VOLTCRAFT®

DIGITAL-MULTIMETER

DIGITAL MULTIMETER

MULTIMÈTRE NUMÉRIQUE

DIGITALE MULTIMETER

Best.-Nr. / Item No. / N° de commande / Bestnr.:
12 44 55 VC135
12 44 56 VC155

CE

Version 10/12

(D)

Diese Bedienungsanleitung gehört zu diesem Produkt. Sie enthält wichtige Hinweise zur Inbetriebnahme und Handhabung. Achten Sie hierauf, auch wenn Sie dieses Produkt an Dritte weitergeben.

Heben Sie deshalb diese Bedienungsanleitung zum Nachlesen auf! Eine Auflistung der Inhalte finden Sie in dem Inhaltsverzeichnis mit Angabe der entsprechenden Seitenzahlen auf Seite 4.

(GB)

These Operating Instructions accompany this product. They contain important information on setting up and using the device. You should refer to these instructions, even if you are buying this product for someone else.

Please retain these Operating Instructions for future use! A list of the contents can be found in the Table of contents, with the corresponding page number, on page 24.

(F)

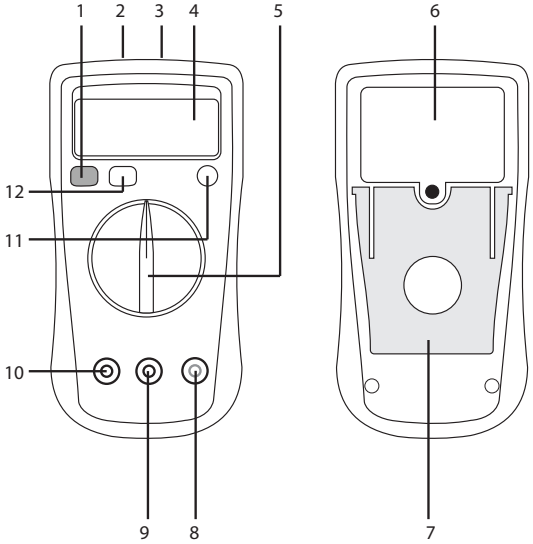
Le présent mode d'emploi fait partie intégrante du produit. Il comporte des directives importantes pour la mise en service et la manipulation de l'appareil. Tenir compte de ces remarques, même en cas de transfert du produit à un tiers.

Conserver ce mode d'emploi afin de pouvoir le consulter à tout moment. La table des matières avec indication des pages correspondantes se trouve à la page 41.

(NL)

Deze gebruiksaanwijzing hoort bij dit product. Zij bevat belangrijke informatie over de inbedrijfstelling en het gebruik. Let hierop, ook wanneer u dit product aan derden overhandigt.

Bewaar daarom deze gebruiksaanwijzing om in voorkomende gevallen te kunnen raadplegen. In de inhoudsopgave op pagina 59 vindt u een lijst met inhoudspunten met vermelding van het bijbehorende.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INTRODUCTION

Dear Customer,

In purchasing this Voltcraft® product, you have made a very good decision for which we would like to thank you.

Voltcraft® - In the field of measuring, charging and network technology, this name stands for high-quality products which perform superbly and which are created by experts whose concern is continuous innovation.

From the ambitious hobby electronics enthusiast to the professional user, products from the Voltcraft® brand family provide the optimum solution even for the most demanding tasks. And the remarkable feature is: we offer you the mature technology and reliable quality of our Voltcraft® products at an almost unbeatable price-performance ratio. In this way, we aim to establish a long, fruitful and successful co-operation with our customers.

We wish you a great deal of enjoyment with your new Voltcraft® product!

INTENDED USE

Measuring and displaying electric parameters in the range of excess voltage category III (up to max. 600 V against ground potential, pursuant to EN 61010-1) and all lower categories.

- Measuring direct and alternating voltage up to a maximum of 600 V
- Measuring of resistance up to 20 MΩ
- Acoustic continuity check
- Diode test
- Non-contact 230 V/AC voltage test
- Electric current measurement (10 A, mA µA, VC155 only)
- K-type temperature measurement (VC155 only)

The two measuring inputs are secured against overload. The voltage in the measuring circuit may not exceed 600 V. The measuring ranges are equipped with ceramic high-performance fuses.

The device may only be operated with a 9 V block battery.

The measuring instrument must not be operated when it is open, i.e. with an open battery compartment or when the battery compartment cover is missing. Measuring in damp rooms or under unfavourable ambient conditions is not admissible.

For safety reasons, when measuring only use measuring cables or accessories which are adjusted to the specifications of the multimeter.

Unfavourable ambient conditions are:

- Wetness or high air humidity,
- Dust and flammable gases, vapours or solvent,
- Thunderstorms or similar conditions such as strong electrostatic fields etc.

Unauthorised conversion and/or modification of the device are inadmissible because of safety and approval reasons (CE). Any usage other than described above is not permitted and can damage the product and lead to associated risks such as short-circuit, fire, electric shock, etc. Please read the operating instructions thoroughly and keep them for further reference.

This product complies with the statutory national and European requirements. All company names and product names are trademarks of their respective owners. All rights reserved.

Observe all safety instructions and information within this operating manual.

DELIVERY CONTENT

- Digital multimeter
- Measuring leads
- 9 V monobloc battery
- K-type thermo sensor (VC155 only)
- Operating instructions

SYMBOL EXPLANATION

An exclamation mark in a triangle indicates important instructions in this operating manual which absolutely have to be observed.

The triangle containing a lightning symbol warns of danger of an electric shock or of the impairment of the electrical safety of the device.

CE This product has been CE-tested and meets the necessary European guidelines.

Class 2 insulation (double or reinforced insulation)

CAT II Overvoltage category II for measurements on electric and electronic devices connected to the mains supply with a power plug. This category also covers all smaller categories (e.g. CAT I for measuring signal and control voltages).

CAT III Overvoltage category III for measuring in building installation (e.g. outlets or sub-distribution). This category also covers all smaller categories (e.g. CAT II for measuring electronic devices).

Ground potential

→ The symbol can be found when you are to be given tips and information on operation.

SAFETY INSTRUCTIONS

Read the operating instructions carefully and especially observe the safety information. If you do not follow the safety instructions and information on proper handling in this manual, we assume no liability for any resulting personal injury or damage to property. Such cases will invalidate the warranty/guarantee.

a) Persons / Product

- The device is not a toy. Keep it out of the reach of children and pets.
- Do not leave packaging material lying around carelessly. These may become dangerous playing material for children.
- Protect the product from extreme temperatures, direct sunlight, strong jolts, high humidity, moisture, flammable gases, vapours and solvents.
- Do not place the product under any mechanical stress.
- If it is no longer possible to operate the product safely, take it out of operation and protect it from any accidental use. Safe operation can no longer be guaranteed if the product:
  - is visibly damaged,
  - is no longer working properly,
  - has been stored for extended periods in poor ambient conditions or
  - has been subjected to any serious transport-related stresses.
- Please handle the product carefully. Jolts, impacts or a fall even from a low height can damage the product.
- Also observe the safety and operating instructions of any other devices which are connected to the product.

b) Batteries / Rechargeable batteries

- Correct polarity must be observed while inserting the batteries.
- Batteries should be removed from the device if it is not used for a long period of time to avoid damage through leaking. Leaking or damaged batteries might cause acid burns when in contact with skin, therefore use suitable protective gloves to handle corrupted batteries.
- Batteries must be kept out of reach of children. Do not leave the battery lying around, as there is risk, that children or pets swallow it.
- Batteries must not be dismantled, short-circuited or thrown into fire. Never recharge non-rechargeable batteries. There is a risk of explosion!

c) Miscellaneous

- Consult an expert when in doubt about operation, safety or connection of the device.
- Maintenance, modifications and repairs are to be performed exclusively by an expert or at a qualified shop.

OPERATING ELEMENTS

See fold-out page

1. HOLD button
2. Non-contact voltage sensor
3. Torch light (Only on VC155)
4. LC display
5. Rotary switch
6. Battery compartment
7. Stand clamp
8. VΩ-►|- socket (VC135) / mA µA °CΩV-►|- socket (VC155)
9. COM socket (reference potential)
10. 10A max socket (Only on VC155)
11. Torch button (Only on VC155)
12. BACK LIGHT button (Only on VC155)

DISPLAY INDICATIONS AND SYMBOLS

	Battery replacement icon; please replace the battery as soon as possible
	Symbol for the diode test
	Lightning icon for voltage measuring (VC155 only)
	Symbol for the acoustic continuity tester
~ AC	Alternating current
⎓ DC	Direct current
	Symbol for active hold function
Ω	Ohm (unit of electric resistance)
°C	Unit of temperature

OPERATION

The multimeter (referred to as DMM in the following) indicates measured values on the digital display.

The measuring value display of the DMM spans 2000 counts with VC135 (count = smallest display value). The measuring device can be used for do-it-yourself or for professional applications (up to CAT III 600 V). For better readability, the DMM can also be mounted with the clip on the rear.

a) Rotary switch (5)

The individual measuring functions are selected via a rotary switch. The measuring range can be selected manually with this switch.

b) Turning the measuring device on and off

The DMM are turned on and off via the rotary switch (5). When the rotary switch (5) is set to “OFF”, the DMM is turned off. Always turn the measuring device off when it is not in use.

Prior to working with the measuring device, you first have to insert the enclosed batteries.

A 9 V block battery is required for voltage supply. This is part of the delivery. Insert the battery as described in the chapter “Cleaning and Maintenance”.

STARTING THE MEASUREMENT

Do not exceed the maximum permitted input values. Do not contact circuits or parts of circuits if there could be voltages higher than 25 V ACrms or 35 V DC present within them. Mortal danger!

Before measuring, check the connected measuring lines for damage such as, for example, cuts, cracks or squeezing. Defective measuring cables must no longer be used. Mortal danger!

During measuring, do not grip beyond the tangible grip range markings present on the test prods.

You may only connect the two measuring leads to the measuring device that are required for measuring operation. Remove all measuring leads not required from the device for safety reasons.

➔ As soon as “1” (towards the left side of the display) appears on the display, you have exceeded the measuring range. Select the next higher measuring range

The voltage range „V/DC“ has an input resistance of >10 MΩ, the V/AC range of >4.5 MΩ.

With the digital multimeter, the automatic range selection (auto range) is active in all measuring functions (except for currency measuring ranges). This function sets the right measuring range automatically.

a) Voltage measuring “V”

Before measuring voltages, always make sure that the measuring instrument is not set to a measuring range for current.

Proceed as follows to measure DC voltages “DC” (V ⎓):

1. Turn the DMM on and select the measuring range “V ⎓” with the rotary switch (5). The values on the rotary switch (5) indicates the maximum measurement value of that selection.
2. Insert the red measuring lead into the V socket (8) and the black measuring lead into the COM socket (9).
3. Now connect the two measuring prods to the object to be measured (battery, switch etc.).
4. The red measuring tip indicates the positive pole, the black measuring tip the negative pole.
5. The polarity of the respective measuring value is indicated on the together with the current measuring value. The unit of the measurement is V.

→ As soon as a minus “-” appears for the direct voltage in front of the measuring value, the measured voltage is negative (or the measuring tips have been mixed up).

6. After measuring, remove the measuring leads from the measuring object and turn the DMM off. Turn the rotary switch to the position “OFF” .

Proceed as follows to measure AC voltages (V~):

1. Put the DMM into operation as described in the section “Measuring of direct voltage” and select the measuring range “V ”.
2. Now connect the two measuring leads to the object to be measured (generator, switch etc.).
3. The measuring value is indicated on the display. The unit of the measurement is V.
4. After measuring, remove the measuring leads from the measuring object and turn the DMM off. Turn the rotary switch to the position “OFF”.

b) Current measuring (A ⎓, only in VC155)

The voltage in the measuring circuit may not exceed 250 V.

Measuring operations of >5 A may only be performed for at most 10 seconds with a subsequent measuring pause of 15 minutes.

All current measuring ranges are provided with fuses and thus protected against overload.

Proceed as follows to measure DC currents "µA, mA, A"

AC current is not supported by this DMM. Do not attempt to measure AC currents with this DMM.

➔ Insert the red measuring lead into the 10 A max socket (10) if you are not sure about the size of the current.

1. Turn the DMM on and select the measuring range "A ⎓" with the rotary switch (5). The values on the rotary switch (5) indicates the maximum measurement value of that selection. Try to start measuring with the largest measuring range if possible, because the fine fuse will trigger in case of excess current.
2. Insert the red measuring lead into the 10 A max socket (10) (with currents > 400 mA) or into the mAµA socket (8) (with currents <400 mA). Plug the black measuring lead into the COM socket.
3. Now connect the two test prods in series with the object to be measured (battery, circuit etc.); the display indicates the polarity of the measured value together with the currently measured value. The unit of the measurement is µA, mA or A (depends on the measuring range selected).

➔ As soon as a minus "-" appears for the direct voltage measuring in front of the measuring value, the measured voltage is negative (or the measuring tips have been mixed up).

c) Resistance measuring

Make sure that all the circuit parts, switches and components and other objects of measurement are disconnected from the voltage and discharged.

Proceed as follows to measure the resistance:

1. Turn the DMM on and select measuring range "Ω".
2. Insert the red measuring lead into the Ω socket (8) and the black measuring lead into the COM socket (9).
3. Check the measuring leads for continuity by connecting both measuring leads to one another. After that the resistance value must be approximately 0.5 Ω (inherent resistance of the measuring leads).
4. Now connect the measuring prods to the object to be measured. As long as the object to be measured is not high-resistive or interrupted, the measured value will be indicated on the display. Wait until the display has stabilised. With resistances of >1 MΩ, this may take a few seconds.
5. As soon as "1" (towards the left side of the display) appears on the display, you have exceeded the measuring range or the measuring circuit has been broken. Select a larger measuring range if necessary.
6. After measuring, remove the measuring leads from the measuring object and turn the DMM off. Turn the rotary switch (5) to the position "OFF".

→ If you carry out a resistance measurement, make sure that the measuring points which you contact with the measuring prods are free from dirt, oil, solderable lacquer or similar. An incorrect measurement may result under such circumstances.

d) Diode test

Make sure that all the circuit parts, switches and components and other objects of measurement are disconnected from the voltage and discharged.

1. Turn the DMM on and select measuring range ⊣◀ with the rotary switch (5).
2. Insert the red measuring lead into the ⊣◀ socket (8) and the black measuring lead into the COM socket (9).
3. Check the measuring leads for continuity by connecting both measuring prods to one another. After that the value must be approximately 0 V. An acoustic signal can be heard.
4. Now connect the two measuring prods with the object to be measured (diode).
5. The display shows the continuity voltage in volt (V). Open-circuit voltage is about 2.6 V.
6. If “1” (towards the left side of the display) is shown, the diode is measured in reverse direction or the diode is faulty (interruption). Perform a counter-pole measuring for control reasons. The red measuring lead corresponds to the positive pole (anode), the black measuring lead to the negative pole (cathode). A silicone diode has an on-state voltage of approx. 0.5 – 0.8 V. If the diode is place in the correct direction, an acoustic signal can be heard.
7. After measuring, remove the measuring leads from the measuring object and turn the DMM off. Turn the rotary switch (5) to the position “OFF” .

e) Continuity test

1. Turn the DMM on and select measuring range •)) with the rotary switch (5).
2. Insert the red measuring lead into the •)) socket (8) and the black measuring lead into the COM socket (9).
3. Check the measuring leads for continuity by connecting both measuring prods to one another. After that the value must be approximately 0 V. An acoustic signal can be heard.
4. Now connect the two measuring prods to the two contact points for checking continuity.
5. The display shows the continuity voltage in volt (V).
6. If “1” (towards the left side of the display) is shown, the two contact points are not in a closed circuit. If the two end points are in a closed circuit, the resistant is less than 10 Ω, an acoustic signal can be heard.
7. After measuring, remove the measuring leads from the measuring object and turn the DMM off. Turn the rotary switch (5) to the position “OFF” .

f) Non contact voltage test “NCV”

Make sure that all measuring sockets are unoccupied. Please remove all measuring leads and adapters from the measuring device.

This function only serves as aid. Prior to performing work on these cables, you have to perform contact measuring operations to check for the absence of voltage.

1. Turn the DMM on and select measuring range “NCV” with the rotary switch (5). You will see the word “NCV” on the display (4).
2. Test this function beforehand on a known AC voltage source.
3. Guide the measuring device with the sensor area (3) towards to position to be tested at a distance of max. 5 mm. In case of twisted cables, it is recommended to check the cable at a length of approx. 20 to 30 cm.
4. In case voltage is detected, the will be an acoustic signal.
5. After you finish measuring, turn the DMM off. Turn the rotary switch to the position “OFF”.

g) Temperature measuring (only in VC155)

Make sure that all measuring sockets are unoccupied. Please remove all measuring leads and adapters from the measuring device.

This function only serves as aid. Prior to performing work on these cables, you have to perform contact measuring operations to check for the absence of voltage.

1. Turn the DMM on and select measuring range “°C” with the rotary switch (5).
2. Disconnect all measuring leads from the measuring instrument.
3. Connect the enclosed temperature sensor to the DMM while observe the correct polarity. The TEMP (+) terminal must be inserted into the ºC socket (8) and the COM (-) terminal must be inserted into the COM socket (9).
4. Now expose the sensor tip to the temperatures.
5. The display shows the temperature on the sensor. The unit of the measured value is “ºC”. If “1” (towards the left side of the display) is shown, the measuring range was exceeded or there is no sensor connected.
6. After measuring, remove the adapter and turn the DMM off. Turn the rotary switch to the position “OFF”.

HOLD FUNCTION

The HOLD button (1) allows you to hold the measuring value on the display. The symbol “H” appears on the display. This facilitates reading, e.g. for documentation purposes. Another press will switch back to measuring operation again.

BACK LIGHT FUNCTION (ONLY IN VC155)

During any measurement, press the BACK LIGHT button (12) to turn on the back light on the display (4). Press it again to turn it off.

TORCH FUNCTION (ONLY IN VC155)

During any measurement, press the torch button (11) to turn on the torch light (3). Press it again to turn if off.

MAINTENANCE AND CLEANING

Never operate the measurement device when it is open.

RISK OF FATAL INJURY!

a) General

To ensure the accuracy of the multimeter over an extended period of time, it should be calibrated once a year.

Apart from occasional cleaning and fuse replacements, the multimeter requires no servicing.

Information on changing the battery and fuse appears below.

Regularly check the technical safety of the instrument and measuring lines, e.g. check for damage to the housing or squeezing etc.

b) Cleaning

Live components may be exposed if covers are opened or parts are removed. The connected lines must be disconnected from the measuring device and all measuring objects prior to cleaning or repairing the device. Switch the DMM off.

Do not use any carbon-containing cleaning agents or petrol, alcohol or the like to clean the product.

These could corrode the surface of the measuring instrument. Furthermore, the fumes are hazardous to your health and explosive. Moreover, you should not use sharp-edged tools, screwdrivers or metal brushes or similar for cleaning.

For cleaning the device or the display and the measuring lines, use a clean, fuzz-free, antistatic slightly damp cloth.

c) Fuse replacement (only for VC155)

Using mended fuses or bridging the fuse holder is not admissible for safety reasons.

Never operate the measurement device when it is open.

RISK OF FATAL INJURY!

The currency measuring ranges are protected against overload with ceramic fine-wire fuses. If measuring in this range is no longer possible, you have to change the fuse.

Proceed as follows for replacement

1. Separate the connected measuring leads from the measuring circuit and the measuring device.
2. Switch the DMM off.
3. Unscrew the screws on the battery cover, carefully remove the battery cover and battery.
4. Unscrew the two screws on the back of the device and carefully pull the casing apart.
5. Replace the defective fuse with a new fuse of the same type and nominal voltage. The fuses have the following values:
   - F1 fine-wire fuse, quick-action, 0.2 A/600 V (6 x 32 mm), Item no.: 433005.
   - F2 fine-wire fuse, quick-action, 10 A/600 V (6 x 25 mm), Item no.: 700161.
6. Now close the housing carefully again.

d) Inserting/replacing the battery

Do not leave flat batteries in the device. Even batteries protected against leaking can corrode and thus release chemicals which may be detrimental to your health or destroy the battery compartment.

Do not leave batteries lying around carelessly. They might be swallowed by children or pets. If swallowed, consult a doctor immediately.

If the device is not used for longer periods of time, remove the batteries in order to prevent leaking.

Leaking or damaged batteries might cause acid burns when getting into contact with skin. Therefore, use suitable protective gloves.

Make sure that the batteries are not short-circuited. Do not throw batteries into fire!

Batteries may not be recharged. Danger of explosion!

Operation of the measuring device requires a 9 V battery (e.g. 1604A). You need to insert a new, charged battery prior to initial operation or when the battery change symbol  appears on the display.

To insert/replace the battery, proceed as follows:

1. Separate the connected measuring leads from the measuring circuit and the measuring device. Switch the DMM off.
2. Unscrew the screw on the rear of the battery compartment (6) and carefully pull the battery cover and the battery out of the measuring device.
3. Insert a new battery with the correct polarity into the battery cover, insert them into the DMM.
4. Screw and fasten the battery cover with the screw.

➔ You can order suitable alkaline batteries stating the following order no.:

Item no. 65 25 09 (please order one).

Only use alkaline batteries, since these are powerful and have a long life.

TROUBLESHOOTING

Always observe the safety instructions!

Repairs other than those described should only be carried out by an authorised specialist.

If you have queries about handling the measuring device, our technical support is available under the following telephone number:

Voltcraft®, 92242 Hirschau, Lindenweg 15, phone 0180 / 586 582 7

In purchasing the DMM, you have acquired a product which has been designed to the state of the art and is operationally reliable.

Nevertheless, problems or faults may occur. For this reason, the following is a description of how you can eliminate possible malfunctions yourself.

Error	Possible cause	Remedy
The DMM does not work.	Is the battery dead?	Check the status.
No measuring change.	The HOLD function is activated (display shows “H”)	Press the button “HOLD” again. The symbol “H” disappears.
	Is the wrong measuring function active (AC/DC)?	Check the display (AC/DC) and switch the function if applicable.
	Did you use the wrong measuring sockets?	Check the measuring sockets.
	Is the fuse defect?	In A/mA/µA range: Change the fuse as described in the chapter ”Changing the fuse”.

DISPOSAL

a) Product

Electronic devices are recyclable waste and must not be disposed of in the household waste.

At the end of its service life, dispose of the product according to the relevant statutory regulations.

Remove any inserted (rechargeable) batteries and dispose of them separately from the product.

b) Batteries / Rechargeable batteries

You as the end user are required by law (Battery Ordinance) to return all used batteries/rechargeable batteries. Disposing of them in the household waste is prohibited.

Contaminated (rechargeable) batteries are labelled with this symbol to indicate that disposal in the domestic waste is forbidden. The designations for the heavy metals involved are: Cd = Cadmium, Hg = Mercury, Pb = Lead (name on (rechargeable) batteries, e.g. below the trash icon on the left).

Used (rechargeable) batteries can be returned to collection points in your municipality, our stores or wherever (rechargeable) batteries are sold.

You thus fulfil your statutory obligations and contribute to the protection of the environment.

TECHNICAL DATA

Operating voltage .....9 V block battery

Display.....2000 count

Measuring frequency .....approx. 2-3 measuring operations/second

Measuring lead length .....approx. 75 cm

Measuring impedance .....>10MΩ (V range)

Operation temperature .....0 to +40 °C

Operation humidity .....≤75 % (for 0 to +30 °C), ≤50 % (for +30 to +40 °C)

Operating altitude .....max. 2000 m

Storage temperature.....-10 to +50 °C

Dimensions (W x H x D) .....75 x 150 x 38 mm

Weight .....approx. 200 g

Measurement tolerances

Statement of accuracy in ± (% of reading + display error in counts (= number of smallest points)). The accuracy is valid for one year at a temperature of +23°C ±5°C, and at a relative humidity of less than 75%, non-condensing.

a) DC voltage (V ⎓)

Range	Accuracy	Resolution
200.0 mV	±(0.5 % reading +8 digits)	0.1 mV
2000 mV		1 mV
20.00 V		0.01 V
200.0 V		0.1 V
600 V	±(0.8% reading +8 digits)	1 V

Overload protection: 600 V

Input impedance: approx. 10 MΩ

b) AC voltage (V~)

Range	Accuracy	Resolution
200.0 V	±(1.6% reading +4 digits)	0.1 V
600 V		1 V

Overload protection: 600 V

Input impedance: approx. 4.5 MΩ

Frequency response: 45 – 400 Hz

Display: Sine wave valid value (average value response)

c) DC current (A ⎓, only in VC 155)

Range	Accuracy	Resolution
2000 µA	±(1.3% reading +3 digits)	1 µA
20.00 mA		0.01 mA
200.0 mA	±(1.5% reading +8 digits)	0.1 mA
10A	±(2.6% reading +7 digits)	0.01A

Overload protection:

mAµA range: F1 fuse 6 x 32 mm F 0.2 A H 600 V (CE) Item no.: 433005

10A range: F2 fuse 6 x 25 mm F 10 A H 600 V (CE) Item no.: 700161

Measuring operations of >5 A may only be performed for at most 10 seconds with a subsequent measuring pause of 15 minutes.

d) Resistance

Range	Accuracy	Resolution
200.0 Ω	±(1.0% reading +10 digits)	0.1 Ω
2000 Ω		1 Ω
20.00 kΩ		0.01 kΩ
200.0 kΩ		0.1 kΩ
20 MΩ	±(1.3% reading +7 digits)	0.01 MΩ

Overload protection: 600 V

e) Temperature (only in VC 155)

Range	Measurement range	Accuracy	Resolution
-40 to +1000 ºC	-40 to 0 ºC	±(1. 0% reading +10 digits)	1 ºC
	>0 to +100 ºC	±(3.3% reading +4 digits)	
	>+100 to +1000 ºC	±(3.9% reading +4 digits)	

Overload protection: 600 V

f) Diode / continuity text

Acoustic continuity tester: ≤10 Ω permanent sound

Acoustic continuity tester resolution: 1 mV

Diode test voltage: 2.6 V

Overload protection: 600 V

g) Non-contact voltage test

Target voltage: 230 V/AC

(D) Impressum

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Deze gebruiksaanwijzing voldoet aan de technische stand bij het in druk bezorgen. Wijziging van techniek en uitrusting voorbehouden.