

## 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.....  | +1 °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                       |

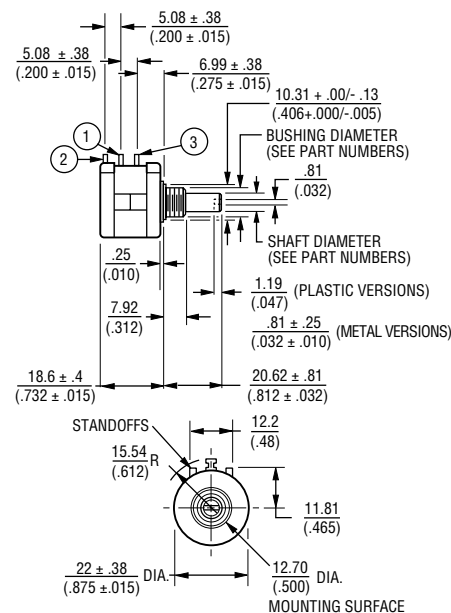
## Mechanical Characteristics<sup>1</sup>

|  |  |
|--|--|
| 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)   |
|  | 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.  |

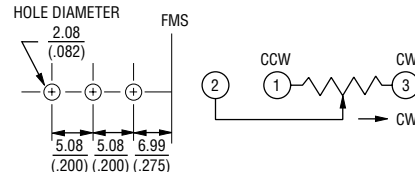
NOTE: For Anti-rotation pin add 91 after configuration dash number. Example: -2 becomes -291 to add AR pin.

## Recommended Part Numbers

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



## RECOMMENDED PC BOARD MOUNTING HOLE LOCATIONS



TOLERANCES: EXCEPT WHERE NOTED

DECIMALS: .XX ± .51 (.02), .XXX ± .13 (.005)

FRACTIONS: ±1/64

DIMENSIONS: MM (IN.)

## SHAFT & BUSHING CONFIGURATIONS

- (Bushing - DxL, Shaft - D)
- (-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)

**BOLDFACE LISTINGS ARE IN STOCK AND READILY AVAILABLE THROUGH DISTRIBUTION.**

FOR OTHER OPTIONS CONSULT FACTORY.

RoHS IDENTIFIER:  
L = COMPLIANT  
BLANK = NON-COMPLIANT

REV. 03/07

\*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.