



200 mA

measurement
current



soil resistivity
without manual
conversion

Multifunctional earthing resistance meter

Measurement methods

- **3-pole and 4-wire method** – measurement of earthing systems using auxiliary probes
- **3-pole method with clamp** – measurement of earthing systems with multiple earth electrodes
- **Two-clamp method** – measurement of earthing system when the auxiliary probes cannot be used
- **Soil resistivity** – Wenner method
- **Resistance of earth connection and equipotential bonding** measured using current ≥ 200 mA with auto-zero function – meets the requirements of EN 61557-4

Additional features

- **Measurement current of 200 mA** – facilitates earth resistance measurements in difficult areas (sand, stony soil)
- Measurement of resistance of auxiliary electrodes R_S and R_H
- Measurement of interference voltage
- Measurement in the presence of interference voltage generated by power networks with frequency of 50 Hz and 60 Hz
- Selection of maximum measuring voltage (25 V and 50 V)
- Automatic calculation of soil resistivity in ohm-meters (Ωm) and ohm-feet (Ωft)
- Memory of 990 measurement results (10 banks of 99 cells each)
- Calibration of clamp used
- Real time clock (RTC)
- Data transmission to the computer
- Battery indication





Application

MRU-120 meter was created for **the most difficult working conditions**. It generates a measuring current exceeding 200 mA, which provides effective measurements of grounding of energy objects such as transformer stations and power stations.

Thanks to the methods using clamps, it is **not necessary to disconnect the control connectors**, which is sometimes a very tedious operation. This plays a special role when performing works on objects exposed to weather conditions, where the connecting elements are sometimes corroded or tarnished.

The graphical user interface provides clear readings and explicit messages. This translates into quick, trouble-free service.



Protection and equipment

Housing of MRU-120 ensures safe operation in field conditions and inside buildings. Ingress protection rating of IP54 protects the device against water and solids in case of splashes or dusty conditions. Moreover, the design of the device provides very good protection during transport and handling. Extensive standard equipment allows user to perform most measurements without the need to purchase additional accessories. MRU-120 is a versatile solution that offers comprehensive testing of earthing systems.



Capabilities

The measuring methods available in the device allow for comprehensive control of working and protective grounding. The calibration function of the test leads eliminates the influence of their resistance on the result. However, this is just the beginning.

- **The 4-wire method** provides very accurate measurement of the expected small values of resistance – eliminates the resistance of the test leads connecting the meter to grounding.
- **Measurement of resistance** of earth connection and equipotential bonding with a current exceeding 200 mA meets the requirements of EN 61557-4 standard.
- Before performing the measurement, the meter checks whether the tested object is a subject to excessive **interference voltage**, which may indicate additional problems.

Memory and results

The results can be saved to the device's memory. It is divided into **10 banks of 99 cells**, each corresponding to one measurement. These results can be easily transferred to the **Sonel Reader** software for archiving or subsequent analysis and research.

Other useful functions

Built-in help function – auxiliary illustrations demonstrate how to properly perform the measurement for each method.

Correctness of connections – if the meter detects an error, which prevents a correct measurement, it will indicate this in the top of the screen using the appropriate test socket symbol.

Complete measurement data – in addition to earth resistance measurement, the device performs additional measurements on interference voltages and resistance of auxiliary probes. Their results are provided with information about the date and time of testing, which facilitates preparing test documentation.



Technical specifications

Measurement functions	Measurement range	Display range	Resolution	Accuracy ±(% m.v. + digits)
Interference voltage	0 V...200 V	0 V...200 V	0.1 V	±(2% m.v. + 3 digits)
Resistance of earth connection and equipotential bonding	0.24 Ω...19.99 kΩ acc. to EN 61557-4	0.00 Ω...19.99 kΩ	from 0.01 Ω	from ±(2% m.v. + 2 digits)
Earth resistance				
3-pole and 4-wire method	0.30 Ω...19.99 kΩ acc. to EN 61557-5	0.00 Ω...19.99 kΩ	from 0.01 Ω	from ±(2% m.v. + 2 digits)
3-pole + clamp method	0.44 Ω...1999 Ω acc. to EN 61557-5	0.00 Ω...1999 Ω	from 0.01 Ω	±(8% m.v. + 3 digits)
two-clamp method	0.00 Ω...149.9 Ω	0.00 Ω...149.9 Ω	from 0.01 Ω	from ±(10% m.v. + 3 digits)
auxiliary electrodes resistance	0 Ω...19.99 kΩ	0 Ω...19.99 kΩ	from 1 Ω	±(5% (R _E +R _H +R _S) + 8 digits), but ≥10% R _E
Earth resistivity	0.0 Ωm...999 kΩm	0.0 Ωm...999 kΩm	from 0.1 Ωm	Depends on the accuracy of the R _E 4p measurement, but not less than ±1 digit

Safety and work conditions

Measuring category according to EN 61010	IV 1000/600V
Ingress protection	IP55
Type of insulation according to EN 61010-1 and IEC 61557	double
Dimensions	288 x 223 x 75 mm 11.3" x 8.8" x 3.0"
Weight	ca. 2 kg ca. 4.4 lbs
Operating temperature	-10...+55°C 14...122°F
Storage temperature	-20...+80°C -4... 176°F
Humidity	20...90%
Nominal temperature	23 ± 2°C 73.4°F ± 3.6°F
Reference humidity	40%...60%

Memory and communication

Memory of measurement results	990 results
Data transmission	USB

Other information

Quality standard – development, design and production	ISO 9001
The product meets the EMC (emission for industrial environment) requirements according to standards	EN 61326-1 EN 61326-2-2

Standard accessories



**Test lead 2.2 m
(banana plugs) black**

WAPRZ2X2BLBB



**Test lead 1.2 m
(banana plugs) red**

WAPRZ1X2REBB



Hanging straps

WAPOZSZEKPL



**Crocodile clip
1 kV 20 A black**

WAKROBL20K01



**Pin probe 1 kV
(banana socket) red**

WASONREOGB1



**4x earth contact
test probe (30 cm)**

WASONG30



**Cramp with
banana socket**

WAZACIMA1



**Test lead 25 m for
earth resistance
measurements
(on a reel, banana
plugs) blue / red**

WAPRZ025BUBBSZ
WAPRZ025REBBSZ



**Test lead 50 m for
earth resistance
measurements
(on a reel, banana
plugs) yellow**

WAPRZ050YEBBSZ



USB cable

WAPRZUSB



**NiMH battery 4.8 V
3.2 Ah**

WAAKU08



**230 V mains power
cable (IEC C7 plug)**

WAPRZLAD230



**Z7 Power sup-
ply adapter**

WAZASZ7



L-2 carrying case

WAFUTL2



**Factory calibra-
tion certificate**



Optional accessories

	ERP-1 adapter WAADAERP1		FS-2 flexible coil (Ø 1260 mm), output level 100 mV / 1 A WACEGFS2OKR		FSX-3 flexible coil (Ø 630 mm), output level 300 mV / 1 A WACEGFSX3OKR
	F-1A flexible coil (Ø 360 mm) WACEGF1AOKR		F-2A flexible coil (Ø 235 mm) WACEGF2AOKR		F-3A flexible coil (Ø 120 mm) WACEGF3AOKR
	C-3 current clamps (Ø 52 mm) WACEGC3OKR		N-1 transmitting clamps (Ø 52 mm, incl. 2-wire cable) WACEGN1BB		Double-wire test lead 2 m for N-1 clamps WAPRZ002DZBB
	Crocodile clip 1 kV 20 A red / blue / yellow WAKRORE20K02 WAKROBU20K02 WAKROYE20K02		Test lead 1.2 m (banana plugs) black / blue / yellow WAPRZ1X2BLBB WAPRZ1X2BUBB WAPRZ1X2YEBB		Pin probe 1 kV (banana socket) black / blue / yellow WASONBLOGB1 WASONBUOGB1 WASONYEOGB1
	Earth contact test probe 25 cm WASONG25		Earth contact test probe 80 cm WASONG80V2		L-3 carrying case (for 80 cm test probes) WAFUTL3
	Test lead on a reel red 75 m / 100 m / 200 m WAPRZ075REBBSZ WAPRZ100REBBSZ WAPRZ200REBBSZ		Test lead on a reel blue 75 m / 100 m / 200 m WAPRZ075BUBBSZ WAPRZ100BUBBSZ WAPRZ200BUBBSZ		Test lead on a reel yellow 75 m / 100 m / 200 m WAPRZ075YEBBSZ WAPRZ100YEBBSZ WAPRZ200YEBBSZ
	Test lead 30 m for earth resistance measurements (banana plugs) red WAPRZ030REBBSZ		Test lead 15 m for earth resistance measurements (banana plugs) blue WAPRZ015BUBBSZ		Test wire reel WAPZOZSP1
	NiMH battery 4.8 V 4.2 Ah WAAKU07		Battery pack 4xLR14 WAP0J1		Cable for battery charging from car cigarette lighter socket (12 V) WAPRZLAD12SAM
	XL3 carrying case (MRU) WAWALXL3		XL-8 carrying case (ERP-1) WAWALXL8		Calibration certificate with accreditation