Index: WMGBMRU200

EARTH RESISTANCE METER

MRU-200

MRU-200
is the unique meter in the market
which uses all measurement methods.

Possible measurements:

- earth resistance measurement with 2-pole, 3-pole,4-pole method,
- selective earth resistance measurement with clamp (no influence from parallel earths; no opening of rusty junctions is needed),
- impulse earth resistance measurement, three kinds of measuring impulse 4/10 µs, 8/20 µs,10/350 µs,
- two clamps earth resistance measurement without auxiliary test probs,
- earth resistivity measurement,
- leakage current measurement,

Standard accessories of the meter MRU-200:

- Test lead with banana plug; 1,2m; red	WAPRZ1X2REBB
- Test lead with banana plugs 2,2m; black	WAPRZ2X2BLBB
- Test lead on a reel with banana plugs; 25m red	WAPRZ025REBBSZ
- Test lead on a reel with banana plugs; 25m blue	WAPRZ025BUBBSZ
- Shielded test lead on a reel with banana plugs; 50m yellow	WAPRZ050YEBBSZE
- USB transmission cable	WAPRZUSB
- charger for battery loading from the socket of car lighter (12 V)	WAPRZLAD12SAM
- Earth contact test probe (rod); 0,30 m - (4 pcs.)	WASONG30
- Carrying case L2	WAFUTL2
- Ni-MH battery package 4,8V 4,2Ah	WAAKU07
- „Crocodile" clip K01; black	WAKROBL20K01
- „Crocodile" clip K02; red	WAKRORE20K02
- Cramp	WAZACIMA1
- Power supply adaptor Z7	WAZASZ7
- Cable for battery charger	WAPRZLAD230
- Hanging straps	WAPOZSZEKPL
- Calibration certificate issued by calibration laboratory	

Optional accessories of the meter MRU-200:

- Hard carrying case	WAWALXL3
- Earth contact test probe (rod); 0,80 m	WASONG80
- Test lead with banana plugs 2 m (N-1)	WAPRZ002DZBB
- Current clamp C-3 (Ø=52 mm)	WACEGC3OKR
- Current clamp N-1 (Ø=52 mm)	WACEGN1BB
- Current flexible clamp (Rogowsky coil) F-1 (Ø=400 mm)	WACEGF1OKR
- Battery case LR14 (size C)	WAPOJ1
- Sonel Reports Plus software	WASONREPORTPLUS
- Carrying case L3	WAFUTL3

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MRU-200

- 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),
  - impulse earth resistance (without disconnecting measured earthing),
  - ground resistivity (Wenner method),
  - current using the clamp (e.g. leakage) and flexible clamp (Rogowsky coil),
  - 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 200 mA.
- 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 16 2/3 Hz, 50 Hz, 60 Hz and 400 Hz (with automatic selection of proper frequency of measuring signal or with manual selection),
  - selection of maximum measuring voltage (25 V and 50 V),
  - introducing the distance between the electrodes for the resistivity in metres (m) and feet (ft),
  - memory of 990 measurements (10 banks of 99 cells each),
  - calibration of clamp used,
  - real time clock (RTC),
  - data transmission to the computer (USB),
  - indication of battery state.

Electric security:	
- type of insulation	double, according to EN 61010-1 and IEC 61557
- measurement category	CAT IV 300 V acc. to EN 61010-1
- protection class acc. to EN 60529	IP 54
Rated operational conditions:	
- operation temperature	-10...+50°C
- storage temperature	-20...+70°C
- humidity	20...90%
Other technical data:	
- LCD display	graphic, backlighted
- interface	USB
- number of measurements carried out of set of batteries	> 1200
- warranty	24 months

Measurement of interference voltage

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

Measurement of interference frequency

Range	Resolution	Accuracy
15...450 Hz	1 Hz	±(1% m.v. + 2 digits)

Measurement of earthing resistance (method 3- and 4-pole)
measurement range to IEC 61557-5: 0,100 **Ω**...19,9 k**Ω**

Range	Resolution	Accuracy
0,000...3,999 Ω	0,001 Ω	±(2% m.v. + 4 digits)
4,00...39,99 Ω	0,01 Ω	±(2% m.v. + 2 digits)
40,0...399,9 Ω	0,1 Ω	
400...3999 Ω	1 Ω	
4,00k...19,99 kΩ	0,01 kΩ	±(5% m.v. + 2 digits)

Measurement of earth connection and equipotential bonding (2P)
range of measurements in accordance with IEC 61557-4: 0,045 **Ω**...19,99 k**Ω**

Range	Resolution	Accuracy
0,000...3,999 Ω*	0,001 Ω	±(2% m.v. + 4 digits)
4,00...39,99 Ω	0,01 Ω	±(2% m.v. + 2 digits)
40,0...399,9 Ω	0,1 Ω	
400...3999 Ω	1 Ω	
4,0...19,99 kΩ	0,01 kΩ	±(5% m.v. + 2 digits)

* - in range 0,000…0,045 Ω the accuracy is not specified.

Measurement of resistance of auxiliary electrodes R_H and R_S

Range	Resolution	Accuracy
0...999 Ω	1 Ω	±(5% (R_S+R_E+R_H) + 8 digits)
1,00...9,99 kΩ	0,01 kΩ	
10,0...19,9 kΩ	0,1 kΩ	

Measurement of multiple earthing resistance with using the clamp and auxiliary electrodes (3p + clamp) measurement range to IEC61557-5: 0,120...1999 **Ω**

Range	Resolution	Accuracy
0,000...3,999 Ω*	0,001 Ω	±(8% m.v. + 4 digits)
4,00...39,99 Ω	0,01 Ω	±(8% m.v. + 3 digits)
40,0...399,9 Ω	0,1 Ω	
400...1999 Ω	1 Ω	

* - in range 0,000…0,045 Ω the accuracy is not specified.

Measurement of multiple earthing resistance with using double clamps

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

Measurement of ground resistivity Measurement method: Wenner, $\rho=2\pi LR_E$

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

L – distance between probes: 1...50 m

Measurement of AC current (leakage)

Range	Resolution	Accuracy
0,1...99,9 mA [1]	0,1 mA	±(8% m.v. + 5 digits)
100...999 mA [1]	1 mA	±(8% m.v. + 3 digits)
1,00...4,99 A [1,2]	0,01 A	±(5% m.v. + 5 digits)[1] unspecified [2]
5,00...9,99 A [1,2]	0,01 A	±(5% m.v. + 5 digits)
10,0...99,9 A [1,2]	0,1 A	
100...300 A [1,2]	1 A	

[1] – receiving clamp (diameter 52 mm) – C-3
[2] – flexible clamp (Rogowsky coil) with diameter 400 mm – F-1

Measurement of dynamic earthing resistance (R_D) with impulse wave method (4)

Range	Resolution	Accuracy
0,0...99,9 Ω	0,1 Ω	±(2,5% m.v. + 3 digits)
100...300 Ω	1 Ω	

choice impulse edges: 4/10 µs, 8/20 µs, 10/350 µs

„m.v.”- measured value