GOSSEN METRAWATT

PROFITEST | PRCD

Adapter for Standards Compliant Testing of PRCDs by Simulating Faults

3-349-796-03
3/4.19

- **Testing of type S and K PRCDs per DIN VDE 0701-0702, BGI / GUV-I 608 and manufacturer specifications using a guided test sequence with the PROFITEST MXTRA**
- **Testing of portable safety switches of the following types:**
  – PRCD-S (single-phase / 3-pole and 3-phase / 5-pole) [1]
  – PRCD-K (single-phase / 3-pole)
  – PRCD (2-pole / 3-pole) [2]
- **Function test, i.e. tripping test by means of simulating the following faults:** interruption, reversed wires and PE to phase
- **Measurement of protective conductor current with current clamp transformer as accessory**
- **Measurement of protective conductor and insulation resistance per DIN VDE 0701-0702 with the PROFITEST MXTRA**
- **Tripping test with nominal residual current and measurement of time to trip with the PROFITEST MXTRA**
- **Evaluation and documentation of the individual test steps with the PROFITEST MXTRA**
- **For testing portable safety switches** used on constructions sites, by fire department and in the field of disaster control



[1] Kopp and elektron BERLIN
[2] All PRCDs without protective conductor detection and monitoring

Applications

According to DIN VDE 0661, portable protective devices are circuit breakers which can be connected between power consuming devices and permanently installed electrical outlets by means of standardized plug-and-socket devices. They offer the increased levels of protection provided by protective measures utilized in electrical systems for the prevention of dangerous shock current as defined in DIN VDE 0100-410. These portable protective devices serve to protect persons from electrical accidents in the low-voltage range from 130 to 1000 V, and consequently have to be suitable for commercial use.

The following faults can be simulated with regard to mains supply power to the PRCD:

- Wire reversals
- Failure of individual conductors (undervoltage detection)
- Interference voltage on the protective conductor
  a) By connecting the phase conductor to the protective conductor (**PE-U_{EXT}** switch setting)
  or
  b)By touching the on key of the single-phase PRCD with the probe

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

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

The following functions are possible after connecting the PROFITEST MXTRA test instrument to the test adapter:

- There are three preset test sequences:
  – PRCD-S (single-phase)
  – PRCD-K (single-phase)
  – PRCD-S (3-phase)
- The test instrument runs through all test steps semi-automatically:
  – Single-phase PRCDs: PRCD-S: 11 test steps
  PRCD-K: 4 test steps
  – 3-phase PRCDs: PRCD-S: 18 test steps
- Each test step is evaluated and assessed by the user (go / no-go) for later documentation.
- Measurement of the PRCD's protective conductor resistance using the test instrument's R_{LO} function
- Measurement of the PRCD's insulation resistance using the test instrument's R_{ISO} function
- Tripping test with nominal residual current using the test instrument's I_F ◢ function
- Time to trip measurement using the test instrument's $I_{\Delta N}$ function
- Varistor test for PRCD-K: measurement via ISO ramp

Measurement of Protective Conductor Resistance

Protective conductor current or bias current may result in premature tripping of PRCDs.

For this reason, the protective conductor is led out of the housing as a loop between the surface mount sockets. This makes it possible to measure any protective conductor current with the help of the **METRACLIP 61** current clamp transformer as an accessory.

PROFITEST | PRCD

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Simulation of "Interference Voltage in the Protective Conductor" with Probe

The probe socket on the PRCD adapter is connected to the phase conductor (L) of the power supply network via a series resistor (safety impedance) with a value of 1 MΩ using the test adapter's earthing contact plug to this end.
Touch current at the probe socket is limited by the internal protective circuit to less than the maximum permissible value of 0.5 mA in accordance with DIN EN 61010-1.
Execution of this test results in maximum touch current of:

$$I_T\,[A] = \frac{U_{Mains\ (L–PE)}\,[V]}{1\ M\Omega}$$

Applicable Regulations and Standards

IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use – General requirements
EN 60529 VDE 0470, part 1	Test instruments and test procedures Degrees of protection provided by enclosures (IP code)

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: 1P+N+PE 16 A 230 V
CEE 3P+N+PE 16 A 400 V

Test plug

Earth contact: 1P+N+PE 16 A 230 V
CEE 3P+N+PE 16 A 400 V

Probe Connection

2 mm connector socket with 1 MΩ safety impedance (laid out and as 5 x 200 kΩ in series) as series resistor to conductor L at the connection for the earthing contact plug
Touch current limited to 0.5 mA in accordance with **DIN EN 61010-1** if the device is used for its intended purpose

Power Supply

Nominal line voltage	230/400 V 50 Hz
Mains connection	Earthing contact plug: 230 V 1P+N+PE 16 A or CEE plug: 230/400 V 3P+N+PE 16 A
Throughput rating	Earth contact: 10 VA, CEE: 30 VA
Power consumption	Earth contact: < 2 VA, CEE: < 4 VA

Electrical Safety

Measuring category	300 V CAT II
Pollution degree	2
Fuse links	5 ea. FF315mA/500V

Ambient Conditions

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

Mechanical Design

Test adapter protection	IP40 per DIN VDE 0470, part 1, connections: IP20
Dimensions	Housing (WxHxD): approx. 24 x 17.5 x 11 cm (without connector cable, with surface mount sockets) Mains connector cable length with plug: Earth contact/CEE: approx. 97/100 cm Connector cable length with test plug: earth contact/CEE to PRCD: approx. 57/60 cm
Weight	Approx. 2.4 kg (with connector cable)

Scope of Delivery

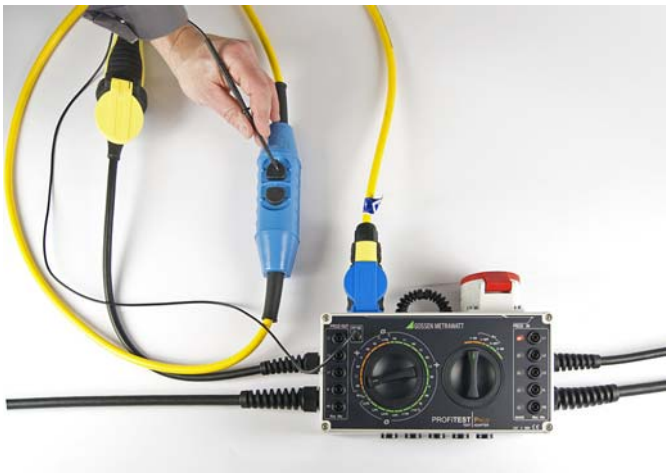
1 Test adapter
1 Probe cable with plug-in test probe
1 Set of operating instructions



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Application Examples

Tripping test for a connected single-phase PRCD with the help of the included probe



Measurement of protective conductor current for a connected PRCD using the METRACLIP 61 current transformer clamp as an accessory



Documentation of protective conductor resistance and insulation resistance measurements with the help of the PROFITEST MXTRA as an accessory



Accessories

SORTIMO L-BOXX GM (Z503D)



Plastic system case
outer dimensions:
W x H x D
450 x 255 x 355 mm
Foam insert Z701E for adapter and accessories, has to be ordered seperately.

PRCD-Adapter-Case (Z512R)



Aluminium case,
outer dimensions:
B x H x T
500 x 165 x 370 mm

Including foam divider for fixing of adapter

Additional space in the cover for operating manual, etc.

Example of case content (content is not part of scope of delivery)

METRACLIP 61 (M311D)



Digital clamp meter
(leakage-current clamp),
1 mA ... 300 A AC

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Order Information

Description	Type	Article number
Test adapter for testing portable safety switches (types PRCD-K and PRCD-S) with the help of the **PROFITEST MXTRA** test instrument (not included)	PROFITEST PRCD	M512R
Accessories		
Plastic system case	SORTIMO L-BOXX GM	Z503D
Foam insert with divider for Test adapter	Foam SORTIMO L-BOXX Adapter	Z701E
PRCD-Adapter-Hardcase printed with compartments for PROFITEST PRCD and Test adaper AT16-DI/AT32-DI	PRCD-Adapter-Case	Z512R
Digital clamp meter (leakage-current clamp), 1 mA ... 300 A AC, including 2 installed button-cell batteries, operating instructions and pouch	METRACLIP 61	M311D
Accessories (see data sheet 3-349-646-01)		
Universal protective measures test instrument per EN 61557, sections 1, 2, 3, 4, 5, 6, 7 and 10 with integrated memory and insulation measurement up to 1000 V as well as additional tripping test for AC/DC sensitive RCDs, loop impedance measurement without tripping the RCD, selective earth measurement with current clamps as optional accessories, testing of IMDs and RCMs, Bluetooth interface, **DAkkS calibration certificate** and **IZYTRONIQ BUSINESS Starter**	**PROFITEST MXTRA IQ**	M535D

Edited in Germany • Subject to change without notice • PDF version available on the Internet

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