

EN

INSTRUCTIONS
PH MEASURING DEVICE



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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.



Wear protective equipment

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



You can download the current version of these instructions via the following link:



BW10



<https://hub.trotec.com/?id=43009>

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.
- This appliance is not a toy. Keep away from children and animals.
- 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 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 batteries of type LR44 (1,5 V).
- 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.
- 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.

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

Reasonably 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.

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 handling corrosive liquids such as bases and acids.
- 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

There is a danger of suffocation for children due to packaging material! Keep packaging films and parts away from children. There is a risk of death due to suffocation.



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

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 (Na_2CO_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.

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 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.

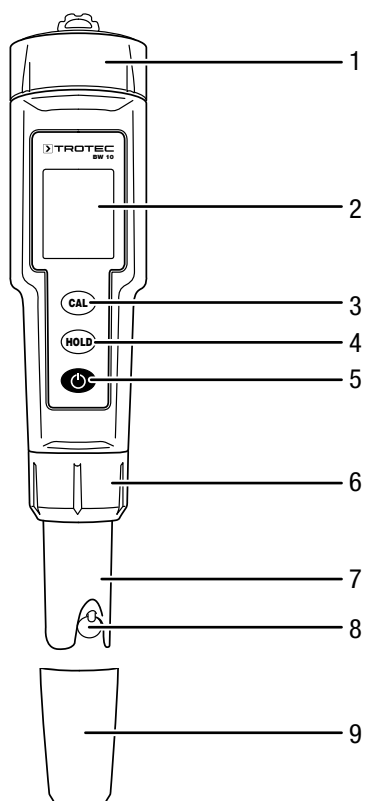
The determined pH value is displayed along with the water temperature.

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.

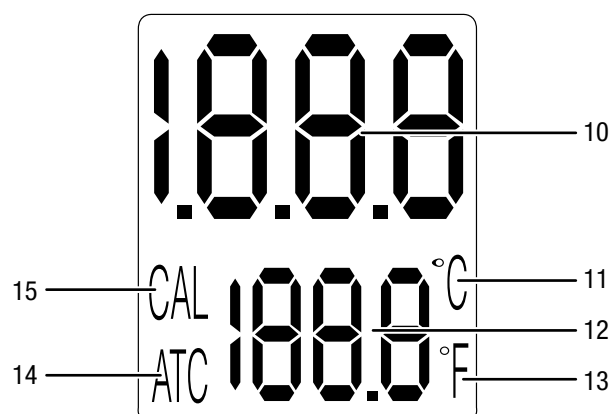
The auto-off function switches the device off after 15 minutes and can be deactivated if required.

Device depiction



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

Display



No.	Designation
10	Measured <i>pH</i> value indication
11	°C indication
12	Measured <i>temperature</i> indication
13	°F indication
14	<i>ATC</i> indication
15	<i>CAL</i> 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 BW10 (without batteries)
- 1 x pH buffer solution set (4.01/7.00/10.01)
- 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 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
- at the temperature specified in the technical data
- Batteries are removed from the device

Operation

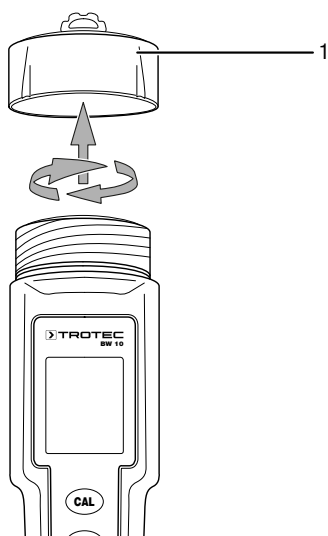
Inserting the batteries

Insert the batteries into the device before first use.

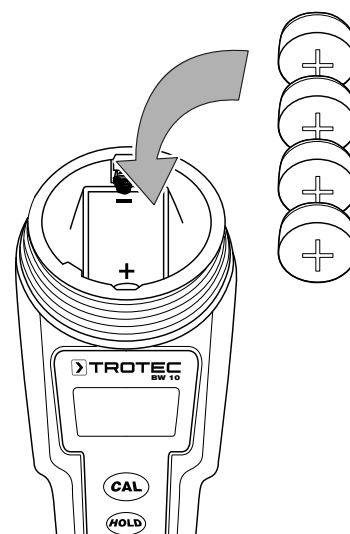
Notice

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

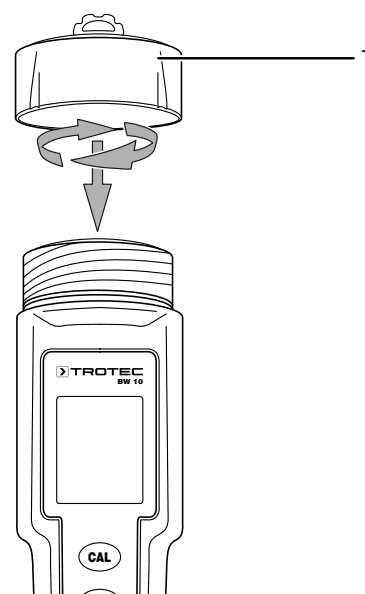
1. Open the battery compartment by unscrewing the lid (1).



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.

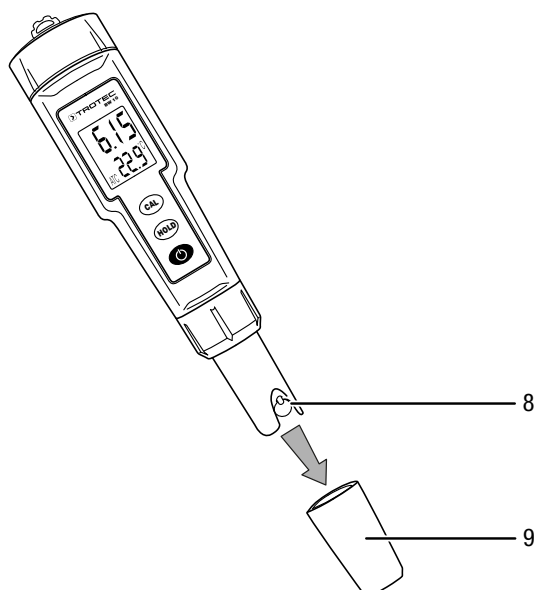


Removing the protective cap

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 (9).

1. Prior to every measurement pull the protective cap off the measuring electrode (8).



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

Switching the device on

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

Performing a calibration



Info

Before calibration immerse the measuring probe (7) 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 ± 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 (Na_2CO_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.

Notice

Only use water at a temperature between 10 and 50 °C. Otherwise, the calibration result may be inaccurate.

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* (5) button to switch the device on.
⇒ The currently measured pH and temperature values are indicated on the display (2).
2. With light circular motions, immerse the measuring probe (7) in the buffer solution for the pH value 7 first.
⇒ The measuring electrode (8) 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 on the measurement value display.
5. Let go of the *CAL* button.
⇒ After approx. 2 s, *SA* is indicated on 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 (8).
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 (7) in the liquid to be measured.
⇒ The measuring electrode (8) should be completely surrounded by the liquid.
2. Press the *Power* (5) button to switch the device on.
⇒ The currently measured pH and temperature values are indicated on the display (2).



Info

If the measured value is outside the measuring range, this is indicated on the respective measured value indication (10, 12).

The 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.

Holding a measured value (*HOLD*)

1. Press the *HOLD* button (4) to freeze the currently measured value.
2. Press the *HOLD* button again to show the currently measured value 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. Please proceed as follows to deactivate the automatic switch-off function if required.

- ✓ The device is switched on.
- 1. Press the *CAL* button (3) once to deactivate the automatic switch-off function.
⇒ *Off* appears briefly on the display (2).
⇒ The cursor of the *pH value* measured value display (10) does not flash.
⇒ Automatic switch-off is deactivated.
- 2. Press the *CAL* button (3) again to reactivate the automatic switch-off function.
⇒ *On* appears briefly on the display (2).
⇒ The cursor of the *pH value* measured value display (10) flashes.
⇒ Automatic switch-off is activated.

Please proceed as follows to switch off the device manually:

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

Maintenance and repair

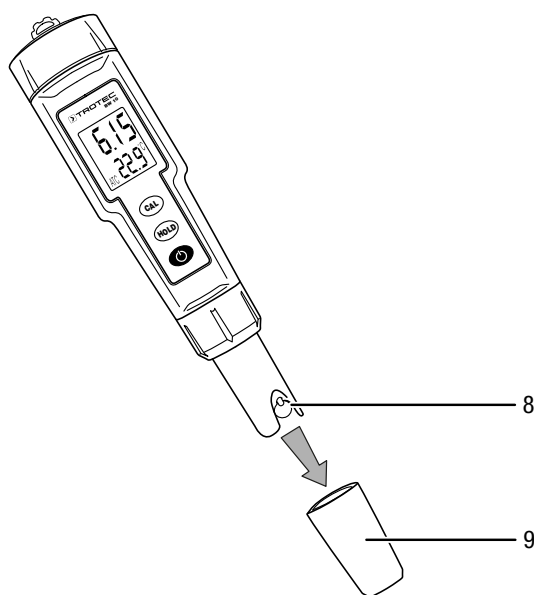
Battery change

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

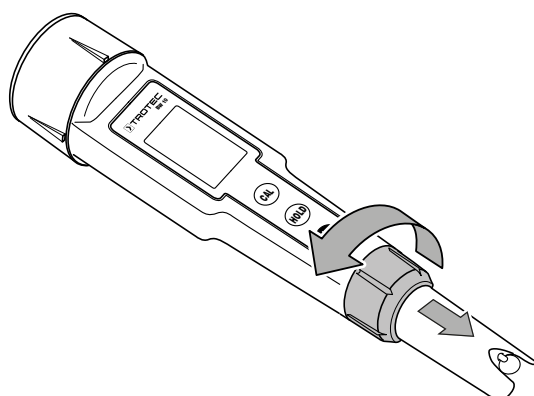
Replacing the measuring electrode

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.

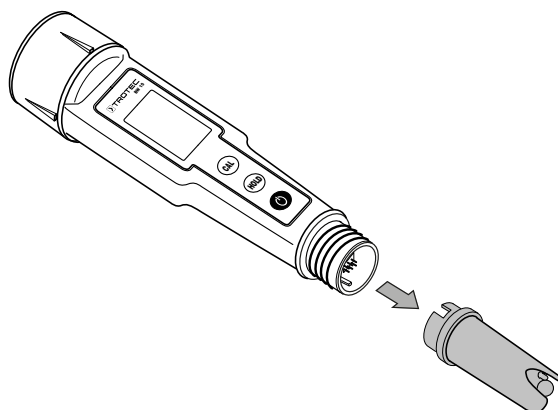
1. Pull the protective cap (9) off the measuring electrode (8).



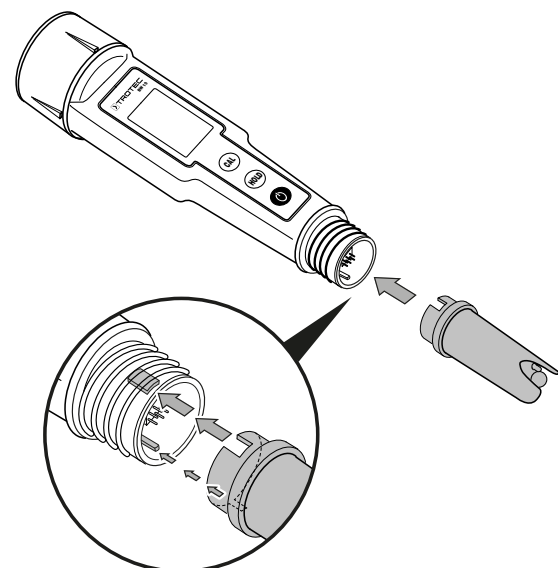
2. Loosen the screwing at the measuring electrode and slide it downwards.



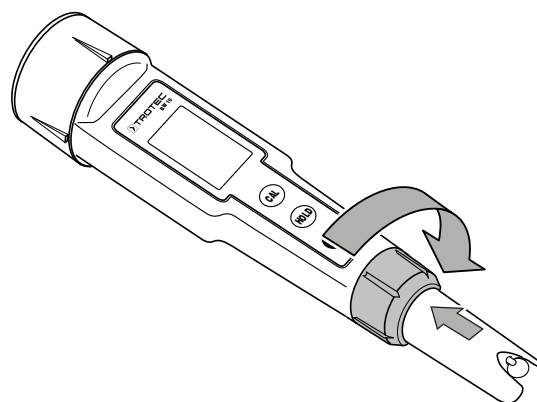
3. Pull the measuring electrode and the seal ring off the device.



4. Place the new seal ring onto the new measuring electrode.
5. Put the new measuring electrode on the device. In doing so, pay attention to the guide rails and connections.



6. Put the screwing back on and tighten it firmly.



7. 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.

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 measuring probe is dirty or defective. Clean the measuring probe as described in the Cleaning section. Replace the measuring electrode if necessary.

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.

Trotec GmbH

Grebbeener Str. 7
52525 Heinsberg
Germany

☎ +49 2452 962-0

☎ +49 2452 962-200

online@trotec.com

www.trotec.com