



OPERATING MANUAL

RCD testing adapter TWR-1



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Connecting the tester to the mains.

1. Plug in the tester to the mains outlet equipped with a grounding pin.
2. Switch on the power supply using "**Sieć**" (Mains) switch.

NOTE: When the signal lamp installed in "**Sieć**" (Mains) switch is lit up, it means that the lines marked as "**Wejście**" (Input) are live and the covers of lead plugs should not be removed!

3. Check whether L and N circuits are correctly connected. Improper connection of L and N leads to the tester is indicated by active signal lamp marked as "**Zamiana L z N**" (L and N exchanged). In this case, the switch marked as "**Podłączenie L i N**" (Connecting L and N) and located on the back of the tester must be switched to turn-off the signal lamp. When signal lamp in "**Podłączenie L i N**" (Connecting L and N) switch is active in position 0, it means that the tester is connected to the mains. In position 0 no voltage is applied to the leads marked as "**Wejście**" (Input). In this case, the signal lamp "**Sieć**" (Mains) switch will be inactive.
4. After completing test measurements, switch off the power supply using "**Sieć**" (Mains) switch.

Checking RCD

All measurements of tested RCD test should be repeated several times to check the stability of parameters. If the results of successive measurements significantly differ from each other, the RCD should be regarded as defective.

For RCDs type A, perform measurements for both sinusoid currents with initial phase of 0 and 180 degrees and for positive and negative unidirectional pulsating currents. In the case of RCDs Type B, perform also measurements for positive and negative Direct Current. The results obtained for different current shapes do not have to be similar, whereas those for a single current shape, but different phases or directions should be similar.

CAUTION: A RCD should be connected to the tester only when the power supply is disconnected!

1. Connect the leads installed at the back of the tester (marked as "**Wejście**" [Input]) to the appropriate input terminals of the RCD. For single-phase RCDs leave L2 and L3 leads unconnected. Set the rotational function selector at MEM.
2. Switch on the power supply and check the RCD using the built-in high-speed testing circuit (usually a button marked as TEST). If the RCD does not trip, further tests may help to precisely determine the defect/damage.
3. Switch off the power supply and connect leads marked as "**Wyjście**" (Output) to the output terminals of the RCD.

4. Connect MRP or MPI meter to the tester and switch on the power supply.
5. Measure RCD tripping time.

RCD type	Operational	Damaged
standard	$t_A = 0 \dots 200 \text{ ms}$	$t_A > 200 \text{ ms}$
selective	$t_A = 0 \dots 500 \text{ ms}$	$t_A > 500 \text{ ms}$

MRP-200 and MIE-500 meters provide measurements of RCD tripping time with currents 1, 2 and 5 x $I_{\Delta N}$ and additionally $\frac{1}{2} \times I_{\Delta N}$ for MPI-5XX. At higher currents the tripping time should be shorter, but does not have to be shortened in proportion to the increase of the current value.

6. Measure RCD tripping current. According to PN-IEC 755 + A1 + A2 "General requirements for protective residual current devices", the measured values for each type of RCD should be within the following limits:

RCDs type AC		
$I_{\Delta N}$	$I_{min} \text{ [mA]}$	$I_{max} \text{ [mA]}$
10 mA	5	10
30 mA	15	30
100 mA	50	100
300 mA	150	300
500 mA	250	500

RCDs type A		
$I_{\Delta N}$	$I_{min} \text{ [mA]}$	$I_{max} \text{ [mA]}$
10 mA	4	20
30 mA	11	42
100 mA	35	140
300 mA	105	420

RCDs type B		
$I_{\Delta N}$	$I_{min} \text{ [mA]}$	$I_{max} \text{ [mA]}$
10 mA	5	20
30 mA	15	60
100 mA	50	200
300 mA	150	600

7. For three-phase RCDs repeat tests three times, in accordance with sec. 5 and 6, switching knob marked as "**Faza**" (Phase) into L1, L2 and L3 positions.

Technical data

Power supply 230V/50Hz

Compatible with the following meters:

- TWR-1.....MRP-120, MRP-200 (and MRP-1, MRP-110, MIE-500 - models withdrawn from the production),
- TWR-1J.....MPI-502, MPI-508, MPI-520, MPI-525 (and MPI-510, MPI-511 - models withdrawn from the production)

Tested RCDs:

- single and three-phase,
- standard and selective,
- $I_{\Delta N}=10, 30, 100, 300$ and 500mA,
- testing range depends on the meter used:
 - MRP-1, MRP-110, MRP-120: current measurement and tripping time of RCDs type AC (sinusoidal current),
 - MPI-508, MPI-502, MIE-500: current measurement and tripping time of RCDs type AC, A (unidirectional pulsating current),
 - MPI-525, MPI-520, MPI-511, MPI-510, MRP-200: current measurement and tripping time (for currents 1, 2 and 5 x $I_{\Delta N}$) RCDs type AC, A (unidirectional pulsating current) and B (direct current).

The testing process does not trip RCDs installed in the system to which the tester is connected.

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