

EN

OPERATING MANUAL
THERMOHYGROMETER



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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.

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 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:



BC25



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

Legal notice

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Changes to construction in the interests of constant improvements to the product, as well as changes to the shape and colour are reserved.

The scope of delivery may vary from product images. This document was created with all due care.

Trotec GmbH & Co. KG accepts no liability whatsoever for possible mistakes or omissions.

The only party responsible for determining valid measured results, drawing conclusions and deriving actions is the user.

Trotec GmbH & Co. KG accepts no claims of warranty for the correctness of the determined measured values or measured results.

Further, Trotec GmbH & Co. KG accepts no liability whatsoever for possible mistakes or damage which have been caused by utilising the determined measured results.

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Warranty and liability

The device complies with the fundamental health and safety requirements of the applicable EU regulations and was tested at the factory for perfect functionality multiple times.

If malfunctions occur nonetheless, please contact your dealer or distributor.

When making a warranty claim, supply the device number (see the rear of the device).

When manufacturer's instructions or legal regulations have not been followed, or after unauthorised changes to the device are made, the manufacturer is not responsible for the resulting damages. Changes to the device or unauthorised replacement of individual parts can drastically impact the electrical safety of this product and will result in the loss of the warranty. Liability does not extend to damages to people or property caused by the device being used other than as described in the instructions in this operating manual. Subject to changes to technical design and model changes as part of constant development and product improvement without prior notice.

No liability is accepted for damages resulting from improper use. In such a case, any warranty claims will be voided also.

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.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

- Do not use the device in potentially explosive rooms.
- Do not use the device in aggressive atmosphere.
- 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 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 with a tool.
- Observe the storage and operating conditions (see chapter Technical data).

Intended use

Only use the device for measuring the temperature and humidity level in indoor areas or, in 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. 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, for measurements in liquids or at live parts. Trotec accepts no liability for damages resulting from improper use. In such a case, any warranty claims be voided. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

Personnel qualifications

People who use this device must:

- have read and understood the operating manual, especially the Safety chapter.

Residual risks



Warning

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!

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.

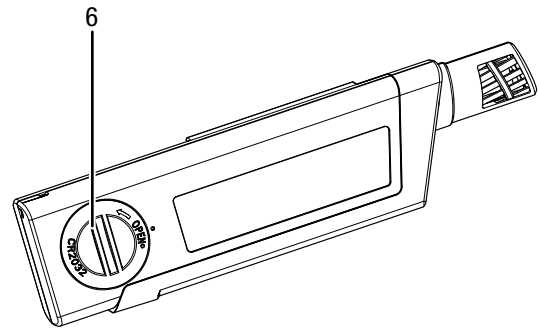
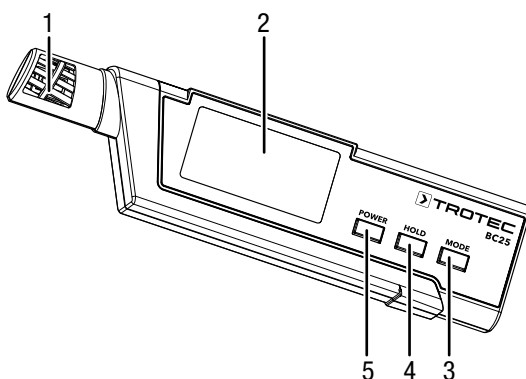
The wet-bulb temperature (or theoretical limit of cooling) is the lowest temperature that can be reached through direct evaporative cooling only. It is determined by wrapping a cotton cloth soaked with distilled water around the measuring tip or mercury bulb of a thermometer and then exposing it to the 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.

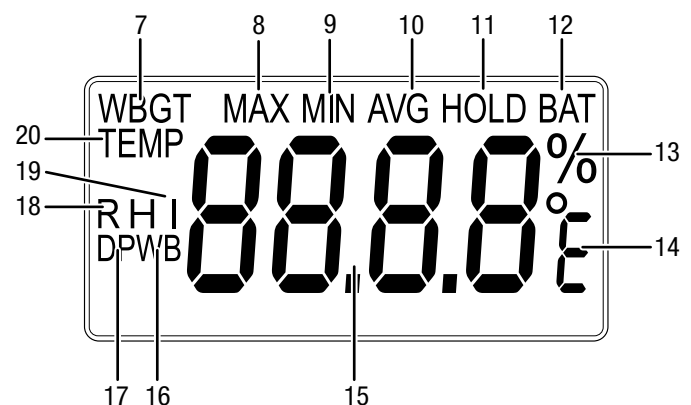
Therefore, the WBGT index is another indicator for determining the climate effects on the human organism. It is, however, even more informative than the heat index since additional parameters are included in the calculation. Established as an international standard, it is described in ISO 7243 and DIN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

Device depiction



No.	Designation
1	Measuring sensor
2	Display
3	Mode button
4	Hold button
5	Power button
6	Battery compartment with cover

Display



No.	Designation
7	WBGT indication
8	Maximum value indication
9	Minimum value indication
10	Average value indication
11	HOLD indication
12	Battery status indication
13	Humidity level percentage indication
14	Air temperature unit °C / °F indication
15	Measurement value display
16	Wet bulb indication
17	Dew point indication
18	Relative humidity indication
19	HI indication
20	Temperature indication

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 CR2032 battery
- 1 x Quick guide

WBGT index

In the course of sports events, for instance, both the WBGT and the HI index are increasingly used as an indication for a 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	Supercooling	below 18 °C	below 65 °F
White	Increased		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.

HI index

	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

For transporting the device use a suitable bag to protect it 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.
- Remove the batteries from the device.

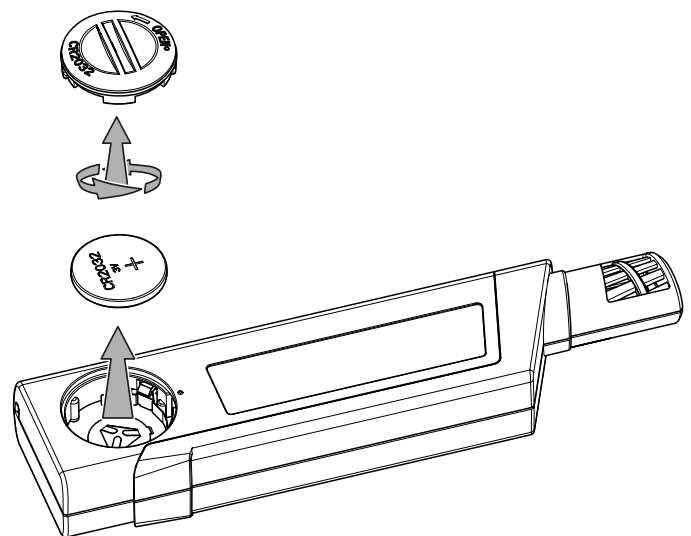
Operation

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 cover.
3. Insert the battery (1 x CR2032 battery) into the battery compartment with correct polarity.
4. Screw the cover back on the battery compartment.



Switch-on and measurements

Note:

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 is switched on and the device is 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

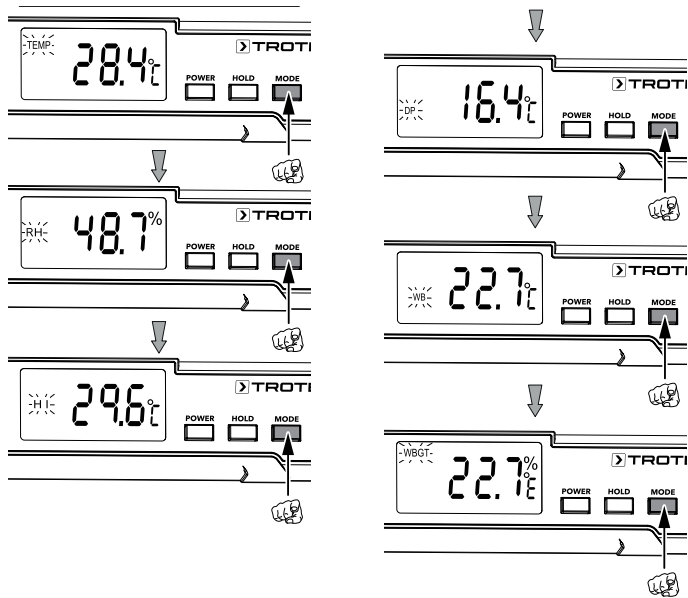
After switch-on, the device displays the temperature (*TEMP* indication, 20).

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>WGBT</i>	Wet-bulb globe temperature index (<i>WGBT</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.

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

The default setting for the temperature unit is °C.

Please proceed as follows to change the temperature unit:

1. Switch off the device by pressing the Power button (5) and holding it for approx. 5 s.
2. Simultaneously press the power button (5) and the *Mode* button (3).
⇒ The currently selected unit °C or °F 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 off the device by pressing the Power button (5) and holding it for approx. 5 s.
2. Simultaneously press the power button (5) and the *Mode* button (3).
 - ⇒ The currently selected unit °C or °F is displayed.
3. Press the Power button (5) again.
 - ⇒ The *HI* indication 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 HI index.
5. Press the Power button (5) to save the setting.
 - ⇒ If the alarm function for the HI 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 HI index.
 - ⇒ The *WBGT* indication 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 off the device by pressing the Power button (5) and holding it for approx. 5 s.
2. Simultaneously press the Power button (5) and the *Hold* button (4) until the message *S-no* is displayed.
 - ⇒ Automatic switch-off is permanently 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

If automatic switch-off is activated, the device switches off after 15 minutes of non-use.

1. Press the Power button (5) for approx. 5 s.
 - ⇒ The device is switched off.

Errors and faults

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	
E -5	Operating temperature too low	
E -6	Hardware fault	

Maintenance and repair

Cleaning

Clean the device with a soft, damp and lint-free cloth. Ensure 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).

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.

You are responsible for deleting any personal data stored on the waste equipment to be disposed of.