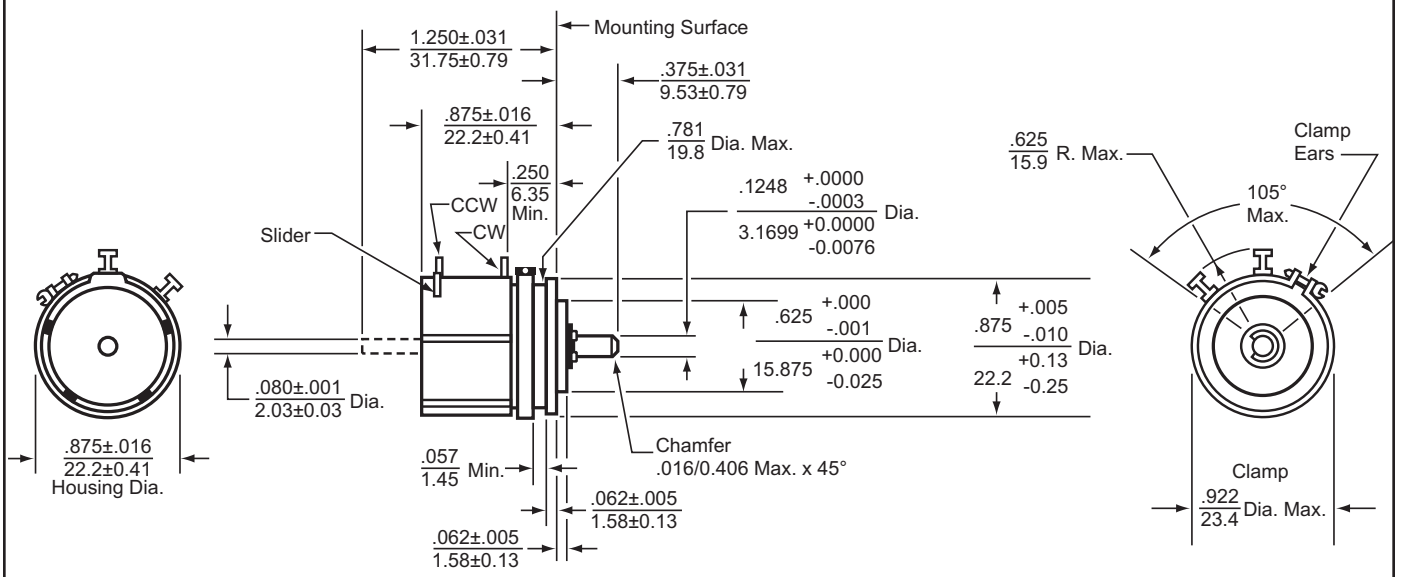



**Enlarged View B**

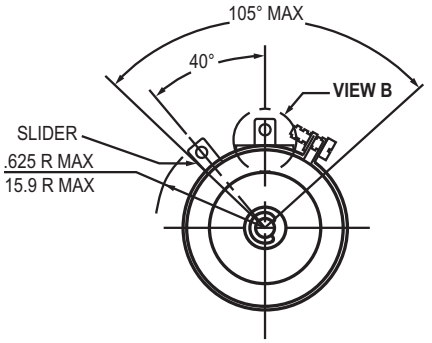
# Model 8140 series

## OUTLINE DRAWINGS (continued)

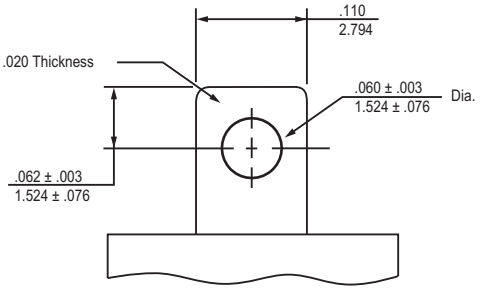
### Model 8143
### Servo Mount with Ball Bearing




### Optional Terminal Configuration




**Use Special Feature Code "FT" to order.**




**Enlarged View B**