



## Features

- Bushing mount
- Optional AR pin feature
- Plastic or metal shaft and bushings
- Wirewound
- Solder lugs or PC pins
- Sealable (Full body seal)

- Designed for use in HMI applications

## 3590 - Precision Potentiometer

### Electrical Characteristics<sup>1</sup>

|                                                                                   |                                               |
|-----------------------------------------------------------------------------------|-----------------------------------------------|
| Standard Resistance Range.....                                                    | 200 to 100 K ohms                             |
| Total Resistance Tolerance.....                                                   | ±5 %                                          |
| Independent Linearity.....                                                        | ±0.25 %                                       |
| Effective Electrical Angle.....                                                   | 3600 ° +10 °, -0 °                            |
| Absolute Minimum Resistance.....                                                  | 1 ohm or 0.1 % maximum (whichever is greater) |
| Noise.....                                                                        | 100 ohms ENR maximum                          |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301)                         |                                               |
| Sea Level.....                                                                    | 1,500 VAC minimum                             |
| Power Rating (Voltage Limited By Power Dissipation or 450 VAC, Whichever is Less) |                                               |
| +40 °C.....                                                                       | 2 watts                                       |
| +125 °C.....                                                                      | 0 watt                                        |
| Insulation Resistance (500 VDC).....                                              | 1,000 megohms minimum                         |
| Resolution.....                                                                   | See recommended part numbers                  |

### Environmental Characteristics<sup>1</sup>

|                                                                           |                             |
|---------------------------------------------------------------------------|-----------------------------|
| Operating Temperature Range.....                                          | -40 °C to +125 °C           |
| Storage Temperature Range.....                                            | -55 °C to +125 °C           |
| Temperature Coefficient Over Storage Temperature Range <sup>2</sup> ..... | ±50 ppm/°C maximum/unit     |
| Vibration.....                                                            | 15 G                        |
| Wiper Bounce.....                                                         | 0.1 millisecond maximum     |
| Shock.....                                                                | 50 G                        |
| Wiper Bounce.....                                                         | 0.1 millisecond maximum     |
| Load Life.....                                                            | 1,000 hours, 2 watts        |
| Total Resistance Shift.....                                               | ±2 % maximum                |
| Rotational Life (No Load).....                                            | 1,000,000 shaft revolutions |
| Total Resistance Shift.....                                               | ±5 % maximum                |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B)                |                             |
| Total Resistance Shift.....                                               | ±2 % maximum                |
| IP Rating                                                                 |                             |
| Sealed Versions (-3, -4, -7, and -8).....                                 | IP 65                       |
| Unsealed Versions (-1 -2, -5, and -6).....                                | IP 40                       |

### Mechanical Characteristics<sup>1</sup>

|                                                |                                                                                                                          |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Stop Strength.....                             | 45 N-cm (64 oz.-in.) minimum                                                                                             |
| Mechanical Angle.....                          | 3600 ° +10 °, -0 °                                                                                                       |
| Torque (Starting & Running).....               | 0.35 N-cm (0.5 oz.-in.) maximum (unsealed)<br>1.1 N-cm (1.5 oz.-in.) maximum (sealed)                                    |
| Mounting.....                                  | 55-80 N-cm (5-7 lb.-in.) (plastic)<br>90-113 N-cm (8-10 in.-lb.) (metal)                                                 |
| Shaft Runout.....                              | 0.13 mm (0.005 in.) T.I.R.                                                                                               |
| Lateral Runout.....                            | 0.20 mm (0.008 in.) T.I.R.                                                                                               |
| Shaft End Play.....                            | 0.25 mm (0.010 in.) T.I.R.                                                                                               |
| Shaft Radial Play.....                         | 0.13 mm (0.005 in.) T.I.R.                                                                                               |
| Pilot Diameter Runout.....                     | 0.08 mm (0.003 in.) T.I.R.                                                                                               |
| Backlash.....                                  | 1.0 ° maximum                                                                                                            |
| Weight.....                                    | Approximately 19 G                                                                                                       |
| Terminals.....                                 | Solder lugs or PC pins                                                                                                   |
| Soldering Condition                            |                                                                                                                          |
| Manual Soldering.....                          | 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire; 370 °C (700 °F) max. for 3 seconds                           |
| Wave Soldering.....                            | 96.5Sn/3.0Ag/0.5Cu solder with no-clean flux; 260 °C (500 °F) max. for 5 seconds                                         |
| Wash processes.....                            | Not recommended                                                                                                          |
| Marking.....                                   | Manufacturer's name and part number, resistance value and tolerance, linearity tolerance, wiring diagram, and date code. |
| Ganging (Multiple Section Potentiometers)..... | 1 cup maximum                                                                                                            |
| Hardware.....                                  | One lockwasher and one mounting nut is shipped with each potentiometer.                                                  |

NOTE: For Anti-rotation pin add 91 after configuration dash number. Example: -2 becomes -291 to add AR pin.

<sup>1</sup>At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.

<sup>2</sup>Consult manufacturer for complete specification details for resistances below 1k ohms.

### Recommended Part Numbers

| (Printed Circuit) | (Solder Lug)        | (Solder Lug) | Resistance (Ω) | Resolution (%) |
|-------------------|---------------------|--------------|----------------|----------------|
| 3590P-2-102L      | <b>3590S-2-102L</b> | 3590S-1-102L | 1,000          | .029           |
| 3590P-2-202L      | <b>3590S-2-202L</b> | 3590S-1-202L | 2,000          | .023           |
| 3590P-2-502L      | <b>3590S-2-502L</b> | 3590S-1-502L | 5,000          | .025           |
| 3590P-2-103L      | <b>3590S-2-103L</b> | 3590S-1-103L | 10,000         | .020           |
| 3590P-2-203L      | <b>3590S-2-203L</b> | 3590S-1-203L | 20,000         | .019           |
| 3590P-2-503L      | <b>3590S-2-503L</b> | 3590S-1-503L | 50,000         | .013           |
| 3590P-2-104L      | <b>3590S-2-104L</b> | 3590S-1-104L | 100,000        | .009           |

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FOR OTHER OPTIONS CONSULT FACTORY.

ROHS IDENTIFIER:

L = COMPLIANT

BLANK = NON-COMPLIANT

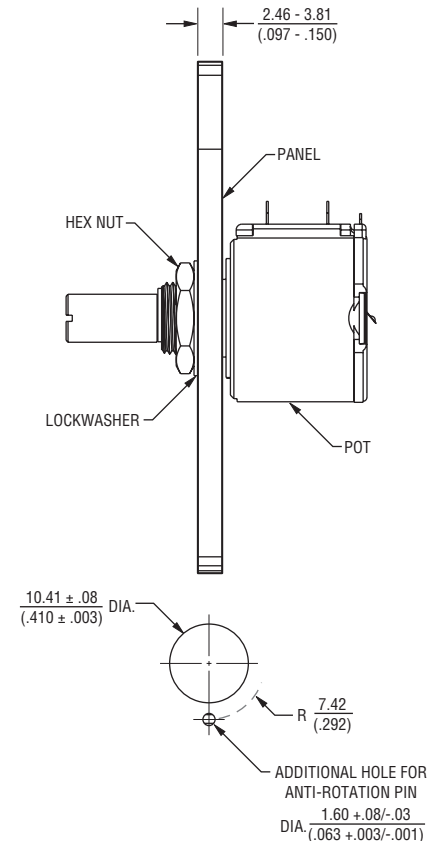
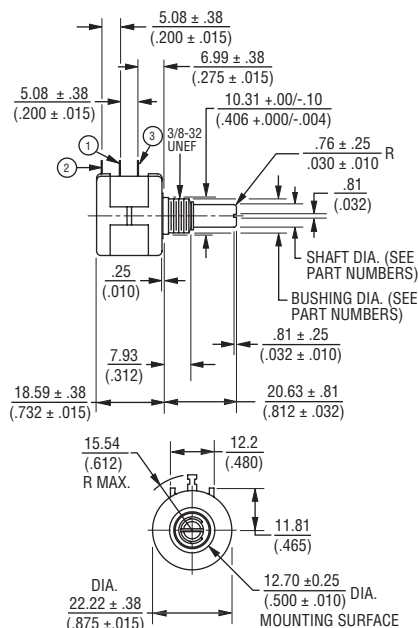
\*RoHS Directive 2002/95/EC Jan 27 2003 including Annex  
Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

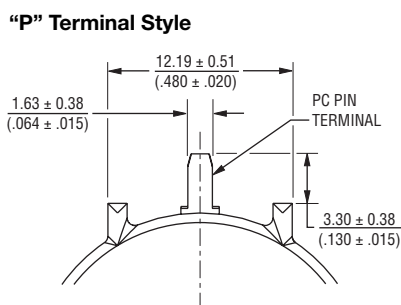
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### Panel Thickness Dimensions

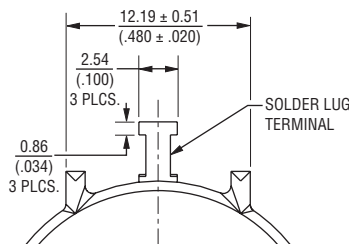
### -2, -4, -6, -8 Configurations



## Terminal Styles



## “S” Terminal Style



## Shaft & Bushing Configurations

(-1) Plastic Bushing (3/8 " x 5/16 ")  
and Shaft (.2480 + .001, - .002)

(-2) Metal Bushing (3/8 " x 5/16 ")  
and Shaft (.2497 + .0000, - .0009)

(-3) Sealed, Plastic Bushing (3/8 " x 5/16 ")  
and Shaft (.2480 + .001, - .002)

(-4) Sealed, Metal Bushing (3/8 " x 5/16 ")  
and Shaft (.2497 + .0000, - .0009)

(-5) Metric, Plastic Bushing (9 mm x 7.94 mm)  
and Shaft (6 mm + 0, - .076 mm)

(-6) Metric, Metal Bushing (9 mm x 7.94 mm)  
and Shaft (6 mm + 0, - .023 mm)

(-7) Metric, Sealed, Plastic Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .076 mm)

(-8) Metric, Sealed, Metal Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .023 mm)

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Actual device performance in their specific applications.