

Precision Resistance Transfer Standards

Very High Stability Calibration Laboratory Resistance Transfer Standards



SR 1050 SERIES FEATURES

- ◆ Very High Quality Laboratory Standard with Same Operation, Specifications and Layout of the Original ESI Design!
- ◆ High Transfer Accuracy better than 2 ppm!
- ◆ 2 Models with Decade Values from 1M Ω /step and 10 M Ω /step!
- ◆ Resistance Transfers from 100k Ω to 110M Ω
- ◆ Each Device Configurable to 10R, 1R, and R/10!
- ◆ Leakage Resistance $>10^{13}\Omega$ from Terminal to Case!
- ◆ Can also be used as a Precision Voltage Divider!
- ◆ Proven Guildline Quality with over 50 Years Design Experience!

GUILDLINE INSTRUMENTS SR 1050 SERIES of Resistance Transfer Standards are designed as very high stability calibration laboratory transfers standards for customers looking to replace the old ESI SR 1050 Series.

The classic look and feel of the original ESI SR1050 Series has been maintained. Actual size and weight are very similar to the ESI model. The switches, binding posts and elements are of the highest quality found in a laboratory instrument. The resistance elements used in the model SR1050 Series undergo the same vigorous testing and acceptance as do the elements found in our primary laboratory resistance standards.

Like the original ESI Design - 3 Position, highly isolated - Lever Switching is used and no shorting or paralleling bars are required. We even alternate switch colors to allow a quick and easy visual that all values are in the correct toggle position. A 12th zero switch is provided.

1M and 10M SR 1050 Transfer Models are available providing with the highest available uncertainty with Guildline's 50 years Plus of Design Experience and Quality in Every Unit Sold!

Available models are 1M and 10M Ohm Decade Resistance Standards which have 11 equal valued, highly precise resistors contained within them. Each model SR1050 Series has 11 equal value resistors in increments of 1M per step or 10M per step, depending on the model.

The Guildline SR1050 Series – Keep the original performance and operational technique, and providing the same exceptional Guildline quality you have come to know since 1957!

SR 1050 Series of Resistance Transfer Standards

Ultra-Stable, 3 Position Lever Switching is used for all resistance switch and no shorting or paralleling bars are required. A 12th zero switch is provided. 12 switches are required so that all possible combinations of the 11 resistance elements can be realized. Based on a unique method for establishing known ratios, the Model SR1050 standard utilizes a transfer technique that consists of switching resistance sections in parallel, series or series-parallel sections.



Guildline only uses Lever switches of the highest quality as required by a laboratory instrument. The switches are isolated from the case through Teflon spacers rated for over 5kV peak break down voltage. Guildline workmanship is first rate with care taken for appearance, performance and functionality. These standards reflect quality found not found in any other manufacturers offering of this product.

Over 50 years of design, highest quality materials and highly experience manufacture of the standards ensure that these SR1050's will be safe for the operator and maintenance personnel throughout the life of the equipment. Particular care has been provided in isolation and leakage design for the expected high voltages required

The SR1050 Series has a 3 terminal binding post design with one terminal used as ground. All measurement binding posts used are 5-way, specifically selected for low thermals and are gold flashed.

A fully isolated UHF connector is provided at the terminal end of the 11 resistor chain and the center pin is connected to the start of the resistor chain such that the decade transfer standard may be utilized as a precision voltage divider. The UHF shell is isolated completely from the case and the resistance chain. Except for the case ground terminal, all terminals, like the switches, are isolated from the case through Teflon spacers rated for over 5kV peak break down voltage.

Internally, each resistance element section employs multiple ultra-high stability low TC film resistors connected in series with an allowance for a fine adjustment resistance element. Each section assembly is rated for 2800 Volts, 1.5 Watts continuous operating voltage and power. The sections are doubly insulated by ceramic stand-off terminals mounted on a Teflon plate material. Techniques no-one else employees.

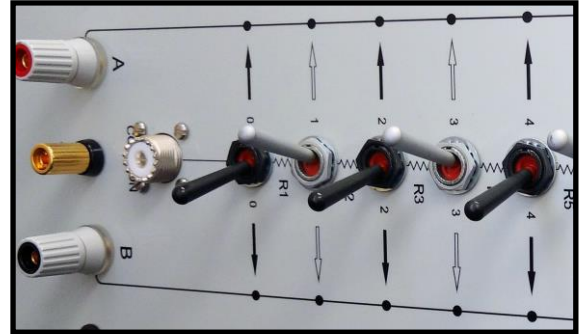
The long term accuracy of the SR1050 Series is typically less than 30 ppm of nominal over a two year period. The use of high quality resistive elements as well as care in assembly and calibration ensure

compliance to the provided specifications and long life reliability.

SR 1050 Series of Resistance Transfer Standards

Various configurations and output values are selectable with the use of SR1050 resistors when connected in series, parallel, or a combination of both.

This can be accomplished by the use of the resistors when connected in series, parallel, or a combination of both (R, 1/R, 10R). An example chart of these settings are shown below.



SR1050 STANDARD SWITCH POSITION	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
SET TO R/10	↓	↑	↓	↓	↓	↓	↓	↓	↓	↓	↓	OFF
SET TO 10R	↓	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	↑	OFF
SET TO -1R	↓	OFF	OFF	↑	OFF	OFF	↓	OFF	OFF	↑	OFF	OFF

Don't Be Fooled!

Other manufacturers claim to have ESI SR1050 replacement models also. However, none of them retain many of the original design, performance and operational requirements that made this instrument a highly prized, high quality and long lasting standard.

There are easy ways to spot the cost reductions other similar models incorporate. The simplest method is to simply look at the switches used. ESI used a 3 position toggle (shown) and Guildline incorporates only the finest, 3 position toggle switches provided low thermals, low noise switches and the repeatability required for a laboratory standard. Additionally, Guildline incorporates additional proprietary techniques to provide the isolation needed for these standards. Just look at the switches installed by other manufacturers.

Another area is to look at the common connector. ESI and Guildline both use a UHF Connector. Other manufacturers took the inexpensive route and put in a standard BNC connector. Does this really make a difference? The answer is not so obvious if you are not designing standards, however remember that this unit is rated up to 3500 Volts peak between any terminal and case. A BNC connector (standard) has a maximum rating of 500 Volts and while some special higher voltage BNC connectors are available, the maximum rating is still only 1kV, or about 1500 Volts short of providing safe operation. Safety and safe designs are one area not worth cost cutting features that can put operators at risk!

Areas not so obvious are internal to the unit. Is the design and components used of laboratory quality instruments? Are techniques such as utilizing multiple resistors for each of the elements buildup used or did the manufacturer decide to only use one element? The best way to test this is to ask the manufacturer to supply a unit for testing and then examine these results carefully.

ORIGINAL ESI SR1050 DESIGN



SR 1050 Series of Resistance Transfer Standards

SPECIFICATIONS

STEP SIZE	ADJUSTMENT (INITIAL) ACCURACY	TRANSFER ACCURACY ¹	STABILITY (PPM/YEAR)	LONG TERM STABILITY	TEMPERATURE COEFFICIENT	RESISTANCE MATCHING	
						ADJUSTMENT	TC
1 MΩ	±20 ppm	±2 ppm	±15 ppm	±30 ppm	±3 ppm/°C	±10 ppm	±3 ppm
10MΩ	±20 ppm	±2 ppm	±15 ppm	±30 ppm	±3 ppm/°C	±10 ppm	±3 ppm

1 – within ±1 °C of measured value

General Specifications		
Maximum Power Rating:	1 W/step or 5 W distributed over 10 steps, or maximum voltage of 2.5 kV where this value does not result in power excess of 1 W per resistor	
Power Coefficient:	<±0.05 ppm/mW per resistor	
Break Down Voltage:	3,500 peak between any terminal and case	
Leakage Resistance:	Greater than 10 ¹³ Ω from terminal to case	
Connection Terminals:	Three gold-plated, 5-way, tellurium-copper binding posts with low thermal emf and low resistance. One shielded UHF terminal labeled COMMON, used when the unit is employed as a precision voltage divider.	
Calibration Data:	Initial Calibration readings are listed on certificate and instrument	
Environmental:	Operating (Specifications)	Storage
Temperature:	23 °C ± 3 °C	0 °C to 50 °C
Humidity:	20% to 50% RH	15% to 80% RH
Size (Either Model) H x W x D	17" x 6.0" x 5.9"	43 cm x 15.2 cm x 15 cm
Weight (Either Model):	11 lbs	5 kgs

Warranty Accuracy - Specifications are guaranteed for 1 year from date of shipment. Typically specifications are maintained for a longer period of time. Instruments are guaranteed for the 1 year standard warranty with the instrument. Refer to Guildline warranty statement.

ORDERING INFORMATION	
SR 1050-1M	1 MΩ/Step Precision Resistance Transfer Standard
SR1050-10M	10 MΩ/Step Precision Resistance Transfer Standard
/TM	SR1050 Technical Manual included at no charge.
/Report	Certificate and Report of Calibration (with data) included
Optional Accessories	
Precision Low Thermal Leads Are Available	

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