9340 Series

Precision Decade Resistance Standards

Excellent for all Decade Resistance Applications whether Classical or Precision!

FEATURES

- Widest Available Resistance Range From 10 mΩ to 10 TΩ
- Temperature Coefficients as low as 5 μΩ/Ω /°C (Down to 0.01 Ω)
- Lowest Available Power Coefficients
- 12 Month Stabilities as Low as 10 μΩ/Ω (Near Resistance Standards Performance)
- Highest Current Handling Capabilities of Any Decade Standard (7 A)
- Smooth Dial Rotation with Stop Position at '10'; (Each Dial has an Overlap Position at '10' Enabling Fine Tuning)
- Five Types Available from 3 Dials to 7 Dials
- All Full Scale Resistance Values Available in All Dial Sizes

Guildline Instruments 9340 Series of precision DC Resistance Standards are a complete family of easy-to-use Decade Standards offering the best accuracy and widest range commercially available.

There are 5 standard types available from 3 dials to 7 dials. The smallest increment offered is 10 mΩ and the largest resistance available is just over 10 TΩ. All resistance values are available in all the dial sizes.

Simply Put – The 9340 Series are the most versatile and accurate Decade Resistance Standards available!

Accuracy of the 9340 Decade Resistance Standards is better than ± 0.01% + 2 mΩ from the range of 0.01 Ω to 10 MΩ. Other important specifications such as current handling capabilities, long term stability, temperature and power coefficients are also typically 5X to 10X better than the nearest competition. The 9340 Series truly sets the highest standard for Decade Resistors.

The long-term stability is maintained by design techniques used for precision resistance standards, combined with the use of today's finest quality materials.

The design minimizes leakage effects by careful shielding and the use of high quality insulation materials. The dials have a smooth rotation from position to position and the switches are stopped at position '10' to prevent the operator from accidentally switching directly from '10' to '0'. This is particularly critical when a decade box forms part of a circuit where there are devices present that cannot have current drawn from them.

Each dial has an overlap '10' position for fine-tuning a value without the need to reset all dials when passing through a decade point. The panel is clearly marked adjacent to each dial with the resistance per step and the current rating of that dial. The 9340 provides a modern compact design of high quality construction and high reliability for a modern version of the classical resistance decade standard.

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9340 Series Specifications

Model Number	# of Decades	Minimum Step (Ω's)	Maximum Value (Ω's)
9343/10	3	0.01	11.10
9343/100	3	0.1	111.0
9343/1k	3	1	1.110 k
9343/10k	3	10	11.10 k
9343/100k	3	100	111.0 k
9343/1M	3	1k	1.110 M
9343/10M	3	10k	11.10 M
9343/100M	3	100k	111.0 M
9343/1G	3	1M	1.110 G
9343/10G	3	10M	11.10 G
9343/100G	3	100M	111.0 G
9343/1T	3	1G	1.110T
9343/10T	3	10G	11.10 T

Model Number	# of Decades	Minimum Step (Ω's)	Maximum Value (Ω's)
9344/100	4	0.01	111.1
9344/1k	4	0.1	1.111 k
9344/10k	4	1	11.11 k
9344/100k	4	10	111.1 k
9344/1M	4	100	1.111 M
9344/10M	4	1k	11.11 M
9344/100M	4	10k	111.1 M
9344/1G	4	100k	1.111 G
9344/10G	4	1M	11.11 G
9344/100G	4	10M	111.1 G
9344/1T	4	100M	1.111 T
9344/10T	4	1G	11.11 T

Model Number	# of Decades	Minimum Step (Ω's)	Maximum Value (Ω's)
9345/1k	5	0.01	1.1111 k
9345/10k	5	0.1	11.111 k
9345/100k	5	1	111.11 k
9345/1M	5	10	1.1111 M
9345/10M	5	100	11.111 M
9345/100M	5	1k	111.11 M
9345/1G	5	10k	1.1111 G
9345/10G	5	100k	11.111 G
9345/100G	5	1M	111.11 G
9345/1T	5	10M	1.1111 T
9345/10T	5	100M	11.111 T

Model Number	# of Decades	Minimum Step (Ω's)	Maximum Value (Ω's)
9346/10k	6	0.01	11.111 1 k
9346/100k	6	0.1	111.111 k
9346/1M	6	1	1.111 11 M
9346/10M	6	10	11.111 1 M
9346/100M	6	100	111.111 M
9346/1G	6	1k	1.111 11 G
9346/10G	6	10k	11.111 1 G
9346/100G	6	100k	111.111 G
9346/1T	6	1M	1.111 11 T
9346/10T	6	10M	11.111 1 T

Model Number	# of Decades	Minimum Step (Ω's)	Maximum Value (Ω's)
9347/100k	7	0.01	111.111 1 k
9347/1M	7	0.1	1.111 111 M
9347/10M	7	1	11.111 11 M
9347/100M	7	10	111.111 1 M
9347/1G	7	100	1.111 111 G
9347/10G	7	1k	11.111 11 G
9347/100G	7	10k	111.111 1 G
9347/1T	7	100k	1.111 111 T
9347/10T	7	1M	11.111 11 T

Model Size and Weight

Model Number	Dimensions (H x L x W)	Weight
9343	11.8 x 23.3 x 10.3 cm	2.7 kg
	4.6 x 9 x 4 inches	6.1 lbs
9344	11.8 x 29 x 10.3 cm	3.25 kg
	4.6 x 11.5 x 4 inches	7.2 lbs
9345	11.8 x 34.7 x 10.3 cm	3.9 kg
	4.6 x 13.5 x 4 inches	8.6 lbs
9346	11.8 x 40.5 x 10.3 cm	4.4 kg
	4.6 x 16 x 4 inches	9.8 lbs
9347	11.8 x 46.1 x 10.3 cm	5.1 kg
	4.6 x 18 x 4 inches	11.3 lbs

Model Specifications

MSD (Most Significant Dial)	Maximum Dial Output (x10 Setting)	Coefficients			Maximum Limits		
		Stability	Temperature	Power	Power	Amperes	Volts
	(ohms)	(± µΩ/Ω /yr)	(± µΩ/Ω /C)	(± µΩ/Ω /mW)	(W/step)	(Adc/step)	(Volts/step)
0.01	0.1 Ω	500	5	0.2	0.5	7	0.07
0.1	1 Ω	50	5	0.2	0.5	2	0.2
1	10 Ω	20	5	0.2	0.5	0.7	0.7
10	100 Ω	10	5	0.2	0.5	0.2	2
100	1 k Ω	10	5	0.2	0.5	0.07	7
1 k	10 k Ω	10	5	0.2	0.5	0.02	20
10 k	100 kΩ	10	5	0.2	0.5	0.007	70
100 k	1 MΩ	10	5	0.2	0.5	0.002	200
1 M	10 MΩ	10	5	0.2	0.5	0.7 mA	700
10 M	100 MΩ	20	20	1	0.1	0.1 mA	1000
100 M	1 GΩ	50	20	50	0.01	0.01 mA	1000
1 G	10 GΩ	500	100	1*	0.001	1.5 uA	1500
10 G	100 GΩ	1000	250	1*	0.0001	0.15 uA	1500
100 G	1 TΩ	2000	-250	-85*	N/A	0.015 uA	1500
1 T	10 TΩ	3000	-2500	-110*	N/A	0.0015 uA	1500

Accuracy – Accuracy is based on the most significant dial (MSD) that is used for the resistance output. The accuracy of the MSD dial used for the resistance output determines the accuracy of all the dial settings for the resistance output desired. Accuracy for 1 MΩ and below is based on subtraction of Zero Resistance (nulling out all dial zero resistances and lead resistance).

	MSD (Most Significant Dial) Used					
Accuracy	10m to 1M	10M & 100M	1G	10G	100G	1T
	0.01% + 2 mΩ	0.1%	1%	2%	5%	6%

Examples show a 9346 Series models dials set to various outputs to show accuracy calculations.

Example 1 – A 9346/10k Decade Standard is set to **7**.96912 kΩ. The most significant dial would be 1k. Since the 1k Dial (set to 7 Position) is most significant dial used, the accuracy would be 0.01% + 2 mΩ for the entire resistance output.

Example 2 – A 9346/100M Decade Standard is set to **2**3.1573 MΩ. The most significant dial would be the 10 MΩ Dial. For this output, this dial would be set to the 2 Position with remaining dials set to values as shown. Since the 10 ΩM dial is the most significant dial used, the accuracy would be 0.1% for all the 9340 Dial Settings for the entire resistance output.

Example 3 – A 9346/1T Decade Standard is set to **100**.59 GΩ. Since the 1 TΩ Dial was not used this resistance requires only the 100 GΩ dials and below. The 100 GΩ is the most significant dial used so the accuracy would be 5% for all the 9340 Dial Settings for the entire resistance output. If the 1 TΩ Dial were used as the most significant dial, the accuracy would change to 6% for the output needed.

Number of Decades Available: 3, 4, 5, 6 & 7
Zero Resistance (Typical): < 3 mΩ + (1 mΩ for each decade dial) after settling
Breakdown Voltage: 1500 volts to case

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A Note about Ordering: To Order, select the model number (e.g. 3, 4, 5, 6 or 7 dial) and enter in the Model's "X" field the value of the highest decade resistance value you require. For example, a 9343/10 would be a 3-dial decade standard with a 0.01, 0.1 and 1 Ohm Decades (10 Ohms highest output on the 1 Ohm Decade). A 9345/10k would be a 5 dial decade standard; with decade steps of 0.1, 1, 10, 100, and 1k (10k would be highest resistance output on the 1k decade step).

ORDERING INFORMATION	
Model #	Values Available for Each Model
9343/X	10, 100, 1K, 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T
9344/X	100,1K, 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T
9345/X	1k,10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T
9346/X	10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T
9347/X	100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T
	17025 Accredited Certificate of Calibration (Included)
	Operation Manual Downloaded from www.guildline.com at no charge
Many Precision Leads Sets Are Available – Please Contact Guildline	

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