

METRALINE RCD^{CHECK} RCD Test Instrument

3-349-693-03
4/6.13

Testing of residual current devices (RCDs)

- Measurement of touch voltage without tripping the RCCB.
Contact voltage is measured with reference to nominal residual current using $\frac{1}{3}$ of the nominal residual current value.
- Tripping test with nom. residual current, time to trip measurement

Special tests for equipment and RCDs

- Testing of equipment and RCDs with rising residual current including indication of tripping current
- Testing of RCDs, $I_{\Delta N} = 10, 30, 100, 300$ and 500 mA
- Testing RCDs with $\frac{1}{2} \cdot I_{\Delta N}, 1 \cdot I_{\Delta N}, 2 \cdot I_{\Delta N},$
($5 \cdot I_{\Delta N}$ up to 100 mA nominal current)
- Testing RCDs with half-waves (pulsating direct current) for determining time to trip and tripping current

Testing of special RCDs

- selective **S**, type AC, type A

Measurement of line voltage and fault loop impedance



Touch voltage



Time to trip



Tripping current



Features

- Digital display, backlit color OLED display
- LED for measurement point illumination
- Patented means of securing the test probes
- **Compact and rugged** – for service calls and laboratory use

Applicable Regulations and Standards

IEC 61010-1/-031 DIN EN 61010-1/-031 VDE 0411-1/-031	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements Part 31: Safety requirements for hand-held probe assemblies for electrical measurement and test
IEC 61557-1/-6 DIN EN 61557-1/-6 VDE 0413-1/-6	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 Part 1: General requirements Part 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems (IEC 61557-6:2007)
IEC 61326-1 DIN EN 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
DIN EN 60529 VDE 0470-1	Degrees of protection provided by enclosures (IP code)

Characteristic Values

Residual Current Devices (RCD) – General Specifications

Nom. residual current 10, 30, 100, 300, 500 mA

Deviation from nominal

residual current $(-0/+0.1) I_{\Delta N}; I_{\Delta N} = I_{\Delta N}, 2x I_{\Delta N}, 5x I_{\Delta N}$

Waveform of nominal

residual current Sinusoidal (AC), pulsating DC (A)

RCD type

Standard and selective S

Initial polarity of

residual current 0° or 180°

Voltage range

$+190$ V to 255 V / 45 to 65 Hz

Residual Current Generated by the Tester (TRMS value at 20 ms):

$I_{\Delta N}$ (mA)	$\frac{1}{2} I_{\Delta N}$		$I_{\Delta N}$		$2 \times I_{\Delta N}$		$5 \times I_{\Delta N}$		$I_{\Delta N}$	
	AC	A	AC	A	AC	A	AC	A	AC	A
10	5	3.5	10	20	20	40	50	100	✓	✓
30	15	10.5	30	42	60	84	150	212	✓	✓
100	50	35	100	141	200	282	500	—	✓	✓
300	150	105	300	424	—	—	—	—	✓	✓
500	250	175	500	—	—	—	—	—	✓	—

Touch Voltage U_c and U_{ci}

Nominal range per EN 61557-6: 3.0 to 49.0 V for a touch voltage limit value of 25 V

Nominal range per EN 61557-6: 3.0 to 99.0 V for a touch voltage limit value of 50 V

Measuring Range	Resolution	Intrinsic Uncertainty	Measuring Uncertainty
0.0 to 9.9 V	0.1 V	-0/+10% rdg. +2 D	-0/+10% rdg. +3 D
10.0 ... 99.9 V		-0/+10% rdg.	-0/+10% rdg. +1 D

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Impedance of Fault Loop RL

Nominal Range per EN 61557-3 – 27 Ω to 2000 Ω

Meas. Range	Resolution	Intrinsic Uncertainty	Measuring Uncertainty
0 to 2000 Ω	1 Ω	(5%rdg.+3D+0.05V/ΔN)	(5%rdg.+5D+0.05V/ΔN)

Measuring current: $\leq \frac{1}{2} I_{\Delta N}$

The results of the fault loop impedance measurement appear at the display, if nominal residual is set to $I_{\Delta N} \geq 30$ mA.

Time to Trip – TIME

Standard Residual Current Circuit Breaker (range per EN 61557-6):

Measuring Range	Resolution	Intrinsic Uncertainty	Meas. Uncertainty
0 to 300 ms ($\frac{1}{2}I_{\Delta N}$, $I_{\Delta N}$)	1 ms	±3 ms	±4 ms
0 to 150 ms (2x $I_{\Delta N}$)			
0 to 40 ms (5x $I_{\Delta N}$)			

Selective Residual Current Circuit Breaker (range per EN 61557-6):

Measuring Range	Resolution	Intrinsic Uncertainty	Meas. Uncertainty
0 to 500 ms ($\frac{1}{2}I_{\Delta N}$, $I_{\Delta N}$)	1 ms	±3 ms	±4 ms
0 to 200 ms (2x $I_{\Delta N}$)			
0 to 150 ms (5x $I_{\Delta N}$)			

Tripping Current I \blacktriangleleft (range per EN 61557-6):

Measuring Range for I_{Δ}	Resolution	Intrinsic Uncertainty	Meas. Uncertainty
0.4 to 1.1 $I_{\Delta N}$ (type AC)	0.1 mA	±0.08 $I_{\Delta N}$	±0.1 $I_{\Delta N}$
0.4 to 1.5 $I_{\Delta N}$ (type A)			

Alternating Voltage (frequency range: 45 to 65 Hz)

Measuring Range	Resolution	Intrinsic Uncertainty	Meas. Uncertainty
190 to 255 V	0.1 V	±(2% rdg. + 2 D)	±(3% rdg. + 3 D)

Key

- In the case of alternating quantities, the TRMS voltage value is measured.
- The measuring uncertainties specified here are only valid if line voltage is stable during measurement, the earthing system is free of interference voltage, there are no influences caused by potential from neighboring systems and no leakage current flows through the measured electrical circuit.
- rdg. means reading, i.e. measured value, D = digits (i.e. number of the decimal place with the least significance)

Reference Conditions

Temperature	23 ± 2 °C
Relative humidity	40 to 60%
Device position	any

Electromagnetic Compatibility (EMC)

Interference emission	EN 61326-1:2006 class B
Interference immunity	EN 61326-1:2006

Operating Conditions

Operating temperature	0 to 40 °C
Relative humidity	max. 85%, no condensation allowed
Device position	any

Storage Conditions

Temperature	-10 to +70 °C
Relative humidity	max. 90% at -10 to +40 °C max. 80% at +40 to +70 °C
Device position	any

Power Supply

Batteries	4 ea. AAA (LR03), 1.5 V alkaline or 1.2V NIMH (with at least 750 mAh)
Number of measurements	with batteries at 800 mAh: approx. 3,000 measurements

Electrical Safety

Measuring category	with safety cap applied to test probe: CAT III 300 V; without safety cap applied to test probe: CAT II 300 V
Pollution degree	2
Protection class	II
Fuse	SIBA ceramic fuse 6.3 mm x 32 mm, F1 A/600 V switching capacity 50 kA at 600 V

Mechanical Design

Display	OLED, multicolored, graphic
Protection	Housing: IP 43
Dimensions	approx. 260 x 70 x 40 mm
Weight	approx. 0.36 kg with batteries

Scope of Delivery

- Test instrument with mobile test probe incl. 4 batteries (AAA)
- Pouch
- Condensed operating instructions
- CD ROM with operating instructions in available languages
- Factory calibration certificate

Order Information

Description	Type	Article number
RCD Test Instrument	METRALINE RCD-CHECK	M507B
Broad-range charger for charging optionally available batteries, e.g. Z507B, inserted in the METRALINE ISO-RCD-Z CHECK Input*: 100 to 240 V AC ±10%; Output: 9 V DC, 180 mA	Charger METRALINE CHECK Series	Z507A
4 rechargeable batteries (AAA) for METRALINE ISO-RCD-Z/CHECK	Akku-Set METRALINE CHECK Series	Z507B

* with plug adapter for the following countries: EU, UK, US, AU

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