GOSSEN METRAWATT

METRISO C
Insulation and Resistance Measuring Instrument

**Battery powered insulation resistance measuring instrument
in accordance with DIN VDE 0413, parts 2 and 4
for measurement in systems with nominal voltages of up to 500 V**

Insulation resistance measurement

- Measuring range   0 … 100 GΩ
  Variable test voltage: adjustable from 50 to 1000 V

Low-resistance measurement

- Measuring range   0 … 100 Ω

Temperature and humidity measurement

via IrDa interface with additional adapter

Contact current measurement

- Measuring range   0 … 10 mA

CE

Special features for insulation resistance measurement

- Quick testing with limit value and signal lamp
- Auto-ranging for insulation resistance measurement over the entire scale range for quick determination of the measured insulation value

Special features for resistance measurement (low-resistance)

- Quick testing with limit value and signal lamp
- Automatic polarity reversal for recognition of interference voltage

Special instrument features

- Hold function: the measured value is frozen at the display after the measurement key is released.
- Measured values can be stored to memory with reference to electrical circuits, distribution cabinets and other objects thanks to alphanumeric entry.
- Data interface for transmission of measured values, and for software updates
- Convenient report generating software, can be expanded to a comprehensive database

Display

The LCD window consists of a backlit dot matrix which is used to display menus, configuration options and measurement results, as well as online help. Various user interface languages can be selected, depending upon the country in which the test instrument is used.

Operation

The instrument is very easy to operate. A multifunction key allows for one-handed operation when selecting menus and starting measurements. Basic functions and sub-functions are selected with the help of four softkeys.

Battery Charge Level Indicator and Device Self-Test

A battery symbol in the main menu with 5 segments ranging from depleted to fully charged keeps the user continuously informed concerning battery charge level.
The test instrument is switched off automatically if the batteries are depleted, and it includes a charge control circuit for safe charging of rechargeable NiMH or NiCd batteries.
Test patterns can be queried one after the other in the self-test mode, and display LEDs and relays can be tested.

Sturdy Housing for Rugged Use

Soft plastic jacketing protects the instrument against impacts, or if it is inadvertently dropped.

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Signal Lamps

The device recognizes errors in the electrical system automatically, which are indicated with four lamps, (see following table).

Lamp	Status	Function
🖐⭘	red	Potential difference between finger contact and measurement input is greater than 150 V
Netz Mains	blinks red	Mains voltage is present at the measurement inputs, insulation resistance measurement is disabled
LIMIT	red	– Measured insulation resistance is below the allowable limit value. – Measured low resistance has exceeded the allowable limit value. – Measured contact current has exceeded the allowable limit value.
U>25V	red	A voltage of greater than 25 V is present at the measurement inputs. Discharging in not yet complete.

Data Interface

Measurement data can be read out to a printer or a PC via the integrated IRDA interface, providing the user with 3 advantages.

- Transmission of stored data to a PC for processing and archiving, or for the generation of official reports
- Immediate print-out of all measurement data (via adapter)

Software Updates

The test instrument will never become obsolete thanks to software updates which can be installed via the IRDA interface. Updates can be performed by our service department as part of our re-calibration service, or by the user himself.

Applicable Regulations and Standards

| IEC 61010-1/ EN 61010-1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements (IEC 61010-1:2010 + Cor. :2011); German edition EN 61010-1:2010
IEC 61557 DIN EN 61557 Part 1:2007 Part 2:2007 Part 4:2007 Part 10:2001 VDE 0413 Part 1:2007 Part 2:2008 Part 4:2007 Part 10:2001	Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures Part 1: General requirements Part 2: Insulation resistance Part 4:2007 Resistance of earth connection and equipotential bonding Part 10:2001 Combined measuring equipment for testing, measuring or monitoring of protective measures
IEC 61326-1:2005 DIN EN 61326-1:2006 VDE 0843-20-1:2006	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, protection provided by enclosures (IP code)
DIN EN 1081:1998	Testing floor coverings in explosive atmospheres for electrostatic discharge capacity

Sample Displays
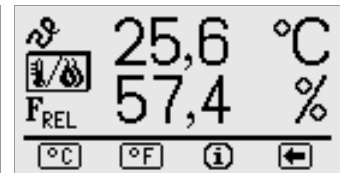
Main Menus

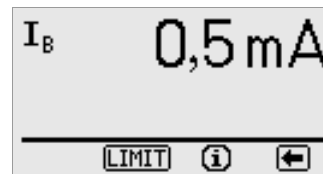### Insulation Resistance Measurement
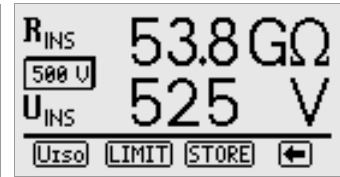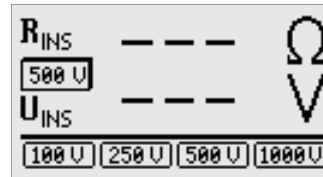
Low-Resistance Measurement
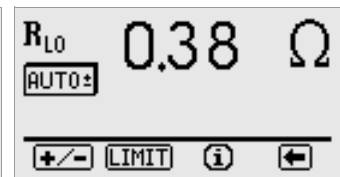
Voltage Measurement

Temperature and Humidity Measurement

Contact Current Measurement

Online Help
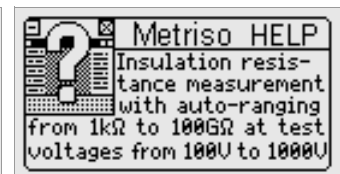
Characteristic Values

Measured Quantity	Display Range	Test Current	Measuring Range	Nominal Values Impedance	Intrinsic Uncertainty	Measuring Uncertainty
R_{ISO}	000 kΩ … 99.9 GΩ	1 mA [3]	20 kΩ … 10.0 GΩ	$U_N = 100$ V [2]	±(5% rdg. + 3 d)	±(7% rdg. + 3 d)
			0.20 MΩ … 10.0 GΩ	$U_N = 250/500/1000$ V [2]	±(5% rdg. + 3 d)	±(7% rdg. + 3 d)
			> 10.0 GΩ … 99.9 GΩ	$U_N = 100/250/500/1000$ V [2]	±(8% rdg. + 3 d)	±(10% rdg. + 3 d)
U_{ISO}	000 V … 1.20 kV		50 … 1.00 kV	5 MΩ	±(2.5% rdg. + 3 d)	±(5% rdg. + 3 d)
U~	00.0 V … 500 V		10 … 500 V	5 MΩ	±(2.5% rdg. + 3 d)	±(5% rdg. + 3 d)
f	15.0 … 400 Hz		45 … 200 Hz	5 MΩ	±(0.5% rdg. + 2 d)	±(1% rdg. + 2 d)
R_{LO}	0.00 … 9.99 Ω	$I_N = 200$ mA	0.15 … 10 Ω	$U_0 = 4.5$ V	±(2.5% rdg. + 3 d)	±(5% rdg. + 3 d)
	> 10.0 … 99.9 Ω		> 10 … 100 Ω		±(8% rdg. + 3 d)	±(10% rdg. + 3 d)
I_B	0.00 … 9.99 mA		0.1 … 10 mA AC	2 kΩ	±(5% rdg. + 3 d)	±(6% rdg. + 3 d)
T [1]	−10.0 … +50.0 °C		0 … +40 °C		±2 °C	
F_{rel} [1]	10.0 … 90.0%		20 … 80%		±5%	
Phase Test	LED PE > 100 V		100 … 500 V	> 100 MΩ/50 Hz		

[1] With external adapter (Z541A) as accessory
[2] Nominal DC voltage = U_N + (0 … 15%)
[3] At nominal resistance of R_N = 1000 Ω/V

Reference Conditions

Ambient Temperature	+ 23 °C ±2 K
Relative Humidity	40 … 60%
Battery Voltage	5.5 V ± 1%
Measured Qty. Frequency	50 Hz ±0.2 Hz
Line Voltage Waveshape	sine, deviation between effective and rectified values < 1%

Power Supply

Batteries	4 ea. 1.5 V baby cells (4 x C-Size) (alkaline-manganese per IEC LR14) or 4 ea. NiCd rechargeable batteries
Nominal Range of Use	4.6 … 6.5 V
Battery Test	Symbolic display
Battery Saving Circuit	Display illumination can be deactivated. The test instrument is switched off automatically 10 to 60 seconds after the last key operation. ON-time can be selected by the user.
Service Life	for R_{ISO} (1000 V/1 MΩ), R_{LO} with 20 sec. on-time and a measurement duration of 5 sec. each – with one set of batteries (alkali-manganese): (1,600 measurements – with one set of storage batteries (2200 mAh): 1,000 measurements
Safety Shutdown	The instrument is switched off if supply voltage drops to below the specified level, or it cannot be switched on.
Charging Socket	Rechargeable batteries can be recharged inside the instrument by connecting the NA102 charger to the charging socket.

Overload Capacity

R_{LO} und I_B	Electronic protection prevents the device from being switched on if interference voltage is present .
U~	500 V~ continuous

Electrical Safety

Safety Class	II per IEC 61010-1/EN 61010-1/ VDE 0411-1
VDE Requirement	VDE 0411 Part 1, 2011
Pollution degree	2
Measuring Category	Insulation measurement –1000 V DC – no overvoltage Voltage measurement – 500 V – CAT II
Fuses	FF0,315-1000G

Electromagnetic Compatibility EMC

Interference Emission	EN 61326-1:2006 Class B
Interference Immunity	EN 61326-1:2006

Ambient Conditions

Nominal Service Temp.	0 ... +40 °C
Operating Temperature	−10 ... +50 °C
Storage Temperature	−20 ... +60 °C (without batteries)
Relative Humidity	max. 85%, no condensation allowed
Elevation	max. 2000 m
Deployment	indoors; outdoors: only under specified ambient conditions

METRISO C
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Mechanical Design

Display	multiple dot matrix display, 128 x 64 pixels (65 mm x 38 mm), illuminated
Protection	housing: IP 52 per DIN VDE 0470, part 1/EN 60529
Dimensions	275 mm x 140 mm x 65 mm
Weight	approx. 1.2 kg with batteries

Data Interface

Type	infrared interface (SIR/IrDa) bidirectional, half-duplex
Format	9600 baud, 1 start bit, 1 stop bit, 8 data bits, no parity, no handshake
Range	max. 10 cm recommended distance: < 4 cm

Standard Equipment

- 1 METRISO C test instrument
- 1 carrying strap
- 1 set of batteries
- 1 pair of measurement cables
- 1 proprietary calibration certificate
- 1 operating instructions

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.

Order Information

Designation	Type	Article Number
Basic Instrument/Instrument Set		
Digital insulation and resistance measurement instrument, operator guidance in english	METRISO C-GB int.	M541D
Expansions		
Sensor for temperature and relative humidity for METRISO C and Profitest 0100S-II (as from Software AH)	T/F Sensor	Z541A
IR interface for connection to a USB PC port for transmission of data between the PC and the METRISO C, e.g. for software updates at the test instrument or for visualization of measured values at the PC	IrDa-USB Converter	Z501J
Accessories		
Charger for recharging batteries while inside the METRISO C	NA102	Z501N
Cable set consisting of measurement cable and high-resistance measurement cable for METRISO C for measurements in the GΩ range	KS-C	Z541F
Hard-shell case with blister insert for 1 series C instrument and accessories	HC30-C	Z541C
Hard-shell case with blister insert for 2 series C instruments and accessories	HC40	Z541D
Triangular probe for floor measurements in accordance with EN 1081 and DIN VDE 0100	1081 Probe	GTZ3196000R0001
Calibration adapter for testing the accuracy of measuring instruments for insulation resistance and low-value resistors	ISO-Calibrator 1	M662A
PC Evaluation Software		
http://www.gossenmetrawatt.com (→ Products → Electrical Testing → Insulation; Grounding; Low Ohmic ... → METRISO C) or http://www.gossenmetrawatt.com (→ Products → Software → Software for Testers)		