Earth Resistance and Resistivity Meter

MRU-120HD

index: WMGBMRU120HD

200 mA

measurement current

soil resistivity without manual conversion

50°C HEAVY DUTY -10°C

CAT IV 300 V

IP67 closed case

IP54 open case

Armored meter for earth resistance and soil resistivity

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
- **Earth 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

- **Outstanding resistance to harsh environmental conditions** – the suitcase housing protects against the ingress of dust and water and protects against the effects of falls
- 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 or 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-120HD 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.

Transport and security

It doesn't matter if you take measurements while wading in the mud or if you act in the sand amongst clouds of dust. The MRU-120HD meter is ready and will not disappoint. **IP67** protection degree when the cover is closed ensures dust-tightness and prevents water ingress – even when the housing is immersed briefly! When measuring, the tightness is still high (IP54), providing protection against dust and water splashes from any direction.

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.

Technical data

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_E 4p measurement, but not less than ±1 digit

Safety and work conditions

Measuring category according to EN 61010	
≤2000 m a.s.l.	IV 300 V
≤3000 m a.s.l.	IV 255 V
Ingress protection	
closed case	IP67
open case	IP54
Type of insulation according to EN 61010-1 and IEC 61557	double
Dimensions	390 x 310 x 180 mm
Weight	ca. 4 kg
Operating temperature	-10...+50°C
Storage temperature	-20...+80°C
Humidity	20...85%
Nominal temperature	23...±2°C
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 4 m (banana plugs) black / blue

WAPRZ004BLBB
WAPRZ004BUBB

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

4x earth contact test probe (30 cm)

WASONG30

2x cramp with banana socket

WAZACIMA1

W1 hanging straps

WAPOZSZE5

USB cable

WAPRZUSB

230 V mains power cable (IEC C7 plug)

WAPRZLAD230

Z7 Power supply adapter

WAZASZ7

L-4 carrying case

WAFUTL4

Calibration certificate issued by an accredited laboratory (no accreditation)

Optional accessories

ERP-1 adapter

WAADAERP1

FS-2 flexible coil (Φ 1260 mm), output level 100 mV / 1 A

WACEGFS2OKR

FSX-3 flexible coil (Φ 630 mm), output level 300 mV / 1 A

WACEGFSX3OKR

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

Pin probe 1 kV (banana socket) black / red / blue / yellow

WASONBUOGB1
WASONREOGB1
WASONBLOGB1
WASONYEOGB1

Test lead 1.2 m (banana plugs) black / blue / yellow

WAPRZ1X2REBB
WAPRZ1X2BUBB
WAPRZ1X2YEBB

Crocodile clip 1 kV 20 A black / red / blue / yellow

WAKROBL20K01
WAKRORE20K02
WAKROBU20K02
WAKROYE20K02

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

Earth contact test probe (25 cm)

WASONG25

Earth contact test probe (80 cm)

WASONG80

L-3 carrying case (for 80 cm test probes)

WAFUTL3

Cable for battery charging from car cigarette lighter socket (12 V)

WAPRZLAD12SAM

Calibration certificate with accreditation