

MPK-256

Digital micro-ohmmeter

User's guide

GF-2062

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Safety Precautions

- This equipment should be operated only by qualified and duly trained people, closely observing the corresponding safety regulations and instructions contained in the present User guide.
- It should be checked that the item to be measured is voltage free.
- Before starting with the measurements, be sure that the battery is well charged and that the line voltage is between specified limits.
- Do not connect or disconnect the test leads during the measurement.
- There are no adjustable parts or parts that can be replaced by the user within the equipment. Taking out the Control Panel in order to have an access to the internal parts may be dangerous as there are high voltages inside, capable of causing fatal accidents.
- Cleaning of this instrument should be carried out using a soft cleaning liquid, after verifying that it doesn't attack the plastic parts used in the case and in the Control Panel of this equipment.

This equipment should be used only by a trained and competent person, strictly applying suitable safety rules.

Used symbols

	<p>Caution, refer to User Guide.</p>
	<p>Battery.</p>
	<p>Printer.</p>
	<p>USB (Universal Serial Bus).</p>
	<p>30 V max. (to ground): indicates the maximum potential allowed in the terminals during resistance measurements.</p>
	<p>Ground protection: the terminal identified by this symbol is intended for connection to an external conductor for protection against electric shock in case of failure, or the terminal of a ground protection electrode.</p>
	<p>Equipment complies with current EU Directives.</p>
	<p>Double insulation: symbol indicates that the equipment is classified as Class II (double isolated).</p>
	<p>The rubbish bin with a line through it means that in the European Union, the product must undergo selective disposal for the recycling of electric and electronic material, in compliance with Directive WEEE 2002/96/EC.</p>

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1. Description

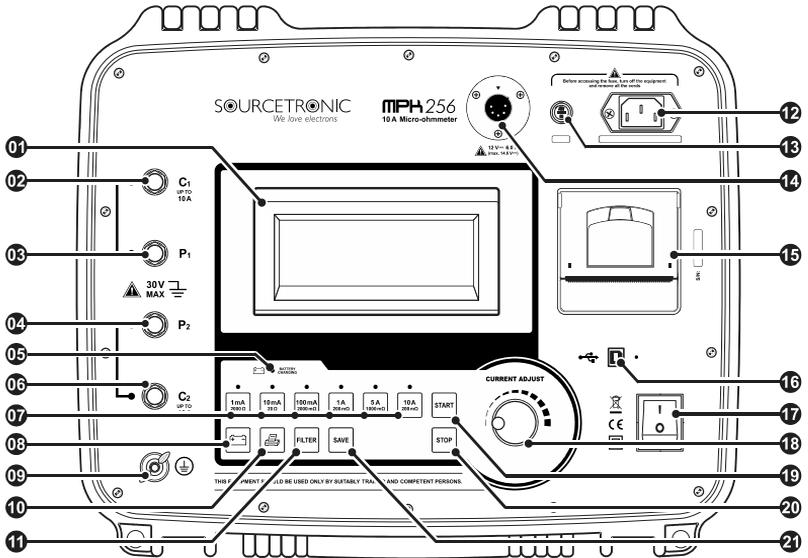
The **MPK-256** micro-ohmmeter is a portable, microprocessor controlled instrument, used to accurately measure very low contact resistances of breakers and switches, busbars, transformers and engines windings, etc, with test currents from 1 mA to 10 A.

- Microprocessor controlled
- Kelvin architecture (four-terminal method)
- Digital reading, alphanumeric display
- Up to 4½ digits readings
- Powered by rechargeable battery
- 1 $\mu\Omega$ resolution
- 2000 Ω maximum reading
- Up to 10 A current
- Remote control through an Android app

1.1. Operating principle

This device uses the Kelvin Bridge architecture, with four terminals, avoiding testing leads resistance to cause error during measurement. The operator may choose test current and the reading is obtained by comparison through internal high-stability standards. The result appears in the alphanumeric display that is very easy to read.

2. Control panel



- | | |
|--|--------------------------------|
| 01 Display. | 12 Power cord connector. |
| 02 Current terminal (C+). | 13 Fuse. |
| 03 Potential terminal (P+). | 14 Auxiliary supply connector. |
| 04 Potential terminal (P-). | 15 Printer. |
| 05 Battery charge indicator. | 16 USB connector. |
| 06 Current terminal (C-). | 17 On/Off switch. |
| 07 Selector of ranges and currents. | 18 Test current control. |
| 08 Battery key. To measure the battery charge condition. | 19 Start key. |
| 09 Safety ground. | 20 Stop key. |
| 10 Printer Key | 21 Save key. |
| 11 Filter key. | |

3. Power supply

Mains supply or internal battery powered

Battery: LFP, rechargeable, 12 V - 6000 mAh.

Mains: 220 - 240 V~.

Auxiliary supply: 12 V.

3.1. Battery condition

The charge condition of the battery can be verified before or during the resistance measurement. In order to achieve that, the operator has to press the **battery**  key while the equipment is turned on. The bargraph shows remaining charge as a percentile value.

3.2. Battery charger

Charging procedure:

- Check that the **On/Off**  switch is in Off.
- Connect the equipment to the mains supply.
- The **battery charge indicator** ( ● **BATTERY CHARGING**) will keep on lightning with a red light up to completing the charge. At that point, it will change to a green light, being like this up to the equipment disconnection from the mains supply.

If during the charging of the battery the device was switched on, by activating the key , the charge will be temporarily interrupted. When the equipment is turned off, the charge will restart automatically.

The rechargeable battery has no "memory effect" so it can be charged as many times as desired. On the other hand, its useful life is significantly reduced if it is allowed to remain totally discharged.

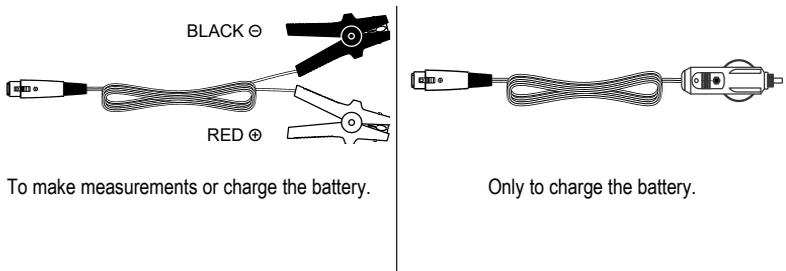
To avoid this effect, charge the battery before storing the equipment and do not allow more than 30 days to pass without repeating the charging process, even if the instrument has not been used (The battery loses part of its charge when it is stored).



At the end of its useful life, the battery must be recycled or disposed of properly to preserve the environment.

3.3. Auxiliary power

The MPK256 has a 12 V auxiliary power input. This input can be used to charge the battery or to power the equipment.

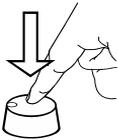


4. Settings and Adjustments

This equipment has a MENU for settings and adjustments. To access the MENU, press the **Selector / Adjust** () button.



All navigation is performed through the  and all panel keys are disabled, with the exception of the key  that has the function to cancel and return to the initial screen.

	<p>Short press: Open MENU, open selected sub-menu / confirm settings. Long press (1.5 s): Go back one level or cancel adjustment.</p>
	<p>Change selection / values</p>
	<p>Cancel and close the MENU</p>

ATTENTION: The configuration MENU can not be accessed during the tests.

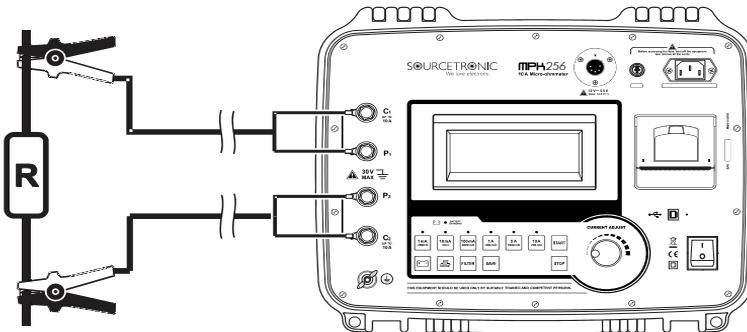


MENU	SUBMENU	DESCRIPTION
AUTO SAVE		Save the last measured value in the internal memory when the test is finished.
LANGUAGE		Allows you to change the interface language between: English, Spanish and Portuguese.
SETTINGS		
	SET DATE FORMAT	Selecting the date format.
	SET TIME FORMAT	Selecting the time format.
	DATE ADJUST	Setting the date.
	TIME ADJUST	Setting the time.
	DISPLAY ADJUST	Setting the display.
	SYSTEM INFO	Displays the firmware version and serial number.
MEMORY		
	USAGE	Displays the percentage of internal memory used.
	DELETE	Deletes all records from memory.

5. Measurement

- The User Manual and its respective safety precautions must be read and understood before using the micro-ohmmeter.
- The usual safety precautions and safety regulations must be strictly observed.
- It should be checked that the item to be measured is voltage free.
- To ensure safety, use only the accessories supplied by the manufacturer.

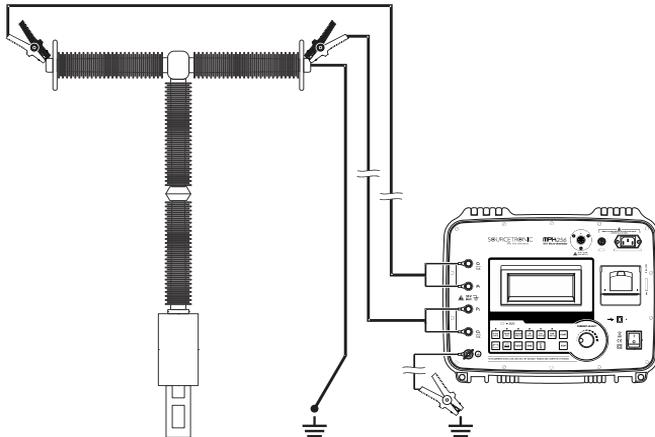
1. Before turning the equipment On, connect the test leads to the item to be measured and to the front panel terminals.



The alligator clamps in the drawings are only for illustration.

Measurement with potential risk

Ex.: High voltage circuit breaker under external influence of electromagnetic fields from nearby energized devices.



The alligator clamps in the drawings are only for illustration.



The safety ground terminal must be connected before making the other connections to the equipment.

2. Turn on the device with the **On / Off** key .
3. The **display** of the equipment will show the presentation message **MPK256**.
4. **The AUTO VERIFICATION message will appear next and then PRESS START.**
5. Select the range and current (     ).
6. Press the key .

7. The message LOW CURRENT will appear. Turning the control  clockwise will increase the current until reaching the desired stable value measured on the display or in the bargraph current indicator.
8. When the current value is greater than 20% of the nominal value of the scale, the display will indicate the measured resistance value.
9. To finish the measurement press . **DO NOT TURN OFF THE EQUIPMENT WITH THE KEY  WITHOUT PRESSING BEFORE .** When you finish all measurements, turn off the equipment with the key .

Caution: *Never connect or disconnect the test leads with the equipment in operation. If you have to make any changes to the connection, it must be done with the equipment turned off.*

6. Display messages

MPK-256

When turning the equipment On using the **On/Off**  switch, this introductory message appears for a while. During that time, the equipment carries out some functional checking.

AUTO CHECK

Indicates that the equipment is performing internal checks.

PRESS START

Indicates that the equipment is able to start a test, for which the operator must press the key .

LOW CURRENT

This warning indicates that the test current is insufficient to perform the measurement. The control  must be turned clockwise to increase current.

I=MAX

Indicates that the current reached the maximum value.

OVERRANGE

Indicates that the measured resistance exceeds the maximum value of the selected scale.

7. Some notes about accuracy

In order to obtain the specified accuracy, the operator has to adjust the test current to a value higher than the 80% and 100% of the nominal value. For minor currents the measurement is only indicative.

MPK-256 has an auto-compensation system that automatically eliminates the error produced by internal offset. Thus, it is not necessary to carry out measurements by reversing the polarity in order to compute the average value. Nevertheless, if the operator suspect that there is a difference of temperature between the contact points that would can generate thermoelectric voltages, it is necessary to carry out two measurements by reversing the current cables and so, the circulation sense of the current through the resistance under measurement. The resistance value to be measured will be the average between the values in one sense and in the contrary (direct and inverse current).

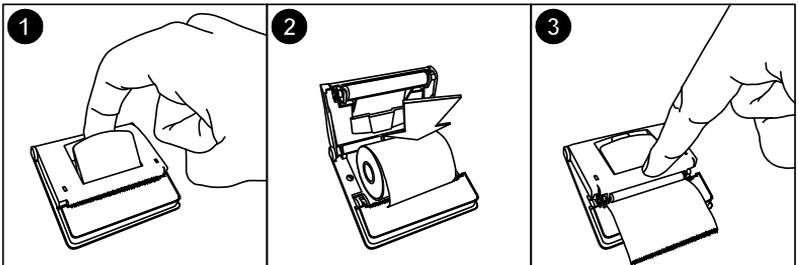
8. Printer

To print a result, press the  key during a measurement.

ATTENTION: Don't pull the paper. The printer can be easily damaged.

This printer uses 57 ± 0.5 mm -wide thermal paper, which comes in a < 40 mm -diameter reel.

- 1 Pull the lever located on the lid.
- 2 Insert the paper reel as shown in the figure.
- 3 Keep the tip of the paper out of the printer and close the lid.



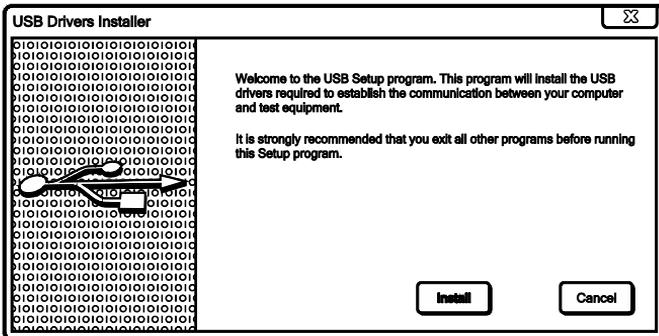
9. Internal memory

This device has an internal memory of up to 30,000 measured values (approximately 10,000 tests).

10. Software

To install the USB drivers required for the communication between PC and equipment follow the instructions:

- Connect the equipment in the PC using the USB cable.
- If there is an available Internet connection, Windows will silently connect to the Windows Update website and install any suitable driver it finds for the device. If no suitable driver is automatically found then you need to insert the CD-ROM, supplied with the equipment, in the PC, run the executable “usb-install.exe” and click in “Install”.



10.1. ST-Logger software

This software makes communication between the equipment and a computer with Windows operative system easier. It makes it possible to synchronize the date and time of the equipment internal clock with the computer date and clock, to transfer the stored date, to clear the memory, to generate test reports, etc. The installation and operation instructions are included in the software.

11. Remote control

The SOURCETRONIC equipment that have Bluetooth interface can be controlled remotely via an Android device (smartphone / tablet) running the application.

Ask info@sourcetric.com for more information.

- *Android™ and Google Play™ Store is a trademark of Google LLC*
- *Bluetooth® is a registered trademark of Bluetooth SIG, Inc. worldwide*

Minimum smartphone / tablet requirements

- Android 4.1 Jelly Bean system (API 16) or higher;
- Bluetooth communication.

Pairing

To perform the pairing between equipment and the Android device, follow the procedure:

- To enable the Bluetooth, in screen "Applications", tap "Settings" > "Bluetooth" and drag the Bluetooth slider to the right.
- To pair your equipment, on screen "Applications", tap "Settings" > "Bluetooth" > "Search". Select the equipment and wait for the end of the pairing (If necessary, accept the automatically generated password to confirm or enter the PIN 1234).

12. Cleaning

The panel, terminals and connectors of the equipment must stay dry and clean. Cleaning should be made using a wet cloth in water and a soft detergent or isopropyl alcohol (be sure that the products to be used for cleaning does not affect plastic goods).

13. Replacement fuse

To check the instrument **fuse**, remove it with a screw driver. If the fuse is ruptured replace it by another with the following specifications:

Fuse Schurter, model SPT 5x20 (Time-lag) 5A/250V. High breaking capacity.

14. Technical specifications

Test currents	: 1 mA - 10 mA - 100 mA - 1 A – 5 A - 10 A. Each current may be continuously adjustable from 0 to 100%.
Resistance ranges	: 0 - 200 mΩ @ 10 A 0 - 1000 mΩ @ 5 A 0 - 200 mΩ @ 1 A 0 - 2000 mΩ @ 100 mA 0 - 20 Ω @ 10 mA 0 - 2000 Ω @ 1 mA
Resolution	: 1 μΩ @ 10 A
Output voltage	: Up to 10 Vd.c. @ 1 A (open circuit).
Measurement principle	: Four-terminal, Kelvin-type.
Basic accuracy	: ± 0.2% of reading ± 2 digits
Advanced features	: Digital direct reading of very low resistances in the alphanumeric display, with up to 4½ digits. Very fast and accurate measurements.
Serial data output	: USB.
Environmental protection	: IP54 with closed lid.
Safety class	: Meets the requirements of IEC 61010-1
Power supply	: Rechargeable battery 12 V – 6000 mAh or 220-240 V~ mains supply.
Built-in battery charger	: 220-240 V~ mains supply.
Auxiliary power supply	: Input for 12 Vdc auxiliary external power supply (car battery or similar) that allows to increase the autonomy of operation.
Operating temperature range	: 23°F to 122°F (-5°C to 50°C)
Storage temperature range	: -13°F to 158°F (-25°C to 70°C)

Humidity range	: 95% RH (non condensing)
Weight	: Approx. 14.33 lb (6.5 kg)
Dimensions	: 14.88" x 12.13" x 6.89" (378 x 308 x 175 mm)
Accessories	: 2 Combined current and potential leads. 1 Ground cable. 1 USB cable. 1 Power cord. 1 Auxiliary external power cord (12 V – charge). 1 Auxiliary external power cord (12 V – charge or measure). 1 User guide. 1 Carrying bag.

Subject to technical change without notice.

15. Warranty

SOURCETRONIC warrants to the original purchaser that each equipment it manufactures will be free from defects in material and workmanship under normal use and service. The warranty period is valid for **12 months**, except the built-in rechargeable battery that has **6 months**, and begins on the date of shipment. The manufacturer's warranty does not apply to any product or accessories which, in the manufacturer's opinion, has been misused, altered, neglected, or damaged by accident or abnormal conditions of operation and handling.

To obtain warranty service, send the equipment, with a description of the problem, shipping and insurance prepaid, to SOURCETRONIC. The manufacturer assumes no risk for damage in transit. SOURCETRONIC will, at its option, repair or replace the defective equipment free of charge. However, if SOURCETRONIC determines that the failure was caused by misuse, alteration, accident or abnormal condition or handling, you will be charged for the repair and the repaired equipment will be returned to you transportation prepaid.

This warranty is exclusive and is instead of all other warranties, express or implied, including but not limited to any implied warranty or merchantability or fitness for a particular purpose or use.

SOURCETRONIC will not be responsible for any special, indirect, incidental, or consequential damages or loss of data, whether in contract, or otherwise.

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