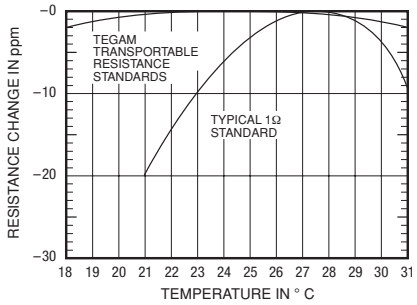
Model SR102/SR104

RESISTANCE STANDARDS & INSTRUMENTS

Transportable Resistance Standards

- **Highest accuracy and stability**
- **Lowest temperature coefficients**
- **Optional A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration**

Temperature coefficient comparison between a typical TEGAM model and typical 1 ohm standard resistor.



The TEGAM precision Transportable Resistance Standards are oil filled, hermetically sealed, five-terminal resistance standards designed for precision bench top or oil bath applications.

The long-term stability of these resistance standards is typically less than 0.2 ppm per year and temperature coefficients are less than 0.1 ppm per degree Celsius. This excellent long-term stability and low temperature coefficient is achieved by using matched groups of resistors constructed of the alloy Evanohm-R. The resulting low temperature coefficient allows high performance applications of these standards inside or outside an accurately controlled temperature environment.

Maximum accuracy is calculated as a temperature corrected resistance value. This is accomplished by using the built-in RTD temperature sensor to measure the internal temperature and referencing a temperature correction chart provided with each unit. The measurement accuracy of the built-in RTD thermometer is better than 0.1 degree Celsius.

Very low power coefficients are achieved by using standard resistors constructed with large surface areas like our original Model SR104, 10kΩ standard resistor. The resistors are surrounded by oil to conduct heat generated by the measuring currents out through the stainless steel case.

These characteristics facilitate precise laboratory comparisons without critical environmental controls and are used wherever a need for a very accurate, stable resistor of low temperature coefficient is required.

100 Ω Standards

These standards were designed to provide an important link between rather odd Quantum Hall resistance values and traditional decade resistance values. 100 Ω provides unique reference capability.

10 KΩ Standards

This has been the long-standing industry standard for the 10 kΩ. This everlasting standard is the benchmark for high accuracy, stability and low temperature coefficients for calibrations requiring NIST traceability.

Prices and specifications subject to change without notice.

TEGAM®

YOUR GLOBAL SOURCE FOR TEST AND MEASUREMENT SOLUTIONS

Model SR102/SR104

TRANSPORTABLE RESISTANCE STANDARDS

Specifications

Stability	±1 ppm/year the first 2 years; ±0.5ppm/year thereafter
Temperature Coefficient	< 0.1 ppm/ºC at 23 ºC
Power Coefficient	Less than 1 ppm/W
Initial Value	
SR102, SR102/DC	±1 ppm
SR104,SR104/DC	±1 ppm
U_C for Standard Resistor (K = 2)	
SR102, SR102/DC	0.41 ppm
SR104, SR104/DC	0.41 ppm
Breakdown Voltage	500 Volts peak to case
Power Rating	1 Watt Momentary 100W overloads will not cause failure
Insulation Resistance	All terminals maintain a minimum $10^{12}\ \Omega$ to ground
AC-DC Difference	Less than ±5 ppm from 0 to 1,592 Hz
Dimensions/Weight	
Bench Top Formica Case	
Height	25.4 cm (10.0 in)
Width	20.6 cm (8.10 in)
Depth	31.1 cm (12.25 in)
Weight	4.8 kg (10.5 lb)
Ship Weight	5.4 kg (12 lb)
Oil Bath Stainless Steel Case	
Height	12.7 cm (5.0 in)
Width	8.9 cm (3.5 in)
Depth	17.8 cm (7.0 in)
Weight	1.8 kg (4.0 lb)
Ship Weight	2.7 kg (6.0 lb)

Temperature Coefficient

Alpha (temperature coefficient) less than ±0.1 ppm/ºC at 23 ºC. Beta (1/2 rate of change of temperature coefficient) does not exceed 0.03 ppm/ºC² over the temperature range of 18 ºC to 28 ºC. This performance is as a passive device without ovens or external power requirements.

Internal Temperature Sensor

The internal temperature sensor is a 1,000 ppm/ºC RTD with integral thermowell provided for calibration.

Hermetic Sealing

The resistor is hermetically sealed in oil with metal to glass seals to eliminate the effects of humidity.

Pressure Effects

Normal changes in atmospheric pressure will not effect the value of these resistors. This means that measurements made at NIST in Gaithersburg, MD (sea level) will be consistent with measurements made at NIST in Boulder, CO (1.6 km or 5,280 ft).

Termination

Five-terminal construction, four-terminal resistor with ground intercept for the standard and temperature sensor. The four resistor binding posts are gold plated tellurium copper to reduce thermal emf. The ground terminals are brass.

Thermal emf

Under normal conditions thermal emf at the terminals does not exceed ±0.1 µV.

Thermal Lagging

Thermal lagging time constant is one hour minimum (1-1/e of total change in one hour).

Dielectric Soakage Effect

The resistance stabilizes to within 0.1 ppm of final value within 5 seconds with 1 V applied to the resistor.

Current Reversal

The resistance value changes less than ±0.1 ppm with reversal of current through the resistor.

Packaging

The bench top versions are mounted in a sturdy formica veneered wooden case having a removable lid and carrying handle. Other versions are packaged in a sturdy stainless steel container.

Ordering Information

Resistance Transfer Standard

SR102	100 Ohm, Bench Top Case
SR102/DC	100 Ohm, Case Deleted
SR104	10,000 Ohm, Bench Top Case
SR104/DC	10,000 Ohm, Case Deleted

Included Accessories

Manual and Coefficient Chart
P/N 13500A

Z540 Compliant Calibration with Certificate and Data for SR102 or SR104
P/N OPT-Z540

Optional Accessories

A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration for SR102 or SR104
P/N OPT-A2LA

Warranty

One year on materials and workmanship.

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