Handheld Micro Ohmmeters RMO-H series

- Handheld – only 0,95 kg / 2.1 lbs
- Powerful – regulated current up to 300 A DC
- Automatic test current ramp
- Operated by high-capacity battery
- Measuring range 0,1 μΩ – 3000 mΩ
- Typical accuracy ± (0,1 % rdg + 0,1 % FS)
- Both Sides Grounded Measurement

Description

RMO-H series contain three models:

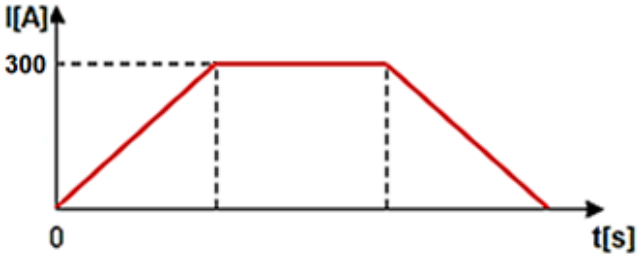
- **RMO-H1** (test current up to 100 A DC),
- **RMO-H2** (test current up to 220 A DC),
- **RMO-H3** (test current up to 300 A DC),

hereafter referred to as “RMO-H”.

RMO-H is a handheld, battery operated Micro Ohmmeter based on a state of the art technology, using the most advanced battery and switch mode technique available today.

The high-capacity Li-Po battery enables generating a true DC ripple-free current. The test current is user selectable and generated in an automatic regulated test ramp.

During a test the RMO-H ramps with increasing current before measuring and decreasing current after the measurement. This significantly decreases magnetic transients.



The RMO-H instrument can store internally up to 1000 measurements. The results are saved on the micro SD card. All measurements are time and date stamped.

DV-Win software enables download of the results, creating and exporting test reports in different formats. Communication between the RMO-H and a PC is through a Bluetooth connection.

The set is equipped with the overcurrent protection.

Application

Typical application is measuring a resistance of non-inductive test objects:

- High, middle and low voltage circuit breakers
- High and middle voltage disconnecting switches
- High-current bus bar joints
- Cable splices
- Welding joints

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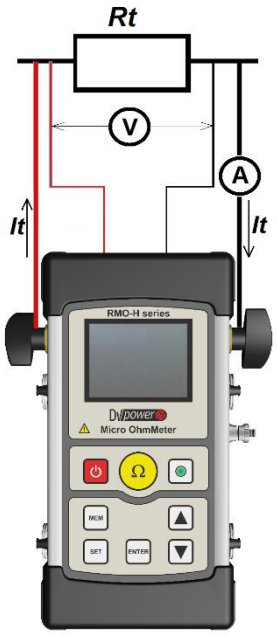
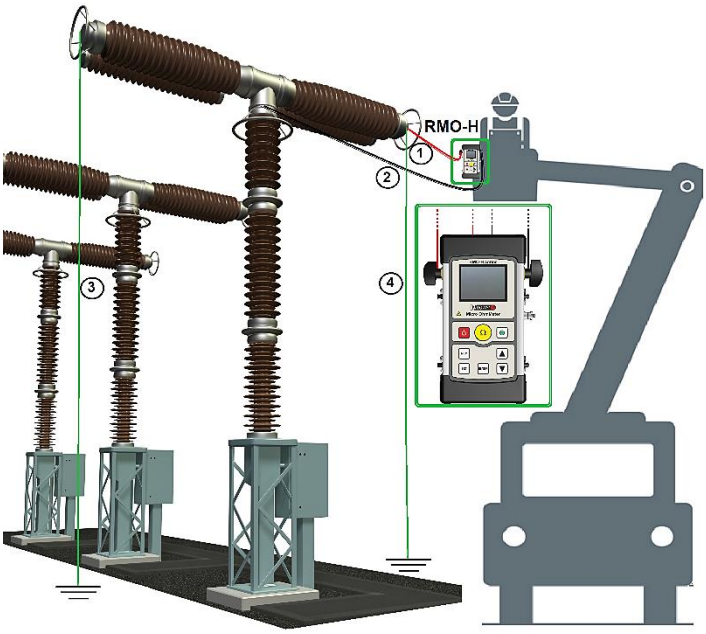
Connecting RMO-H to test object

The connection diagram of the RMO-H devices corresponds to the Kelvin's (four point) measurement principle. The measuring cables from the "Voltage Sense" sockets are attached as close as possible to ***Rt***, and in between the current feeding cables. That way, a resistance of both cables and clamps is almost completely excluded from the resistance measurement.



For the contact resistance measurement of a medium voltage circuit breaker with the RMO-H it is convenient to use the cables with the same length. The cables with Kelvin probes (with trigger button) are specially designed for this application.

When testing live tank HV circuit breakers with RMO-H a different cables length may be used. The short cable (red cable, 1,3 m) connects the RMO-H to the CB's bushing close to the test person and the device. The long cable (black cable, 3 or 5 m) is connected to a further away positioned bushing on the other side of the breaking point.



1. ***Short test leads (current and voltage sense cables labeled with red color)***
2. ***Longer test lead (current and voltage sense cables labeled with black color)***
3. ***Ground cable***
4. ***Ground cable (used in case of Both Sides Grounded testing)***

Both Sides Grounded testing

The RMO-H device provides a safe measurement of circuit breakers with both terminals grounded. The connection diagram is the same as for the one-side-grounded circuit breakers.

Note:
This type of measurement could be less accurate comparing to a one-side-grounding measurement, because of a small amount of the current that can flow through groundings.

Benefits and features

RMO-H is a handheld instrument ideal for a field and factory testing, with a very user-friendly interface. The user needs only a few clicks to set and start a preferred test. This is achieved with an intuitive keyboard and menu design.

Unlike other handheld micro ohmmeters available in the market, RMO-H device has regulated test current, generated in an automatic regulated test ramp. This enables the following unique features:

- User selectable test current
- A constant DC (ripple-free) current during the measurement

The high capacity Li-Po battery enables multiple measurements in the field/factory.

The instrument has a very high typical accuracy ± (0,1% rdg + 0,1% FS), with the best resolution of 0,1 µΩ.

The additional feature is the pass/fail criteria implemented through the R_{max} function. When this function is turned ON, the RMO-H device displays information if the measured resistance is higher than the set R_{max} resistance value.

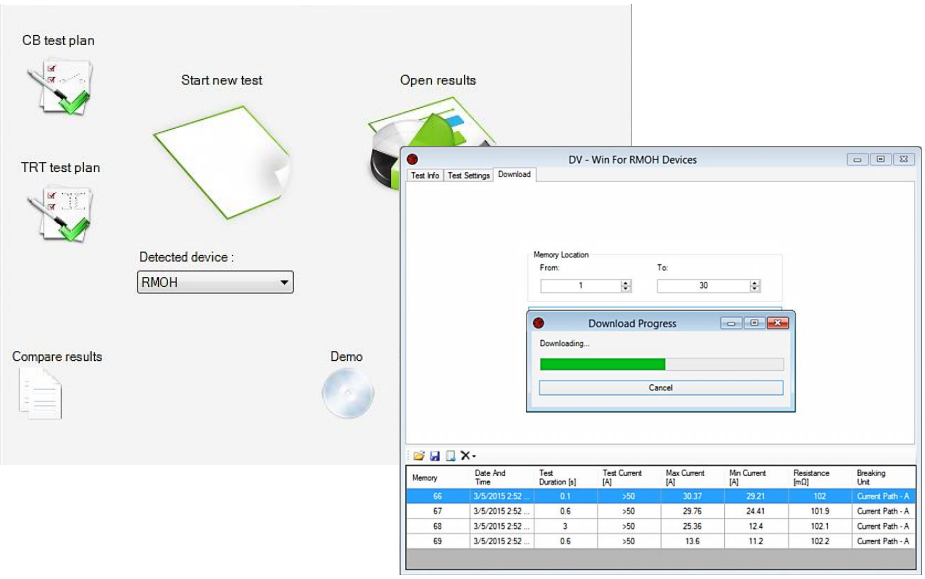
DV-Win software

*included in the purchase price

DV-Win Software for the RMO-H device is an application set of tools based on the Windows operating system. It enables the two-way communication between the RMO-H device and a standard PC over the Bluetooth connection.

The main features of the software are:

- Download of the test results to a PC
- Analysis of the test results
- Saving the test results in different formats
- Test reports



Technical data

Battery

- Type: 1 Cell – Li-Po (User replaceable)
- Voltage: 3,7 V
- Recharge time: 2 hours

AC Adapter

- Input voltage: 90 – 264 V AC, 50/60 Hz
- Output voltage: 12 V DC
- Output current: 3 A

Output data

- Test current:
  - RMO-H1: up to 100 A DC (regulated)
  - RMO-H2: up to 220 A DC (regulated)
  - RMO-H3: up to 300 A DC (regulated)
- Max. output voltage (no load): 4,1 V DC

Measurement

- Resistance range 0 – 3000 mΩ
- Resolution

0,1 – 999,9 µΩ	0,1 µΩ
1,000 – 9,999 mΩ	0,001 mΩ
10,00 – 99,99 mΩ	0,01 mΩ
100,0 – 999,9 mΩ	0,1 mΩ
1000 – 3000 mΩ	1 mΩ

- Typical accuracy*

± (0,1 % rdg + 0,1 % FS) - up to 1 Ω range

± (0,25 % rdg + 0,25 % FS) - from 1 Ω to 3 Ω

**Accuracy is valid under the maximal test current per the range being used (as defined in the Section 3.6 – Measurement parameters in the RMO-H's Manual)*

CE – marking

EMC	2004/108/EC
LVD	2006/95/EC

Memory

- Internal: 2 GB SD Card
- RMO-H can store up to 1000 measurements

Interface

- Bluetooth: Device to PC connection

Real time clock

- Precision: ±5 seconds per month
- Calendar: 100 year with a leap year detection
- Time retention: 10+ years (battery removed)

Environment conditions

- Operating temperature:
  -10 ºC - +55 ºC / +14 ºF - +131 ºF
- Storage & transportation temperature:
  -40 ºC - +70 ºC / -40 ºF - +158 ºF
- Humidity 5 % - 95 % relative humidity

Environmental protection (IP rating)

- Device: IP54
- Device in plastic case: IP67 (closed lid)

Dimensions and Weight

- Dimensions (L x W x D):
  226 mm x 116 mm x 50 mm
  8.9 in x 4.5 in x 1.9 in
- Weight: 0,95 kg / 2.1 lbs

Warranty

- Three years

Applicable Standards

- Installation/overvoltage: category II
- Pollution: degree 2
- Safety: Directive 2014/35/EU (CE conform)
  Standard EN61010-1
- EMC: Directive 2014/30/EU (CE conform)
  Standard EN 61326-1:2006
- CAN/CSA-C22.2 No. 61010-1, 2nd edition

All specifications herein are valid at the rated battery voltage (3,7 V) or higher, ambient temperature of + 25 °C and recommended accessories. Specifications are subject to change without notice.

Current cables and Sense cables with TTA clamps (combined)

Current cables with battery clamps Sense cables with alligator clamps

Transport case with included device accessories and cables

Current cables and Sense cable with Kelvin probes

Power supply adapter

Power supply adapter (car charger)

Order info

- **RMO-H1 model** (up to 100 A DC)

Instrument with included accessories	Article No
Handheld Micro Ohmmeter RMO-H1	RMOH100-N-00
- USB with DV-Win PC software - Ground (PE) cable - Carrying belts - Plastic transport case	
Power supply adapter 3 A EU	PWR-ADP3A-EU

Recommended accessories RMO-H1	Article No
Current and sense cables 1,3 m with TTA clamps	CS2-1Z3-10CLWC

Optional accessories RMO-H1	Article No
Current and sense cables 1,3 m with Kelvin probes	CS2-1Z3-10CLKP
Current and sense cables 1,3 m (red) and 3 m (black) with TTA clamps	CS-1Z33-10CLWC
Current and sense cables 1,3 m (red) and 5 m (black) with TTA clamps	CS-1Z35-10CLWC
Current and sense cables 5 m with TTA clamps	CS2-05-10CLWC
Current cables 2 x 1,3 m 10 mm^2 with battery clamps	C2-1Z3-10CLB1
Sense cables 2 x 1,3 m with alligator clamps (A2)	S2-1Z3-02BPA2
Current cables 1,3 m and 3 m 10 mm^2 with battery clamps	C-1Z33-10CLB1

Sense cables 1,3 m and 3 m with alligator clamps (A2)	S-1Z33-02BPA2
Current cables 1,3 m and 5 m 10 mm^2 with battery clamps	C-1Z35-10CLB1
Sense cables 1,3 m and 5 m with alligator clamps (A2)	S-1Z35-02BPA2
Current cables 2 x 5 m 10 mm^2 with battery clamps	C2-05-10CLB1
Sense cables 2 x 5 m with alligator clamps (A2)	S2-05-02BPA2
Current cables 2 x 10 m 16 mm^2 with battery clamps	C2-10-16CLB1
Sense cables 2 x 10 m with alligator clamps (A2)	S2-10-02BPA2
Test shunt 240 µΩ (250 A/60 mV)	SHUNT-240-MK
Test shunt 1 mΩ (150 A/150 mV)	SHUNT-150-MK
Power supply adapter (car charger)	PWR-ADP3-CC0

**** test leads with up to 20 m length are available on request.***

- **RMO-H2 model** (up to 220 A DC)

Instrument with included accessories	**Article No**
Handheld Micro Ohmmeter RMO-H2	RMOH220-N-00
- USB with DV-Win PC software - Ground (PE) cable - Carrying belts - Plastic transport case	
Power supply adapter 3 A EU	PWR-ADP3A-EU

Recommended accessories RMO-H2	**Article No**
Current and sense cables 1,3 m with TTA clamps (220 A rated)	CS2-1Z3-10CLWC

Optional accessories RMO-H2	**Article No**
Current and sense cables 1,3 m with Kelvin probes (220 A rated)	CS2-1Z3-10CLKP
Current and sense cables 1,3 m (red) and 3 m (black) with TTA clamps (220 A rated)	CS-1Z33-16CLWC
Current and sense cables 1,3 m (red) and 5 m (black) with TTA clamps (200 A rated)	CS-1Z35-16CLWC
Current and sense cables 5 m with TTA clamps (200 A rated)	CS2-05-25CLWC
Current cables 2 x 1,3 m 10 mm^2 with battery clamps (220 A rated)	C2-1Z3-10CLB1
Sense cables 2 x 1,3 m with alligator clamps (A2)	S2-1Z3-02BPA2
Current cables 1,3 m and 3 m 16 mm^2 with battery clamps (220 A rated)	C-1Z33-16CLB1
Sense cables 1,3 m and 3 m with alligator clamps (A2)	S-1Z33-02BPA2
Current cables 1,3 m and 5 m 16 mm^2 with battery clamps (200 A rated)	C-1Z35-16CLB1
Sense cables 1,3 m and 5 m with alligator clamps (A2)	S-1Z35-02BPA2
Current cables 2 x 5 m 25 mm^2 with battery clamps (200 A rated)	C2-05-25CLB1
Sense cables 2 x 5 m with alligator clamps (A2)	S2-05-02BPA2
Current cables 2 x 10 m 35 mm^2 with battery clamps (180 A rated)	C2-10-35CLB1
Sense cables 2 x 10 m with alligator clamps (A2)	S2-10-02BPA2
Test shunt 240 µΩ (250 A/60 mV)	SHUNT-240-MK
Test shunt 1 mΩ (150 A/150 mV)	SHUNT-150-MK
Power supply adapter (car charger)	PWR-ADP3-CC0

**** test leads with up to 20 m length are available on request. The maximum output current in this case will be up to 100 A.***

- **RMO-H3 model** (up to 300 A DC)

Instrument with included accessories	Article No
Handheld Micro Ohmmeter RMO-H3	RMOH300-N-00
- USB with DV-Win PC software - Ground (PE) cable - Carrying belts - Plastic transport case	
Power supply adapter 3 A EU	PWR-ADP3A-EU

Recommended accessories RMO-H3	Article No
Current and sense cables 1,3 m with TTA clamps (300 A rated)	CS2-1Z3-25CLWC

Optional accessories RMO-H3	Article No
Current and sense cables 1,3 m with Kelvin probes (270 A rated)	CS2-1Z3-16CLKP
Current and sense cables 1,3 m (red) and 3 m (black) with TTA clamps (270 A rated)	CS-1Z33-25CLWC
Current and sense cables 1,3 m (red) and 3 m (black) with TTA clamps (290 A rated)	CS-1Z33-35CLWC
Current and sense cables 1,3 m (red) and 5 m (black) with TTA clamps (240 A rated)	CS-1Z35-25CLWC
Current and sense cables 1,3 m (red) and 10 m (black) with TTA clamps (220 A rated)	CS-1Z310-35CLWC
Current cables 2 x 1,3 m 25 mm^2 with battery clamps (300 A rated)	C2-1Z3-25CLB1
Sense cables 2 x 1,3 m with alligator clamps (A2)	S2-1Z3-02BPA2
Current cables 1,3 m and 3 m 25 mm^2 with battery clamps (270 A rated)	C-1Z33-25CLB1
Sense cables 1,3 m and 3 m with alligator clamps (A2)	S-1Z33-02BPA2
Current cables 1,3 m and 3 m 35 mm^2 with battery clamps (290 A rated)	C-1Z33-35CLB1
Sense cables 1,3 m and 3 m with alligator clamps (A2)	S-1Z33-02BPA2
Current cables 1,3 m and 5 m 25 mm^2 with battery clamps (240 A rated)	C-1Z35-25CLB1
Sense cables 1,3 m and 5 m with alligator clamps (A2)	S-1Z35-02BPA2
Current cables 1,3 m and 10 m 35 mm^2 with battery clamps (220 A rated)	C-1Z310-35CLB1
Sense cables 1,3 m and 10 m with alligator clamps (A2)	S-1Z310-02BPA2
Current cables 2 x 5 m 35 mm^2 with battery clamps (230 A rated)	C2-05-35CLB1
Sense cables 2 x 5 m with alligator clamps (A2)	S2-05-02BPA2
Current cables 2 x 10 m 50 mm^2 with battery clamps (200 A rated)	C2-10-50CLB1
Sense cables 2 x 10 m with alligator clamps (A2)	S2-10-02BPA2
Test shunt 240 µΩ (250 A/60 mV)	SHUNT-240-MK
Test shunt 1 mΩ (150 A/150 mV)	SHUNT-150-MK
Power supply adapter (car charger)	PWR-ADP3-CC0

**** test leads with up to 20 m length are available on request. The maximum output current in this case will be up to 100 A***

IBEKO Power AB
Stockholmsvägen 18
181 50 Lidingö, Sweden

Contact
Phone: +46 70 0925 000
E-mail:sales@dv-power.com