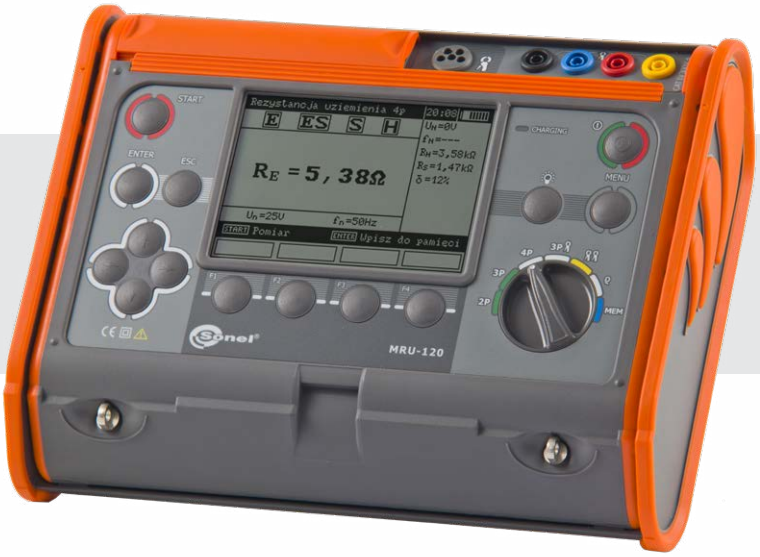
Earthing resistance and soil resistivity meter

MRU-120

index: WMGBMRU120

200 mA
measurement current

soil resistivity without manual conversion



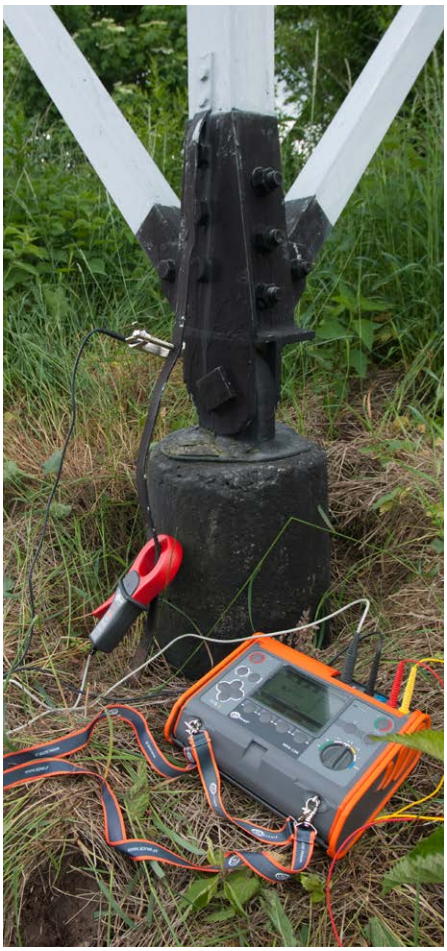
CAT IV
300 V

IP54

Multifunctional earthing resistance meter

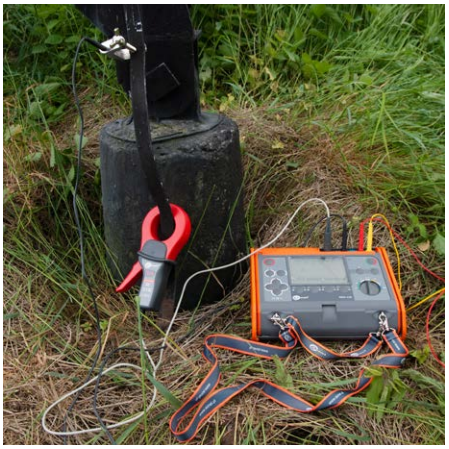
Measurement methods

- **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

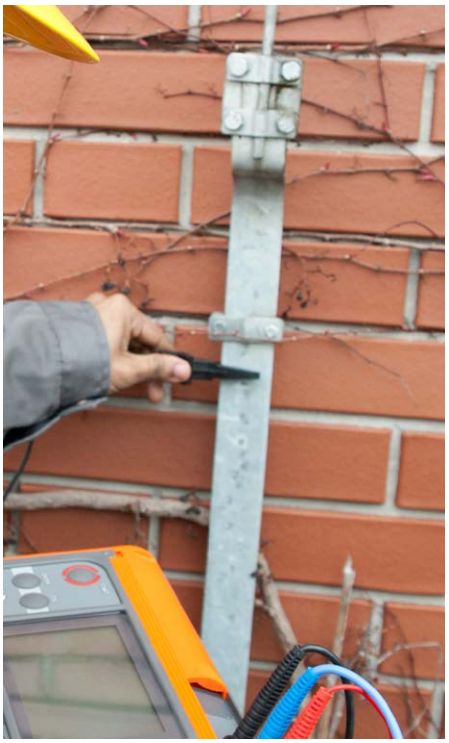
MRU-120 meter was created for **the most difficult working conditions**. It generates a measuring current exceeding 200 mA, which provides effective measurements of grounding of energy objects such as transformer stations and power stations.

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.



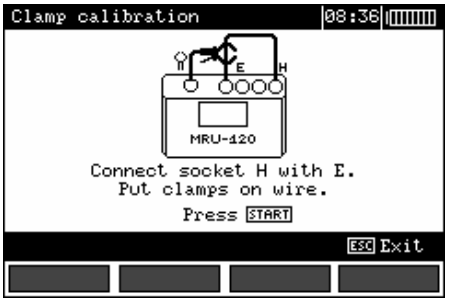
Capabilities

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...100 V	0 V...100 V	1 V	±(2% m.v. + 3 digits)
Resistance of earth connection and equipotential bonding	0.24 Ω...19.9 kΩ acc. to EN 61557-4	0.00 Ω...19.9 kΩ	from 0.01 Ω	from ±(2% m.v. + 2 digits)
Earth resistance				
3-pole and 4-wire method	0.30 Ω...19.9 kΩ acc. to EN 61557-5	0.00 Ω...19.9 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...19.9 kΩ	0 Ω...19.9 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_E4p measurement, but not less than ±1 digit

Safety and work conditions

Measuring category according to EN 61010	III 600 V / IV 300 V
Ingress protection	IP54
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...+50°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

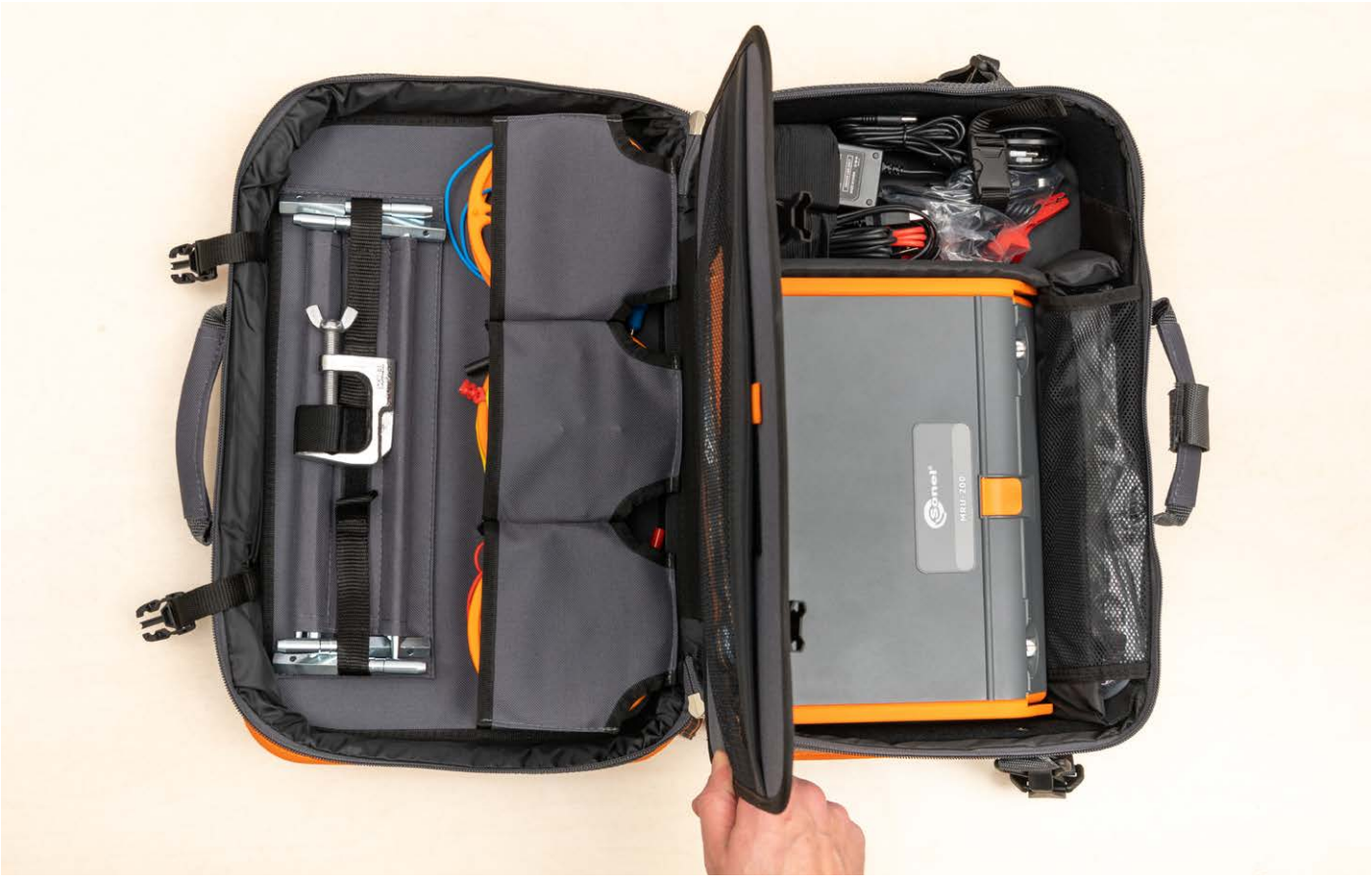
Z7 Power supply adapter

WAZASZ7

L-2 carrying case

WAFUTL2

Factory calibration 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

WAPOZSZP1

NiMH battery 4.8 V 4.2 Ah

WAAKU07

Battery pack 4xLR14

WAPOJ1

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