Micro ohmmeters RMO-G series

Manual

Manual Version: M-RX00GN-208-EN
This Manual refers to the firmware versions 11.04 and 11.05 for
RMO100G, RMO200G, RMO300G, RMO400G, RMO500G, RMO600G and RMO800G models
Publishing date: 2017-04-04

Contents

1 Introduction

The manual refers to RMO100G, RMO200G, RMO300G, RMO400G, RMO500G, RMO600G and RMO800G models (hereafter referred to as “RMO-G”). This Manual provides instructions on how to use the RMO-G instruments safely, properly and efficiently.

The following instructions will help the user avoid unsafe situations, reduce maintenance costs and will ensure the reliability and durability of the RMO-G instruments.

The RMO-G must be used in accordance with all existing safety requirements and regulations based on national/local standards for accident prevention and environmental protection. In addition, the relevant international standards are listed in the “Technical Data” section of this document.

1.1 Safety Instructions

Safety is the responsibility of the user. Before operating the RMO-G, please read the following safety instructions carefully.

It is not recommended the RMO-G being used (or even turned on) without careful observation of the instructions listed in this Manual. The RMO-G should only be operated by trained and authorized personnel.

1.1.1 Safety Terms and Symbols

Terms in this Manual

These terms may appear in the Manual:

WARNING: Warning statements identify conditions or practices that could result in an injury or a loss of life.

CAUTION: Caution statements identify conditions or practices that could result in a damage to this product or to the other property.

Terms on the Device

The following warning terms used in this document may appear on the device:

WARNING: indicates that a potential hazard may occur.

CAUTION: indicates that a potential damage may occur to the instrument or to the test object connected to the instrument.

Symbols on the Device

The following symbols may appear on the device:

Refer to Manual

Protective Earth Terminal

1.1.2 Terms of Use

- The RMO-G shall be used only if it is in a good technical condition. Its use shall be in accordance with local safety and industrial regulations. Adequate precautions must be taken to avoid any risks related to high voltages associated with this equipment and nearby objects.
- The RMO-G shall be used only for the application purposes described in the ”Intended Use” section. The manufacturer and distributors are not liable for a damage resulting from the wrong usage. The user bears responsibility for not following the instructions defined in this document.
- Do not remove the protective casing of the RMO-G.
- All service and maintenance work must be performed by qualified personnel only.

1.1.3 Orderly Practices and Procedures

- The Manual shall always be available on the site where the RMO-G is used.
- Before using the RMO-G, all personnel (even personnel who only occasionally, or less frequently, work with the RMO-G) assigned to operate the RMO-G should read the operations Manual.
- Do not make any modifications, extensions, or adaptations to the RMO-G.
- Use the RMO-G only with the original accessories provided by the manufacturer.
- Use the RMO-G and its original accessories for the device’s intended use only.

1.1.4 Device maintenance

Device should be kept in a clean condition to prevent excessive dust or other contaminants affecting its operation. It should be cleaned with water/isopropyl alcohol after noticing any dirt/contaminants on its surfaces.

1.1.5 Operator Qualifications

- Testing with the RMO-G should only be carried out by authorized and qualified personnel.
- While receiving training, instruction or education on the RMO-G device personnel should remain under the constant supervision of an experienced operator while working with the test set and the test object.

1.1.6 Safe Operating Procedures

- Hazardous voltages of up to 400 V can occur inside the RMO-G. Therefore, it is not permitted to remove the protective casing of the RMO-G.
- Before putting the RMO-G into operation, check the test set for any visible damage.
- Do not operate the RMO-G under wet or moist conditions (condensation).
- Do not operate the RMO-G if explosive gas or vapors are present.
- Only the external devices which meet the requirements for SELV equipment according to EN 60950 or IEC 60950 should be connected to the RMO-G through the serial interface.
- Removing the RMO-G protective casing will void the warranty. Any work inside the instrument without prior authorization from DV Power will also void the warranty.
- If the RMO-G seems to be malfunctioning, please contact the DV Power Support Team (refer to the “Manufacturer Contact Information” section) after previously checking the “Error Messages” section.

- Do not use the RMO-G without the extra protective ground cables supplied with the RMO-G. It must never be operated in a non-grounded configuration as this may result in an electrical shock to the user or damage the RMO-G. Always establish this connection first before establishing any other connections and remove this connection as the very last one.
- Cables between the RMO-G and any other equipment should be connected and disconnected from the RMO-G only while the instrument is switched off.

1.2 Power Supply

- Supply the RMO-G only from a power outlet which is equipped with the protective ground.
- Besides being supplied from phase – neutral (L1-N, A-N), it may also be supplied from phase to phase (e.g., L1-L2; A-B). However, the voltage must not exceed 264 V AC. Please refer to the section “Technical Data”.
- The RMO-G should be positioned in such a way that it is possible to safely disconnect it from the power supply at any moment.

WARNING / AVERTISSEMENT

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Il s'agit d'un produit de classe A. Dans un environnement domestique, ce produit peut provoquer des interférences radio, auquel cas l'utilisateur peut être amené à prendre des mesures adéquates.

1.3 Measurement Category

RMO-G is intended to be used for measurements in Measurement Category I (CAT I) for voltages to 20 V. Device is also designed to withstand occasional transient overvoltage up to 1000 Vpk.

WARNING / AVERTISSEMENT

This equipment is classified as measurement category I, and must not be used within measurement category II, III and IV.

Cet équipement est classée dans la catégorie de mesure I, et ne doit pas être utilisé dans les catégories de mesure II ,III et IV.

1.4 Intended Use

The Micro Ohmmeters RMO-G is designed for measuring contact resistances of non-inductive test objects used in the electric power industry or similar branches. It is employed for resistance measurement during manufacturing, commissioning and testing of:

- Power circuit breakers (including dead-tank circuit breakers)
- Disconnecting switches,
- Interrupters,
- Bar installation,
- Cable splices,
- Welded joints,
- Groundings

CAUTION: Any use of the RMO-G other than mentioned above is being considered improper and will void the warranty and exempt the manufacturer from its liability for repair or exchange.

2 Description

2.1 Front Panel Components

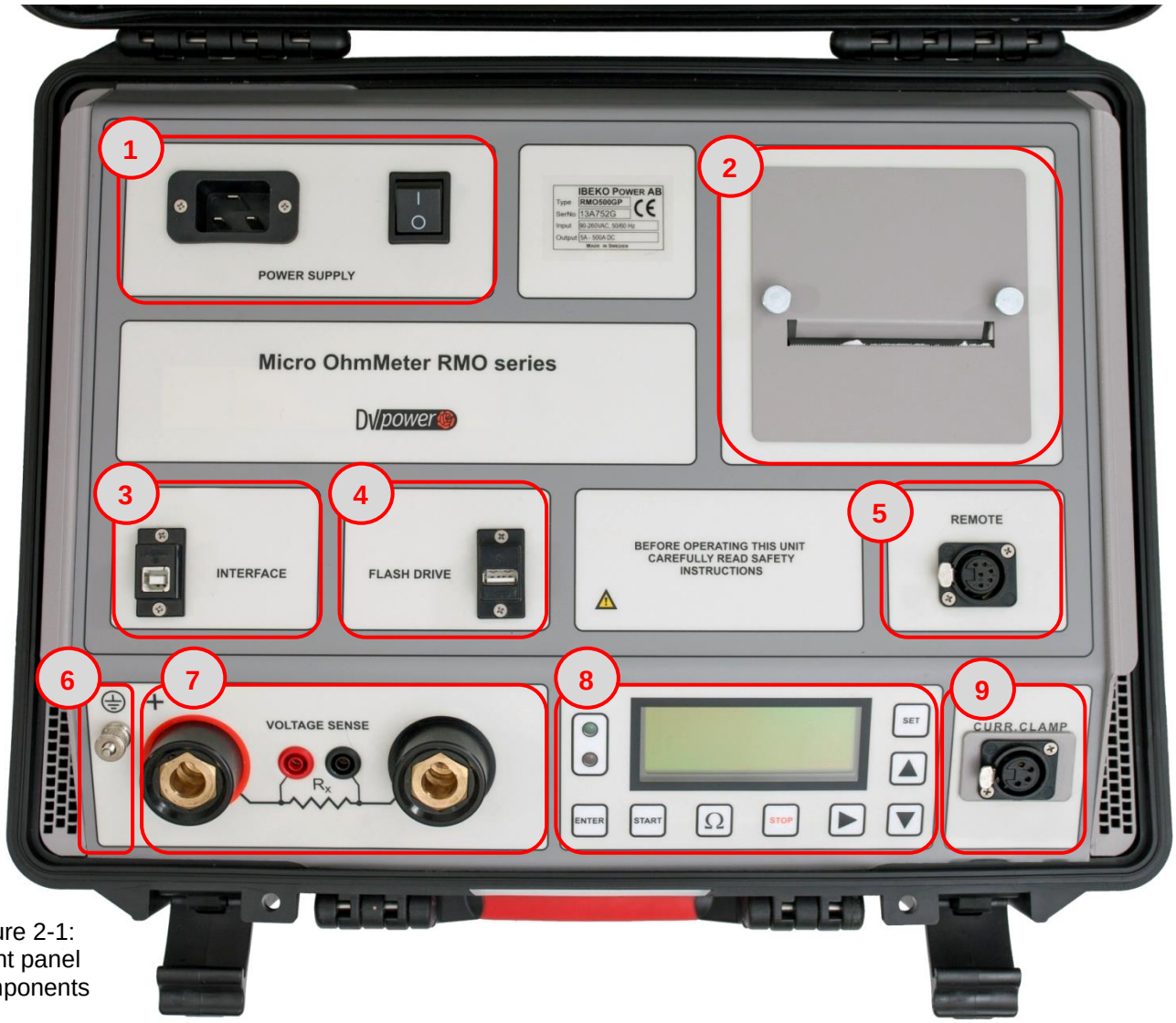


Figure 2-1: Front panel components

1 - Mains power supply input
90 V – 264 V AC;50 Hz – 60 Hz

2 - Thermal printer (optional)
(built-in 80 mm wide) Graphic and numeric printout of contact and travel wave form

3 - USB Interface
Used for PC communication
(RS 232 communication interface optional)

4 - Flash Drive Connectors
For direct download of test results on a USB

5 - Remote control (optional)
Used for remote testing (safety feature)

6 - Protective Earth Connector
Used for protection against parasitic currents or voltages

7 - Main current and sense connectors
Used for contact resistance measurement

8 - Operator control
Display and Keyboard

9 - Current clamp connectors
Used for Both Sides Grounded measurement

Mains power supply input

Mains power connector
Connects the RMO-G device to the mains power supply with a power cord.

Power switch – Double pole switch

- **I** In this position, the RMO-G is connected to the mains power supply.
- **0** In this position, the RMO-G is separated from the mains power supply.

Thermal printer (optional)

The device can be delivered with 80 mm paper wide built-in thermal printer, as an optional accessory.

USB Interface and Flash Drive Connectors

USB Interface
The RMO is contains a USB serial interface to connect to an external computer if required. The RS232 communication port is also available as an option instead of USB interface.

Flash Drive
The RMO is equipped with a USB flash drive connector to save the test results to a flash drive for additional analysis if desired.

Bluetooth communication (optional)

The Bluetooth communication module is optional accessories for RMO-G devices. In case of this module ordering, RS232 port is implemented instead of USB interface. After connecting the Bluetooth adapters to the device (RS232 port) and to the PC (USB port), the device is automatically ready for the Bluetooth communication with the DV-Win software.

Remote control (optional)

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

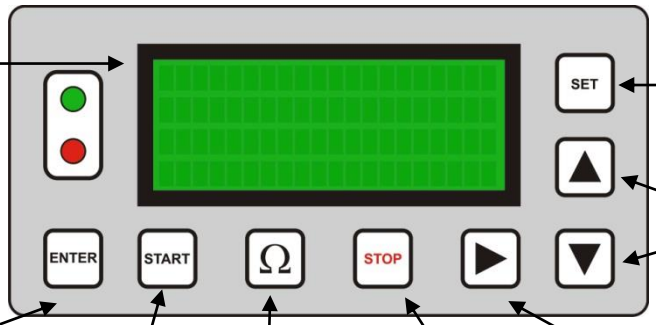
Very often the same test current is fed through the test object for a series of tests. To simplify this and speed up the process, multiple measurements can be carried out with the RMO Remote Control Unit.

Protective Earth Connector

For protection against parasitic currents or voltages, always connect the RMO-G protective earth connector to the protective ground (PE). Use only the originally supplied cable.

For safety reasons, always establish earth/ground connection as the first step before establishing any other connections, and disconnect it as the very last one.

Operator Control



Display

SET button to scroll between the menus

UP/DOWN buttons to select a menu, define a test current and set test parameters

RIGHT button to navigate in the active menu

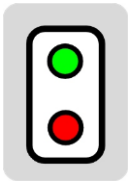
ENTER button to confirm the defined test parameters, Language, and Date and Time

START button to start the test current

Ω button to save the current resistance value in **Contin** menu

STOP button to stop a test, to acknowledge the alarm buzzer and return to the current menu

Green LED
- Lights continuously when RMO-G is turned on.
- Flashes when a test can be started.
- Flashes alternately with the red LED during a test.



Red LED
- Lights continuously in case of operational error.
- Flashes alternately with the green LED during a test.
- Lights when assigned maximum value in **Rmax** menu is exceeded (or equaled)

Current clamps connectors

When connecting the current clamp meter please pay attention the current circuit through the current clamp meter is positioned far away from the rest of the current circuits. This will prevent an electromagnetic interference. A distance between the current cables must be more than 10 cm (4 ").

Current and sense connectors

Current connector marked red is the current output connector.
Current connector marked black is the current returning connector.

3 Getting Started

3.1 Connecting a Test Object to RMO-G

Before connecting the RMO-G to a circuit breaker, make sure that:

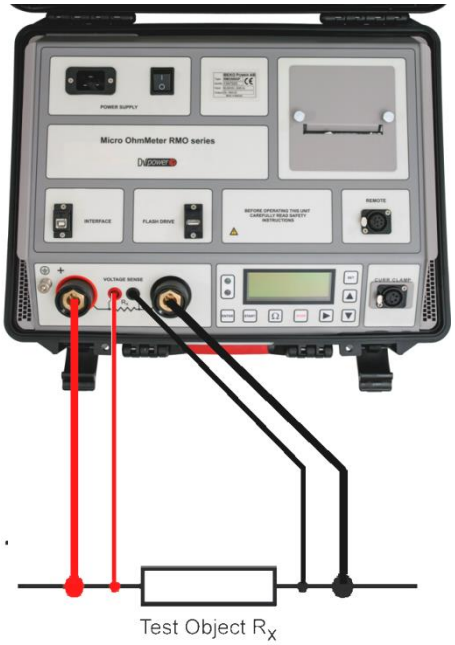
- the breaker is disconnected or separated from its circuit on both sides of the breaker in accordance with the national safety regulations; **always comply with local safety regulations when using the RMO-G,**
- the breaker is properly grounded to a protective ground (PE),
- the RMO-G itself is properly grounded. To do so, connect the grounding screw of the RMO-G to a PE using only original grounding cable.

With the RMO-G turned off, connect it to the circuit breaker with its appropriate cables.

Cables between the RMO-G and other equipment should be connected and removed ONLY when the RMO-G is switched off.

Always connect the measuring cables to the RMO-G first and then to the test object; and when disconnecting always disconnect the cables from the test object first and after that from the RMO-G. The grounding wire PE should be disconnected last. Failure to do this may result in a serious injury or even a loss of life.

Figure 3-1: Connecting test object to RMO-G



With RMO-G turned off, connect RMO-G to the test object (R_X) in such a way that the measuring cables from the "Voltage Sense" input sockets are attached as close as possible to the test object R_X, and closer to Rx than the connection points of the current feeding cables. That way, resistance of both, cables and clamps is almost completely excluded from the resistance measurement.

Please pay attention to the polarity while connecting the measuring cables otherwise the measurement results will be incorrect.

To maximize accuracy and measurement repeatability make sure that all clamps have a good connection to the test object and avoid any connection between Sense and Current clamps.

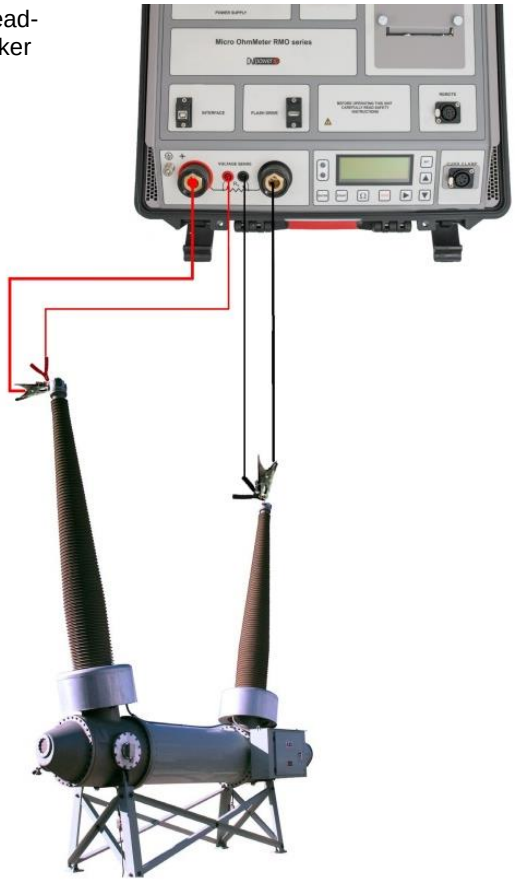
3.2 Connecting RMO-G to Dead Tank circuit breaker

The contact resistance measurement of dead tank circuit breakers requires a different approach comparing to the live tank circuit breakers due to their design. A DC current used for this measurement flows directly through the current transformers mounted on the bushings. Presence of current transformers (CT) on this type of circuit breakers may introduce errors during a test due to CT magnetizing process.

It is necessary to saturate a CT prior to measurement. This can be achieved in DTRtest menu, specially designed for dead tank circuit breakers.

The connecting diagram and the test parameters setup are the same as for the live tank circuit breakers testing, as presented in the figure below:

Figure 3-2: Connecting a dead-tank circuit breaker to RMO-G



As explained in the previous section, the measuring cables from the "Voltage Sense" input sockets should be attached as close as possible to the tested dead-tank circuit breaker, and closer than the connection points of the current feeding cables.

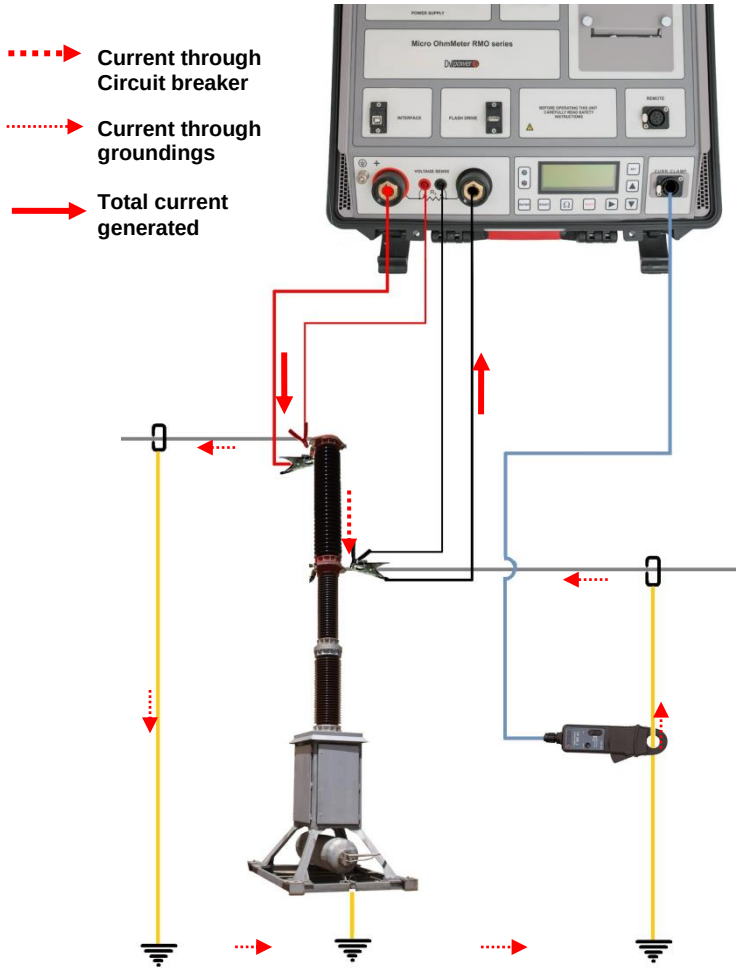
Please pay attention to the polarity while connecting the measuring cables otherwise the measurement results will be incorrect.

3.3 Connecting RMO to Both Sides Grounded circuit breaker

Using the RMO-G 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 RMO 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.

The connection diagram for RMO-G device with both sides grounded circuit breaker is presented in the following figure. The current flow through the circuit breaker and groundings is also marked with red arrows.

Figure 3-3: Connecting RMO-G to both sides grounded CB



The connection diagram for BSG testing is the same as for one side grounded circuit breaker testing, with only one addition – the current clamps should be connected to the one grounding cable.

Using the RMO-G 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 RMO 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.

Please connect the current clamp-meter cables to the appropriate input terminals of the RMO device. By pressing the side button open the current clamp-meter's jaws and clamp one conductor only. The jaw must be firmly closed around the conductor. Make sure conductor is passed through the middle of the clamp- meter jaw opening. Make sure the angle is 90 degrees between the central axis of a conductor and a plane of the opening of the clamp-meter. The continuous red LED light indicates the clamp-meter works correctly. In the case the red LED is blinking it is necessary to change the battery.

3.4 Connecting the Remote Control Unit to RMO-G and Test Object

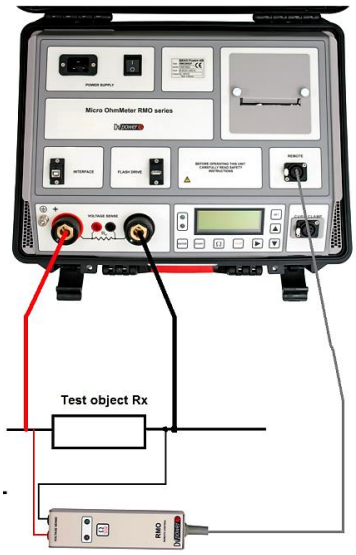
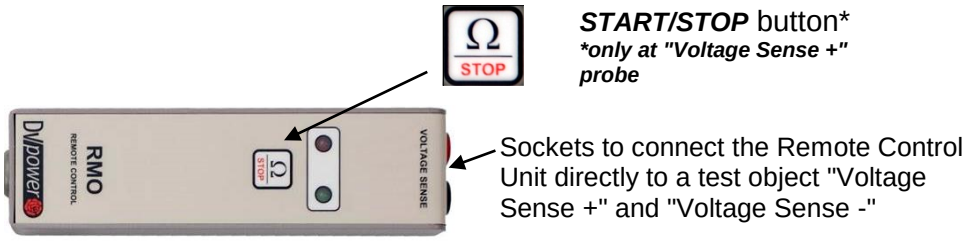


Figure 3-4: Connecting Remote control unit

Turn off the RMO-G and plug in the Remote Control Unit to the connector on the RMO's front panel.

Connect the Remote Control Unit to the test object (R_X) in such a way that the measuring cables from the "Voltage Sense" sockets are situated as close as possible to R_X, and in between the current feeding cables from the RMO. That way, both the cable's and the clamps' typical contact resistance is largely excluded from the resistance measurement.



START/STOP button*
only at "Voltage Sense +" probe

Sockets to connect the Remote Control Unit directly to a test object "Voltage Sense +" and "Voltage Sense -"

Figure 3-5: Remote control Unit (top) and Remote Control test probes (bottom)

START/STOP button*
only at "Voltage Sense +" probe

Socket to connect the Remote Control "Voltage Sense -" probe with "Voltage Sense +" probe (one with trigger button).

Depending on the situation, the Ω/STOP button has various functions:

- When the green LED flashes a new test can be started by pressing this button
- When the green LED is continuously ON, pressing this button will prepare the RMO for a new test, using the test parameters set on the RMO.
- While a test is running (the green and the red LEDs flash alternately), pressing this button stops the test immediately.

Never connect the Remote Control Unit to any other device but the RMO.

3.5 Settings

To set RMO-G's language, date and time and **Rmax** press and hold ***SET*** button for 3 seconds to select **Settings** menu.

Figure 3-6:
Settings menu

Pressing ***STOP*** to cancel, returns you to the **Single** menu.

Setting RMO-G's Language

To set RMO-G's language, please use the ***RIGHT*** button, and then ***ENTER*** button to select the **Set Language** menu.

Figure 3-7:
The **Language** menu

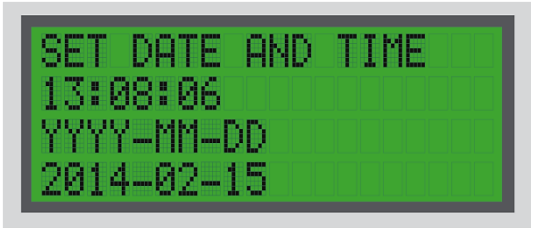
Move the cursor using the ***RIGHT*** button and select the language of your choice.

Pressing ***ENTER*** to confirm, returns you to the **Settings** menu.
Pressing ***STOP*** to cancel, returns you to the **Settings** menu.

Setting RMO-G's Date and Time

To set RMO-G's date and time, please use the ***RIGHT*** button, and then ***ENTER*** button to select the **Set date and time** menu.

Figure 3-8:
Date and Time menu showing RMO-G's internal date and time



Move the cursor to the position of your choice using the ***RIGHT*** button, and change the value with the ***UP/DOWN*** buttons.

One of three different date formats can be selected:

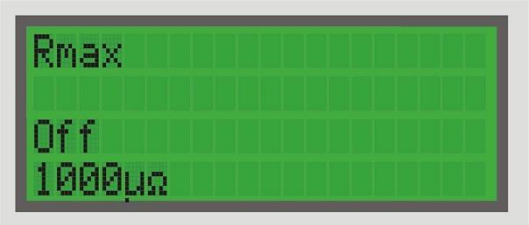
1. YYYY-MM-DD
2. DD-MM-YYYY
3. MM-DD-YYYY

Pressing ***ENTER*** to confirm, returns you to the **Settings** menu.
Pressing ***STOP*** to cancel, returns you to the **Settings** menu.

Setting Rmax

To set RMO-G's Rmax value, please use the ***RIGHT*** button, and then ***ENTER*** button to select the **Set Rmax** menu.

Figure 3-9:
Rmax menu



In the **Rmax** menu, define the status of **Rmax** (**On** or **Off**) and assigned value of resistance.
Using the ***RIGHT*** button move the cursor to the position of **Rmax** menu status, and using ***UP/DOWN*** buttons select **Off** (Figure 3-9) or **On** option.

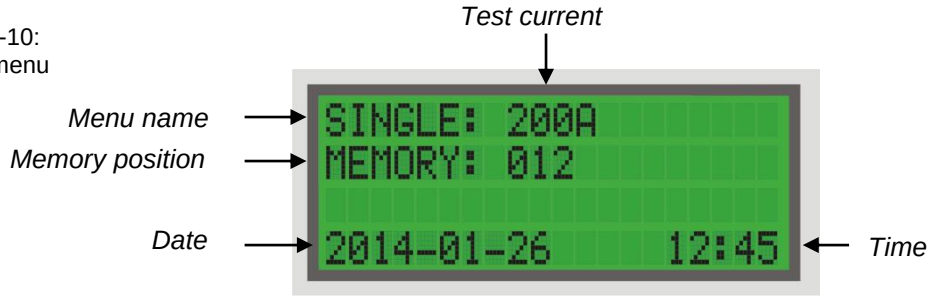
Using the ***RIGHT*** button move the cursor to the position of assigned value of resistance, and using ***UP/DOWN*** buttons select desired value between 1 µΩ and 9999 µΩ. The default value is 1000 µΩ (figure 3-9). When device is turned off and then turned on, RMO-G remembers the last saved setting of Rmax value and a status. Once these parameters are defined, press ***ENTER*** to change to the **Settings** menu.

3.6 Setting the Measurement Parameters

3.6.1 Single Test

Turn the RMO-G power switch **ON**. The RMO-G will display the **Single** menu and the green LED is **ON**.

Figure 3-10:
Single menu



Before a test can be started, the following parameters need to be defined in the **Single** menu:

- Test current; the following values can be selected:
  5 A, 10 A, 20 A, 50 A, 100 A, *200 A, *300 A, *400 A, *500 A, *600 A and *800 A.
  *maximal test current is related to the model name.
  e.g. for RMO100G maximal test current is 100 A, for RMO200G is 200 A, …, for RMO800G is 800 A.
- Memory position, 000-499

In the **Single** menu, define a test current for the test (here **200A**). To do so please set the desired value by using the ***UP/DOWN*** buttons.
Using the ***RIGHT*** button move the cursor to the memory location position and using the ***UP/DOWN*** buttons select a desired memory position to which the obtained results will be saved. Once the test is completed the last measured result will remain registered in RMO-G, and the memory position is automatically switched over to the next memory position. The result can be recalled later by selecting that particular memory position number.

3.6.2 Continuous Test

Turn the RMO-G power switch ON. The RMO-G will display the **Single** menu. Press ***SET*** button to go to the **Contin** menu. Other option to go to the **Contin** menu is to press ***RIGHT*** button four times consecutively and then to press UP button. Press ***STOP*** to return to the **Single** menu.

Figure 3-11:
Contin menu

In the **Contin** menu, please define a test current, memory location and test current duration time.
Using ***RIGHT*** button to move the cursor to the position of a test current, and using the ***UP/DOWN*** buttons select a desired value.
Use the ***RIGHT*** button to move the cursor to the position of a test current duration (here **60 s**), and use the ***UP/DOWN*** buttons to select a desired value.

Use the ***RIGHT*** button to move the cursor to the position of a memory location. Use the ***UP/DOWN*** buttons to select a desired memory position (here **Memory: 020**) to which obtained results will be saved. Upon the test completion (either due to time expiration or because the test is interrupted by pressing the ***STOP*** button) the last measured result will remain registered in the RMO-G memory.

Note: If DV-Win software is used during the test, all measurements will be registered in Excel table format, with option of additional editing and graphic presentation.

When using DV-Win software it is possible to download only the last stored test results from the selected internal memory location.

3.6.3 BSG Test

Turn on the RMO-G with the power switch on the test set. The display shows the **Single** menu. Go to **BSG** menu by pushing ***SET*** button twice or using ***RIGHT*** button four times, ***DOWN*** button, ***RIGHT*** button three times and then ***DOWN*** button.

Figure 3-12:
The **BSG** menu

Define a test current through the circuit breaker (here **200G**) and a memory position (here **Memory: 013**). Once these parameters are defined, press ***ENTER*** to change to the **Ready** state.

Note: The current clamps should be turned ON. The measurement range 300 A (1 mV/A) should be selected.

3.6.4 DTR Test

Turn on the RMO-G with the power switch on the test set. The display shows the **Single** menu. Go to **DTRtest** menu by pushing ***SET*** button three times.

Figure 3-13:
The **DTRtest** menu

DTRtest menu is specially designed for resistance measurement of the dead tank circuit breakers.

The contact resistance measurement of dead tank circuit breakers requires a different approach comparing to the live tank circuit breakers due to their design. A DC current used for this measurement flows directly through the current transformers mounted on the bushings. Presence of current transformers (CT) on this type of circuit breakers may introduce errors during a test due to CT magnetizing process. For this reason, **it is necessary to saturate a CT prior to measurement.**

As mentioned, DTRtest menu is specially designed for dead tank circuit breakers testing and all calculations for detecting the saturated condition of CTs is done by internal algorithm. Accordingly, the process of measurement parameters setting and testing is very simple and does not differ much from testing in SINGLE/CONTIN/BSG test modes.

The user only needs to define a test current through the circuit breaker (here **100A**) and a memory position (here **Memory: 013**).

The following test current values can be selected: 5 A, 10 A, 20 A, 50 A, 100 A, *200 A and *300 A.

Note: Maximum test current is related to the model name. e.g. for RMO200G maximum test current is 200 A. For DTRtest mode the test current is limited up to 300 A maximum (e.g. for RMO600G maximum test current is 600 A, but for DTRtest it is 300 A).

Once these parameters are defined, press ***ENTER*** to change to the Ready state.

3.7 Measuring with RMO-G

3.7.1 Single Test

Before a test can start, both a test current and a memory position need to be defined using the **Single** menu. Once these parameters are defined, please press ***ENTER*** to change to the **Ready** state.

Figure 3-14:
Ready state

The **Ready** state displays the test current and memory position defined. If one of these values has to be changed, press ***STOP*** to return to the **Single** menu.

The flashing green LED indicates RMO-G is now ready to start the test. Press the ***START*** button to run a test. At the start of the test, the internal cable connection safety check is done automatically by the device itself. In case of e.g. a disconnection, an alarm is activated and the error message is shown on the display.

During the test, both the green and the red LEDs flash alternately. The display shows a graphical representation of the output current that ramps from 0 A to the defined maximum value (here **200A**).

Figure 3-15:
Single menu during the test

Once the current ramp reaches its maximum value, RMO-G measures the current through the test object and the voltage at the test object for 1s, calculates the resistance from these values, and saves the data at the predefined memory location.

Afterwards, RMO-G ramps down the output current from the predefined value to 0 A. After 0 A is reached, the test is finished and the green LED is ON.

Note: To stop the test at any time, press the *STOP* button. The current will immediately drop to 0 A.

3.7.1.1 Measuring with the Remote Control Unit

Testing with the Remote Control Unit is much like testing procedure with the RMO itself:

- Connect the Remote Control Unit to the RMO
- Connect the Remote Control Unit to a test object,
- In the RMO **Single** menu, define the test parameters, and press ***ENTER*** to change to the **Ready** state,
- The flashing green LED indicates that RMO is now ready to start the test.
- Press the ***Ω/STOP*** button once more to start the test.

While the test is running, the green and red LEDs flash alternately. To stop the test at will, press the ***Ω/STOP*** button once more. Once the test is finished, RMO automatically changes to the **Result** menu to display the test results. The green LED lights up continuously.

If an error occurred during the test, the red LED lights up continuously, and the display presents the adequate error message.
In case of multiple tests, the same test current is fed through the test object. Multiple tests can be carried out with the Remote Control Unit. Simply press the ***Ω/STOP*** button again to repeat the procedure. If different test parameters are required, set them on RMO directly, and start the new test by pressing the ***Ω/STOP*** button again.

3.7.2 Continuous Test

Before the test could be started, a test current, duration of the test and memory location must be defined using **Contin** menu. Press ***ENTER*** to change to the **Ready** state.

Figure 3-16:
Ready state

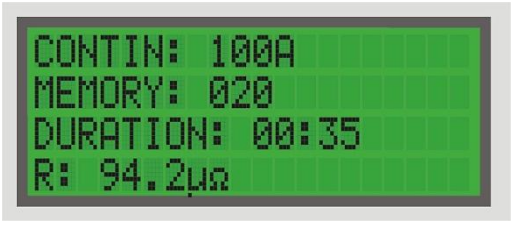
The **Ready** state displays the selected test current (here **100A**), duration of the test (here **60** sec) and memory location of the result (here **Memory: 020**). If one of these values has to be changed, press ***STOP*** button to return to the **Contin** menu.

The flashing green LED indicates RMO-G is now ready to start the test. Press the ***START*** button to run a test.

During the test, both green and red LEDs flash alternately. The display shows test current (here **100A**) and the current value of the measured resistance (here **94,2µΩ**). The time passed since the beginning of the test is also shown on the display (here **00:35 s)**

Note: To stop the test at will, please press the STOP button at any time during the test. The current will immediately drop to 0 A.

Figure 3-17:
Contin menu
during the test



Upon completion of the test (either due to expiration of selected time or using the ***STOP*** button) the last measured result will remain registered at the previously selected memory location.

By pushing the ***Ω*** button the recent test result is stored in the internal device memory.

Note: If DV-Win software is used during the test, all measurements will be registered in the Excel table format, allowing additional editing and graphic presentation options.

When using DV-Win software it is possible to download only the last stored test results from the selected internal memory location.

3.7.3 BSG Test

Before a test can start, both a test current and a memory position need to be defined using the **BSG** menu. Once these parameters are defined, please press ***ENTER*** to change to the **Ready** state.

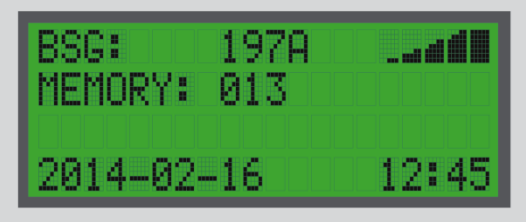
Figure 3-18:
The **Ready** state

The **Ready** state displays the test current and a memory position defined. If one of these values has to be changed, press ***STOP*** to return to the **BSG** menu.

The flashing green LED indicates RMO-G is now ready to start the test. Press the ***START*** button to run a test. At the start of the test, the internal cable connection safety check is done automatically by the device itself. In case of e.g. a disconnection, an alarm is activated and the error message is shown on the display.

During the test, both the green and the red LEDs flash alternately. The display shows a graphical representation of the output current that ramps from 0 A to defined maximum value (here **197 A**).

Figure 3-19:
The **Contin** menu during the test



The RMO-G measures the current through the test object and the voltage at the test object for 1s, calculates the resistance from these values, and saves the data at the predefined memory location.

Afterwards, RMO-G ramps down the output current from the predefined value to 0 A.
After 0 A is reached, the test is finished and the green LED is ON.

Note: To stop the test at any time, press the *STOP* button. The current will immediately drop to 0 A.

The RMO-G device measures the current through the ground circuit connection (with the current clamps) and subtracts this value from the measured test current. In this way, the test current through the test object is calculated.

Note: The accuracy of a measured resistance in this menu is lower than accuracy in the Single or Contin menus due to accuracy of a current clamp-meter. The clamp-meter accuracy is ± (1 % of rdg + 0.3 A).

3.7.4 DTRtest

Before a test can start, both a test current and a memory position need to be defined using the **DTRtest** menu. Once these parameters are defined, please press ***ENTER*** to change to the **Ready** state.

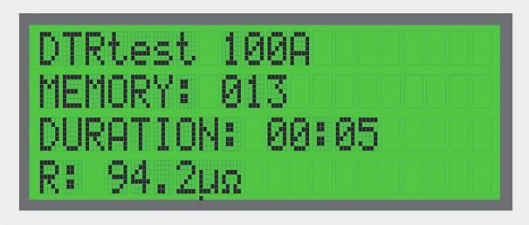
Figure 3-20:
The **Ready** state

The **Ready** state displays the test current and memory position defined. If one of these values has to be changed, press ***STOP*** to return to the **DTRtest** menu.

The flashing green LED indicates RMO-G is now ready to start the test. Press the ***START*** button to run a test. At the start of the test, the internal cable connection safety check is done automatically by the device itself. In case of e.g. a disconnection, an alarm is activated and the error message is shown on the display.

During the test, both the green and the red LEDs flash alternately. The display shows a graphical representation of the output current that ramps from 0 A to the defined maximum value (here **100A**).

Figure 3-21:
The **DTRtest** menu during the test



As mentioned, presence of current transformers (CT) on this type of circuit breakers may introduce errors during a test due to CT magnetizing process. For this reason, it is necessary to saturate a CT prior to measurement.

Once the current ramp reaches its maximum value, RMO-G measures the current through the test object and the voltage at the test object for each 1s, calculates the resistance from these values. The device compares the results in order to detect when the CTs are saturated. After the device detects that CTs are saturated it displays the result, saves it in the internal memory and stops the test automatically.

Afterwards, RMO-G ramps down the output current from the predefined value to 0 A.
After 0 A is reached, the test is finished and the green LED is ON.

Note: To stop the test at any time, press the *STOP* button. The current will immediately drop to 0 A.

3.8 Measurement parameters

The table below provides RMO-G device accuracy parameters under the maximal test current per the range being used.

Table 3-1 Measurement parameters for RMO-G series

Range	Recommended Test Current	Nominal Resistance	Full Range Display	Resolution	Typical accuracy
1	100 A - *I_{max}	1 mΩ	999,9 µΩ	0,1 µΩ	± 0,1 % rdg ± 0,1 % FS
2	100 A - 200 A	10 mΩ	9999 µΩ	1 µΩ	± 0,1 % rdg ± 0,1 % FS
3	50 A - 100 A	20 mΩ	20,00 mΩ	10 µΩ	± 0,1 % rdg ± 0,1 % FS
4	20 A - 50 A	50 mΩ	50,00 mΩ	10 µΩ	± 0,1 % rdg ± 0,1 % FS
5	10 A - 20 A	100 mΩ	99,99 mΩ	10 µΩ	± 0,1 % rdg ± 0,1 % FS
6	10 A	500 mΩ	500,0 mΩ	0,1 mΩ	± 0,1 % rdg ± 0,1 % FS
7	5 A	1 Ω	999,9 mΩ	0,1 mΩ	± 0,1 % rdg ± 0,1 % FS

I_{max} – maximal test current for appropriate model (e.g. 600 A for RMO600G model)

3.9 Duty Cycles

During tests RMO-G generates a high DC current that heats up the test set. To prevent overheating, certain duty cycles apply depending on the test current being used.

Table 3-2: Cooling time between single and continuous tests

Single Test		
Test current (A)	**Cooling time between first 3 tests (sec)**	**Cooling time after 4 tests (sec)**
5, 10, 20, 50, 100	0	0
200	0	10
300	0	20
400	5	30
500	10	40
600	10	50
Continuous Test		
Test current (A)	**Maximal test duration time (sec)**	**Cooling time (sec)**
5, 10, 20, 50, 100	300	0
200	150	1 x test duration
300	90	2 x test duration
400	50	3 x test duration
500	30	4 x test duration
600	20	6 x test duration

A built-in control prevents these cooling times from being skipped. If a start of the next test attempted within the cooling period, the display shows "Wait" message and a timer displays remaining time till the end of a prescribed cooling period. After a cooling period has elapsed, start the test using the set test parameters by pressing the ***START*** button. Cooling of RMO-G is supported by a built-in fan that is automatically activated every time a test is started from the **Ready** state. It continues running 5 minutes after the test is finished.

3.10 Test Results

Once a test is finished, the RMO-G automatically changes to the **Result** menu to display the test results. For measurements in **CONTIN**uous and **DTRtest** menus only the last performed test is shown. The test current value displayed on the device screen is the maximal test current reached.

Note: If the defined test current could not be reached, this could be due to a too high resistance of the test object and/or of the current cables.

The **Result** menu is displayed for 12 seconds and the display automatically goes back to the start menu.

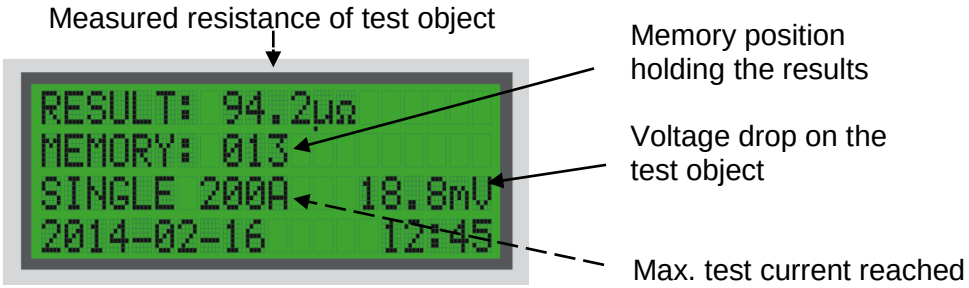


Figure 3-22: **Result** menu showing the test results obtained in Single test

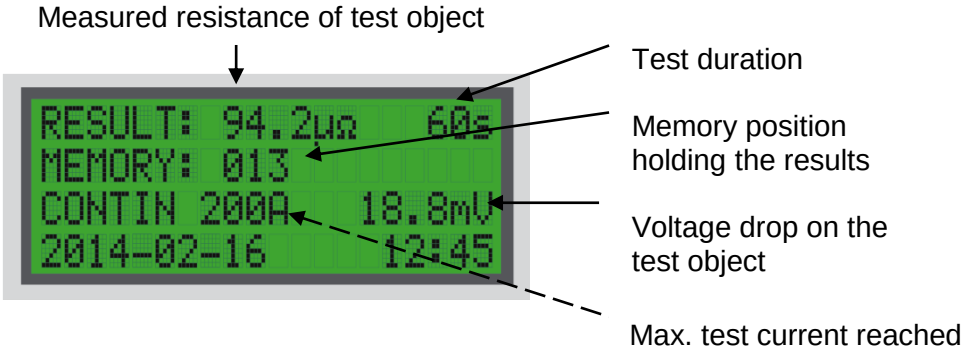


Figure 3-23: **Result** menu showing the test results obtained in Continuous test

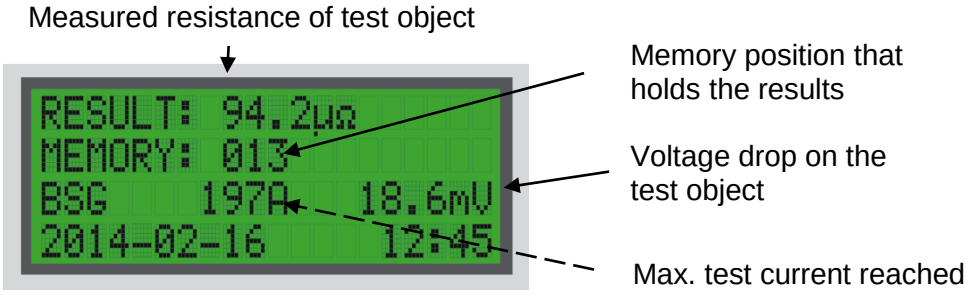


Figure 3-24: The **Result** menu showing the test results obtained in BSG test

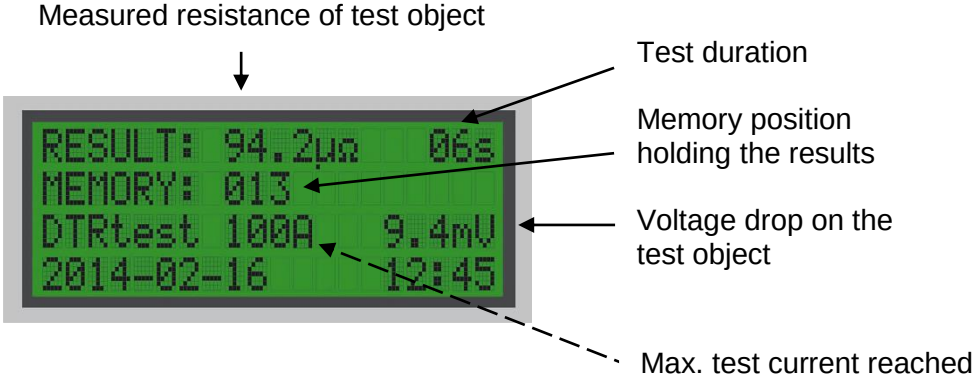


Figure 3-25: **Result** menu showing the test results obtained in DTRtest

Starting a new test with the same current value:

- press the ***ENTER*** button to change to the **Ready** state with same test conditions,
- press the ***START*** button to run the test.
  The current value remains the same as in the previous test. The memory position increases by one.

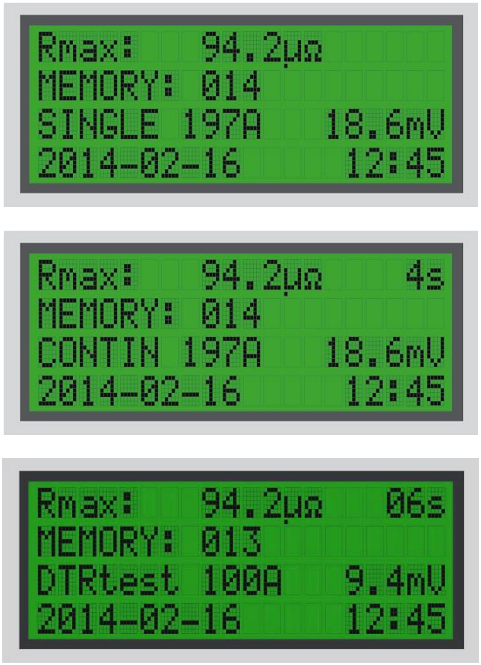
Starting a new test with a different current value:

- press the ***STOP*** button to change to the starting menu (**Single** or **Contin**), set a new current value and/or another memory position,
- confirm entries by pressing the ***ENTER*** button,
- start the test by pressing the ***START*** button.

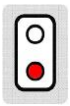
3.10.1 Test results when Rmax function is enabled

If the **Rmax** menu is set to option **ON**, once a SINGLE test is finished, RMO-G automatically changes to the **Rmax** to display the test results in case the measured resistance is equal or greater than the maximum assigned value.

Figure 3-26:
The **Rmax** showing the test results



In case of the Continuous and DTRtest modes, first time when the measured resistance is equal or greater than maximum assigned value, RMO-G automatically stops the test and changes to the **Rmax**. In this case device displays the last measured resistance equal or greater to a maximum assigned value and time of obtaining that.

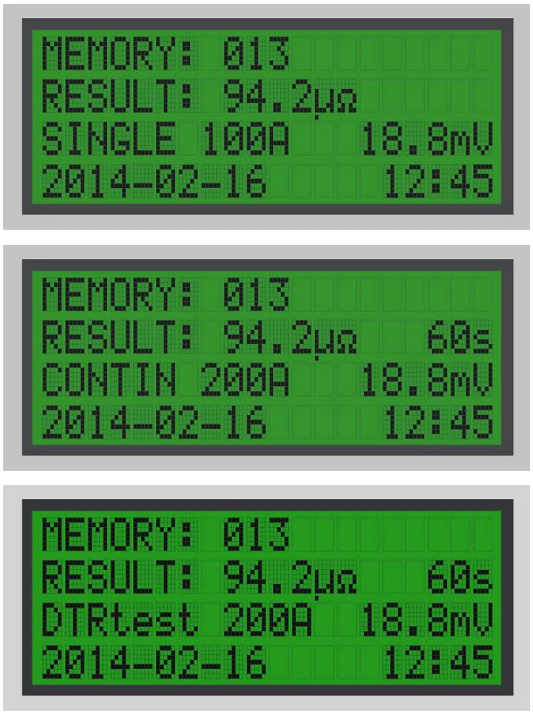


The red LED lights continuously and the alarm buzzer is activated indicating the assigned maximum value in **Rmax** menu is exceeded (or equaled).

3.10.2 Memory menu

Turn the RMO-A power switch ON. The RMO-A will display the **Single** menu. Press ***SET*** button three times to go to the **Memory** menu. When in the **DTRtest** menu, press ***SET*** button once to go to the **Memory** menu.

Figure 3-27:
Memory menu showing the test results



3.10.3 Deleting Results of Previous Tests

In the **Memory** menu, press ***ENTER***.

Figure 3-28: The **Memory** menu showing an option to delete all saved measurements from the memory positions

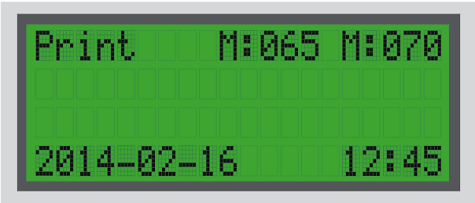
Press ***ENTER*** once more to delete all saved measurements from the memory positions.
Press ***STOP*** to leave the **Memory** menu without deleting any measurements.

3.10.4 Printing the Test Results

If RMO-G has a built-in thermal printer (optional), the test results can be printed using the **Print** menu at memory positions 000 ... 499. Go to **Print** menu using ***LEFT*** and then three times ***UP*** button or 5 times ***SET*** button.

Selecting first and last memory position and press ***ENTER*** button. The results that are located in the range between this emory locations, including the chosen memory locations, will be printed.

Figure 3-29:
The **Print** menu



4 Error Messages

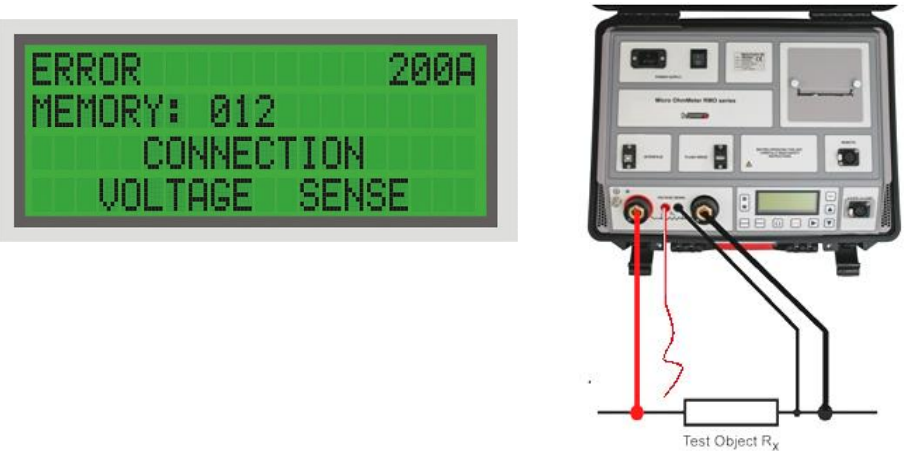
Any operational error is indicated by a red LED and an audio alarm. Furthermore, the display indicates an error status message.

To stop the alarm buzzer, remove the status message on the display, and return to the **Single** menu, press the ***STOP*** button.

4.1 Error Message "Connection VS"

If one of the "Voltage Sense" cables is disconnected from the test object, or from the test set at the start of the test, the error message "Connection VS" is displayed.

Figure 4-1:
Disconnection of a "**Voltage Sense**" cable and corresponding error message

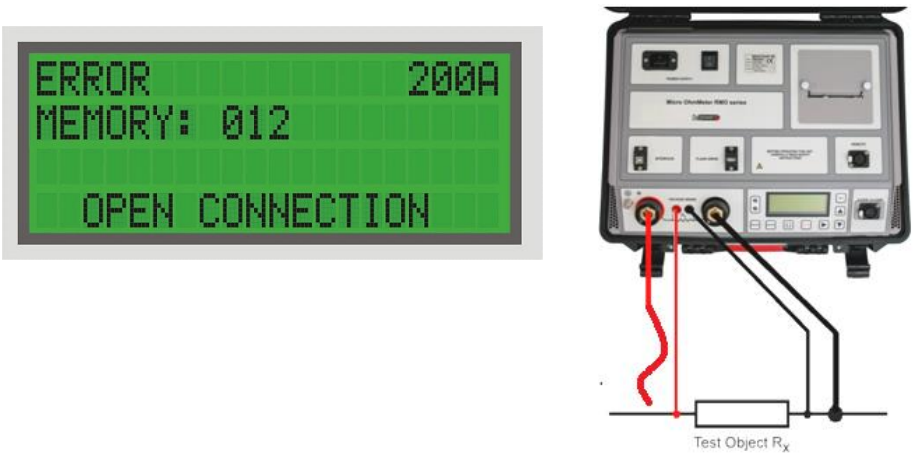


Note: Voltage sense cables disconnection, occurred during the test, will cause an erroneous result. The display will not show this as an error message.

4.2 Error Message "Open Connection"

If one of RMO-G current cables ("+" or "-") is disconnected, from the test set or from the test object at the start or during the test, the error message "Open Connection" is displayed.

Figure 4-2:
Disconnection of the current cables and corresponding error message



Note: The error message "Open Connection" can be displayed not only in case one of the current cables is disconnected, but also in case of high test resistance due to bad contact. It is recommended to clean the contact surface of the circuit breaker terminal before testing with the RMO-G device.

4.3 Error Message "Polarity"

This message is displayed if the polarity of measuring cables is incorrect. In this case connect measuring cables correctly and repeat the test.

Figure 4-3:
Error message
"Polarity"

4.4 Error Message "Change Current"

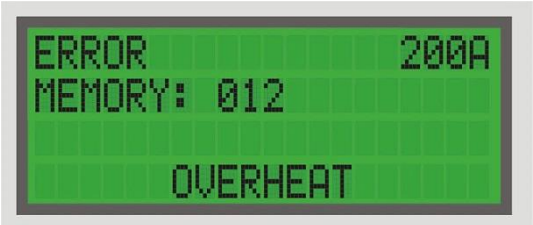
This message is displayed if during the test the voltage at the test object exceeds 5 V. In this case reduce the test current and repeat the test.

Figure 4-4:
Error message
"Change Current"

4.5 Error Message "Overheat"

The message is displayed when RMO-G device's operating temperature rises too high due to a high ambient temperature or, despite the duty cycle time control, too many high current tests were performed in too short of a time.

Figure 4-5:
Error message
"Overheat"



In this case, wait for the test set to cool down and repeat the test.

4.6 Error Message "Malfunction"

If this message is shown on the display, or if RMO-G cannot operate anymore at all, a serious internal error occurred.

Figure 4-6:
Error message
"Malfunction"

Note: Please do not open RMO-G without permission and instructions given by IBEKO Power AB. Contact the IBEKO Power AB (refer to the Section ”Manufacturer Contact Information”).

4.7 Error Message "Mains Voltage < 90V"

This message is displayed when RMO-G’s mains voltage is below 90 V.

Figure 4-7:
Error message
"Mains Voltage < 90V"

To remove it please restart RMO-G.

5 Troubleshooting

If it is suspected the device is presenting inaccurate results, the following tests should be performed:

5.1 Maximum current test

If the device is unable to reach the set test current on the test object the following procedure should be performed:

5.1.1 Testing with test shunts

This test can be done in the office or in the field.

1. Connect two test shunts R_1 (100 µΩ) and R_2 (1 mΩ) in series with Micro Ohmmeter as shown in the Figure 5.2. *Please make sure to use only the original set of cables intended for that device.*
2. Set the maximum test current on the RMO-G device and start the test (**Single** test).
3. If the selected current is reached the device is working correctly.
4. If the selected current cannot be reached, please contact the DV Power Support Team.

5.1.2 Testing with the test object (in the field)

This test is performed in the field, using the test object. Purpose of the test is to measure the total resistance: the resistance of the test object, as well as the resistance of the connections.

1. Connect the RMO-G device to the test object as shown in the Figure 5.1: Connect the voltage sense clamps to the screws on the current cables clamps. Position the sense conductors outside the loop made by the current cable conductors' leads. *Please make sure to only use the original set of cables intended for that device.*

NOTE: This connection method is used ONLY for this test. When performing a regular resistance measurement of the test object, it is necessary to make sure that the Kelvin (4-wire) measuring method is applied – the voltage sense connections must be connected directly to the test object, as shown in the Figure 5.1.

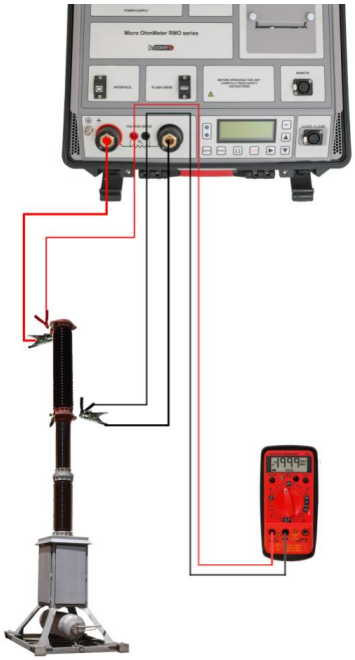


Figure 5.1 – *Test connection scheme*

2. Set the maximum current on the RMO-G device and start the test (Single test).
3. Read the resistance obtained from the RMO device. Please note that in this case the resistance of the test object is increased by the resistance of contacts between Current cables and a test object.
4. If the measured resistance exceeds several hundred micro ohms (~500µΩ) the resistance of the contacts is too high. Please perform the necessary actions to lower the resistance of these contacts.
5. If the measured resistance is low, and the device still cannot reach some test currents, please contact the DV Power Support Team.

NOTE: **If a voltmeter is available in the test field, connect the voltmeter to the Voltage Sense inputs of the device. Total resistance of the test object can be calculated by dividing the voltage obtained from the voltmeter by the current generated from the device (shown on the display):**

$$R = \frac{Uv}{Id}$$

5.2 Measurement accuracy check

If suspected the device is presenting inaccurate results, the accuracy check described bellow should be performed:

5.2.1 Accuracy check

1. Connect two test shunts R_1 (100 μΩ) and R_2 (1 mΩ) and Voltage Sense cables as shown in the Figure 5.2.
2. Set Single test on the device, set the first test current from the list and start the test. Read the resistance value measured by the Micro Ohmmeter and compare it to the expected values written in the Table 5.1. Repeat this step for all test currents written in the Table 5.1.
3. Connect the Voltage Sense cables in parallel to the R_2 test shunt and repeat tests described in the previous step.
4. If the measured results differ from the expected values please proceed to the next step (Section 5.2.2) – looking for the root cause of inaccurate measurements.

5.2.2 Test currents check

1. Short circuit the Voltage Sense input of the device and connect a digital voltmeter in parallel to the R_2 test shunt as shown in the Figure 5.3.
2. Set **Contin** test (10s) on the device, set the first test current from the list and start the test. Note the voltage V_2 measured by the voltmeter and compare it to the expected one: $V_2 = I \cdot R_2$.
3. Repeat the test for all test currents specified in the Table 5.2. If the measured voltages do not differ significantly from expected ones, the device is generating current correctly. Please proceed to the next step.

5.2.3 Voltage measurement check

1. Connect the Voltage Sense cables in parallel to the R_1 test shunt and digital Voltmeter in VS input of the device, as shown in the Figure 5.4.
2. Set **Conti** test (10s) on the device, set the first test current from the list and start the test. Note the resistance measured with the RMO device (R_{1meas}), the voltage V_1 measured with the voltmeter, and calculate the resistance:

$$R_{1cal} = \frac{V_1}{I}$$

3. Repeat the test for all the test currents specified in the Table 5.3. If the calculated resistances does not differ significantly from the resistances measured with the RMO-G device, the device is measuring correctly.

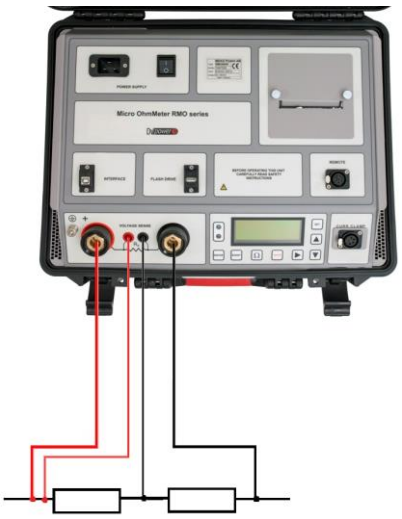


Figure 5.2 – *Connection diagram*

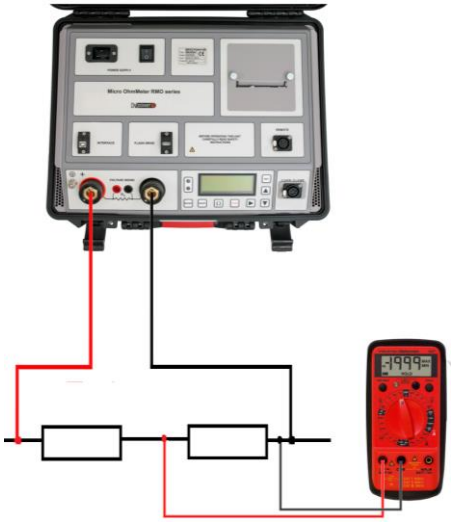


Figure 5.3 –*Connection diagram*

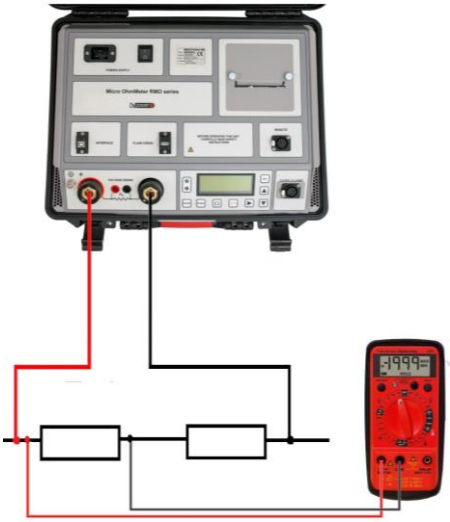


Figure 5.4 – *Connection diagram*

I [A]	R_1 [μΩ]	R_2 [mΩ]
50	*98,9 – 101,1*	*0.989 – 1,011*
100	*98,9 – 101,1*	*0.989 – 1,011*
200	*98,9 – 101,1*	*0.989 – 1,011*
300	*98,9 – 101,1*	*0.989 – 1,011*

Table 5.1 – *Expected results*

I [A]	V_2 [mV]
50	*49,45 – 50,55*
100	*98,9 – 101,1*
200	*197,8 – 202,2*
300	*296,7 – 303,3*

Table 5.2 – *Expected results*

I [A]	R_1 [μΩ]	V_1 [mV]
50	*98,9 – 101,1*	*4,945 – 5,055*
100	*98,9 – 101,1*	*9,89 – 10,11*
200	*98,9 – 101,1*	*19,78 – 20,22*
300	*98,9 – 101,1*	*29,67 – 30,33*

Table 5.3 – *Expected results*

5.3 TestCom application

In case TestCom application is not provided, please contact the DV Power Support Team to request the latest version.

1. Connect the device to a computer and turn it ON.
2. Run the TestCom.exe.
3. Click "Connect" to establish a communication between the device and the computer.
4. Click "Start" and a log file will be generated in the same folder where TestCom.exe is located.
5. Send the log file to DV Power Support Team for analysis.

NOTE: If experiencing problems with running TestCom.exe, please install the Patch.exe, which is included in the TestCom archive. After the installation, it should be possible to run TestCom.exe.

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6 Customer Service

Before calling or sending an e-mail to Customer Service for assistance, please perform the following steps:

1. Check all cable connections.
2. Try the test on another instrument, if available.
3. Perform the troubleshoot procedure.
4. Have the following information available:
   - Instrument serial numbers, hardware configuration, and software revision
   - Exact description of the problem, including the test object information, error messages and the sequence of events before it appeared
   - List of solutions that have been tried

The Customer Support Department can be reached at:

Local support (Sweden): +46 8 731 78 24

International support: +46 70 0925 000

E-mail: support@dv-power.com

Note: **Email communication is preferred for support issues, since the case is then documented and traceable. Also, the time zone problems and issues with occupied telephones do not occur.**

7 Packing the Instrument for Shipment

If you need to send the instrument to DV Power for servicing, please contact the DV Power Customer Service for return instructions at:

Local support (Sweden): +46 8 731 78 24

International support: +46 70 0925 000

E-mail: support@dv-power.com

Note: DV Power is not responsible for shipping damage. Please protect each instrument from shipping and handling hazards carefully. Please ensure protective covers are securely in place. Instruments should be sent to DV Power freight pre-paid, unless other arrangements have been authorized in advance by DV Power Customer Service.

To prepare an instrument for shipment, please follow these instructions:

1. Disconnect and remove all external cables. Do not include manuals and cables, unless recommended by DV Power Customer Service.

2. Reuse the original packing material if it is available. If it is not, pack the instrument for shipment according to the instructions for fragile electronic equipment. It is recommended use two-wall minimum corrugated cardboard box with a minimum 5 cm (2 inch) thick poly foam padding, or a wooden crate with minimum of 5 cm (2 inch) thick poly foam padding all around.

8 Technical Data

Mains Power Supply

- Connection — according to IEC/EN60320-1; C320
- Voltage — 90 V – 264 V AC, 50 / 60 Hz, single-phase
- Power consumption

@ 230 V AC

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
1190 VA	1815 VA	2400 VA	3570 VA	3970 VA	4720 VA	5010 VA

@ 115 V AC

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
1130 VA	1810 VA	2215 VA	2710 VA	3920 VA	4145 VA	3510 VA

- Fuse

RMO100G & RMO200G	12 A / 250 V, type F
RMO300G & RMO400G	15 A / 250 V, type F
RMO500G & RMO600G	20 A / 250 V, type F
RMO800G	20 A / 250 V, type F

Output data

- Test current

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
5 – 100 A	5 – 200 A	5 – 300 A	5 – 400 A	5 – 500 A	5 – 600 A	10 – 800 A

- Max load interval @ I max

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
*300 s	150 s	60 s	60 s @ 300A	30 s	20 s	20 s @ 600A

if it is specifically requested, the maximum test duration at 100 A test current can be up to 30 min (optional)

- Full Load Voltage*

@ 230 V of supply voltage

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
7,15 V	6,80 V	6,00 V	6,70 V	5,95 V	5,90 V	4,70 V

@ 115 V of supply voltage

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
6,80 V	5,90 V	4,80 V	4,40 V	5,10 V	3,80 V	2,85 V

maximal output voltage at maximal test current

Measurement data

- Resistance range — 0,1 µΩ – 999,9 mΩ for RMO100-600G
  0,1 µΩ – 499,9 mΩ for RMO800G
- Resolution

0,1 µΩ – 999,9 µΩ	*0,1 µΩ ***(*0,01 µΩ in version with built in High-precision module)***
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)
- Guaranteed accuracy — ± (0,2 % rdg + 0,2 % FS)

Environmental conditions

- Operating temperature: -10 ºC - +55 ºC / +14 ºF - +131 ºF
- Storage & transportation: -40 ºC - +70ºC / -40 ºF - +158 ºF
- Humidity 5 % - 95 % relative humidity, non condensing
- Installation/overvoltage category II
- Pollution degree 2

Dimensions and Weight

- Dimensions (*small plastic case): 405 mm x 165 mm x 330 mm
  (W x H x D) 15.94 in x 6.5 in x 12.99 in
  RMO100G, RMO200G, RMO300G, RMO400G and RMO500G without built-in thermal printer
- Dimensions (*large plastic case): 480 mm x 190 mm x 385 mm
  (W x H x D) 18.90 in x 7.48 in x 15.16 in
  ****RMO600G, RMO800G and all models with built-in thermal printer***
- Weight:

RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
8 kg / 17.6 lbs	8 kg / 17.6 lbs	8 kg / 17.6 lbs	9 kg / 20 lbs	9 kg / 20 lbs	11 kg / 24.3 lb	11,5 kg / 25.4 lb

Data storage and transfer

- Internal memory locations 500 result sets
- Connection Interface USB serial interface to connect to an external computer, or RS232 interface (optional)
  Bluetooth communication module (optional) - works in combination with RS232 interface.

Printer (optional)

- Thermal printer Paper width 80 mm

NOTE
The print density is guaranteed within the range 5°C to 40°C, 20 to 85% relative humidity, no condensation. The printer can operate from 0°C to 50°C.

Low Voltage Directive Directive 2014/35/EU (CE conform)
Applicable standards, for a class I instrument, pollution degree 2, Installation category II: IEC EN 61010-1

Electromagnetic Compatibility (EMC) Directive 2014/30/EU (CE conform)
Applicable standard: EN 61326-1

Mechanical Protection

- Ingress Protection Rating IP67 (with closed lid)

9 Instrument & Accessories

Instrument with included accessories	Article No
Micro Ohmmeters RMO-G - DV-Win PC software including USB cable - Mains power cable - Ground (PE) cable	RMO**1**00G-N-00 RMO**2**00G-N-00 RMO**3**00G-N-00 RMO**4**00G-N-00 RMO**5**00G-N-00 RMO**6**00G-N-00 RMO**8**00G-N-00

Recommended accessories	Article No
Current cables 2 x 5 m, ***XX** mm² with battery clips	C2-05-**XXY**MB**Y**
Sense cables 2 x 5 m with alligator clips	S2-05-02BPA2
*Transport case *RMO100G, RMO200G, RMO300G, RMO400G, RMO500G without built-in thermal printer	HARD-CASE-SC
Cable bag	CABLE-BAG-00

Optional accessories	Article No
*Transport case for RMO100G, RMO200G, RMO300G, RMO400G and RMO500G without built-in thermal printer	HARD-CASE-SC
*Transport case for RMO600G, RMO800G & all models in version 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, ***XX** mm² with battery clips	C2-10-**XXY**MB**Y**
Current cables 2 x 15 m, ***XX** mm² with battery clips	C2-15-**XXY**MB**Y**
Current extension cable 2 x 10 m, ***XX** mm²	E2-10-**XXY**M**Y**F
Sense cables, extension 2 x 10 m	E2-10-02BPBP
Sense cables 2 x 10 m with alligator clips	S2-10-02BPA1
Sense cables 2 x 15 m with alligator clips	S2-15-02BPA1
Bluetooth communication module	BLUET-MOD-00
Built-in thermal printer	PRINT-080-00
High Precision Module (built-in)	**RMO-HPMM-DG0**
Remote control unit	**RMORCU-09-00**
Remote control test probes (one with trig button)	**RMO-RCTP-TB0**
Current clamp 30/300 A power supplied from the instrument with extension 5 m *(Both Sides Grounded Unit)*	**CACL-0300-06**

***XX - Cross-section of current cables varies, depending of the ouput power of the model.**

****Y**MB**Y – For RMO100G and RMO200G: Y**MB**Y=L**MB**1;**
For RMO100G and RMO200G with built-in thermal printer and for other models: YMB**Y=V**MB**3**

Recommended cross-sections of the current cables for RMO-G models:

CROSS SECTION/ LENGHT	16 mm²	25 mm²	35 mm²	50 mm²	70 mm²	95 mm²
5 m	RMO100G	RMO200G	RMO300G & RMO400G	RMO500G & RMO600G	-	RMO800G*
10 m	RMO100G	RMO200G	RMO300G & RMO400G	RMO500G & RMO600G	-	RMO800G*
15 m	-	RMO100G	RMO200G	RMO300G & RMO400G	RMO500G & RMO600G	-

RMO800G device can also be provided with the 50 mm² or 70 mm² current cables cross-section as per request

High – Precision module (optional)

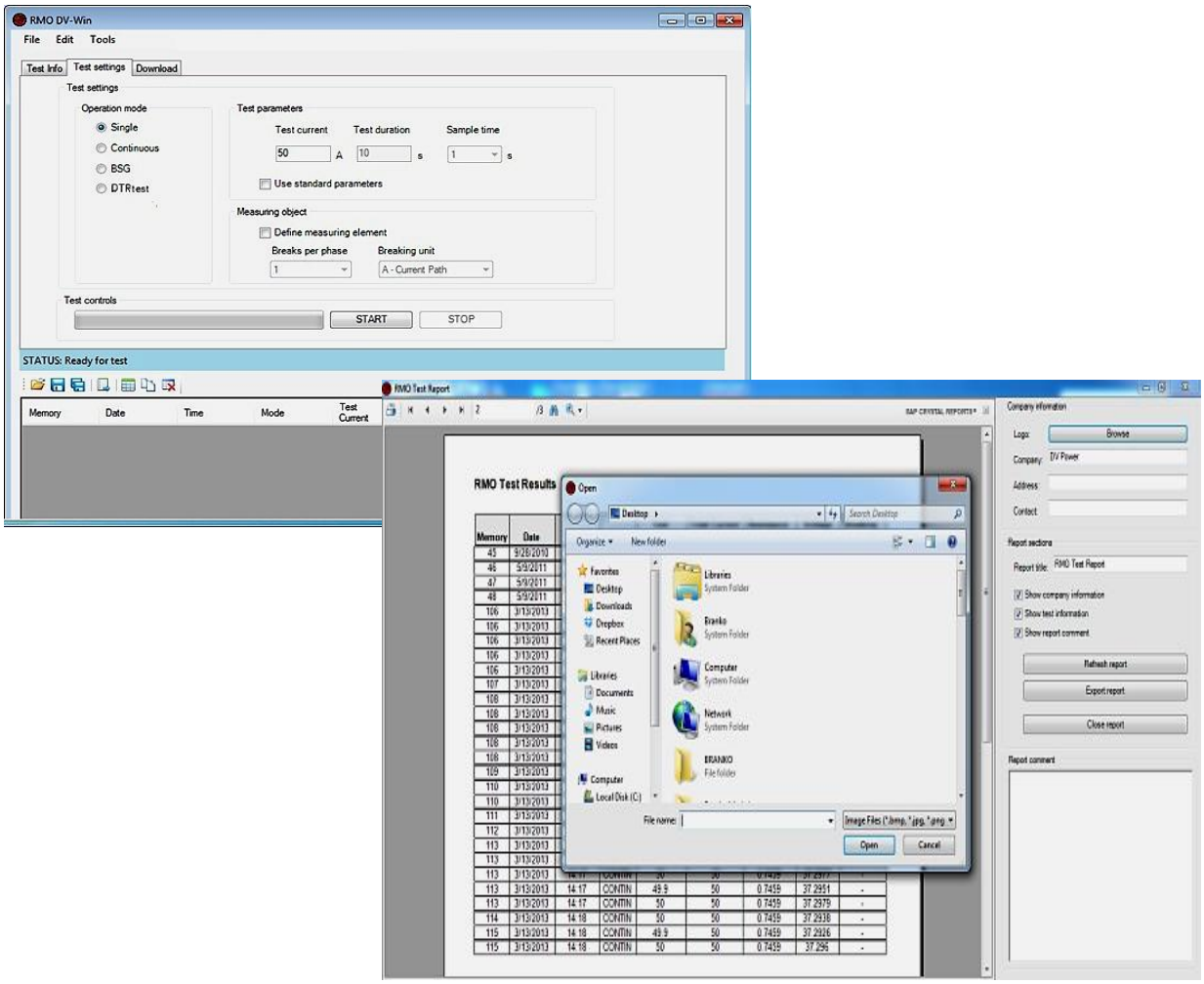
The high-precision module is newly developed optional built-in addition to our RMO-G micro ohmmeters. It provides an increased precision and offers a highly accurate contact resistance measurement in the range from 1 μΩ to 30 μΩ, with 0,01 μΩ resolution.

RMO-G devices with the built-in High Precision Module may be used for applications on very small resistance measurements of non-inductive test objects. This requirement is usually met at resistance inspections of generator circuit breakers, welding joints, GIS testing, etc.

DV-Win software

***included in the purchase price**

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



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