

**EN**

**INSTRUCTIONS**  
PYROMETER



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## Information on the use of these instructions

### Symbols



#### Warning of electrical voltage

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



#### Warning of laser radiation

This symbol indicates dangers to the health of persons due to laser radiation.



#### 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.

#### Notice

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 instructions must be observed.

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



TP10



<https://hub.trotec.com/?id=40356>

## 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.**

- Do not use the device in potentially explosive rooms or areas and do not install it there.
- Do not use the device in an aggressive atmosphere.
- Do not immerse the device in water. Do not allow liquids to penetrate into the device.
- The device may only be used in dry surroundings and must not be used in the rain or at a relative humidity exceeding the operating conditions.
- Protect the device from permanent direct sunlight.
- Do not expose the device to strong vibrations.
- Do not open the device.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Avoid looking directly into the laser beam.
- Never point the laser beam at people or animals.
- Use batteries of type 6LR61 (9 V battery).
- Never charge batteries that cannot be recharged.
- Different types of batteries and new and used batteries must not be used together.
- Insert the batteries into the battery compartment according to the correct polarity.
- Remove discharged batteries. Batteries contain materials hazardous to the environment. Dispose of the batteries according to the national regulations.
- Remove the batteries from the device if you will not be using the device for a longer period of time.

- Never short-circuit the terminals of batteries!
- Do not swallow batteries! If a battery is swallowed, it can cause severe internal burns within 2 hours! These burns can lead to death!
- If you think batteries might have been swallowed or otherwise entered the body, seek medical attention immediately!
- Keep new and used batteries and an open battery compartment away from children.
- Observe the storage and operating conditions (see Technical data).

### Intended use

This device is exclusively intended for measuring temperature by means of an infrared sensor in the measuring range specified in the technical data.

Any use other than the intended use is regarded as misuse.

### Reasonably foreseeable misuse

The device must not be pointed at people or animals. Do not use the device in potentially explosive atmospheres, for measurements in liquids or at live parts. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

### Personnel qualification

People who use this device must:

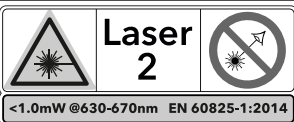
- be aware of the dangers that occur when working with laser measuring devices.
- have read and understood the instructions, especially the Safety chapter.

### Safety signs and labels on the device

#### Notice

Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.

The following safety signs and labels are attached to the device:

Warning sign	
Meaning	<p>The warning sign is located on the back of the device and indicates that the device is equipped with a class 2 laser.</p> <p>The power is less than 1.0 mW. The frequency range of the laser is 630 to 670 nm.</p> <p><b>Do not look directly into the laser beam or the opening from which the laser beam emerges!</b></p>

### Residual risks



#### 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 of laser radiation

**Laser class 2, P max.: < 1 mW, λ: 400-700 nm, EN 60825-1:2014**

Do not look directly into the laser beam or the opening from which it emerges.

Never point the laser beam at people, animals or reflective surfaces. Even brief eye contact can lead to eye damage.

Examining the laser output aperture by use of optical instruments (e.g. magnifying glass, magnifiers and the like) entails the risk of eye damage.

When working with a laser of class 2, observe the national regulations on wearing eye protection.



#### 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.

#### Notice

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

#### Notice

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

## Information about the device

### Device description

The pyrometer TP10 uses an infrared sensor to measure surface temperatures without contact. An integrated multi-laser pointer serves for the determination of the measuring spot.

You can set the emissivity of the material to be measured so as to achieve a more precise measurement result.

For the temperature measurement the device allows you to set freely definable thresholds. Exceeding or falling below these preselected thresholds is indicated by an acoustic alarm function and visually by a changed display colour.

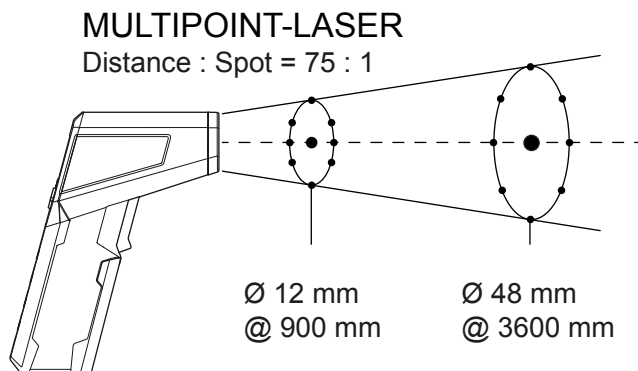
The display can be illuminated as needed. When not in use, an automatic switch-off saves the battery.

### Measuring principle

The device measures the temperature by means of an infrared sensor. Important factors playing a role in the temperature measurement are the measuring spot diameter and the emissivity.

### Measuring spot

Observe the distance to measuring spot diameter ratio. The larger the distance to the object, the larger the measuring spot diameter and hence, the less precise the measured result. The device calculates an average temperature from all the temperatures in the measuring spot.



### Emissivity

Emissivity is a value used to describe the energy radiation characteristics of a material.

Most organic materials have an emissivity of 0.95. Metals or shiny materials come with a much lower value.

A material's emissivity depends on various factors, e.g. on

- Material composition
- Surface condition
- Temperature

The emissivity can range between 0.1 and 1 (in theory).

The following rule of thumb can be assumed:

- When a material is rather dark and its surface texture matt, it probably has a high emissivity.
- The brighter and smoother the surface of a material, the lower will be its emissivity, presumably.
- The higher the emissivity of the surface to be measured, the better it is suited for non-contact temperature measurement by use of a pyrometer or thermal imaging camera, since falsifying temperature reflections become negligible.

Nevertheless, entering an emissivity as appropriate as possible is indispensable for a precise measurement.

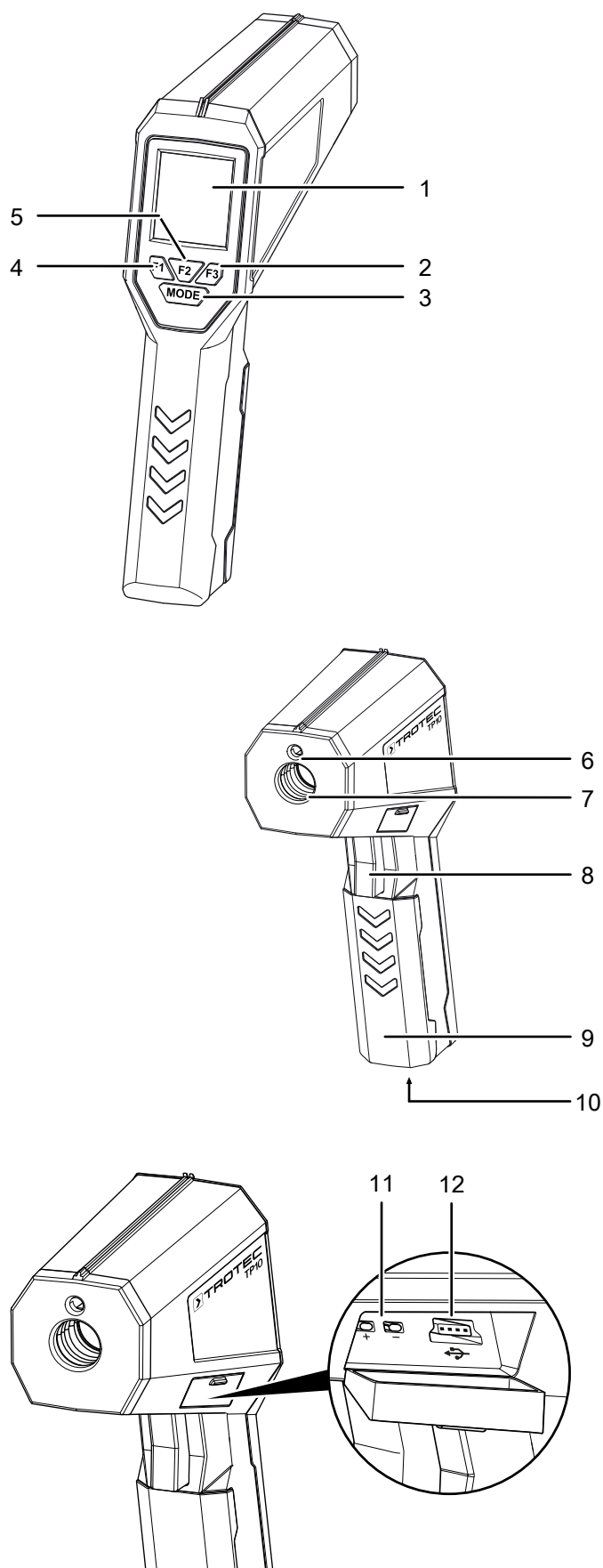
## Emissivity table

The table below may be used as reference for setting the emissivity. It supplies reference values for the emissivity of common materials.

Material	Emissivity
Aluminium, roughened	0.1 to 0.3
Aluminium, alloy A3003, oxidized	0.3
Aluminium, oxidized	0.2 to 0.4
Asbestos	0.92 to 0.95
Tarmac	0.92 to 0.95
Basalt	0.7
Concrete	0.92 to 0.95
Bitumen	0.98 to 1.00
Lead, oxidized	0.2 to 0.6
Lead, rough	0.4
Roofing felt	0.95
Ice	0.98
Iron (forged), blunt	0.9
Iron, oxidized	0.5 to 0.9
Iron, rusted	0.5 to 0.7
Enamel varnish, black	0.95
Earth	0.92 to 0.96
Paint (not alkaline)	0.90 to 0.95
Paint (non-metal)	0.95
Gypsum	0.60 to 0.95
Glass, pane	0.85 to 0.95
Rubber	0.92 to 0.95
Cast iron, molten	0.2 to 0.3
Cast iron, not oxidized	0.2
Skin	0.98
Haynes alloy	0.3 to 0.8
Radiator enamel	0.95
Timber (natural)	0.90 to 0.95
Inconel, electro-polished	0.15
Inconel, oxidized	0.70 to 0.95
Inconel, sand-blasted	0.3 to 0.6
Limestone	0.95 to 0.98
Carborundum	0.9
Ceramics	0.88 to 0.95
Gravel	0.95
Carbon, graphite	0.70 to 0.85
Carbon, not oxidized	0.8 to 0.9

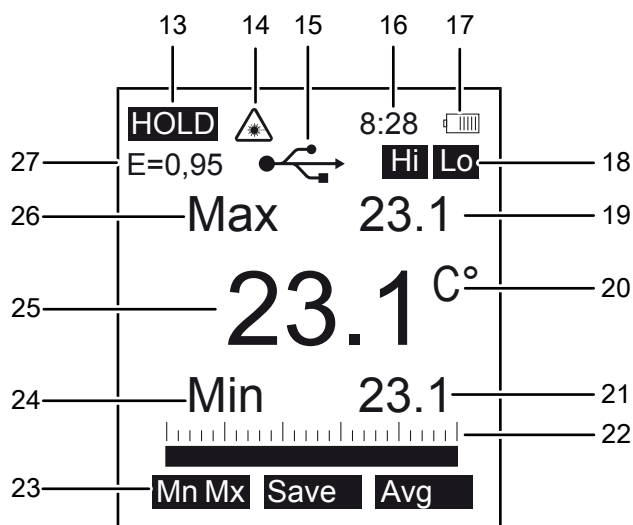
Material	Emissivity
Plastic, non-transparent	0.95
Copper, oxidized	0.4 to 0.8
Varnish	0.80 to 0.95
Marble	0.90 to 0.95
Brass, highly polished	0.3
Brass, oxidized	0.5
Molybdenum, oxidized	0.2 to 0.6
Nickel, oxidized	0.2 to 0.5
Plastic	0.85 to 0.95
Plaster	0.90 to 0.95
Sand	0.9
Snow	0.9
Steel, heavy plate	0.4 to 0.6
Steel, cold-rolled	0.7 to 0.9
Steel, oxidized	0.7 to 0.9
Steel, polished sheet metal	0.1
Steel, stainless	0.1 to 0.8
Cloth	0.95
Wallpaper (non-metal)	0.95
Textiles (non-metal)	0.95
Titanium, oxidized	0.5 to 0.6
Clay	0.90 to 0.95
Water	0.93
Cement	0.90 to 0.96
Brick (rough)	0.90 to 0.95
Zinc, oxidized	0.1

## Device depiction



No.	Designation	Function
1	Display	Measurement value and status displays
2	F3 button	- Execute right menu option - Navigate through lists - Set values
3	Mode button	- Rotate menu options - Close menu
4	F1 button	- Execute left menu option - Navigate through lists - Set values
5	F2 button	- Execute middle menu option - Confirm settings
6	Laser pointer	Marking the measuring point
7	Infrared sensor	Temperature sensor
8	Measurement button	Carrying out measurements
9	Battery compartment	Battery connection
10	Tripod thread	For mounting a tripod
11	Type K connection	Connection for thermal elements
12	Mini USB port	Connection to PC

## Display



No.	Indication	Meaning
13	SCAN/HOLD	- SCAN: Measurement in progress. - HOLD: Measurement completed.
14	Laser	Laser pointer active.
15	USB	USB connection established.
16	Time	Current time
17	Battery status	Battery charge level
18	Saving/Hi/Lo	- Saving: Measured value is saved. - Hi: Upper alarm threshold set. - Lo: Lower alarm threshold set.
19	Upper measured value	Maximum or average value
20	Temperature unit	Unit of the displayed temperature
21	Lower measured value	Minimum value or difference of measured value from average value
22	Scale	Deviation of measured value from minimum value
23	Menu	Configurable, three-part menu
24	Min/Dif	Type of measured value displayed in (20)
25	Measured value	Current or last measured temperature value
26	Max/Avg	Type of measured value displayed in (18)
27	Emissivity	Preset emissivity

## Technical data

Parameter	Value	
Model	TP10	
Weight	300 g	
Dimensions (length x width x height)	168 mm x 56 mm x 225 mm	
Measuring range	-50°C to 1850°C (-58°F to 2912°F)	
Resolution	≤ 1000 °C > 1000 °C	0.1 °C / °F 1 °C / °F
Target display	Laser class II, 630 to 670 nm < 1 mW	
Accuracy	-50 °C to 20 °C (-58 °F to 68 °F)	± 3.0 °C (± 5.4 °F)
	21 °C to 500 °C (69 °F to 932 °F)	± 1 % ± 1 °C (1.8 °F)
	501 °C to 1000 °C (933 °F to 1832 °F)	± 1.5 %
	1001 °C to 1850 °C (1833 °F to 3362 °F)	± 2.0 %
Repeatability	-50 °C to 20 °C (-58 °F to 68 °F)	± 1.5 °C (2.7 °F)
	21 °C to 1000 °C (69 °F to 1832 °F)	± 0.5 %, ± 0.5 °C (0.9 °F)
	1001 °C to 1850 °C (1833 °F to 3362 °F)	± 1 %
Emissivity	adjustable from 0.10 to 1.0	
Optical resolution	75:1 (D:S)	
Smallest measuring spot	ø 18 mm	
Spectral sensitivity	8~14 µm	
Response time	< 150 ms	
Operating temperature	0 °C to 50 °C (32 °F to 122 °F), 10 % to 90 % RH	
Storage conditions	-10 °C to 60 °C, < 80 % RH	
Power supply	9 V battery	
Switch-off	After approx. 7 seconds of non-use	
Type K contact sensor		
Temperature range	-50 °C to 300 °C (-58 °F to 572 °F)	
Resolution	0.1 °C / °F	
Accuracy	± 1.5 %, ± 3 °C (5 °F)	
Repeatability	± 1.5 %	
Operating conditions	0 °C to 50 °C (32 °F to 122 °F), 10 to 90 % RH	
Storage conditions	-10 °C to 60 °C (-2 °F to 140 °F), < 80 % RH	



**Note:**

Apart from the contact sensor included in the scope of delivery, other type K temperature probes with miniature contact pin can also be connected to the device. The pyrometer can process and display the measurement data of the external sensor in a measuring range from -50 °C to 1,370 °C.

**Scope of delivery**

- 1 x Pyrometer TP10
- 1 x Device bag
- 1 x CD with software
- 1 x Type K contact sensor
- 1 x USB cable
- 1 x Mini tripod
- 1 x Quick guide

**Transport and storage**

**Notice**

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:

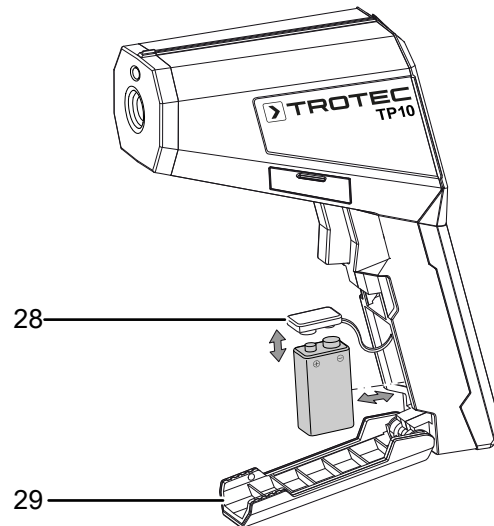
- dry and protected from frost and heat
- protected from dust and direct sunlight
- protected from dust ingress in the supplied bag
- at the temperature specified in the technical data
- battery is removed from the device

**Operation**

**Inserting the battery**

**Notice**

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



1. Open the battery compartment by folding open the cover (29) with your fingers.
2. Use the battery clip (28) to connect the new battery (1 x 9 V) with correct polarity.
3. Insert the battery in the battery compartment.
4. Close the cover of the battery compartment (29).

**Carrying out a measurement**



**Info**

Please note that moving from a cold area to a warm area can lead to condensation forming on the device's circuit board. This physical and unavoidable effect can falsify the measurement. In this case, the display shows either no measured values or they are incorrect. Wait a few minutes until the device has become adjusted to the changed conditions before carrying out a measurement.

- Ensure that the surface to be measured is free of dust, dirt or similar substances.
- To be able to gain exact measurement results on surfaces which reflect heavily, stick matt masking tape to the surface or apply matt black paint with a very high and known emissivity.
- Note the 75:1 ratio of the distance to the measuring spot diameter. For accurate measurements the measuring object should be at least twice as large as the measuring spot.



Please proceed as follows to carry out a measurement:

1. Point the device at the object to be measured.
2. Press the measurement button (8). Hold the measurement button (8) if you want to perform a prolonged measurement.
  - ⇒ The device turns on and carries out a measurement.
  - ⇒ The *SCAN* indication (13) appears on the display. The currently measured value is indicated.
3. Release the measurement button (8).
  - ⇒ The device stops measuring. The *HOLD* symbol (13) appears in the display.
  - ⇒ Depending on the setting of the device, either the Max/Min value or the Avg/Dif value of the last measurement will be displayed.

## Menu

The bottom line of the display contains a three-part menu, which can be customized. You can switch through the different menu combinations using the *Mode* button (3).


Menu example:

<i>MxMn</i>	<i>Save</i>	<i>Avg</i>
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The menu is controlled as follows:

- Use the *F1* button (4) to select the function on the left, *MxMn* in our example.
- Use the *F2* button (5) to select the function in the centre, *Save* in our example.
- Use the *F3* button (2) to select the function on the right, *Avg* in our example.

The following menu options are available:

Option	Meaning
<i>MxMn</i>	Minimum/maximum value
<i>Save</i>	Save measured value
<i>Avg</i>	Average value
<i>Unit</i>	Unit
<i>Mem</i>	Memory function
<i>ε</i>	Emissivity
	Continuous measurement
<i>Lit</i>	Display illumination
<i>Laser</i>	Laser pointer
<i>Hi</i>	Upper alarm threshold
<i>Set</i>	Settings
<i>Lo</i>	Lower alarm threshold

## Setting the Max/Min function

This function allows you to display the highest and lowest value since the last switch-on. To do so, proceed as follows:

1. Select the *MxMn* function from the menu.
  - ⇒ The maximum value is displayed in the *Upper measured value* indication (19).
  - ⇒ The minimum value is displayed in the *Lower measured value* indication (21).
  - ⇒ The discrepancy between the current measured value and the minimum value is indicated as deflection on the scale (22).

## Setting the Avg/Dif function

This function allows you to display the average value since the last switch-on and the difference from the current measured value. To do so, proceed as follows:

1. Select the *Avg* function from the menu.
  - ⇒ The average value is displayed in the *Upper measured value* indication (19).
  - ⇒ The difference between the current measured value and the average value is displayed in the *Lower measured value* indication (21).
  - ⇒ The difference between the current measured value and the average value is indicated on the scale (22).

Please bear in mind that the average value is continually determined anew during a measurement, which means that there can be deviations of the displayed *Dif* value in the range of hundredths of a °C.

## Using the save function

You can also save up to 30 measured values. To do so, proceed as follows:

1. Select the *Save* function from the menu.
  - ⇒ The *Yes* and *Esc* menus are shown on the display.
2. Press the *F1* button (4, *Yes*) to save the measured value.
  - ⇒ It takes a short moment until the measured value will be saved. The *Saving* indication (18) lights up on the display. After that the last measured value will be displayed again.
3. Press the *F3* button (2, *Esc*) to cancel the operation.
  - ⇒ The last measurement will be displayed.

## Using the memory function

Using the memory function you can call up values previously saved with the save function. To do so, proceed as follows:

1. Select the *Mem* function from the menu.
  - ⇒ The last saved value appears on the display.
  - ⇒ The ▼ *Set* ▲ menu will be displayed.
2. Use the *F3* (2) and *F1* (4) buttons to navigate through the saved values.
3. Press the *F2* button (5) to select *Del*.
  - ⇒ The *Yes All Esc* menu is displayed.
4. If you want to delete a measured value (*Yes*), press the *F1* button (4).
  - ⇒ The currently displayed measured value will be deleted.

5. If you want to delete all measured values (*All*), press the *F2* button (5).  
⇒ All saved measured values will be deleted.
6. If you want to cancel the operation (*Esc*), press the *F3* button (2).  
⇒ The ▼ *Del* ▲ menu is shown on the display.
7. Press the *Mode* button (3) to return to the measurement value display.

### Setting the temperature unit

You can change the temperature unit. To do so, proceed as follows:

1. Select the *Unit* function from the menu.  
⇒ The *Unit* °C °F menu is shown on the display.
2. Press the *F2* button (5) for °C or the *F3* button (2) for °F.
3. Press the *Mode* button (3) to return to the measurement value display.

### Setting the emissivity

You can adjust the emissivity to obtain more accurate measurement results for different surfaces. To do so, please proceed as follows:

1. Select the *ε* function from the menu.  
⇒ The last saved value for the emissivity appears on the display.  
⇒ The ▼ *Tab* ▲ menu will be displayed.
2. Either press the *F3* button (2) or the *F1* button (4) to change the emissivity.  
⇒ The value range is between 0.10 and 1.00.  
⇒ The selected setting will be saved automatically.
3. Press the *F2* button (5) to select a specific emissivity.  
⇒ The ▼ *Tab* ▲ menu will be displayed.  
⇒ A list with different emissivities will be displayed:

Surface	Emissivity
Default	0.95
Ox Aluminium	0.30
Ox Brass	0.50
Ox Copper	0.60
Paint	0.93

4. Either press the *F3* button (2) or the *F1* button (4) to select a specific emissivity.
5. Confirm your selection with the *F2* button (5).  
⇒ The new emissivity is set.
6. Press the *Mode* button (3) to return to the measurement value display.



#### Info

A set specific emissivity will not be stored in the device after it has been switched off. When being switched on again, the device will always return to the emissivity previously set by hand.

### Activating/deactivating continuous measurements

Once the function is activated, the measurement will continue until the function is terminated again. Within this time frame settings can only be made in the following menu:

☐	<i>Lit</i>	<i>Laser</i>
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1. Select the ☐ function from the menu.  
⇒ Continuous measurement is activated.  
⇒ The ☐ *On* ▲ menu will be displayed.
2. Press the *F1* button (4).  
⇒ Continuous measurement is deactivated.  
⇒ The ☐ *Lit Laser* menu is displayed.

### Adjusting the display illumination

Ex works the display illumination is switched off. There are two ways to adjust the display illumination.

*Option 1: Via the menu.*

1. Repeatedly press the *Mode* button (3) until the ☐ *Lit Laser* menu is displayed.
2. Repeatedly press the *F2* button (5) until the display is illuminated as desired.

*Option 2: Via the additional settings.*

1. Select the *Set* function from the menu.  
⇒ The ▼ *Set* ▲ menu will be displayed.
2. Either press the *F3* button (2) or the *F1* button (4) to select the *Backlight* option.
3. Confirm your selection with the *F2* button (5).
4. Press the *Mode* button (3) to return to the measurement value display.



#### Info

The selected setting will be saved when the device is switched off.

## Switching the laser pointer on or off



### Warning of laser radiation

Class 2 laser radiation.

Lasers of class 2 only radiate in the visible range and during continuous wave operation (lasting beam) no more than 1 milliwatt (mW) of output will be emitted. Looking directly into the laser beam for a longer period of time (more than 0.25 seconds) can cause damage to the retina.

Avoid looking directly into the laser beam. Never look into the laser beam using optical aides. Do not suppress the winking reflex when looking into the laser beam unintentionally. Never point the laser beam at people or animals.



### Info

Please note that when the laser is switched on, the laser pointer will light up as soon as you press the measurement button (8) or activate continuous measurement.

Ex works the laser pointer is switched off.

1. Select the *Laser* function from the menu.
  - ⇒ The *Laser* indication (14) appears on the display.
  - ⇒ The laser pointer is active and will switch on when starting with the next measurement.
2. Press the *F3* button (2) again.
  - ⇒ The *Laser* indication (14) disappears.
  - ⇒ The laser pointer is switched off.



### Info

The selected setting will be saved when the device is switched off.

## Setting the alarm

The device is equipped with an alarm function for which an upper and a lower alarm threshold can be specified. When exceeding or falling below these values, an acoustic signal will be emitted. Additionally, the display lights up in one of the following colours:

Display colour	Meaning
Flashing in red	Surface temperature exceeds activated upper threshold. The display flashes red and a constant alarm tone is emitted. Also works when the display illumination is deactivated.
Flashing in blue	Surface temperature below activated lower threshold. The display flashes blue and a constant alarm tone is emitted. Also works when the display illumination is deactivated.
Continuously illuminated in green	Surface temperature is in normal range. The display will only be illuminated in green if the display illumination is activated.

## Setting the lower alarm threshold

1. Select the *Lo* function from the menu to set the lower alarm threshold.
  - ⇒ The ▼ *On* ▲ menu will be displayed.
  - ⇒ The current value for the lower alarm threshold appears on the display.
2. Press the *F2* button (5) to enable (*On*) or disable (*Off*) the lower alarm threshold.
  - ⇒ With enabled lower alarm threshold the indication *Lo* (18) will be displayed.
3. Either press the *F3* button (2) or the *F1* button (4) to set the value.
  - ⇒ For larger temperature changes hold onto these buttons, as needed.
4. Press the *Mode* button (3) to return to the measurement value display.
  - ⇒ The setting for the lower alarm threshold is saved.

## Setting the upper alarm threshold

1. Select the *Hi* function from the menu to set the upper alarm threshold.
  - ⇒ The ▼ *On* ▲ menu will be displayed.
  - ⇒ The current value for the upper alarm threshold appears on the display.
2. Press the *F2* button (5) to enable (*On*) or disable (*Off*) the upper alarm threshold.
  - ⇒ With enabled upper alarm threshold the indication *Hi* (18) will be displayed.
3. Either press the *F3* button (2) or the *F1* button (4) to set the value.
  - ⇒ For larger temperature changes hold onto these buttons, as needed.
4. Press the *Mode* button (3) to return to the measurement value display.
  - ⇒ The setting for the upper alarm threshold is saved.



### Info

The selected setting will be saved when the device is switched off.

## Further setting options

In the submenu *Set* you can make further settings for the device.

1. Select the *Set* function from the menu.
  - ⇒ The ▼ *Set* ▲ menu will be displayed.
  - ⇒ The following list of setting options will be displayed:

Option	Setting options
Time	Setting the time
Date	Setting the date
Backlight	Setting the display illumination: 7 brightness levels
Buzzer	Setting the touch tone and alarm sound
Contrast	Setting the display contrast: 30 – 99 digits
APO Time	Setting the automatic switch-off function: 7 – 60 seconds
Send Data	De-/activating and setting the USB function

2. Use the *F3* button (2) or the *F1* button (4) to select the desired setting option.
3. Confirm your selection with the *F3* button (5).
4. Use the *F3* button (2) or the *F1* button (4) to select the desired setting.
5. Press the *Mode* button (3) to confirm your selection.
  - ⇒ The desired settings are saved.

## USB connection

Via the USB port (12) you can connect the device to a PC. While connected, the device will be supplied with power via the PC. Consequently, the device can be operated without battery for the duration of the connection.

1. Open the lateral sealing cap of the device.
2. Attach the USB cable to the USB port (12) of the device.
3. Connect the USB cable to a PC.
  - ⇒ Wait for a few seconds until the connection is established.

## De-/activating the USB function



### Info

Activating the USB function is not required, if you only want to use the USB port for the sake of ensuring the power supply for the measuring device. The USB function is only required for the software-supported recording of measurement series in real time.

1. Select the *Set* function from the menu.
  - ⇒ The ▼ *Set* ▲ menu will be displayed.
2. Select *Send Data* and press the *F2* button (5).
  - ⇒ You can now choose between *Real Time* and *Memory*.
3. Select *Real Time*, if you want to activate the USB function.
4. Press the *F2* button (5) to switch between *On* (enable) and *Off* (disable).
5. Press the *Mode* button (3) to confirm your selection.
6. If you want to transfer the measured values saved in the device to the PC, select *Memory* and confirm with *OK*.
  - ⇒ USB mode will then be active for the transmission period and will be deactivated again afterwards.

## Using the software for recording measurement series



### Info

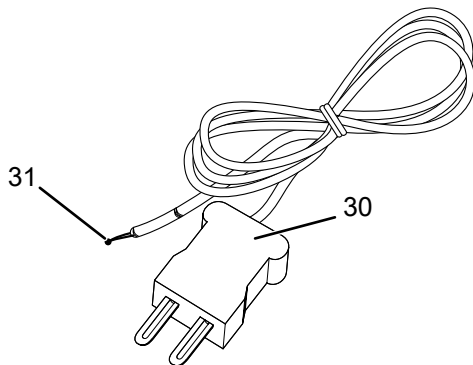
The supplied software is a complimentary bonus that does not belong to the standard scope of delivery and is offered for use without support or warranty. The program interface (only available in the English language) is generally easily comprehensible and can be used intuitively. Further information regarding the use is provided in the application.

- Make sure the device is connected to a PC via USB cable.
- Make sure that the software for recording measurement series required for USB operation is installed on the PC.
- Make sure that the USB function is activated.

During the entire measuring procedure, both the temperature values of the infrared sensor and those of the external type K sensor (if connected) will be transmitted to the software and recorded.

### Using external sensors (contact sensor type K)

In addition to the non-contact temperature measurement, the measuring device can be used for contact measurements using an external type K contact sensor.



1. Open the lateral sealing cap of the device.
2. Connect the plug (30) of the contact sensor to the type K connection (11) of the device with correct polarity.  
⇒ It takes a few seconds until the sensor is detected.
3. Carefully hold the sensor tip (31) against the object to be measured.  
⇒ During the measurement the contact sensor's measured value is indicated in the lower measurement value display (21).

### Switching the device off

The device switches off automatically after the set time of non-use has elapsed. The default setting for automatic switch-off is 7 seconds.

## Maintenance and repair

### Battery change

The battery must be replaced when the *Battery status* indication (17) flashes in the display or the device can no longer be switched on. See chapter Operation.

### 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.

### Display segments are only faintly visible or flicker:

- Check the charging status of the battery. Change the battery, if required (see chapter Inserting the battery).
- Make sure that the battery is properly positioned. Check the polarity is correct.

### The device displays implausible measured values:

- Check the charging status of the battery. Change the battery, if required (see chapter Inserting the battery).
- Make sure that the battery is properly positioned. Check the polarity is correct.
- The sensor is defective or soiled. Clean the device as described in the Cleaning chapter.

## Disposal

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.



The icon with the crossed-out wheeled bin indicates that this device and any associated components (e.g. remote controls) must not be disposed of with household waste at the end of their life, in accordance with the Waste Electrical and Electronic Equipment Directive (2012/19/EU) and national laws.

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. You can also find out about other return options that apply for many EU countries on the website <https://hub.trotec.com/?id=45090>. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

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.



This icon with the crossed-out wheeled bin indicates that batteries or accumulators must not be disposed of with household waste at the end of their life. If the device contains batteries or accumulators that contain mercury, cadmium or lead, the respective chemical symbol (Hg, Cd or Pb) is shown below the icon of the crossed-out wheeled bin. To prevent environmental pollution, do not carelessly leave batteries or electrical and electronic equipment containing batteries in public areas. In the European Union, batteries and accumulators must be returned to a designated collection point in accordance with REGULATION (EU) 2023/1542 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 July 2023 concerning batteries and waste batteries. Remove batteries/accumulators and dispose of them separately according to the relevant legal requirements.

### Only for United Kingdom

According to Waste Electrical and Electronic Equipment Regulations 2013 (SI 2013/3113) (as amended) and the Waste Batteries and Accumulators Regulations 2009 (SI 2009/890) (as amended), devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.

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