

MODEL 9200 & 9210

DC MULTI-VALUE RESISTANCE STANDARDS & CURRENT SHUNTS

Dual Purpose as Precision Current Shunts or as Standard Resistors



Guildline Model 9200 and 9210 are compact four-terminal Multi-Value Resistance Standards. These standards are in a durable Formica case, with all terminals and adjustments available at a panel on the top surface. Separate current and potential terminals are provided. Two range plugs, inserted as a pair in the top panel, select one of several decade resistance values. Both models produce a maximum DVM reading up to 0.15 volts.

THE 9200 AND 9210 PROVIDE DUAL CAPABILITIES AS A VERSATILE HIGH POWER MULTIPLE VALUE RESISTANCE STANDARD OR AS A PRECISION DC CURRENT SHUNT!

The Model 9200 has seven ranges from 0.01 Ω through 10 k Ω with current up to 15 A at the Low Ohmic range.

The Model 9210 has six ranges with values from 0.0025 Ω to 0.1 Ω with currents up to 60 A at the Low Range.

Both models provide an accuracy of 0.01% for DC Current at full power. Both units provide a stability for the resistance value that is better than 10 ppm per year. These standards may be overloaded to 150% of rated current at all resistance values for short periods (e.g. 5 minutes), without sustaining permanent damage. The self-heating caused by such overload may however put the resistance values temporarily outside tolerance, but these will recover when the shunt is allowed to cool.

The resistor elements are mounted in air to reduce size and weight while minimizing self-heating effects. The elements are non-inductively wound of selected and heat treated Zeranin wire.

Selection of resistance is conveniently accomplished by insertion of two plugs in the appropriate locations. Either model may be used as a calibration standard for the resistance ranges of milli or micro-Ohmmeters and DVMs up to 10,000 Ω and as low as 0.0025 Ω .

FEATURES

- Accuracy $\pm 0.01\%$ (100 ppm)
- Resistance Values from 0.01 to 10,000 Ω (Model 9200)
- Resistance Values from 0.0025 to 0.1 Ω (Model 9210)
- Currents up to 15 A (Model 9200)
- Currents up to 60 A (Model 9210)
- Compact for Bench Use
- Very Low Temperature Coefficients < 5ppm/ $^{\circ}$ C
- High Stability < 10 ppm/year

PRECISION DC MULTI-VALUE RESISTANCE STANDARDS & CURRENT SHUNTS

| Model 9200 12 Month Specifications | Resistance | Current Range | Maximum Current ¹ | Accuracy ^{2,3} | Max Power |
|--|------------|------------------|------------------------------|-------------------------|-----------|
| | 0.01 Ω | 1.5 A to 15 A | 15 A | ± 0.01% | 2.25 W |
| | 0.1 Ω | 150 mA to 1.5 A | 3.2 A | ± 0.01% | 1 W |
| | 1 Ω | 15 mA to 150 mA | 700 mA | ± 0.01% | 0.5 W |
| | 10 Ω | 1.5 mA to 15 mA | 220 mA | ± 0.01% | 0.5 W |
| | 100 Ω | 150 μA to 1.5 mA | 70 mA | ± 0.01% | 0.5 W |
| | 1,000 Ω | 15 μA to 150 μA | 22 mA | ± 0.01% | 0.5 W |
| | 10,000 Ω | 0 to 15 μA | 7 mA | ± 0.01% | 0.5 W |

| Model 9210 12 Month Specifications | Resistance | Current Range | Maximum Current ¹ | Accuracy ^{2,3} | Max Power |
|--|------------|---------------|------------------------------|-------------------------|-----------|
| | 0.0025 Ω | 30 A to 60 A | 60 A | ± 0.01% | 9 W |
| | 0.005 Ω | 15 A to 30 A | 30 A | ± 0.01% | 4.5 W |
| | 0.01 Ω | 7.5 A to 15 A | 15 A | ± 0.01% | 2.25 W |
| | 0.02 Ω | 3 A to 7.5 A | 7.5 A | ± 0.01% | 1.12 W |
| | 0.05 Ω | 1.5 A to 3 A | 3.0 A | ± 0.01% | 0.45 W |
| | 0.1 Ω | 0 mA to 1.5 A | 1.5 A | ± 0.01% | 0.225 W |

Note 1: Maximum current is the over range current that can be sustained for a maximum time of 5 minutes without damaging standard. No accuracy is specified.

Note 2: Calibrated in air at 23 °C traceable to the SI unit of electric resistance, calibration uncertainties expanded and expressed at the 95 % level of confidence. An ISO/IEC 17025 accredited certificate and report of calibration stating the calibrated value and estimated uncertainty is provided with each resistor.

Note 3: Measured values and uncertainty is provided with each unit at rated current down to a minimum of 0.1mA. Resistance selections of 1 Ω and lower are provided with additional values at 1/10 rated current.

GENERAL SPECIFICATIONS (BOTH MODELS)

| Environmental | Temperature | | Humidity | |
|---------------|-----------------|--------|-------------------------|--------|
| Operating | 15°C to 35 °C | | < 70% RH Non-Condensing | |
| Storage | -20 °C to 55 °C | | < 90% RH Non-Condensing | |
| Dimensions | Height | Width | Depth | Weight |
| Millimetres | 200 mm | 183 mm | 283mm | 5.5 kg |
| Inches | 7.8" | 7.3" | 11.1" | 12 lbs |

ORDERING INFORMATION

| | |
|-------------------------------------|--|
| 9200 | DC Multi-Value Resistance Standard |
| 9210 | DC Multi-Value Resistance and Current Standard |
| /TM | Technical Manual (Included) |
| /C | ISO/IEC 17025 Calibration Certificate (Included) |
| 92301 | 20A, 1 Meter Lead Set |
| 92321 | 150A, 1.5 Meter Lead Set |
| Lead-10 | SCW Lead Set Low Thermal 1.5 M Length (Potential Terminal) |
| Other Precision Lead Sets Available | |

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