GOSSEN METRAWATT
GMC-INSTRUMENTS GROUP

METRISO PRIME
High-Voltage Insulation Measuring Instrument

3-349-819-03
4/6.25

- Battery operation
- Extensive measuring range from 10 kΩ to 1 TΩ
- Concise logarithmic display
- Test voltages:
  100 V, 250 V, 500 V, 1000 V, 1500 V, 2000 V, 2500 V, 5000 V
- Measurements up to 2000 V per DIN VDE 0413
- Measuring range from 100 kΩ to 100 MΩ (1000 V)
- Voltage measurement up to 2000 $V_{AC/DC}$
- Guard terminal for the elimination of surface current
- 5 m extension cable as accessory



Applications

Insulation measurement at cables, motors etc.

Features

Test Voltages Up to 5000 V

The instrument is suitable for non-destructive measurement of insulation resistance in electrical systems, as well as at machines, transformers, cables and electrical equipment utilized in, for example, locomotives, street cars and ocean going vessels, with eight selectable test voltages of up to 5 kV.

Voltage measurement Up to 2000 V

Testing for the absence of voltage at the device under test in systems of up to 2 kV can be performed with the voltage measuring ranges. This is important for insulation resistance measurement, because interference voltages distort measurement results.

Discharging Capacitive Devices Under Test

Capacitive devices under test such as cables and coils, which may be charged with test voltage, are discharged by the measuring instrument. The falling voltage value can be monitored by observing pointer deflection.

Measurements per EN 61557, Parts 1 and 2 (VDE 0413)

Measuring current amounts to 1 mA at test voltages of 100 V, 250 V, 500 V and 1000 V.

Highly Insulated Measurement Cables

The highly insulated measurement cables are permanently connected for safety as well as technical reasons. Danger resulting from an inadvertently disconnected cable, for example in the event of charging caused by capacitive devices under test, is thus avoided.

Scale Panel with LEDs

Three LEDs located on the scale panel make for easy reading. The LED next to the scale assigned to the selected measuring range lights up. During measurement, the green LED indicates whether or not the battery is still sufficiently charged for the respective measurement.

Applicable Regulations and Standards

IEC 61010-1 DIN EN 61010-1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
IEC 61010-031 DIN EN 61010-031 VDE 0411-031	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 31: Safety requirements for hand-held probe assemblies for electrical measurement and testing
IEC 61010-2-030 DIN EN 61010-2-030 VDE 0411-2-030	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits
IEC 61557-1 IEC 61557-2 DIN EN 61557-1 DIN EN 61557-2 VDE 0413-1 VDE 0413-2	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements Part 2: Insulation resistance
IEC 61326-1 DIN EN 61326-1 VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
DIN EN 60529 VDE 0470-1	Test instruments and test procedures – Degrees of protection provided by enclosures (IP code)

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Measuring Ranges

Insulation Resistance

Scale/ Standard	Measuring Range	Nominal Range of Use	Nominal/ Test Voltage U_N/U_T	Nominal/ Test Current I_N/I_T	Intrinsic Error [1]	Operating Error
① VDE0413	100 kΩ … 100 MΩ	100 kΩ … 10 MΩ	100 V 250 V 500 V 1000 V	1 mA	±2.5%	±30% of the measured value
②	10 kΩ … 1 TΩ	100 kΩ … 100 GΩ	100 V/1500 V 250 V/2000 V 500 V/2500 V 1000 V/5000 V	1mA/0.7mA 1mA/0.5mA 1mA/0.4mA 1mA/0.1mA	±5%	

Short-circuit current I_{SC}1.3 mA

Response After Power On When Measuring Insulation Resistance

Response time: < 100 GΩ: < 3 s; > 100 GΩ: < 8 s
Also applies if test voltage or the measuring range is changed.

Direct and Alternating Voltage

Measuring Range	Frequency	Internal Resistance	Max. Allowable Voltage	Intrinsic Uncertainty [1]
0 … 2000 $V_{DC/AC}$	15 Hz … 500 Hz	5 MΩ	2200 $V_{DC/AC}$ max. 10 s	±5%

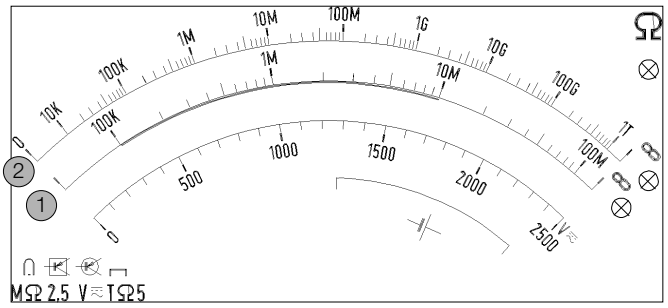
Protective Functions

Connection	Internal Resistor	Max. Allowable Voltage	Protective Functions
–measurement cable	—	To +measurement cable / guard cable: 2000 $V_{DC/AC}$ max. 10 s	Connected to ground via protective diodes
+measurement cable, insulation measurement	—	To –measurement cable / guard cable: 2000 $V_{DC/AC}$ max. 10 s	High-voltage cascade diodes, PTC thermistors [2] and series resistors
Guard cable	Between guard and measurement cable: 90 kΩ	To measurement cable: 2000 $V_{DC/AC}$ max. 10 s	PTC thermistors [2] and series resistors
Battery	—	10 V	Reverse polarity protection with diodes

[1] Based on a scale length of 97.5 mm (100 MΩ range) or 109.8 mm (1 TΩ range)
[2] PTC thermistor cool-down time until start of a new measurement: at least 2 minutes!

Display

Measuring movement: Moving-coil mechanism with core magnet
Scale length: 111.5 mm (longest scale)



Technical Data

Reference Conditions

Ambient temperature	+23 °C ±2 K
Relative humidity	40% ... 60%
Frequency of measured quantity	50 Hz ±10 Hz (during voltage measurement)
Waveform of line voltage	Sine, deviation between TRMS and rectified value < 1%
Battery voltage	8 V ±1%
Normal position of use	Horizontal

Power Supply

Batteries	6 ea. 1.5 V mono cell / D LR20
Working range	6 V … 10 V
Battery operating time	6000 measurements with 1000 V test voltage and measuring resistance of 1 MΩ, 12,000 measurements with 500 V test voltage and measuring resistance of 500 kΩ, A 25 s pause is required for each 5 s of measurement time.
Nominal voltage	7.5 V (at approx. 2.5 rev./s)
Nominal power	4 W (at approx. 2.5 rev./s)

Ambient Conditions

Operating temperature range	0 °C … +40 °C
Storage temperature range	–20 °C … +60 °C (without batteries)
Relative humidity	Max. 75%, no condensation allowed
Elevation	To 2000 m

Electrical Safety

Protection class	II
Test voltage	8.5 kV_{AC}
Measuring category	1000 V CAT II, 600 V CAT III, 300 V CAT IV
Nominal voltage	1000 V
Open-circuit voltage	5000 V
Pollution degree	2

Using the Test Probes

Maximum rated voltage	300 V	600 V	1000 V	5000 V
Measuring category	CAT IV	CAT III	CAT II	—
With safety cap attached	•	•	—	—
Without safety cap	—	—	•	•

Electromagnetic Compatibility (EMC)

Product standard DIN EN 61326-1

Interference emission		Class
EN 55022		B
Interference immunity	Test value	Feature
EN 61000-4-2	Contact/atmos. – 4 kV/8 kV	B
EN 61000-4-3	10 V/m	B

Mechanical Design

Dimensions	W× D × H: 290 × 250 ×140 mm
Weight	3.4 kg with batteries
Protection	IP 52 (protection against ingress of solid foreign objects: dust protected; protection against water ingress: dripping – 15° angle)

Scope of Delivery

Standard scope of delivery:

1 High-voltage insulation measuring instrument with permanently connected measurement cables and test probes, 2 alligator clips (5 kV version) and battery module with batteries
1 Carrying strap
1 Set of operating instructions

Optional Accessories

F2000 Carrying Pouch (Z700D)

Test instrument, replacement batteries, guard cable etc. can be stored in an orderly fashion and conveniently transported in the F2000 carrying pouch.



ISO Calibrator 1 (M662A)

Calibration adapter for testing the accuracy of measuring instruments for insulation resistance and low-value resistance for test voltages of up to 1000 V.



KY 5000A (Z580B)

Alligator clips, 2 ea.



Guard 5000A (Z580C)

Guard cable and 1 alligator clip



Leadex 5000 (Z580D)

Extension cable, 5 m



METRISO PRIME
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Order Information

Instruments

Type	Designation	Article Number
METRISO PRIME	High-voltage insulation measuring instrument for battery operation with standard scope of delivery	M550T
METRISO PRIME Set	High-voltage insulation measuring instrument for battery operation with standard scope of delivery, F2000, KY 5000A and Guard 5000A	M551T

Accessories

Type	Designation	Article Number
F2000 [D]	Universal carrying pouch	Z700D
ISO-Kalibrator 1 [D]	Calibration adapter for insulation and resistance measuring instruments	M662A
KY 5000A	2 alligator clips 1000 V CAT III / 5000 V CAT I 16 A	Z580B
Guard 5000A	1 guard cable with alligator clip	Z580C
Leadex 5000	Extension cable, 5 m	Z580D

[D] Data sheet available

For additional information regarding accessories please refer to:

- Our Measuring Instruments and Testers catalog
- Our website at www.gossenmetrawatt.com

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