GOSSEN METRAWATT

# PROFITEST MASTER IQ SERIES
# PROFITEST MTECH+ IQ, MPRO IQ, MXTRA IQ
## IEC 60364-6, EN 50110-1

3-447-154-03
1/8.22

- Testing of residual current devices (RCCBs)
- Measurement of touch voltage without tripping the RCCB – touch voltage is measured with reference to nominal residual current using ⅓ of the nominal residual current value.
- Testing for N-PE reversal
- Tripping test with nominal residual current, measurement of time to trip
- Testing of equipment and RCCBs with rising residual current including indication of tripping current and touch voltage
- Testing of RCCBS with the following nominal current values: ½ • $I_{\Delta N}$, 1 • $I_{\Delta N}$, 2 • $I_{\Delta N}$, (5 • $I_{\Delta N}$ up to 300 mA: PROFITEST MPRO IQ/PROFITEST MXTRA IQ up to 100 mA: PROFITEST MTECH+ IQ)
- Intelligent ramp (PROFITEST MXTRA IQ only): simultaneous measurement of breaking current $I_{\Delta N}$ and breaking time $t_A$
- Testing of selective S SRCDs, PRCDs (SCHUKOMAT, SIDOS or comparable), type G/R, type AC, types A and F, types B and B+ and type EV (except PROFITEST MPRO IQ)
- Testing of RCCBs which are suitable for pulsating residual direct current – testing is conducted with positive or negative half-waves.
- Creation of test sequences (IZYTRONIQ)
- Intelligent data transmission
  Bidirectional interface to Graphisoft™ DDScad Elektro
- Simulation of operating states of electric vehicles at charging stations from different manufacturers (PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ only)




### Large Voltage and Frequency Ranges

A broad-range measuring device permits use of the test instrument in all alternating and 3-phase electrical systems with voltages from 65 to 500 V and frequencies of 16 to 400 Hz.

### Loop and Line Impedance Measurement

Measurement of loop and line impedance can be performed in the 65 to 500 V range. Conversion to short-circuit current is based on the respective nominal line voltage, insofar as the measured line voltage is within the specified range. Test instrument measuring error is also taken into account for conversion. Outside of this range, short-circuit current is calculated on the basis of momentary line voltage and measured impedance.

### Insulation Resistance Measurement
### Using Nominal Voltage, with Variable or Rising Test Voltage

Insulation resistance is usually measured with a nominal voltage of 500, 250 or 100 V. A test voltage which deviates from nominal voltage, and lies within a range of 20/50 to 1000 V, can be selected for measurements at sensitive components, as well as systems with voltage limiting devices.
Measurement can be performed with a constantly rising test voltage in order to detect weak points in the insulation and determine tripping voltage for voltage limiting devices.
Voltage at the device under test and any triggering/breakdown voltage appear at the test instrument's display.

### Standing-Surface Insulation Measurement

Standing-surface insulation measurement is performed with momentary line frequency and line voltage.

### Low-Resistance Measurement

Bonding conductor resistance and protective conductor resistance can be measured with a test current of ≥ 200 mA DC, automatic polarity reversal of the test voltage and selectable current flow direction. If the adjustable limit value is exceeded, an LED lights up.

### Earthing Resistance Measurement

In addition to measurement of the overall resistance of an earthing system, selective measurement of the earthing resistance of an individual earth electrode is also possible, without having to disconnect it from the earthing system. A current clamp sensor available as an accessory is utilized to this end.
The PROFITEST MPRO IQ and the PROFITEST MXTRA IQ also permit battery-powered earthing resistance measurements in the "battery mode":
3/4-pole and earth loop resistance measurements.

### Universal Connector System

The interchangeable plug inserts and 2-pole plug-in adapter – which can be expanded to 3-poles for phase sequence testing – allows for use of the test instrument all over the world.

### Special Features

- **Display of approved fuse types for electrical systems**
- **Energy meter start-up testing**
- **Measurement of biasing, leakage and circulating current of up to 1 A, as well as working current of up to 1000 A with current clamp sensor (available as an accessory)**
- **Phase sequence measurement (including highest line-to-line voltage)**

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### Display with Selectable Language

Menus, setting options, measurement results, tables, notes and error messages as well as schematic diagrams appear at the LCD.

The display can be set to the desired language depending on the country in which the test instrument is used:
D, GB, I, F, E, P, NL, S, N, FIN, CZ or PL.

### Operation

Device functions are selected directly with the help of a rotary selector knob. Softkeys allow for convenient selection of sub-functions and parameter settings. Unavailable functions and parameters are automatically prevented from appearing at the display.

The start and RCD tripping functions included directly on the instrument are identical to the functions of the two keys located on the test plug, allowing for easy measurement at difficult to access locations.
Schematic diagrams, measuring ranges and help texts can be displayed for all basic functions and sub-functions.

### Phase Tester

Protective conductor potential is tested after starting a test sequence and touching the contact surface for finger contact. The PE symbol appears at the display if a potential difference of more than 25 V is detected between the contact surface and the protective contact at the mains plug.

### Error Indication

- The instrument automatically detects instrument-to-system connection errors, which are indicated in a connection pictograph.
- Errors within the electrical system (no mains or phase voltage, tripped RCD) are indicated at 3 LEDs and in the tilting LCD panel.

### Battery Monitoring and Self-Test

Battery monitoring is conducted while the instrument is subjected to an electrical load. Results are displayed both numerically and with a symbol. Test images can be called up one after the other, and LEDs can be tested during the self-test. The tester is shut down automatically when the batteries are depleted. A microprocessor controlled charging circuit is used to assure safe charging of rechargeable batteries.

### Data Entry at the RS-232 Port

Data can be read in via a barcode or RFID scanner connected to the RS-232 port, and comments can be entered with the help of the softkeys.

### USB Port

Measurement data are transmitted to a PC via the integrated USB port, at which they can be printed in report form and archived.

### PC Database and Report Generating Software – IZYTRONIQ

IZYTRONIQ is newly developed test software with which the entire testing scenario can be visualized, managed and documented in an audit-proof, instrument-independent fashion. And thus for the first time ever, measurement and test data from various test instruments and multimeters can be combined into a single test and documented. Intuitive operation and a modern look assure quick access to all functions.

The software is available on different scales and in different versions for the commercial trades, for industry and for training applications.

All test instruments included in the PROFITEST MASTER IQ series can be managed by IZYTRONIQ, with which their measured values can also be documented (as of firmware version 3.1.0).

Further information regarding user software is available on the Internet at www.izytron.com.

### Instrument Updates

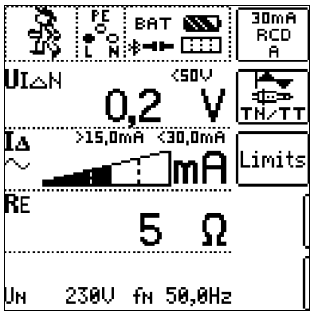
The test instrument can always be kept current because the firmware/software can be updated via the USB port. Updating is executed during the course of recalibration by our service department, or directly by the customer.

## Display

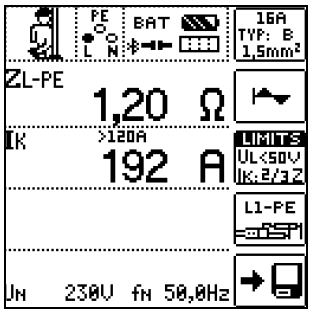
(illustrative selection)

Softkeys allow for convenient selection of sub-functions and parameter settings. Unavailable sub-functions and parameters are automatically prevented from appearing at the display.

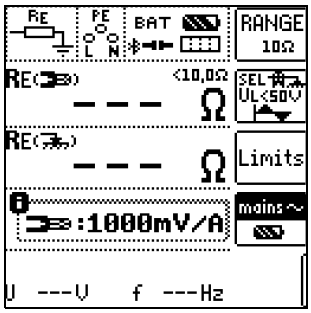
*RCD Measurement Display*



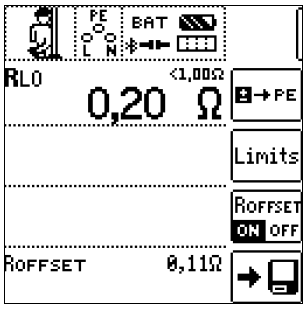

*Loop Resistance Meas. Display*



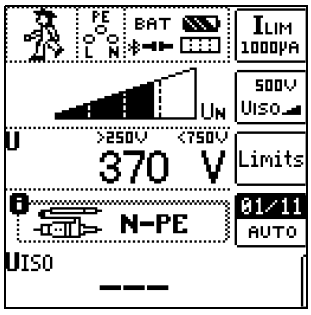

*Earthing Resistance Meas. Display*



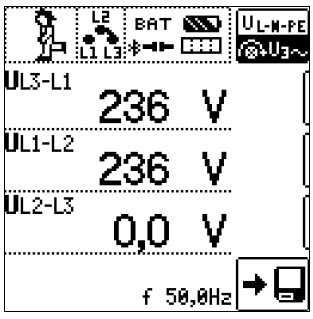

*Low-Resistance Meas. Display*




*Insulation Measurement Display*




*Voltage Measurement Display*



## Features of Instrument Variants

| PROFITEST … (article number) | MPRO IQ (M534C) | MTECH+ IQ (M534L) | MXTRA IQ (M534M) |
|---|---|---|---|
| **Testing of residual current devices (RCDs)** | | | |
| **$U_T$ measurement without tripping the RCD** | ✓ | ✓ | ✓ |
| **Tripping time measurement** | ✓ | ✓ | ✓ |
| **Measurement of tripping current $I_F$** | ✓ | ✓ | ✓ |
| **Selective, SRCDs, PRCDs, type G/R** | ✓ | ✓ | ✓ |
| **AC/DC sensitive RCDs, types B and B+** | — | ✓ | ✓ |
| **DC-sensitive RDC-DDs and RCMBs** | — | ✓ | ✓ |
| **Testing of insulation monitoring devices (IMDs)** | — | — | ✓ |
| **Testing of residual current monitoring devices (RCMs)** | — | — | ✓ |
| **Testing for N-PE reversal** | ✓ | ✓ | ✓ |
| **Measurement of loop impedance $Z_{L-PE}$ / $Z_{L-N}$** | | | |
| Fuse table for systems without RCDs | ✓ | ✓ | ✓ |
| Without tripping the RCD, fuse table | — | ✓ | ✓ |
| 15 mA measurement [1] | ✓ | ✓ | ✓ |
| **Earth resistance $R_E$ (mains operation)** I/U measuring method (2/3-wire measuring method via measuring adapter: 2-pole/2-pole + probe) | ✓ | ✓ | ✓ |
| **Earthing resistance $R_E$ (battery operation)** 3 or 4-wire measuring method via PRO-RE adapter | ✓ | — | ✓ |
| **Soil resistivity $\rho_E$ (battery operation)** (4-wire measuring method via PRO-RE adapter) | ✓ | — | ✓ |
| **Selective earth resistance $R_{E\ (mains\ operation)}$** with 2-pole adapter, probe, earth electrode and current clamp sensor (3-wire measuring method) | ✓ | ✓ | ✓ |
| **Selective earth resistance $R_{E\ (battery\ operation)}$** with probe, earth electrode and current clamp sensor (4-wire measuring method via PRO-RE adapter and current clamp sensor) | ✓ | — | ✓ |
| **Earth loop resistance $R_{ELOOP}$ (battery operation)** with 2 clamps (current clamp sensor direct and current clamp transformer via PRO-RE/2 adapter) | ✓ | — | ✓ |
| **Measurement of equipotential bonding $R_{LO}$** Automatic polarity reversal | ✓ | ✓ | ✓ |
| **Insulation resistance $R_{INS}$** Variable or rising test voltage (ramp) | ✓ | ✓ | ✓ |
| **Voltage $U_{L-N}$ / $U_{L-PE}$ / $U_{N-PE}$ / f** | ✓ | ✓ | ✓ |
| **Special measurements** | | | |
| **$I_L$, $I_{AMP}$ current measurement with clamp** | ✓ | ✓ | ✓ |
| **Phase sequence** | ✓ | ✓ | ✓ |
| **Earth leakage resistance $R_{E(INS)}$** | ✓ | ✓ | ✓ |
| **Voltage drop (**ΔU) | ✓ | ✓ | ✓ |
| **Standing-surface insulation $Z_{ST}$** | ✓ | ✓ | ✓ |
| **Meter start-up (**kWh test) | ✓ | ✓ | ✓ |
| **Leakage current with PRO-AB (**IL) **adapter** | — | — | ✓ |
| **Residual voltage test (**Ures) | — | — | ✓ |
| **Intelligent ramp (**ta + ΔI) | — | — | ✓ |
| **Electric vehicles at charging stations (IEC 61851)** | — | ✓ | ✓ |
| **Documentation of fault simulations at PRCDs with the PROFITEST PRCD adapter** | — | — | ✓ |
| **Features** | | | |
| **Selectable user interface language** [2] | ✓ | ✓ | ✓ |
| **Memory (database for up to 50,000 objects)** | ✓ | ✓ | ✓ |
| **Automatic test sequence function** | ✓ | ✓ | ✓ |
| **RS-232 port for RFID/barcode reader** | ✓ | ✓ | ✓ |
| **USB port for data transmission** | ✓ | ✓ | ✓ |
| **IZYTRONIQ** [3] **PC database and report generating software** | ✓ | ✓ | ✓ |
| **Measuring category: CAT III 600 V / CAT IV 300 V** | ✓ | ✓ | ✓ |
| **DAkkS calibration certificate** | ✓ | ✓ | ✓ |

[1] The so-called live measurement is only advisable if there's no bias current within the system. Only suitable for motor protection switches with small nominal current values.
As of firmware 3.4.4: 15 mA test current only applies if the RCD is set for $I_{\Delta N}$ = 30 mA. Otherwise test current = ½ · $I_{\Delta N}$ of the preselected RCDs.
[2] Currently available languages D, GB, I, F, E, P, NL, S, N, FIN, CZ, PL
[3] IZYTRONIQ BUSINESS Starter for PROFITEST MPRO IQ or IZYTRONIQ CLOUD for PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ

## Applicable Regulations and Standards

| | |
|---|---|
| IEC 60364-6<br>EN 50110-1 | Operation of electrical installations –<br>Part 100: General requirements |
| EN 60529 | Test instruments and test procedures<br>Degrees of protection provided by enclosures (IP code) |
| IEC 60364-6 | Low-voltage electrical installations –<br>Part 6: Tests |
| IEC 60364-7-710 | Low-voltage electrical installations – Requirements for special installations or locations –<br>Part 710: Medical locations |
| IEC 61010/<br>EN 61010/ | Safety requirements for electrical equipment for measurement, control and laboratory use<br>Part 1: General requirements (IEC 61010-1 + cor.)<br>Part 31: Safety requirements for hand-held probe assemblies for electrical measurement and test (IEC 61010-031 + A1) |
| IEC 61140<br>DIN EN 61140 | Protection against electric shock<br>Common aspects for installations and equipment |
| DIN EN 61326-1 | Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements |
| IEC 61557/<br>EN 61557/ | Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures<br>Part 1: General requirements (IEC 61557-1)<br>Part 2: Insulation resistance (IEC 61557-2)<br>Part 3: Loop resistance (IEC 61557-3)<br>Part 4: Resistance of earth connection and equipotential bonding (IEC 61557-4)<br>Part 5: Earthing resistance (IEC 61557-5)<br>Part 6: Effectiveness of residual current devices (RCDs) in TT, TN and IT systems (IEC 61557-6) 6<br>Part 7: Phase sequence (IEC 61557-7)<br>Part 10: Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures (IEC 61557-10)<br>Part 11: Effectiveness of type A and type B residual current monitors (RCMs) in TT, TN and IT systems (IEC 61557-11) (PROFITEST MXTRA IQ only) |
| IEC 61851-1<br>DIN EN 61851-1 | Electrical equipment for electric vehicles –<br>Electric vehicle conductive charging systems<br>– Part 1: General requirements |

## Nominal ranges of use

| | | |
|---|---|---|
| Voltage $U_N$ | 120 V | (108 … 132 V) |
| | 230 V | (196 … 253 V) |
| | 400 V | (340 … 440 V) |
| Frequency $f_N$ | 16 ⅔ Hz | (15.4 … 18 Hz) |
| | 50 Hz | (49.5 … 50.5 Hz) |
| | 60 Hz | (59.4 … 60.6 Hz) |
| | 200 Hz | (190 … 210 Hz) |
| | 400 Hz | (380 … 420 Hz) |
| Overall voltage range | 65 … 550 V | |
| Overall frequency range | 15.4 … 420 Hz | |
| Line voltage | Sinusoidal | |
| Temperature range | 0 °C … + 40 °C | |
| Battery voltage | 8 … 12 V | |
| Line impedance angle | Corresponds to cosφ = 1 … 0.95 | |
| Probe resistance | < 50 kΩ | |

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## Characteristic Values for PROFITEST MTECH+ IQ

| Function | Measured Quantity | Display Range | Resolution | Input Impedance / Test Current | Measuring Range | Nominal Values | Measuring Uncertainty | Intrinsic Uncertainty | Connections: Plug Insert [1] | 2-Pole Adapter | 3-Pole Adapter | Probe | Clamp Meters: WZ12C | Z3512A | MFLEX P300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U | $U_{L-PE}$<br>$U_{N-PE}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | 5 MΩ | 0.3 … 600 V [1] | $U_N$ = 120/230/400/500 V<br>$f_N$ = 16⅔/50/60/200/400 Hz | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | ±(\|1% rdg.\|+5d)<br>±(\|1% rdg.\|+1d) | • | • | • | | | | |
| | f | 15.0 … 99.9 Hz<br>100 … 999 Hz | 0.1 Hz<br>1 Hz | | DC 15.4 … 420 Hz | | ±(\|0.2% rdg.\|+1d) | ±(\|0.1% rdg.\|+1d) | | | | | | | |
| | $U_{3\sim}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 0.3 … 600 V | | ±(\|3% rdg.\|+5d)<br>±(\|3% rdg.\|+1d) | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | | | • | | | | |
| | $U_{Probe}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 1.0 … 600 V | | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | ±(\|1% rdg.\|+5d)<br>±(\|1% rdg.\|+1d) | | | | • | | | |
| | $U_{L-N}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 1.0 … 600 V [1] | | ±(\|3% rdg.\|+5d)<br>±(\|3% rdg.\|+1d) | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | • | | • | | | | |
| $I_{\Delta N}$<br>$I_F$ | $U_{I\Delta N}$ | 0 … 70.0 V | 0.1 V | 0.3 · $I_{\Delta N}$ | 5 … 70 V | $U_N$ = 120 V 230 V 400 V [2]<br>$f_N$ = 50/60 Hz<br>$U_L$ = 25/50 V<br>$I_{\Delta N}$ = 6 mA 10 mA 30 mA 100 mA 300 mA 500 mA [2] | +10% rdg.\|+1d | +1% rdg.\|–1d … +9% rdg.\|+1d | • | • | | • optionally | | | |
| | $R_E$ | 10 Ω … 999 Ω<br>1.00 kΩ … 6.51 kΩ | 1 Ω<br>0.01 kΩ | $I_{\Delta N}$ = 10 mA · 1.05 | Calculated value from $R_E = U_{I\Delta N} / I_{\Delta N}$ | | | | | | | | | | |
| | | 3 Ω … 999 Ω<br>1 kΩ … 2.17 kΩ | 1 Ω<br>0.01 kΩ | $I_{\Delta N}$ = 30 mA · 1.05 | | | | | | | | | | | |
| | | 1Ω … 651 Ω | 1Ω | $I_{\Delta N}$ = 100 mA · 1.05 | | | | | | | | | | | |
| | | 0.3 Ω … 99.9 Ω<br>100 Ω … 217 Ω | 0.1 Ω<br>1 Ω | $I_{\Delta N}$ = 300 mA · 1.05 | | | | | | | | | | | |
| | | 0.2 Ω … 9.9 Ω<br>10 Ω … 130 Ω | 0.1 Ω<br>1 Ω | $I_{\Delta N}$ = 500 mA · 1.05 | | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 6 mA) | 1.8 … 7.8 mA | 0.1 mA | 1.8 … 7.8 mA | 1.8 … 7.8 mA | | ±(\|5% rdg.\|+1d) | ±(\|3.5% rdg.\|+2d) | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 10 mA) | 3.0 … 13.0 mA | | 3.0 … 13.0 mA | 3.0 … 13.0 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 30 mA) | 9.0 … 39.0 mA | | 9.0 … 39.0 mA | 9.0 … 39.0 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 100 mA) | 30 … 130 mA | 1 mA | 30 … 130 mA | 30 … 130 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 300 mA) | 90 … 390 mA | 1 mA | 90 … 390 mA | 90 … 390 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 500 mA) | 150 … 650 mA | 1 mA | 150 … 650 mA | 150 … 650 mA | | | | | | | | | | |
| | $U_{I\Delta}$ / $U_L$ = 25 V | 0 … 25.0 V | 0.1 V | Same as I$\Delta$ | 0 … 25.0 V | | +10% rdg.\|+1d | +1% rdg.\|–1d … +9% rdg.\|+1d | | | | | | | |
| | $U_{I\Delta}$ / $U_L$ = 50 V | 0 … 50.0 V | | | 0 … 50.0 V | | | | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 1) | 0 … 1000 ms | 1 ms | 6 … 500 mA | 0 … 1000 ms | | ±4 ms | ±3 ms | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 2) | 0 … 1000 ms | 1 ms | 2 · 6 … 2 · 500 mA | 0 … 1000 ms | | | | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 5) | 0 … 40 ms | 1 ms | 5 · 6 … 5 · 300 mA | 0 … 40 ms | | | | | | | | | | |
| $Z_{L-PE}$<br>$Z_{L-N}$ | $Z_{L-PE}$ ( ) $Z_{L-N}$ | 0 … 999 mΩ<br>1.00 … 9.99 Ω | 1 mΩ<br>0.01 Ω<br>0.1 Ω | 1.3 … 3.7 A AC<br>0.5/1.25 A DC | 0.15 … 0.49 Ω<br>0.50 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V 400/500 V [1]<br>$f_N$ = 16⅔[8]/50/60 Hz | ±(\|10% rdg.\|+30d)<br>±(\|10% rdg.\|+30d)<br>±(\|5% rdg.\|+3d) | ±(\|5% rdg.\|+30d)<br>±(\|4% rdg.\|+30d)<br>±(\|3% rdg.\|+3d) | • | • $Z_{L-PE}$ | | | | | |
| | $Z_{L-PE}$ + DC | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 29.9 Ω | | | 0.25 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|18% rdg.\|+30d)<br>±(\|10% rdg.\|+3d) | ±(\|6% rdg.\|+50d)<br>±(\|4% rdg.\|+3d) | | | | | | | |
| | $I_K$ ($Z_{L-PE}$ , $Z_{L-PE}$ + DC) | 0 … 9.9 A<br>10 … 999 A<br>1.00 … 9.99 kA<br>10.0 … 50.0 kA | 0.1 A<br>1 A<br>10 A<br>100 A | | 120 (108 … 132) V<br>230 (196 … 253) V<br>400 (340 … 440) V<br>500 (450 … 550) V | | Value calculated from $Z_{L-PE}$ | | | | | | | | |
| | $Z_{L-PE}$ (15 mA[9]) | 0.6 … 9.9 Ω | 0.1 Ω | Display range only | | | | | | | | | | | |
| | | 10.0 … 99.9 Ω<br>100 … 999 Ω | 0.1 Ω<br>1 Ω | 15 mA AC [9] | 10.0 … 99.9 Ω<br>100 … 999 Ω | $U_N$ = 120/230 V<br>$f_N$ = 16⅔[8]/50/60 Hz | ±(\|10% rdg.\|+10d)<br>±(\|8% rdg.\|+2d) | ±(\|2% rdg.\|+2d)<br>±(\|1% rdg.\|+1d) | | | | | | | |
| | $I_K$ (15 mA[9]) | 100 … 999 mA<br>0.00 … 9.99 A<br>10.0 … 99.9 A | 1 mA<br>0.01 A<br>0.1 A | | Calculated value depending on $U_N$ and $Z_{L-PE}$: $I_K = U_N / 10 … 1000\Omega$ | | Value calculated from $Z_{L-PE}$ (15 mA[9]): $I_K = U_N / Z_{L-PE}$ (15 mA[9]) | | | | | | | | |
| $R_E$ | $R_E$ (with probe)<br>[$R_E$ (without probe) values same as $Z_{L-PE}$] | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω<br>1 kΩ … 9.99 kΩ | 1 mΩ<br>0.01 Ω<br>0.1 Ω<br>1 Ω<br>0.01 kΩ | 1.3 … 3.7 A AC<br>1.3 … 3.7 A AC<br>1.3 … 3.7 A AC<br>400 mA AC<br>40 mA AC<br>4 mA AC | 0.15 Ω … 0.49 Ω<br>0.50 Ω … 0.99 Ω<br>1.0 Ω …9.99 Ω<br>10 Ω …99.9 Ω<br>100 Ω …999 Ω<br>1 kΩ …9.99 kΩ | $U_N$ = 120/230 V<br>$U_N$ = 400 V [1]<br>$f_N$ = 50/60 Hz | ±(\|10% rdg.\|+30d)<br>±(\|10% rdg.\|+30d)<br>±(\|5% rdg.\|+3d)<br>±(\|10% rdg.\|+3d)<br>±(\|10% rdg.\|+3d)<br>±(\|10% rdg.\|+3d) | ±(\|5% rdg.\|+30d)<br>±(\|4% rdg.\|+30d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d) | • | • | | • | | | |
| | $R_E$ DC+ | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 29.9 Ω | 1 mΩ<br>0.01 Ω<br>0.1 Ω | 1.3 … 3.7 A AC<br>0.5/1.25 A DC | 0.25 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|18% rdg.\|+30d)<br>±(\|10% rdg.\|+3d) | ±(\|6% rdg.\|+50d)<br>±(\|4% rdg.\|+3d) | | | | | | | |
| | $U_E$ | 0 … 253 V | 1 V | — | Calculated value | | | | | | | | | | |
| $R_E$ Sel Clamp | $R_E$ | 0 … 999 Ω | 1 mΩ … 1 Ω | 1.3 … 2.7 A AC<br>0.5/1.25 A DC | 0.25 … 300 Ω [4] | See $R_E$ | ±(\|20% rdg.\|+20 d) | ±(\|15% rdg.\|+20 d) | | | | | | • | • |
| | $R_E$ DC+ | 0 … 999 Ω | 1 mΩ … 1 Ω | | | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|22% rdg.\|+20 d) | ±(\|15% rdg.\|+20 d) | | | | | | | |
| EXTRA | $Z_{ST}$ | 10 kΩ … 199 kΩ | 1 kΩ | 2.3 mA at 230 V | 10 kΩ … 199 kΩ | $U_0 = U_{L-N}$ | ±(\|20% rdg.\|+2d) | ±(\|10% rdg.\|+3d) | • | • | • | • | | | |
| | | 200 kΩ … 999 kΩ<br>1.00 MΩ … 9.99 MΩ<br>10.0 MΩ … 30.0 MΩ | 1 kΩ<br>0.01 MΩ<br>0.1 MΩ | | 200 kΩ … 999 kΩ<br>1.00 MΩ … 9.99 MΩ<br>10.0 MΩ … 30.0 MΩ | | ±(\|10% rdg.\|+2d) | ±(\|5% rdg.\|+3d) | | | | | | | |

## Characteristic Values for PROFITEST MTECH+ IQ

| Function | Measured Quantity | Display Range | Resolution | Test Current | Measuring Range | Nominal Values | Measuring Uncertainty | Intrinsic Uncertainty | Connections: Plug Insert [1] | 2-Pole Adapter | 3-Pole Adapter | Clamps / Meas. Ranges: WZ12C | Z3512A | MFLEX P300 | CP1100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R_{ISO}$ | $R_{INS}$, $R_{E\ INS}$ | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 49.9 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ | $I_K$ = 1.5 mA | 50 … 999 kΩ<br>1.00 … 49.9 MΩ | $U_N$ = 50 V<br>$I_N$ = 1 mA | KΩ range<br>±(\|5% rdg.\|+10d)<br>MΩ range<br>±(\|5% rdg.\|+1d) | kΩ range<br>±(\|3% rdg.\|+10d)<br>MΩ range<br>±(\|3% rdg.\|+1d) | • | • | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ | | 50 … 999 kΩ<br>1.00 … 99.9 MΩ | $U_N$ = 100 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ<br>100 … 200 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ | | 50 … 999 kΩ<br>1.00 … 200 MΩ | $U_N$ = 250 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ<br>100 … 500 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ | | 50 … 999 kΩ<br>1.00 … 499 MΩ | $U_N$ = 325 V<br>$U_N$ = 500 V<br>$U_N$ = 1000 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | U | 10 … 999 V–<br>1.00 … 1.19 kV | 1 V<br>10 V | | 10 … 1.19 kV | | ±(\|3% rdg.\|+1d) | ±(\|1.5% rdg.\|+1d) | | | | | | | |
| $R_{LO}$ | $R_{LO}$ | 0.00 Ω … 9.99 Ω<br>10.0 Ω … 99.9 Ω<br>100 Ω … 199 Ω | 0.01 Ω<br>0.1 Ω<br>1 Ω | I ≥ 200 mA DC<br>I < 260 mA DC | 0.10 Ω … 5.99 Ω<br>6.00 Ω … 99.9 Ω | $U_0$ = 4.5 V | ±(\|4% rdg.\|+2d) | ±(\|2% rdg.\|+2d) | | • | | | | | |
| | $R_{OFFSET}$ | 0.00 … 9.99 Ω | 0.01 Ω | I ≥ 200 mA DC<br>I < 260 mA DC | 0.10 Ω … 5.99 Ω<br>6.00 Ω … 99.9 Ω | | | | | | | | | | |
| | | | | Transformation ratio [3] | | | [5] | [5] | | | | | | | |
| SENSOR [6, 7] | $I_{L/Amp}$ | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 5 … 15 A | $f_N$ = 50/60 Hz | ±(\|13% rdg.\|+5d) | ±(\|5% rdg.\|+4d) | | | | I 15A | | | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|13% rdg.\|+1d) | ±(\|5% rdg.\|+1d) | | | | | | | |
| | | 1.00 … 9.99 A | 0.01 A | | | | | | | | | | | | |
| | | 10.0 … 15.0 A | 0.1 A | | | | | | | | | | | | |
| | | 1.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 150 A | | ±(\|11% rdg.\|+4d) | ±(\|4% rdg.\|+3d) | | | | II<br>150 A | | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|11% rdg.\|+1d) | ±(\|4% rdg.\|+1d) | | | | | | | |
| | | 100 … 150 A | 1 A | | | | | | | | | | | | |
| | | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 5 … 1000 mA | $f_N$ = 16.7/50/60/200/400 Hz | ±(\|7% rdg.\|+2d) | ±(\|5% rdg.\|+2d) | | | | | 1 A | | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|7% rdg.\|+1d) | ±(\|5% rdg.\|+1d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 100 mV/A | 0.05 … 10 A | | ±(\|3.4% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | 10 A | | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 0.5 … 100 A | | ±(\|3.1% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | 100 A | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 1000 A | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | 1000 A | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|3.1% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |
| | | 100 … 999 A | 1 A | | | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | | | |
| | | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 30 … 1000 mA | $f_N$ = 50/60 Hz | ±(\|27% rdg.\|+100d) | ±(\|3% rdg.\|+100d) | | | | | | 0.03 | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 3 | |
| | | 0.00 … 9.99 A | 0.01 A | 100 mV/A | 0.3 … 10 A | | ±(\|27% rdg.\|+12d) | ±(\|3% rdg.\|+12d) | | | | | | 0.3 | |
| | | | 0.01 A | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 30 | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 3 … 100 A | | ±(\|27% rdg.\|+100d) | ±(\|3% rdg.\|+100d) | | | | | | 3 | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 300 | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 0.5 … 100 A | $f_N$ = DC/16.7/50/60/200 Hz | ±(\|5% rdg.\|+12d) | ±(\|3% rdg.\|+12d) | | | | | | | 100 A~ |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|5% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 1000 A | | ±(\|5% rdg.\|+50d) | ±(\|3% rdg.\|+50d) | | | | | | | 1000 A~ |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|5% rdg.\|+7d) | ±(\|3% rdg.\|+7d) | | | | | | | |
| | | 100 … 999 A | 1 A | | | | ±(\|5% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |

1 U > 230 V with 2 or 3-pole adapter only
2 1 · / 2 · $I_{\Delta N}$ > 300 mA and 5 · $I_{\Delta N}$ > 500 mA and $I_f$ > 300 mA only up to $U_N \leq$ 230 V! $I_{\Delta N}$ 5 · 300 mA only where UN = 230 V
3 The transformation ratio selected at the clamp (1/10/100/1000 mV/A) must be set in the "Type" menu with the rotary switch in the "SENSOR" position.
4 Where $R_{Eselective}/R_{Etotal}$ < 100
5 The specified measuring and intrinsic uncertainties already include those of the respective current clamp.
6 Measuring range of the signal input at the test instrument, $U_E$: 0 … 1.0 $V_{TRMS}$ (0 … 1.4 $V_{peak}$) AC/DC
7 Input impedance of the signal input at the test instrument: 800 kW
8 Up to firmware 3.4.4:where $f_N$ < 45 Hz => $U_N$ < 253 V
As of firmware 3.6.0:where $f_N$ < 45 Hz => $U_N$ < 500 V
9 As of firmware 3.4.4: 15 mA test current only applies if the RCD is set for $I_{\Delta N}$ = 30 mA. Otherwise test current = ½ · $I_{\Delta N}$ of the preselected RCDs.

**Key:** d = digit(s), rdg. = reading (measured value)

# PROFITEST MASTER IQ SERIES
# PROFITEST MTECH+ IQ, MPRO IQ, MXTRA IQ
# IEC 60364-6, EN 50110-1

## Characteristic Values for PROFITEST MPRO IQ, PROFITEST MXTRA IQ

| Function | Measured Quantity | Display Range | Resolution | Input Impedance / Test Current | Measuring Range | Nominal Values | Measuring Uncertainty | Intrinsic Uncertainty | Connections: Plug Insert [1] | 2-Pole Adapter | 3-Pole Adapter | Probe | Clamp Meters: WZ12C | Z3512A | MFLEX P300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U | $U_{L-PE}$<br>$U_{N-PE}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | 5 MΩ | 0.3 … 600 V [1] | $U_N$ = 120 V, 230 V, 400 V, 500 V<br>$f_N$ = 16⅔/50/60/200/400 Hz | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | ±(\|1% rdg.\|+5d)<br>±(\|1% rdg.\|+1d) | • | • | • | | | | |
| | f | 15.0 … 99.9 Hz<br>100 … 999 Hz | 0.1 Hz<br>1 Hz | | DC 15.4 … 420 Hz | | ±(\|0.2% rdg.\|+1d) | ±(\|0.1% rdg.\|+1d) | | | | | | | |
| | $U_{3\sim}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 0.3 … 600 V | | ±(\|3% rdg.\|+5d)<br>±(\|3% rdg.\|+1d) | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | | | • | | | | |
| | $U_{Probe}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 1.0 … 600 V | | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | ±(\|1% rdg.\|+5d)<br>±(\|1% rdg.\|+1d) | | | | • | | | |
| | $U_{L-N}$ | 0 … 99.9 V<br>100 … 600 V | 0.1 V<br>1 V | | 1.0 … 600 V [1] | | ±(\|3% rdg.\|+5d)<br>±(\|3% rdg.\|+1d) | ±(\|2% rdg.\|+5d)<br>±(\|2% rdg.\|+1d) | • | | • | | | | |
| $I_{\Delta N}$<br>$I_F$ | $U_{I\Delta N}$ | 0 … 70.0 V | 0.1 V | 0.3 · $I_{\Delta N}$ | 5 … 70 V | $U_N$ = 120 V, 230 V, 400 V [2]<br>$f_N$ = 50/60 Hz<br>$U_L$ = 25/50 V<br>$I_{\Delta N}$ = 6 mA, 10 mA, 30 mA, 100 mA, 300 mA, 500 mA [2] | +10% rdg.\|+1d | +1% rdg.\|–1d … +9% rdg.\|+1d | • | • | | • optionally | | | |
| | $R_E$ | 10 Ω … 999 Ω<br>1.00 kΩ … 6.51 kΩ | 1 Ω<br>0.01 kΩ | $I_{\Delta N}$ = 10 mA · 1.05 | Calculated value from $R_E = U_{I\Delta N} / I_{\Delta N}$ | | | | | | | | | | |
| | | 3 Ω … 999 Ω<br>1 kΩ … 2.17 kΩ | 1 Ω<br>0.01 kΩ | $I_{\Delta N}$ = 30 mA · 1.05 | | | | | | | | | | | |
| | | 1Ω … 651 Ω | 1Ω | $I_{\Delta N}$ = 100 mA · 1.05 | | | | | | | | | | | |
| | | 0.3 Ω … 99.9 Ω<br>100 Ω … 217 Ω | 0.1 Ω<br>1 Ω | $I_{\Delta N}$ = 300 mA · 1.05 | | | | | | | | | | | |
| | | 0.2 Ω … 9.9 Ω<br>10 Ω … 130 Ω | 0.1 Ω<br>1 Ω | $I_{\Delta N}$ = 500 mA · 1.05 | | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 6 mA) | 1.8 … 7.8 mA | 0.1 mA | 1.8 … 7.8 mA | 1.8 … 7.8 mA | | ±(\|5% rdg.\|+1d) | ±(\|3.5% rdg.\|+2d) | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 10 mA) | 3.0 … 13.0 mA | | 3.0 … 13.0 mA | 3.0 … 13.0 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 30 mA) | 9.0 … 39.0 mA | | 9.0 … 39.0 mA | 9.0 … 39.0 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 100 mA) | 30 … 130 mA | 1 mA | 30 … 130 mA | 30 … 130 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 300 mA) | 90 … 390 mA | 1 mA | 90 … 390 mA | 90 … 390 mA | | | | | | | | | | |
| | $I_F$ ($I_{\Delta N}$ = 500 mA) | 150 … 650 mA | 1 mA | 150 … 650 mA | 150 … 650 mA | | | | | | | | | | |
| | $U_{I\Delta}$ / $U_L$ = 25 V | 0 … 25.0 V | 0.1 V | Same as IΔ | 0 … 25.0 V | | +10% rdg.\|+1d | +1% rdg.\|–1d … +9% rdg.\|+1d | | | | | | | |
| | $U_{I\Delta}$ / $U_L$ = 50 V | 0 … 50.0 V | | | 0 … 50.0 V | | | | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 1) | 0 … 1000 ms | 1 ms | 6 … 500 mA | 0 … 1000 ms | | ±4 ms | ±3 ms | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 2) | 0 … 1000 ms | 1 ms | 2 · 6 … 2 · 500 mA | 0 … 1000 ms | | | | | | | | | | |
| | $t_A$ ($I_{\Delta N}$ · 5) | 0 … 40 ms | 1 ms | 5 · 6 … 5 · 300 mA | 0 … 40 ms | | | | | | | | | | |
| $Z_{L-PE}$<br>$Z_{L-N}$ | $Z_{L-PE}$ ( ) $Z_{L-N}$ | 0 … 999 mΩ<br>1.00 … 9.99 Ω | 1 mΩ<br>0.01 Ω | 3.7 … 4.7 A AC | 0.10 … 0.49 Ω<br>0.50 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V 400/500 V [1]<br>$f_N$ = 16⅔/50/60 Hz | ±(\|10% rdg.\|+20d)<br>±(\|10% rdg.\|+20d)<br>±(\|5% rdg.\|+3d) | ±(\|5% rdg.\|+20d)<br>±(\|4% rdg.\|+20d)<br>±(\|3% rdg.\|+3d) | • | • $Z_{L-PE}$ | | | | | |
| | $Z_{L-PE}$ + DC [10] | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 29.9 Ω | 0.1 Ω | 3.7 … 4.7 A AC<br>0.5/1.25 A DC [10] | 0.25 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|18% rdg.\|+30d)<br>±(\|10% rdg.\|+3d) | ±(\|6% rdg.\|+50d)<br>±(\|4% rdg.\|+3d) | | | | | | | |
| | $I_K$ ($Z_{L-PE}$ , $Z_{L-PE}$ + DC [10] | 0 … 9.9 A<br>10 … 999 A<br>1.00 … 9.99 kA<br>10.0 … 50.0 kA | 0.1 A<br>1 A<br>10 A<br>100 A | | 120 (108 … 132) V<br>230 (196 … 253) V<br>400 (340 … 440) V<br>500 (450 … 550) V | | Value calculated from $Z_{L-PE}$ | | | | | | | | |
| | $Z_{L-PE}$ (15 mA [9]) | 0.6 … 99.9 Ω<br>100 … 999 Ω | 0.1 Ω<br>1 Ω | 15 mA AC [9] | 10.0 … 99.9 Ω<br>100 … 999 Ω | $U_N$ = 120/230 V<br>$f_N$ = 16⅔ [8]/50/60 Hz | ±(\|10% rdg.\|+10d)<br>±(\|8% rdg.\|+2d) | ±(\|2% rdg.\|+2d)<br>±(\|1% rdg.\|+1d) | | | | | | | |
| | $I_K$ (15 mA [9]) | 0.10 … 9.99 A<br>10.0 … 99.9 A<br>100 … 999 A [14] | 0.01 A<br>0.1 A<br>1 A | | 100 mA … 12 A ($U_N$ = 120 V)<br>200 mA … 25 A ($U_N$ = 230 V) | | Value calculated from $I_K = U_N / Z_{L-PE}$ (15 mA [9]) | | | | | | | | |
| $R_E$ | $R_{E.sl}$ (without probe)<br>$R_E$ (with probe) | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω<br>1 kΩ … 9.99 kΩ | 1 mΩ<br>0.01 Ω<br>0.1 Ω<br>1 Ω<br>0.01 kΩ | 3.7 … 4.7 A AC<br>3.7 … 4.7 A AC<br>400 mA AC<br>40 mA AC<br>4 mA AC | 0.10 Ω … 0.49 Ω<br>0.50 Ω … 0.99 Ω<br>1.0 Ω …9.99 Ω<br>10 Ω …99.9 Ω<br>100 Ω …999 Ω<br>1 kΩ …9.99 kΩ | $U_N$ same as U function [1]<br>$f_N$ = 50/60 Hz | ±(\|10% rdg.\|+20d)<br>±(\|10% rdg.\|+20d)<br>±(\|5% rdg.\|+3d)<br>±(\|10% rdg.\|+3d)<br>±(\|10% rdg.\|+3d)<br>±(\|10% rdg.\|+3d) | ±(\|5% rdg.\|+20d)<br>±(\|4% rdg.\|+20d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d)<br>±(\|3% rdg.\|+3d) | • | • | | • | | | |
| | $R_E$ (15 mA) (without/with probe) | 0.5 … 99.9 Ω<br>100 … 999 Ω | 0.1 Ω<br>1 Ω | 15 mA AC | 10 Ω …99.9 Ω<br>100 Ω …999 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|10% rdg.\|+10d)<br>±(\|8% rdg.\|+2d) | ±(\|2% rdg.\|+2d)<br>±(\|1% rdg.\|+1d) | | | | | | | |
| | $R_{E.sl}$ (without probe) + DC [10]<br>$R_{E.sl}$ (with probe) + DC [10] | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 29.9 Ω | 1 mΩ<br>0.01 Ω<br>0.1 Ω | 3.7 … 4.7 A AC<br>0.5/1.25 A DC [10] | 0.25 … 0.99 Ω<br>1.00 … 9.99 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|18% rdg.\|+30d)<br>±(\|10% rdg.\|+3d) | ±(\|6% rdg.\|+50d)<br>±(\|4% rdg.\|+3d) | | | | | | | |
| | $U_E$ | 0 … 253 V | 1 V | 3.7 … 4.7 A AC | $R_E$ = 0.10 … 9.99 Ω | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | Calculated $U_E = U_N \cdot R_E / R_{E.sl}$ | | | | | | | | |
| $R_E$ Sel Clamp | $R_{E.sel}$ (only with probe) | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω | 1 mΩ<br>0.01 Ω<br>0.1 Ω<br>1 Ω | 2.1 A AC<br>2.1 A AC<br>400 mA AC<br>40 mA AC | 0.25 … 300 Ω [4] | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|20% rdg.\|+20 d) | ±(\|15% rdg.\|+20 d) | | | | | | • | • |
| | $R_{E.sel}$ + DC [10] (only with probe) | 0 … 999 mΩ<br>1.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω | 1 mΩ<br>0.01 Ω<br>0.1 Ω<br>1 Ω | 3.7 … 4.7 A AC<br>0.5/1.25 A DC [10] | 0.25 … 300 Ω<br>$R_{E.tot}$ < 10 Ω [4] | $U_N$ = 120/230 V<br>$f_N$ = 50/60 Hz | ±(\|22% rdg.\|+20 d) | ±(\|15% rdg.\|+20 d) | | | | | | | |
| EXTRA | $Z_{ST}$ | 10 kΩ … 199 kΩ<br>200 kΩ … 999 kΩ<br>1.00 MΩ … 9.99 MΩ<br>10.0 MΩ … 30.0 MΩ | 1 kΩ<br>1 kΩ<br>0.01 MΩ<br>0.1 MΩ | 2.3 mA at 230 V | 10 kΩ … 199 kΩ<br>200 kΩ … 999 kΩ<br>1.00 MΩ … 9.99 MΩ<br>10.0 MΩ … 30.0 MΩ | $U_0 = U_{L-N}$ | ±(\|20% rdg.\|+2d)<br>±(\|10% rdg.\|+2d) | ±(\|10% rdg.\|+3d)<br>±(\|5% rdg.\|+3d) | • | • | • | • | | | |
| EXTRA | IMD test | 20 … 648 kΩ<br>2.51 MΩ | 1 kΩ<br>0.01 MΩ | IT line voltage<br>U.it = 90 … 550 V | 20 kΩ … 199 kΩ<br>200 kΩ … 648 kΩ<br>2.51 MΩ | IT system nominal voltages UN.it = 120/230/400/500 V<br>$f_N$ = 50/60 Hz | ± 7%<br>± 12%<br>± 3% | ± 5%<br>± 10%<br>± 2% | • | | • | | | | |

| Function | Measured Quantity | Display Range | Resolution | Test Current | Measuring Range | Nominal Values | Measuring Uncertainty | Intrinsic Uncertainty | Connections: Plug Insert [1] | 2-Pole Adapter | 3-Pole Adapter | Clamp Meters: WZ12C | Clamp Meters: Z3512A | Clamp Meters: MFLEX P300 | CP1100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R_{ISO}$ | $R_{INS}$, $R_{E\ INS}$ | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 49.9 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ | $I_K$ = 1.5 mA | 50 … 999 kΩ<br>1.00 … 49.9 MΩ | $U_N$ = 50 V<br>$I_N$ = 1 mA | KΩ range<br>±(\|5% rdg.\|+10d)<br>MΩ ρανγε<br>±(\|5% rdg.\|+1d) | kΩ range<br>±(\|3% rdg.\|+10d)<br>MΩ ρανγε<br>±(\|3% rdg.\|+1d) | • | • | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ | | 50 … 999 kΩ<br>1.00 … 99.9 MΩ | $U_N$ = 100 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ<br>100 … 200 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ | | 50 … 999 kΩ<br>1.00 … 200 MΩ | $U_N$ = 250 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | | 1 … 999 kΩ<br>1.00 … 9.99 MΩ<br>10.0 … 99.9 MΩ<br>100 … 500 MΩ | 1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ | | 50 … 999 kΩ<br>1.00 … 499 MΩ | $U_N$ = 325 V<br>$U_N$ = 500 V<br>$U_N$ = 1000 V<br>$I_N$ = 1 mA | | | | | | | | | |
| | U | 10 … 999 V–<br>1.00 … 1.19 kV | 1 V<br>10 V | | 10 … 1.19 kV | | ±(\|3% rdg.\|+1d) | ±(\|1.5% rdg.\|+1d) | | | | | | | |
| $R_{LO}$ | $R_{LO}$ | 0.00 Ω … 9.99 Ω<br>10.0 Ω … 99.9 Ω<br>100 Ω … 199 Ω | 0.01 Ω<br>0.1 Ω<br>1 Ω | I ≥ 200 mA DC<br>I < 260 mA DC | 0.10 Ω … 5.99 Ω<br>6.00 Ω … 99.9 Ω | $U_0$ = 4.5 V | ±(\|4% rdg.\|+2d) | ±(\|2% rdg.\|+2d) | | • | | | | | |
| | $R_{OFFSET}$ | 0.00 … 9.99 Ω | 0.01 Ω | I ≥ 200 mA DC<br>I < 260 mA DC | 0.10 Ω … 5.99 Ω<br>6.00 Ω … 99.9 Ω | | | | | | | | | | |
| | | | | Transformation ratio [3] | | | [5] | [5] | | | | | | | |
| SENSOR [6, 7] | $I_{L/Amp}$ | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 5 … 15 A | $f_N$ = 50/60 Hz | ±(\|13% rdg.\|+5d) | ±(\|5% rdg.\|+4d) | | | | I 15A | | | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|13% rdg.\|+1d) | ±(\|5% rdg.\|+1d) | | | | | | | |
| | | 1.00 … 9.99 A | 0.01 A | | | | | | | | | | | | |
| | | 10.0 … 15.0 A | 0.1 A | | | | | | | | | | | | |
| | | 1.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 150 A | | ±(\|11% rdg.\|+4d) | ±(\|4% rdg.\|+3d) | | | | II<br>150 A | | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|11% rdg.\|+1d) | ±(\|4% rdg.\|+1d) | | | | | | | |
| | | 100 … 150 A | 1 A | | | | | | | | | | | | |
| | | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 5 … 1000 mA | $f_N$ = 16.7/50/60/200/400 Hz | ±(\|7% rdg.\|+2d) | ±(\|5% rdg.\|+2d) | | | | | 1 A | | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|7% rdg.\|+1d) | ±(\|5% rdg.\|+1d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 100 mV/A | 0.05 … 10 A | | ±(\|3.4% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | 10 A | | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 0.5 … 100 A | | ±(\|3.1% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | 100 A | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 1000 A | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | 1000 A | | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|3.1% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |
| | | 100 … 999 A | 1 A | | | | ±(\|3.1% rdg.\|+1d) | ±(\|3% rdg.\|+1d) | | | | | | | |
| | | 0.0 … 99.9 mA | 0.1 mA | 1 V/A | 30 … 1000 mA | $f_N$ = 50/60 Hz | ±(\|27% rdg.\|+100d) | ±(\|3% rdg.\|+100d) | | | | | | 0.03 | |
| | | 100 … 999 mA | 1 mA | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 3 | |
| | | 0.00 … 9.99 A | 0.01 A | 100 mV/A | 0.3 … 10 A | | ±(\|27% rdg.\|+12d) | ±(\|3% rdg.\|+12d) | | | | | | 0.3 | |
| | | | 0.01 A | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 30 | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 3 … 100 A | | ±(\|27% rdg.\|+100d) | ±(\|3% rdg.\|+100d) | | | | | | 3 | |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|27% rdg.\|+11d) | ±(\|3% rdg.\|+11d) | | | | | | 300 | |
| | | 0.00 … 9.99 A | 0.01 A | 10 mV/A | 0.5 … 100 A | $f_N$ = DC/16.7/50/60/200 Hz | ±(\|5% rdg.\|+12d) | ±(\|3% rdg.\|+12d) | | | | | | | 100 A ~ |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|5% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |
| | | 0.00 … 9.99 A | 0.01 A | 1 mV/A | 5 … 1000 A | | ±(\|5% rdg.\|+50d) | ±(\|3% rdg.\|+50d) | | | | | | | 1000 A ~ |
| | | 10.0 … 99.9 A | 0.1 A | | | | ±(\|5% rdg.\|+7d) | ±(\|3% rdg.\|+7d) | | | | | | | |
| | | 100 … 999 A | 1 A | | | | ±(\|5% rdg.\|+2d) | ±(\|3% rdg.\|+2d) | | | | | | | |

[1] U > 230 V, with 2 or 3-pole adapter only
[2] $1 \cdot / 2 \cdot I_{\Delta N}$ > 300 mA and $5 \cdot I_{\Delta N}$ > 500 mA and $I_f$ > 300 mA only up to $U_N \leq$ 230 V!
[3] The transformation ratio selected at the clamp (1/10/100/1000 mV/A) must be set in the "Type" menu with the rotary switch in the "SENSOR" position.
[4] Where $R_{Eselective}/R_{Etotal}$ < 100
[5] The specified measuring uncertainties already include those of the respective current clamp.
[6] Measuring range of the signal input at the test instrument, $U_E$: 0 … 1.0 $V_{TRMS}$ (0 … 1.4 $V_{peak}$) AC/DC
[7] Input impedance of the signal input at the test instrument: 800 kΩ
[8] Up to firmware 3.4.4:where $f_N$ < 45 Hz => $U_N$ < 253 V
As of firmware 3.6.0:where $f_N$ < 45 Hz => $U_N$ < 500 V
[9] As of firmware 3.4.4: 15 mA test current only applies if the RCD is set for $I_{\Delta N}$ = 30 mA. Otherwise test current = ½ · $I_{\Delta N}$ of the preselected RCDs.
[10] DC bias only possible with PROFITEST MXTRA IQ

**Key:** d = digit(s), rdg. = reading (measured value)

### Characteristic Values, Special Measurements with PROFITEST MPRO IQ and PROFITEST MXTRA IQ

| Function | Measured Quantity | Display Range | Resolution | Test Current / Signal Frequency [5] | Measuring Range | Measuring Uncertainty | Intrinsic Uncertainty | Connections: Adapter for Test Plug PRO-RE | Connections: Adapter for Test Plug PRO-RE/2 | Connections: Current Clamps Z3512A | Connections: Current Clamps Z591B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $RE_{BAT}$ | RE, 3-pole | 0.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω<br>1.00 … 9.99 kΩ<br>10.0 … 50.0 kΩ | 0.01 Ω<br>0.1 Ω<br>1 Ω<br>0.01 kΩ<br>0.1 kΩ | 16 mA/128 Hz<br>1.6 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz | 1.00 Ω … 19.9 Ω<br>5.0 Ω … 199 Ω<br>50 Ω … 1.99 kΩ<br>0.50 kΩ … 19.9 kΩ<br>0.50 kΩ … 49.9 kΩ | ±(\|10% rdg.\|+10d) + 1 Ω | ±(\|3% rdg.\|+5d) + 0.5 Ω | 6 | | | |
| | RE, 4-pole | | | | | ±(\|10% rdg.\|+10d) | ±(\|3% rdg.\|+5d) | | | | |
| | RE, 4-pole selective with clamp meter | 0.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω<br>1.00 … 9.99 kΩ<br>10.0 … 19.9 kΩ [15]<br>10.0 … 49.9 kΩ [16] | 0.01 Ω<br>0.1 Ω<br>1 Ω<br>0.01 kΩ<br>0.1 kΩ<br>0.1 kΩ | 16 mA/128 Hz<br>16 mA/128 Hz<br>1.6 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz | 1.00 Ω … 9.99 Ω<br>10.0 Ω … 200 Ω | ±(\|15% rdg.\|+10d)<br>±(\|20% rdg.\|+10d) [10] | ±(\|10% rdg.\|+10d)<br>±(\|15% rdg.\|+10d) | 6 | | 9 | |
| | Soil resistivity (ρ) | 0.0 … 9.9 Ωm<br>100 … 999 Ωm<br>1.00 … 9.99 kΩm | 0.1 Ωm<br>1 Ωm<br>0.01 kΩm | 16 mA/128 Hz<br>1.6 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz<br>0.16 mA/128 Hz | 100 Ωm … 9.99 kΩm [12]<br>500 Ωm … 9.99 kΩm [12]<br>5.00 kΩm … 9.99 kΩm [13]<br>5.00 kΩm … 9.99 kΩm [13]<br>5.00 kΩm … 9.99 kΩm [13] | ±(\|20% rdg.\|+10d) [11] | ±(\|12% rdg.\|+10d) [11] | 6 | | | |
| | Probe clearance d (p) | 0.1 … 999 m | | | | | | | | | |
| | RE, 2 clamps | 0.00 … 9.99 Ω<br>10.0 … 99.9 Ω<br>100 … 999 Ω<br>1.00 … 1.99 kΩ | 0.01 Ω<br>0.1 Ω<br>1 Ω<br>0.01 kΩ | 30 V / 128 Hz | 0.10 … 9.99 Ω<br>10.0 … 99.9 Ω | ±(\|10% rdg.\|+5d)<br>±(\|20% rdg.\|+5d) | ±(\|5% rdg.\|+5d)<br>±(\|12% rdg.\|+5d) | | 7 | 9 | 8 |

[5] Signal frequency without interference signal
[6] PRO-RE (Z501S) adapter cable for test plug, for connecting earth probes (E-Set 3/4)
[7] PRO-RE/2 adapter cable for test plug, for connecting the E-CLIP2 generator clamp
[8] Generator clamp: E-CLIP2 (Z591B)
[9] Clamp meter: Z3512A (Z225A)
[10] Where $R_{E.sel}/R_E < 10$ or clamp meter current > 500 µA
[11] Where $R_{E.H}/R_E \leq 100$ and $R_{E.E}/R_E \leq 100$
[12] Where d = 20 m
[13] Where d = 2 m
[14] Where $Z_{L-PE} < 0.6\ \Omega$, $I_K > U_N/0.5\ \Omega$ is displayed
[15] Only where RANGE = 20 kΩ
[16] Only where RANGE = 50 kΩ or AUTO

## Reference Conditions

| | |
|---|---|
| Line voltage | 230 V ± 0.1% |
| Line frequency | 50 Hz ± 0.1% |
| Measured qty. frequency | 45 Hz …65 Hz |
| Measured qty. waveform | Sine (deviation between effective and rectified value ≤ 0.1%) |
| Line impedance angle | cos φ = 1 |
| Probe resistance | ≤ 10 Ω |
| Supply voltage | 12 V ± 0.5 V |
| Ambient temperature | + 23° C ± 2 K |
| Relative humidity | 40% … 60% |
| Finger contact | For testing potential difference to ground potential |
| Standing surface insulation | Purely ohmic |

## Power Supply

| | |
|---|---|
| Rechargeable batteries | 8 each AA 1.5 V<br>We recommend exclusive use of the included battery pack (article number: Z502H) |
| Number of measurements (standard setup with illumination) | |
| – For $R_{INS}$ | 1 measurement – 25 s pause: approx. 1100 measurements |
| – For $R_{LO}$ | Auto polarity reversal / 1 Ω (1 measuring cycle) – 25 s pause: approx. 1000 measurements |
| Battery test | Symbolic display of battery voltage **BAT** |
| Battery-saving circuit | Display illumination can be switched off. The test instrument is switched off automatically after the last key operation. The user can select the desired on-time. |
| Safety shutdown | If supply voltage is too low, the instrument is switched off, or cannot be switched on. |
| Recharging socket | Inserted rechargeable batteries can be recharged directly by connecting a charger to the recharging socket: Z502R charger |
| Charging time | Z502R charger: approx. 2 hours * |

* Maximum charging time with fully depleted batteries.
A timer in the charger limits charging time to no more than 4 hours.

## Overload Capacity

| | |
|---|---|
| $R_{ISO}$ | 1200 V continuous |
| $U_{L-PE}$, $U_{L-N}$ | 600 V continuous |
| RCD, $R_E$, $R_F$ | 440 V continuous |
| $Z_{L-PE}$, $Z_{L-N}$ | 550 V (Limits the number of measurements and pause duration. If overload occurs, the instrument is switched off by means of a thermostatic switch.) |
| $R_{LO}$ | Electronic protection prevents switching on if interference voltage is present. |
| Protection with fine-wire fuses | FF 3.15 A 10 s, Fuses blow at > 5 A |

## Electrical Safety

| | |
|---|---|
| Protection class | II |
| Nominal voltage | 230/400 V (300/500 V) |
| Test voltage | 3.7 kV, 50 Hz |
| Measuring category | CAT III 600 V or CAT IV 300 V |
| Pollution degree | 2 |
| Fuses | |
| L and N terminals | 1 cartridge fuse-link ea. FF 3.15/500G 6.3 x 32 mm |

## Electromagnetic Compatibility (EMC)

Product standard EN 61326-1

| **Interference emission** | | Class |
|---|---|---|
| EN 55022 | | A |
| **Interference immunity** | Test value | Feature |
| EN 61000-4-2 | Contact/atmos. – 4 kV/8 kV | |
| EN 61000-4-3 | 10 V/m | |
| EN 61000-4-4 | Mains connection – 2 kV | |
| EN 61000-4-5 | Mains connection – 1 kV | |
| EN 61000-4-6 | Mains connection – 3 V | |
| EN 61000-4-11 | 0.5 periods / 100% | |

## Ambient Conditions

| | |
|---|---|
| Accuracy | 0 … + 40 °C |
| Operation | –5 … + 50 °C |
| Storage | –20 … + 60 °C (without batteries) |
| Relative humidity | Max. 75%, no condensation allowed |
| Elevation | Max. 2000 m |

## Mechanical Design

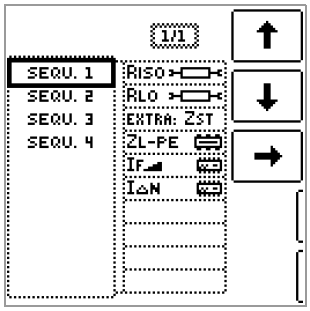
| | |
|---|---|
| Display | Multiple display with dot matrix, 128 x 128 pixels |
| Dimensions | W × L × H = 260 × 330 × 90 mm |
| Weight | Approx. 2.7 kg with batteries |
| Protection | Housing: IP 40, test probe: IP 20 per EN 60529 |

## Data Interfaces

| | |
|---|---|
| Type | USB for PC connection |
| Type | RS-232 for barcode and RFID readers |

## Special Measurements (all types)

### Automatic Test Sequence Function

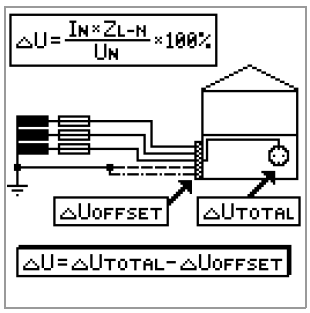



If the same sequence of tests will be run frequently (one after the other with subsequent report generation), for example as specified in the standards, it's advisable to make use of test sequences.

Automated test sequences can be compiled from manually created individual measurements with the help of the test sequence function. A test sequence consists of up to 200 individual steps, which are executed one after the other.
The test sequences are created at the PC with the help of IZYTRONIQETC software, and are then transferred to the test instrument.

Measurement parameters are also configured at the PC. However, parameters can be changed at the test instrument during the test sequence before the respective measurement is started.

### Voltage Drop Measurement (at $Z_{LN}$) – ΔU Function

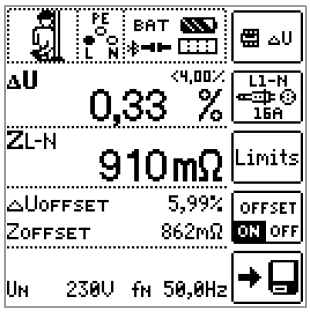



According to IEC 60364-6, voltage drop from the intersection of the distribution network and the consumer system to the point of connection of an electrical power consumer (electrical outlet or device connector terminals) should not exceed 4% of nominal line voltage.

Voltage drop calculation:

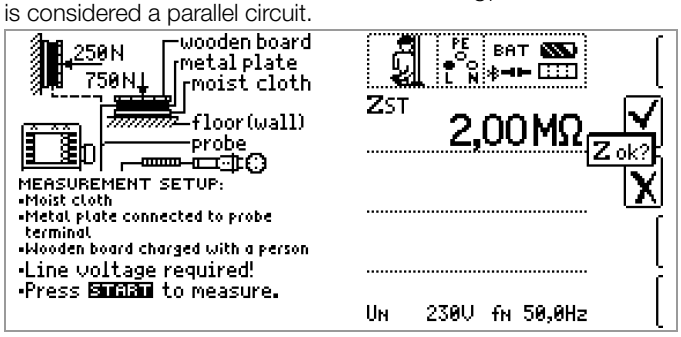
$\Delta U = Z_{L-N}$ • nominal current of the fuse

$\Delta U$ as % = $\Delta U / U_{L-N}$




### Measurement of the Impedance of Insulating Floors and Walls (standing surface insulation impedance) – $Z_{ST}$ Function

The instrument measures the impedance between a weighted metal plate and earth. Line voltage available at the measuring site is used as an alternating voltage source. The $Z_{ST}$ equivalent circuit is considered a parallel circuit.

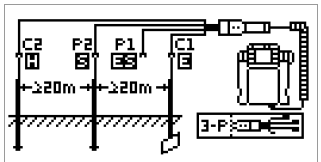



## Special Measurements PROFITEST MPRO IQ and PROFITEST MXTRA IQ

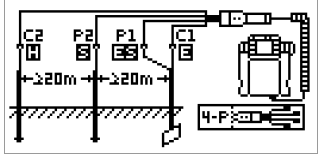
### Battery Powered Earthing Resistance Measurements, "Battery Mode"

#### Earthing Resistance $R_E$

3-wire measuring method,
probes and earth electrodes connected via PRO-RE adapter

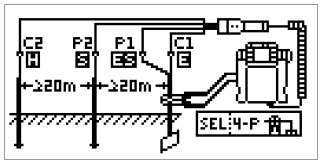



4-wire measuring method,
probes and earth electrodes connected via PRO-RE adapter



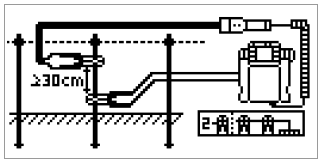

#### Selective Earthing Resistance $R_E$

(4-wire measuring method)
Current clamp sensor connected directly, probes and earth electrodes connected via PRO-RE adapter



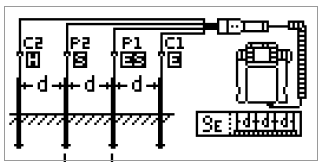

#### Earth Loop Resistance $R_{Eloop}$

2-clamp measurement:
Current clamp sensor directly connected,
current clamp transformer connected via PRO-RE/2 adapter



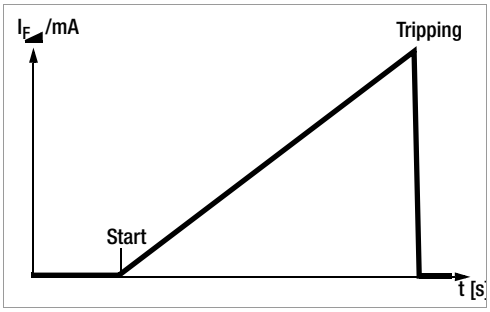

#### Soil Resistivity $R_{ho}$

Probes connected via PRO-RE



## Special Measurements
## PROFITEST MTECH+ IQ, PROFITEST MXTRA IQ

### Tripping Test for Type B, AC/DC Sensitive RCDs
### with Rising DC Residual Current and Measurement of Tripping Current




With the selector switch in the $I_F$ position, slowly rising current flows via N and PE. The momentary measured current value is continuously displayed. When the RCCB is tripped, the last measured current value is displayed. A greatly reduced rate of increase is used for delayed RCCBs (type S).

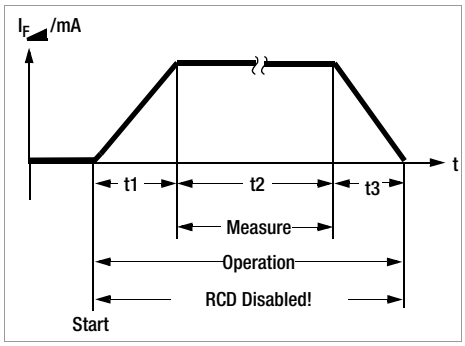
### Tripping Test for Type B, AC/DC Sensitive RCDs
### with Constant DC Residual Current and Measurement of Tripping Time

With the selector switch set to the respective nominal residual current, twice the selected nominal current flows via N and PE. Time to trip is measured for the RCCB and displayed.

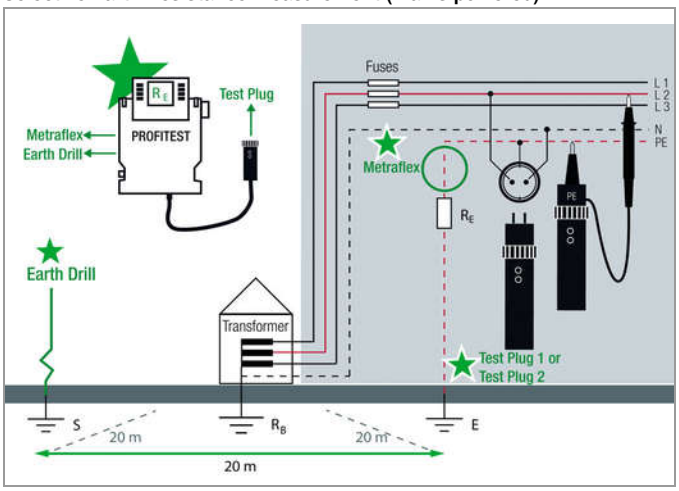
### Loop Resistance Measurement with Suppression of RCD Tripping

The test instruments make it possible to measure loop impedance in TN systems with type A, F and AC RCCBs (10, 30, 100, 300, 500 mA nominal residual current).

The respective test instrument generates a DC residual current to this end, which saturates the RCCB's magnetic circuit.
The test instrument then superimposes a measuring current which only demonstrates half-waves of like polarity. The RCCB is no longer capable of detecting this measuring current and is consequently not tripped during measurement.



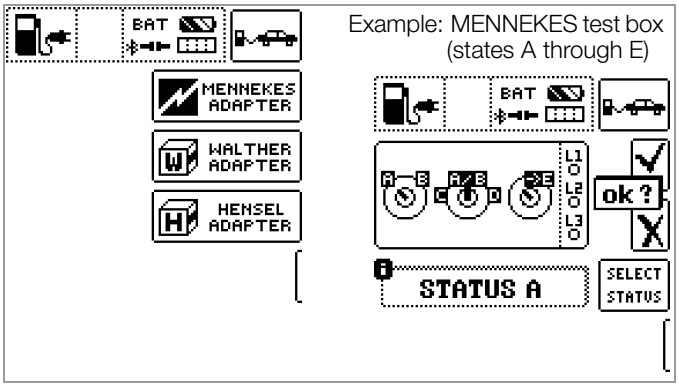

### Selective Earth Resistance Measurement (mains powered)




## Special Measurements
## PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ

### Checking the Operating States of Electric Vehicles
### at Charging Stations per IEC 61851

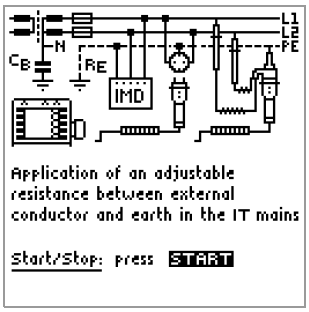
In combination with an adapter, the operating state of an electric vehicle can be tested at charging points in accordance with IEC 61851. The adapter is used to simulate the various operating states of a fictitious electric vehicle connected to a charging station.




## Special Measurements
## PROFITEST MXTRA IQ

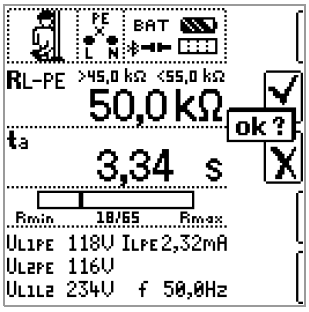
### Testing of Insulation Monitoring Devices (IMDs)

Insulation monitors are used in power supplies for which a single-pole earth fault may not result in failure of the power supply, for example in operating rooms or photovoltaic systems.

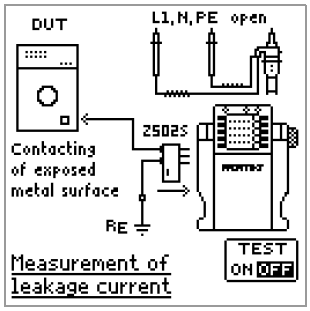



Insulation monitors can be tested with the help of this special function. After pressing the start button, an adjustable insulation resistance is activated between one of the two phases of the IT system to be monitored and ground to this end. This resistance can be changed in the manual sequence mode with the help of the softkeys, and it can be varied automatically from $R_{max}$ to $R_{min}$ in the automatic operating mode.

Time during which the momentary resistance value prevails at the system until the next change in value is displayed. The IMD's display and response characteristics can be subsequently evaluated and documented with the help of the softkeys.



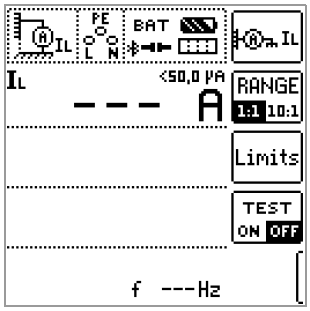
### Leakage Current Measurement with PRO-AB Adapter



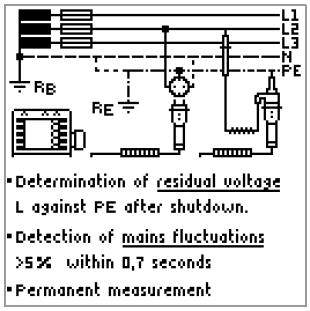

Measurement of continuous leakage and patient auxiliary current per IEC 62353 / IEC 601-1 / EN 60 601-1 (Medical electrical equipment – General requirements for basic safety) is possible with the help of the PRO-AB leakage current measuring adapter used as an accessory with the PROFITEST MXTRA IQ test instrument.

As specified in the standards listed above, current values of up to 10 mA can be measured with this measuring adapter.

In order to be able to fully cover this measuring range using the measurement input provided on the test instrument (2-pole current clamp input), the measuring instrument is equipped with range switching including transformation ratios of 10:1 and 1:1.



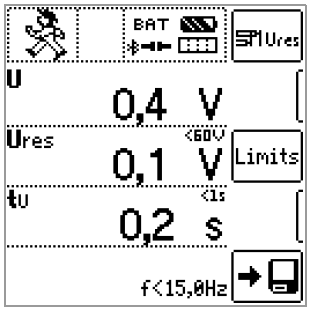

### Determination of Residual Voltage / Detection of Mains Fluctuation




EN 60204 specifies that after switching supply power off, residual voltage between L and PE must drop to a value of 60 V or less within 5 seconds at all accessible, active components of a machine to which a voltage of greater that 60 V is applied during operation.

With the PROFITEST MXTRA IQ, testing for the absence of voltage is performed as follows by means of a voltage measurement which involves measuring discharge time tu:

In the case of voltage dips of greater than 5% of momentary line voltage (within 0.7 seconds), the stopwatch is started and momentary undervoltage is displayed as Ures after 5 seconds and indicated by the red $U_L/R_L$ diode.

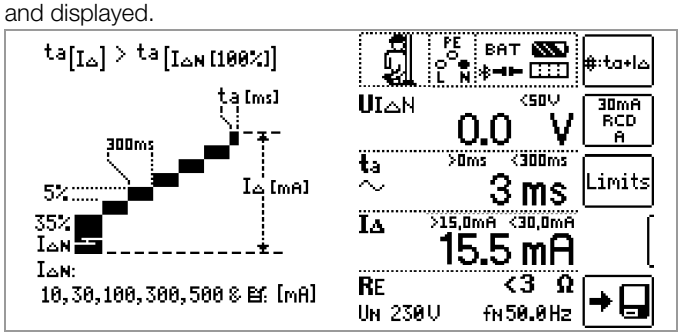



### Intelligent Ramp

The advantage of this measuring function in contrast to individual measurement of $I_{\Delta N}$ and $t_A$ is the simultaneous measurement of breaking time and breaking current by means of a test current which is increased in steps, during which the RCD is tripped only once.

The intelligent ramp is subdivided into time segments of 300 ms each between the initial current value (35% $I_{\Delta N}$) and the final current value (130% $I_{\Delta N}$). This results in a gradation for which each step corresponds to a constant test current which is applied for no longer than 300 ms, assuming that tripping does not occur.

And thus both tripping current and tripping time are measured and displayed.

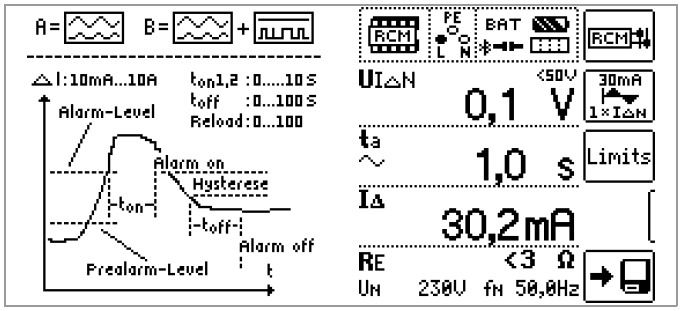



### Testing of Residual Current Monitoring Devices (RCMs)

Residual current monitors (RCMs) monitor residual current in electrical systems and display it continuously. As is also the case with residual current devices, external switching devices can be controlled in order to shut down supply power in the event that a specified residual current value is exceeded. However, the advantage of an RCM is that the user is informed of fault current within the system before shutdown takes place.

As opposed to individual measurement of $I_{\Delta N}$ and $t_A$, measurement results must be evaluated manually in this case.

If an RCM is used in combination with an external switching device, the combination must be tested as if it were an RCD.



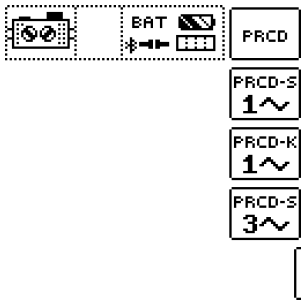
**Test Sequences for Documenting Fault Simulations at type S and K PRCDs with the Optional PROFITEST PRCD Adapter**

- 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
- Measurement of time to trip using the test instrument's $I_{\Delta N}$ function
- Varistor test for PRCD-K:
  measurement via ISO ramp

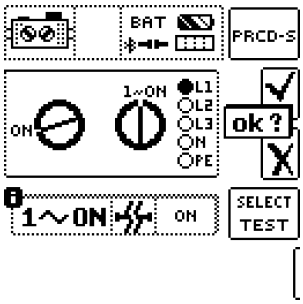
Further information is available in the data sheet for the PROFITEST PRCD.




Selecting the PRCD to be Tested:




Sample Simulation, Interruption:



# Accessories

## Report Generating Accessories

See also separate “ID systems” data sheet

**Barcode Profiscanner RS232 (Z502F)**

Barcode reader and scanner for RS-232 connection to the test instrument for identifying systems, electrical circuits and operating equipment.

Supported barcodes: EAN13, CODE 39, CODE 128 and 2D codes

(2D code capability including QR codes as of serial number G15 – approx. August 2015)



**Barcode and Label Printer for USB Connection to a PC (Z721E)**

Barcode/label printer for connection to a PC for self-adhesive, smudge-proof barcode labels – for identifying devices and system components. Devices and system components can be logged by our test instrumens, and acquired measured values can be allocated to them with the scanner.




**SCANBASE RFID Reader for Connection to the RS-232 Port at the Tester (Z751G)**

The SCANBASE RFID is used to identify tools and equipment: The RFID reader scans the code and forwards it to our test instruments in order to unequivocally assign the measured values and test results to a device under test.



The SCANBASE RFID is preprogrammed to read the following RFID tags:

| Article no. | Frequency | Standard | Layout | Quantity per Package |
|---|---|---|---|---|
| Z751R | 13.56 MHz | ISO 15693 | Dia. approx. 22 mm, self-adhesive | 500 pieces |
| Z751S | 13.56 MHz | ISO 15693 | Dia. approx. 30 × 2 mm with 3 mm hole | 500 pieces |
| Z751T | 13.56 MHz | ISO 15693 | Pigeon ring, dia. approx. 10 mm | 250 pieces |

## Power Supply Accessories

**Master Battery Pack (Z502H)**



**Charger (Z502R)**



With Angled Barrel Plug

## Accessory Plug Inserts and Adapters

**PRO-HB Test Probe and Measuring Adapter Holder (Z501V)**



**Country-Specific Plug Inserts**



GTZ3228000R0001

- PRO-Schuko (GTZ3228000R0001) for Germany: earth contact plug
- PRO-W (Z503A) for Germany: angled earth contact plug
- PRO-W II (Z503V) for Germany: angled earth contact plug with PE socket
- PRO-GB/USA (Z503B)
- PRO-CH (GTZ3225000R0001)




**Test Tips, Probe Set (Z503F)**

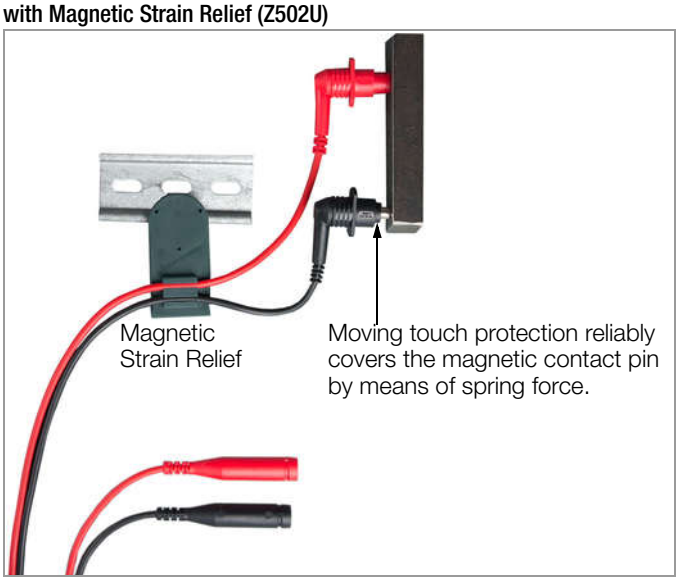
Length: 68 mm, diameter: 2.3 mm



**PRO-PE Clip – Flat Test Clip for Busbars (Z503G)**



### Magnetic Measuring Probes (patented) with Magnetic Strain Relief (Z502U)




### Safety Clip (Z503W)



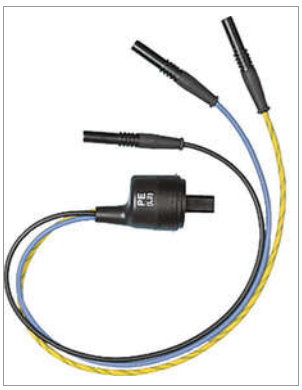
### Plug Inserts for PE and Other Similar Measurements



With 4-wire technology
CAT IV, 300 V

- PRO-RLO-II (Z501P)
  Cable length: 10 m
- PRO-RLO 20 (Z505F)
  Cable length: 20 m
- PRO-RLO 50 (Z505G)
  Cable length: 50 m

### PRO-UNI-II Plug Insert (Z501R)



3 connector cables for any connection standards
CAT IV, 300 V

### 5-Pole 3-Phase Adapter



3-phase adapters

- A3-16 (GTZ3602000R0001),
- A3-32 (GTZ3603000R0001) and
- A3-63 (GTZ3604000R0001)

permit trouble-free connection of test instruments to 5-pole CEE outlets The three variants differ with regard to plug size, which corresponds respectively to 5-pole CEE outlets with current ratings of 16, 32 and 63 A. Phase sequence is indicated with lamps at all three variants. Testing the effectiveness of safety measures is conducted via five 4 mm sockets with touch protection.

### 7-Pole 3-Phase Adapter

**A3-16 Shielded (Z513A)**




**A3-32 Shielded (Z513B)**




Shielded A3-16 and A3-32 three-phase adapters are used for trouble-free connection of test instruments to 7-pole CEE outlets.

The two variants differ with regard to plug size, which corresponds respectively to 7-pole CEE outlets with current ratings of 16 and 32 A.

Testing the effectiveness of safety measures is conducted via seven 4 mm sockets with touch protection.

### VARIO Plug Adapter Set (Z500A)



Three self-retaining test probes with touch protection for the connection of measurement cables with 4 mm banana plugs, or with touch protected plugs for sockets with an opening of 3.5 mm to 12 mm, e.g. CEE or Perilex sockets etc.

For example, the test probes also fit the square PE jacks on Perilex sockets. Maximum allowable operating voltage: 600 V per IEC 61010.

### 3-Phase Test Adapter for PROFITEST REMOTE (M514R)
For PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ




For measuring loop and mains impedance, as well as insulation resistance, without the inconvenience of replugging, swapping etc.

### PRO-AB Leakage Current Measuring Adapter (Z502S)
For PROFITEST MXTRA IQ




Input current:
0 … 10 mA
Input impedance:
1 kΩ ±0.5%
Output voltage:
10:1: 0 … 1 V (0.1 V/mA)
1:1: 0 … 10 V (1 V/mA)
Output impedance: 10 kΩ

### ISO Calibrator 1 (M662A)




Calibration adapter for rapid, efficient testing of the accuracy of measuring instruments for insulation resistance and low-value resistors

### KS24 Cable Set (GTZ3201000R0001)



The KS24 cable set includes a 4 m long extension cord with a permanently attached test probe at one end and a contact protected socket at the other end, as well as an alligator clip which can be plugged onto the test probe.

### Telescoping Rods TELEARM 120 (Z505C) and TELEARM 180 (Z505D)



### TELEARM Case (Z505E)




### 1081 Floor Probe (GTZ3196000R0001)



The 1081 floor probe makes it possible to measure the resistance of insulating floors in accordance with IEC 60364-6 and EN 1081.



### Current Clamp Sensor WZ12C (Z219C)

Current clamp sensor for leakage current,
selectable measuring ranges:
1 mA … 15 A, 3%
and 1 A … 150 A, 2%
Transformation ratios:
1 mV/mA, 1 mV/A

### METRAFLEX P300 (Z502E)



Flexible current clamp sensor for selective earthing resistance measurement
3/30/300 A,
1 V/100 mV/10 mV/A

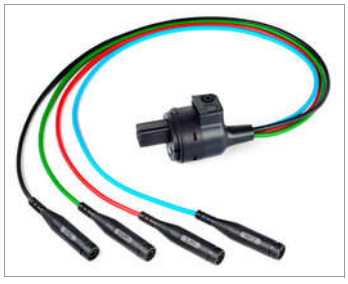
## Earth Measurement Accessories

### PRO-RE/2 Clamp Adapter (Z502T)



Adapter which is mounted to the test plug allowing for connection of the E-Clip 2 generator clamp for 2-clamp or ground-loop earthing resistance measurement.
2-clamp or ground loop measurement is thus made possible.

### PRO-RE Adapter (Z501S)



Earth electrodes, auxiliary earth electrodes, probe and auxiliary probe are connected to the tester via the banana plug sockets, and thus via the adapter which is mounted to the test plug.

### E- CLIP 2 Clamp Generator (Z591B)



Measuring range: 0.2 A … 1200 A
Measuring category: 600 V CAT III
Max. cable diameter: 52 mm
Transformation ratio: 1000A/1A
Frequency range:
40 Hz … 5 kHz
Output signal: 0.2 mA … 1.2 A
Equipped with laboratory safety plug inputs

### AC Current Clamp Sensor (Z3512A)



Switchable measuring ranges:
1 mA … 1/100/1000 A~
Transmission ratios:
1 V/A, 100 mV/A, 10 mV/A; 1 mV/A

### TR25II Cable Reel (Z503X)




25 m measurement cable coiled onto a plastic reel. Connection to the inside end of the cable is made possible with two sockets integrated into the reel. The other end is equipped with a banana plug.
Cable resistance can be compensated for with the rotary selector switch in the $R_{LO}$ position.

### TR50II Cable Reel (Z503Y)




50 m measurement cable coiled onto a plastic reel. Connection to the inside end of the cable is made possible with two sockets integrated into the reel. The other end is equipped with a banana plug.
Cable resistance can be compensated for with the rotary selector switch in the $R_{LO}$ position.

### SP500 Earth Drill (Z503Z)



### E-SET PROFESSIONAL (Z592Z)



### E-SET BASIC (Z593A)




## Accessory Cases, Trolleys and Pouches

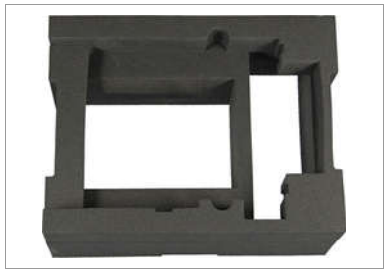
### SORTIMO L-BOXX GM (Z503D)




Plastic system case, outside dimensions:
W × H × D
450 × 255 × 355 mm

Z503E foam insert for test instrument and accessories must be ordered separately, see below.

### Foam Insert for SORTIMO L-BOXX GM (Z503E)



# PROFITEST MASTER IQ SERIES
# PROFITEST MTECH+ IQ, MPRO IQ, MXTRA IQ
## IEC 60364-6, EN 50110-1

**Profi-Case (Z502W)**




Outside dimensions:
H × W × D
390 × 590 × 230 mm

**E-CHECK Case (Z502M)**




Outside dimensions:
H × W × D
390 × 590 × 230 mm

Sample Content



**F2000 Universal Carrying Pouch (Z700D)**



Outside dimensions:
W × H × D
380 × 310 × 200 mm
(without buckles, handle or carrying strap)

**F2020 Large Universal Carrying Pouch (Z700F)**



Outside dimensions:
W × H × D
430 × 310 × 300 mm
(without buckles, handle or carrying strap)

**Trolley for Profi-Case (Z502W) and E-CHECK Case (Z502N)**

Folded delivery dimensions: 395 × 150 × 375 mm




**PROFITEST MASTER Ever-Ready Case (Z502X)**




Back

Front with Test Instrument
(test instrument not included)

## E-Mobility Accessories

**PROFITEST EMOBILITY (M513R)**

Adapter for standards-compliant testing of single and 3-phase, mode 2 and 3 charging cables with simulation of faults in accordance with DIN EN 50678 / DIN EN 50699 and the manufacturer's specifications




- Testing of mode 2 and 3, single and 3-phase charging cables
- 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 EN 50678 / DIN EN 50699 with the PROFITEST MXTRA IQ / PROFITEST MTECH+ IQ
- Tripping test with nominal residual current and measurement of time to trip with the PROFITEST MXTRA IQ / PROFITEST MTECH+ IQ
- Evaluation and documentation of individual test steps with the PROFITEST MXTRA IQ / PROFITEST MTECH+ IQ

**Test Adapter for Electric Charging Points (single/3-phase, type 2)**

Single and 3-phase test adapter with type 2 plug for testing the effectiveness of protective measures at electric charging points:

– METRALINE PRO-TYP EM I (Z525F)
– METRA,PRO-TYP EM III (Z525H): with earthing contact socket and interchangeable test plug



Z525F



Z525G



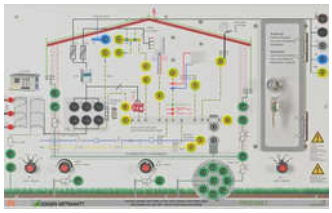
Z525H

- Vehicle simulation (CP): Vehicle states A through E are selected with a rotary switch.
- Cable simulation (PP): The various codings for charging cables with 13, 20, 32 and 63 A, as well as "no cable connected", can be simulated with the help of a rotary switch.
- Fault simulation: Simulation of a short-circuit between CP and PE by means of a rotary switch
- Indication of phase voltages via LEDs: Depending on the charging station, either one or three phases can be active.
- Testing of electric charging stations with permanently attached charging cable by means of an extended CP test pin

## Fault Simulation Accessories

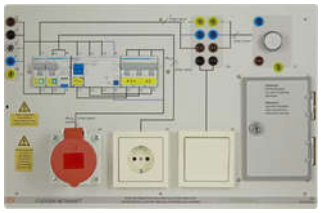
**PROFSIM 1 (M560A)** **PROFSIM 2 (M560B)**

Installation board with option for fault simulation for measurements per IEC 60364-6 and EN 50110 for training and project work.



M560A

Service line with main grounding busbar, external and internal lightning protection, earth measurements, TN/TT systems



M560B

Sub-distribution branch with installation circuits, RCD type B, RCBO (FI/LS)

Further information regarding accessories can be found:

- In our Measuring Instruments and Testers catalog
- On the Internet at www.gossenmetrawatt.com

# PROFITEST MASTER IQ SERIES
# PROFITEST MTECH+ IQ, MPRO IQ, MXTRA IQ
# IEC 60364-6, EN 50110-1

## Scope of Delivery

Standard scope of delivery for PROFITEST MASTER IQ series:

1 Test instrument
1 Earthing contact plug insert, country-specific (PRO-SCHUKO / GTZ3228000R0001)
1 2-pole measuring adapter and cable for expansion into a 3-pole adapter (PRO-A3-II / Z501O)
2 Alligator clips
1 Shoulder strap
1 Compact battery pack (Z502H)
1 Charger (Z502R)
1 USB cable
1 DAkkS calibration certificate
1 Condensed operating instructions
1 IZYTRONIQ BUSINESS Starter software (with PROFITEST MPRO IQ) or IZYTRONIQ CLOUD (with PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ) **

* Set of complete operating instructions available on the Internet for download from www.gossenmetrawatt.com
** Download from Internet, registration certificate included

Refer to the order information below for further accessories and instrument sets with additional accessories for specific testing purposes.

## Order Information

Test instruments from the PROFITEST MASTER IQ series can be ordered with the standard scope of delivery (see above) or as instrument sets. Sets consist of the test instrument and extended accessories which are adapted to a specific test purpose.

Refer to the scope of delivery on page 3 with regard to the differences between the instrument variants

Accessories can also be ordered separately. Data sheets are available separately for some products, in which additional information can be found. These are indicated with a [D)] in the table.

Each product is identified with its article number, by means of which it can also be ordered.

Note concerning test instrument article numbers:
The instrument's individual number can be found on the rating plate. This cannot be used for ordering – only the article numbers shown below for instruments with standard scope of delivery or for instrument sets can be used when placing orders.

**Test Instruments – Standard Scope of Delivery**

| Designation | Description / Scope of Delivery | Article Number |
|---|---|---|
| PROFITEST MXTRA IQ | PROFITEST MXTRA IQ test instrument (M534M) with standard scope of delivery | M535M |
| PROFITEST MTECH+ IQ | PROFITEST MTECH+ IQ(M534L) with standard scope of delivery | M535L |
| PROFITEST MPRO IQ | PROFITEST MPRO IQ test instrument (M534C)with standard scope of delivery | M535C |

**Test Instrument Sets**

| Designation | Description | Article Number |
|---|---|---|
| Starterpaket XTRA IQ | PROFITEST MXTRA IQ test instrument (M534M)<br>with standard scope of delivery and<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– SORTIMO L-BOXX GM (Z503D)<br>– Foam SORTIMO L-BOXX, Profitest M (Z503E)<br>– IZYTRONIQ BUSINESS ADVANCED | M536K |
| Meisterpaket XTRA IQ | PROFITEST MXTRA IQ test instrument (M534M)<br>with standard scope of delivery and<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– PRO-W (Z503A)<br>– PRO-RLO-II (Z501P)<br>– Profi-Case (Z502W)<br>– IZYTRONIQ BUSINESS PROFESSIONAL | M536L |
| Profipaket XTRA IQ | PROFITEST MXTRA IQ test instrument (M534M)<br>with standard scope of delivery and<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– PRO-W (Z503A)<br>– E-CLIP 2 (Z591B)<br>– Z3512A (Z225A)<br>– PRO-RE-2 (Z502T)<br>– Profi-Case (Z502W)<br>– IZYTRONIQ BUSINESS PROFESSIONAL | M536M |
| MEDpaket XTRA IQ | PROFITEST MXTRA IQ test instrument (M534M)<br>with standard scope of delivery and<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– PRO-W (Z503A)<br>– PRO-RLO-II (Z501P)<br>– PRO-AB (Z502S)<br>– Profi-Case (Z502W)<br>– IZYTRONIQ BUSINESS ADVANCED | M536T |
| Meisterpaket TECH+ IQ | PROFITEST MTECH+ IQ test instrument (M534L)<br>with standard scope of delivery and<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– TR50II (Z503Y)<br>– PRO-A3 II (Z501O)<br>– PRO-W (Z503A)<br>– PRO-RLO-II (Z501P)<br>– SP500 (Z503Z)<br>– Profi-Case (Z502W)<br>– IZYTRONIQ BUSINESS PROFESSIONAL | M536P |
| E-Mobility-Paket MTECH+ IQ | PROFITEST MTECH+ IQ test instrument (M534L)<br>with standard scope of delivery and<br>– METRALINE PRO-TYP EM II (Z525G)<br>– PRO-A3 II (Z501O)<br>– PRO-RLO 20 (Z505f)<br>– SORTIMO L-BOXX GM (Z503D)<br>– Foam SORTIMO L-BOXX, Profitest M (Z503E)<br>– Protective gloves (Z500Z) | M536R |
| PROFITEST MTECH+ IQ EV Basic Paket | PROFITEST MTECH+ IQ test instrument (M534L)<br>with standard scope of delivery and<br>– METRALINE PRO-TYP EM I (Z525F)<br>– VARIO Plug Adapter Set (Z500A)<br>– Probe Set (Z503F)<br>– PRO-A3 II (Z501O)<br>– PRO-RLO 20 (Z505f)<br>– SORTIMO L-BOXX GM (Z503D)<br>– Foam SORTIMO L-BOXX, Profitest M (Z503E) | M536S |

### Report Generating Accessories

| Designation | Description | Article Number |
|---|---|---|
| Profiscanner-RS-232 barcode scanner D) | Barcode scanner for RS-232 connection with coil cable (approx. 1 m long) | Z502F |
| SCANBASE RFID D) | RFID reader/writer | Z751G |

### Power Supply Accessories

| Designation | Description | Article Number |
|---|---|---|
| Master Battery Pack | 8 LSD NiMH rechargeable batteries with reduced self-discharging (AA), with sealed cells | Z502H |
| Charger | Broad-range charger for charging the Master Battery Pack in the test instrument (Z502H)<br>Input: 100 … 240 $V_{AC}$<br>Output: 16.5 $V_{DC}$, 1 A | Z502R |

### Accessory Cases and Trolleys

| Designation | Description | Article Number |
|---|---|---|
| PROFITEST MASTER ever-ready case | Ever-ready case with external pockets for accessories | Z502X |
| E-CHECK case | Aluminum case for test instrument and accessories | Z502M |
| Trolley for E-CHECK case | Trolley to which the E-CHECK case can be mounted | Z502N |
| F2000 D | Universal carrying pouch | Z700D |
| F2020 D | Large universal carrying pouch | Z700F |
| SORTIMO L-BOXX GM | Plastic system case | Z503D |
| Foam SORTIMO L-BOXX Profitest M | Foam insert for SORTIMO L-BOXX GM with compartment for test instrument | Z503E |
| Profi-Case | Profi-Case printed with content layout for sets including test instrument plus accessories, with trolley mount | Z502W |

### Accessories – Plug Inserts, Plugs, Measuring Attachments etc.

| Designation | Description | Article Number |
|---|---|---|
| PRO-HB | Holder for test probes and measuring adapter | Z501V |
| PRO-Schuko | Plug insert, earthing contact plug: D, A, NL, F etc. | GTZ3228000R0001 |
| PRO-W | Plug insert, angled earthing contact plug: D, A, NL, F etc. | Z503A |
| PRO-W II | Plug insert, angled earthing contact plug with PE socket | Z503V |
| PRO-CH | Plug insert per SEV: CH | GTZ3225000R0001 |
| PRO-GB/USA | Plug insert with adapter for GB and USA | Z503B |
| Probe set | Test probe set (red/black)<br>CAT III 600 V, 1 A<br>Length: 68 mm, diameter: 2.3 mm | Z503F |
| Safety Clip | Safety clips (red/blue) with hook, CAT IV 1 kV, 20 A | Z503W |
| PRO-PE Clip | Flat test clip for contacting busbars quickly and safely. Good contact at the front and back of the busbar thanks to time-tested contact blades. Rigid 4 mm socket in the handle, suitable for the insertion of spring-loaded 4 mm plugs with rigid insulating sleeve. CAT IV 1000 V, 32 A | Z503G |
| Magnetic Test Probes | 2 touch-guarded magnetic test probes, with magnetic holder, 4 mm sockets, CAT III 1000 V, 4 A | Z502Z |
| PRO-RLO-II | Plug insert for PE and other similar measurements, 2-wire measuring technology, cable length: 10 m, CAT I300 V, 16 A | Z501P |
| PRO-RLO 20 | Measuring adapter for PE and other similar measurements, cable length: 20 m, CAT III 600 V | Z505F |
| PRO-RLO 50 | Measuring adapter for PE and other similar measurements, cable length: 50 m, CAT III 600 V | Z505G |
| PRO-UNI-II | Plug insert with 3 connector cables for any connection standards, CAT IV 300 V, 16 A | Z501R |
| Z500A | VARIO-STECKER-Set (3 self-retaining, contact protected test probes for the connection of measurement cables with 4 mm banana plugs, or with contact protected plugs for sockets with an opening of 3.5 mm to 12 mm, e.g. CEE or Perilex sockets) 600 V per IEC 61010 | Z500A |

### Accessories – Extensions

| Designation | Description | Article Number |
|---|---|---|
| KS24 | Extension cord, 4 m | GTZ3201000R0001 |
| TELEARM 120 D) | Telescoping rod for RLO and RINS measurements, CAT III 600 V / CAT IV 300 V, 1 A, retracted: 53.5 cm, extended: 120 cm, 190 g | Z505C |
| TELEARM 180 D) | Telescoping rod for RLO and RINS measurements, CAT III 600 V / CAT IV 300 V, 1 A, retracted: 73.5 cm, extended: 180 cm, 250 g | Z505D |
| TELEARM case | Pouch for TELEARM 120/180<br>L × W: 920 × 170 mm | Z505E |

### Accessory Test Probes and Sensors

| Designation | Description | Article Number |
|---|---|---|
| Probe 1081 | Triangular probe for floor measurements in accordance with EN 1081 and IEC 60364 | GTZ3196000R0001 |
| WZ12C D | Current clamp sensor for leakage current, switchable: 1 mA ¼ 15 A, 3% and 1 A ¼ 150 A, 2% | Z219C |
| METRAFLEX P300 | Flexible AC current sensor, 3/30/300 A, 1 V/100 mV/10 mV/A, with batteries, probe length: 45 cm | Z502E |

### Accessory Adapters

| Designation | Description | Article Number |
|---|---|---|
| PROFITEST REMOTE | 3-phase for PROFITEST MTECH+ IQ and PROFITEST MXTRA IQ (instrument not included) | M514R |
| PRO-A3-II | 2 and 3-pole measuring adapter for 3-phase and rotating-field systems, with coil cables,<br>300 V/1 A CAT IV with protective cap<br>600 V/1 A CAT III with protective cap<br>600 V/16 A CAT II without protective cap | Z501O |
| PRO-A3-II NCC | 2 and 3-pole measuring adapter for 3-phase and rotating-field systems, with straight cables (10 m),<br>300 V/1 A CAT IV with protective cap<br>600 V/1 A CAT III with protective cap<br>600 V/16 A CAT II without protective cap | Z503C |
| A3-16 | 5-pole 3-phase adapter<br>For 16 A CEE outlets | GTZ3602000R0001 |
| A3-32 | 5-pole 3-phase adapter<br>For 32 A CEE outlets | GTZ3603000R0001 |
| A3-63 | 5-pole 3-phase adapter<br>For 63 A CEE outlets | GTZ3604000R0001 |
| A3-16 Shielded | 7-pole 3-phase adapter<br>Shielded for 32 A CEE outlets, 16 A, CAT III 300 V, 10 A | Z513A |
| A3-32 Shielded | 7-pole 3-phase adapter<br>Shielded for 32 A CEE outlets, 32 A, CAT III 300 V, 10 A | Z513B |

| Designation | Description | Article Number |
|---|---|---|
| ISO Calibrator 1 | Calibration adapter for testing the accuracy of measuring instruments for insulation resistance and low-value resistance | M662A |
| PRO-AB | Leakage current measuring adapter as upstream device for PROFITEST MXTRA IQ (instrument not included) | Z502S |

### Earth Measurement Accessories

| Designation | Description | Article Number |
|---|---|---|
| PRO-RE/2 | Measuring adapter for connecting a second clamp (generator clamp), permits 2-clamp measuring method (ground loop measurement) | Z502T |
| PRO-RE | Connection adapter for earthing accessories for 3/4-wire measurement and selective earthing resistance measurement | Z501S |
| E-CLIP 2 | Generator clamp for 2-clamp measuring method (ground loop measurement) Transformation ratio: 1000 A/1 A Current measuring range: 0.2 A … 1200 A Output signal: 0.2 mA … 1.2 A | Z591B |
| Z3512A [D] | Current clamp sensor for selective earth measurement and as clamp meter for 2-clamp measuring method (ground loop measurement), switchable measuring ranges: 0 … 1/100/1000 A~ AV~ ± (0.7% … 0.2%) | Z225A |
| TR25II | Cable reel with 25 m measurement cable for low-resistance and earth measurements | Z503X |
| TR50II | Cable reel with 50 m measurement cable for low-resistance and earth measurements | Z503Y |
| SP500 earth drill | Earth drill, 50 cm long | Z503Z |
| E-SET PROFESSIONAL | Earth Measurement Accessories Consisting of one carrying pouch, four 500 mm earth drills, one 40 m blue measurement cable on cable reel with hand strap, one 20 m red measurement cable on cable reel with hand strap, one 5 m black measurement cable, one 5 m green measurement cable, one black test clamp with 4 mm socket, one green test clamp with 4 mm socket, one hammer, one reel tape measure, one dust cloth, one pad with pen | Z592Z |
| E-SET BASIC | Accessories for earth measurement including one rugged outdoor carrying pouch, two 420 mm earth drills, one 40 m blue measurement cable on cable reel with hand strap (1 kV CAT III), one 20 m red measurement cable on cable reel with hand strap (1 kV CAT III), one 2 m black measurement cable (1 kV CAT IV), one 2 m green measurement cable (1 kV CAT IV), one 30 cm red measurement cable (1 kV CAT IV), one 30 cm blue measurement cable (1 kV CAT IV), one black test clamp with 4 mm socket, one green test clamp with 4 mm socket | Z593A |
| E-Set 5 | Earth measurement case consisting of imitation leather case including one reel with 25 m measurement cable, two reels with 50 m measurement cable each, three 0.5 m measurement cables, one 2 m measurement cable, one test clamp, four 350 mm earth drills, one dust cloth, two pads with forms | Z590B |
| PROFITEST PRCD [D)] | Test adapter for testing portable safety switches (types PRCD-K and PRCD-S) with the help of the PROFITEST MXTRA IQ (instrument not included) | M512R |

### E-Mobility Accessories

| Designation | Description | Article Number |
|---|---|---|
| PROFITEST EMOBILITY | Test adapter for testing of mode 2 and 3, single and 3-phase charging cables | M513 |
| METRALINE PRO-TYP EM I | Single and 3-phase test adapter for testing the effectiveness of protective measures at electric charging points, simulation of fictitiously connected electric vehicles and simulation of current-carrying capacity of cord sets per IEC 61851-1, measurement inputs: 4 mm safety sockets for L1, L2, L3, N and PE for the test instrument, CP socket | Z525F |
| METRALINE PRO-TYP EM II | Single and 3-phase test adapter for testing the effectiveness of protective measures at electric charging points, simulation of fictitiously connected electric vehicles and simulation of current-carrying capacity of cord sets per IEC 61851-1, measurement inputs: 4 mm safety sockets for L1, L2, L3, N, PE and earthing contact socket for the test instrument, CP socket | Z525G |
| METRALINE PRO-TYP EM III | Single and 3-phase test adapter for testing the effectiveness of protective measures at electric charging points, simulation of fictitiously connected electric vehicles and simulation of current-carrying capacity of cord sets per IEC 61851-1, measurement inputs: 4 mm safety sockets for L1, L2, L3, N, PE and earthing contact socket for the test instrument, CP socket, interchangeable type 2 test plug | Z525H |

### Fault Simulation Accessories

| Designation | Description | Article Number |
|---|---|---|
| PROFISIM 1 | Installation board with option for fault simulation for measurements per IEC 60364-6 and EN 50110, service line with main grounding busbar, external and internal lightning protection, earth measurements, TN/TT systems | M560A |
| PROFISIM 2 | Installation board with option for fault simulation for measurements per IEC 60364-6 and EN 50110, Sub-distribution branch with installation circuits, RCD type B, RCBO (FI/LS) | M560B |

# PROFITEST MASTER IQ SERIES
# PROFITEST MTECH+ IQ, MPRO IQ, MXTRA IQ
## IEC 60364-6, EN 50110-1

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