

METRISO[®] 500D/1000D/1000IR Insulation Tester with Digital Display

3-349-115-03
4/6.06

Features

- Digital and analog display
- Warning in event of dangerous contact voltage
- Quick test with signal lamp in the test probe
- Low-resistance measurement per VDE 0413 Part 4/EN 61557-4
- Voltage measurement to 500 V (500D) or 1000 V (1000D)

Applications

The insulation testers are suitable for the following tasks:

- Measurement of insulation resistance at voltage-free devices and systems, up to 1000 V depending upon model
- Resistance testing at earthing, protective and equipotential bonding conductors
- Testing of devices for absence of voltage
- Testing of discharge capacity for floor coverings with reference to electrostatic charging (METRISO[®]1000D)



Insulation Resistance Measurement

Insulation resistance can be measured within 7 measuring ranges, depending upon model up to 3 G Ω .

Quick Test for Insulation Resistance

As long as the signal lamp at the test probe is illuminated, insulation resistance is in compliance with values set forth in DIN VDE 0100. At the same time, the lamp serves to illuminate the measuring point or the display.

Low-Resistance Measurement

Low-value resistance at earthing, protective and equipotential bonding conductors, as well as their connections and terminals, can be measured within a range of 0 to 30 Ω . Interference voltages are detected by means of test voltage polarity reversal as required by the standards. Polarity reversal can be performed automatically or manually.

Quick Low-Resistance Testing

The signal lamp in the test probe lights up to indicate measured values of less than 0.3 Ω .

Voltage Measurement to 500 V or 1000 V

Devices under test can be tested for the absence of voltage with the voltage measuring range. This is important for resistance measurement, because interference voltages distort measurement results.

Discharging Capacitive Devices Under Test

Capacitive devices under test such as cables and coils, which may become charged with open-circuit voltage, are discharged by the measuring instrument. The falling voltage level is indicated by the pointer at the quasi-analog display.

Display

The measured value is displayed both digitally and in analog format. The entire scale range (6 decades) is displayed logarithmically at the analog display for automatic measuring range selection, and the selected range is displayed in linear fashion for manual measuring range selection.

Save Display Value

The displayed measurement value can be saved to temporary memory, and can thus be frozen at the display (HOLD function) for easy reading.

Automatic / Manual Measuring Range Selection

The measuring range is automatically adapted to the measured value for insulation resistance measurements. If desired, the measuring range can also be selected manually.

Warning in the Event of Dangerous Contact Voltage

As soon as a dangerous contact voltage is applied to the measurement cables, a warning symbol appears at the display – even if the instrument is switched off.

METRISO® 500D/1000D/1000IR

Insulation Tester with Digital Display

Measurement in Accordance with the Standards

The instrument allows for measurement in accordance with DIN VDE 0100, 0105, 0190, 0701, 0702 and DIN 51953 (METRISO®1000D).

Applicable Regulations and Standards

IEC/EN 61 010-1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN EN 61 557/ VDE 0413	Part 1:1998-05 General requirements Part 2:1998-05 Insulation resistance measuring instruments Part 4:1998-05 Instruments for the measurement of resistance at earthing conductors, protective conductors and bonding conductors
DIN EN 61 326 VDE 0843 Part 20	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 60 529 DIN VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)
EN 1081	Testing of the discharge capacity for electrostatic charges for floor coverings in potentially explosive rooms

Characteristic Values

Insulation Resistance

Measuring Range	Resolution	Intrinsic Error ± (... % of reading + ... digits)		
		$U_N = 100 \text{ V}$	$U_N = 250 \text{ V}$	$U_N = 500 \text{ V} / 1000 \text{ V}$
30 kΩ	10 Ω	1.5 + 2	1.5 + 2	1.5 + 2
300 kΩ	100 Ω	1.5 + 2	1.5 + 2	1.5 + 2
3 MΩ	1 kΩ	1.5 + 2	1.5 + 2	1.5 + 2
30 MΩ	10 kΩ	1.5 + 2	1.5 + 2	1.5 + 2
300 MΩ	100 kΩ	3.0 + 2	1.5 + 2	1.5 + 2
3 GΩ	10 MΩ	20.0 + 2	3.0 + 2	3.0 + 2
30 GΩ *	100 MΩ	—	—	20.0 + 2

* METRISO®1000D(IR) only

Nominal Voltage, U_N	100 V	250 V	500 V	1000 V
500D	—	—	•	—
1000D	•	—	•	•
1000IR	—	•	•	•
Nominal Current, I_N	1.0 mA	1.0 mA	1.0 mA	1.0 mA
Open-Circuit Voltage, U_0	≤ 110 V	≤ 225 V	≤ 550 V	≤ 1100 V
Short-Circuit Current, I_K	≤ 2 mA	≤ 2 mA	≤ 2 mA	≤ 2 mA
Lamp ON for R_X	> 220 kΩ	> 550 kΩ	> 1.1 MΩ	> 2.2 MΩ
Measuring Error (100 kΩ ... 100 MΩ)	± 5%	± 5%	± 3%	± 4%

Low-Resistance Measurement (e.g. cable resistance)

Measuring Range Upper Limit	Resolution	Intrinsic Error ± (... % of reading + ... digits)
Digital: 30 Ω	0.01 Ω	1.5 + 5
Analog: 3 Ω	0.05 Ω	
Open-Circuit Voltage, U_0	4.5 V	
Short-Circuit Current, I_K	250 mA	
Lamp ON for R_X	< 0.3 Ω	
Measuring Error ±10% (0.3 Ω ... 30 Ω)		

Direct and Alternating Voltage

Measuring Range Upper Limit	Resolution		Intrinsic Error ± (... % of reading + ... digits)	
	500D	1000D(IR)	500D	1000D(IR)
500 V	1 V	—	1,5 + 2	—
1000 V	—	1 V	—	2,0 + 2
Internal Resistance, R_i / Measuring Error				
		500D	1000D(IR)	
		480 kΩ ± 25 kΩ ± 3% (50 V ... 500 V)	880 kΩ ± 50 kΩ ± 3.5% (50 V ... 1000 V)	

Overload Capacity

	500D	1000D(IR)
Insulation Resistance	AC / DC 600 V	AC / DC 1200 V
Cable Resistance	315 mA	315 mA
Voltage	AC / DC 600 V	AC / DC 1200 V

Display

Analog

Display	LCD scale with pointer
Scale Length	78 mm
Scaling	61 graduations – logarithmic for automatic measuring range selection, – linear for manual measuring range selection
Overrange Display	triangle symbol

Digital

Display	7 segment characters
Character Height	14 mm
Number of Places	3¾ ± 0 to 3000 steps
Overrange Display	"OL" appears

Cable Resistance

If the measurement results in both directions (polarity reversal) deviate from one another by more than 10% (max. allowable measuring error) both measurement values are displayed next to each other with reduced resolution.

Reference Conditions

Ambient Temperature	+ 23 °C ± 2 K
Relative Humidity	40% ... 60%
Measured Quantity	
Frequency	45 Hz ... 65 Hz
Measured Quantity	
Waveshape	≤ 0.5% deviation between effective and rectified value
Battery Voltage	9 V ± 0.5 V

METRISO® 500D/1000D/1000IR

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Influence Quantities and Influence Error

Influence Quantity / Sphere of Influence	Measured Quantity		Influence Error ± (... % of reading + ... digits)	
	500D	1000D (IR)	500D	1000D (IR)
Temperature	Indicated influence error valid per 10 K temperature change			
0 °C ... 21 °C	3 GΩ	3 GΩ	2.0 + 2	2.0 + 2
and	—	30 GΩ	—	5.0 + 2
25 °C ... 40 °C	All other measuring ranges		0.5 + 2	0.5 + 2
Auxiliary Voltage				
6 V ... < 8.5 V	—	30 kΩ ... 300 MΩ	—	0.5 + 2 where U _N =100 V /500 V
	3 GΩ	3 GΩ	2.0 + 2 where U _N = 500 V	1.0 + 2 where U _N =1000 V
	—	30 GΩ	—	2.0 + 2 where U _N =100 V /500 V
	All other measuring ranges		0.5 + 2	5.0 + 2 where U _N =1000 V
Frequency				
25 Hz ... < 45 Hz and > 65 Hz ... 1 kHz	Alternating voltage		0.5 + 2	1.0 + 2

Power Supply

Batteries 6 ea. 1.5 V single-cell battery (6 x D size); alkaline-manganese per IEC LR20, zinc-carbon per IEC R20

Service Life for insulation resistance measurement where U_N = 500 V:

METRISO®500D:
18,000 measurements
with alkaline-manganese batteries
9000 measurements with zinc-carbon

METRISO®1000D:
10,000 measurements
with alkaline-manganese batteries
5000 measurements with zinc-carbon

METRISO®1000IR:
10,000 measurements
with alkaline-manganese batteries
5000 measurements with zinc-carbon

Battery Test Battery voltage can be displayed under operating conditions.

Battery Saving Circuit The instrument is automatically switched to stand-by three minutes after the last key or rotary switch operation.

Fuses

Cable Resistance Measuring Range

METRISO®500D: FF 0.315/500 V
METRISO®1000D: FF 0.315/1000 V
METRISO®1000IR: FF 0.315/1000 V

Electrical Safety

Safety Class II
Test Voltage 3.7 kV
Nominal Insulation Voltage
METRISO®500D: 600 V
METRISO®1000D: 1000 V
METRISO®1000IR: 1000 V
Measuring Category II
Contamination Degree 2

Electromagnetic Compatibility (EMC)

Product Standard DIN EN 61326:2002

Interference Emission		Class
EN 55022		B
Interference Immunity	Test Value	Performance Feature
EN 61000-4-2	Contact/atmosphere - 4 kV/8 kV	B
EN 61000-4-3	10 V/m	B

Mechanical Design

Protection housing: IP 52
test probes: IP 20

Extract from table on the meaning of IP codes

IP XY (1 st digit X)	Protection against foreign object entry	IP XY (2 nd digit Y)	Protection against the penetration of water
0	not protected	0	not protected
2	≥ 12,5 mm Ø	2	vertically falling drops with enclosure tilted 15°
5	dust protected	5	water jets

Dimensions 165 mm x 125 mm x 110 mm
(without measurement cables)

Weight 1.85 kg (with batteries)

Ambient Conditions

Working Temperature 0 °C ... + 40 °C
Operating Temp. - 10 °C ... + 55 °C
Storage Temperature - 25 °C ... + 70 °C (without batteries)
Relative Humidity max. 75%, no condensation allowed
Elevation to 2000 m

Standard Equipment

- 1 insulation tester (with permanently connected measurement cables)
- 2 plug-on alligator clips
- 1 carrying strap with 2 test probe holsters
- 1 set of batteries (6 single-cell batteries)
- 1 operating instructions
- 1 replacement fuse

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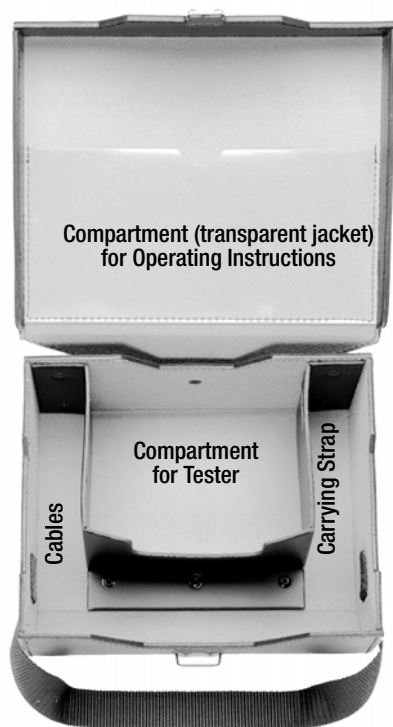
Accessories

Floor Probe

The 1081 floor probe allows for the measurement of resistance at insulating floor coverings in accordance with DIN VDE 0100, part 610, and EN 1081.



F837 Ever-Ready Case



Training

We offer interesting seminars in German with practical experience concerning "Protective Measures in Power Installations and Devices". Operation of the METRISO®500D and the METRISO®1000D is also covered in detail in these seminars, as are currently required DIN VDE measurements.

Order Information

Description	Type	Article Number
Insulation tester	METRISO®500D	GTM 5040 000 R0001
Insulation tester	METRISO®1000D	GTM 5050 000 R0001
Insulation tester	METRISO®1000IR	GTM 5050 000 R0002
Ever-ready case for all above listed insulation testers	F837	GTZ 3312 000 R0001
Telescoping rod for PE measurements	Telearm 1	GTZ 3232 000 R0001
Reel with 25 m measurement cable	TR25 reel	GTZ 3303 000 R0001
Drum with 50 m measurement cable	TR50 drum	GTY 1040 014 E34
Cable set for insulation tester	KS24	GTZ 3201 000 R0001
Floor measurement triangle probe, recommended for METRISO®1000D	1081	GTZ 3196 000 R0001
Calibration adapter for testing the accuracy of measuring instruments used for insulation resistance and low-resistance for measuring voltages of up to 1000 V	ISO-Kalibrator 1	M662A

For additional information concerning accessories please refer to

- the relevant datasheet for the instrument or our Measuring Instruments and Testers Catalog
- our website www.gossenmetrawatt.com

Carrying Strap with 2 Test Probe Holders (included)



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