GenRad 1433 Series

The 1433 Decade Resistors are convenient resistance standards for checking the accuracy of resistance-measuring devices. They are primarily intended for precision-measurement applications where accuracy, stability, and low-zero-resistance are important. They are used as components in dc and audio frequency impedance bridges.

*Model **1433** Precision Decade Resistor*

Features:

- Resistance range from 1 mΩ to 111 MΩ
- High accuracy: 0.01% up to 10 MΩ
- Low temperature coefficient
- Good frequency characteristics
- Excellent stability
- Low zero resistance
- Rack mount option available

See also:

- Higher accuracy: **HARS-LX Series**
- Higher power: **HPRS Series**
- Higher resistance: **HRRS Series**
- Higher voltage: **HRRS-5kV** and **HRRS-10kV Series**
- RTD simulators: **RTD Series**
- Programmable models: **PRS Series**

SPECIFICATIONS

Resistance per step	Total decade resistance	Max current	Max voltage (per step)	Max power (per step)	Stability (±ppm/yr)	Long-term stability (±ppm/3 yrs)	Temperature coefficient (±ppm/°C)	Resistor type
1 mΩ	10 mΩ	8.0 A	5 mV	0.04 W	50	75	50	Resistance wire
10 mΩ	100 mΩ	4.0 A	40 mV	0.16 W	50	75	20	
100 mΩ	1 Ω	1.6 A	0.16 V	0.25 W	50	75	20	
1 Ω	10 Ω	0.8 A	0.8 V	0.6 W	20	25	20	Wirewound, non-inductive
10 Ω	100 Ω	0.25 A	2.5 V	0.6 W	20	25	15	
100 Ω	1 kΩ	80 mA	8 V	0.6 W	20	25	5	
1 kΩ	10 kΩ	23 mA	23 V	0.5 W	20	25	5	
10 kΩ	100 kΩ	7 mA	70 V	0.5 W	20	25	5	
100 kΩ	1 MΩ	2.3 mA*	230 V*	0.5 W*	20	25	5	
1 MΩ	10 MΩ	0.7 mA*	700 V*	0.5 W*	20	25	5	
10 MΩ	100 MΩ	0.1 mA*	1000 V*	0.1 W*	50	100	10	Metal oxide film

**Subject to maximum of 2000 V to case*

Accuracy:
≤1 MΩ decades: ±(0.01% + 2 mΩ)
10 MΩ decades: ±0.03%
after subtraction of zero resistance, at 23°C; traceable to SI

Zero resistance:
≤1 MΩ decades: <1 mΩ per decade at dc
10 MΩ decade: ≈3 mΩ at dc

Max voltage to case:
2000 V peak

Terminals:
Gold-plated, 5-way, tellurium-copper binding posts with low thermal emf and low resistance. Rear outputs are available as an option.

Terminals:
3 binding posts, labeled **HI**, **LO**, and **GND**

-K Option: Kelvin connection is available as an option with 5 binding posts, labeled **HI CURRENT**, **HI SENSE**, **LO SENSE**, **LO CURRENT**, and **GND**

Switch capacitance:
<1 pF between contacts

Environmental conditions:
Operating: 10°C to 40°C; < 80% RH
Storage: -40°C to 70°C

Typical Value of Zero Impedance:
<0.001 Ω/decade at 1 Hz
0.04 Ω/decade at 1 MHz
Proportional to square root of frequency above 100 kHz

Switches:
Continuous rotation
11 positions marked "0"-"10"
Multiple solid silver-alloy contacts

Supplied with unit:
Instruction manual
Calibration Certificate

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MECHANICAL SPECIFICATIONS

Model	Dimensions	Weight
3 decade	31 cm W x 8.9 cm H x 10.2 cm D (12.2" x 3.5" x 4")	1.7 kg (3.8 lb)
4-5 decade	37.6 cm W x 8.9 cm H x 10.2 cm D (14.8" x 3.5" x 4")	2.0 kg (4.3 lb)
6-7 decades	43.9 cm W x 8.9 cm H x 10.2 cm D (17.3" x 3.5" x 4")	2.4 kg (5.3 lb)
8-9 decades	48.3 cm W x 17.8 cm H x 17.8 cm D (19" x 7" x 7")	3.5 kg (7.7 lb)
10-11 decades		3.7 kg (8.1 lb)

ORDERING INFORMATION

Model	Total resistance	Number of decades	Resolution	Historic GR model numbers
1433-01	1.11 Ω	3	0.001 Ω	
1433-00	111.1 Ω	4	0.01 Ω	1433-U
1433-02	1.111 kΩ	4	0.1 Ω	1433-K
1433-04	11.11 k Ω	4	1 Ω	1433-J
1433-06	111.1 k Ω	4	10 Ω	1433-L
1433-08	1.111 MΩ	4	100 Ω	1433-Q
1433-09	11.11 MΩ	4	1 kΩ	
1433-09A	111.1 MΩ	4	10 kΩ	
1433-10A	111.11 Ω	5	0.001 Ω	
1433-10	1.1111 kΩ	5	0.01 Ω	1433-T
1433-12	11.111 kΩ	5	0.1 Ω	1433-N
1433-14	111.11 kΩ	5	1 Ω	1433-M
1433-16	1.1111 M Ω	5	10 Ω	1433-P
1433-18	11.111 MΩ	5	100 Ω	1433-Y
1433-18A	111.11 MΩ	5	1 kΩ	
1433-19	1.111 11 kΩ	6	0.001 Ω	
1433-20	11.1111 kΩ	6	0.01 Ω	1433-W
1433-22	111.111 kΩ	6	0.1 Ω	1433-X
1433-24	1.111 11 MΩ	6	1 Ω	1433-B
1433-26	11.1111 MΩ	6	10 Ω	1433-Z

Model	Total resistance	Number of decades	Resolution	Historic GR model numbers
1433-27	111.111 MΩ	6	100 Ω	
1433-28	11.111 11 kΩ	7	0.001 Ω	
1433-29	111.1111 k Ω	7	0.01 Ω	1433-F
1433-31	1.111 111 MΩ	7	0.1 Ω	1433-G
1433-33	11.111 11 MΩ	7	1 Ω	1433-H
1433-34	111.1111 MΩ	7	10 Ω	
1433-35	111.111 11 kΩ	8	0.001 Ω	
1433-36	1.111 111 1 MΩ	8	0.01 Ω	
1433-37	11.111 111 MΩ	8	0.1 Ω	
1433-38	111.111 11 MΩ	8	1 Ω	
1433-39	1.111 111 11 MΩ	9	0.001 Ω	
1433-39A	11.111 111 1 MΩ	9	0.01 Ω	
1433-39B	111.111 111 MΩ	9	0.1 Ω	
1433-40A	11.111 111 11 MΩ	10	0.001 Ω	
1433-40	111.111 111 1 MΩ	10	0.01 Ω	
1433-41	111.111 111 11 MΩ	11	0.001 Ω	

Options:

1433-xx-RM: Rack Mount Front Panel
1433-XX-RO: Rear output binding posts
1433-XX-K: Kelvin-type 4-terminal posts and GND

Mouser Electronics

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IET Labs:

1433-09 1433-35 1433-39 1433-33 1433-06 1433-37 1433-38 1433-34 1433-36 1433-31 1433-39A 1433-02 1433-40A 1433-16 1433-12 1433-18 1433-10 1433-14 1433-19 1433-18A 1433-10A 1433-08 1433-01 1433-20 1433-28 1433-24 1433-22 1433-26 1433-27 1433-39B 1433-04 1433-40 1433-09A 1433-00 1433-41 1433-24-C