

Product Datasheet - Technical Specifications



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Technical and commercial sales, price information,
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Tel.: **+49 - 81 41 - 52 71-0**

FAX: **+49 - 81 41 - 52 71-129**

E-Mail: sales@meilhaus.com

Downloads:

www.meilhaus.com/en/infos/download.htm

Meilhaus Electronic GmbH | Tel. **+49 - 81 41 - 52 71-0**
Am Sonnenlicht 2 | Fax **+49 - 81 41 - 52 71-129**
82239 Alling/Germany | E-Mail sales@meilhaus.com

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PeakTech[®]

Prüf- und Messtechnik

 Spitzentechnologie, die überzeugt



PeakTech[®] 1125

**Bedienungsanleitung/
Operation Manual**

Digital Milli – Ohmmeter

1. Introduction

This product complies with the requirements of the following European Community Directives: 2004/108/EC (Electromagnetic Compatibility) and 2004/22/EC (Low Voltage) as amended by 2006/95/EC (CE-Marking). Overvoltage category IV; pollution degree: 2

2. Safety Rules

The **PeakTech**[®] 1125 has been designed with safety in mind. However, no design can completely protect against incorrect use. Electrical circuits are dangerous through lack of caution or poor safety practice. The following rules should reduce the danger:

- * Read the user's manual carefully and completely before using the instrument. Fully understand the instructions before using this product. Follow the instructions for every test. Take all necessary precautions. Do not exceed the limits of this instrument.
- * The circuit to be tested must be de-energised and isolated before connections are made to it.
- * Do not use test leads, probes or crocodiles/alligator-clips that are dirty, damaged or have broken or cracked insulation. Such accessories should be removed and repaired immediately.
- * Always disconnect the test leads before replacing any fuse.

- * Always replace the fuse with the type specified and ensure that they are correctly fitted.
- * Double check the switch settings and leads connections before measuring. Make a sketch to ensure proper operation and principle of measurement is correct and well understood.
- * Don not touch any exposed wiring, connections or other “live” parts on an electrical circuit. If in doubt, check the circuit first for voltage before touching it.
- * **This instrument should only be used by a competent, suitable trained person, which understand fully this test & measurement procedure.**
- * ***Mearsuring instruments don´t belong to children hands.***



Caution!! Risk of electric shock



Caution !! Refer to the user´s manual

3. General Description

The **PeakTech**[®] 1125 digital Milli-Ohmmeter is a low current instrument with which stable, accurate measurement of low resistance can be made, still, over a wide range is of values. Resolution on the lowest range is 100 μ Ohm and on the highest range, 1 Ohm.

The **PeakTech**[®] 1125 has 5 measuring ranges, from 200.0 milli-ohm to 2000 ohms.

Measurements are displayed on a 3 ½ digit custom liquid crystal display with large digits.

This instrument is powered from the mains. It has a regulated DC constant current source with current of 1 mA, 10 mA and 100 mA. The instrument supplies that current to the resistance being measured though the C₁ and C₂ terminals (C₁ being +, C₂ being -).

The voltage drop across the resistance under test is measured by the potential terminals P₁ and P₂ (P₁ being +, P₂ being -).

Should the current regulation drops out, the R_C LED will lit, indicating, that the resistance in the current circuit is too high. (Lowering the current by selecting a higher resistance range can solve the regulation).

Should the R_P LED lit, that means, that the voltage measured on the resistance is too high, and therefore over-range. The resistance is measured precisely, when the R_P and R_C LED's do not lit. If anyone of these LED's lit, then the measurement can be inaccurate.

The **PeakTech**[®] 1125's LC-Display can be viewed in most lightning conditions. This display indicated the different conditions (Hold, buzzer, polarity condition of load, + or -. The ranges are selected by a rotary switch, and a test is initiated by pressing the ON push-button. The instrument takes measurements for 10 seconds if the "ON" "TEST R_P" button is depressed for less than 2 seconds.

If the same button is pressed for more than 3 seconds, the test will carry on for 60 seconds. The auto-off is 5 minutes.

The tester switch “OFF” completely when the rotary switch is in the “OFF” position.

The tester has a “Hold the last reading before stopping the test”. The tester is fuse protected and has a crowbar between C_1 and C_2 . This crowbar is activated by voltage. If the voltage is too high, that crowbar will blow the fuse automatically to interrupt the circuit.

The voltage between P_1 and P_2 is also protected for over voltage, but does not have a fuse.

The tester has a temperature shut down. The temperature sensing is done on a current regulation transistor. Should this over-temperature LED lit, allow the instrument to cool down for a while before proceeding further.

4. Specifications

Electrical

Measuring ranges	0-200.0 m Ω in steps of 100 $\mu\Omega$ 0-2000 m Ω in step of 1m Ω 0-20.00 Ω in steps of 10 m Ω 0-200.0 Ω in steps of 100 m Ω 0-2000 Ω in steps of 1 Ω
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Accuracy	+/- 0,5% of reading +/- 2 digits over the operating temperature range, -15°C to +55°C, with the supplied test leads
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Test current	1 mA in 2000 Ω range 10 mA in 200/20 Ω range 100 mA in 2000 m/200 m Ω range
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Test current accuracy	+/- 0,5% -20-
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Protection Fuses Supply = 1,5 A, HBC, 5x20 mm, DIN
 Current = 1 A, HBC, 5x20 mm, DIN
 Voltage = 0,5 A, HBC, 5x20 mm, DIN

Mechanical

Case Height: 110 mm
Case Width: 250 mm
Case Dept: 190 mm

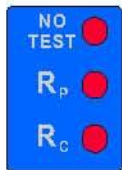
Bump Test: IEC68-2-29
Vibration Test: IEC1010, clause 8.3
Drop Test: IEC1010, clause 8.4
Impact Test: IEC1010, clause 8.2

Weight: 1,5 kg

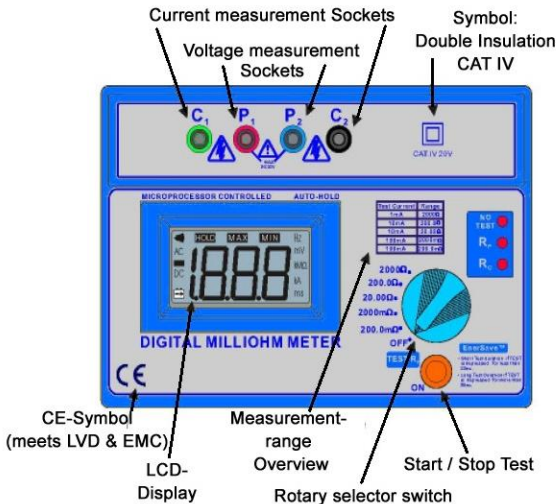
Environmental

Operating Temperature: -15°C to +55°C
Storage Temperature: -20°C to +65°C
Humidity: 93% RH at 40°C
Cold Temperature: IEC 68-2-1
Dry Heat: IEC 68-2-2
Damp Heat: IEC 68-2-3

5. Front Panel Layout



- Over Temperature indicator.
Lit=Over-Temperature
- Resistance between the current leads too high
(fuse!)
- Resistance between the potential leads too high



5.1. Preparation for use

When unpacked, the tester should be inspected for any visible signs of damage, and the preliminary checks described in the user's manual should be performed to ensure, that it is operating correctly. If there is any sign of damage, or if the instrument does not operate correctly, return it to your nearest supplier.

5.2. Preliminary checks

If the battery symbol is shown on the LCD, then replace the batteries with new 8 alkalines batteries (AA) before proceeding.

Check the current regulation:

1. Connect the current leads to C_1 and C_2 .
2. Select a range, and short the current test leads. The R_C LED should go off, indicating that the current regulation is ok.

Check the voltage measurement:

1. Connect the potential leads to P_1 and P_2 .
2. Short the P_1 and P_2 . The display should indicate 000.
3. Remove the short from P_1 and P_2 and C_1 and C_2 . The R_P LED should lit, indicating an over-voltage or over-range.

This proving test can be repeated on all the ranges if needed.

You can also check the polarity indication of the milli-voltmeter by touching the potential test leads P_1 to C_2 and P_2 to C_1 . The R_P LED should not lit, indicating an over-voltage or over-range.

The “-” indicator should be indicating “-” on the LCD, showing the polarity change.

Total check can be done by shorting all the test leads together C_1 , C_2 , P_1 , P_2 . The display should indicate close to 000 (depending of the crocodile clips used and how they are shorted). Both R_C and R_P LED should be OFF, indicating, that everything works okay.

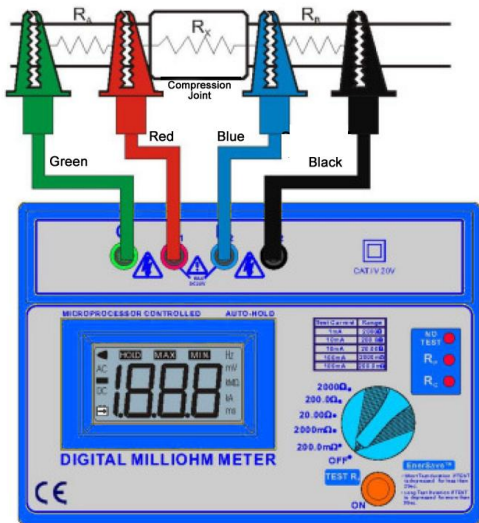
5.3. Precautions

- * Always ensure, that the circuit to be measured is switched “OFF”, isolated and completely de-energised before connecting the test leads.

- * If it is probable, that the instrument's protection has been impaired due to electrical, mechanical or environmental damage, it must not be used. It should be returned to your nearest distributor or agent for checking and repair.
- * To prevent damage to the liquid crystal display, the minimum storage temperature of -20°C must be observed. It should also be noted that below 0°C the operation of the LCD will be sluggish.
- * If the exterior of the instrument requires cleaning, it should be done with a sponge and a mild solution of detergent and water. Other mechanical cleaning agents must not be used.

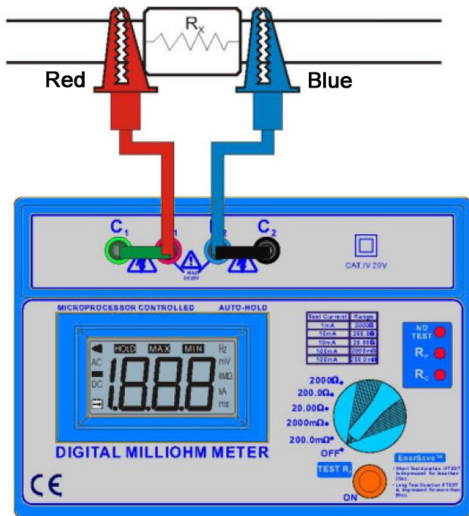
5.4. Measuring

- * Perform the preliminary checks before proceeding with measurement and ensure, that the precautions listed are observed.
- * Connect the test leads (color coded) to the instrument as shown.
- * The current test leads must always be outside of the potential test leads.
- * Please note, that the shorter the potential test leads, the better. Long potential test leads will pick up noise.
- * Screened test leads are recommended for better environmental noise rejection.



5.5. Simplified Measurement

The 4 wires measurement has many advantages. The errors due to the resistance of the test leads and the contacts as well as R_A and R_B are eliminated. However, in some cases, for example when using the high resistance range (2000 ohms) the four wires method is not necessary to still have a good percentage of accuracy (compared to the full scale). The simplified method of two wires can be used without too much problems, C_1 and P_1 can be shorted as well as C_2 and P_2 .



6. Applications

The **PeakTech**[®] 1125 Digital Milli-Ohmmeter, with its measuring range of 100 μ Ohms to 2000 Ohms, is suitable for a wide range of applications such as:

- * Measuring the winding resistance of electric motors, generators and transformers.
- * Bond testing in aircraft, railway, ships, domestic and industrial wiring installations.
- * Measuring the ring mains continuity testing in industrial and domestic wiring installations.
- * Measuring resistance in electronic equipment such as shunts, PCB tracks, switch and relay resistance.
- * Checking compression joints on overheads lines.
- * Testing and maintenance of switchboard/sub-stations equipment on such items as fuses, joints, contacts and bonds.

Test Leads

The test leads supplied with the instrument are suitable for connecting to conductors up to 17 mm in diameter or bus bars 17 mm thick. There will be instances, where the item being measured requires large jaws and the user is advised to make up his own leads. There will be occasions when longer leads are required due to the geometry of the item being tested. Some guidance notes should assist in the assembly of such leads:

Length of the potential leads should be as short as possible. Insulated 16/0.2 mm, tinned copper wire is recommended. The two potential leads should have the same length to minimise inaccuracies due to unbalance.

Supplied Potential- and Current Test Leads

P_1 test leads is of red colour, P_2 is blue, C_1 is green and C_2 is black, shrouded, 4 mm safety plug, which at one end has a crocodile (alligator) clip for connection to the resistance to be measured. The other end plugs into the **PeakTech**[®] 1125 (4 mm shrouded) colour coded sockets.

Thermal Effects

Temperature can have a significant effect on the performance of a Digital Milli-Ohmmeter, due to the temperature coefficient of the resistance under test and thermal EMF's across the dissimilar conductors.

Most conductors have a large temperature coefficient of resistance.

For example: 0,4% / °C for copper. A copper conductor, that has a resistance of 10.00 mOhm at 20°C will increase to 10.40 mOhm at 30°C. This change should be taken into account, when making measurements.

A current going through a resistance will also elevate its temperature. So duration of the test can change the resistance.

When measuring the resistance of item, such as current shunts, which have joints of dissimilar conductors, thermal EMF can affect the accuracy of the measurement. This condition can be detected if the reading alters, when the leads are reversed. To compensate for this effect, the average of the two readings should be taken as the true measurement.

Fuse Replacement

There are three fuses:

1. Power Supply Fuse

The power supply fuse is situated under the tester. Open the battery compartment, and replace the fuse with the same type (1.5A, >24V, Slow Blow)

2. Current Circuit Fuse.

Fuse protection is provided on the current terminals. This fuse is situated under the Printed Circuit Board. To access it, you need to unscrew the four mounting screws which are holding the front panel. Two of these screws are located under the foots, and the two others are located inside the battery compartment. The fuse is automatically blow by the crowbar, should voltage be present on the resistance under test. This is to prevent damage to the instrument. It is indicative of this fuse being blown is the R_C LED stays "on". (HBC, 1A, 250Vac, Slow Blow)

3. Potential Circuit Fuse.

Fuse protection is provided on the potential terminals. This fuse is situated under the Printed Circuit Board. To access it, you need to unscrew the four mounting screws which are holding the front panel. Two os these screws are located under the foots, and the two others are located inside the battery compartment. The fuse is automatically blow by the crowbar, should voltage be present on the resistance under test. This is to prevent damage to the instrument. If the preliminary tests does not lit R_P this is indicative of this fuse being blown. (HBC, 0.5A, 250Vac, Slow Blow)

Input Limits and Protections

The maximum continuous voltage, which can be applied across the potential and current leads is around 10,7 V.

Applying more than that voltage will automatically blow their respective fuses.

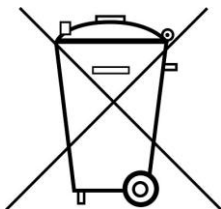
However, the crowbar trigger can be factory adjusted for your application.

We have specially selected that method to stop damaging the instrument, should it be misused.

7. Statutory Notification about the Battery Regulations

The delivery of many devices includes batteries, which for example serve to operate the remote control. There also could be batteries or accumulators built into the device itself. In connection with the sale of these batteries or accumulators, we are obliged under the Battery Regulations to notify our customers of the following:

Please dispose of old batteries at a council collection point or return them to a local shop at no cost. The disposal in domestic refuse is strictly forbidden according to the Battery Regulations. You can return used batteries obtained from us at no charge at the address below or by posting with sufficient stamps.



Batteries, which contain harmful substances, are marked with the symbol of a crossed-out waste bin, similar to the illustration shown left. Under the waste bin symbol is the chemical symbol for the harmful substance, e.g. „Cd“ for cadmium, „Pb“ stands for lead and „Hg“ for mercury.

You can also find this notification in the paperwork accompanying the goods delivery or in the manufacturer's operating instructions.

You can obtain further information about the Battery Regulations from the Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (*Federal Ministry of Environment, Nature Conservation and Reactor Safety*).

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This manual is according to the latest technical knowing. Technical alternations reserved.

We herewith confirm that the units are calibrated by the factory according to the specifications as per the technical specifications.

We recommend to calibrate the unit again, after 1 year.

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