

METRAOHM[®] 413

Low-Resistance Ohmmeter

3-348-810-03
3/8.00

- Handy measuring instrument per VDE 0413 part 4 / EN 61557-1 / -4
- Two measuring ranges from 0.01 ... 20 Ω and 0.1 ... 200 Ω
- Measurement cable zero balancing
- Compact and durable
For rugged service calls and laboratory use
- Overvoltage protection
Protects the instrument in the event of inadvertent connection to mains voltage
- Indication of interference voltage
- IP 65 protection



QUALITY MANAGEMENT SYSTEM



DQS Certified per
DIN EN ISO 9001 reg. nr. 1262

Applications

The METRAOHM[®] 413 is a battery powered instrument for the measurement of low-value resistances of up to 200 Ω in electrical systems.

Large protective conductor, earthing, equipotential bonding and lightning protection systems can also be tested quickly and safely with the METRAOHM[®] 413. Resistance is measured between reference earth (e.g. an equipotential bonding strip) and any desired points to this end.

A measuring current of 200 mA (in the 20 Ω range) and automatic functions assure reliable measuring results.

- Adjustment of shunts in instrumentation applications
- Testing of electrical connections at busbars in open-pit mining, in industry and in household applications
- Testing of cable resistance, wiring, shunt resistors in printed circuit boards and thick-film circuits
- Measurement of contact resistance in relays, power contactors and load interrupters
- Measurement of fuse resistance, as well as cable resistance in power circuits
- Testing of coil resistance in transformers, coils, small motors etc.

Description

Easy Operation

Operation is very easy. Measurement cables of almost any length can be used thanks to the offset balancing function.

Measurement polarity can be reversed, and both measured values are stored to memory for subsequent comparison. Resultant deviations in the measuring results (e.g. possible galvanic voltages) can thus be recognized.

Offset Balancing

Offset balancing compensates for measurement cable resistance. The offset value is saved to memory and is utilized for all future measurements until balancing is performed once again. The value remains in memory, even after the measuring instrument has been switched off.

A variety of measurement cables with resistances of up to 3.5 Ω can be used.

Protection Against Operator Error

The METRAOHM[®] 413 is protected against inadvertent connection to devices under test with fault voltages of up to 500 V by means of protective devices.

Interference Voltage Warning

Interference voltage is indicated visually with a red LED, and audibly with an acoustic warning signal. The voltage value is displayed at the LCD as well, as long as the test probe makes contact.

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Features

Display

Type	LCD
Character Height	13 mm
Display Range	1999
Overload	indicated with a 1 at the far left of the display
Battery Display	at the LCD
Interference Voltage Display	red LED, and at the LCD

Battery Saving Circuit

The measuring instrument is switched off automatically if none of the keys are activated for a period of approximately 20 seconds.

Applicable Regulations and Standards

IEC 61010-1 / EN 61010-1 / VDE 0411 Part 1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN 43751	Digital measuring instruments
EN 61557-1 / -4 / VDE 0413 Part 4	Ohmmeters
IEC 60529 / EN 60529 / VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)
EN 50081-1 / VDE 0839 Part 81-1	Electromagnetic compatibility (EMC), generic standard for interference emission
EN 50082-1 / VDE 0839 Part 82-1	Electromagnetic compatibility (EMC), generic standard for interference immunity

Characteristic Values

Measuring Range in Ω	Resolution in m Ω	Short-Circuit Current in mA	Intrinsic Error \pm (% of rdg. + d ¹⁾)	Open-Circuit Voltage
19.99	10	200	1.5 % + 4	> 6
199.9	100	20	1.5 % + 4	> 6

¹⁾ Percentage of reading plus digits

Ambient Conditions

Reference Temp.	20 °C
Storage Temperature	-10 °C ... +70 °C
Operating Temp.	-10 °C ... +50 °C

Power Supply

Battery	9 volt block battery per IEC 6 LR 61 AIMn, 1 battery is sufficient for approx. 150 measurements at 200 mA (in 20 Ω range), automatic shutdown after 20 seconds of inactivity
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Electrical Safety

Safety Class	II per IEC 61010-1
Operating Voltage	500 V
Test Voltage	3.2 kV
Overvoltage Category	II
Fouling Factor	2
Overvoltage Protection	reversible by means of semiconductor at nominal voltages of up to 230 V, from 230 to 500 V with special fuse (can only be replaced at the factory)

Electromagnetic Compatibility (EMC)

Interference Emission	EN 50081-1
Interference Immunity	EN 50082-1

Mechanical Design

Housing	impact resistant with unbreakable display cover
Protection	housing: IP 65 per IEC 60529
Dimensions	60 x 230 x 40 mm
Weight	approx. 0.25 kg including battery

Standard Equipment

- 1 METRAOHM[®]413 low-resistance ohmmeter
- 1 plug-in measuring cable
- 1 9 volt block battery per IEC 6 LR61
- 1 operating instructions

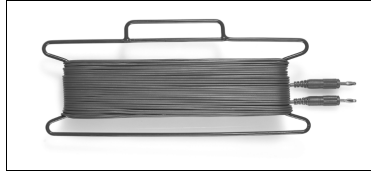
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Accessories

TR25 Reel with Measurement Cable

Reel with 25 m measurement cable. Cable ends are equipped with banana plugs.



TR50 Drum with Measurement Cable

50 m measurement cable coiled onto a metal drum. Connection to the inside end of the cable is made possible with a socket integrated into the drum. The other end is equipped with a banana plug. The drum axle with handle can be removed for space saving storage.



Order Information

Designation	Type	Article Number
Low-Resistance Ohmmeter	METRAOHM® 413	M630A
Reel with 25 m Measurement Cable	TR25	GTZ 3303 000 R0001
Drum with 50 m Measurement Cable	TR50	GTY 1040 014 E34

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