

EN

OPERATING MANUAL  
PH MEASURING DEVICE



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



BW10



<https://hub.trotec.com/?id=39360>

**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.



**Wear protective equipment**

Information marked with these symbols indicates that you should wear your personal protective equipment.



**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 aggressive atmosphere.
- This device is not a toy. Keep away from children and animals. Do not leave the device unattended during operation.
- Never immerse the entire device in a liquid. Only the measuring probe is intended to be immersed.
- 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.
- 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 from the device. 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.
- Only use the device, if sufficient safety precautions were taken at the surveyed location (e.g. when performing measurements along public roads, on building sites etc.). Otherwise do not use the device.
- Observe the storage and operating conditions (see Technical data).
- Check accessories and connection parts for possible damage prior to every use of the device. Do not use any defective devices or device parts.

### Intended use

Only use the device to determine the pH value and temperature of liquids in aquaria, ponds, swimming pools or in food.

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

### Foreseeable misuse

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

The device is not designed to be used under laboratory conditions.

Trotec accepts no liability for damages resulting from improper use. In such a case, any warranty claims will be voided. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

### Personnel qualifications

People who use this device must:

- be aware of the dangers that occur when handling corrosive liquids such as bases and acids.
- have read and understood the operating manual, 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

Be careful when handling strong acids or bases!  
If you are unsure whether or not a liquid has a corrosive effect, wear suitable protective equipment consisting of eye protection, protective clothing, protective gloves and safety boots in any case.



#### 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

Sodium carbonate ( $\text{Na}_2\text{CO}_3$ , contained in buffer solution 10.01) may cause eye irritation. Upon contact with eyes, thoroughly rinse with water and seek medical advice.

Keep sodium carbonate out of the reach of children.  
Do not breathe dust containing sodium carbonate.



#### 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 pH measuring device BW10 is suited for measuring pH values and temperatures of liquids.

With the automatic temperature compensation and the automatic calibration functions the measuring device permits a quick and precise determination of the pH value between pH 0 and pH 14 in the temperature measuring range between 0 and 50 °C.

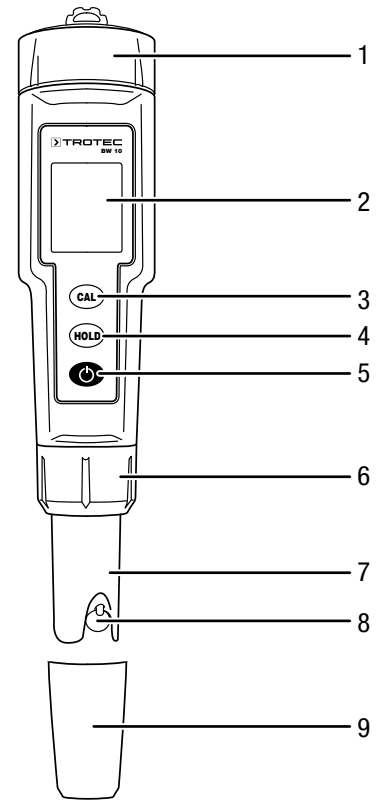
The three-point calibration is already carried out before leaving the factory, but it can also be repeated using the supplied pH buffer solution set.

The determined pH value is displayed along with the water temperature.

The device comes equipped with an exchangeable pH electrode. The electrode and the water temperature probe are protected from external influences by means of a removable protective cap.

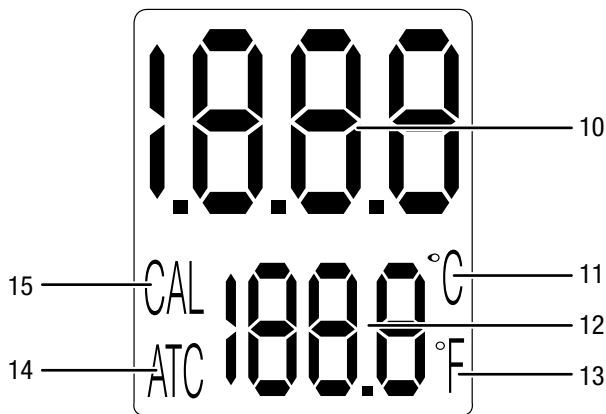
The device is further equipped with a Hold function for holding the currently measured value.

**Device depiction**



No.	Designation
1	Battery compartment with screw-on lid
2	LC display
3	CAL button
4	HOLD button
5	Power button
6	Screw cap
7	Measuring probe
8	Measuring electrode
9	Protective cap

## Display



No.	Designation
10	Measured pH value indication
11	°C indication
12	Measured temperature indication
13	°F indication
14	ATC indication
15	CAL indication

## Technical data

Parameter		Value
Article number		3,510,205,810
pH value	Measuring range	0.00 pH to 14.00 pH
	Accuracy	±0.02 pH
	Resolution	0.01 pH
Temperature	Measuring range	0 °C to 50 °C / 32 °F to 122 °F
	Accuracy	0.2 °C / 2 °F
	Resolution	0.1 °C / 1 °F
Display	LCD	
Protection type	IP65	
Operating conditions	0 °C to 50 °C / 32 °F to 122 °F with <85 % RH	
Storage conditions	10 °C to 25 °C with <65 % RH	
Power supply	4 x 1.5 V, LR44	
Dimensions	188 mm x 38 mm x 38 mm	
Weight	83 g	

## Scope of delivery

- 1 x pH measuring device
- 4 x 1.5 V LR44 batteries
- 1 x pH buffer solution set (4.01/7.00/10.01)
- 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 a suitable bag to protect it from external influences.

Make sure that the protective cap is attached to the measuring probe.

### 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 complies with the values specified in the Technical data
- Remove the batteries from the device.

## Operation

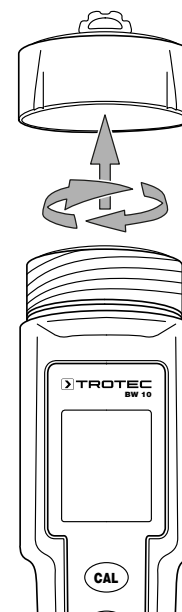
### Inserting the batteries

Insert the supplied batteries into the device before first use.

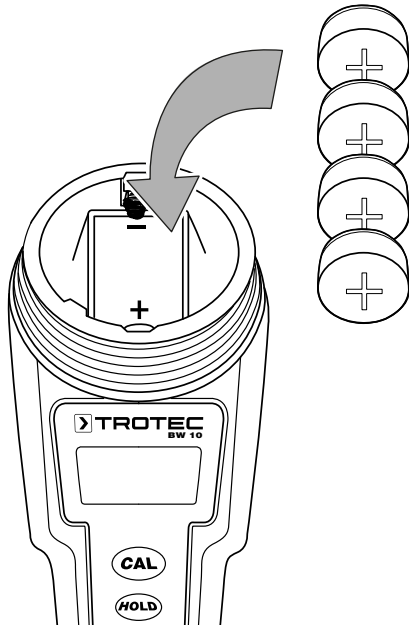
### Note

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

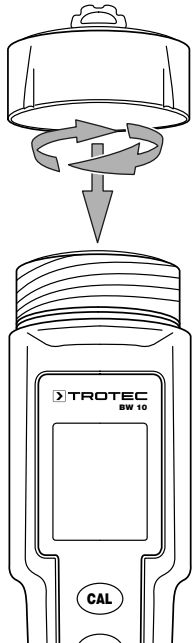
1. Open the battery compartment at the top by unscrewing the lid.



2. Insert the batteries (4 x LR44 button cells) into the battery compartment with correct polarity.



3. Screw the lid back on the battery compartment. In doing so, make sure that the rubber seal is properly seated.

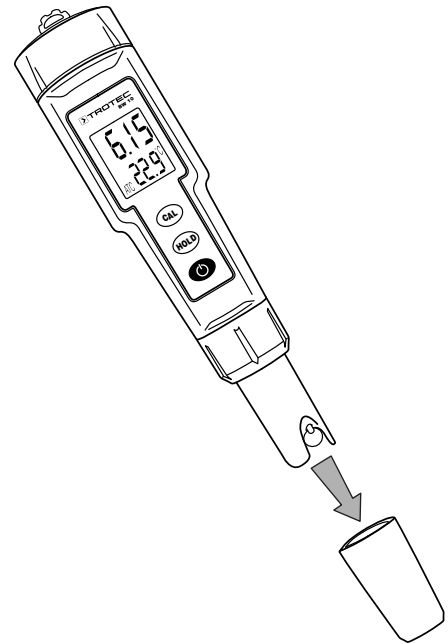


### Removing the protective cap

The device has already been calibrated at the factory using a highly concentrated saline solution. This often leads to the formation of salt crystals at the diaphragm electrode (fibre bundle) during later usage. These visible residues are completely normal for pH measuring electrodes of this type. Such residues are harmless for the measuring electrode and can easily be washed off with water; thus they do not represent any quality defect!

The measuring electrode is protected from external influences by means of a protective cap.

1. Prior to every measurement pull the protective cap off the measuring electrode.



2. After every measurement put the protective cap back on the electrode.

### Performing calibration



#### Info

Before calibration immerse the measuring probe in distilled water for approx. 10 to 15 min.

To perform a calibration of the pH measuring device, you first have to prepare the buffer solutions contained in the supplied set.

The buffer solutions correspond to the pH values 4 (red), 7 (green) and 10 (blue) with an accuracy of  $\pm 0.01$  pH (at 25 °C).

Please proceed as follows to prepare a buffer solution:



### Caution

The powder for the buffer solutions as well as the buffer solutions made thereof are unfit for human consumption.



### Caution

Sodium carbonate ( $\text{Na}_2\text{CO}_3$ , contained in buffer solution 10.01) may cause eye irritation. Upon contact with eyes, thoroughly rinse with water and seek medical advice.

Keep sodium carbonate out of the reach of children.

Do not breathe dust containing sodium carbonate.

1. Fill the contents of a sachet (e.g. pH 7 = green) into a beaker glass or suitable glass vessel with a capacity of at least 250 ml.
2. Add 250 ml of distilled water.
3. Stir the solution with a glass rod until the powder is completely dissolved.

Please note that the pH value of the buffer solution may vary depending on the temperature. The table below indicates the pH value as a function of the temperature (see also imprint on plastic sachets):

°C	pH 4	pH 7	pH 10
10	4.00	7.06	10.18
15	4.00	7.04	10.12
20	4.00	7.02	10.06
25	4.00	7.00	10.01
30	4.01	6.99	9.97
35	4.02	6.98	9.93
40	4.03	6.97	9.89
45	4.04	6.97	9.86
50	4.06	6.96	9.83

To perform the calibration, please proceed as follows:

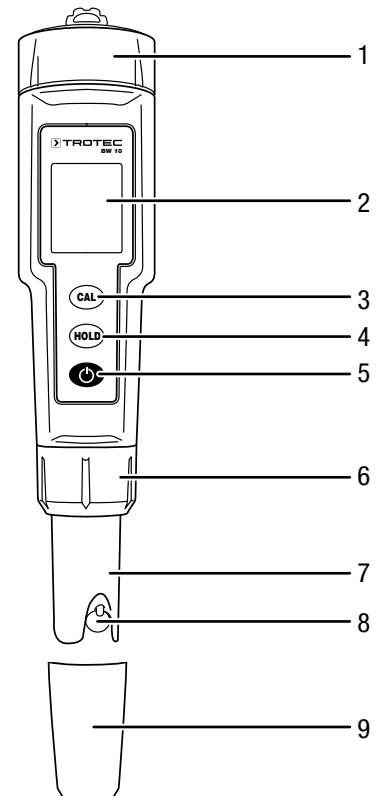


### Info

Always use fresh buffer solutions for calibration.

1. Press the Power button (5) to switch the device on.
  - ⇒ The currently measured pH and temperature values are displayed.
2. With light circular motions, immerse the measuring probe in the buffer solution for the pH value 7 first.
  - ⇒ The measuring electrode should be completely surrounded by the buffer solution.
3. Wait until a stable measured value is shown on the measurement value display (10).
4. Press the *CAL* button (3) for approx. 3 s.
  - ⇒ *CAL* is displayed in the measurement value display (10).

5. Let go of the *CAL* button (3).
  - ⇒ After approx. 2 s, *SA* is displayed in the measurement value display (10).
  - ⇒ Afterwards, *End* is displayed.
  - ⇒ Calibration for pH value 7 is now completed and the current measurement result is displayed.
6. Repeat steps 2 to 5 for the buffer solution which is closest to the expected pH value.



### Info

If calibration is aborted, this is either due to a wrong buffer solution or to a defective measuring electrode. First check whether the correct buffer solution was used by means of a second measuring device if necessary. If the buffer solution corresponds to the pH value to be calibrated, the measuring electrode is defective and must be replaced, see chapter Replacing the measuring electrode.

### Carrying out a measurement

1. Immerse the measuring probe in the liquid to be measured.
  - ⇒ The measuring electrode should be completely surrounded by the liquid.
2. Press the Power button (5) to switch the device on.
  - ⇒ The currently measured pH and temperature values are displayed.



### Holding a measured value (HOLD)

1. Press the *HOLD* button (4) to freeze the currently measured value.
2. Press the *HOLD* button (4) again to show the currently measured values again.

### Switching the device off

The device comes equipped with an automatic switch-off function and switches off automatically if no button was pressed for approx. 15 min.

1. Press the Power button (5) to switch the device off.

## Maintenance and repair

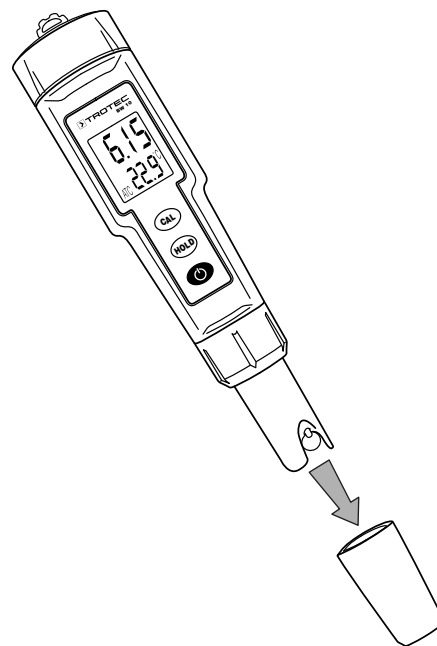
### Battery change

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

### Replacing the measuring electrode

The measuring electrode must be replaced if it is damaged or can no longer be properly calibrated. This manifests itself in the fact that calibration is aborted despite using the correct buffer solution.

1. Pull the protective cap off the measuring electrode.



### Info

If the measured value is outside the measuring range, this is indicated on the display.

The measurement value display will show --- for the pH value and either *L* or *H* for too low or too high temperature values.

### Changing the unit °C / °F

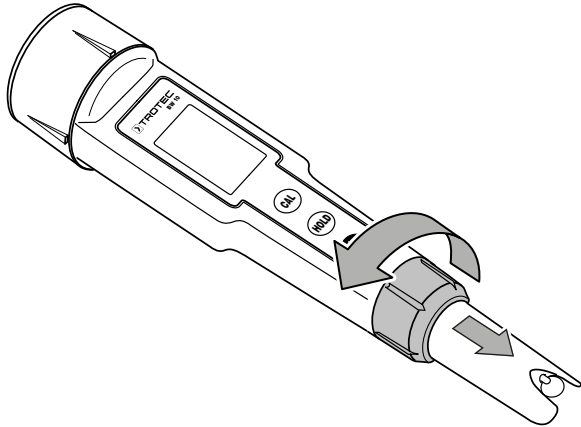
In default setting, the measuring device is set to °C.

Please proceed as follows to change between the units °C and °F:

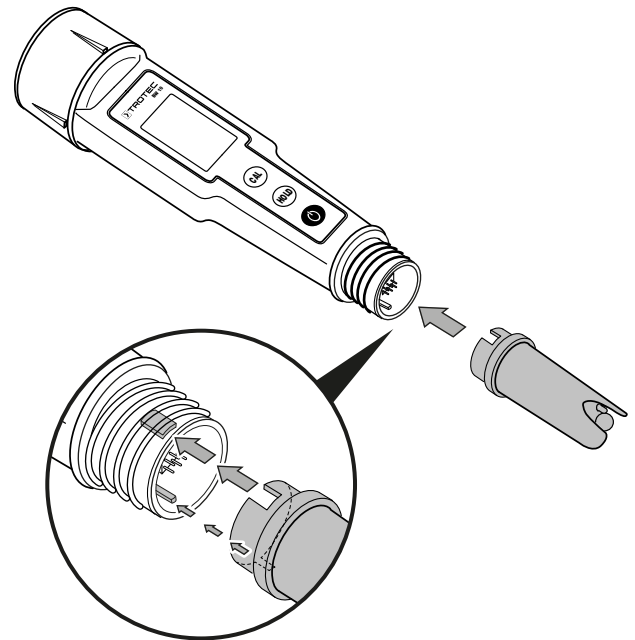
- ✓ The measuring device is switched off.
1. Simultaneously press the *CAL* (3) and Power button (5) until the unit °C (11) or °F (13) is displayed.
  2. Press the *CAL* button (3) to switch between °C and °F.
  3. Press the *HOLD* button (4) to save the setting.
    - ⇒ *SA* appears on the display.
    - ⇒ The setting is saved and the current measurement result is displayed.



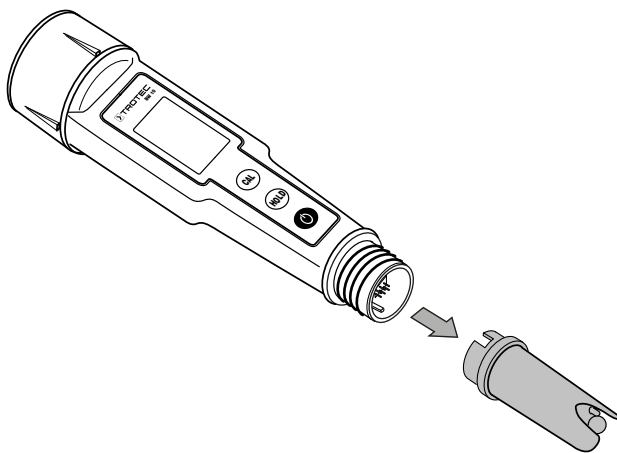
- Loosen the screwing at the measuring electrode and slide it downwards.



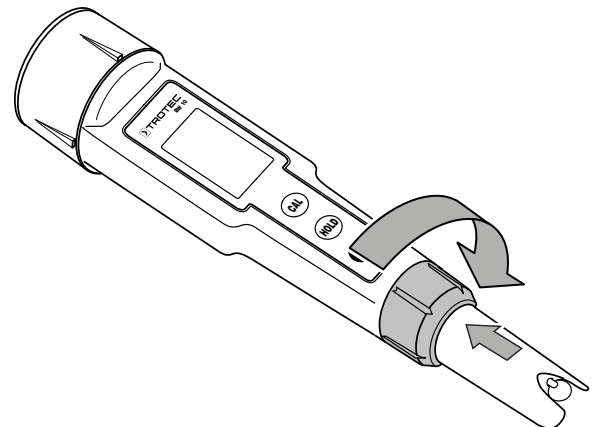
- Put the new measuring electrode on the device. In doing so, pay attention to the guide rails and connections.



- Pull the measuring electrode and the seal ring off the device.



- Put the screwing back on and tighten it firmly.



- Place the new seal ring onto the new measuring electrode.

- Calibrate the device with the new measuring electrode, 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.

### Cleaning the measuring probe

When cleaning the measuring probe, proceed with great caution:

- Rinse the electrode with distilled water.
- Avoid unnecessary friction / contact with the glass ball electrode as it may be damaged or age faster.

### Repair

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

### 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 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. 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.



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.

### 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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