

## Decade Resistance Standards

### Classic Line of Decade Resistance Standards



**G**uildline Model 9340 Series of Precision Decade Resistance Boxes is a complete family of easy to use resistance standards offering the best combination of highest accuracy and widest range commercially available. There are 5 standard types available from 3 dial to 7 dial. The smallest increment offered is  $10\text{m}\ \Omega$  and the largest full scale total resistance available is just over  $10\text{T}\ \Omega$ . All full scale resistance values in the range are available in all the dial sizes.

The accuracy of the 9340 Decade Resistance Boxes is better than  $\pm 0.01\%$ . This performance has been achieved by techniques established at Guildline over a quarter of a century in the construction and stabilization of resistors and using low level switching techniques already proven in many of our precision instruments. Accuracy is maintained in a wide variety of application situations, not necessarily in a controlled environment by the use of resistive elements with low temperature and power coefficients. The long term stability is maintained by using classical resistance techniques developed by Guildline, combined with the use of today's finest quality materials.

***The 9340 provides a modern compact design of high quality and reliability.***

### 9340 FEATURES

- > Resistance range from  $10\text{m}\ \text{W}$  to  $10\text{T}\ \text{W}$
- > Accuracy  $0.01\%$ ,  $1\text{W}$  to  $10\text{M}\ \text{W}$
- > Smooth dial rotation with stop position at '10'; each dial has an overlap position at '10' enabling fine tuning
- > Five types available from 3 dial to 7 dial; all full scale resistance values in the range available in all the dial sizes

The individual decade switches have multiple contacts made of solid silver, which minimizes contact resistance. 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 positions '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 a classical type of resistance decade standard.

# 9340 Decade Resistance Standards

## 9340 Specifications

### Model 9340 Series Decade Resistance Boxes

#### Model Selection Table

Model	Decades	Minimum Step (Ohms)	Maximum Value (Ohms)
9343/10	3	0.01	11.10
9343/100	3	0.1	111.0
9343/1k	3	1	1.110k
9343/10k	3	10	11.10k
9343/100k	3	100	111.0k
9343/1M	3	1k	1.110M
9343/10M	3	10k	11.10M
9343/100M	3	100k	111.0M
9343/1G	3	1M	1.110G
9343/10G	3	10M	11.10G
9343/100G	3	100M	111.0G
9343/1T	3	1G	1.110T
9343/10T	3	10G	11.10T

Model	Decades	Minimum Step (Ohms)	Maximum Value (Ohms)
9346/10k	6	0.01	11.111 1k
9346/100k	6	0.1	111.111k
9346/1M	6	1	1.111 11M
9346/10M	6	10	11.111 1M
9346/100M	6	100	111.111M
9346/1G	6	1k	1.111 11G
9346/10G	6	10k	11.111 1G
9346/100G	6	100k	111.111G
9346/1T	6	1M	1.111 11T
9346/10T	6	10M	11.111 1T

Model	Decades	Minimum Step (Ohms)	Maximum Value (Ohms)
9344/100	4	0.01	111.1
9344/1k	4	0.1	1.111k
9344/10k	4	1	11.11k
9344/100k	4	10	111.1k
9344/1M	4	100	1.111M
9344/10M	4	1k	11.11M
9344/100M	4	10k	111.1M
9344/1G	4	100k	1.111G
9344/10G	4	1M	11.11G
9344/100G	4	10M	111.1G
9344/1T	4	100M	1.111T
9344/10T	4	1G	11.11T

Model	Decades	Minimum Step (Ohms)	Maximum Value (Ohms)
9347/100k	7	0.01	111.111 1k
9347/1M	7	0.1	1.111 111M
9347/10M	7	1	11.111 11M
9347/100M	7	10	111.111 1M
9347/1G	7	100	1.111 111G
9347/10G	7	1k	11.111 11G
9347/100G	7	10k	111.111 1G
9347/1T	7	100k	1.111 111T
9347/10T	7	1M	11.111 11T

Model	Decades	Minimum Step (Ohms)	Maximum Value (Ohms)
9345/1k	5	0.01	1.1111k
9345/10k	5	0.1	11.111k
9345/100k	5	1	111.11k
9345/1M	5	10	1.1111M
9345/10M	5	100	11.111M
9345/100M	5	1k	111.11M
9345/1G	5	10k	1.1111G
9345/10G	5	100k	11.111G
9345/100G	5	1M	111.11G
9345/1T	5	10M	1.1111T
9345/10T	5	100M	11.111T

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Decade Resistance (Ohms)	Step Resistance (Ohms)	Step Accuracy (±%)	Stability (± ppm/yr)	Temperature Coefficient (± ppm/C)	Power Coefficient (± ppm/mW)	Maximum Power (W/step)	Maximum Current (amperes)	Maximum Voltage (volts/step) Note 1
0.1	0.01	1	500	5	0.2	0.5	7	0.07
1	0.1	0.1	50	5	0.2	0.5	2	0.2
10	1	0.01	20	5	0.2	0.5	0.7	0.7
100	10	0.01	10	5	0.2	0.5	0.2	2
1K	100	0.01	10	5	0.2	0.5	0.07	7
10K	1K	0.01	10	5	0.2	0.5	0.02	20
100K	10K	0.01	10	5	0.2	0.5	0.007	70
1M	100K	0.01	10	5	0.2	0.5	0.002	200
10M	1M	0.01	10	5	0.2	0.5	0.7mA	700
100M	10M	0.1	20	20	1	0.1	0.1mA	1000
1G	100M	0.1	50	20	50	0.01	0.01mA	1000
10G	1G	1	500	100	1*	0.001	1.5uA	1500
100G	10G	2	1000	250	1*	0.0001	0.15uA	1500
1T	100G	5	2000	-250	-85*	N/A	0.015uA	1500
10T	1T	6	3000	-2500	-110*	N/A	0.0015uA	1500

**Zero Resistance:** < 0.0015 ± 0.0005 ohm per decade after settling of contacts

\* Voltage Coefficient – PPM/volt

**Breakdown Voltage:** 1500 volts to case

**Number of Decades:** 3, 4, 5, 6 & 7

**Note 1.** Maximum voltage: 1500 V

## 9340 Ordering Information

### Model#

### Description

### Values available

9343/ Ohmic value3 Dial Decade Resistance Box  
 9344/ Ohmic value4 Dial Decade Resistance Box  
 9345/ Ohmic value5 Dial Decade Resistance Box  
 9346/ Ohmic value6 Dial Decade Resistance Box  
 9347/ Ohmic value7 Dial Decade Resistance Box

10, 100, 1K, 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T  
 100, 1K, 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T  
 1K, 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T  
 10K, 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T  
 100K, 1M, 10M, 100M, 1G, 10G, 100G, 1T, or 10T

9340 Decade Resistance Standards  
 TM934x Technical Manual (included)  
 Certificate of Calibration (included)  
 Report of Calibration (extra charge)

## General Specifications

<b>Dimensions</b>	9343	11.8 H x 23.3 L x 10.3 W cm (4.6 x 9 x 4 in)
	9344	11.8 H x 29 L x 10.3 W cm (4.6 x 11.5 x 4 in)
	9345	11.8 H x 34.7 L x 10.3 W cm (4.6x 13.5 x 4 in)
	9346	11.8 H x 40.5 L x 10.3 W cm (4.6 x 16 x 4 in)
	9347	11.8 H x 46.1 L x 10.3 W cm (4.6 x 18 x 4 in)
<b>Weight</b>	9343	2.7 KG (6.1 lbs)
	9344	3.25 KG (7.2 lbs)
	9345	3.9 KG (8.6 lbs)
	9346	4.4 KG (9.8 lbs)
	9347	5.1 KG (11.3 lbs)

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