

# 1 13/16" (46 mm) Ten Turn Wirewound Potentiometer, Bushing Mount



## FEATURES

- Gangable up to 2 sections
- Large range of ohmic values: 20  $\Omega$  to 200 k $\Omega$
- Extra taps available upon request
- Ideally suits for all industry applications

## QUICK REFERENCE DATA

|                  |                                  |
|------------------|----------------------------------|
| Sensor type      | ROTATIONAL, multi turn wirewound |
| Output type      | Output by turrets                |
| Market appliance | Industrial                       |
| Dimensions       | 1 13/16" (46 mm)                 |

## ELECTRICAL SPECIFICATIONS

| PARAMETER                    |                                                                                 |                              |
|------------------------------|---------------------------------------------------------------------------------|------------------------------|
| Total resistance             | 20 $\Omega$ to 200 k $\Omega$                                                   | Special up to 500 k $\Omega$ |
| Standard range               | <b>STANDARD</b>                                                                 | <b>SPECIAL</b>               |
| Tolerance:                   | $\pm 3\%$                                                                       | $\pm 1\%$                    |
| 200 $\Omega$ and above       | $\pm 5\%$                                                                       | $\pm 3\%$                    |
| Below 200 $\Omega$           |                                                                                 |                              |
| Linearity (independent)      | $\pm 0.25\%$ standard                                                           |                              |
| 20 $\Omega$ to 50 $\Omega$   | $\pm 0.15\%$                                                                    |                              |
| 50 $\Omega$ to 200 $\Omega$  | $\pm 0.10\%$                                                                    |                              |
| 200 $\Omega$ to 5 k $\Omega$ | $\pm 0.05\%$                                                                    |                              |
| 5 k $\Omega$ and above       | $\pm 0.025\%$                                                                   |                              |
| Noise                        | 100 $\Omega$ ENR                                                                |                              |
| Electrical angle             | 3600° + 4° - 0°                                                                 |                              |
| Power rating                 | 8.0 W at 40 °C derated to zero at 125 °C                                        |                              |
| Insulation resistance        | 1000 M $\Omega$ minimum 500 V <sub>DC</sub>                                     |                              |
| Dielectric strength          | 1000 V <sub>RMS</sub> , 60 Hz                                                   |                              |
| Absolute minimum resistance  | Not to exceed linearity x total resistance or 1 $\Omega$ , whichever is greater |                              |
| End Voltage                  | 0.5 % of total applied voltage maximum                                          |                              |
| Phasing                      | CCW end points sect. 2 phased to sect 1 within 1°                               |                              |
| Taps (extra)                 | Available as special standard tolerance $\pm 1^\circ$                           |                              |

## ORDERING INFORMATION/DESIGNATION

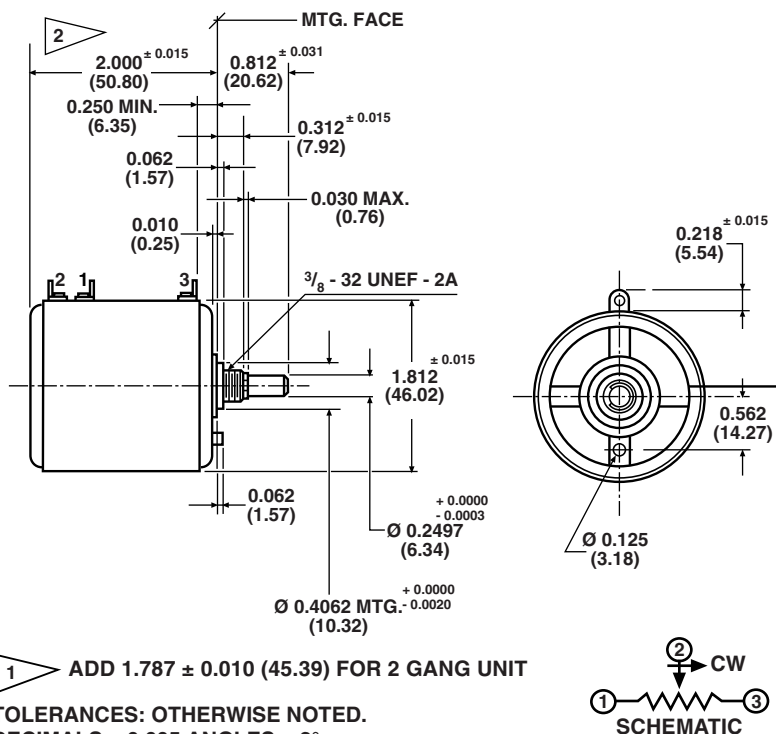
Model 860 can be ordered from this datasheet with a variety of alternate characteristics, as shown. For most rapid service on your order, please state:

|            |               |                                   |                                                     |                  |
|------------|---------------|-----------------------------------|-----------------------------------------------------|------------------|
| <b>860</b> | <b>B</b>      | <b>1</b>                          | <b>20K</b>                                          | <b>BO10</b>      |
| MODEL      | BUSHING MOUNT | NUMBER OF SECTIONS                | RESISTANCE OF EACH SECTION                          | PACKAGING        |
|            |               | From 1 up to 2 sections (maximum) | Beginning with the section nearest the mounting end | Box of 10 pieces |

## SAP PART NUMBERING GUIDELINES

|            |          |                    |                             |            |
|------------|----------|--------------------|-----------------------------|------------|
| <b>860</b> | <b>B</b> | <b>1</b>           | <b>203</b>                  | <b>B10</b> |
| MODEL      | STYLE    | NUMBER OF SECTIONS | OHMIC VALUE OF SECTION N° 1 | PACKAGING  |

**DIMENSIONS** in inches (millimeters)

**MODEL: 860B/860-1**

**MECHANICAL SPECIFICATIONS**

| PARAMETER          |                                                                                                                         |                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Rotation           | $3600^\circ + 4^\circ - 0^\circ$                                                                                        |                                                               |
| Bearing type       | Sleeve bearing                                                                                                          |                                                               |
| Torque (maximums): |                                                                                                                         |                                                               |
| Section 1          | <b>STARTING</b>                                                                                                         | <b>RUNNING</b>                                                |
| Section 2          | 1.75 oz. - in (126.02 g - cm)<br>2.55 oz. - in (183.62 g - cm)                                                          | 1.26 oz. - in (90.01 g - cm)<br>1.85 oz. - in (133.21 g - cm) |
| Runouts (maximums) |                                                                                                                         |                                                               |
| Shaft (TIR)        | 0.002" (0.05 cm)                                                                                                        |                                                               |
| Pilot dia (TIR)    | 0.002" (0.05 cm)                                                                                                        |                                                               |
| Lateral (TIR)      | 0.005" (0.13 cm)                                                                                                        |                                                               |
| Shaft end play     | 0.002" min. 0.010" max. (0.05 cm to 0.25 cm)                                                                            |                                                               |
| Shaft radial play  | 0.003" max. (0.08 cm)                                                                                                   |                                                               |
| Weight (maximums)  |                                                                                                                         |                                                               |
| Single section     | 4.5 oz. (127.58 g)                                                                                                      |                                                               |
| Additional section | 4.0 oz. (113.40 g)                                                                                                      |                                                               |
| Stop strength      | 750 oz. - in (static) (54.01 kg - cm)                                                                                   |                                                               |
| Ganging            | 2 sections maximum ears of clamp band between sections positioned $45^\circ \pm 10^\circ$ CCW from terminal center line |                                                               |
| Moment inertia     | 15.0 g - $\text{cm}^2$ maximum                                                                                          |                                                               |

**MATERIAL SPECIFICATIONS**

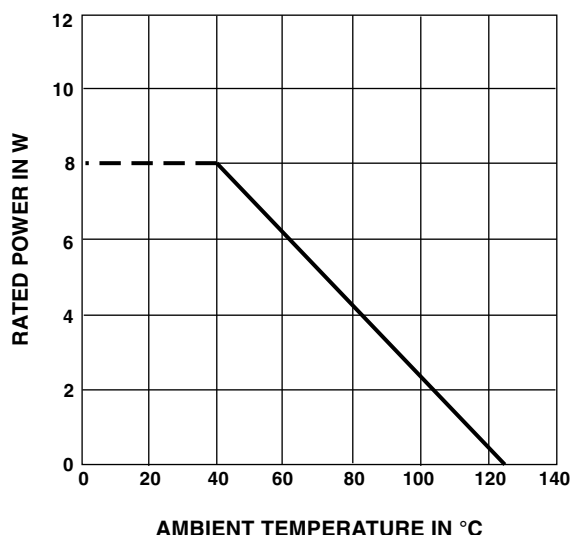
|                                                |                                                             |
|------------------------------------------------|-------------------------------------------------------------|
| Bushing                                        | Aluminum, nickel plated                                     |
| Housing and front lid                          | Molded glass filled thermoset plastic                       |
| Rear lid                                       | Molded glass filled nylon                                   |
| Shaft                                          | Stainless steel, non magnetic, non-passivated               |
| Terminals                                      | Brass, plated for solderability                             |
| Mounting hardware<br>Lockwasher:<br>Panel nut: | Internal tooth steel, nickel plated<br>Brass, nickel plated |

**ENVIRONMENTAL SPECIFICATIONS**

|                   |                           |
|-------------------|---------------------------|
| Vibration         | 10 g thru 500 CPS         |
| Shock             | 50 g                      |
| Rotational life   | 500 000 shaft revolutions |
| Load life         | 900 h                     |
| Temperature range | - 55 °C to + 125 °C       |
| Salt spray        | 48 h                      |

**MARKING**

|                     |                                                                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit identification | Units will be marked with Vishay Spectrol name and model no, resistance and resistance tolerance, linearity, terminal identification, and date code.<br>Example of a marking for a standard part: 860-11202 |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**POWER RATING CHART****RESISTANCE ELEMENT DATA**

| STANDARD RESISTANCE VALUES (Ω) | RESOLUTION (%) | OHMS PER TURN | MAXIMUM CURRENT AT 70 °C AMBIENT (mA) | MAXIMUM VOLTAGE ACROSS COIL (V) | WIRE TEMPERATURE COEFFICIENT (ppm/°C) |
|--------------------------------|----------------|---------------|---------------------------------------|---------------------------------|---------------------------------------|
| 20                             | 0.044          | 0.009         | 632                                   | 13                              | 800                                   |
| 50                             | 0.027          | 0.014         | 400                                   | 20                              | 800                                   |
| 100                            | 0.024          | 0.024         | 283                                   | 28                              | 800                                   |
| 200                            | 0.028          | 0.056         | 200                                   | 40                              | 180                                   |
| 500                            | 0.023          | 0.115         | 126                                   | 63                              | 20                                    |
| 1K                             | 0.018          | 0.182         | 89                                    | 89                              | 20                                    |
| 2K                             | 0.020          | 0.402         | 63                                    | 126                             | 20                                    |
| 5K                             | 0.015          | 0.754         | 40                                    | 200                             | 20                                    |
| 10K                            | 0.013          | 1.23          | 28                                    | 283                             | 20                                    |
| 20K                            | 0.010          | 1.97          | 20                                    | 400                             | 20                                    |
| 50K                            | 0.007          | 3.69          | 13                                    | 632                             | 20                                    |
| 100K                           | 0.007          | 6.51          | 8.9                                   | 894                             | 20                                    |
| 200K                           | 0.005          | 9.63          | 5.0                                   | 1000                            | 20                                    |
| 500K                           | 0.004          | 20.0          | 2.0                                   | 1000                            | 20                                    |



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