

# METRISO 5000 A/AK

## High-Voltage Insulation Tester

3-348-858-03  
9/8.14

- Broad measuring range from 10 kΩ to 1 TΩ
- Easy to read logarithmic display
- Test voltages:  
100 V, 250 V, 500 V, 1000 V, 1500 V, 2000 V, 2500 V, 5000 V
- Measurement to 2000 V in accordance with DIN VDE 0413
- Measuring range: 100 kΩ to 100 MΩ (1000 V)
- Voltage measurement to 2000 V  $\Rightarrow$ ,  $\sim$
- Guard terminal eliminates surface current
- 5 m extension cable as accessory equipment
- Power supply with batteries or hand crank generator (optional)



### Applications

Insulation measurement for cables, motors etc.

### Features

#### Test Voltages to 5000 V

This instrument is suited for the non-destructive measurement of insulation resistance in electrical systems, at machines and transformers and in cables, as well as within the electrical equipment of, for example, locomotives, tram systems and ocean going vessels, with eight selectable test voltages up to 5 kV.

#### Voltage Measurement to 2000 V

With the voltage measuring ranges, test objects can be checked for the absence of voltage in networks of up to 2 kV. This is important for insulation resistance measurement, because extraneous voltages distort measurement results.

#### Discharge of Capacitive Devices Under Test

Capacitive devices under test such as cables and coils, which might be discharged to test voltage, are discharged by the measuring instrument. The drop in voltage can be observed at the needle gauge.

#### Measurements in accordance with EN 61557 part 1 and 2 (VDE 0413)

Measuring current is equal to 1 mA at a test voltage of 100 V, 250 V, 500 V and 1000 V.

#### Measurement Cables with Heavy-Duty Insulation

The measurement cables with heavy-duty insulation are permanently connected for safety and technical reasons. Possible danger caused by the unintentional removal of cables is thus avoided, for example when charging occurs due to capacitive test objects.

#### Needle Gauge with LEDs

Three LEDs arranged within the needle gauge make reading easier. The lamp lights up which is located next to the scale, which is assigned to the selected measuring range. During the measurement sequence, the green LED indicates whether or not the battery charge is sufficient for the measurement.

### Applicable Regulations and Standards

IEC 61010-1:2001 DIN EN 61010-1:2002 VDE 0411-1:2002	Safety regulations for electrical measurement, control, regulation and lab devices – General requirements
IEC 61557 DIN EN 61557 Part 1:2007 Part 2:2007	Measuring and monitoring facilities for testing the electrical safety in lines with nominal voltages up to AC 1000 V and DC 1500 V Part 1 – General Part 2 – Insulation resistance measuring devices
VDE 0413 Part 1:2007 Part 2:2008	
IEC 61326-1:2005 DIN EN 61326-1:2006 VDE 0843-20-1:2006	Generic Emission Standard; Electrical equipment for measurement, control and laboratory use – EMC requirements Part 1 – General requirements
DIN EN 60529 VDE 0470-1:2000	Test instruments and test procedures – degree of protection provided by enclosures (IP code)

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### Measuring Ranges

#### Insulation Resistance

Scale/Standard	Measuring Range	Nominal Range of Use	Nominal/Open-Circuit Voltage $U_N/U_0$	Nom. Current $I_N$	Short-Circuit Current $I_k$	Intrinsic Error <sup>1)</sup>	Deviation
1 VDE0413	100 k $\Omega$ ... 100 M $\Omega$	100 k $\Omega$ ... 10 M $\Omega$	100 V 250 V 500 V 1000 V	1 mA	1.3 mA	$\pm 2.5\%$	$\pm 30\%$ of measured value
2	10 k $\Omega$ ... 1 T $\Omega$	100 k $\Omega$ ... 100 G $\Omega$	100/1500 V 250/2000 V 500/2500 V 1000/ 5000 V	0.7 mA 0.5 mA 0.4 mA 0.1 mA	1.3 mA	$\pm 5\%$	

#### Making Capacity for Insulation Resistance Measurement

Response Time < 100 G $\Omega$ : < 3 s; > 100 G $\Omega$ : < 8 s  
also valid for test voltage or measuring range changes

#### Direct and Alternating Voltage

Measuring range	Frequency	Internal resistance	Max. allowable voltage	Intrinsic error <sup>1)</sup>
0 ... 2000 V AC/DC	15 ... 500 Hz	5 M $\Omega$	2200 V AC/DC max. 10 s	$\pm 5\%$

#### Protective Devices

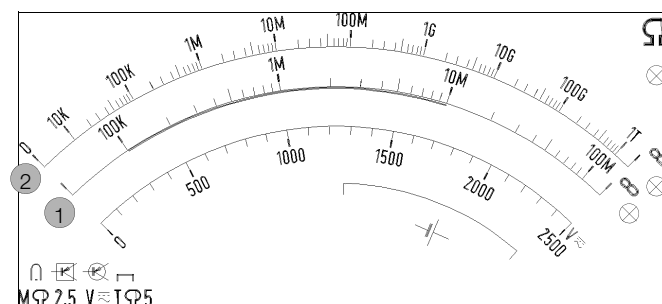
Terminal	Internal Resistance	Max. Allowable Voltage	Protective Device
-Measurement cable	—	to +meas. cable/ to Guard cable: 2000 V DC/AC max. 10 s	via grounded damping diodes
+Measurement cable Insulation measurement	—	to -meas. cable/ to Guard cable: 2000 V DC/AC max. 10 s	Diodes in high-voltage cascade, PTC thermistor <sup>2)</sup> and series resistors
Guard cable	between Guard and meas. cables 90 k $\Omega$	to meas. cable 2000 V DC/AC max. 10 s	PTC thermistor <sup>2)</sup> and series resistors
Battery	—	10 V	Pole protection with diodes voltage limiting in battery charger (optional)

<sup>1)</sup> with reference to scale length 97.5 mm (100 M $\Omega$  range) or 109.8 mm (1 T $\Omega$  range)

<sup>2)</sup> PTC resistor cool-down period until start of new measurement: at least 2 minutes must be observed!

### Display

Movement Core-magnet moving-coil mechanism  
Scale length 111.5 mm (longest scale)



### Reference Conditions

Ambient Temperature +23 °C  $\pm$  2 K  
Relative Humidity 40 ... 60%  
Meas. Quantity Frequency 50 Hz  $\pm$  10 Hz  
(for voltage measurements)  
Line Voltage Waveform Sine, deviation between effective and rectified value < 1%  
Battery voltage 8 V  $\pm$  1%  
Operating position Horizontal

### Power Supply

Standard or Storage Battery 6 ea. 1.5 V single cell per IEC R20 (6 x D-Size)  
Working Range 6 V ... 10 V  
Battery Service Life 7500 measurements for test voltage of 1000 V with meas. resistance of 1 M $\Omega$ , 15000 measurements for test voltage of 500 V with meas. resist. of 500 k $\Omega$ , measurement of 5 s – pause 25 s  
**Crank Generator (optional)** 2 to 3 r.p.s. with moderate strength, the LED  $\Omega$  signals sufficient crank frequency and consequently the validity of measuring values  
Nominal Voltage 7.5 V (at approx. 2.5 r.p.s.)  
Nominal Power 4 W (at approx. 2.5 r.p.s.)

### Ambient Conditions

Operating Temperature 0 °C ... + 40 °C  
Storage Temperature -20 °C ... + 60 °C (without batteries)  
Relative Humidity max. 75%,  
condensation must be avoided  
Elevation up to 2000 m

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## Electrical Safety

Protection Class	II
Test Voltage	8.5 kV~
Measuring Category	1000 V CAT II or 2000 V CAT I
Nominal Voltage	1000 V
Open Circuit Voltage	5000 V
Contamination Degree	2

## Electromagnetic Compatibility (EMC)

Product standard DIN EN 61326-1:2006

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

## Mechanical Design

Dimensions	W x D x H: 290 mm x 250 mm x 140 mm
Weight	3.4 kg with batteries
Protection	IP 52

Extract from table on the meaning of IP codes

IP XY (1 <sup>st</sup> digit X)	Protection against foreign object entry	IP XY (2 <sup>nd</sup> digit Y)	Protection against the penetration of water
0	not protected	0	not protected
1	≥ 50.0 mm dia.	1	vertically falling drops
2	≥ 12.5 mm dia.	2	vertically falling drops with enclosure tilted 15°
3	≥ 2.5 mm dia.	3	spraying water
4	≥ 1.0 mm dia.	4	splashing water
5	dust protected	5	water jets

## Equipment METRISO 5000 A

- 1 high-voltage insulation tester with permanently connected measurement cables and test prods,
- 2 crocodile clips (5 kV version)
- and plug-in battery module including batteries**
- 1 carrying strap
- 1 operating instructions

## Equipment METRISO 5000 AK

- 1 high-voltage insulation tester with permanently connected measurement cables and test prods,
- 2 crocodile clips (5 kV version)
- and hand crank generator**
- 1 carrying strap
- 1 operating instructions

## Accessories

### Hand Crank Generator for retrofit



### Carrying Bag F2000

The test instrument, replacement batteries, guard cable, etc., can all be conveniently stored and transported with the F2000 carrying bag.



### ISO-Kalibrator 1

Calibration adapter for testing the accuracy of measurement instruments for insulation resistances and low impedance resistances for test voltages up to 1000 V.



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## High-Voltage Insulation Tester

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### Order Information

Designation	Type	Article Number
High-voltage insulation tester, for battery operation	METRISO 5000 A	M580A
High-voltage insulation tester, for hand crank generator operation	METRISO 5000 AK	M580C
Universal carrying bag for METRISO 5000 A/AK, PROFiTEST®0100S-II or PROFITEST 204	F2000 <sup>D)</sup>	Z700D
2 alligator clips 1000 V CAT III / 5000 V CAT I 16 A	KY 5000A	Z580B
1 guard cable with plug and crocodile clip	Guard 5000A	Z580C
5 m extension cable	Leadex 5000	Z580D
Hand crank generator for retrofitting METRISO 5000 A to hand crank generator operation	Z580A	Z580A
Set consisting of: METRISO 5000 A, F2000, KY 5000A and 5000A guard	METRISO 5000A-Set	M580S
Set consisting of: METRISO 5000AK, F2000, KY 5000A and 5000A guard	METRISO 5000AK-Set	M580T
Calibration adapter for test voltages <b>up to 1000 V</b>	ISO-Kalibrator 1	M662A

<sup>D)</sup> Data sheet available

For additional information on accessories, please refer to

- the relevant datasheet or our „Measuring Instruments and Testers“ catalog
- our website [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

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