

# 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<sub>s</sub> and R<sub>H</sub>
- 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 ( $\Omega m$ ) and ohm-feet ( $\Omega ft$ )
- Memory of 990 measurement results (10 banks of 99 cells each)
- Calibration of clamp used
- Real time clock (RTC)
- Data transmission to the computer
- 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

Technical data ———				
Measurement functions	Measurement range	Display range	Resolution	Accuracy ±(% m.v. + digits)
Interference voltage	0 V100 V	0 V100 V	1 V	±(2% m.v. + 3 digits)
Resistance of earth connection and equipotential bonding	<b>0.24 Ω19.9 kΩ</b> acc. to EN 61557-4	0.00 Ω19.9 kΩ	from 0.01 Ω	from ±(2% m.v. + 2 digits)
Earth resistance				
3-pole and 4-wire method	0.30 Ω19.9 kΩ acc. to EN 61557-5	0.00 Ω19.9 kΩ	from 0.01 Ω	from ±(2% m.v. + 2 digits)
3-pole + clamp method	<b>0.44 Ω1999 Ω</b> acc. to EN 61557-5	0.00 Ω1999 Ω	from 0.01 Ω	±(8% m.v. + 3 digits)
two-clamp method	0.00 Ω149.9 Ω	0.00 Ω149.9 Ω	from 0.01 Ω	from ±(10% m.v. + 3 digits)
auxiliary electrodes resistance	0 Ω19.9 kΩ	0 Ω19.9 kΩ	from 1 Ω	±(5% (R <sub>E</sub> +R <sub>H</sub> +R <sub>s</sub> ) + 8 digits), but ≥10% R <sub>E</sub>
Earth resistivity	0.0 Ωm999 kΩm	0.0 Ωm999 kΩm	from 0.1 Ωm	Depends on the accuracy of the R <sub>E</sub> 4p measurement, but not less than ±1 digit
Safety and work conditions				
Measuring category according to EN 61	010			
≤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 15.4" x 12.2" x 7.1"		
Weight		ca. 4 kg ca. 8.8 lbs		
Operating temperature		-10+50°C		
	-20 +80°C			
Storage temperature		-4 176°F		
Humidity		2090%		
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**





WAPRZ004BLBB WAPRZ004BUBB



4x earth contact test probe (30 cm) WASONG30



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

WAPR7025BUBBS7 WAPRZ025REBBSZ

2x cramp with banana socket WAZACIMA1

230 V mains power cable (IEC C7 plug) WAPRZLAD230

Factory calibration certificate



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

WAPRZ050YEBBSZ



W1 hanging straps WAPOZSZE5



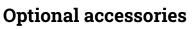
Z7 Power supply adapter WAZASZ7



L-4 carrying case WAFUTL4

USB cable

WAPRZUSB





**ERP-1** adapter WAADAERP1

C-3 current clamps

(Ø 52 mm)

WACEGC30KR



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

N-1 transmitting

clamps (Ø 52 mm,

incl. 2-wire cable)

Test lead 1.2 m

WACEGN1BB

WACEGFS20KR



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

WACEGFSX30KR



Double-wire test lead 2 m for N-1 clamps

WAPRZ002DZBB

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

WAKROBL20K01 WAKRORE20K02 WAKROYE20K02

Test lead on a reel yellow 75 m / 100 m / 200 m

WAPRZ075YEBBSZ WAPRZ100YEBBSZ WAPRZ200YEBBSZ

Earth contact test probe (80 cm)

WASONG80V2

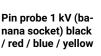
Calibration certificate with accreditation











WASONBUOGB1 WASONREOGB1 WASONBLOGB1 WASONYEOGB1

Test lead on a reel red 75 m / 100 m / 200 m

WAPRZ075REBBSZ WAPRZ100REBBSZ WAPRZ200REBBSZ

Test lead 40 m / 60 m / 80 m (on a reel, banana plugs) yellow

WAPRZ040YEBBSZ WAPRZ060YEBBSZ WAPRZ080YEBBSZ



WAFUTL3









/ blue / yellow WAPRZ1X2REBB WAPRZ1X2BUBB WAPRZ1X2YEBB

(banana plugs) black

Test lead on a reel blue 75 m / 100 m / 200 m

WAPRZ075BUBBSZ WAPRZ100BUBBSZ WAPRZ200BUBBSZ

Earth contact test probe (25 cm)

WASONG25

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





WAPRZLAD12SAM





