BE50

EN

OPERATING MANUAL
DIGITAL MULTIMETER

TRT-BA-BE50-TC2019-17-002-EN

TROTEC

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Notes regarding the operating manual

Symbols

Warning of electrical voltage
This symbol indicates dangers to the life and health of persons due to electrical voltage.

Warning
This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.

Caution
This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

Note
This signal word indicates important information (e.g. material damage), but does not indicate hazards.

Info
Information marked with this symbol helps you to carry out your tasks quickly and safely.

Follow the manual
Information marked with this symbol indicates that the operating manual must be observed.

You can download the current version of the operating manual and the EU declaration of conformity via the following link:

BE50

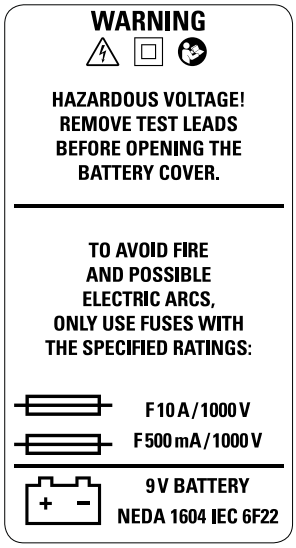
https://hub.trotec.com/?id=39962

Safety

Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use!

Warning
Read all safety warnings and all instructions.
Failure to follow the warnings and instructions may result in electric shock, fire and / or serious injury.
Save all warnings and instructions for future reference.

- The device is supplied with a warning sign. Prior to initial start-up, make sure to paste the corresponding warning sign in your local language over the one present at the rear of the device as described in chapter Operation.



- Do not use the device in potentially explosive rooms.
- Do not use the device in aggressive atmosphere.
- Protect the device from permanent direct sunlight.

- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Do not open the device.
- Observe the storage and operating conditions as given in the Technical data chapter.

Intended use

Only use the multimeter for measuring voltage, current or resistance whilst adhering to the technical data.

Intended use comprises:

- measurements of AC and DC voltages
- measurements of direct and alternating currents
- capacitance measurements
- frequency / duty cycle measurements
- resistance measurements
- temperature measurements using external type K sensor
- testing diodes
- acoustic continuity tests

The device is dust- and water-proof as per IP67 and corresponds to the overvoltage categories CAT III (1000 V) and CAT IV (600 V).

To use the device for its intended use, only use accessories and spare parts which have been approved by Trotec.

Improper use

Do not use the device in potentially explosive atmospheres, when wet or very humid.

Unauthorized modifications of the device are forbidden.

Personnel qualifications

People who use this device must:

- master the 5 safety rules (1 De-energise, 2 Secure against restart, 3 Verify de-energised state (bipolar), 4 Earth and short-circuit, 5 Cover neighbouring live parts).
- use the measuring device in accordance with safe working procedures.
- be aware of the dangers that occur when working with electric devices in damp areas.
- take measures to protect themselves from direct contact with live parts.
- have read and understood the operating manual, especially the Safety chapter.

Residual risks

Warning of electrical voltage

Electric shock due to insufficient insulation! Check the device for damages and proper functioning before each use.
If you detect damages, do not use the device any longer.
Do not use the device when wither the device or your hands are damp or wet!
Do not use the device when the battery compartment or the housing is open.

Warning of electrical voltage

Electric shock due to contact with live parts! Do not touch any live parts. Secure neighbouring live parts by covering them or by switching them off.

Warning of electrical voltage

Electric shock due to contact with live parts! When using the measuring tips, make sure not to reach behind the protection against contact.

Warning of electrical voltage

There is a risk of a short-circuit due to liquids penetrating the housing!
Do not immerse the device and the accessories in water. Make sure that no water or other liquids can enter the housing.

Warning of electrical voltage

Work on the electrical components must only be carried out by an authorised specialist company!

Warning

Risk of suffocation!
Do not leave the packaging lying around. Children may use it as a dangerous toy.

Warning

The device is not a toy and does not belong in the hands of children.

Warning

Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way! Observe the personnel qualifications!

Caution

Keep a sufficient distance from heat sources.

Note

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

Note

Do not use abrasive cleaners or solvents to clean the device.

Information about the device

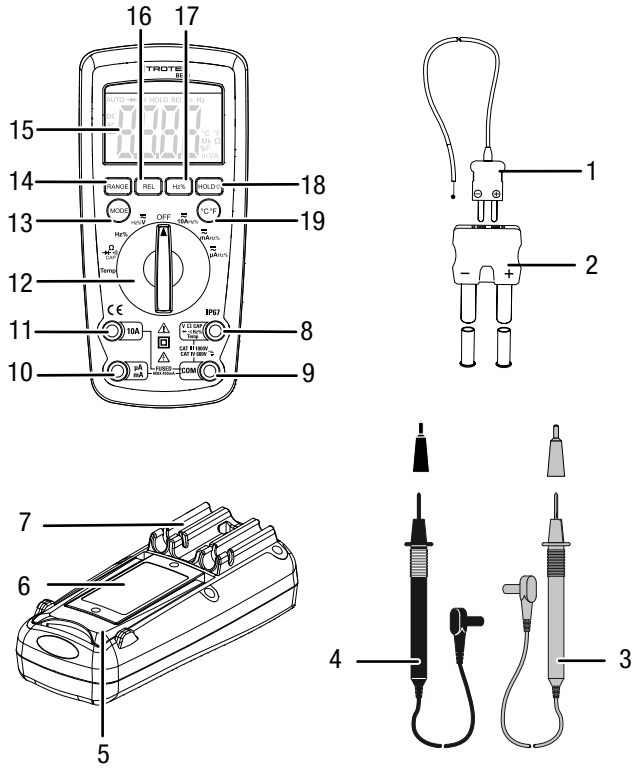
Device description

The multimeter is a battery-powered, mobile hand-held measuring device with an extensive range of measurement possibilities.

It comes with the following functional properties and equipment features:

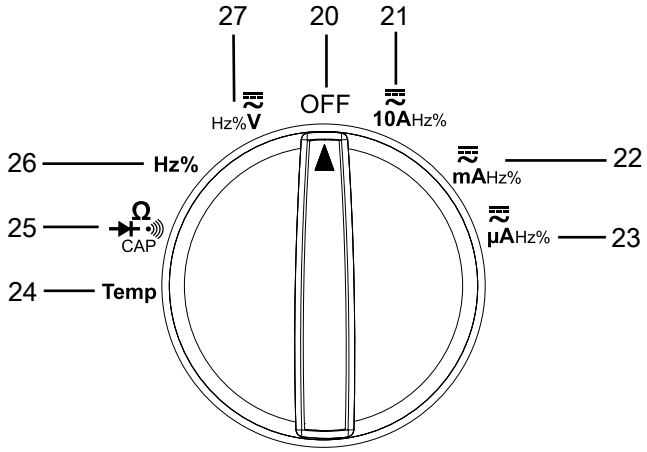
- Automatic / manual range selection
- 4000 digit display, can be illuminated with white light
- Can also be operated while wearing gloves
- Fold-out stand and holding fixture for measuring tips
- Protection type IP67, safety category CAT III (1000 V) / CAT IV (600 V)
- AC and DC voltage measurement
- Measurement of direct and alternating currents
- Resistance measurement
- Capacitance measurement
- Frequency / duty cycle measurement
- Temperature measurement using external type K sensor
- Diode testing function
- Acoustic continuity testing
- Hold function and relative value measurement function

Device depiction



No.	Designation
1	Temperature sensor
2	Adapter for temperature sensor
3	Red measuring tip
4	Black measuring tip
5	Fold-out stand
6	Battery compartment
7	Holding fixture for measuring tips
8	V/Ω socket
9	COM socket
10	mA socket
11	10 A socket
12	Rotary switch
13	*MODE* button
14	*RANGE* button
15	LC display
16	*REL* button
17	*Hz%* button
18	*HOLD* button
19	*°C/°F* button

Rotary switch



No.	Position	Description
20	OFF	The device is switched off.
21	10A	Direct and alternating current: up to 10 A
22	mA	Direct and alternating current: up to 400 mA
23	µA	Direct and alternating current: up to 400 µA
24	Temp	Temperature measurement: -20 °C to +760 °C -4 °F to +1400 °F
25	Ω	Resistance measurement: 0.1 Ω to 10 MΩ
	→+ ·))	Diode test / continuity measurement
	CAP	Capacitance measurement: 10 pF to 100 µF
26	Hz%	Frequency measurement: 1 mHz to 10 MHz Duty cycle: 0.1 % to 99.9 %
27	V	DC voltage: 0.1 V to 1000 V AC voltage: 0.1 mV to 1000 V

Technical data

General characteristics

Parameter	Value
Diode test	Test current of 0.3 mA, test voltage approx. 1.5 V DC (typically)
Continuity test	An acoustic signal is emitted if the resistance amount to less than 150 Ω.
LC display	3 3/4 digits, 4000 count LCD
Exceedance of the measuring range (outside limits)	OL will be displayed.
Polarity	Automatic (no indication for positive); minus (-) sign for negative
Measuring speed	2 x per second, nominal
Battery indication	The battery icon will be displayed when the battery voltage drops below the operating voltage threshold.
Battery	9 V battery
Fuses	mA, µA range: 0.5 A / 1000 V (fast acting) A range: 10 A / 1000 V (fast acting)
Operating temperature	0 °C to 50 °C (32 °F to 122 °F)
Relative humidity	< 70 %
Operating height above sea level	Max. 2000 m (7000 ft)
Type of protection	IP67
Weight	approx. 320 g (11.29 oz)
Dimensions	182 x 82 x 55 mm (7.17" x 3.23" x 2.17")
Safety	This measuring device is designed for indoor use and complies with overvoltage category CAT III (1000 V) / CAT IV (600 V).

Measuring ranges

Function	Measuring range	Resolution	Accuracy
DC voltage (V DC)	400 mV	0.1 mV	± (1 % + 2 digits)
	4 V	1 mV	± (1.2 % + 2 digits)
	40 V	10 mV	
	400 V	100 mV	
	1000 V	1 V	± (1.5 % + 5 digits)
AC voltage (V AC) (50 / 60 Hz)	400 mV	0.1 mV	± (1.5 % + 2 digits)
	4 V	1 mV	± (2.0 % + 5 digits)
	40 V	10 mV	
	400 V	100 mV	
	1000 V	1 V	± (2.0 % + 8 digits)
Direct current (A DC)	400 µA	100 nA	± (1.0 % + 3 digits)
	4 mA	1 µA	± (1.5 % + 3 digits)
	40 mA	10 µA	
	400 A	100 µA	
	10 A	10 mA	± (2.5 % + 5 digits)
Alternating current (A AC)	400 µA	100 nA	± (2.0 % + 5 digits)
	4 mA	1 µA	± (2.5 % + 5 digits)
	40 mA	10 µA	
	400 A	100 µA	
	10 A	10 mA	± (3.0 % + 7 digits)
Capacitance (nF)	40 nF	0.01 nF	± (5.0 % + 7 digits)
	40 nF	0.1 nF	± (3.0 % + 5 digits)
	4 µF / 40 µF	1 nF / 10 nF	
	100 µF	100 nF	± (5.0 % + 5 digits)
Resistance (Ω)	400 Ω	0.1 Ω	± (1.2 % + 4 digits)
	4 kΩ	1 Ω	± (1.0 % + 2 digits)
	40 kΩ	10 Ω	± (1.2 % + 2 digits)
	400 kΩ	100 Ω	
	4 MΩ	1 kΩ	
	40 MΩ	10 kΩ	± (2.0 % + 3 digits)
Frequency / duty cycle	9.999 Hz	0.001 Hz	n/s
	99.99 Hz	0.01 Hz	± (1.5 % + 5 digits)
	999.9 Hz	0.1 Hz	± (1.2 % + 3 digits)
	9.999 kHz	1 Hz	
	99.99 kHz	10 Hz	
	999.9 kHz	100 Hz	
	9.999 MHz	1 kHz	± (1.5 % + 4 digits)
Duty cycle %	0.1–99.9 %	0.1 %	± (1.2 % + 2 digits)
Temperature (°C / °F)	-20 °C to +760 °C	1 °C	± 3.0 % ± 5 °C / 9 °F
	-4 °F to +1400 °F	1 °F	
Diode measurement	Test voltage: approx. 1.5 V ± 10 % + 5 digits	1 mV	
	Test current: typ. 0.3 mA		
Continuity test	Acoustic signal at ≤ 150 Ω		
	Typ. test current 0.3 mA		

Note:
The accuracy is based on an ambient temperature of 18 °C to 28 °C and a relative humidity of less than 75 %.
The accuracy specification consists of two values:

- % value referring to the reading: Corresponds to the accuracy of the installation to be measured.
- + digits: Corresponds to the accuracy referring to the analogue-to-digital converter.

Scope of delivery

- 1 x Multimeter
- 2 x Measuring tip
- 2 x Protective cap for measuring tips
- 1 x Temperature sensor (type K) with adapter
- 1 x 9 V battery
- 1 x Quick guide

Transport and storage

Note

If you store or transport the device improperly, the device may be damaged.
Note the information regarding transport and storage of the device.

Transport

For transporting the device, use the bag included in the scope of delivery in order to protect the device from external influences.

Storage

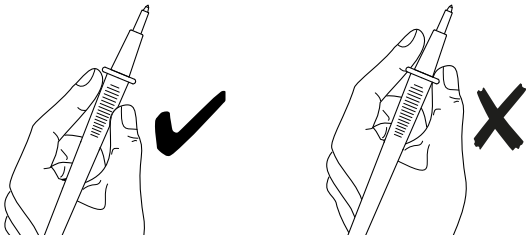
When the device is not being used, observe the following storage conditions:

- dry and protected from frost and heat
- protected from dust and direct sunlight
- with a cover to protect it from invasive dust if necessary
- The storage temperature is the same as the range given in the Technical data chapter.
- Remove the battery from the device.

Operation

Warning of electrical voltage

Electric shock due to contact with live parts! When using the measuring tips, make sure not to reach behind the protection against contact.



Inserting the battery

Insert the battery before first use.

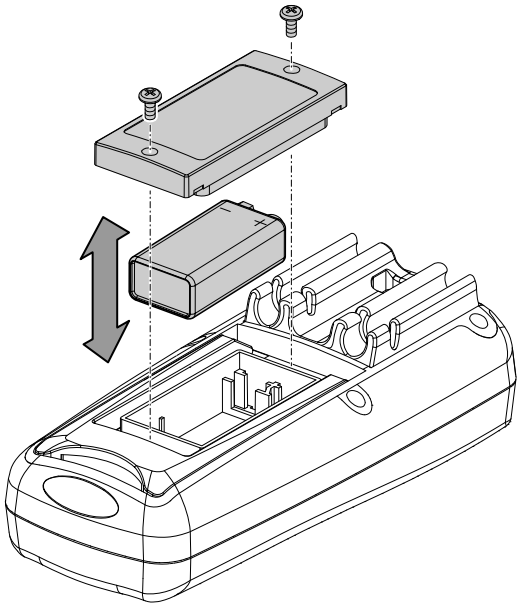
Note

Disconnect the measuring tips from the device before opening the battery compartment.

Note

Make sure that the surface of the device is dry and the device is switched off.

1. Loosen the screws at the battery compartment (6).
2. Open the battery compartment.
3. Connect the battery to the battery clip with correct polarity.

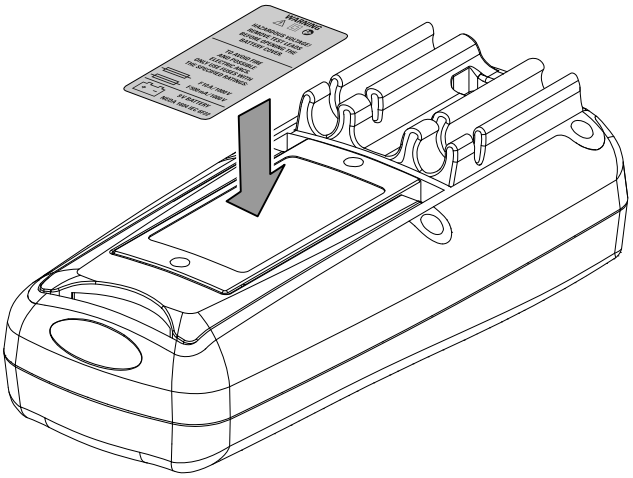


4. Close the battery compartment and retighten the screws.

Attaching the warning sign

Prior to initial start-up, check whether the warning sign at the rear of the device is in your local language, if not, paste the proper one over it. A warning sign in your native language is supplied along with the device. Please proceed as follows to attach the warning sign to the rear of the device:

1. Remove the label in your local language from the supplied film.
2. Affix the label in the intended position at the rear of the device.



Undefined displays

If measuring inputs are open or touched by hand, this can lead to undefined displays. This is not a malfunction but a reaction of the sensitive measuring input to existing interference voltages.

Normally, when there is no high interference level at the workplace or in case of a short circuit at the measuring input zero is displayed immediately. Or, if the measuring object is connected, the exact measured value is displayed. Fluctuations in the displayed value by some digits are systemic and within the tolerance.

If the resistance measuring range, the continuity testing range or the diode test was selected and the measuring input is open, the *OL* indication (exceedance of the measuring range) will be displayed.

Measuring DC voltage

Warning of electrical voltage
Improper handling of the measuring device entails a risk of electric shock!

Before carrying out voltage measurements, observe the following:

- Never apply a voltage exceeding the rated nominal voltage of the measuring device between the connections or between the connections and earth (see imprint on the housing).
- Check the measuring tips for damaged insulation and for continuity. Replace damaged measuring tips.
- Check the insulation of the measuring device sockets.
- Before using the measuring device, check its functionality by carrying out measurements with a known voltage.
- First connect the measuring tip connected to earth and afterwards the live measuring tip. When disconnecting the measuring tips, proceed in reverse order, i.e. disconnect the live measuring tip first.
- Prior to every voltage measurement make sure that the measuring device is not set to the current measuring range.
- If the device indicates an exceedance of the measuring range (*OL*) immediately after being connected to the measuring object, first switch off the circuit at the measuring object, then immediately remove the measuring tips from the measuring object.
- Do not switch any motors in the measuring circuit on or off during a measurement. Voltage peaks caused by a switch-on or switch-off can damage the measuring device.

1. Set the rotary switch to the voltage measuring range, then use the *MODE* button to select the desired measuring mode (*DC* indication for DC voltage).
2. Insert the plug of the black measuring tip into the *COM* measuring socket and the plug of the red measuring tip into the *V/Ω* measuring socket.
3. Connect both measuring tips to the measuring object with correct polarity (black to minus, red to plus).
   ⇨ If the input voltage is negative, a minus (-) will appear in front of the measured value on the display.
   ⇨ The measured value will be indicated on the display.
4. If the *OL* indication (exceedance of the measuring range) appears after the manual range selection, immediately switch over to the respectively next higher range (*RANGE* button). If the *OL* indication appears and the maximum range has been set already or in case of the automatic range selection, immediately switch off the voltage supply at the measuring object and disconnect the measuring device from the measuring object.

⇨ The measured value will be indicated on the display.

Measuring AC voltage

Warning of electrical voltage
Improper handling of the measuring device entails a risk of electric shock!

Before carrying out voltage measurements, observe the following:

- Never apply a voltage exceeding the rated nominal voltage of the measuring device between the connections or between the connections and earth (see imprint on the housing).
- Check the measuring tips for damaged insulation and for continuity. Replace damaged measuring tips.
- Check the insulation of the measuring device sockets.
- Before using the measuring device, check its functionality by carrying out measurements with a known voltage.
- First connect the measuring tip connected to earth and afterwards the live measuring tip. When disconnecting the measuring tips, proceed in reverse order, i.e. disconnect the live measuring tip first.
- Prior to every voltage measurement make sure that the measuring device is not set to the current measuring range.
- If the device indicates an exceedance of the measuring range (*OL*) immediately after being connected to the measuring object, first switch off the circuit at the measuring object, then immediately remove the measuring tips from the measuring object.
- Do not switch any motors in the measuring circuit on or off during a measurement. Voltage peaks caused by a switch-on or switch-off can damage the measuring device.

1. Set the rotary switch to the voltage measuring range, then use the *MODE* button to select the desired measuring mode (*AC* indication for AC voltage).
2. Insert the plug of the black measuring tip into the *COM* measuring socket and the plug of the red measuring tip into the *V/Ω* measuring socket.

3. Connect both measuring tips to the measuring object.
   ⇨ If the input voltage is negative, a minus (-) will appear in front of the measured value on the display.
   ⇨ The measured value will be indicated on the display.
4. If the *OL* indication (exceedance of the measuring range) appears after the manual range selection, immediately switch over to the respectively next higher range (*RANGE* button). If the *OL* indication appears and the maximum range has been set already or in case of the automatic range selection, immediately switch off the voltage supply at the measuring object and disconnect the measuring device from the measuring object.

⇨ The measured value will be indicated on the display.

Measuring direct current

Warning of electrical voltage
Improper handling of the measuring device entails a risk of electric shock!

Before carrying out current measurements, observe the following:

- Before connecting a measuring device to an electric circuit, cut off the circuit current. Discharge the capacitors.
- For measuring the current, interrupt the circuit to be checked and connect the measuring device in series with the consumer in this circuit.
- Never connect a voltage source to the multimeter's measuring sockets when a current measuring range is selected. Otherwise the device could be damaged.
- The voltage in the measuring circuit must not be higher than 1000 V (CAT III) or 600 V (CAT IV) to earth.
- For measuring higher currents starting at 400 mA in the 10 A range, one must observe a maximum measurement duration of 30 s each with an intermission of 15 minutes between two measurements. Otherwise, the device may be damaged due to excessive heating.

1. Depending on the expected measuring current set the rotary switch to the µA, mA or 10 A range, then use the *MODE* button to select the desired measuring mode (*DC* indication for direct current).
2. Insert the plug of the black measuring tip into the *COM* measuring socket and the plug of the red measuring tip into the *µA/mA* or *10 A* measuring socket – depending on the selected range.
3. Switch off the voltage supply at the measuring object and connect the measuring tips to the measuring object with correct polarity (in series; red to plus, black to minus).
4. Switch the measuring circuit back on and read the measured value from the display.
5. If the *OL* indication (exceedance of the measuring range) appears after the manual range selection, immediately switch over to the respectively next higher range. If the *OL* indication appears and the maximum range has been set already or in case of the automatic range selection, immediately switch off the voltage supply at the measuring object and disconnect the measuring device from the measuring object.

Note:
If there is no indication and all connections have been established correctly, the cause of the fault may be a defective internal fuse protecting the current measuring ranges (see chapter Fuse replacement).

Note:
If you have selected the 10 A range for safety's sake, but the measuring current amounts to less than 400 mA, switch the measuring circuit back off. Plug the red measuring tip into the mA socket and select a measuring range in the mA range. Switch the measuring circuit back on.

Measuring alternating current

Warning of electrical voltage
Improper handling of the measuring device entails a risk of electric shock!

Before carrying out current measurements, observe the following:

- Before connecting a measuring device to an electric circuit, cut off the circuit current. Discharge the capacitors.
- For measuring the current, interrupt the circuit to be checked and connect the measuring device in series with the consumer in this circuit.
- Never connect a voltage source to the multimeter's measuring sockets when a current measuring range is selected. Otherwise the device could be damaged.
- The voltage in the measuring circuit must not be higher than 1000 V (CAT III) or 600 V (CAT IV) to earth.
- For measuring higher currents starting at 400 mA in the 10 A range, one must observe a maximum measurement duration of 30 s each with an intermission of 15 minutes between two measurements. Otherwise, the device may be damaged due to excessive heating.

1. Depending on the expected measuring current set the rotary switch to the µA, mA or 10 A range, then use the *MODE* button to select the desired measuring mode (*AC* indication for alternating current).
2. Insert the plug of the black measuring tip into the *COM* measuring socket and the plug of the red measuring tip into the *µA/mA* or *10 A* measuring socket – depending on the selected range.
3. Switch off the voltage supply at the measuring object and connect the measuring tips (in series) to the measuring object.

4. Switch the measuring circuit back on and read the measured value from the display.
5. If the *OL* indication (exceedance of the measuring range) appears after the manual range selection, immediately switch over to the respectively next higher range. If the *OL* indication appears and the maximum range has been set already or in case of the automatic range selection, immediately switch off the voltage supply at the measuring object and disconnect the measuring device from the measuring object.

Note:
If there is no indication and all connections have been established correctly, the cause of the fault may be a defective internal fuse protecting the current measuring ranges (see chapter Fuse replacement).

Note:

If you have selected the 10 A range for safety's sake, but the measuring current amounts to less than 400 mA, switch the measuring circuit back off. Plug the red measuring tip into the mA socket and select a measuring range in the mA range. Switch the measuring circuit back on.

Measuring resistance

Warning of electrical voltage
Before carrying out resistance, continuity or diode measurements, switch off the current of the electric circuit and discharge all capacitors.

1. Set the rotary switch to the resistance measuring range (*Ω/→|•))/CAP*), then use the *MODE* button to select the resistance measurement (*MΩ* indication).
2. Insert the plug of the red measuring tip into the *V/Ω* measuring socket and the plug of the black measuring tip into the *COM* measuring socket.
3. Connect the measuring tips to the measuring object. The measuring device may take some time to display a stable value. This is due to the measuring principle and not a malfunction.
   ⇨ The measured value will be indicated on the display.
4. Turn the rotary switch to the position that is closest to the indicated value but does not fall below it.

⇨ The measured value will be indicated on the display.

Note:
In case of very low resistance values (400 Ω range) the internal resistors of the measuring tips and sockets might lead to a falsified display. The resistance value displayed in case of short-circuited measuring tips will be put down in writing and later subtract from the measured value for the subsequent measurements.

Diode testing

This function permits the testing of semi-conductor paths for continuity and blocking function.

Warning of electrical voltage
Before carrying out resistance, continuity or diode measurements, switch off the current of the electric circuit and discharge all capacitors.

1. Set the rotary switch to the *Ω/→|•))/CAP* position, then use the *MODE* button to select the diode test (→|•)) indication).
2. Insert the plug of the red measuring tip into the *V/Ω* measuring socket and the plug of the black measuring tip into the *COM* measuring socket.
3. Connect the measuring tips to the diode. If the *OL* indication (exceedance of the measuring range) is displayed, swap the measuring tip connections at the diode.
   ⇨ If a value is displayed, the component is working properly. The component's forward voltage will be displayed (approx. 0.2 V for Ge diodes and approx. 0.5 V in case of Si diodes).

Measuring capacitance

Before carrying out capacitance measurements, observe the following:

- Discharge each capacitor before carrying out a measurement! Residual voltage in the capacitor can lead to a destroyed measuring device! Do not discharge the capacitor by means of a short circuit. Instead bypass the connections using a 100 kΩ resistor.
- Never connect the measuring inputs to a voltage source, since this would destroy the measuring device.
- For reasons of safety, measure whether there is a residual charge in the capacitor (using the DCV range) before you perform a capacitance measurement.

1. Set the rotary switch to the *Ω/→|•))/CAP* position, then use the *MODE* button to select the capacitance measurement (*nF* indication).
2. Insert the plug of the red measuring tip into the *V/Ω* measuring socket and the plug of the black measuring tip into the *COM* measuring socket.

3. Connect the capacitor to be tested to the measuring tips. Electrolytic capacitors must be connected with correct polarity (red to plus, black to minus).
   Since the charging processes within the capacitor require a certain amount of time, the indication will be delayed by up to 30 s. This delay is systemic, not a malfunction. Wait until the displayed value has stabilized before reading the measured value.

⇨ The measured value will be indicated on the display.

Note:

In case of a defective capacitor zero will be displayed.

Bear in mind that electrolytic capacitors can come with a substantial scattering within their tolerance range.

Residual voltages in the capacitor or damaged insulating layers / dielectrics can lead to significantly falsified results.

Measuring frequency / duty cycle

1. Set the rotary switch to the frequency measuring range (*Hz%*).
2. Insert the plug of the red measuring tip into the *V/Ω* measuring socket and the plug of the black measuring tip into the *COM* measuring socket.
3. Connect the measuring tips to the measuring object.
   ⇨ The frequency will be displayed.
4. If you want to measure a duty cycle, press the *Hz%* button.

Measuring temperature

Note

For a temperature measurement never connect the temperature sensor to a voltage source, since this would destroy the measuring device.

1. Set the rotary switch to *Temp* and, if necessary, switch between the units °C and °F using the *°C/°F* button.
2. Plug the connectors of the temperature sensor with correct polarity into the sockets *COM* (-) and *V/Ω* (+). The two sockets for current measurement (10) and (11) must not be assigned during a temperature measurement.
3. Hold the measuring tip of the temperature sensor to the measuring object and, if possible, wait for approx. 30 seconds until a stable measured value will be displayed.
4. Disconnect the temperature sensor from the measuring sockets before switching over into another measuring mode.

Maintenance and repair

Battery change

A battery change is required when the battery status indication flashes or the device can no longer be switched on (see chapter Inserting the battery).

Fuse replacement

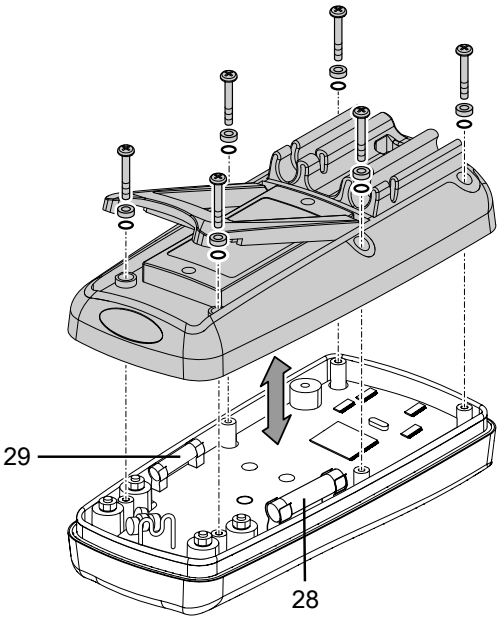
Caution

Switch the device off and remove the measuring tips from the measuring sockets before opening the device! Internal fuses may only ever be replaced with fuses of the same type, never with one of a higher amperage or with a provisional solution! Otherwise the consequences include the risk of accidents, the destruction of the device and the loss of warranty.

Note

Only replace fuses of the same type!

1. Open the housing at the rear by loosening the 6 screws.
2. Replace the defective fuse:
   - 10 A range: 10 A / 1000 V (28)
   - 400 mA range: 0.5 A / 1000 V (29)



3. Attach the cover and secure it by tightening the screws.

Cleaning

Clean the device with a soft, damp and lint-free cloth. Make sure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

Errors and faults

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

For repairs or device testing, contact the manufacturer.

Display segments are only faintly visible or flicker:

- Do not perform another measurement or stop ongoing measurements immediately!
- The battery voltage is too low. Exchange the battery immediately.

The device displays implausible measured values:

- Do not perform another measurement or stop ongoing measurements immediately!
- The battery voltage is too low. Exchange the battery immediately.

Disposal

The icon with the crossed-out waste bin on waste electrical or electronic equipment stipulates that this equipment must not be disposed of with the household waste at the end of its life. You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. For further return options provided by us please refer to our website www.trotec24.com.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.

In the European Union, batteries and accumulators must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators. Please dispose of batteries and accumulators according to the relevant legal requirements.

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