



**200 mA**

measurement  
current



soil resistivity  
without manual  
conversion



**CAT IV**  
**300 V**



closed case



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  $\geq 200$  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 ( $\Omega m$ ) 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

Measurement functions	Measurement range	Display range	Resolution	Accuracy ±(% m.v. + digits)
<b>Interference voltage</b>	0 V...100 V	0 V...100 V	1 V	±(2% m.v. + 3 digits)
<b>Resistance of earth connection and equipotential bonding</b>	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)
<b>Earth resistance</b>				
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 <sub>E</sub> +R <sub>H</sub> +R <sub>S</sub> ) + 8 digits), but ≥10% R <sub>E</sub>
<b>Earth resistivity</b>	0.0 Ωm...999 kΩm	0.0 Ωm...999 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 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
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<b>Dimensions</b>	390 x 310 x 180 mm 15.4" x 12.2" x 7.1"
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<b>Weight</b>	ca. 4 kg ca. 8.8 lbs
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<b>Operating temperature</b>	-10...+50°C 14...122°F
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<b>Storage temperature</b>	-20...+80°C -4... 176°F
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<b>Humidity</b>	20...90%
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<b>Nominal temperature</b>	23 ± 2°C 73.4°F ± 3.6°F
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<b>Reference humidity</b>	40%...60%
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### Memory and communication

<b>Memory of measurement results</b>	990 results
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<b>Data transmission</b>	USB
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### Other information

<b>Quality standard – development, design and production</b>	ISO 9001
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<b>The product meets the EMC (emission for industrial environment) requirements according to standards</b>	EN 61326-1 EN 61326-2-2
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## 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 clamp with  
banana socket**

WAZACIMA1



**W1 hanging straps**

WAPOZSZE5



**USB cable**

WAPRZUSB



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

WAPRZLAD230



**Z7 Power sup-  
ply adapter**

WAZASZ7



**L-4 carrying case**

WAFUTL4



**Factory calibra-  
tion certificate**

## Optional accessories



**ERP-1 adapter**

WAADAERP1



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

WACEGFS20KR



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

WACEGFSX30KR



**C-3 current clamps  
(Ø 52 mm)**

WACEGC30KR



**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 (ba-  
nana 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



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

WAPRZ040YEBBSZ  
WAPRZ060YEBBSZ  
WAPRZ080YEBBSZ



**Earth contact test  
probe (25 cm)**

WASONG25



**Earth contact test  
probe (80 cm)**

WASONG80V2



**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**