

# EARTH RESISTANCE METER MRU-120



### Possible measurements:

- earth resistance measurement with 3-pole, 4-pole method,
- selective earth resistance measurement with clamp (no influence from parallel earths; no opening of rusty junctions is needed),
- continuity of equipotential bondings and protecting conductors
- two clamps earth resistance measurement without auxiliary test probs,
- earth resistivity measurement,

### Standard accessories of the meter MRU-120:

- Test lead with banana plug; 1,2m; red
- Test lead with banana plugs 2,2m; black
- Test lead on a reel with banana plugs; 25m red
- Test lead on a reel with banana plugs; 25m blue
- Shielded test lead on a reel with banana plugs; 50m yellow
- USB transmission cable

- WAPRZ1X2REBB
- WAPRZ2X2BLBB
- WAPRZ025REBBSZ
- WAPRZ025BUBBSZ
- WAPRZ050YEBBSZE
- WAPRZUSB

- Pin probe with banana plug; yellow
- Earth contact test probe (rod); 0,30m
- Carrying case L2
- Ni-MH battery package 4,8V 3Ah
- „Crocodile” clip K01; black
- Power supply adaptor Z7
- Cable for battery charger
- Hanging straps
- Calibration certificate issued by calibration laboratory

- WASONYE0G1
- WASONG30
- WAFUTL2
- WAAKU03
- WAKROBL20K01
- WAZASZ7
- WAPRZLAD230
- WAPZOZSEKPL

### Optional accessories of the meter MRU-120:

- Earth contact test probe (rod); 0,80m
- Test lead with banana plugs 2m (N-1)
- Carrying case L3
- Current clamp C-3 (Ø=52mm)
- Current clamp N-1 (Ø=52mm)
- Akumulator Ni-MH 4,8V 4,2Ah
- Battery case LR14 (size C)
- USB radio interface

- WASONG80
- WAPRZ002DZBB
- WAFUTL3
- WACEGC30KR
- WACEGN1BB
- WAAKU07
- WAP0J1
- WAAUDAUSB0R1

- „Crocodile” clip K02; red
- Cramp
- Software for creation of documentation from electrical measurements „SONEL PE4”
- Charger for battery loading from the socket of car lighter (12V)

- WAKRORE20K02
- WAZACIMA1
- WAPROSONPE4
- WAPRZLAD12SAM

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# MRU-120

## It allows to take the measurements of:

- earthing resistance using auxiliary electrodes,
- earthing resistance using auxiliary electrodes and clamp (for measurements of multiple earthing)
- earthing resistance using double clamps (for measurement of earthing when it is impossible to use auxiliary electrodes),
- ground resistivity (Wenner method),
- measurement of continuity of equipotential bondings and protective conductors (meeting the requirements of IEC 60364-6-61:2000 section 6.12.2) with auto-zero function – with current 200mA.

## Additionally:

- measurement of resistance of auxiliary electrodes  $R_s$  and  $R_H$ ,
- measurement of interference voltage,
- measurement of interference frequency,
- measurement in the presence of interference voltage in the power network with frequency 50Hz, 60Hz
- selection of maximum measuring voltage (25V and 50V)
- introducing the distance between the electrodes for the resistivity in metres (m) or feet (ft)
- memory of 990 measurement results (10 banks of 99 cells each),
- calibration of clamp used,
- real time clock (RTC),
- data transmission to the computer (USB, wireless),
- indication of battery state.

### Electric security:

- type of insulation double, according to EN 61010-1 and IEC 61557
- measurement category CAT IV 300V acc. to EN 61010-1
- protection class acc. to EN 60529 IP54

### Rated operational conditions:

- operation temperature -10...+50°C
- storage temperature -20...+70°C
- humidity 20...80%

### Other technical data:

- LCD display graphic, backlighted
- interface USB, wireless
- number of measurements carried out of set of batteries > 500
- warranty 36 months

## Measurement of interference voltage

Range	Resolution	Accuracy
0...100V	1V	±(2% m.v. + 3 digits)

- signalling overvoltage 24V or 40V rms
- measurement for DC and AC 45...65 Hz,

## Measurement of continuity of equipotential bondings and protective conductors ( $R_{com}$ ) measurement range to IEC61557-5: 0,24Ω...19,9kΩ

Range	Resolution	Accuracy
0,00...19,99Ω	0,01Ω	±(2% m.v. + 2 digits)
20,0...199,9Ω	0,1Ω	
200...1999Ω	1Ω	
2,0k...9,99kΩ	0,01kΩ	±(5% m.v. + 2 digits)
10,0k...19,9kΩ	0,1kΩ	

- voltage on open terminals: <24Vrms but >4Vrms,
- measurement current: under short circuit >200mA,
- frequency of measurement current: 125 (for networks 50Hz) or 150Hz (for networks 60Hz), possible choice of measurement frequency in menu,
- auto-zero function measurement leads

## Measurement of earthing resistance (method 3- and 4-pole)

measurement range to IEC61557-5: 0,30Ω...19,9kΩ

Range	Resolution	Accuracy
0,00...19,99Ω	0,01Ω	±(2% m.v. + 2 digits)
20,0...199,9Ω	0,1Ω	
200...1999Ω	1Ω	
2,0k...9,99kΩ	0,01kΩ	±(5% m.v. + 4 digits)
10,0k...19,9kΩ	0,1kΩ	

- measurement current: under short circuit >200mA,
- voltage on open terminals: selectable <25V AC or <50V AC,
- frequency of measurement current: 125 (for networks 50Hz) or 150Hz (for 60Hz),

## Measurement of resistance of auxiliary electrodes $R_H$ and $R_s$

Range	Resolution	Accuracy
0...999Ω	1Ω	±(5% ( $R_s+R_\epsilon+R_H$ ) + 8 digits)
1,00k...9,99kΩ	0,01kΩ	
10,0k...19,9kΩ	0,1kΩ	

## Measurement of multiple earthing resistance with using the clamp and auxiliary electrodes (3p + clamp)

measurement range to IEC61557-5: 0,44Ω...1999Ω

Range	Resolution	Accuracy
0,00...19,99Ω	0,01Ω	±(8% w.m. + 3 digits)
20,0...199,9Ω	0,1Ω	
200...1999Ω	1Ω	

- voltage on open terminals: selectable <25V AC or <50V AC,
- measurement current: under short circuit > 200mA,
- frequency of measurement current: 125 (for networks 50Hz) or 150Hz (for 60Hz),

## Measurement of multiple earthing resistance with using double clamps

Range	Resolution	Accuracy
0,00...19,99Ω	0,01Ω	±(10% m.v. + 3 digits)
20,0...149,9Ω	0,1Ω	±(20% m.v. + 3 digits)

- frequency of measurement current 125 (for networks 50Hz) or 150Hz (for networks 60Hz)

## Measurement of ground resistivity

Measurement method: Wenner,  $\rho=2\pi LR_\epsilon$

Range	Resolution	Accuracy
0,0...199,9Ωm	0,1Ωm	depending on measurement accuracy $R_\epsilon$ with 4p method, but not less than ±1 digit
200...1999Ωm	1Ωm	
2,00k...19,99kΩm	0,01kΩm	
20,0k...99,9kΩm	0,1kΩm	
100k...999kΩm	1kΩm	

L – distance between probes: 1...50m