

# 1 13/16" (46 mm) Ten Turn Wirewound Upper Grade Precision Potentiometer



## FEATURES

- Large range of ohmic values: 20  $\Omega$  to 200 k $\Omega$
- Bushing mount, servo mount and screw mount versions
- Gangable up to 3 sections
- Extra taps available upon request

## QUICK REFERENCE DATA

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

## ELECTRICAL SPECIFICATIONS

| PARAMETER                                                                                                      | STANDARD                                                                                                                   | SPECIAL                                                 |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Total resistance<br>Tolerance: 200 $\Omega$ and above<br>Below 200 $\Omega$                                    | 20 $\Omega$ to 200 k $\Omega$<br>$\pm 3\%$<br>$\pm 5\%$                                                                    | 500 k $\Omega$<br>$\pm 1\%$<br>$\pm 3\%$                |
| Linearity (independent)<br>20 $\Omega$ to 50 $\Omega$<br>50 $\Omega$ to 200 $\Omega$<br>200 $\Omega$ and above | STANDARD<br>$\pm 0.25\%$<br>$\pm 0.25\%$<br>$\pm 0.25\%$                                                                   | SPECIAL<br>$\pm 0.15\%$<br>$\pm 0.10\%$<br>$\pm 0.05\%$ |
| Noise                                                                                                          | 100 $\Omega$ ENR                                                                                                           |                                                         |
| Electrical rotation                                                                                            | 3600° +4° -0°                                                                                                              |                                                         |
| Power rating<br>Section 1<br>Each additional sections:                                                         | 5.00 $\Omega$ 70 °C ambient, derated to zero at 125 °C<br>75 % of the rating of section 1 (3.8 W at 70 °C)                 |                                                         |
| Insulation resistance                                                                                          | 1000 M $\Omega$ minimum, 500 V <sub>DC</sub>                                                                               |                                                         |
| Dielectric strength                                                                                            | 1000 V <sub>RMS</sub> , 60 Hz                                                                                              |                                                         |
| Absolute minimum resistance                                                                                    | Linearity x total resistance or 0.5 $\Omega$ , whichever is greater                                                        |                                                         |
| End voltage                                                                                                    | Linearity x total applied voltage for total resistance above 20 $\Omega$ , 2.0 % of total applied voltage for 20 and below |                                                         |
| Phasing (CCW end points)                                                                                       | Additional sections phased to section 1 within $\pm 1^\circ$                                                               |                                                         |
| Taps (extra)                                                                                                   | Available as special, standard tolerance $\pm 1^\circ$                                                                     |                                                         |

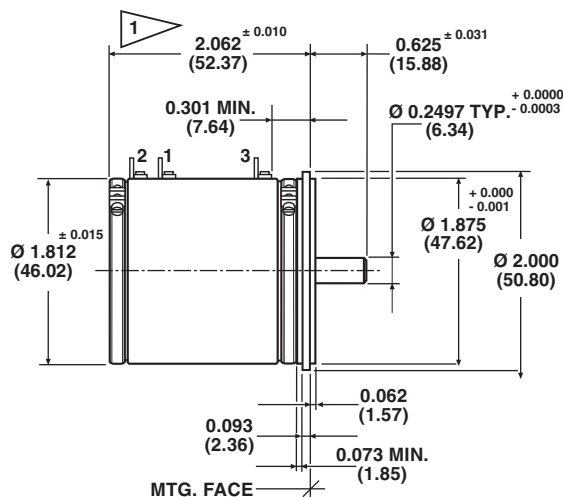
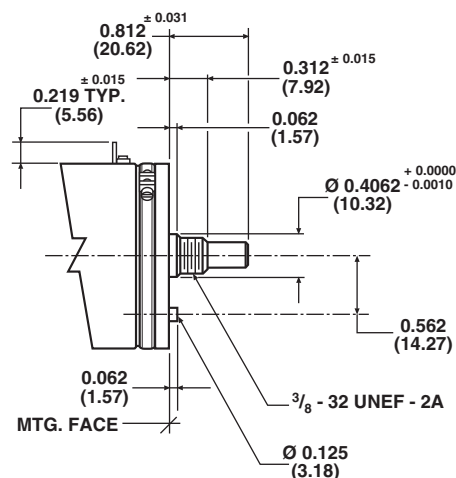
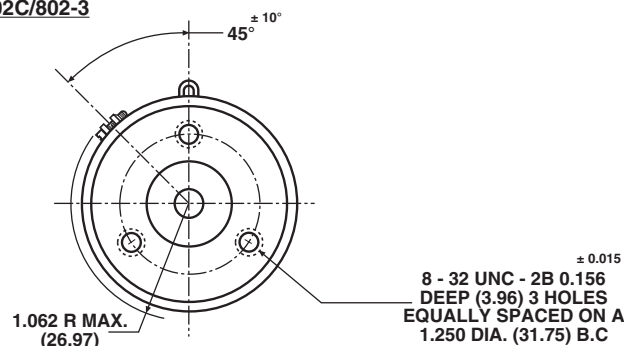
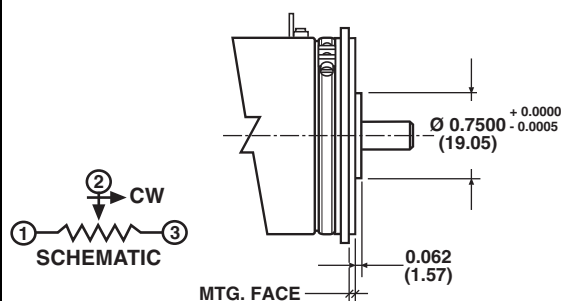
## ORDERING INFORMATION

|       |   |   |                                    |   |                  |   |                                                                                                                              |   |                                                                                                                              |   |                 |  |  |  |
|-------|---|---|------------------------------------|---|------------------|---|------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------|---|-----------------|--|--|--|
| 8     | 0 | 2 | B                                  | 2 | 1                | 0 | 3                                                                                                                            | 2 | 0                                                                                                                            | 3 |                 |  |  |  |
| MODEL |   |   | STYLE                              |   | GANGS            |   | OHMIC VALUE<br>GANGS N° 1                                                                                                    |   | OHMIC VALUE<br>GANGS N° 2                                                                                                    |   | SPECIAL REQUEST |  |  |  |
| 802   |   |   | B: bushing<br>S: servo<br>C: screw |   | 1<br>2<br>3<br>4 |   | 470 = 47 $\Omega$<br>222 = 2.200 $\Omega$<br>103 = 10 k $\Omega$<br>For ohmic value<br>range see electrical<br>specification |   | 470 = 47 $\Omega$<br>222 = 2.200 $\Omega$<br>103 = 10 k $\Omega$<br>For ohmic value<br>range see electrical<br>specification |   | xxxx            |  |  |  |

## PART NUMBER DESCRIPTION (for information only)

|       |                      |       |                           |                           |         |
|-------|----------------------|-------|---------------------------|---------------------------|---------|
| 802-  | 1                    | 1     | 103                       | 203                       | xxxx    |
| MODEL | STYLE                | GANGS | OHMIC VALUE<br>GANGS N° 1 | OHMIC VALUE<br>GANGS N° 2 | SPECIAL |
|       | B: 1<br>S: 2<br>C: 3 |       |                           |                           |         |

**DIMENSIONS** in inches (millimeters)

**SERVO MOUNT: 802S/802-2**

**BUSHING MOUNT: 802B/802-1**

**SCREW MOUNT: 802C/802-3**


TOLERANCES: UNLESS OTHERWISE NOTED.  
DECIMALS ± 0.005 ANGLES ± 2°

1 ADD 1.770 ± 0.010 (44.96) FOR EACH  
ADDITIONAL SECTION

**MECHANICAL SPECIFICATIONS**

| PARAMETER                      |                                                                                           |                   |                             |
|--------------------------------|-------------------------------------------------------------------------------------------|-------------------|-----------------------------|
| Rotation                       | 3600° +10° -0°                                                                            |                   |                             |
| Bearing type                   | SERVO<br>Ball bearing                                                                     | BUSHING<br>Sleeve | SCREW<br>Ball bearing       |
| Torque (maximums)              | <b>MAX. STARTING</b>                                                                      |                   | <b>MAX. RUNNING</b>         |
| Servo or screw section 1       | 1.20 oz. - in (86.4 g - cm)                                                               |                   | 0.80 oz. - in (57.6 g - cm) |
| Bushing section 1              | 1.75 oz. - in (126.0 g - cm)                                                              |                   | 1.25 oz. - in (90.0 g - cm) |
| Each additional section        | 0.80 oz. - in (57.6 g - cm)                                                               |                   | 0.60 oz. - in (43.2 g - cm) |
| Mechanical runouts (maximums): | <b>SERVO OR SCROLL</b>                                                                    |                   | <b>BUSHING</b>              |
| Shaft (TIR/in)                 | 0.002" (0.05 cm)                                                                          |                   | 0.002" (0.05 cm)            |
| Pilot dia. runout (TIR)        | 0.002" (0.05 cm)                                                                          |                   | 0.002" (0.05 cm)            |
| Lateral runout (TIR)           | 0.003" (0.08 cm)                                                                          |                   | 0.005" (0.13 cm)            |
| Shaft end play                 | 0.005" (0.13 cm)                                                                          |                   | 0.005" (0.13 cm)            |
| Shaft radial play              | 0.002" (0.05 cm)                                                                          |                   | 0.003" (0.08 cm)            |
| Weight:                        |                                                                                           |                   |                             |
| Single section                 | 5.5 oz. (156 g)                                                                           |                   |                             |
| Each additional section        | 3.7 oz. (105 g)                                                                           |                   |                             |
| Stop strength                  | 1000 oz. - in, static (72 kg - cm)                                                        |                   |                             |
| Ganging                        | 3 sections maximum terminal alignment, added sections within ± 10° of section 1 terminals |                   |                             |
| Moment of inertia              | 15 g - cm <sup>2</sup> per section maximum                                                |                   |                             |

**MATERIAL SPECIFICATIONS**

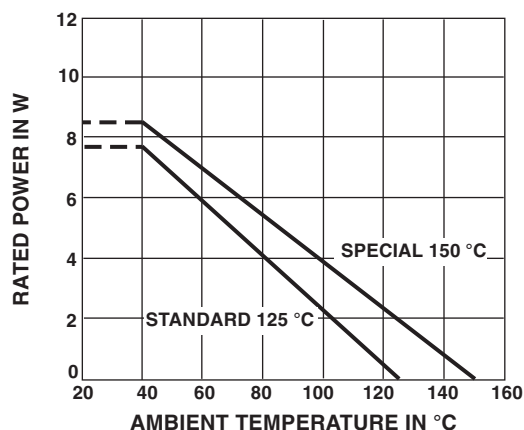
|                                                     |                                                             |
|-----------------------------------------------------|-------------------------------------------------------------|
| Housing                                             | Glass filled thermoset plastic                              |
| Lids                                                | Aluminum, anodized                                          |
| Shaft                                               | Stainless steel, non-magnetic, non-passivated               |
| Terminals                                           | Brass, plated for solderability                             |
| Clamp ring                                          | Stainless steel                                             |
| Bushing mount hardware<br>Lockwasher:<br>Panel nut: | Internal tooth steel, nickel plated<br>Brass, nickel plated |

**MARKING**

|                     |                                                                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit identification | Units shall be marked with Spectrol name and model no, resistance and resistance tolerance, linearity, terminal identification, and date code. Example of a marking for a standard part: 802-31502 |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**POWER RATING CHART**

(Ratings for cup N° 1. Additional cups 75 % of values shown)

**ENVIRONMENTAL SPECIFICATIONS**

|                             |                             |
|-----------------------------|-----------------------------|
| Vibration                   | 15 g thru 2000 CPS          |
| Shock                       | 50 g                        |
| Salt spray                  | 96 h                        |
| Rotational life             | 2 million shaft revolutions |
| Load life                   | 900 h                       |
| Operating temperature range | -55 °C to +125 °C           |

**Note**

- Nothing stated herein shall be construed as a guarantee of quality or durability.

**RESISTANCE ELEMENT DATA**

| STANDARD RESISTANCE VALUES (Ω) | RESOLUTION (%) | OHMS PER TURN | MAXIMUM CURRENT AT 70 °C AMBIENT (mA) | MAXIMUM VOLTAGE ACROSS COIL (V) | WIRE TEMP. COEF. (ppm/°C) |
|--------------------------------|----------------|---------------|---------------------------------------|---------------------------------|---------------------------|
| 20                             | 0.044          | 0.009         | 500                                   | 10.0                            | 800                       |
| 50                             | 0.027          | 0.014         | 316                                   | 15.8                            | 800                       |
| 100                            | 0.024          | 0.024         | 224                                   | 22.4                            | 800                       |
| 200                            | 0.028          | 0.056         | 158                                   | 31.6                            | 180                       |
| 500                            | 0.023          | 0.115         | 100                                   | 50.0                            | 20                        |
| 1K                             | 0.018          | 0.182         | 70.7                                  | 70.7                            | 20                        |
| 2K                             | 0.020          | 0.402         | 50.0                                  | 100                             | 20                        |
| 5K                             | 0.015          | 0.754         | 31.6                                  | 158                             | 20                        |
| 10K                            | 0.013          | 1.229         | 22.4                                  | 224                             | 20                        |
| 20K                            | 0.010          | 1.970         | 15.8                                  | 316                             | 20                        |
| 50K                            | 0.007          | 3.686         | 10.0                                  | 500                             | 20                        |
| 100K                           | 0.007          | 6.507         | 7.07                                  | 707                             | 20                        |
| 200K                           | 0.005          | 6.929         | 5.00                                  | 1000                            | 20                        |
| 500K                           | 0.004          | 19.987        | 2.00                                  | 1000                            | 20                        |



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