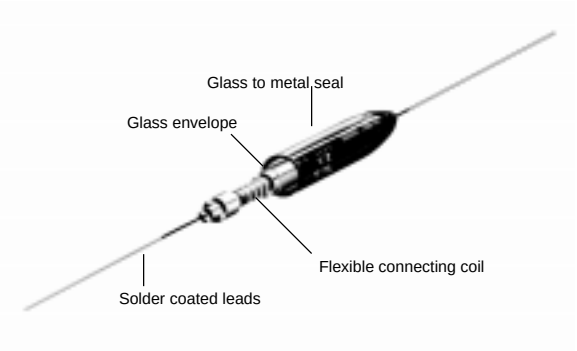
# ULTRA-HIGH VALUE PRECISION RESISTOR

ISO-9001 Registered

# 3810 SERIES




- Resistance range up to 100T ohms ($10^{14}$ ohms)
- Low voltage
- Hermetically sealed
- Designed for low current (pica ampere level) measurements
- Leakage current minimised by hermetic sealing and guard ring

## SPECIFICATIONS:

| IRC Type | Resistance Range (ohms) | Limiting Element Voltage (volts) | TCR (20°C - 70°C) ppm/°C | Resistance Tolerance (%) | Values | Operating Temperature Range (°C) | Voltage Coefficient of Resistance (measured at voltages of 100 & 500 volts) ppm/volt | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 100MΩ | 1TΩ | 100TΩ |
| **3810** | 100M TO 1T | 500 | -500 to -3500 | 10, 20 | EIA 2% values preferred | -40 to 100 | -20 | -160 | |
| **3811** | 100M TO 1T | 1000 | | 1, 2, 5, 10 | | | -10 | -80 | -150 |
| **3812** | 1T TO 100T | 1000 | | 2, 5, 10 | | | -10 | -80 | -150 |

**CONSTRUCTION:** The Cermetox® resistive film is fired onto a high quality ceramic substrate; brass end caps are force fitted to the substrate which is then adjusted to value with a helical cut in the film; the leads are mechanically locked into the end caps and the assembly sealed into the glass envelope.

All close tolerance units utilize two resistors connected in series within the glass envelope. High value units, type 3812, are part filled with silicone oil. The guard band is described, with application notes, in a Product Information sheet, available on request.

**TERMINATIONS:** Solder-coated dumet wire.

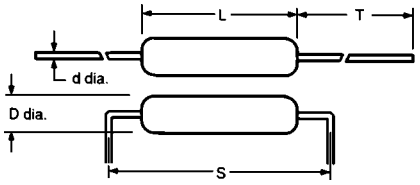
**MARKING:** Type reference, TCR code, resistance value and tolerance code are legend marked. Resistance value marking conforms to IEC 62.

**SOLVENT RESISTANCE:** The glass envelope is coated with silicone and should not be subjected to solvents or their vapors. (See application notes.)

**PACKAGING:** Each resistor is individually packed in a polythene envelope together with a card carrying measurement details and serial number. (See application notes.)

## DIMENSIONS (Inches and (mm)):

| Type | L max | D max | T min | d nom | S min | Weight nom (g) |
|---|---|---|---|---|---|---|
| **3810** | 0.984 (25.0) | 0.236 (6) | 1.181 (30) | 0.024 (0.6) | 1.220 (31) | 1.5 |
| **3811** | 1.689 (42.9) | 0.236 (6) | 1.181 (30) | 0.024 (0.6) | 1.929 (49) | 2.2 |
| **3812** | 1.890 (48.0) | 0.236 (6) | 1.181 (30) | 0.024 (0.6) | 2.126 (54) | 2.5 |




## PERFORMANCE DATA:

| | Load At Rated Voltage (1000 hrs at 20°C) ΔR% | Shelf Life (12 months at room temperature) ΔR% | Resistance To Solder Heat ΔR% | Inductance | Capacitance pF | |
|---|---|---|---|---|---|---|
| | | | | Low inductance versions available in the range100M to 1T | **3810** | **3811** |
| **Typical** | 1 | 0.5 | <0.1 | | 0.4 | 0.2 |

**APPLICATION NOTES:**

Each resistor is packed with a card stating nominal resistance value at 100 V applied, selection tolerance, date and serial number. Although the glass envelope is an excellent insulant and would be adequate in a dry atmosphere, the condensation which occurs in a normal atmosphere will provide a shunt resistance which will modify the very high resistance value. To minimise this effect all units are coated with silicone, and it is essential that this coating is not damaged; any handling should be by the terminations. For the same reason solvents must not be used. The resistors should not be used in a damp atmosphere. If moisture develops on the body the resistor should be dried for 30 minutes at 70°C and allowed to cool for a further 30 minutes in a dry atmosphere.

To avoid damage to the seal between terminations and glass, the leads must be fully supported inside the point of bending during any preforming operation.

**Guard Band:** For details of how to use the guard band, fitted to resistors of 100GΩ and over, ask for Product Information Sheet No. 32.

**Non-standard Versions:** Units without the glass envelope but withlacquer protection are available, but will have a limited electrical performance. Measured values at a voltage other than 100V may be recorded.

For non-standard items contact IRC Resistors.

**WIREWOUND AND FILM TECHNOLOGIES DIVISION**
736 Greenway Road • Boone, North Carolina 28607-1860 • Tel: 828-264-8861 • Fax: 828-264-8866 • www.irctt.com