Operating Instructions

GOSSEN METRAWATT

PROFITEST | EMOBILITY

Adapter for Standards-Compliant Testing of Single and 3-Phase, Mode 2 and 3 Charging Cables with Simulation of Faults

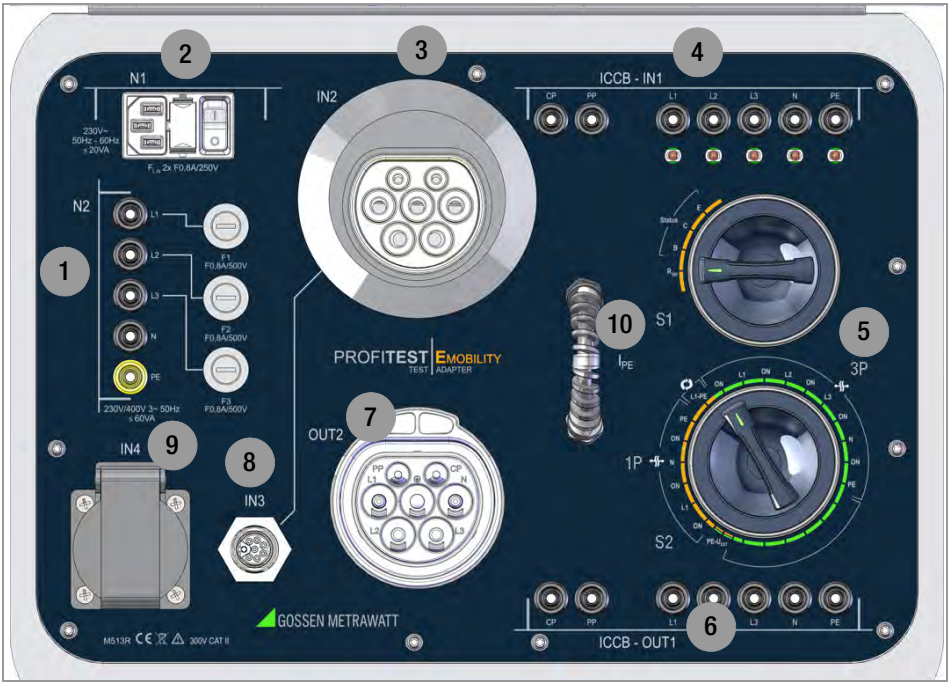
3-349-981-15
5/7.19

Important

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

Please observe the manufacturer's details on the devices under test!

Connections Overview



1 **N2:** Input sockets for 3-phase mains connection with the help of a CEE adapter (16 A, 32 A with five 4 mm safety sockets) and mains connection fuses F1, F2 and F3 for the 3 phases

2 **N1:** Inlet plug for mains connection, mains connection fuses F_{LN} for L and N

3 **IN2:** Socket (MENNEKES) for connecting a 3-phase, mode 3 charging cable (charging station end) via a type 2 charging plug

4 **ICCB-IN1*:** Input sockets wired parallel to connection sockets IN2, IN3 and IN4 for connecting a test instrument for protective conductor and insulation measurement

* ICCB = **i**n-**c**able **c**ontrol **b**ox: control box inside the mode 2 charging cable

5 **Rotary selector switches (S1 and S2):** See description on page 3.

6 **ICCB-OUT1*:** Charging cable output sockets wired parallel to OUT2 for connecting a test instrument for protective conductor and insulation measurement

7 **IN2:** Socket (MENNEKES) for connecting a mode 2 charging cable (vehicle end) via a type 2 charging plug

8 **IN3:** Input socket in order to be able to connect a charging cable with specific plug per IEC 62196 or CEE plug (charging station end) via adapter

9 **IN4:** Earthing contact input socket for connecting the supply plug of a single-phase, mode 2 charging cable (charging station end)

10 I_{PE}: Loop for measuring protective conductor current with a current clamp transformer

Operating Overview

Mains connect, mode 2 charging cable
Status B, C, E
– For fault simulation
– For R_{PE} measurement
– For tripping test with I_{Nom} and measurement of time to trip

Mains disconnect, mode 2/3 charging cable
Riso
– For RISO measurement

Fault Selection

Interrupted phase

Reversed wires

Orange switch positions: testing at single-phase, mode 2/3 cables
Green switch positions: testing at 3-phase, mode 2/3 cables

Meanings of Symbols on the Instrument

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

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

CE conformity marking

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”.

Meanings of Symbols in the Operating Instructions

LED L1, L2, L3, N or PE at test adapter

LED on LED off

Scope of Delivery

1 Test adapter in case
1 Mains power cable
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,
IEC/EN 61577/VDE 0413-2,-4/
DIN EN 61557-16/VDE 0413-16
Safety of the operator, as well as that of the test adapter and the charging cable, is only assured when it's used for its intended purpose.

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 instrument.
Read the operating instructions for the respective test instrument as well, in particular the sections concerning the R_{PE}, R_{ISO} and time-to-trip measurements, as well as the tripping test.
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 instrument 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 testing mode 2 and 3 charging cables.
- No power consuming devices may be connected to any of the sockets.
- Measurements within electrical systems are prohibited.
- Make certain that the measurement cables are in flawless condition, e.g. no damage to insulation, no cracks in cables or plugs etc.
- When using a test probe with coil cord (**PROFITEST MXTRA**):
  Grip the tip of the test probe firmly, for example during insertion into a jack socket. Tensioning at the coil cord may otherwise cause the test probe to snap back resulting in possible injury.

Attention!
Insulation resistance can only be measured at voltage-free objects: R_{ISO} switch position.

- Do not touch the insulation measuring instrument's test probes during insulation resistance measurements!
- Please observe the manufacturer's details on the devices under test!

Fuse Replacement

All fuses for neutral and phase conductors are accessible from the outside (see section 9.3). 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 8).

Opening the Instrument / Repairs

The test adapter may only be opened by authorized, trained personnel from GMC-I Service GmbH 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 from GMC-I Service GmbH.

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, if its LEDs are defective (voltage at the **ICCB-IN1** sockets would no longer be indicated in this case)
- If the seal or sealing lacquer has been removed as the result of repairs or manipulation carried out by an unauthorized/non-certified service provider
- 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

We recommend the following test instruments per EN 61557/VDE 0413 for testing charging cables with the **PROFITEST EMOBILITY** test adapter:

- **PROFITEST MXTRA**
- **PROFITEST MTECH+**
- **PROFITEST PRIME**
- **SECUTEST PRO**

Special test sequences for use with the test adapter are currently being prepared for the test instruments listed above.

Testing of Mode 2 and 3 Charging Cables with the Test Adapter by Simulating Faults
The following faults can be simulated for mains power supply to a mode 2 charging cable:

- Wire reversals
- Failure of individual conductors (undervoltage detection)
- Interference voltage on the protective conductor by connecting the phase conductor to the protective conductor (**PE-U_{EXT}** switch setting)

The evaluation of the test object's reaction to each respective fault is strictly visual:

- ICCB active or inactive (indicator lamp on the ICCB)
- Fault indication by means of LEDs on the test adapter

Attention!
In any case, comply with the manufacturer's recommendations concerning tests to be conducted in accordance with DGUV rule 3.

Testing of Mode 2 and 3 Charging Cables with the Test Adapter by Simulating Faults and Measuring Protective Conductor and Insulation Resistance, as well as Tripping Current and Time to Trip, using the Respective Test Instrument
Refer to the operating instructions for the respective test instrument concerning the test sequence.

Measuring Protective Conductor Current
Protective conductor current or bias current may result in premature tripping of RCDs used in ICCBs.
For this reason, the protective conductor is led out of the housing as a loop between surface mount sockets 4 and 6. This makes it possible to measure any protective conductor current with the help of a current clamp transformer.

3 Initial Startup

See the connections overview on page 2 for all connection variants.

3.1 Mains Connection

The test adapter must be connected to the mains for fault simulation, as well as for indication by means of the phase LEDs.

Attention!
Only one mains power cable (single or 3-phase) may be connected to the test adapter at any given time.

Attention!
Despite isolation of mains connections N1 and N2, do not touch open inlet plug N1 in the case of CEE connection at N2.

- Connect the test adapter to the mains via the single or 3-phase mains power cable (with the help of the Z570B adapter for 3-phase 16 A mains or the Z570C adapter for 3-phase 32 A connection). Refer to the characteristic values on page 13 for nominal mains values.

Attention!
Single-Phase Mains Connection
For correct phase connection, the earthing contact plug must inserted into the mains outlet such that only the **ICCB-IN1 L1** LED lights up.
The **ICCB-IN1** PE LED lights up as well in the case of polarity reversal.

3.2 Testing the LEDs

Single-Phase Mains Connection

- Insert the earthing contact plug into the earthing contact mains outlet, remove it, rotate it 180° and insert it again.

When connected with correct polarity, only the **ICCB-IN1 L1** LED may light up. When connected with incorrect polarity or if rotated 180°, the **ICCB-IN1 L1** and **ICCB-IN1 PE** LEDs light up simultaneously.

3-Phase Mains Connection

- Connect socket N2 to the 3-phase 16 A mains with the help of the Z570B adapter (or the Z570C adapter for 3-phase 32 A connection).

The **ICCB-IN1 L1**, **L2** and **L3** LEDs must light up.

3.3 Connecting the Mode 2/3 Charging Cable

The respective charging cable must be connected to the test adapter for all tests.

Connecting a Single-Phase, Mode 2 Charging Cable

- Insert the power supply plug of the mode 2 charging cable into earthing contact outlet IN4, or into IN3 at the test adapter via an adapter.
- Insert the test object's plug at the vehicle end into test socket OUT2.

Connecting a 3-Phase, Mode 2/3 Charging Cable

- Insert the plug at the power supply end of the test object into the outlet of the adapter connected to IN3, or into IN2 (mode 3 charging cable).
- Insert the test object's plug at the vehicle end into test socket OUT2.

4 Measurement with Test Instruments

The test adapter must remain connected to the mains for protective conductor measurements (R_{PE}) at mode 2 charging cables by means of the respective test instrument.
The test adapter can remain connected to the mains for protective conductor measurements conducted at test objects whose protective conductor is not switched, as well as for insulation measurements (Riso) with the respective test instrument.

4.1 Measuring Protective Conductor Resistance (RIo)

4.1.1 Mode 2 Charging Cable

As opposed to the usual default setting for low-resistance measurements, the device under test does not have to be disconnected from all sources of voltage in this case. Both rotary selector switches (S1 and S2) have to be set to the **ON** and the **Status C** positions, in order to be able to activate the test object and switch the protective conductor through. Prior to a protective conductor resistance measurement, an offset measurement must be performed (the offset value of the test adapter must be taken into account during the test).

- ➪ Connect the test object as described in section 3.3.
- ➪ Connect the test object to the **ICCB-IN1 PE** and **ICCB-OUT1 PE** sockets.
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)
- ➪ Switch the test object's ICCB on.
- ➪ Perform the measurement as described in the operating instructions for the respective test instrument.

4.1.2 Mode 3 Charging Cable

- ➪ The rotary selector switch must be set to the R_{ISO} position.
- ➪ Connect the test object as described in section 3.3.
- ➪ Connect the test object to the **ICCB-IN1 PE** and **ICCB-OUT1 PE** sockets.
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)
- ➪ Perform the measurement as described in the operating instructions for the respective test instrument.

4.2 Measuring Insulation Resistance (RISO)

Attention!
The top rotary selector switch must be set to the mains disconnect position: R_{ISO}.

- ➪ In order to perform the insulation measurement (Riso), connect the test instrument to the **ICCB-IN1** socket for the mains-end of the cable and the **ICCB-OUT1** socket for the output end of the cable under test.
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)
- ➪ Connect the test object as described in section 3.3.
- ➪ **Mode 2 charging cable:** Connect the test instrument to the **ICCB-IN1/ICCB-OUT1** L1 or N and PE sockets, one after the other.
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)
- ➪ Perform the measurement as described in the operating instructions for the respective test instrument.
- ➪ **Mode 2/3 charging cable:** Connect the respective test instrument to the **ICCB-IN1/ ICCB-OUT1** L1, L2, L3, N and PE sockets, one after the other.
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)

4.3 Tripping Test with Nominal Residual Current and Measurement of Time to Trip at Mode 2 Charging Cable

Note!
If you operate your test adapter at an electrical system with a 30 mA breaker, the mains RCD may be tripped during the tripping test (tripping current or time to trip) instead of the charging cable's ICCB. In this case the **ICCB-IN1 L1** LED goes out.

We recommend the following procedure in order to prevent an upstream RCD (selective RCD as well) from tripping, and to ensure that actual tripping current or correct time to trip is measured:

- Connect the respective test instrument with the (L1) pole to the energized pole of the charging cable L1, N, depending on the wiring of the earthing contact plug (**ICCB-OUT1**), and the (PE) pole to N (**ICCB-IN1**) (observe limit values and manufacturer's details).
  PROFITEST MTECH+: 2-pole measuring adapter
  PROFITEST MXTRA: 2-pole measuring adapter
  PROFITEST PRIME: probes L(1) and PE(3)
- Refer to the operating instructions for the respective test instrument regarding performance of the measurement.

5 Measuring R_C

Testing of specified resistance value RC for maximum current-carrying capacity of the mode 2/3 charging cable per DIN EN 61851-1 (VDE 0122-1)

- Connect the test object as described in section 3.3.
- Measure resistance between the PP and PE sockets at **ICCB-OUT1** with a standards-compliant measuring instrument.
- Compare the measured resistance value with the value specified in table X (table B3, DIN EN 61851-1:2012-01).

Note!
Observe the maximum current-carrying capacity specified on the cable.

Vehicle State	Function Test	Results
Testing of resistance coding for vehicle inlets and vehicle connectors per IEC 61851, table B.3	Resistance measurement with multimeter or test instrument	13 A charging cable, 1.5 k Ω 20 A charging cable, 680 Ω 32 A charging cable, 220 Ω 63 A charging cable, 100 Ω

6 Protective Conductor Current Measurement (I_{PE}) at Mode 2 Charging Cable

- Connect the test object as described in section 3.3.
- Switch mains voltage on by turning the top rotary selector switch (S1) to the **Status C** position (system state: vehicle ready for charging).
- Turn the bottom rotary selector switch (S2) to the first **ON** position in the orange area for single-phase interruption.
- Close the jaws of the current clamp transformer around the external protective conductor loop I_{PE}.
- Read the measured value for protective conductor current at the current clamp transformer.

Protective conductor current should not exceed 3.5 mA.

7 Fault Simulation

7.1 Mode 2 Charging Cable (single-phase)

➪ Switch mains power on by turning the top rotary selector switch (S1) to the **Status C** position.

7.1.1 Simulated Interruption

➪ Start with the bottom rotary selector switch (S2) in the first **ON** position in the orange area for single-phase interruption.

➪ Switch through the positions, one after the other, in the clockwise direction (table from top to bottom).

Step	Rotary Switch	Test Adapter L1 LED	Test Adapter PE LED	ICCB LED	Action
1	ON	●	○	●	*
2	L1	○	○	○	
3	ON	●	○	●	
4	N	●	○	○	
5	ON	●	○	●	
6	PE	●	○	○	

* The test object's correct reaction to the simulated fault can be found in the manufacturer's operating instructions.

7.1.2 Simulated Wire Reversal

➪ Turn the bottom rotary selector switch (S2) to the **L1-PE** position in the orange area for single-phase wire reversal.

Instead of the **L1 LED**, the **PE LED** must light up.

Step	Rotary Switch	Test Adapter L1 LED	Test Adapter PE LED	ICCB LED	Action
7	L1-PE	○	●	○	*

* The test object's correct reaction to the simulated fault can be found in the manufacturer's operating instructions.

7.1.3 Simulation of PE to Phase – $\mathbf{PE\text{-}U_{EXT}}$

➪ Set the bottom rotary selector switch (S2) to the $\mathbf{PE\text{-}U_{EXT}}$ position.

Interference voltage is switched to PE with touch protection.

The **L1 LED** and the **PE LED** light up.

Step	Rotary Switch	Test Adapter L1 LED	Test Adapter PE LED	ICCB LED	Action
8	$PE\text{-}U_{EXT}$	●	●	○	*

* The test object's correct reaction to the simulated fault can be found in the manufacturer's operating instructions.

7.2 Mode 2 Charging Cable (single-phase)

➪ Switch mains voltage on by turning the top rotary selector switch (S1) to the **Status C** position (system state: vehicle ready for charging).

7.2.1 Simulated Interruption

➪ Start with the bottom rotary selector switch (S2) in the first **ON** position in the green area for single-phase interruption.

➪ Switch through the positions, one after the other, in the clockwise direction (table from top to bottom).

Conductor Interruption Using a 3-Phase, Mode 3 Charging Cable as an Example

Step	Rotary Switch	Test Adapter L1 LED	L2 LED	L3 LED	N LED	PE LED	ICCB LED	Action
1	ON	●	●	●	○	○	●	*
2	L1	○	●	●	○	○	○	
3	ON	●	●	●	○	○	●	
4	L2	●	○	●	○	○	○	
5	ON	●	●	●	○	○	●	
6	L3	●	●	○	○	○	○	
7	ON	●	●	●	○	○	●	
8	N	●	●	●	●	○	○	
9	ON	●	●	●	○	○	●	
10	PE	●	●	●	○	○	○	

* The test object's correct reaction to the simulated fault can be found in the manufacturer's operating instructions.

Regarding step 8: The N LED also lights up due to star connection, although N is interrupted!

Note!
Tripping performance may deviate from this example in the case of ICCBs from other manufacturers – adhere to the manufacturer's test instructions!

7.2.2 Simulation of PE to phase

➪ Set the bottom rotary selector switch (S2) to the **PE-U_{EXT}** position.

Step	Rotary Switch	Test Adapter					ICCB-IN1	Action
		L1 LED	L2 LED	L3 LED	N LED	PE LED	LED	
11								*

* The test object's correct reaction to the simulated fault can be found in the manufacturer's operating instructions.

➪ Step 18: see section entitled "Protective Conductor Current Measurement (I_{PE}) at Mode 2 Charging Cable" on page 9.

8 Characteristic Values

Measurement with **METRACLIP 61** as Accessory

Protective conductor current measurement	Measuring range: 0 ... 30 mA AC

Measurements with **PROFITEST MXTRA** as accessory:

Protective conductor measurement	Measuring range: 0.1 Ω ... 6 Ω, see technical data on R_{LO} function of the **PROFITEST MXTRA**
Insulation measurement	Measuring range: 50 kΩ ... 500 MΩ, see technical data on R_{ISO} function of the **PROFITEST MXTRA**

Connections

Test outlets

Earth contact	IN4: 1P+N+PE, 0.8 A, 230 V
3P+N+PE	IN2/OUT2: 0.8 A, 400 V

Power Supply

Nominal line voltage	230/400 V 50 Hz
Mains connection	Single-phase via inlet socket: 230 V 1P+N+PE 16 A or 3-phase via ISO adapter: 230/400 V 3P+N+PE 16 A
Throughput rating	Earth contact: 20 VA CEE: 60 VA
Power consumption	Earth contact: < 3 VA CEE: < 6 VA

Electrical Safety

Measuring category	300 V CAT II
Pollution degree	2
Fuse links	Supply network: **Single-phase (N1):** F_{LN}: 2 ea. F0-8A/ 250V, 5 x 20 mm **3-phase (N2):** F1, F2 and F3: 3 ea. F0.8A/500V, 6.3 x 32 mm

Ambient Conditions

Operating temperature	-5 ... + 50°C
Storage temperature	-20 ... + 60°C
Relative humidity	Max. 75%, no condensation allowed

Mechanical Design

Test adapter protection	IP 40 per DIN VDE 0470, part 1, connections: IP 20
Dimensions	Housing (WxHxD): approx. 401 x 307 x 173 mm (without connector cable, with surface mount sockets)
Weight	Approx. 4.6 kg (with connector cable)

9 Maintenance

9.1 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.

Note!
If the test adapter has not been used for a long period of time, the switches may demonstrate increased contact resistance depending upon storage conditions.
If this is the case, actuate the switches several times.

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.

9.2 Technical Safety Inspections Testing per DGUV Rule 3

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

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

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

9.2.1 Testing Protective Conductor Resistance R_{PE}

Test Adapter Contacting, Single-Phase (230 V)
Protective conductor resistance is tested between the PE contact at the mains plug (inlet plug N1) and PE contacts ICCB IN1 through IN4.

Testing the Single-Phase Connection

- Turn the top rotary selector switch (S1) at the test adapter to the **Status C** position (system state: vehicle ready for charging).

With the exclusion of the exceptions specified in the following table, protective conductor resistances R_{PE} of less than 2 Ω are permissible. This is due to the design of the test adapter.

Step	Rotary Switch	Test Adapter L1 LED	Test Adapter PE LED	ICCB LED	Protective Conductor Resistance R_{PE}, Permissible
1	ON	●	○	✳	< 2 Ω
2	L1	○	○	○	< 2 Ω
3	ON	●	○	✳	< 2 Ω
4	N	●	○	○	< 2 Ω
5	ON	●	○	✳	< 2 Ω
6	PE	●	○	○	> 30 MΩ
	↻				
7	L1-PE	○	●	○	> 30 MΩ
8	PE-U_{EXT}	●	●	○	> 30 MΩ

Test Adapter Contacting, 3-Phase (400 V)
Protective conductor resistance is tested between the PE contact at mains connection N2 and the PE contact at ICCB-IN1 (parallel to IN2, IN3 and IN4).

Testing the 3-Phase Connection

- ⇨ Turn the top rotary selector switch (S1) at the test adapter to the **Status C** position (system state: vehicle ready for charging).
- ⇨ Turn the bottom rotary selector switch (S2) to each switch position*.

With the exclusion of the exceptions specified in the following table, protective conductor resistances R_{PE} of less than 2 Ω are permissible. This is due to the design of the test adapter.

Step	Rotary Switch	Protective Conductor Resistance R PE, Permissible
1	ON	< 2 Ω
2	L1	< 2 Ω
3	ON	< 2 Ω
4	L2	< 2 Ω
5	ON	< 2 Ω
6	L3	< 2 Ω
7	ON	< 2 Ω
8	N	< 2 Ω
9	ON	< 2 Ω
10	PE	> 30 MΩ
11	PE-U_{EXT}	> 30 MΩ

The PE connection between OUT1 and OUT2 must also be tested (< 2 Ω).

9.2.2 Testing Insulation Resistance

Testing is conducted in the respective switch positions for Status B, C or E and in the green ON position for 3-phase testing at short-circuited L-N or L1-L2-L3-N contacts (for earthing contact and CEE respectively)

- At mains connections N1 and N2
- At the supply end of the test object, ICCB-IN1
- At the output end of the test object, ICCB-OUT1

in each case against PE.

The usual limit values apply.

9.2.3 Touch Current Measurement

Touch current measurement is conducted at the screw connections of the IN sockets (IN2, IN3 and IN4) with the standard limit values (I_B < 0,5 mA).

9.3 Fuse Replacement

All fuses for neutral and phase conductors are accessible from the outside.

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 respective fuse type must comply with the specifications in the technical data or the labeling on the instrument.

9.4 Return and Environmentally Sound 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 subject to the RoHS directive. We also make reference to the fact that in this regard, the current status can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term WEEE.

In accordance with WEEE 2012/19/EU and ElektroG, we identify our electrical and electronic devices with the symbol in accordance with DIN EN 50419 which is shown at the right. Devices identified with this symbol may not be disposed of with the trash.

Please contact our service department regarding the return of old devices (see address below).

10 Repair and Replacement Parts Service Calibration Center and Rental Instrument Service

When you need support, please contact:

GMC-I Service GmbH
Service Center
Beuthener Straße 41
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.

11 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

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