Model SR1030

RESISTANCE STANDARDS & INSTRUMENTS

- Part-per-million transfers from 100 mΩ to 1 MΩ
- Thermally isolated by oil for maximum short-term thermal stability
- Excellent long-term stability; ±20 ppm for 6 months
- Accuracy calibrated to ±10 ppm
- Seven decades of resistance transfer-1, 10, 100, 1 k, 10 k and 100 kΩ/step
- 100:1 resistance transfers using series, parallel, series/parallel connection
- Calibration readings traceable to the NIST are provided

Resistance Transfer Standard System

Extremely Accurate and Stable

The Model SR1030 provides the part-per-million (ppm) resistance transfer accuracies and the long-term stabilities you need in today's modern metrology and calibration laboratories.

The SR1030 Resistance Transfer Standards are extremely accurate, stable resistance standards that are used on the bench and are light enough to carry with you to remote calibration, repair, production or R&D sites. The SR1030 consists of six transfer standards in decades from 1 Ω to 100 kΩ per step. Each decade standard consists of 12 nominally equal resistors matched initially to within 10 ppm. In addition, each decade standard produces three decade values – 10 resistors in series (10R), 10 resistors in parallel (R/10), and nine of the 10 resistors in series/parallel (R). By making a 1:1 comparison with the tenth resistor, you can resolve a series-parallel value to better than 1 ppm.

Oil Immersion Provides Thermal Isolation

All standards, except the 100 kΩ/step standard, are immersed in a mineral oil bath. Oil immersion provides thermal isolation to minimize the effects of ambient temperature variations. This means maximum short-term thermal stability for the standards. The SR1030 also exhibits superior long-term stability (±20 ppm of nominal for six months; ±35 ppm typical for two years; ±50 ppm typical for five years). This gives you longer mean time between calibrations, increasing your calibration throughput.

As an added benefit, the oil speeds the dissipation of heat created in the resistors during calibration. This heat dissipation further contributes to the stability of the standards.

Gaskets seal the SR1030 to keep the work surface and measuring contacts clean. The gaskets also minimize oil aging and contamination to lengthen the time between oil changes.

Since the 100 kΩ standard can be measured at much lower bridge power than the lower value standards, it is not necessary to immerse the standard in oil. However, this standard still benefits from the thermal lagging effects because it is sealed in a chamber using insulating materials that provide approximately the same temperature lagging effects as oil.

Refining Resistance Technology

TEGAM's experience in design and manufacture of resistance standards has made TEGAM's standards highly respected throughout government and industry. The SR1030 incorporates all the features of the SR1010 Resistance Transfer Standards with the many benefits of a sealed oil bath.

Ideal as a Multi-Value Standard Resistor or Reference Voltage Divider

The high accuracy and precision of the individual resistors make the SR1030 ideal for use as a multi-value standard resistor or reference voltage divider. The superior stability of the SR1030 makes it particularly suitable for calibrating 6-1/2, 7-1/2 and 8-1/2 digit digital multimeters.

Certified Traceable to the NIST

The SR1030 Resistance Transfer Standard is certified traceable to the National Institute of Standards and Technology. You can use the SR1030 to transfer this traceability to your resistance standards and measuring equipment. Certified calibration data is supplied with every standard.

TEGAM®

YOUR GLOBAL SOURCE FOR TEST AND MEASUREMENT SOLUTIONS

Model SR1030

RESISTANCE TRANSFER STANDARDS

Specifications

Nominal Values (per step)
1, 10, 100, 1 k, 10 k and 100 kΩ

Transfer Accuracy

100:1	±(1 ppm + 0.1 μΩ) at parallel value, using SB103, PC101, and SPC102 as necessary
10:1	± (1 ppm + 0.1 μΩ) at series or parallel value, using SB103, PC101, and SPC102 as necessary

Initial Adjustment
±20 ppm of nominal value matched within 10 ppm

Calibration Accuracy
±10 ppm, NIST traceable

Calibration Conditions
23 ±1 ºC, low-power, four-terminal measurement, initial calibration readings are provided

Long-Term Resistance Stability
±20 ppm of nominal for 6 months
±35 ppm for 2 years, typical
±50 ppm for 5 years, typical

Temperature Coefficient

1 Ω	±15 ppm/ºC, matched within 5 ppm/ºC
10 Ω	±1 ppm/ºC
100 Ω to 100 kΩ	±5 ppm/ºC, matched within 3 ppm/ºC

Power Coefficient (typical)

1 Ω	±0.3 ppm/mW/resistor
10 Ω	±0.02 ppm/mW/resistor
100 Ω to 100 kΩ	±0.1 ppm/mW/resistor

Maximum Power Rating

Single Step	1W/step
10 resistors	5W/distributed

Leakage Resistance

1 Ω to 10 kΩ	>10^{12} Ω terminal to case
100 kΩ	>10^{13} Ω terminal to case

Breakdown Voltage
1500 volts peak to case

Oil Bath

Type	Mineral oil, Penreco Drakeol #9, white
Insulation	
Resistance	Typically 10^{14} Ω cm
Quantity	Approximately 0.5 gallons

Dimensions (with oil)

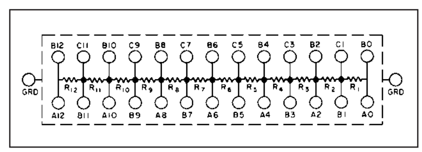
Height	120 mm (4.7 in)
Width	117 mm (4.6 in)
Depth	335 mm (13.2 in)
Weight	6.35 kg (10 lb)

Operating Environment

Temperature	22.8 ºC ±3.3 ºC (73±6 ºF)
Humidity	20 to 50 % relative humidity

Safe Operating Environment

Temperature	0 ºC to 50 ºC (32 ºF to 126 ºF)
Humidity	15 to 80 % relative humidity



Maximum Current and Voltage Capabilities

SR1030 Resistance Value Per Step	One Resistor Alone Maximum I, V	10 Resistors in Parallel (R/10) Maximum I, V	10 Resistors in Series (R10) Maximum I, V
1 Ω	1.0 A, 1.0 V	7.07 A, 707 mV	707 mA, 7.07 V
10 Ω	316 mA, 3.16 V	2.23 A, 2.23 V	223 mA, 22.3 V
100 Ω	100 mA, 10 V	707 mA, 7.07 V	70.7 mA, 70.7 V
1 kΩ	31.6 mA, 31.6 V	223 mA, 22.3 V	22.3 mA, 233 V
10 kΩ	10 mA, 100 V	70.7 mA, 70.7 V	7.07 mA, 707 V

* Based on the breakdown voltage of 1500 volts peak to case

Combined Option Functional Specifications

Resistor Grouping	Ten Resistors in Parallel	Nine Resistors in Series/Parallel	Ten Resistors in Series
Nominal Value (Relative to Individual Resistor Value R)	0.1R	R	10R
Four-Terminal Measurement	Resistance Added to Value Calculated from Individual Resistor Values (Value and Tolerance in Microhms)		
With SB103 and PC101 or SPC102	0 ±0.1 μΩ	0 ±1 μΩ	–
With SB103 Alone	50 ±10 μΩ	200 ±40 μΩ	–
With No Accessories	–	–	0 ±10 μΩ
Two-Terminal Measurement			
With SB103	150 ±30 μΩ	300 ±60 μΩ	–
With No Accessories	–	–	300 ±60 μΩ

Order Information

SR1030 Resistance Transfer Standard

	Part No.
1 Ω Resistance Transfer Std.	SR1030-1
10 Ω Resistance Transfer Std.	SR1030-10
100 Ω Resistance Transfer Std.	SR1030-100
1 kΩ Resistance Transfer Std.	SR1030-1 K
10 kΩ Resistance Transfer Std.	SR1030-10 K
100 kΩ Resistance Transfer Std.	SR1030-100 K

Included Accessories

Manual	P/N 67041
Z540 Compliant Calibration with Certificate and Data for SR1030	P/N OPT-Z540

Optional Accessories

Shorting Bars	P/N SB103
Series Parallel Compensation Network	P/N SPC102
Parallel Compensation Network	P/N PC101

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