

EN

INSTRUCTIONS
THERMOHYGROMETER



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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**
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:



BC25



<https://hub.trotec.com/?id=39585>

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.
 - Use the CR2032 button battery type.
 - 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 supply terminal in the battery compartment!

- 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

Only use the device for measuring the temperature and humidity level in indoor areas or, in the case of small or negligible amounts of sunlight, in outdoor areas within the measuring range specified in the technical data. Observe and comply with the technical data.

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

Reasonably foreseeable misuse

Do not use the device in potentially explosive atmospheres, for measurements in liquids or at live parts.

Any unauthorised changes, modifications or alterations to the device are forbidden.

Personnel qualification

People who use this device must:

- have read and understood the instructions, especially the Safety chapter.

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

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 thermohygrometer BC25 can be used to determine the air, dew point and wet-bulb temperature as well as the humidity level of indoor areas.

For assessing the measurements, a Max/Min function (maximum and minimum value), an average value and a Hold function for freezing the currently measured value are also available.

Moreover, the heat index (HI) and apparent temperature (WBGT index) can be determined. A configurable alarm function issues a warning as soon as a certain value is exceeded.

When not in use, an automatic switch-off saves the battery.

Heat index

The heat index, also referred to as humidex, is an indicator developed in the 1970s by the American Steadman. It describes the combined effect of temperature and (high) humidity levels on the human body.

The higher the relative humidity, the worse or slower does the moisture (perspiration) emitted by the human body evaporate as the ambient air can only absorb little additional moisture.

This evaporation, however, is necessary for the human organism to be able to regulate itself in case of strong heat or physical exertion and to keep the core body temperature on a healthy level. If this natural cooling mechanism is slowed down, the body can no longer discharge the generated heat properly, which results in so-called heat stress. Overheating or heat strokes can be among the health consequences.

Even without any physical effort, high temperatures combined with high humidity levels (muggy heat) are therefore generally considered as unpleasant, while high temperatures and low humidity values are more tolerable.

Sweating and the associated cooling effect are thus vitally important for both humans and many mammals, and are indispensable for the physical well-being.

Wet-bulb globe temperature index (WBGT index)

The wet-bulb globe temperature index is a climate index developed by the US army as early as in the 1950s. It serves to specify the effects of the current climate on the human body.

Unlike the heat index, the WBGT does not only incorporate the air temperature (dry-bulb temperature) and humidity level, but also the wind speed, the wet-bulb and radiation temperature (globe temperature) for assessing the outdoor thermal stress.

The wet-bulb temperature (WB temperature) is the lowest temperature that can be reached through direct evaporative cooling only (also known as theoretical limit of cooling). It is determined by wrapping a cotton cloth soaked with distilled water around the measuring tip or mercury bulb of a thermometer and then exposing it to the environment. The cooling effect achieved by the evaporated water can thus be measured and simulated for the perspiring human body under these conditions.

The radiation temperature, which is also taken into consideration, is measured inside a thin-walled matt black globe reacting to the infrared heat radiation emitted by the sun.

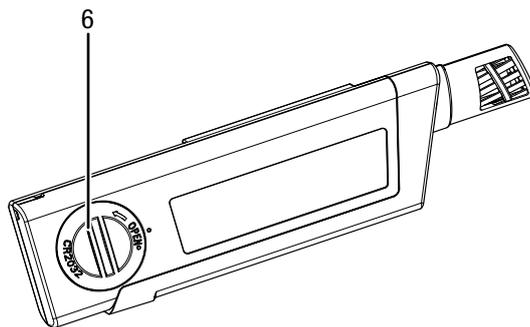
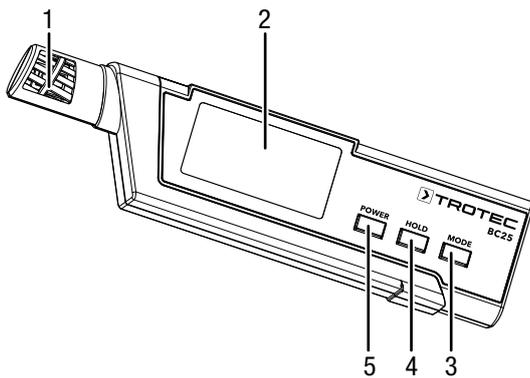
When calculating the WBGT in indoor areas or outdoor areas exposed to negligible amounts of sunlight, it can be assumed that the radiation temperature has practically no influence. In this case, the globe temperature is assumed to be identical with the ambient temperature.

Therefore, the WBGT index is another indicator for determining the climate effects on the human organism. It is, however, even more informative than the heat index since additional parameters are included in the calculation. Established as an international standard, it is described in ISO 7243 and DIN EN 27243.

Dew point temperature

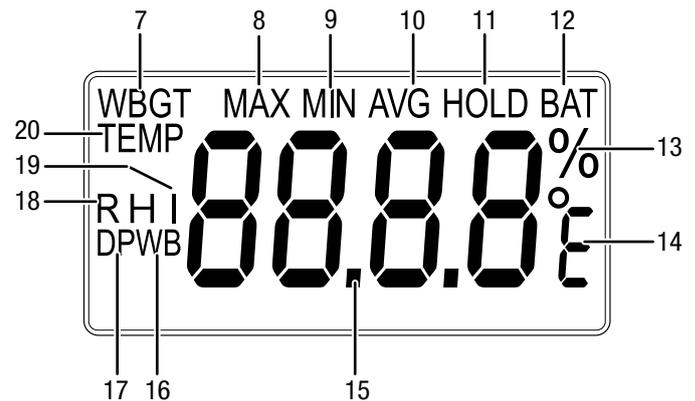
The dew point temperature is the temperature at which the moisture contained in the air reaches 100 % RH and condenses. Both values are influenced by the initial values of air temperature, relative humidity and air pressure.

Device depiction



No.	Designation	Function
1	Measuring sensor	Recording the measured values
2	Display	Measurement value display
3	Mode button	Changing the measuring mode Configuring functions
4	HOLD button	hold measured value
5	Power button	Switching the device on and off Configuring functions
6	Battery compartment with cover	Space for 1 x CR2032 battery

Display



No.	Indication	Function
7	<i>WBGT</i>	Device switched on: <i>WBGT</i> (wet-bulb globe temperature index) measuring mode active Device switched off: Configuring the alarm for the <i>WBGT</i> index
8	<i>MAX</i>	The highest measured value since switch-on in active measuring mode is displayed
9	<i>MIN</i>	The lowest measured value since switch-on in active measuring mode is displayed
10	<i>AVG</i>	The average measured value since switch-on in active measuring mode is displayed
11	<i>HOLD</i>	Current measured value is being held
12	<i>Battery status</i>	Flashes: Low battery status
13	<i>Per cent</i>	<i>RH</i> measuring mode: The measured value indicates the humidity in per cent
14	<i>Temperature unit</i>	<i>TEMP</i> , <i>DP</i> , <i>WB</i> , <i>WBGT</i> measuring mode: Measured temperature value is displayed in °C or °F
15	Measurement value display	Current measured value
16	<i>WB</i>	<i>WB</i> (wet-bulb temperature) measuring mode active
17	<i>DP</i>	<i>DP</i> (dew point temperature) measuring mode active
18	<i>RH</i>	<i>RH</i> (relative humidity) measuring mode active
19	<i>HI</i>	<i>HI</i> (heat index) measuring mode active
20	<i>TEMP</i>	<i>TEMP</i> (ambient temperature) measuring mode active

Technical data

Parameter	Value
Model	BC25
Article number	3.510.205.008
Weight	52 g
Dimensions (length x width x height)	142 mm x 20 mm x 36 mm
Temperature	
Measuring range	-20 °C to +50 °C or -4 °F to 122 °F
Accuracy	±0.6 °C (-20 °C to +50 °C)
Measuring range resolution	0.1 °C or 0.1 °F
Relative humidity	
Measuring range	0.0 % RH to 99.9 % RH
Accuracy	± 3 % RH (10 % to 90 %) ± 5 % RH (0 % to 10 % and 90 % to 99.9 %)
Measuring range resolution	0.1 % RH
Reaction time	<15 seconds
Type of protection	IP57
Operating conditions	-20 °C to 50 °C, <80 % RH (non-condensing)
Storage conditions	-10 °C to 50 °C, <80 % RH (non-condensing)
Automatic switch-off	after approx. 15 minutes
Power supply	1 x CR2032 battery

Scope of delivery

- 1 x Thermohygrometer BC25
- 1 x Quick guide

WBGT index

In the course of sports events, for instance, both the WBGT and the heat index (HI) are increasingly used as an indication for potential physical strain and associated hazards.

Colour of warning flag	Risk	Effect	WBGT °C	WBGT °F
Black	Extreme	Overheating	above 28 °C	above 82 °F
Red	High		23 °C to 28 °C	73 °F to 82 °F
Yellow	Moderate		18 °C to 22 °C	65 °F to 72 °F
Green	Low		below 18 °C	below 65 °F
White	Increasing	Supercooling	below 10 °C	below 50 °F

Source: American College of Sports Medicine



Info

The index is only intended to provide a basis of information. Personal perceptions and heat-related effects may differ.

Heat index (HI)

	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
42°	48	50	52	55	57	59	62	64	66	68	71	73	75	77	80	82
41°	46	48	51	53	55	57	59	61	64	66	68	70	72	74	76	79
40°	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75
39°	43	45	47	49	51	53	55	57	59	61	63	65	66	68	70	72
38°	42	44	45	47	49	51	53	55	56	58	60	62	64	66	67	69
37°	40	42	44	45	47	49	51	52	54	56	58	59	61	63	65	66
36°	39	40	42	44	45	47	49	50	52	54	55	57	59	60	62	63
35°	37	39	40	42	44	45	47	48	50	51	53	54	56	58	59	61
34°	36	37	39	40	42	43	45	46	48	49	51	52	54	55	57	58
33°	34	36	37	39	40	41	43	44	46	47	48	50	51	53	54	55
32°	33	34	36	37	38	40	41	42	44	45	46	48	49	50	52	53
31°	32	33	34	35	37	38	39	40	42	43	44	45	47	48	49	50
30°	30	32	33	34	35	36	37	39	40	41	42	43	45	46	47	48
29°	29	30	31	32	33	35	36	37	38	39	40	41	42	43	45	46
28°	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
27°	27	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
26°	26	26	27	28	29	30	31	32	33	34	34	35	36	37	38	39
25°	25	25	26	27	27	28	29	30	31	32	33	34	34	35	36	37
24°	24	24	24	25	26	27	28	28	29	30	31	32	33	33	34	35
23°	23	23	23	24	25	25	26	27	28	28	29	30	31	32	32	33
22°	22	22	22	22	23	24	25	25	26	27	27	28	29	30	30	31

up to 29 °C	No discomfort
30 °C to 34 °C	Slight discomfort
35 °C to 39 °C	Caution: Limit intensive physical activity
40 °C to 45 °C	Warning: Avoid physical activity
46 °C to 53 °C	Danger: Overheating, stop all activities
above 54 °C	Danger: Potentially fatal heat stroke
Source: www.eurometeo.com	



Info

The index is only intended to provide a basis of information. Personal perceptions and heat-related effects may differ.

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

When transporting the device, ensure dry conditions and protect the device from external influences e.g. by using a suitable bag.

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
- at the temperature specified in the technical data
- battery is removed from the device

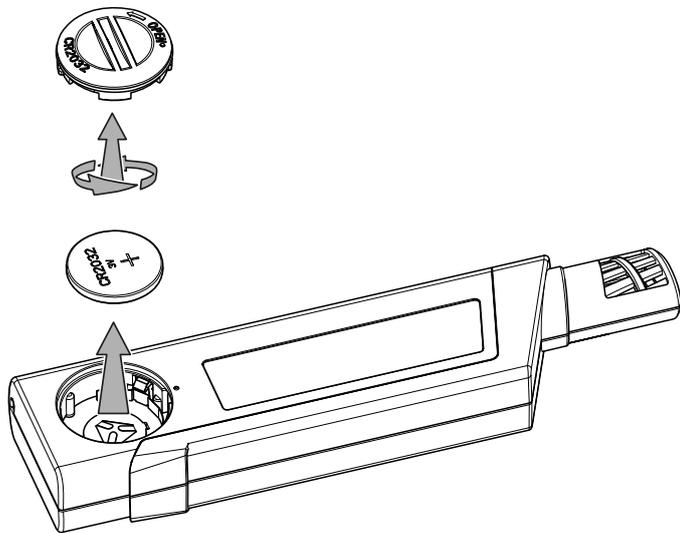
Operation

Inserting / Changing the batteries

Notice

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

1. Open the battery compartment by unscrewing it with a suitable object (e.g. a coin).
2. Remove the battery compartment cover.
3. Insert the battery (1 x CR2032 battery) into the battery compartment with correct polarity.
4. Screw the lid back on the battery compartment.



Switch-on and measurements

Notice

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.

1. Press the *Power* button (5).
 - ⇒ The display will be switched on and the device ready for operation.
 - ⇒ The *TEMP* indication (20) and the currently measured temperature value are displayed.
2. Point the device at the area to be measured.
 - ⇒ Wait for a moment to achieve a stable measured value.

Selecting the measuring mode

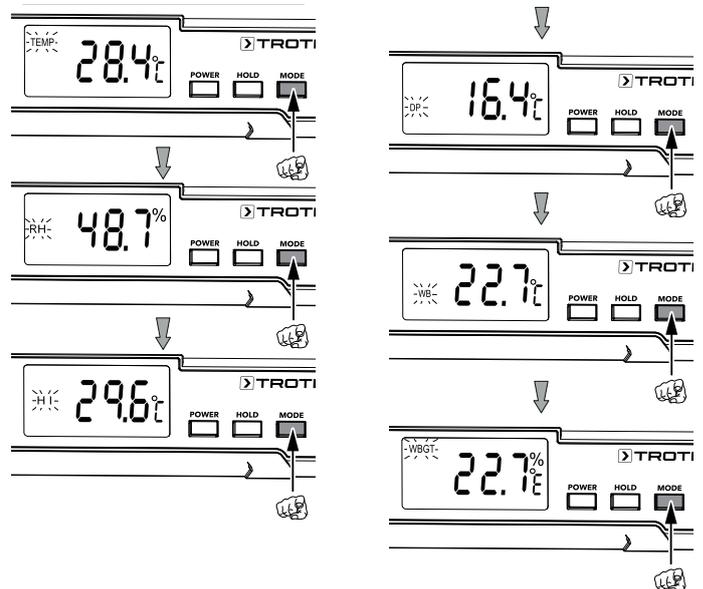
After switch-on, the device displays the temperature (*TEMP* indication, 20).

The following measuring modes are available:

Measuring mode	Description
<i>TEMP</i>	Ambient temperature
<i>RH</i>	Relative humidity
<i>HI</i>	Heat index
<i>DP</i>	Dew point temperature
<i>WB</i>	Wet-bulb temperature
<i>WBGT</i>	Wet-bulb globe temperature index (<i>WBGT</i> index)

Please proceed as follows to set the measuring mode:

1. Repeatedly press the *Mode* button (3) until the desired measuring mode is displayed.



Setting the HOLD function

1. Press the *HOLD* button (4).
 - ⇒ The current value will be held.
2. Press the *HOLD* button (4) again.
 - ⇒ The display again indicates the current measured value.

Setting the MAX/MIN/AVG function



Info

These functions can only be used in the *TEMP* and *RH* measuring modes.

You can view the highest, lowest or average temperature or relative humidity value from the current measuring interval.

To do so, please proceed as follows:

1. Briefly press the *Power* button (5).
 - ⇒ The *MAX* indication (8) appears on the display.
 - ⇒ The display now indicates the highest temperature or humidity value measured since the device was switched on in the selected measuring mode.
2. Press the *Power* button (5) again.
 - ⇒ The *MIN* indication (9) appears on the display.
 - ⇒ The display now indicates the lowest temperature or humidity value measured since the device was switched on.
3. Press the *Power* button (5) again.
 - ⇒ The *AVG* indication (10) appears on the display.
 - ⇒ The display now indicates the average temperature and humidity values measured since the device was switched on.
4. Press the *Power* button (5) again.
 - ⇒ The display again indicates the current measured value.

Changing the unit °C / °F



Info

The default setting for the temperature unit is °C.

Please proceed as follows to change the temperature unit:

1. Switch the device off by pressing the *Power* button (5) and holding it for approx. 5 seconds.
2. Simultaneously press the *Power* button (5) and the *Mode* button (3).
 - ⇒ The currently selected unit °C or °F (14) is displayed.
3. Press the *Mode* button (3) to change the unit.
4. Afterwards repeatedly press the *Power* button (5) until the measured temperature value is displayed again.

Configuring the alarm for HI and WBGT index

You can define values for the HI and WBGT index above which an acoustic alarm is triggered. In default setting, the alarm function is deactivated.

Please proceed as follows to configure the alarm function:

1. Switch the device off.
2. Simultaneously press the *Power* button (5) and the *Mode* button (3).
 - ⇒ The currently selected unit °C or °F (14) is displayed.
3. Press the *Power* button (5) again.
 - ⇒ The *HI* indication (19) and the "*A-of*" message appear on the display.
4. Press the *Mode* button (3) to activate ("*A-on*") or deactivate ("*A-of*") the alarm function for the heat index.
5. Press the *Power* button (5) to save the setting.
 - ⇒ If the alarm function for the heat index is activated, the alarm value can now be determined. If the alarm function is deactivated, please continue with step 8.
6. Press the *Mode* button (3) to increase the alarm value in steps of 0.1.
 - Press and hold the *Mode* button (3) to increase the value faster or in larger steps.
7. Press the *Power* button (5) to save the alarm value for the heat index.
 - ⇒ The *WBGT* indication (7) and the "*A-of*" message appear on the display.
8. Press the *Mode* button (3) to activate ("*A-on*") or deactivate ("*A-of*") the alarm function for the WBGT index.
 - ⇒ If the alarm function for the WBGT index is activated, the alarm value can now be determined.
9. Press the *Mode* button (3) to increase the alarm value in steps of 0.1.
 - Press and hold the *Mode* button (3) to increase the value faster or in larger steps.
10. Press the *Power* button (5) to save the alarm value for the WBGT index.
 - ⇒ The display again indicates the current measured value.
 - ⇒ The selected settings are saved.

Automatic switch-off

In default setting, the automatic switch-off function is activated. The device switches off when not in use for 15 minutes.

To deactivate automatic switch-off, please proceed as follows:

1. Switch the device off by pressing the *Power* button (5) and holding it for approx. 5 seconds.
2. Simultaneously press the *Power* button (5) and the *Hold* button (4) until the message "S-no" is displayed.
⇒ Automatic switch-off is deactivated.



Info

If you switch off the device manually, the automatic switch-off setting is reset, i.e. automatic switch-off is activated again when the device is switched back on.

Switch-off

1. Press the *Power* button (5) for approx. 5 seconds.
⇒ The device will be switched off.

Maintenance and repair

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.

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 batteries).

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.

The device does not switch on:

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

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.

The following error messages can be displayed in the measurement value display (15):

Error no.	Cause	Remedy
E-2	Defective humidity sensor	Please contact the customer service.
E-3	Defective temperature sensor	
E-4	Operating temperature too high	Allow the device to cool down. Reduce the ambient temperature or perform the measurement in a cooler place.
E-5	Operating temperature too low	Increase the ambient temperature or perform the measurement in a warmer place.
E-6	Hardware fault	Please contact the customer service.

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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