Operating instructions

GOSSEN METRAWATT

ISO-Kalibrator 1

Calibration tester for insulation meters and low-ohmic measuring instruments

14206
5/4.11

Contents Page

1 Applications

Using the tester ISO-Kalibrator 1, you can quickly and rationally test measuring instruments for insulation resistances and low-ohmic resistances for their functionality and accuracy, and thus ensure their proper function. This way, you can assure that the measured values determined with such resistance measuring instruments and confirmed by you, actually correspond to the true resistance value, taking into account the tolerances of such measuring instruments.

As, in practice, insulation meters and low-ohmic measuring instruments are used as combination equipment (e.g. insulation meters of the METRISO series by GMC-I Messtechnik GmbH), the ISO-Kalibrator 1 offers test resistors for both insulation meters and low-ohmic measuring instruments in an advantageous connection.

The ISO-Kalibrator 1 is particularly suited for testing insulation measuring instruments according to DIN VDE 0413, part 1, and for testing ohmmmeters according to DIN VDE 0413, part 4. Thanks to its built-in test resistor with a load capacity of 15 A max., it is also suited for appliances for testing the protective conductor which comply with DIN VDE 0113 or DIN VDE 0701-702, for instance.

2 Safety features and safety precautions

The tester ISO-Kalibrator 1 is constructed and tested in compliance with the safety rules of

IEC 61010-1 / EN 61010-1 / VDE 0411-1.

When properly used, the safety of both the user and the tester is assured.

Please read the operating instructions completely and carefully before using the tester, and follow them in all respects.

Caution!
The tester must not be used as load resistor for measuring and test instruments other than those mentioned here.
By no means must the unit be used in electrical systems!

Caution!
For technical reasons, the ISO-Kalibrator 1 does not contain protecting devices against overcurrent or excessive temperature. Particularly when using the low-ohmic test resistors, absolutely make sure that the load limits given under Specifications in section 5, are not on any account exceeded – not even temporarily.

The tester must not be used:

- When the case is open
- When there are obvious signs of damage on the exterior
- When it no longer functions correctly
- When the safety sockets are damaged
- After severe stress that is, exceeding of the load limits given under Specifications
- After severe transportation stress
- After prolonged storage under adverse conditions (e.g. moisture, dust, temperature)

2.1 Meaning of the symbols on the unit

The symbols on the unit have the following meaning:

Warning of danger
Attention! See operating instructions.

Class II equipment

Reference to ground

CAT II Measuring Category II equipment

EC conformity mark

This device may not be disposed of with the trash. Further information regarding the WEEE mark can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term 'WEEE'.

3 How to test insulation meters

The ISO-Kalibrator 1 permits testing of insulation meters having a nominal voltage up to 1000 V. The test range extends from 100 kΩ to 100 MΩ.

Caution!
To assure the safety of both the user and the unit, do not on any account apply a test voltage of more than 1000 V to ground to the sockets of the unit. The load limits of the test resistors given in section 5, Specifications, must on no account be exceeded.

To test your insulation meter, proceed as follows:

1) Connect the two probes of your insulation meter to the test sockets B1 and B3 (blue sockets).
2) Select the desired test resistor with the rotary knob on your ISO-Kalibrator 1.
3) Select the desired test voltage and the desired measuring range on your insulation meter according to the operating instructions of your insulation meter.
4) Perform the insulation measurement. Wait for your meter to stabilize – particularly in the case of higher resistance values, 10 MΩ and higher.
5) Read the measured value on your insulation meter.

6) Check that the displayed value corresponds to that set on the ISO-Kalibrator 1, taking into account the tolerances of the insulation meter. In critical cases, you should use the true value listed in the test protocol of your ISO-Kalibrator 1 as comparison value.
7) Conclude the measurement and put the ISO-Kalibrator 1 into an electrically dead condition.
8) You now can select another test resistor and start a new measurement, or disconnect the insulation meter from the ISO-Kalibrator 1.
9) Do not on any account switch resistors over in live condition.

No test resistor is active when the ISO-Kalibrator 1 is set to the "OFF" position. In this case, your insulation meter should indicate overrange, or at least show an insulation resistance of > 1 GΩ, provided it permits the measurement of insulation resistances with several GΩ.

4 How to test measuring instruments for low-ohmic resistances

The ISO-Kalibrator 1 permits ohmmeters for low-ohmic resistances to be tested for their function and accuracy.
Two precision resistors are available for instruments with a measuring current of less than 1.5 A DC or AC:

- 1 Ω precision resistor (sockets B1 and B2)
- 50 mΩ precision resistor (sockets B3 and B4)

Caution!
The 50 mΩ resistor (sockets B3 and B4) must exclusively be used for measuring instruments with a nominal measuring current of 10 A.

Caution!
By no means must the 1 Ω resistor be used with measuring currents of more than 2.0 A as this could cause the resistor to be destroyed or its accuracy to be impaired.
The use of the 1 Ω resistor with a measuring current of 10 A or higher causes an instant destruction of the test resistor in any case. Should this happen, the tester must immediately be taken out of service as the safety of the user and also the accuracy of the other test resistors is no longer guaranteed.

To test your ohmmeter, proceed as follows:

1 Connect the two probes of your measuring instrument to the test sockets B1 and B2 (blue and black socket), if you whish to select the 1 Ω resistor.

2) Connect the two probes of your measuring instrument to the test sockets B3 and B4 (blue and black socket), if you whish to select the 50 mΩ resistor.

3) On your ohmmeter, select the desired measuring range according to the operating instructions of your ohmmeter.

4) Perform the resistance test.

5) Read the measured value on your measuring instrument.

6) Check that the displayed value corresponds to the value selected on the ISO-Kalibrator 1, taking into account the tolerances of the ohmmeter.
The resistance value at a time is given on the resistance symbol which is correlated with the test sockets. You should use this value as a comparison value. It was individually determined for your ISO-Kalibrator 1.

7) Conclude the measurement and put the ISO-Kalibrator 1 into an electrically dead condition.

8) You now can select another test resistor and start a new test, or disconnect your measuring instrument from the ISO-Kalibrator 1.

9) Do not on any account remove the probes in live condition.

Note

The resistance values given in the resistance symbols of the ISO-Kalibrator 1 are referred to a four-terminal resistance measurement immediately at the B1/B2 safety sockets and/or the B3/B4 safety sockets with gold-plated 4 mm laboratory plugs. When using probes of poor contact, additional extension leads or measuring instruments suited for two-terminal measurements only, additional transient resistances and measuring errors occur the magnitude of which you can find in the operating instructions of your ohmmeter.

Note

Try by all means to establish an optimum contact between the ISO-Kalibrator 1 and your measuring instrument!

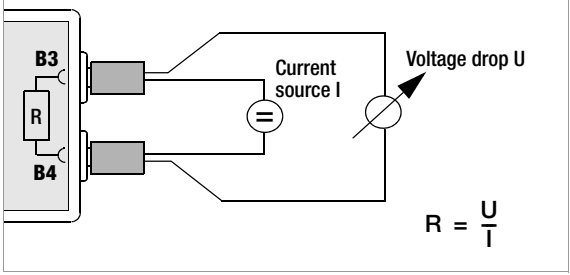

Figure 1 Example of a four-terminal resistance measurement

5 Specifications

5.1 Measuring resistors for testing insulation meters

Characteristic features and load limits

Resistance value	Tolerance / TC	Dielectric strength max.	Current loading capacity max.
100 kΩ	0.5 % / 50 ppm	250 V	2.5 mA
250 kΩ	0.5 % / 50 ppm	500 V	2.0 mA
500 kΩ	0.5 % / 50 ppm	1000 V	2.0 mA
1 MΩ	0.5 % / 50 ppm	1200 V	1.2 mA
2 MΩ	0.5 % / 50 ppm	1200 V	0.6 mA
5 MΩ	0.5 % / 50 ppm	1200 V	0.24 mA
10 MΩ	0.5 % / 50 ppm	1200 V	0.12 mA
20 MΩ	1.0 % / 50 ppm	1200 V	0.06 mA
50 MΩ	1.0 % / 50 ppm	1200 V	0.02 mA
100 MΩ	1.0 % / 50 ppm	1200 V	0.01 mA

5.2 Measuring resistors for testing measuring instruments for low-ohmic resistances

Characteristic features and load limits

Resistance value	Tolerance / TC	Current loading capacity, cont.	Current loading capacity, temp. *
1 Ω **	1.0 % / 50 ppm	1.5 A	2.0 A, 2 min
0.05 Ω **	2.5 % / 100 ppm	10.0 A	15.0 A, 15 s

* Between the load phases, wait 5 min. for cooling

** See inscription on case / entry in protocol for exact value.
The tolerance data refer to the inscription on the case / entry in protocol.

Caution!
The unit has no protecting means against overcurrent or excessive temperature.
By all means, take care not to exceed the load limits of the instrument as this could cause damage to the instrument or impair its accuracy.

5.3 Nominal range of use

Nominal voltage (insulation resistance)	0 ... 1000 V DC, 0 ... 750 V AC_{rms}
Nominal current (low-ohmic resistance)	200 mA DC/AC_{rms} / 10 A DC/AC_{rms}
Waveform AC	Sinusoidal
Frequency AC	50 Hz ... 60 Hz
Temperature range	0 °C ... +40 °C

5.4 Environmental conditions

Working temperature	–10 °C ... +50 °C
Storage temperature	–20 °C ... +60 °C

5.5 Electrical safety

Protection class	II according to IEC 61010-1 / EN 61010-1 / VDE 0411-1
Operating voltage	1000 V
Test voltage	5.55 kV 50 Hz
Measuring Category	II
Degree of pollution	2
EMC	IEC/EN 61326

5.6 Mechanical configuration

Degrees of protection	Case: IP 50 Sockets: IP 20
Dimensions	122 mm x 60 mm x 53 mm (L x W x H)
Weight	0.13 kg

6 Maintenance

6.1 Case

Special maintenance of the case is not required. Take care that the surface is clean. Use a slightly moist cloth for cleaning. Do not use solvents, detergents and scouring agents.

6.2 Device Return and Environmentally Compatible Disposal

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Electrical and Electronic Device Law). This device is not subject to the RoHS directive.

We identify our electrical and electronic devices (as of August 2005) in accordance with WEEE 2002/96/EG and ElektroG with the symbol shown to the right per DIN EN 50419.

These devices may not be disposed of with the trash. Please contact our service department regarding the return of old devices.

7 Product Support

When you need support, please contact:

GMC-I Messtechnik GmbH
Product Support Hotline
Phone +49 911 8602-0
Fax +49 911 8602-709
E-Mail support@gossenmetrawatt.com

8 Repair and Replacement Parts Service Calibration Center * and Rental Instrument Service

When you need service, please contact:

GMC-I Service GmbH
Service Center
Thomas-Mann-Strasse 20
90471 Nürnberg • Germany
Phone +49 911 817718-0
Fax +49 911 817718-253
E-Mail service@gossenmetrawatt.com
www.gmci-service.com

This address is only valid in Germany.
Please contact our representatives or subsidiaries for service in other countries.

*** DKD Calibration Laboratory for Electrical Quantities DKD–K–19701 accredited per DIN EN ISO/IEC 17025**

Accredited measured quantities: direct voltage, direct current values, DC resistance, alternating voltage, alternating current values, AC active power, AC apparent power, DC power, capacitance and frequency and temperature

Edited in Germany • Subject to change without notice • A pdf version is available on the internet

GOSSEN METRAWATT
GMC-I Messtechnik GmbH
Südwestpark 15
90449 Nürnberg • Germany

Phone +49 911 8602-111
Fax +49 911 8602-777
E-Mail info@gossenmetrawatt.com
www.gossenmetrawatt.com