# Micro Ohmmeter RMO200D

- Lightweight – only 9 kg
- Powerful 5 A – 200 A DC
- Measuring range 0 – 999,9 mΩ
- Resolution to 0,1 µΩ
- Typical accuracy 0,1 %
- Remote Control Unit (optional)
- Both Sides Grounded Unit (optional)
- Rmax function
- Demagnetization of a CT core


## Description

RMO200D is a Micro Ohmmeter based on a state of the art technology, using the most advanced switch mode technique available today. RMO200D generates a true DC ripple-free current with automatically regulated test ramps. During a test the RMO200D ramps with increasing current before measuring and decreasing current after the measurement. This eliminates magnetic transients. After the test current has been set, the automatic test procedure is started by pressing the Ω-button.

The new feature is the ability to perform a fully automatic demagnetization of a current transformer core after the measurement. Demagnetizing a magnetic core of a current transformer requires alternating current applied with decreasing magnitude down to zero. The RMO200D provides this alternating current by internally changing the polarity of a controlled DC current. During the demagnetization process the instrument supplies a current at decreasing magnitude for each step, following a proprietary developed software solution.

The RMO200D instrument can store internally up to 500 measurements. All measurements are time and date stamped. Using the DV-Win software a test can be performed from a user's PC, and the results can be obtained directly on the PC. Communication between the RMO200D and a PC is through an USB (as standard) or an RS232 cable (as an option). Using the DV-Win the result can be arranged as an Excel spreadsheet which can be later shown as a diagram and printed for a report.

The set is equipped with a thermal and an overcurrent protection. The RMO200D has a very high ability to cancel electrostatic and electro-magnetic interference in HV electric fields. It is achieved by very efficient filtration. The filtration is made utilizing a proprietary hardware and software.

The RMO200D instrument has three separate test modes:

- SINGLE mode
- CONTIN mode
- BSG mode

## Single Test

The RMO200D instrument generates a filtered (true) DC current and output it in an automatically regulated current ramp. By sloping the current up and down, magnetic transients are virtually eliminated. Below is an example of single test ramp for the 200 A current.

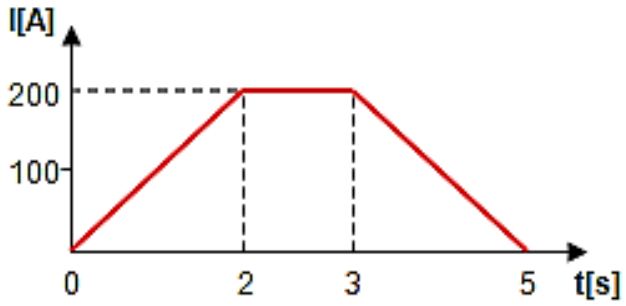


Figure 1 - *Single test ramp*

## Continuous Test

RMO200D can generate DC current continuously using the **Contin** menu. In this menu the current can be chosen the same way like in the **Single** menu, but the duration of the test can be preset.
The RMO200D current output is rated at 200 A for 150 seconds and 100 A for 300 seconds at 25°C ambient temperature.

## BSG test

This test mode is specially designed for **B**oth **S**ides **G**rounded testing. A current clamp meter is used for measuring the current through the grounding. The test setup is very simple (same as for the SINGLE test) and all calculations are made automatically by the device internal algorithm.

## Application

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

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

## Connecting the Test Object to RMO200D

With RMO200D turned off, connect RMO200D to the test object ($R_X$) in such a way that the measuring cables from the "Voltage Sense" sockets are attached as close as possible to $R_X$, and in between the current feeding cables. That way, a resistance of both cables and clamps is almost completely excluded from the resistance measurement.

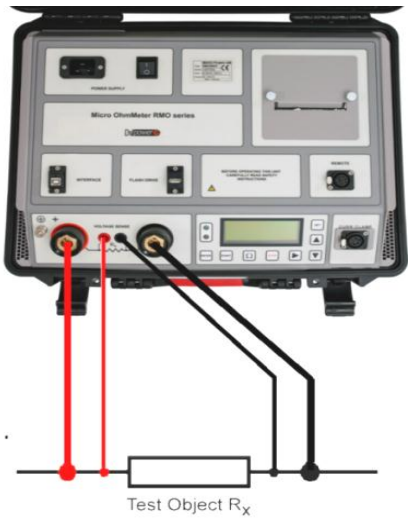


Figure 2 – *Connecting to the test object*

## Both Sides Grounded Unit

Using RMO200D with both sides grounded option it is possible to make safer measurement of breakers with both terminals of the breaker grounded.

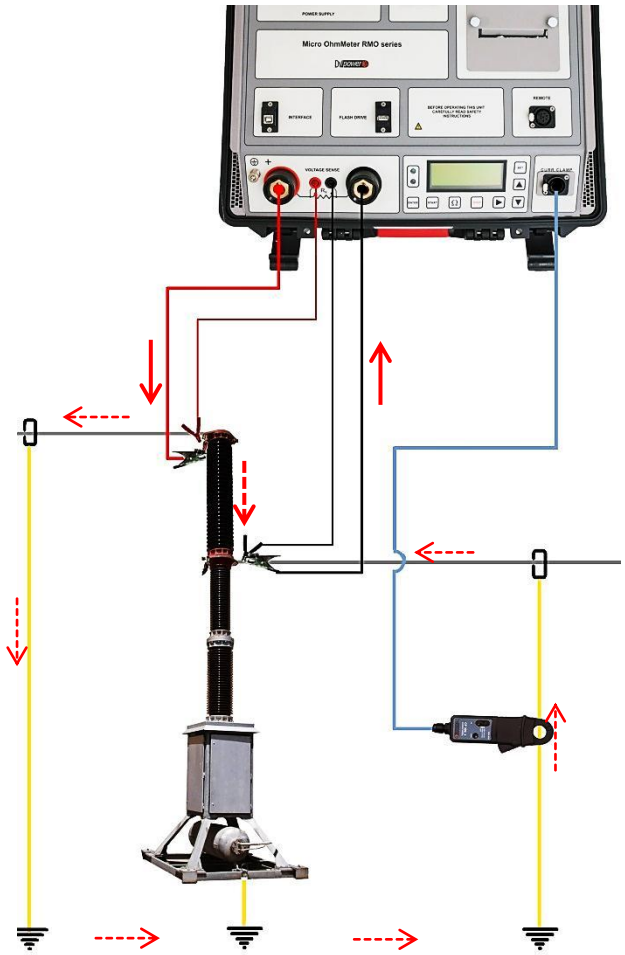


Figure 3 – *BSG measurement*

Using the RMO200D with a current clamp-meter is an additional safety feature. Measurement of a circuit breaker contact resistance is done with both sides of the breaker grounded.

The RMO200D device will measure the current through the ground circuit connection and add this value to the selected test current value in order to provide the selected test current through the test object.

## Remote Control Unit

The RMO Remote Control Unit is an optional control unit that is used to start and stop the tests from a remote location, away from the actual RMO.

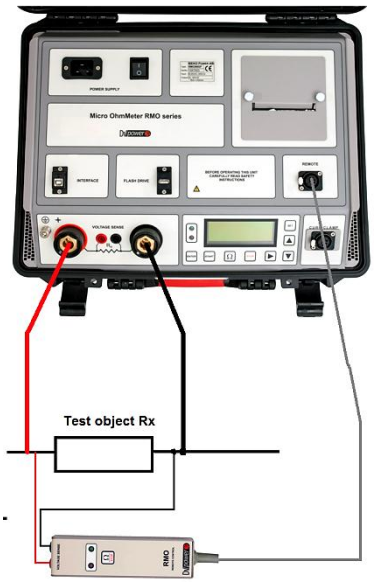


Figure 4 – *Measurement with the Remote Control Unit*

Provided that, for a series of tests, the same test current is fed through the test object, multiple measurements can be carried out with the RMO Remote Control Unit.

## Benefits and features

The RMO200D device has very stable and powerful voltage source used for current injecting. A very high voltage output enables wide resistance measurement range even when very high currents are used. In addition, this enables use of thinner/longer test cables, depending of the customer requirement.

The full output is available from the RMO200D at 230 V Mains Supply. A reduced output is available from lower supply voltages.

| Supply Voltage | Output Current | Full Load Voltage |
|---|---|---|
| 230 V AC | 200 A DC smoothed | 6,7 V DC |
| | 100 A DC smoothed | 7,0 V DC |
| 115 V AC | 200 A DC smoothed | 5,8 V DC |
| | 100 A DC smoothed | 6,7 V DC |

The output current is filtered and has a ripple of less than 1 %.
The instrument has a very high typical accuracy ± (0,1 % rdg + 0,1 % FS), with the best resolution of 0,1 µΩ.
Several advanced features are available as standard/optional accessories:

- Both Sides Grounded Unit *(requires current clamps available as optional accessory)*
- Remote Control Unit *(enables remote testing; optional accessory)*
- Rmax feature *(pass/fail criteria, enabled with the device and the DV-Win software)*
- Demagnetization feature *(enables testing of Dead Tank circuit breakers with current transformer mounted on its bushings)*
- Built-in thermal printer *(optional accessory)*

## DV-Win software

DV-Win software provides acquisition and analysis of the test results, as well as control of all the RMO functions from a PC. The DV-Win also provides several advanced features as a supplement to multiple functions of RMO devices. Testing in Continuous mode is upgraded with a sample time feature which allows user to record test results in specific time intervals set in seconds.

After performed measurements results can be saved in a various formats and test report can be generated and saved or printed. Result can also be downloaded from the device to the PC by use of several different search filters.
For the RMO form of DV-Win software there is Help menu available, with detailed instructions and explanations of all functions and features.

## DV-Win Main Features

- Full control of the device in test
- Test reports *available in several formats
- Several filters for results download to PC
- Test plans
- Sampling time feature for CONTIN mode

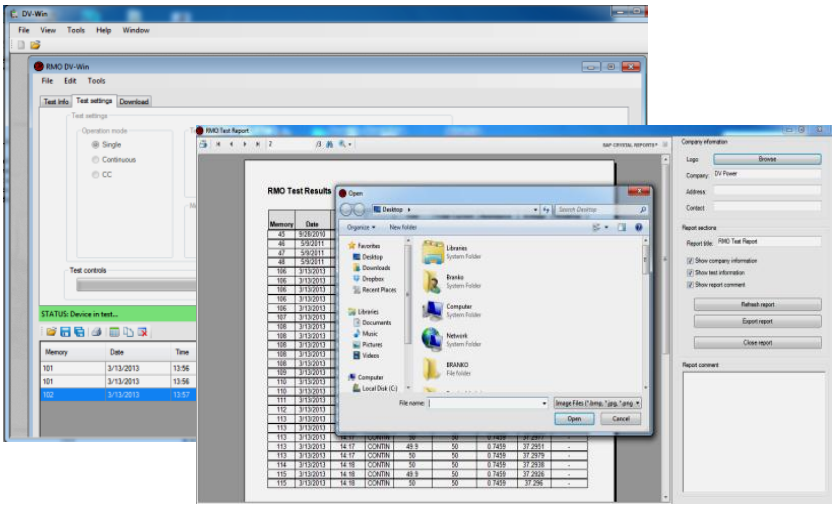


Figure 5 – *DV-Win Software for RMO*

## Technical data

### Mains power supply

- Connection according to IEC/EN60320-1; C320
- Mains supply: 90 V – 264 V AC
- Frequency: 50 / 60 Hz
- Input power: 1790 VA (230 V AC)
  1770 VA (115 V AC)
- Fuse: 12 A / 250 V, type F

### Output data

- Test current: 5 A – 200 A DC
- Max load interval (at 200 A): 150 s
- Full Load Voltage (at 200 A): 6,7 V
  *At 230 V of supply voltage

### Measurement

- Resistance range: 0,1 µΩ – 999,9 mΩ
- Resolution

| | |
|---|---|
| 0,1 µΩ - 999,9 µΩ | 0,1 µΩ |
| 1,000 mΩ - 9,999 mΩ | 1 µΩ |
| 10,00 mΩ - 99,99 mΩ | 10 µΩ |
| 100,0 mΩ - 999,9 mΩ | 0,1 mΩ |

- Typical accuracy ± (0,1 % rdg + 0,1 % FS)

### Display

- LCD screen 20 characters by 4 lines
- LCD display with backlight, visible in bright sunlight

### Interface

- RMO200D is equipped with an USB port
- optional: RS232 (connection to an external computer)

### Test Result Storage

- RMO200D can store up to 500 measurements

### Environmental conditions

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

### Environmental protection

- Ingress protection rating: IP67 (with closed lid)

### Printer (optional)

- Thermal printer
- Paper width 80 mm / 3.2 in

### Dimensions and weight

- Dimensions (W x H x D) - RMO200D without built-in thermal printer:
  405 x 165 x 330 mm
  15.94 x 6.5 x 23.99 in
- Dimensions (W x H x D) - RMO200D with built-in thermal printer:
  480 x 190 x 395 mm
  18.9 x 7.48 x 15.16 in
- Weight: 9 kg / 20 lbs.

### Applicable Standards

- Installation/overvoltage: category II
- Pollution: degree 2
- Safety: LVD 2006/95/EC (CE Conform)
  EN 61010-1
- EMC: Directive 2004/108/EC (CE Conform)
  Standard EN 61326-1:2006
- CAN/CSA-C22.2 No.61010-1, 2nd edition, including Amendment 1

### Warranty

- 3 Years

*All specifications herein are valid at ambient temperature of + 25 °C and recommended accessories.*
*Specifications are subject to change without notice.*

Current cables

Voltage sense cables

Extension cable

Test shunt

Cable bag

Current clamp 30/300A + cable set 5 m (16.4 ft.)

* Besides battery clamps, current cables are also available with C clamps or with alligator clamps (as option)

** Besides semi-isolated alligator (A1) clamps, sense cables are also available with isolated alligator (A2) clamps or with TTA clamps (as option)

## Order info

| Instrument with included accessories | Article No |
|---|---|
| **Micro Ohmmeter RMO200D** | RMO200D-N-00 |
| DV-Win PC software including USB cable | |
| Mains power cable | |
| Ground (PE) cable | |

| Recommended accessories | Article No |
|---|---|
| Current cables 2 x 5 m (16.4 ft.), 25 $mm^2$ (4 AWG) with battery clips | C2-05-25LMB1 |
| Sense cables 2 x 5 m (16.4 ft.) with alligator clips | S2-05-02BPA1 |
| Cable bag | CABLE-BAG-00 |

| Optional accessories | Article No |
|---|---|
| Transport case for RMO200D without built-in thermal printer | HARD-CASE-SC |
| Transport case for RMO200D with built-in thermal printer | HARD-CASE-LC |
| Test shunt 100 µΩ (600 A/60 mV) | SHUNT-600-MK |
| Current cables 2 x 10 m (32.8 ft.), 25 mm² (4 AWG) with battery clips | C2-10-25LMB1 |
| Current cables 2 x 15 m, 35 mm² (2 AWG) with battery clips | C2-15-35LMB1 |
| Current extension cable 2 x 10 m (32.8 ft.), 35 mm² (2 AWG) | E2-10-35LMLF |
| Sense cables, extension 2 x 10 m (32.8 ft.) | E2-10-02BPBP |
| Sense cables 2 x 10 m (32.8 ft.) with alligator clips | S2-10-02BPA1 |
| Sense cables 2 x 15 m (49.2 ft.) with alligator clips | S2-15-02BPA1 |
| Built-in thermal printer | PRINT-080-00 |
| **Remote control unit** | **RMORCU-09-00** |
| **Current clamps (Both Sides Grounded Unit)** | **CACL-0300-06** |

**IBEKO Power AB**
Stockholmsvägen 18
181 50 Lidingö, Sweden

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