Measurements International

Metrology is Our Science, Accuracy is Our Business™

4310HR TEMPERATURE STABILIZED RESISTANCE STANDARD

Featuring

- 100 MΩ TO 10 TΩ Elements
- Other Values Available
- N-Type Connectors
- Temperature Coefficient ± 0.2 ppm/°C
- Eliminates Oil Bath/Air Bath Requirements
- Low Thermal EMF's - Shielded Chamber
- Temperature Regulation: ± 0.01 °C Per Year

Overview

The model 4310HR is a newly re-designed six-element resistance standard that is the latest development from Measurements International's series of DC resistors and shunts. After many years of research in resistance materials, the model 4310HR ensures that you get the best performance on the market today. Combined with MI's experience in automated high-value resistance measurements, the 4310HR is used as a temperature-controlled, 6-element working resistance reference.

With a complete focus on re-design for improvement of specification, the 4310HR utilizes the proven delta-wye network for unmatched accuracy and precision. Special consideration is taken into the selection of every element used to ensure that it meets the specifications and performance you expect from an MI product.

The six-resistance elements cover the range from 10 MΩ to 100 TΩ and are maintained at 30 °C, with an operating environment temperature range of 23 °C ± 5 °C. The elements feature excellent stability and extremely low-temperature coefficients housed in a single unit. Each resistor is accessible from the Teflon back panel with all connections being made via N-type connectors. The model 4310HR can be mounted in any standard 19-inch instrument rack.

Based on the highly accurate 9331H series (released in 2013) of resistance standards, combined with the release of the dual source bridge technology and replacement of older methods of measurement, customers required a higher level of resistance standard than previous methods from the range of 10 M to 100 T. Hence, the release of the 9331H series of delta-wye configuration and now the release of the new and improved, redesigned 4310HR.

Feature	Benefit
Temperature Controlled	A shielded air bath for temperature stability.
MI Reputation	The same expected performance as all MI standard resistors.
Delta-Wye Construction	Produces lowest voltage coefficient.
Shielded and Isolated	Greatly reduces environmental and grounding errors.
Excellent Stability	Unmatched by any manufacturer.

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Specifications: Rev 11

Nominal Resistance (Ohms)	Nominal Resistance Tolerance (± ppm)[1]	12 Month Stability (± ppm)	Max Current (100 mW)	Temperature Coefficient (± ppm/°C)[2]	Voltage Coefficient[3]
100 MΩ	100	20	10 µA	1	1 kV (1 ppm/V)
1 GΩ	200	40	1 µA	2	1 kV (1 ppm/V)
10 GΩ	500	100	100 nA	2	1 kV (5 ppm/V)
100 GΩ	1000	200	10 nA	10	1 kV (5 ppm/V)
1 TΩ	2500	500	1 nA	15	1 kV (5 ppm/V)
10 TΩ	5000	1000	100 pA	25	1 kV (5 ppm/V)
Enclosure Stability			< ± 0.01 °C Over a 1 Year Period		
Operating Temperature			23 °C ± 5 °C		
Ambient Humidity Range			20 to 50 % RH Non-Condensing		
Connectors			N-Type Female		
Rack Mount Kit			Included		
Storage Temperature/Humidity			-23 °C to 60 °C, 90 % RH Non-Condensing		
Warranty			Standard 1 Year Parts & Labour		

Note 1: Accuracy over the life of the resistor when used and handled in accordance with 4310HR User Manual.
Note 2: Temperature Coefficient: Temperature coefficient shall be applied the resistance standard is outside the normal 23 °C ± 5 °C.
Note 3: Voltage Gradient: Voltage coefficient shall apply to a voltage that the resistance standard is not calibrated up to its maximum allowable voltage.

Dimensions (L × W × H):
445 x 430 x 127 (mm)

Weight:
9 kg

Shipping Weight:
13 kg

Mains Power:
85 V_{ac} to 264 V_{ac}, 47 Hz to 440 Hz

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