Operating Manual

for

TG Basic 2 / TG Basic 2+

Appliance Tester

DIN VDE 0701/0702

ÖVE 8701 - 1 - 2

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APPLIANCE TESTER


LOW VOLTAGE AND MEDIUM VOLTAGE CURRENT


CONVERTER ENERGY MANAGEMENT


ANALOGUE DISPLAY UNITS


DIGITAL PANEL-MOUNTED MEASURING INSTRUMENTS


MEASURING TRANSDUCERS


PRINTERS


SHUNTS


SWITCH CABINET COMPONENTS


POTENTIOMETERS


LOW VOLTAGE SWITCHGEARS

All texts, illustrations and technical specifications were compiled with care. In spite of this care, errors cannot be ruled out entirely. The author and the manufacturer of the test device cannot assume legal responsibility nor any liability for incorrect information and the consequences thereof.

This operating manual must be read carefully and fully before using the test device!

Warning notices and warning signs are intended to warn in particular against risks or hazards!

Warning notices and warning signs in the operating manual, on the test device and accessories, must be heeded in particular e.g.:

General warning: hazardous situation!
Follow the operating manual!

Warning: dangerous high voltage!

1 General safety and warning notices

The „TG Basic 2 (+)“ test device was built and tested to the following safety regulations:

- DIN EN 61010-1 (VDE 0411 Part 1),
- DIN EN 61010-2-30; VDE 0411-2-030

„Safety requirements for electrical equipment for measurement, control, and laboratory use, General requirements“

- DIN VDE 0404 Part 1 and Part 2,

„Devices for testing the safety measures of electrical equipment“

- Interference immunity in accordance with DIN EN 61326,

„Electrical equipment for control and laboratory use - EMC requirements “

To maintain this level of safety and ensure danger-free operation, users must heed the following warning notices:

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This operating manual must be read carefully and fully before using the test device. Make the operating manual available to all users.

All tests must be performed by a specialist or an electrically trained person under his or her direction and supervision. The user (tester) must have been instructed by a specialist in conducting and evaluating the test! TRBS 1203 stipulates the precise requirements that must be met for this.

The test device must be used for the intended purpose to ensure the safety of the tester, test device and test object.

Heed the warnings on the test device and the mains adapter cables!

The he device must only be operated on a 230 V AC mains fused with max. 16 A!
It is not suitable for testing electrical installations!

Unfused measurement circuits must not be measured!

Repair work and modifications to the test device must only be carried out by the manufacturer itself or specialists authorised by the manufacturer!
Only specialists may perform repair work on mains adapter cables.

Only the original replacement parts specified by the manufacturer may be fitted and used!

If safe operation is no longer possible, e.g. due to:

- Visible damage,
- Improper storage,
- Improper transportation,
- Failure of a phase control lamp,
- Failure of measurement functions, etc.,

the test device must no longer be operated! The test device must be decommissioned without delay and secured to prevent unintentional commissioning! The test device may be repaired by centres authorised by the manufacturer!

Measurements may only be performed on protective earth conductor resistances and touch currents under certain circumstances
and in compliance with the corresponding hazard warnings!

Note that the test objects may carry high voltages, e.g. from charged capacitive circuits!

Do not connect the test object to the test socket until the mains connection is technically safe!

WARNING! When connecting the test object to a test socket, voltages dangerous to the touch can result on a defective test object or touchable conductive parts not connected to the protective earth conductor.

Directive 2012/19/EU on Waste Electrical and Electronic Equipment
WEEE Directive 2012/19/EU is intended to avoid electrical and electronic equipment waste and reduction of such waste via re-use, recycling and other forms of use.
REACH Directive (EC) No.: 1907/2006 on registration, evaluation, approval and restriction of chemicals.

1.1 Meaning of symbols on the device

Warning hazardous situation
WARNING! HEED documentation

The device must not be disposed of with domestic waste.

European conformity marking

300 V CAT II Maximum permissible voltage and measurement category between the connections and the earth

1.2 Meaning of symbols in the operating manual

WARNING!

Warning: Voltage!

Note!

2 USE

The TG basic 2 / TG basic 2+ test device is a measuring device for evaluating the effectiveness of protective measures on electrical appliances in accordance with DIN VDE 0701-0702 respektive ÖVE 8701-1-2

3 Scope of delivery

- 1 TG basic 2 or TG basic 2+ test device
- 1 red measuring line, 2m
- 1 black measuring line, 2m
- 1 mains connection cable, shockproof plug, Neutrik powerCon blue 1,5m
- Test cable, shockproof non-heating appliance plug (TG basic 2+)
- Test cable, shockproof 4mm safety plug [A1] (TG basic 2)
- Test cable, non-heating appliance plug -4mm safety plug [A2] (TG basic 2)
- 1 soft pouch
- Quick guide
- Factory calibration certificate

4 Connections, operating and display elements

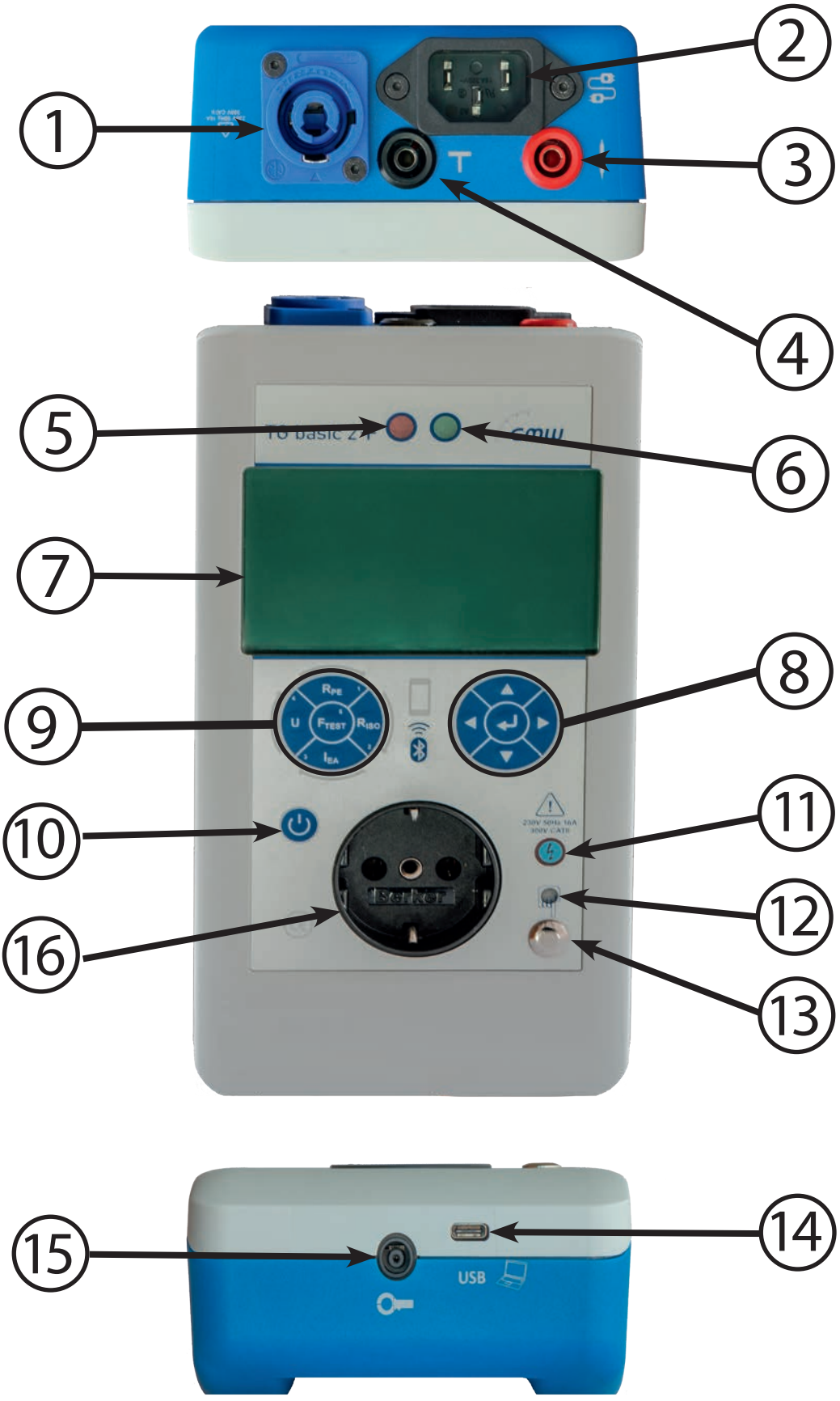


Bild 2

Connections (Figure 2)

Before connecting the test device to the mains voltage, the corresponding warnings in Section 1 'General safety and warning notices', the warnings on the mains adapter cable and, if applicable, the warnings on the accessories must be heeded! The safety of the user, appliance and test object is only ensured when they are used as intended! The protective earth conductor potential must be tested using the finger contact after connecting the test device.

① Mains connection Neutrik Power CON blue
② Non-heating appliance plug connection for extension cables and RCD testing (TG Basic 2+), IEC 60320 C19
③ Connection for red measuring line „Probe" or for connecting adapter A1 and A2 (Rpe measurement) (for TG Basic 2 only)
④ Connection for black measuring line „GND"
⑤ FAULT LED
⑥ GOOD LED
⑦ LCD-Display
⑧ Arrow keys
⑨ Buttons for individual measurements R_{PE} R_{ISO} I_{EA} U and F_{TEST}
⑩ On / Off button
⑪ Phase control lamp indicates mains voltage at the shockproof test socket
⑫ Finger contact LED
⑬ Finger contact
⑭ USB Typ C connection for communication (for TG Basic 2+only)
⑮ Connection for a clip-on ammeter (for TG Basic 2+ only)
⑯ Test socket

4.1 Mains connection, Neutrik powerCON blue (1)

Mains connection of the test device. The test device must only be operated on a 230 V AC +/-10 % 40 – 60 Hz, grid fused with max. 16 A!

4.2 Connection, non-heating appliance plug TG Basic 2+ C13 (2)

To connect the included non-heating appliance line with an extension, or test non-heating appliance lines.

4.3 Connection, TG basic 2 (3)

To connect the included test cables/adapters (A1 or A2) with an extension or to test non-heating appliance lines.

4.4 Connection, shockproof test socket (16)

To connect the test cable to a shockproof socket up to 16 A.

Do not connect protective earth conductor until immediately before the mains is switched on.

WARNING!!!

When connecting the test object to a test socket, a voltage dangerous to the touch can result on a defective test object or touchable conductive parts not connected to the protective earth conductor.

4.5 Red measuring socket „Probe“ (3)

Connecting the measuring line for the plus pole for measurement of the protective earth conductor resistance, insulation resistance. Measurement input for voltage, substitute leakage current and touch current measurement.

4.6 Black measuring socket „GND“ (4)

Connecting the measuring line for the minus pole for measurement of the protective earth conductor resistance, touch current, voltage and insulation resistance.

4.7 Red LED indicator (5)

Display: Threshold exceeded

4.8 Green LED indicator (6)

Display: Measurement value OK

4.9 LCD display (7)

The display has a resolution of 320x240 pixels and is backlit.
All information (user interface, help texts) and measurement results
(Measurement functions, threshold values, measurement values and units) are shown in plain text.

- For displaying the menu and measurement values in single mode
- In remote mode, the display shows only ‘Remote mode

4.10 Adjustment buttons (8)

All measurements can be operated simply and conveniently using the arrow key controls.

-  - Bluetooth symbol without function or ESC
-  - Arrow keys to move the cursor/select parameters
-  - Enter key to enter and confirm the menu

4.11 Buttons for individual measurements (9)

- On / OFF button 
- Passive measurements:  - Protective earth conductor measurement
   - Insulation measurement
   - Substitute leakage current measurement
- Active measurements:  - Function test with measurement of touch current, differential current, voltage, current consumption and output
   - ELV test, secondary DC voltage measurement

4.12 Phase control lamp (11)

Indicates presence of mains voltage at the shockproof test socket.

4.13 Finger contact LED (12)

The finger contact LED must not flash!

The finger contact LED indicates the presence of voltage at the PE conductor when the finger contact LED is touched.

The finger contact LED is normally off.

4.14 Finger contact (13)

The finger contact is used to check the mains potential at the PE conductor. Information is displayed via finger contact LED.

4.15 Clip-on ammeter connection, TG Basic 2+ only (15)

Connection of a TGSZ 40 differential clip-on ammeter, to measure phase currents and differential currents.

4.16 USB Typ C (16) interface, for TG Basic 2+ only

Connection of a USB-C connector for service mode only.

5 Functionality description

5.1 Power supply

The device is supplied with power via the mains (230V ± 10%).

The measurement electronics are supplied via an internal fuse.

5.2 Memory

The measurement values can only be stored in the Test-Master app on a mobile phone or tablet.
Test devices TG Basic 2 / TG Basic 2+ do not have internal memory.

6 Testing the electrical connection

The operator is responsible for the safety of the electrical installation (incl. on-site electrical connection and equipotential bonding system), in accordance with the fundamental statutory regulations (accident prevention regulations, valid standards).

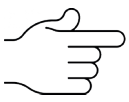
Testing the electrical connection is not part of the test requirements for modification, testing and repeat testing on the electrical devices. In spite of this, it is still important to know that the mains status is OK before testing electrical appliances.

The test device does not test the electrical connection as required by DIN VDE 0100.
However, it does make important and meaningful measurements for the electrical connection, e.g.:

- Testing the mains protective earth conductor potential via the finger contact
- Mains protective earth conductor potential PE < 30 V
- Testing the N conductor for disruptions (display stays off)
- Display of the phase control lamp when the relay is activated
- Measurements of voltage phase to N (display 1 bis 260 V AC)

Note:

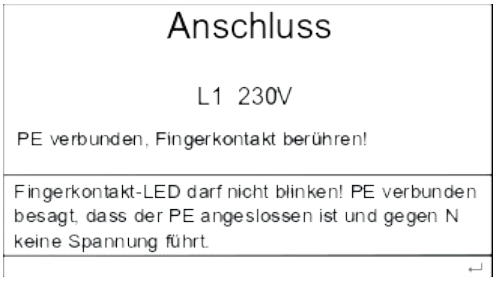
- First, check whether the protective earth conductor is connected by touching the finger contact. If the red LED flashes, the protective earth conductor is not connected. 'PE>30V!!' appears on the display if the protective earth conductor connection is not OK. The device also emits a short audible warning signal.
- Measurements with the test device can only be performed again after the protective earth conductor has been repaired successfully.
- If N/PE are mixed up, the on-site fault-current circuit breaker disconnects.
- If there is no display, there may be voltage present at PE. Test the appliance using the finger contact, disconnect the test device from the mains and check it in another socket. If the appliance works now, have the socket checked by a specialist.
- When used in an IT network, and if the test device is connected via an isolating transformer, there is no PE connection: The following message is shown on the display: „PE > 30V!!".



Note!

The designations described here could differ by device, operating system and software version!

6.1 Display connection



The first menu, „Connection", shows the mains voltage present and the quality of the N and PE conductor connection.

You can check that the finger contact LED is working properly by touching the finger contact in the individual measurement „IEA LN - Probe" with the probe. The LED must flash.

6.2 Single-phase connection

WARNING!!!

- If voltage L1 < 207 V, or L1 > 253 V, reliable and meaningful measurements are no longer possible! If the message 'PE>30V!!' is shown, there is probably a disruption in the protective earth conductor or there may be an external voltage at the protective earth conductor (check with the finger contact)! See „Checking the electrical connection" on page 13 for details of how to check the protective earth conductor.

7 Commissioning the test device

7.1 Performing a visual inspection

- See the safety instructions in Section 1!
- Visually inspect the mains connection, test device and measurement accessories!
- Heed warnings on the test device, mains adapter cable and measurement accessories!

7.2 Supplying the test device with mains voltage

The test device is supplied via the mains connection on the top of the device.

The TG Basic 2 and TG Basic 2+ devices are automatically deactivated completely after approx. 10 min.

Important note! For the TG Basic 2+ tester:

The rechargeable batteries are fully charged after approx. 5 hours of charging.

The rechargeable batteries must be fully charged before commissioning for the first time!!!

The device can only be charged when it is switched off.

The charging process is indicated by a flashing red LED.

There is no automatic deactivation if the device is in remote mode (Test-Master app).

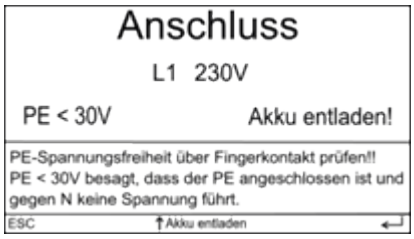
The Ni-MH batteries can be affected by a memory effect. To counteract this, you should discharge the batteries completely roughly once a month.

- The „Discharge battery“ function can be found on the Connection menu of the TG Basic 2+.

- Press the ↑ button to start the discharge process; the screen switches off, the relays switch on and the red LED flashes. The charging process starts automatically as soon as the batteries are completely discharged
- The maximum discharge period is 5 hours
- The maximum charge period is 10 hours

The device must be supplied with power at all times during the discharging and charging process!

- When the device has been charged 20 times (without previously discharging it fully), a message appears prompting you to discharge the battery.



Display of the charging state: ‘Charge!’ is shown on the display when the device needs charging.

7.3 Starting the test

The individual tests can be selected via the direct selection buttons. Optionally, tests can be performed automatically via the Bluetooth connection using the **Test-Master app** in remote mode.

8 Testing electrical appliances

The tests required by standards are implemented in the integrated test sequences. Before performing the test, the test object has to be classified in the Profile menu.

After repairs, modifications and repeat testing, electrical appliances must also offer users protection comparable with the protection of new appliances against electrical hazards. Tests in compliance with the corresponding standards can determine whether the required safety is given. The tests outlined below must be conducted in the specified sequence. Each test must be passed before the next test is started:

- Visual inspection
- Testing the protective earth conductor
- Measure the insulation resistance and leakage current or insulation resistance and an alternative measurement in the substitute leakage current method for appliances with protection class I, where this is permitted for the test object.
- Measure the insulation resistance, the touch current or insulation resistance and an alternative measurement in the substitute leakage current method for appliances with protection class II and for all touchable conductive parts of appliances with protection class I that are not connected to the protective earth conductor, where this is permitted for the test object.
- Note for

Function tests:

The protective earth conductor resistance measurement must have been completed successfully before a protective earth conductor current measurement is performed on appliances with protection class I!

An insulation resistance measurement at 500 V DC must be successfully completed before performing a touch current measurement on appliances with protection class II or III (except IT equipment)!

External connection points from protective extra-low voltage generated in the device must be assessed for compliance with the limits for the protective measure!

8.1 Specialist responsibility

There are particularly strict requirements for the specialist qualifications of electricians.
DGUV Regulation 3 and the VDE Regulations, which are also formalised as electrical regulations, include the legally binding and mandatory requirement that a responsible electrician is deployed. Specialist responsibility includes the obligation to do the right thing. Accordingly, the corresponding technical rules (electrical rules, VDE provisions etc.) must be observed. The specialist electrician must not omit any actions that should have been taken to avoid damage. The specialist responsibility becomes particularly clear when, for whichever reasons, tests cannot be performed completely. If a test required in the corresponding standard cannot be performed for technical reasons or local factors, or the associated workload, the specialist electrician must decide whether safety can be confirmed or not in spite of this omission. This decision must be justified, documented and the specialist must take responsibility!

8.2 Electrical connection

According to the fundamental statutory regulations, the accident prevention regulations and valid standards, it is not the manufacturer of the appliances to be connected who is responsible for the safety of the on-site electrical connection and, where applicable, connection of the equipotential bonding system to the device; these are the client's responsibility. Tests on devices with fixed connections cannot always be conducted, often for technical reasons, local circumstances or the associated workload. If the appliance connection is difficult to reach, full testing entails disconnecting its connections to the mains supply (L1, L2, L3, N, PE) elsewhere, e.g. at the appliance's mains terminal, socket, distributor etc., which is a labour-intensive process.

WARNING!!!

Electrical appliances with a rated current of over 16 A must be connected directly to an all-pole mains isolator (load switch, circuit breaker or power switch). Plugs and sockets or appliance connectors with a rated current of over 16 A must not be connected or disconnected from the mains under load (always deactivate beforehand).

Plugs and sockets or appliance connectors for appliances with a rated current of no more than 16 A do not require a mains isolator.

8.3 Visual inspection

The appliances are always subject to a visual inspection for externally visible defects and, where possible, for suitability for the place of installation:

- Damage to the housing
- External defects of the connecting cables
- Defects of the cord connector guard and strain relief of the connecting cables
- Signs of overload and improper use
- Unauthorised interference and modifications
- Proper condition of the protective covers
- Soiling and corrosion with an adverse effect on safety
- Existence of necessary air filters
- Clear cooling vents
- Absence of leaks
- Clear legibility of safety-related inscriptions, e.g. warning symbols, protection class, fuse specifications, switch positions on circuit breakers, etc.

Note:

Externally visible defects, which could lead to a mechanical or fire hazard, should be repaired immediately.

8.4 Individual measurement

Depending on the test object and potential electrical hazards arising from it, the following measurements can be selected. Potential individual measurements are marked on the circuit in the appliance.

Buttons: Function:

R_{PE} = Low-resistance measurement with 200 mA DC test current

- **Plug** = Low-resistance measurement via the shockproof socket and the red connection
- **Fixed connection** = Low-resistance measurement via the mains connecting cable (blue powerCON)/via the system installation and the red probe connection
- **Probe - probe** = Low-resistance measurement between the red probe connection and black probe connection
- **Extension** = Low-resistance measurement via the shockproof socket and the non-heating appliance plug C13 (TG Basic 2+)
- **Extension** = Low-resistance measurement via the shockproof socket and adapter A2 (TG Basic 2)
- **Rsl calibration** = Calibration of measurement line resistances

R_{ISO} / = Insulation test with a test voltage of 250 or 500 V DC (max. 1 mA)

- **LN – PE** = Isolationsprüfung zwischen Aktivleitern (gebrückt) und Schutzleiter
- **LN – probe** = Insulation test between active conductors and the red probe connection
- **Probe – PE** = Insulation test between the red probe connection and the protective earth conductor contact on the shockproof plug test socket
- **Probe – probe** = Insulation test between the red probe connection and black probe connection
- **L – N** = Insulation test between the L and N active conductors

WARNING! The test voltage of 500 V DC can destroy the test objects.

I_{EA} = Substitute leakage current measurement with an idle voltage of approx. 95 V AC (max. 2,5 mA)

- **LN – PE** = Measurement of substitute leakage currents when an alternating current is applied between the active conductor and the protective earth conductor.
- **LN – probe** = Measurement of substitute leakage currents when an alternating current is applied between the active conductor and the red probe connection.
- **Probe – probe** = Measurement of substitute leakage currents when an alternating current is applied between the red and black probe connections.

U = Voltage measurement across the red and black probe connections. The mains voltage is switched on at the shockproof test socket for this!

F_{TEST} = Function test with **differential**, **touch current measurement**, **phase current**, **voltage**, **active power** and **standby power measurement** in one measurement step.

- **Socket function test** = The mains voltage is switched on at the shockproof test socket. Touch currents can be sampled at all conductive parts with the red sensor, while differential current, voltage, phase current and active power measurements are conducted simultaneously. The arrow keys can be used to activate additional functions, like standby power measurement and polarity reversal of phase and neutral conductor.

- **Additional functions in the TG Basic 2+**
- **Clip-on ammeter function test** = Differential current and phase current can be tested here with a clip-on ammeter. The touch current can also be sampled with the red sensor.
- **RCD triggering time function test with 30 mA**

8.5 Function test

After completion of the electrical test, a function test must be carried out on the appliance.
A partial test can be sufficient in accordance with legal requirements.

8.6 Inspecting the inscriptions

Safety-related inscriptions, for example stipulations on the direction of rotation, must be checked and, where necessary, renewed or supplemented in suitable form.

8.7 Documenting the test

Tests must be documented when they are passed. If an appliance proves to be unsafe, this should be clearly indicated on the appliance and the operator must be informed in writing (test report/list of defects). The measurement values and any changes must be documented. Attachment of a test seal e.g. „Tested per VDE 0701-0702 and DGUV Regulation 3“ on the appliance is recommended when a safety test is passed.

9 Connection options, figures, examples[1]

9.1 Protective earth conductor measurements of alternating current test objects

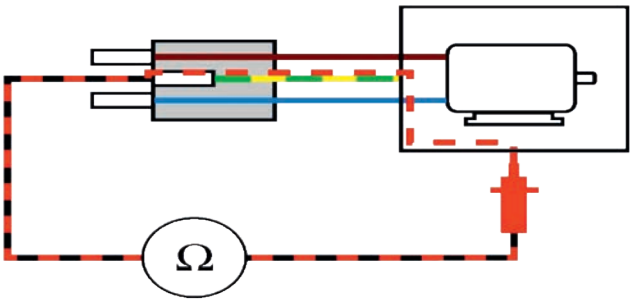
For precise determination of protective earth conductor resistances, probe calibration is recommended after every probe replacement or deactivation. Choose RSL calibration under RPE. Use the red probe to contact a protective earth conductor contact in the shockproof test socket, wait for a stable value and press 'Enter' to finish. The measured value is saved until the next restart.

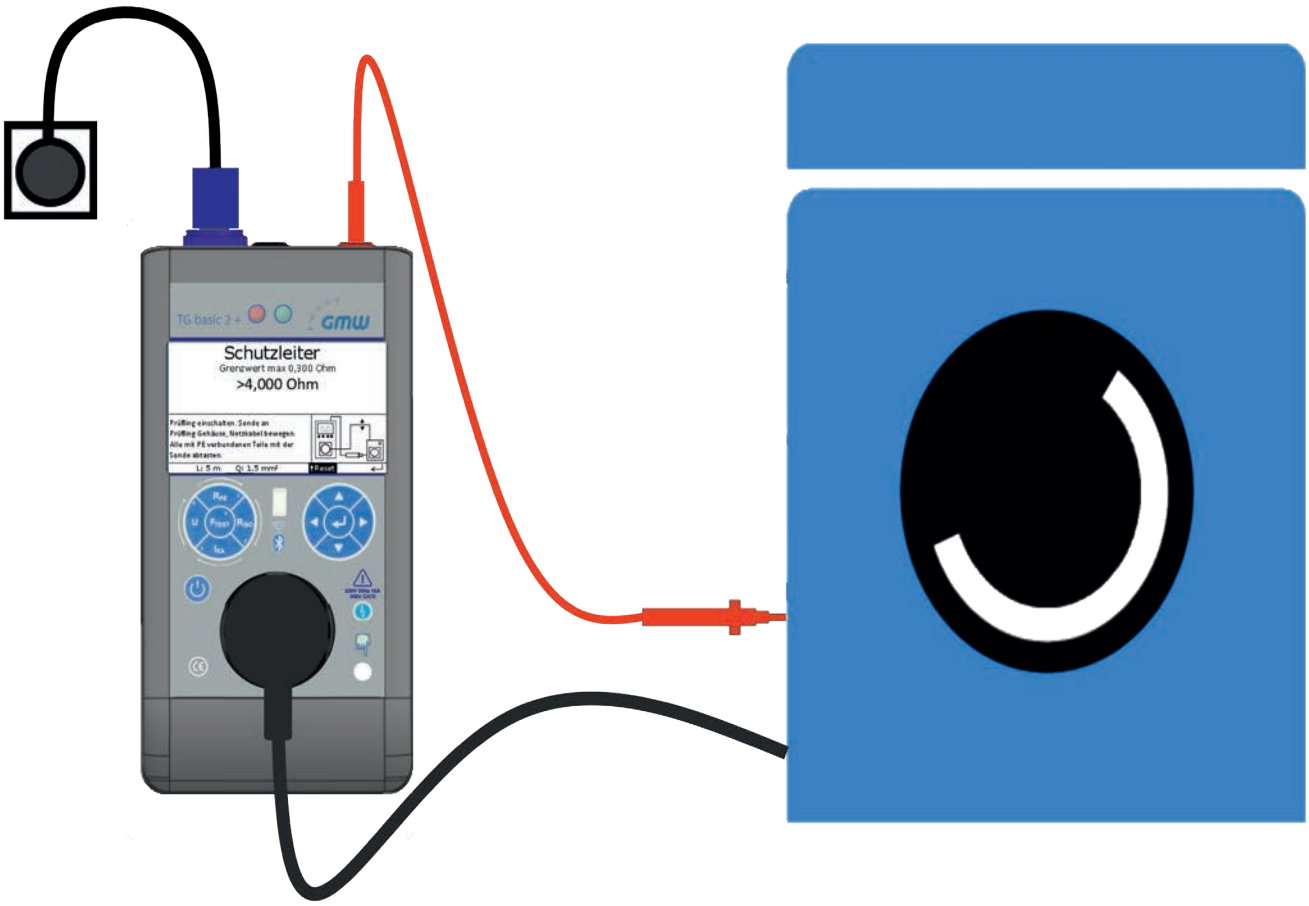
1 The TG Basic 2+ testers do not always need to be supplied with mains voltage. Certain tests can be carried out with battery power.

9.2 Protective earth conductor measurements of alternating current test objects

PE conductor measurement: Sample the housing parts with the PE conductor probe and move the connection cable.

Select „Plug“ under RPE measurement for individual measurements on the appliance.



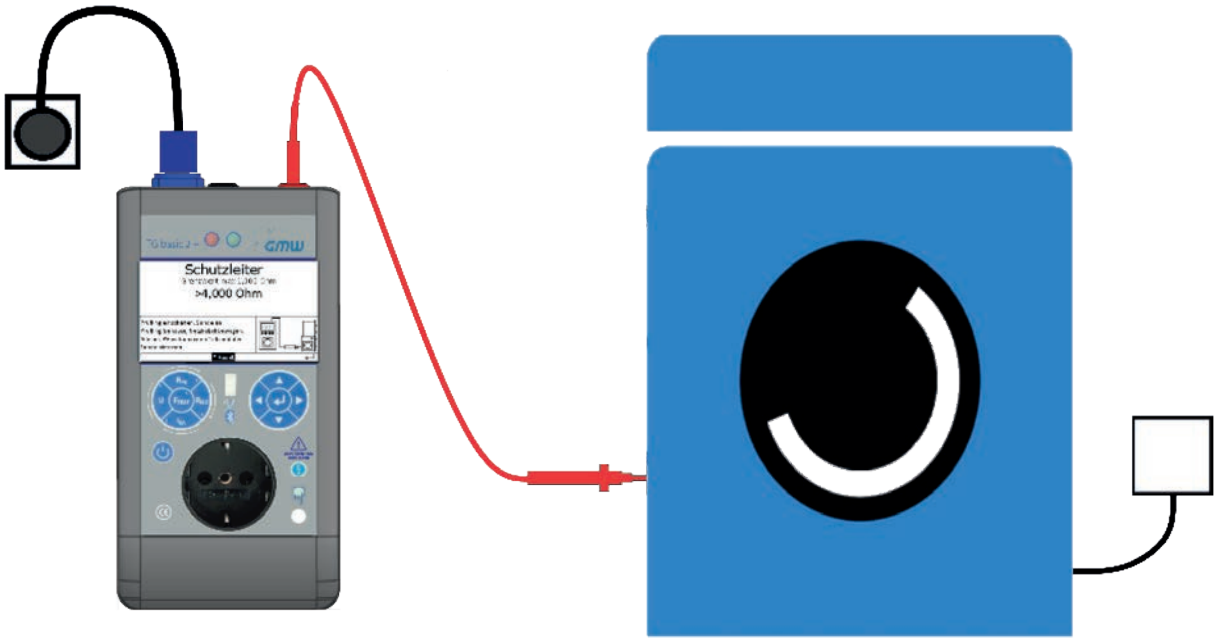


9.3 Protective earth conductor resistance measurements of test objects with fixed connections

Where possible for appliances with fixed connections, supply them with power in the test object's current circuit.

Set the automatic test sequence „Fixed connection (protection class I)" via the **Test-Master app**. Sample the housing parts with the test probe.

Select „Fixed connection" under RPE measurement for individual measurements on the appliance.



If this is the case, the PE is measured via the test device mains connection, the installation in the system and the test object mains connection.

That is why the limit value is higher than for direct measurement.

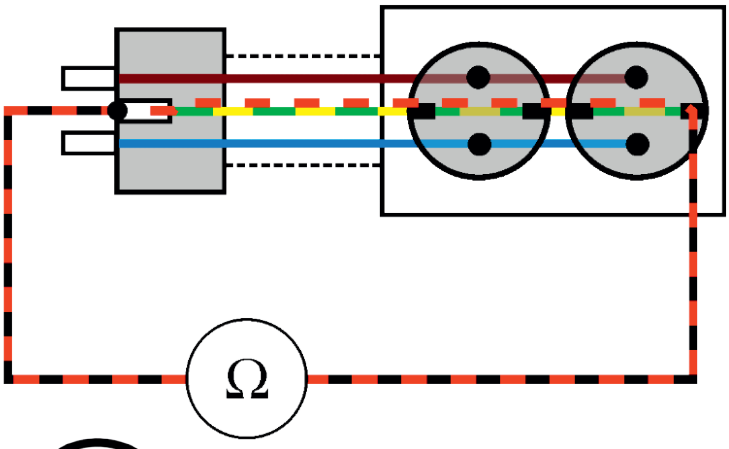
9.4 Protective earth conductor resistance measurement of extension cables

In extension cables and power strips, the presence of the PE conductor must be proven at every shock-proof socket.

Set the automatic test sequence „Extension (protection class I)" in the **Test-Master app**. Sample all PE conductor contacts.

For individual measurements on the appliance, select „Plug" under RPE measurement and contact the PE conductor with adapter [A1] or [A2] (TG Basic 2).

Use the included test cable for measurement with the TG basic 2+.



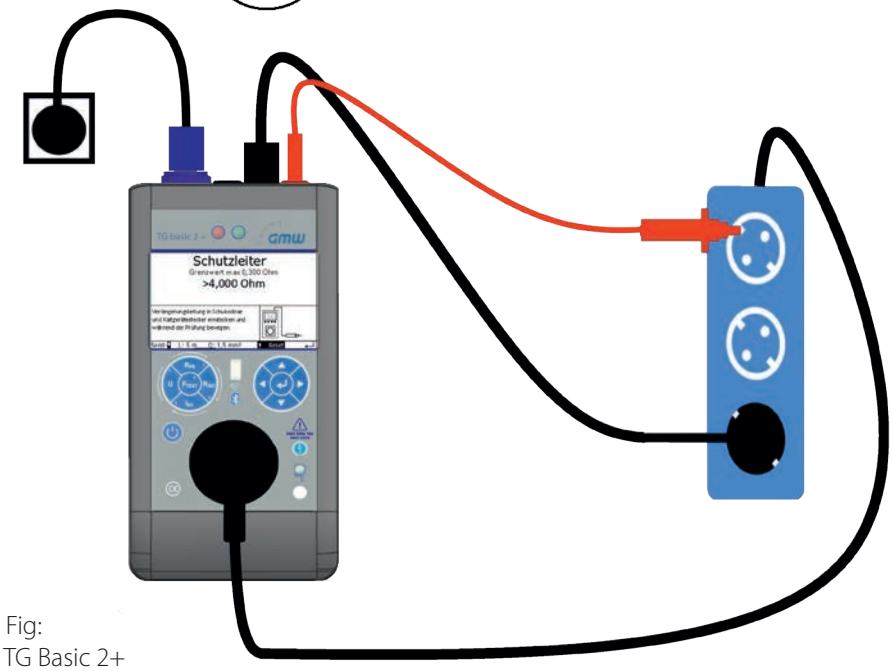


Fig:
TG Basic 2+

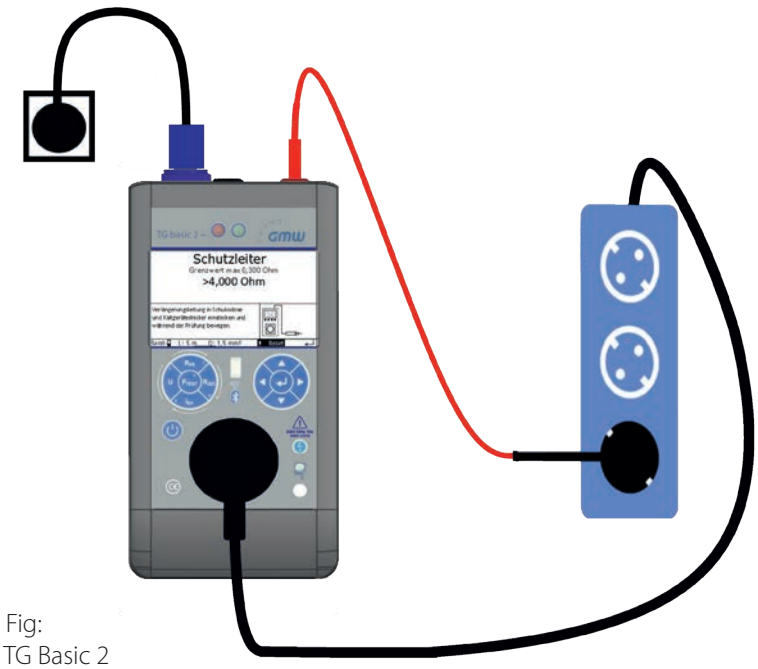
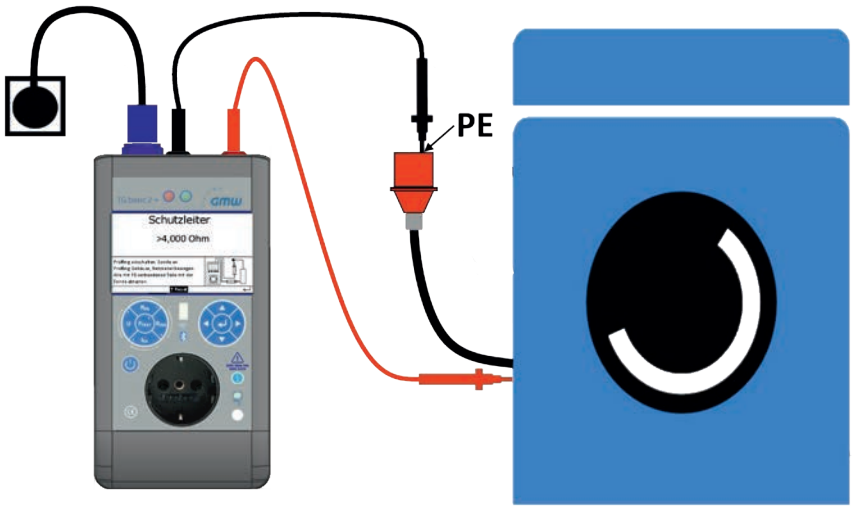


Fig:
TG Basic 2

9.5 Protective earth conductor resistance measurement(e.g. three-phase current test objects) with two measuring lines

Select „Probe - Probe“ under RPE measurement for individual measurements on the appliance.



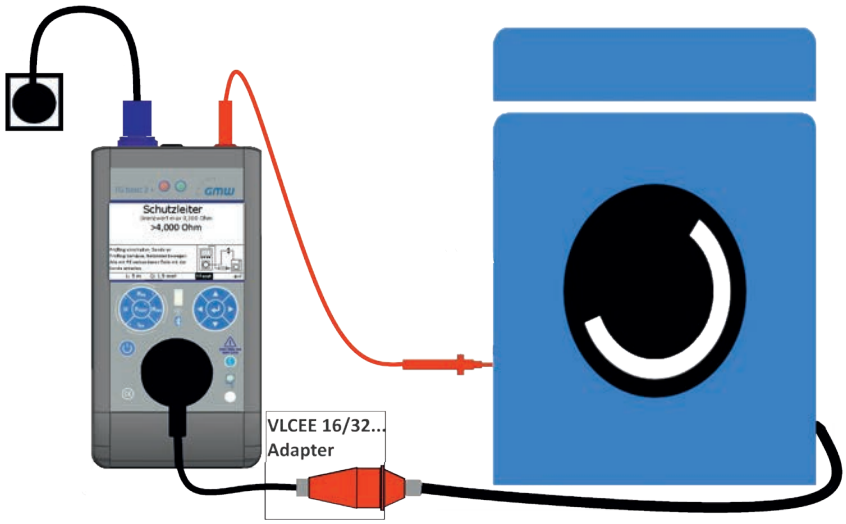
Insert the measuring line in the black socket of the test device and connect it to the PE conductor connection of the test object.

Sample the earthed metal parts of the test object with the red measuring line (probe).

9.6 Protective earth conductor resistance measurement of three-phase current test objects with the extension cable adapter

Automatic test sequence via Test-Master „Protection class I (with PE) active“.

Select „Plug“ under RPE measurement for individual measurements on the appliance.



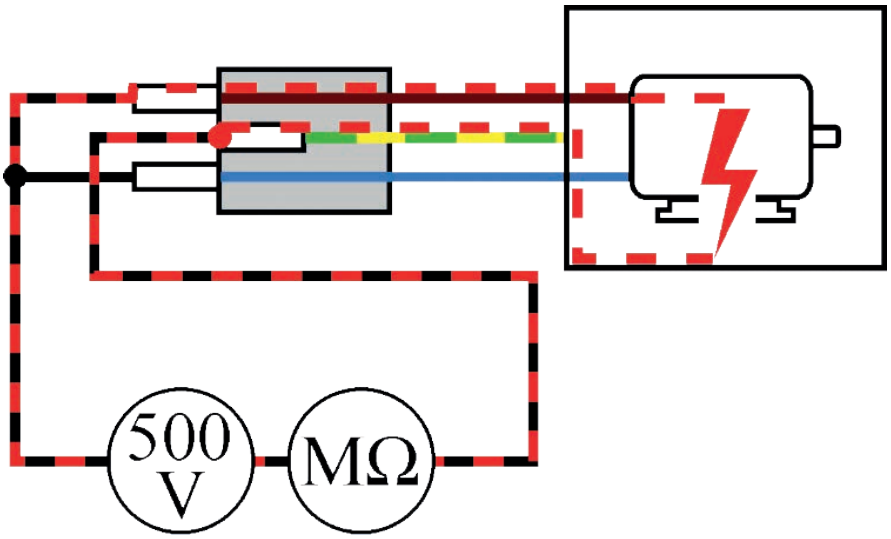
Insert the extension cable adapter into the test device. Connect the test object to the extension adapter and sample the PE housing parts.

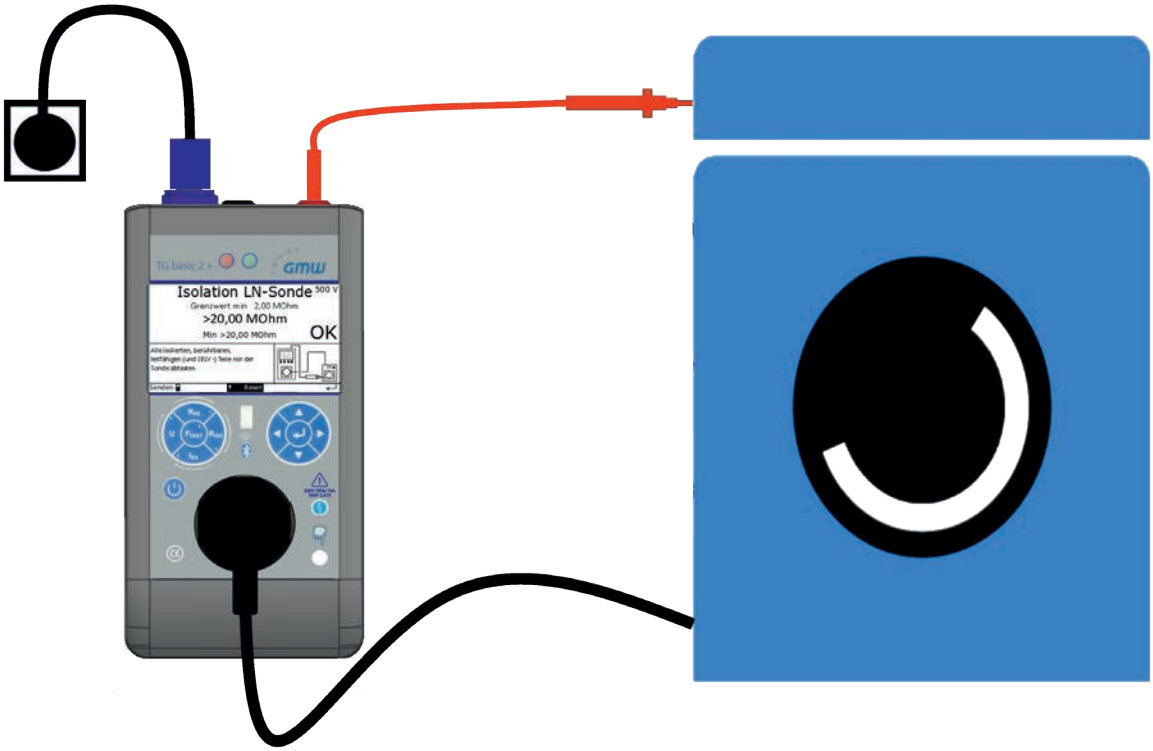
Note!

A test adapter is required!

9.7 Touchable, insulated, conductive parts

Select „Probe - Probe“ under RPE measurement for individual measurements on the appliance.

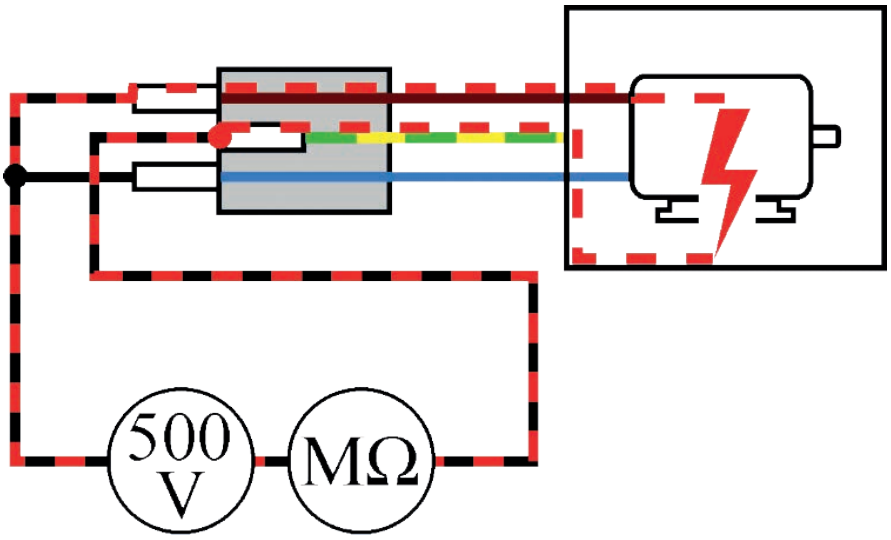




Measuring touchable parts that are not connected to PE: Sample these parts with the probe. For moving parts, such as those in a drill, sample the chuck in the rotating operating condition, ideally with the **optional brush probe**.

9.8 Insulation resistance LN-PE

Automatic test sequence in the Test-Master app:
Protection class I (with PE) „Active“ or individual test „Insulation resistance LN-PE“.
For individual measurements on the appliance, select „LN - PE“ under R_{ISO} = RISO measurement.
Check the preset parameters (heat el. YES/NO), correct test voltage (250 V/500 V) if necessary.

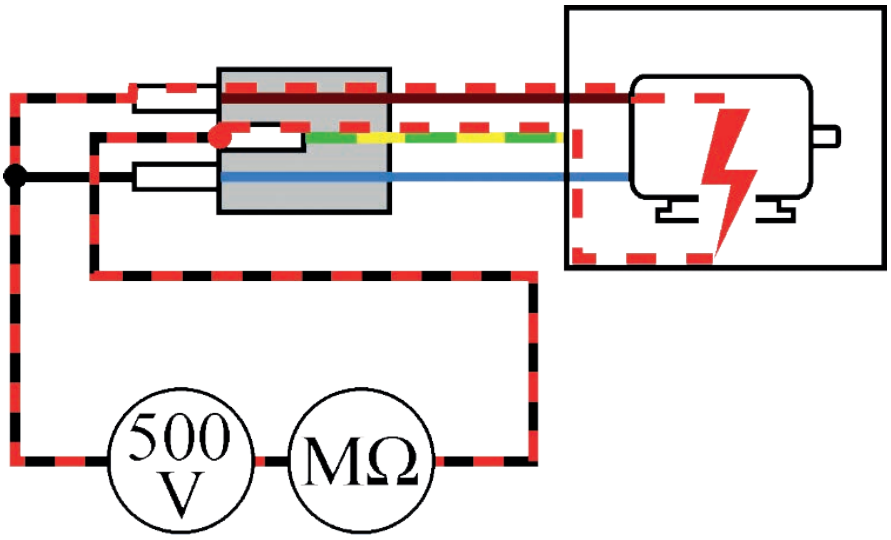


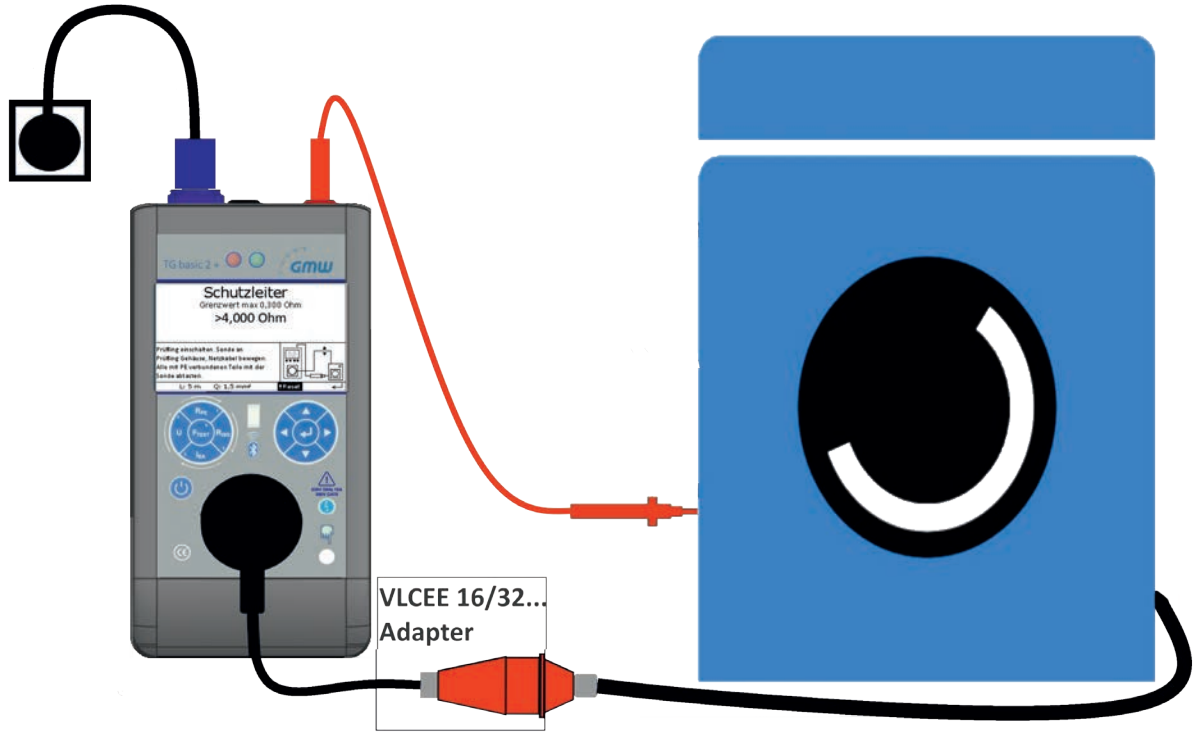
Insert the test object in the test socket. The measurement is made when no voltage is present.

9.9 Insulation resistance LN-PE of three-phase current test objects with the extension cable adapter

Automatic test sequence „Protection class I (with PE) active“ in the Test-Master app or individual test. „Insulation resistance LN-PE'“

For individual measurements on the appliance, select „LN - PE“ under R_{ISO} = insulation test.





Insert the extension cable adapter into the test device.

Connect the test object to the extension adapter. Active conductors L1, L2, L3 and N are jumpered electronically in the VLCEE 16/32 A adapter and checked for insulation against PE. Switch on the test object.

9.10 Substitute leakage current measurement LN-PE
The „Substitute leakage current measurement“ is not available in the app!!!

Note!

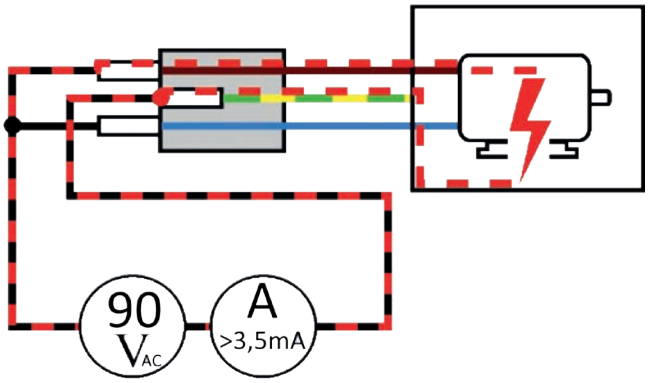
The substitute leakage current measurement may only be carried out after the insulation resistance test has been passed.

Note!

The substitute leakage current measurement is not a sufficient test if the appliance has switching elements that switch all poles, as this measurement does not test the underlying current circuits. Also, any leakage currents caused by inverters cannot be measured. As a result, active testing should generally be preferred to this measurement.

Automatic test sequence in Omni-Remote: „Protection class I passive“.

For individual measurements on the appliance, select „LN - PE“ under I_{EA} = Substitute leakage current measurement.



Note: The measurement value is halved if you select „Symmetrical circuitry Yes“. This occurs if the test object has Y capacitors from L and N to PE.

9.11 Substitute leakage current measurement LN probe

The measurement is made when no voltage is present in the test object. This measurement is carried out between LN and touchable parts insulated from PE
(including SELV parts – e.g. the secondary side of power adaptors).

9.12 Substitute leakage current measurement probe-probe

Connect the measuring device as shown in the diagram. The substitute leakage current is measured between the probe and GND. There is no limit value for this measurement, so the LED does not display anything.

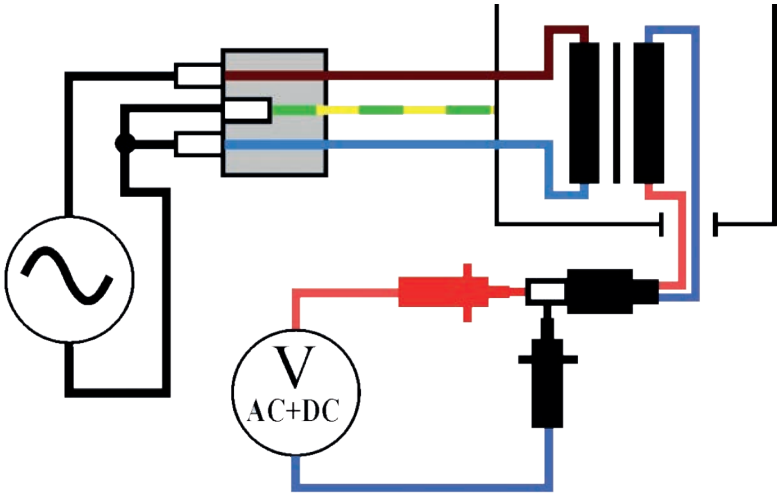
9.13 Voltage measurement[1]

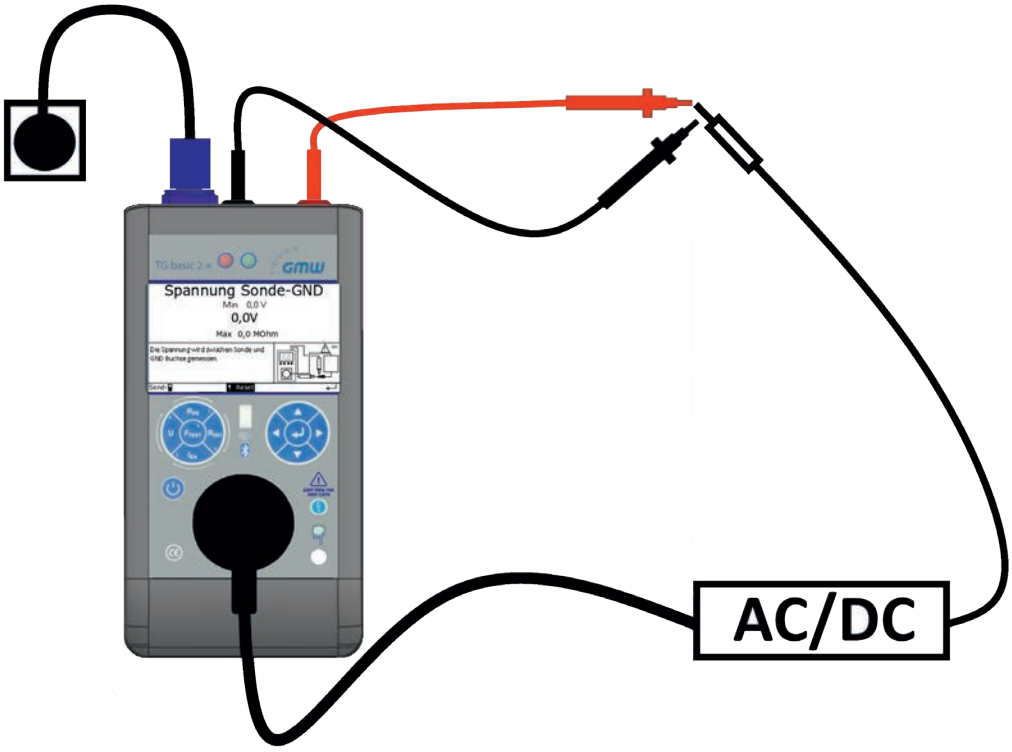
Insert the test object in the test socket.

Automatic test sequence in the Test-Master app: „Protection class I (with PE) active“ or individual measurement.

For individual measurements on the appliance, under U = Voltage measurement. The Voltage measurement.

Caution: The mains voltage is switched on at the shockproof test socket! As soon as there is mains voltage at the test socket, the LED on the high voltage display lights up in red.



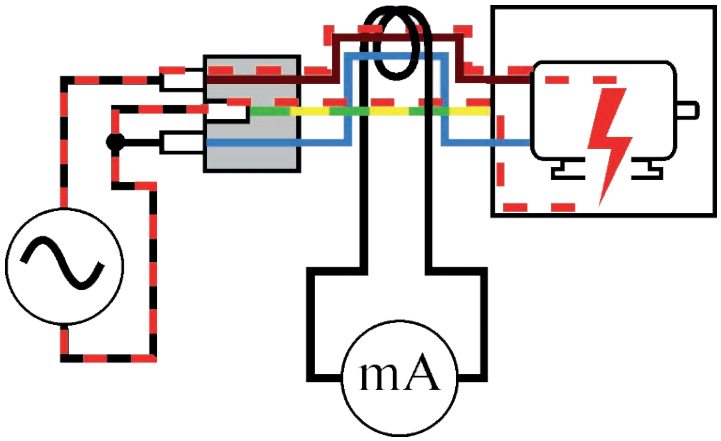


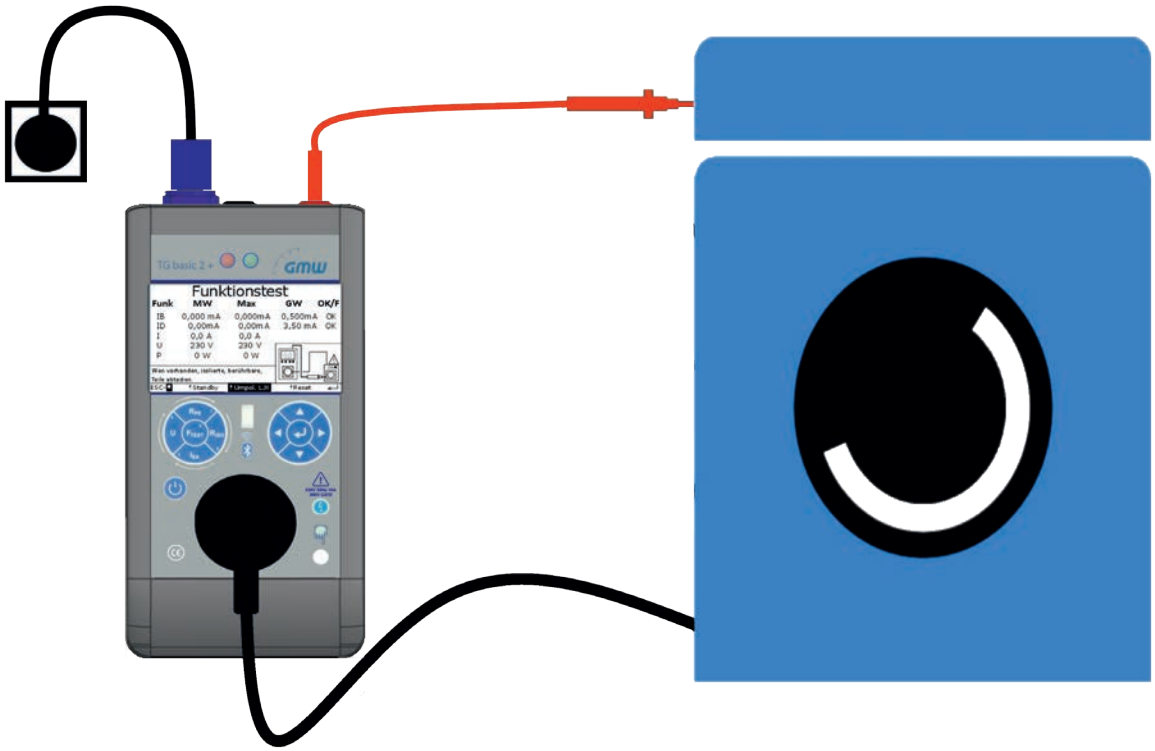
1 Mains voltage is required, not possible in battery mode.

9.14 Differential current measurement on test objects with a shockproof plug

Differential current measurement, function test: Insert the test object in the test socket. Automatic test sequence in the Test-Master app1 and „Protection class I (with PE) active“ or individual test „Diff.+touch current+function test“.

For individual measurements on the appliance, select „Socket function test“ under F_{TEST} = Function test.





The test object is supplied via the test device during the test.
Attention! Mains voltage 230 V

9.15 Clip-on ammeter function test (TG Basic 2+ only)

Connect the TGSZ 40 clip-on ammeter to test device TG Basic 2+ at the clip-on ammeter connection (15).
This cannot be implemented via an automatic sequence in the app!!!
For individual measurements on the appliance, select „Clip-on ammeter function test“ under
FTEST. Carry out the test

9.16 RCD function test (for TG Basic 2+ only)

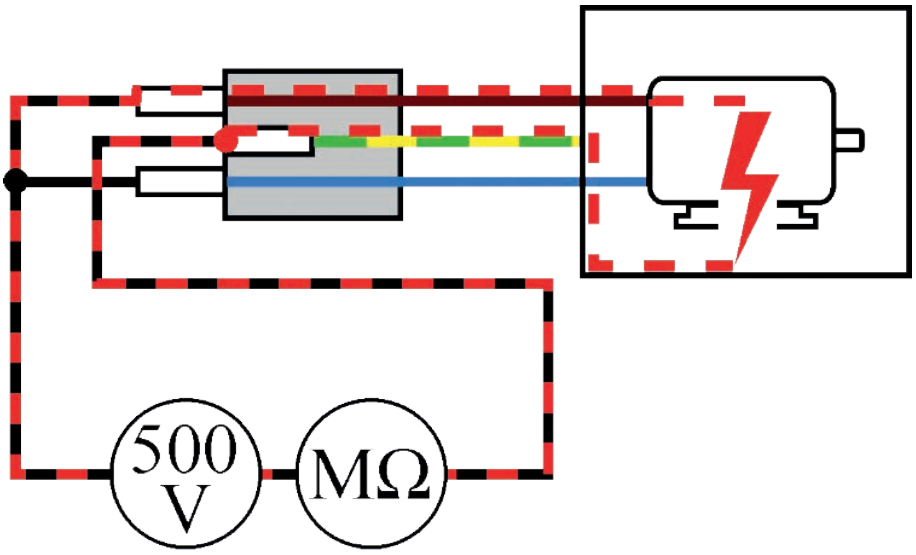
This cannot be implemented via an automatic sequence in the app!!!
For individual measurements on the appliance, select 'Clip-on ammeter function test' under FTEST.
Carry out the test.

9.17 Wiring test (only in the Test-Master app)

Wiring test for a non-heating appliance cable, extension cable or a CEE extension via an automatic test sequence with the Test-Master app.

1. The non-heating appliance cable is tested on TG Basic 2 via the included adapter for testing non-heating appliance plugs A2 or the shockproof extension via the adapter for testing extension cables A1.
2. A non-heating appliance plug cable or a shockproof extension cable can be tested directly on the device via the integrated non-heating appliance plug of the „TG Basic 2+“. The limit value should be between 0.17-0.28 MOhm. If the value measured is below the limit, there is probably a wiring error.

Cannot be measured via individual measurements on the appliance!



10 Error message, troubleshooting

10.1 The display is off

Note: The L or N conductor connection is probably not OK.
If the mains is OK, the internal fuse may have blown.

10.2 Touch current measurement shows 0.000 mA

That is not an error, it is the normal status.

10.3 Touch current measurement over 0.5 mA

Attention! There is voltage present at the touchable conductive parts!!!
Disconnect the test object from the mains socket immediately!!!
Make an insulation resistance measurement between the touchable conductive parts and the test object's mains connection (L1/L2/L3/N). All switching elements must be closed during the insulation measurement, so that all insulations are reached.
The measured value must be over 2 MΩ. Measure the touch current after a successful insulation measurement. The measured value must be less than 0.5 mA.

10.4 Differential current measurement shows 'F'

The device determines the limit value of the differential current based on the total heat output. There is a limit value of 1 mA/kW total heat output.
Check the total heat output of the test object (rating plate).
If the performance specifications of the test device and rating plate of the test object are identical, the insulation properties of the test object are not OK!
Disconnect the test object from the mains connection.
Use an insulation meter to look for the fault. The mains voltages are not displayed correctly.
Check the mains voltage with a measuring device. If the fault is due to the test device, the test device must be sent to the service department or replaced!

11 Spare parts

WARNING!!!

See the safety instructions and warnings in Section 1!
Only original replacement parts of the manufacturer may be used, see Section 1!
The test device and accessories must only be assessed and, if necessary, repaired by the manufacturer or a service provider authorised by the manufacturer!

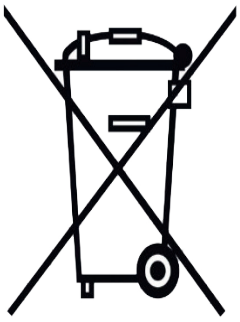
12 Technical data

Mains power supply	Alternating current 230 V ± 10% Test object connection: 16 A shockproof
Operating ambient temperature:	0 – 40°C
Measurements	Operating error 5% of the measured value + 1% of the range
Protective earth conductor resistance (probe-PE, probe-PE-mains, probe-probe):	Measuring range: 0,000 Ω ...4,000 Ω. Idle voltage 10 V Current 200 mA DC
Insulation resistance (LN-PE, LN-probe, probe-PE, probe-probe):	Measuring range: 0,00 MΩ...20,00 MΩ Test voltages 250 V, 500 V Short circuit current 1 mA
Substitute leakage current (LN-PE, LN-probe, probe-PE, probe-probe):	Measuring range: 0,00 mA ...20,00 mA Idle voltage approx. 85 V
Differential current:	Measuring range: 0.00 mA ...20.00 mA Filter characteristics per DIN VDE 0404 for correct evaluation of the harmonics
Clip-on ammeter connection:	Measurement of phase currents to 40 A AC and differential current measurement to 40mA AC
Touch current:	Measuring range: 0,000 mA ... 4,000 mA
Voltage measurement probe-probe:	Measuring range: 0,0 V...440 V AC/DC Current: 0,00 A ... 20 A Total power: 0 W ... 4.000 W
Total power:	0 W ... 4.000 W
PE conductor monitoring:	Voltage N-PE> 30 V
Integrated leakage current deactivation:	Differential > approx. 20 mA.
Test sequences:	Automatic test sequence via Test-Master app or Omni-Remote Regulation DIN VDE 0701-0702 Protection class I active/passive (with or without mains) Protection class II Protection class III Fixed connection Extension cable with optional adapters
Interface:	USB Type C for data transfer to the PC with USB A/C cable

12.1 Dimensions

Display	LCD display Backlit, with 320 x 240-pixel resolution
Dimensions	L x W x H 210 x 110 x 80 mm
Weight	TG basic 2 (incl. soft pouch and accessories) TG basic 2+ (incl. soft pouch, accessories and batteries)

13 Disposal



The end user disposes of the device appropriately in accordance with the valid directives.

Directive 2012/19/EU on Waste Electrical and Electronic Equipment

WEEE Directive 2012/19/EU is intended to avoid electrical and electronic equipment waste and reduction of such waste via re-use, recycling and other forms of use.

REACH Directive (EC) No.: 1907/2006 on registration, evaluation, approval and restriction of chemicals.

Please contact our service department for details on acceptance of returned old appliances.

14 Service information

14.1 Location

Gilgen, Müller & Weigert (GMW) GmbH & Co. KG
Am Farrnbach 4A
90556 Cadolzburg
Tel: +49 (0) 9103 7129-0

E-Mail: info@g-mw.de

14.2 Product description

14.3 Calibration / service order

15 Warranty and guarantee

Test devices TG Basic 2 and TG Basic 2+ are subject to strict quality control. Every test device comes with a corresponding test protocol with all calibration data.
Unless otherwise agreed, the test device is guaranteed for 12 months after the device is handed over. Our General Terms and Conditions also apply.

No warranty claims shall be accepted in the following cases:
In the event of improper use of the device or use in conjunction with another non-compatible device.
After changes to the device made without express permission of the manufacturer.
After interventions in the device that were not made by persons approved by the manufacturer for this purpose.
After adaptations of the device to specific applications for which the device is not intended or not mentioned in the operating manual.
In the event of impacts, falls, chemical or water damage.

16 Test-Master-App

The Test-Master app is a device-specific application and is activated by GMW free of charge for a 12-month period. After 12 months, an annual maintenance fee is charged.
In the event of regular, annual device calibration, the maintenance fee will be credited in full. The Test-Master app works with all Android devices with version 5.0 or higher.

17 Accessories (optional):

Description	Item number	
Brush probe, 4 mm black	7910086049	
Red measuring line, 2 m with crocodile clip	7920019020	
Black measuring line, 2 m	auf Anfrage	
Mains connection cable, GER Neutrik powerCon blue, 1.5 m, CH plug	On request	
Non-heating appliance connection line, 0.6 m (For extension and RCD test, TG Basic 2+ only)	On request	
Three-phase adapter VLCEE 16 A	7920019030	
Three-phase adapter VLCEE 32 A	7920019040	
Three-phase adapter set, 16 A with clip-on ammeter, consisting of: VLCEE 16A, TCEE 16A und TGSZ 40	7920019180	
Three-phase adapter set, 32 A with clip-on ammeter, consisting of: VLCEE 32A, TCEE 32A und TGSZ 40	7920019190	

Description	Item number	
Differential clip-on ammeter TGSZ 40	79200190010	
Adapter for a standard differential clip-on ammeter TGSZ 40	On request	
Adapter for testing extension cables (for TG Basic 2 only)	7920018680	
Adapter for testing non-heating appliance cables (for TG Basic 2 only)		
Software		
Omni-Remote (database software)	7920019130	
8“ tablet Incl. cover and Test-Master app	7920019005	

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http://www.g-mw.de

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