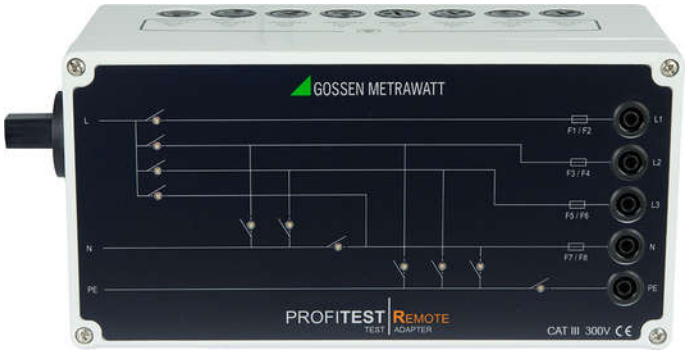
GOSSEN METRAWATT

PROFITEST REMOTE

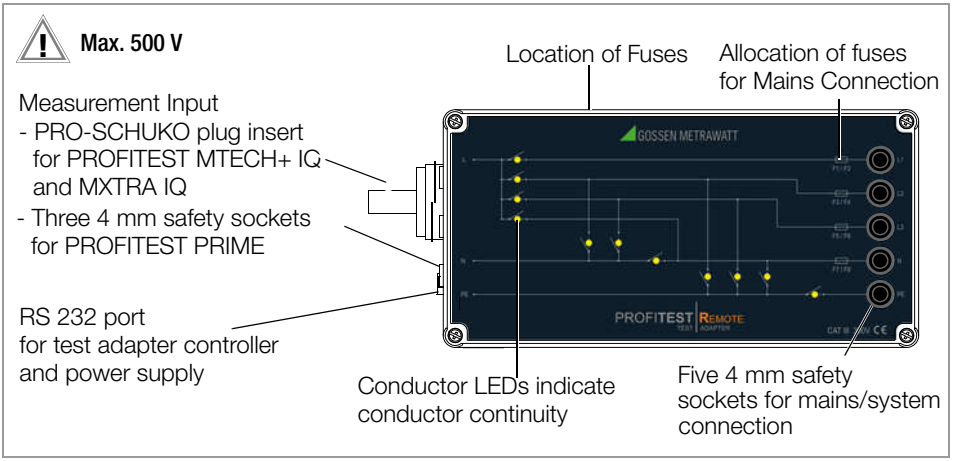
3-Phase Test Adapter for Testers Including PROFITEST MTECH+ IQ, MXTRA IQ and PRIME

3-447-051-15
4/6.22

Important
Read carefully before use!
Keep on file for future reference!



Connections Overview



Meanings of Symbols on the Instrument

300 V CAT III Maximum permissible voltage and measuring category between connections and ground

Warning concerning a point of danger (attention: observe documentation!)

Indicates European Conformity

This device may not be disposed of with household trash, see “Returns and Environmentally Sound Disposal” on page 15.

Scope of Delivery

1 Test adapter (M514R)
1 RS 232 interface cable, type Z3241
1 Set of operating instructions

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1 Safety Precautions

The test adapter has been manufactured and tested in accordance with the following safety regulations:
IEC/EN 61010-1/VDE 0411-1,
DIN EN 61326-1/VDE 0843-20-1
Safety of the operator, as well as that of the test adapter, is only assured when it's used for its intended purpose.
Use for intended purpose stipulates application for loop and line impedance measurement ZL-PE and ZL-N as well as insulation resistance measurement RISO exclusively in combination with the

– **PROFITEST MTECH+ IQ**, as of FW V03.04.04
– **PROFITEST MXTRA IQ**, as of FW V03.04.04
– **PROFITEST PRIME**, as of FW V03.05.00

test instruments. Any other application (e.g. voltage measurement or use in combination with other test instruments) are not permissible.

Read the operating instructions carefully and completely before placing your test instrument into service. Follow all instructions contained therein. Make sure that the operating instructions are available to all users of the device.
Read the operating instructions for the respective test instrument as well, in particular the sections concerning the measurement of insulation, loop and internal line resistance.

Tests may only be performed by a qualified electrician, or under the supervision and direction of a qualified electrician. The user must be instructed by a qualified electrician concerning performance and evaluation of the test (see also training seminars listed at www.gossenmetrawatt.com).

OBSERVE THE FOLLOWING SAFETY PRECAUTIONS:

- The device may only be connected to electrical systems with a maximum of 230/ 400 V which comply with applicable safety regulations
  (e.g. IEC 60346, VDE 0100) and are protected with a fuse or circuit breaker with a maximum rating of 16 A.
- The test adapter may only be used for tests described in the section entitled “Applications”.
- When using a test probe with coil cord: Grip the tip of the test probe firmly, for example if it has been inserted into a jack socket. Tensioning at the coil cord may otherwise cause the test probe to snap back resulting in possible injury.
- Insulation resistance can only be measured at voltage-free systems.
- Do not touch the test probes during measurement!

FUSE REPLACEMENT

All fuses for the test adapter’s neutral and phase conductors are accessible from the outside (see section 6.3). The fuses may only be replaced when the instrument is voltage-free, i.e. the instrument must be disconnected from mains supply power and may not be connected to a measuring circuit. The fuse type must comply with the specifications in the technical data or the labeling on the instrument (see section 5).

Opening the Device / Repairs

The test adapter may only be opened by authorized, trained personnel in order to ensure flawless operation and to assure that the guarantee is not rendered null and void.

Even original replacement parts may only be installed by authorized, trained personnel.

If it can be ascertained that the test adapter has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages.

The test adapter may not be used:

- If external damage is apparent, for example if parts which conduct dangerous touch voltage are freely accessible, and in the event of defective LEDs
- With damaged connection and/or measurement cables, e.g. interrupted insulation or kinked cable
- If it no longer functions flawlessly
- After extraordinary stressing due to transport

In such cases, the test adapter must be removed from operation and secured against unintentional use.

2 Applications

Use of the test adapter eliminates bothersome replugging, and thus reversing of the phases as well during measurement of RISO, ZL-PE and ZL-N.

The following measurements are supported:

L1-PE, L2-PE, L3-PE,
N-PE, L+N-PE,
L1-N, L2-N, L3-N,
L1-L2, L1-L3, L2-L3

The following test instruments are suitable for use with the test adapter:

- **PROFITEST MTECH+ IQ**, as of FW V03.04.04
- **PROFITEST MXTRA IQ**, as of FW V03.04.04
- **PROFITEST PRIME**, as of FW V03.05.00

Indication of Conductor Connections

The LEDs indicate conductor continuity between the connected system and the test instrument's input:

- **RED LED:** Switch closed, conductor continuity
- **GREEN LED:** Switch open, no connection

The line circuit-breaker is opened and closed via the **TEST ADAPTER CONTROLLER** at the respective test instrument.

Measuring Insulation Resistance RISO in Electrical Systems

In order to be able to detect faults in electrical systems which are caused by defective insulation, insulation resistance must be measured between each active conductor and the protective earth conductor.

Observe the corresponding chapters in the operating instructions of your test instrument concerning correct measurement procedures.

NOTE!
Thanks to 4-wire measurement, there's no need to determine the test adapter's offset value.

Measuring Loop and Line Impedance ZL-PE and ZL-N

Loop impedance is the sum of all resistances within the distribution network and the conductors in the branch circuit.

In order to be able to determine the effectiveness of residual current devices, loop impedance ZL-PE must be ascertained between the phase conductor and the protective conductor. The same measuring procedure is used for line impedance ZL-N as is also the case for loop impedance ZL-PE. However, the current loop is completed via neutral conductor N, rather than protective conductor PE as is the case with loop impedance measurement.

Observe the corresponding chapters in the operating instructions of your test instrument concerning correct measurement procedures.

NOTE!
Thanks to 4-wire measurement, there's no need to determine the test adapter's offset value.

3 Initial Startup

3.1 Testing the LEDs

Before performing any measurements, the LEDs should be tested for correct functioning. The test adapter has to be connected to the test instrument via the serial port to this end. Use the serial interface cable for this purpose (included).
After switching the test instrument on, the LEDs must light up green in all switch positions except for RISO, ZL-P and ZL-N.

3.2 Connecting the Test Instrument to the Test Adapter

Connecting the Measurement Inputs

The respective test instrument is always connected to the test adapter via 3 poles using the PRO-SCHUKO plug insert or via safety sockets L, N and PE.
PROFITEST MTECH+ IQ: test plug
PROFITEST MXTRA IQ: test plug
PROFITEST PRIME: probes 1(L), 2(N), 3(PE)

This also applies in the case of 2-pole measurements, because the corresponding probes are controlled from the test instrument via the test adapter controller – the measurement cables or probes no longer have to be manually replugged.

Data Interface Connection

The test adapter must also be connected to the test instrument via the serial port in order to control the line circuit-breaker, for the purpose of indication by means of the conductor LEDs and for power supply. Only use the serial interface cable included in the scope of delivery to connect the test adapter with the test instrument.

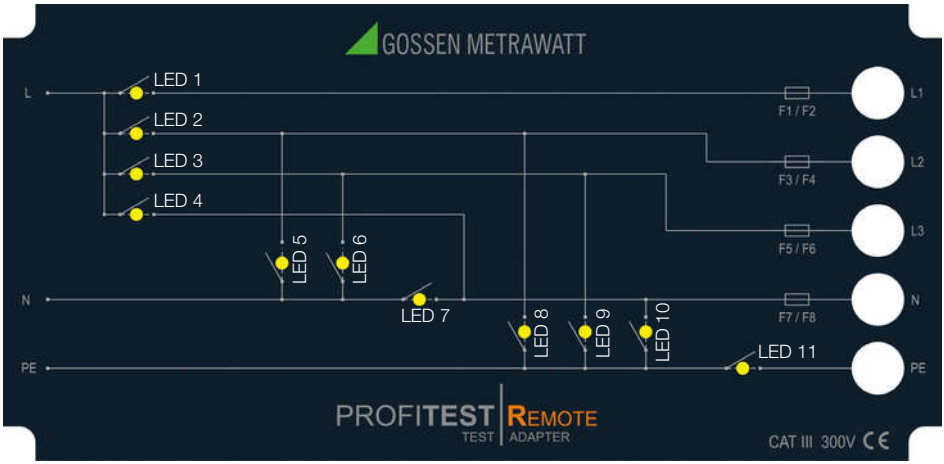
3.3 Connection to the System or the Mains

The test adapter must be connected to the system for all tests (see connections overview on page 2). The following adapter cables are available for this purpose:

Description	Type	Article No.
Adapter cable with 5-pole 16 A CEE plug and 4 mm safety plugs (L1, L2, L3, N, PE), CAT III 300 V, cable length: 4.8 m	Connecting-Cable-16	Z570B
Adapter cable with 5-pole 32 A CEE plug and 4 mm safety plugs (L1, L2, L3, N, PE), CAT III 300 V, cable length: 4.8 m	Connecting-Cable-32	Z570C
Adapter cable with 5-pole 63 A CEE plug and 4 mm safety plugs (L1, L2, L3, N, PE), CAT III 300 V, cable length: 4.8 m	Connecting-Cable-63	Z570D

- ➪ Disconnect the system from all sources of voltage and secure against restart.
- ➪ Check the measuring points for absence of voltage before connecting them to the test adapter.
- ➪ Using the appropriate adapter cable, connect the test adapter to the system via connector sockets L1, L2, L3, N and PE:
  Refer to the characteristic values on page 14 for nominal mains values.

3.4 Key and Significance of the LEDs



Significance of the LEDs

LED lights up red: Switch closed
LED lights up green: Switch open

LED Test

The LEDs must light up green in all switch positions except for RISO, ZL-P and ZL-N.
Repeat the LED test after each test run.

4 Measurements

The test adapter can remain connected to the system or the mains during the course of all measurements, assuming absence of voltage during the insulation resistance measurement.

NOTE!
The fuses have to be checked before each measurement. Blown fuses must be replaced with new ones (see "Fuse Replacement" on page 15).

4.1 Measuring Insulation Resistance (RISO)

ATTENTION!
Single-Phase Mains Connection
The phase must be connected to L1 for single-phase mains connection.

➪ Make sure that the system remains voltage-free for the entire duration of the measurement.

ATTENTION!
Insulation resistance can only be measured at voltage-free systems.

ATTENTION!
The N and PE conductors must be disconnected at all times. Consuming devices should not be connected.

4.1.1 Measuring Insulation Resistance with the PROFITEST MTECH+ IQ or PROFITEST MXTRA IQ

Preparing for Measurement

➪ Connect the test instrument's test plug to the PRO-SCHUKO plug insert.

➪ Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.

➪ Connect the system to sockets L1, L2, L3, N and PE.

Performing Measurement

ATTENTION!
Insulation test voltage may not exceed 500 V.

➪ Perform the measurement as described in the operating instructions for the respective test instrument:
PROFITEST MTECH+ IQ: sections 5.8 and 11
PROFITEST MXTRA IQ: sections 5.8 and 11

Overview of Connected Conductors
The red illuminated LEDs in the connections overview indicate the respectively connected (closed) conductors.

Continuity, **PROFITEST MTECH+ IQ**/ **PROFITEST MXTRA IQ** RISO

Test Sequence	R_{INS}	LED Displays (red)
01/11	N-PE	LED4 + LED11
02/11	L1-PE	LED1 + LED11
03/11	L2-PE	LED2 + LED11
04/11	L3-PE	LED3 + LED11
05/11	L+N-PE	LED1 + LED2 + LED3 + LED4 + LED11
06/11	L1-N	LED1 + LED10
07/11	L2-N	LED2 + LED10
08/11	L3-N	LED3 + LED10
09/11	L1-L2	LED1 + LED8
10/11	L2-L3	LED2 + LED9
11/11	L1-L3	LED1 + LED9

4.1.2 Measuring Insulation Resistance with the PROFITEST PRIME

Preparing for Measurement

- Using the corresponding test probes, connect the test instrument to the L, N and PE sockets at the test adapter.
- Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.
- Connect the system to sockets L1, L2, L3, N and PE.

Performing the Measurement

> **ATTENTION!**
> Insulation test voltage may not exceed 500 V.

- Perform the measurement as described in the operating instructions for the test instrument:
  PROFITEST PRIME: sections 8.6 and 11
- The following measuring functions are available for the measurement of insulation resistance: insulation measurement with constant voltage ⎍ and insulation measurement with rising test voltage ◢.

Overview of Connected Conductors

The red illuminated LEDs in the connections overview indicate the respectively connected conductors.

Continuity, PRIME RISO

Test Sequence	R_{INS}	LED Displays (red)
01/11	N-PE	LED4 + LED11
02/11	L1-PE	LED1 + LED11
03/11	L2-PE	LED2 + LED11
04/11	L3-PE	LED3 + LED11
05/11	L+N-PE	LED1 + LED2 + LED3 + LED4 + LED11
06/11	L1-N	LED1 + LED10
07/11	L2-N	LED2 + LED10
08/11	L3-N	LED3 + LED10
09/11	L1-L2	LED1 + LED8
10/11	L2-L3	LED2 + LED9
11/11	L1-L3	LED1 + LED9

4.2 Measuring Loop Impedance (ZL-PE)

ATTENTION!
Single-Phase Mains Connection
The phase must be connected to L1 for single-phase mains connection.

4.2.1 Measuring Loop Resistance with the PROFITEST MTECH+ IQ or PROFITEST MXTRA IQ

Preparing for Measurement

- Connect the test instrument's test plug to the PRO-SCHUKO plug insert.
- Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.
- Connect the system to sockets L1, L2, L3, N and PE.
- Switch the system on.

Performing the Measurement

ATTENTION!
Insulation test voltage may not exceed 500 V.

- Perform the measurement as described in the operating instructions for the respective test instrument:
  PROFITEST MTECH+ IQ: sections 5.8 and 9
  PROFITEST MXTRA IQ: sections 5.8 and 9

NOTE!
Measurement of loop impedance ZL-PE with the **PROFITEST MTECH+ IQ** and/or **PROFITEST MXTRA IQ** is conducted with sine (full-wave) and 15 mA sine. Measurements with DC and halve-wave are not possible.

Overview of Connected Conductors
The red illuminated LEDs in the connections overview indicate the respectively connected conductors.

Continuity, ZL-PE

Test Sequence	Z_{L-PE}	LED Display (red)
01/3	L1-PE	LED1 + LED11
02/3	L2-PE	LED2 + LED11
03/3	L3-PE	LED3 + LED11

4.2.2 Measuring Loop Impedance with the PROFITEST PRIME

Preparing for Measurement

- Using the corresponding test probes, connect the test instrument to the L, N and PE sockets at the test adapter.
- Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.
- Connect the system to sockets L1, L2, L3, N and PE.
- Switch the system on.

Performing the Measurement

ATTENTION!
Insulation test voltage may not exceed 500 V.

NOTE!
If many loop measurements are performed with the **PROFITEST PRIME** in quick succession, fine-wire fuses in the **PROFITEST REMOTE** may blow. This is due to the increased test current in order to achieve a higher measuring accuracy.

- Perform the measurement as described in the operating instructions for the test instrument:
  PROFITEST PRIME: sections 8.6 and 13
- Loop impedance is measured using the ZLOOP AC/DC measurement variant.

NOTE!
Measurement with the following measurement variants is not possible with the **PROFITEST PRIME**:
– ZLOOP DC+
– ZLOOP
– ZLOOP

Overview of Connected Conductors
The red illuminated LEDs in the connections overview indicate the respectively connected conductors.

Continuity, ZLOOP AC/DC

Test Sequence	Z_{loop} AC/DC	LED Display (red)
01/9	L1-PE	LED1 + LED11
02/9	L2-PE	LED2 + LED11
03/9	L3-PE	LED3 + LED11
04/9	L1-N	LED1 + LED10
05/9	L2-N	LED2 + LED10
06/9	L3-N	LED3 + LED10
07/9	L1-L2	LED1 + LED8
08/9	L2-L3	LED2 + LED9
09/9	L1-L3	LED1 + LED9

4.3 Measuring Line Impedance (ZL-N)

ATTENTION!
Single-Phase Mains Connection
The phase must be connected to L1 for single-phase mains connection.

4.3.1 Measuring Line Impedance with the PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ

Preparing for Measurement
- Connect the test instrument's test plug to the PRO-SCHUKO plug insert.
- Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.
- Connect the system to sockets L1, L2, L3, N and PE.
- Switch the system on.

Performing the Measurement

ATTENTION!
Insulation test voltage may not exceed 500 V.

- Perform the measurement as described in the operating instructions for the respective test instrument:
  PROFITEST MTECH+ IQ: sections 5.8 and 9
  PROFITEST MXTRA IQ: sections 5.8 and 9

Overview of Connected Conductors
The red illuminated LEDs in the connections overview indicate the respectively connected conductors.

Continuity, ZL-N

Test Sequence	R_{INS}	LED Displays (red)
01/6	L1-N	LED1 + LED7
02/6	L2-N	LED2 + LED7
03/6	L3-N	LED3 + LED7
04/6	L1-L2	LED1 + LED5
05/6	L2-L3	LED2 + LED6
06/6	L1-L3	LED1 + LED6

4.3.2 Measuring Line Impedance with the PROFITEST PRIME

Preparing for Measurement

- Using the corresponding test probes, connect the test instrument to the L, N and PE sockets at the test adapter.
- Disconnect the system from all sources of voltage before connecting the measuring points to the test adapter.
- Connect the system to sockets L1, L2, L3, N and PE.

Performing the Measurement

ATTENTION!
Insulation test voltage may not exceed 500 V.

NOTE!
If many loop measurements are performed with the **PROFITEST PRIME** in quick succession, fine-wire fuses in the **PROFITEST REMOTE** may blow. This is due to the increased test current in order to achieve a higher measuring accuracy.

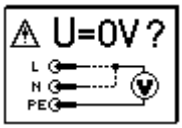
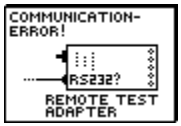
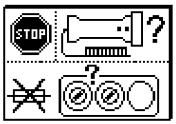
- Perform the measurement as described in the operating instructions for the test instrument:
  PROFITEST PRIME: sections 8.6 and 13
- Line impedance is measured using the ZLOOP AC/DC measurement variant.
- Switch the system on.

Overview of Connected Conductors
The red illuminated LEDs in the connections overview indicate the respectively connected conductors.

Continuity, ZLOOP AC/DC

Test Sequence	Z_{loop} AC/DC	LED Displays (red)
01/9	L1-PE	LED1 + LED11
02/9	L2-PE	LED2 + LED11
03/9	L3-PE	LED3 + LED11
04/9	L1-N	LED1 + LED10
05/9	L2-N	LED2 + LED10
06/9	L3-N	LED3 + LED10
07/9	L1-L2	LED1 + LED8
08/9	L2-L3	LED2 + LED9
09/9	L1-L3	LED1 + LED9

4.4 Error Messages at the Test Instrument

LCD Pictogram	Test Plug	Measuring Adapter	Position of the Function Switch	Function / Meaning
	X	X	R_{ISO}	Check mains connections for absence of voltage. If voltage is present, it results in short-circuiting between L and N and the device's fuses are blown. Remedy: Assure absence of voltage before switching through!
	X	X	All	No interface connection between the test instrument and the test adapter. Remedy: Check the interface connection and establish connection if necessary. Use the serial interface cable for this purpose (included).
	X	X	R_{ISO}	Contact error or defective fuse. Remedy: Check the test plug for proper fit with the test adapter or replace fuse in the test instrument or test adapter.

5 Characteristic Values

Measurement input	PRO-SCHUKO plug insert for **PROFITEST MTECH+ IQ** and **PROFITEST MXTRA IQ**, three 4 mm safety sockets **PROFITEST PRIME**
Mains connection	Five 4 mm safety sockets, (adapter cable for CEE 16A, CEE 32A and CEE 63A available as accessory)

Ambient Conditions

Operating temperature	+5 … + 45 °C
Storage temperature	-20 … + 60 °C
Relative humidity	Max. 75%, no condensation allowed
Elevation	Max. 2000 m

Power Supply

Auxiliary voltage	5 V via RS 232 port
Current consumption	60 mA (all relays dropped out) 240 mA (2 relays picked up) 600 mA (5 relays picked up)
Power consumption	3 W

Electrical Safety

Measuring category	300 V CAT III
Pollution degree	2
Protection class	II per IEC 61010-1/ EN 61010-1/ VDE 0411-1
Fuse links	F1 to F8: 8 × F 3.15 A FF/500 V
Test voltage	Insulation test voltage may not exceed 500 V.
Operating conditions	Continuous operation

Electromagnetic Compatibility (EMC)

Interference emission	EN 61326-1:2013, class B
Interference immunity	EN 61326-1:2013 EN 61326-2-1:2013

Mechanical Design

Protection	Housing: IP 40 per DIN VDE 0470, part 1 / EN 60 529

Table Excerpt Regarding Significance of IP Codes

IP XY (1st digit X)	Protection Against Foreign Object Ingress	IP XY (2nd digit Y)	Protection Against Water Ingress
4	≥ 1.0 mm dia.	0	Not protected

Dimensions	Housing (W × H × D): approx. 27.5 × 10.5 × 12 cm (with PRO-SCHUKO plug insert)
Weight	Approx. 1.1 kg (test adapter without interface cable)

Data Interface

Transmission parameters	9600 baud, 1 stop bit, no parity
Transmission format	All commands are transmitted as ASCII character strings.

6 Maintenance

6.1 Housing Maintenance

No special maintenance is required. Keep outside surfaces clean and dry. Use a slightly dampened cloth for cleaning. Avoid the use of solvents, cleansers and abrasives.

6.2 Technical Safety Inspections, Testing per DGUV Regulation 3

Subject your test adapter to technical safety inspections at regular intervals.

The test adapter is designed in accordance with IEC 61010 and VDE 0413-16 as a protection category I and II test instrument.

Testing of protective conductor and insulation resistance is described in the following subsections.

6.2.1 Testing Protective Conductor Resistance

Testing the 3-Phase Connection

Protected conduct or resistance values of $R_{PE} < 2\ \Omega$ are permissible. This is due to the design of the test adapter.

Connecting/Contacting the Test Adapter, 3-Phase (400 V)

Protective conductor resistance is tested between the PE safety contact at the mains connection sockets and the parallel connected 4 mm safety socket at the PE measurement input.

6.2.2 Testing Insulation Resistance

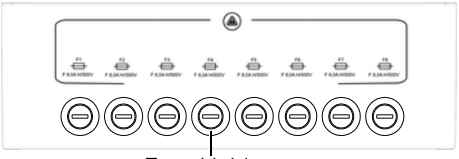
Testing is conducted respectively between short-circuited contacts L_{123}-N and PE for the mains connection safety sockets and between L-N and PE for the measurement inputs.

The usual limit values apply.

6.3 Fuse Replacement

All eight fuses for neutral (F7/F8) and phase conductors (F1 to F6) are accessible from the outside.

The fuses may only be replaced when the device is voltage-free, i.e. the device must be disconnected from mains supply power and may not be connected to a measuring circuit. The respective fuse type must comply with the specifications in the technical data or the labeling on the device.



Fuse Holders

- Unscrew the appropriate fuse holder with the help of a suitable screwdriver.
- Remove the blown fuse from the holder.
- Insert the new fuse into the holder.
- Reinsert the fuse holder and screw it tight.

6.4 Returns and Environmentally Sound Disposal

This instrument is subject to directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its German national equivalent implemented as the Waste Electrical and Electronic Equipment Act (ElektroG) on the marketing, return and environmentally sound disposal of electrical and electronic equipment. The device is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Waste Electrical and Electronic Equipment Act).



The symbol at the left indicates that this device and its electronic accessories must be disposed of in accordance with applicable legal regulations, and not together with household trash. In order to dispose of the instrument, bring it to a designated collection point or contact our product support department.

Segregated disposal and recycling conserves resources and protects our health and the environment.

Current and further information is available on our website at http://www.gossenmetrawatt.com under the search terms “WEEE” and “environmental protection”.

7 Contact, Support and Service

You can reach Gossen Metrawatt GmbH directly and uncomplicated, we have one number for everything! Whether it's a support question, or individual desire, we answer every request at::

+49 911 8602-0

Monday – Thursday:	8:00 a.m. – 4:00 p.m.
Friday:	8:00 a.m. – 2:00 p.m.

You can also e-mail to: info@gossenmetrawatt.com

Do you prefer support via e-mail?

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