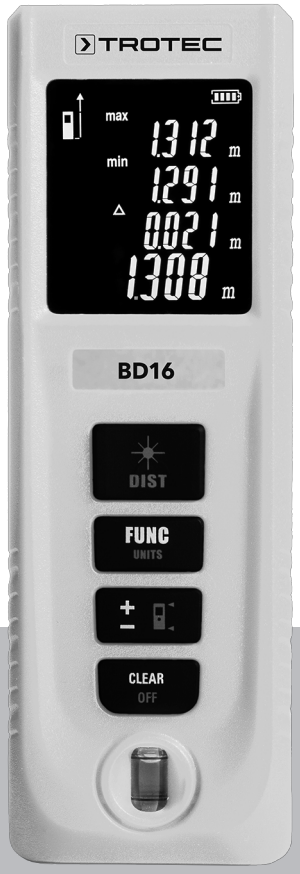
# BD16




# EN

**INSTRUCTIONS**
LASER DISTANCE MEASURING DEVICE

TROTEC

TRT-BA-BD16-TC220823TTRT06-005-EN

## Table of contents



## 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:

BD16

https://hub.trotec.com/?id=40084

## 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 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 LR06 (AA).
- 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.
- 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).

## Intended use

Only use the laser distance measuring device BD16 for measuring distances, areas and volumes by means of the integrated laser and 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, or for measurements in liquids.
Never point it at people or animals.

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:

| Safety symbol | Meaning |
|---|---|
|  | The warning sign is located on the back of the device and indicates that the device is equipped with a class 2 laser. **Do not look directly into the laser beam or the opening from which the laser beam emerges!** |
|  | The warning sign is located on the back of the device. **Do not look directly into the laser beam or the opening from which the laser beam emerges!** |

## 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 laser distance measuring device is used to determine distances, areas and volumes in interior spaces. Indirect measurements are carried out employing the Pythagoras function.

The multi-line, illuminated display indicates the determined values.

Owing to the dust- and splash-proof housing (IP54), the device is also suited for use on construction sites.

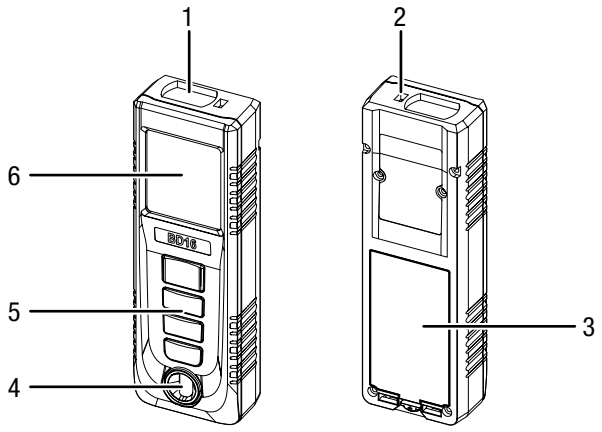
#### Measuring range

The range of the device can be gathered from the Technical data chapter. Under certain conditions – e.g. at night, in twilight or when the target is hidden in the shade – greater distances are possible even without target plate. During the day use a target plate to increase the distance for poorly reflecting targets.

#### Target surfaces

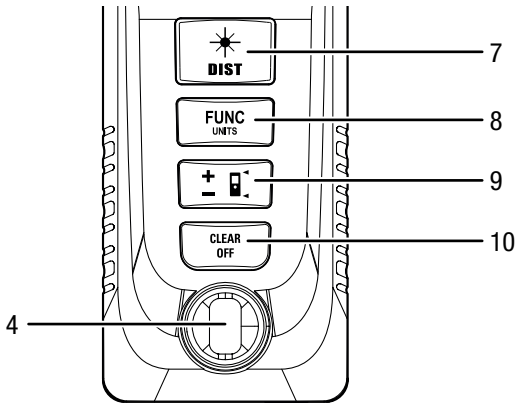
There might be measurement errors when the laser encounters colourless liquids (e.g. water), dust-free glass, styrofoam or other semi-permeable materials. The measurement result may also be falsified if the laser encounters a high-gloss surface and is deflected by it. Non-glossy, non-reflective or dark surfaces can extend the measurement duration.

### Device depiction



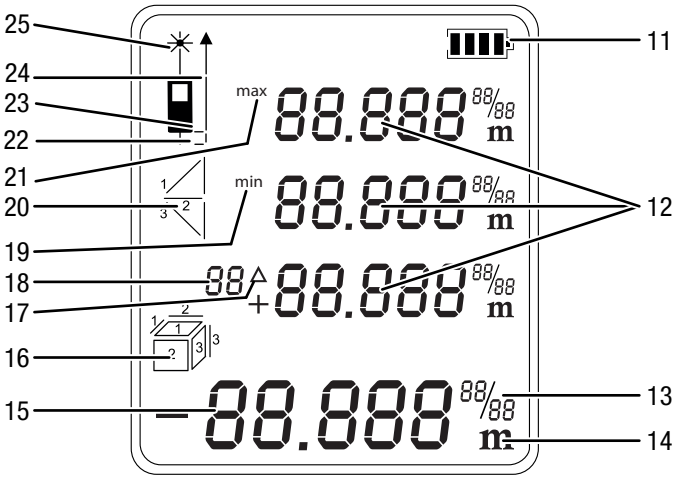

| No. | Designation |
|---|---|
| 1 | Optical sensor |
| 2 | Laser |
| 3 | Battery compartment with cover |
| 4 | Spirit level |
| 5 | Operating elements |
| 6 | Display |

### Operating elements




| No. | Button | Function |
|---|---|---|
| 7 | *DIST* | Press briefly: switching the device on starting an individual measurement |
| | | Press and hold: starting continuous measurement |
| 8 | *FUNC/UNITS* | Press briefly: selecting the type of measurement |
| | | Press and hold: selecting the unit (ft, in, m) |
| 9 | *Reference point* | Press briefly: adding/subtract a value navigating forward/back |
| | | Press and hold: changing the reference point |
| 10 | *CLEAR/OFF* | Press briefly: deleting the value |
| | | Press and hold: switching the device off |

## Display




| No. | Indication | Function |
|---|---|---|
| 11 | *Battery status* | indicates the battery charge level |
| 12 | *Upper measurement value displays* | show the past three measured values, the minimum and maximum value or the measured values to be added or subtracted |
| 13 | *Additional info units* | Complementary display when using imperial units |
| 14 | *Unit* | Possible units are: ft, $ft^3$, $ft^2$, in, m, $m^3$, $m^2$ |
| 15 | *Lower measurement value display* | shows the last measured value or the result of a calculation |
| 16 | *Space* | Area measurement |
| | | Volume measurement |
| 17 | *Delta* | Delta value is displayed delta = maximum minus minimum |
| 18 | *History* | Current timer/ number of the saved measured value of the third measurement value display |
| 19 | *Min* | Minimum measured value is displayed |
| 20 | *Indirect measurement* | Indirect measurement (two auxiliary measurements) |
| | | Indirect measurement (three auxiliary measurements) |
| 21 | *Max* | Maximum measured value is displayed |
| 22 | *Reference value end piece* | indicates that the reference point is located at the end piece |
| 23 | *Reference value rear* | indicates that the reference point is located at the rear |
| 24 | *Reference value front* | indicates that the reference point is located at the front |
| 25 | *Laser* | Laser active |

## Technical data

| Parameter | Value |
|---|---|
| Model: | BD16 |
| Weight: | 150 g |
| Dimensions (H x W x D): | 120 x 42 x 24 mm |
| Measuring range: | 0.05 to 40 m |
| Accuracy: | ±3 mm* |
| Measuring range resolution: | 1 mm |
| Number of recordings logged in the history: | 10 |
| Type of protection: | IP54 |
| Operating temperature: | 0 °C to 40 °C |
| Storage temperature: | -20 °C to 70 °C |
| Laser output: | < 1 mW (620–690 nm) |
| Laser class: | II |
| Diameter of the measuring spot per distance | 10 mm / 10 m<br>12 mm / 20 m<br>20 mm / 40 m |
| Power supply: | 2 x AA batteries, 1.5 V or NiMH 1.2 V to 1.5 V (rechargeable batteries)<br>battery life: approx. 5000 to 8000 measurements |
| Automatic switch-off of the device: | After approx. 3 minutes of non-use |
| Automatic switch-off of the laser: | After approx. 30 seconds of non-use |
| *under favourable conditions (good target surface, room temperature) up to 10 m | |

### Scope of delivery

- 1 x Laser distance measuring device BD16
- 1 x Wrist strap
- 1 x Belt clip
- 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

When transporting the device, ensure dry conditions and 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
- Batteries are removed from the device

## Operation

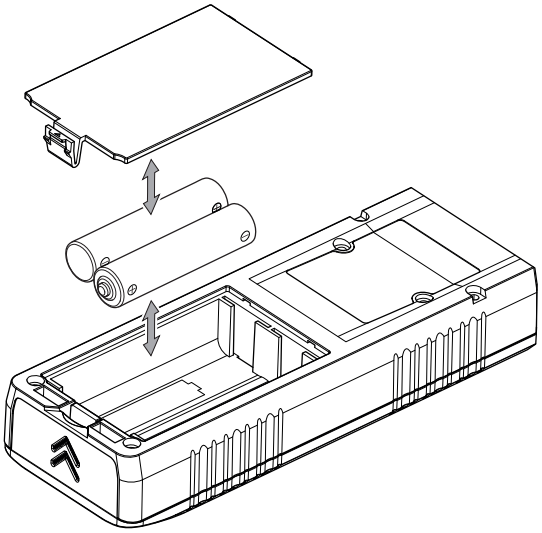
### Inserting the batteries

Insert the appropriate batteries before first use. To do so, please proceed as follows.

**Notice**

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

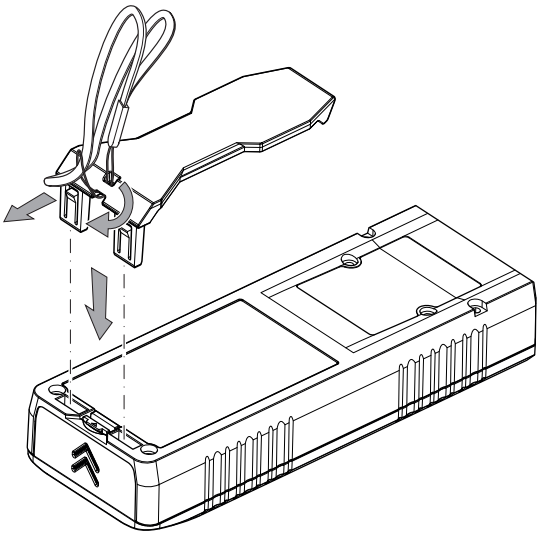
1. Open the cover of the battery compartment (3).
2. Insert two AA batteries (1.5 V) or two NiMH rechargeable batteries (1.2 V to 1.5 V) into the battery compartment with correct polarity +/- (batteries not included in the scope of delivery).



3. Refit the cover of the battery compartment into the device.

### Attaching the belt clip and wrist strap (optional)

1. Attach the wrist strap to the designated recess on the belt clip.
2. Attach the belt clip to the designated recess at the rear of the device.



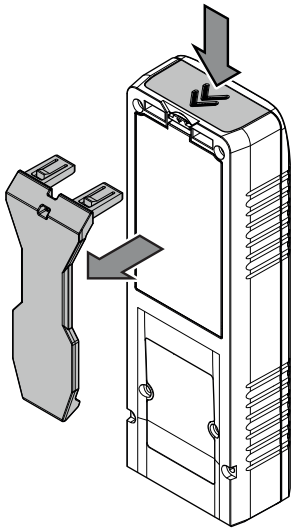
**Info**

Please note that the belt clip has to be removed to change the batteries (see chapter Inserting the batteries).

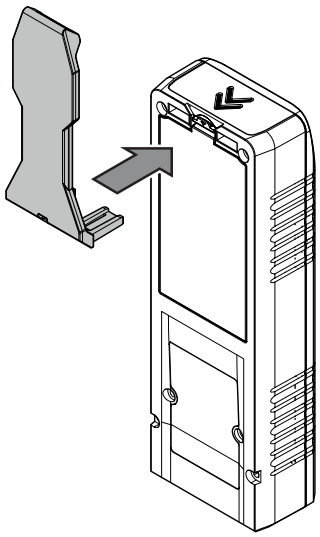
### Using the belt clip as end piece

To stabilise the device, you can use the belt clip as an end piece. In this case, you can shift the reference value to the end of the end piece.

1. Remove the belt clip if it is mounted. To do so, press the button on the underside of the device and at the same time pull out the belt clip.



2. Attach the belt clip to the recess as shown below.



3. Press and hold the *Reference point* button (9) until the *Reference value end piece* indication (22) is displayed (see section Adjusting the reference point).
   ⇨ The belt clip is now used as the end piece.

## Switch-on

**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.

1. Briefly press the *DIST* button (7).
   ⇨ The display will be switched on and the device ready for operation.

## Basic settings

### *Adjusting the reference point*

The device always measures the total distance starting at the reference point. This means that if the rear end of the device is set as reference point, the length of the device will be part of the measurement. By default the reference point is set to the rear of the device. You can, however, also relocate the reference point to the front part of the device.

To do so, please proceed as follows:

1. Press and hold the *Reference point* button (9) to relocate the reference point to the front end of the device.
   ⇨ The *Reference value front* indication (24) appears on the display.
2. Proceed the same way to relocate the reference value to the end of the end piece.

When switching the device off and then on again, the reference value will automatically be relocated to the rear end of the device.

### *Changing the units*

You can have the measured values displayed in ft, $ft^3$, $ft^2$, in, m, $m^3$ or $m^2$. To do so, please proceed as follows:

**Info**
If no measurement has been performed yet and if you want to switch to another unit, there will be no unit indication at first if you select **ft in**. Only if a measurement is performed or if measured values are already available will the measured values be displayed in the *xx' yy''* format.

1. Press and hold the *FUNC/UNITS* button (8) to switch to the next unit.
2. Repeat the process as needed until the desired unit is shown in the *Unit* indication (14).

### *Calling up a measured value in the device history*

The device automatically saves the last 10 measured values. The saved measured values can be called up as follows:

1. Briefly press the *FUNC/UNITS* button (8) five times to call up the history.
   ⇨ The *History* indication (18) appears on the display.
2. Briefly press the *Reference point* button (9) to navigate through the history and call up the saved measured values.
3. Briefly press the *CLEAR/OFF* button (10) or press the *DIST* button (7) to return to the measuring menu.

## Carrying out measurements

**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.

**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.

**Info**
Before carrying out measurements, make sure that the correct reference point is selected. By default, the rear reference point is selected. The reference point should not be changed in the course of a measurement!

You can carry out measurements in the following measuring modes:

- Single distance measurement:
  You can add or subtract measured values.
  You can perform a continuous measurement with MAX/ MIN value.
- Area measurement
- Volume measurement
- Indirect height measurement
- Twofold indirect height measurement

### *Aborting the measurement and deleting the display*

You can cancel an ongoing measurement. To do so, please proceed as follows:

1. Briefly press the *CLEAR/OFF* button (10) to abort the current measurement or to delete the displayed measured values one at a time. The laser switches off for this purpose.

### *Performing a single distance measurement*

1. Briefly press the *DIST* button (7) to activate the laser.
   ⇨ The *Laser* indication (25) appears.
2. Point the laser at the target area.
3. Briefly press the *DIST* button (7) again to perform a distance measurement.
   ⇨ The measured value is immediately indicated on the display.

### *Adding / subtracting measured values*

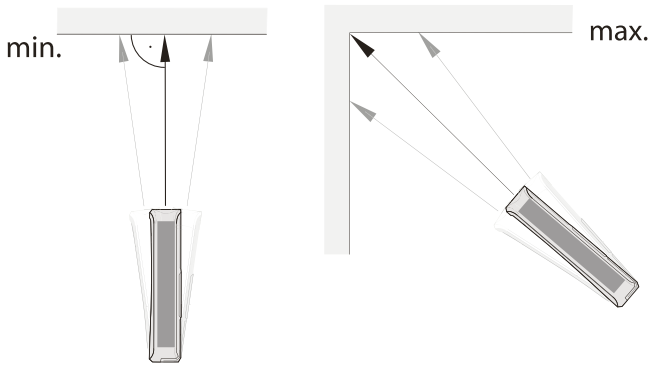
1. Carry out a single distance measurement.
2. Briefly press the *Reference point* button (9) once to add the next measured value to the previous one.
   Briefly press the *Reference point* button (9) twice to subtract the next measured value from the previous one.
3. Press the *DIST* button (7) to determine the next measured value.
   ⇨ The individual measured values will be indicated in the upper measurement value displays (12).
   ⇨ The overall result will be indicated in the lower measurement value display (15).

**Info**
If you want to add or subtract further measured values, please note that you first have to confirm the current values with the *DIST* button (7).

### *Performing a continuous, MIN or MAX measurement*

Use the non-stop measuring function to correlate measurements e.g. with construction drawings. With this measurement method the device can be moved closer toward the target with the measured value being recalculated roughly every 0.5 seconds. The corresponding maximum and minimum measured values are displayed in the first and second line of the upper measurement value displays (12) respectively.

For instance, you can direct the laser beam at a wall and then retreat from it step by step. Keep reading the measured values until the desired distance is achieved.




1. Press and hold the *DIST* button (7) until the *Max* (21), *Min* (19) and *Delta* (17) indications appear on the display.
2. With reference to the target point, move the device slowly back and forth as well as up and down (e.g. in a corner).

3. Briefly press the *DIST* button (7) to terminate the continuous measurement.

⇨ The maximum and minimum measured values and the difference (Δ) between these two are indicated on the display. Additionally, the last measured value will be displayed in the lower measurement value display (15).

***Performing an area measurement***

1. Briefly press the *FUNC/UNITS* button (8) once.
   ⇨ The ▱ symbol for area measurement is displayed in the *Space* indication (16).
2. Briefly press the *DIST* button (7) to carry out the first measurement (e.g. length).
3. Briefly press the *DIST* button (7) again to carry out the second measurement (e.g. width).
   ⇨ Upon pressing the *DIST* button (7) for the second time the device calculates the area and displays this value in the lower measurement value display (15). The most recently measured value will be indicated in one of the upper measurement value displays (12).

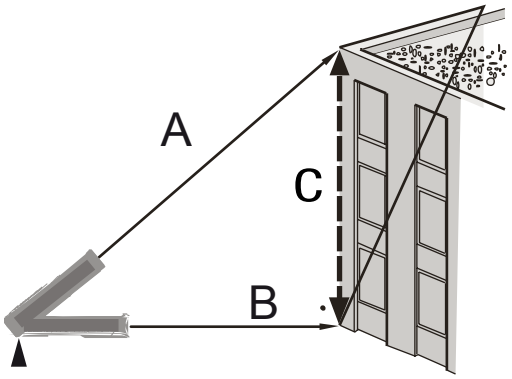
***Performing a volume measurement***

1. Briefly press the *FUNC/UNITS* button (8) twice.
   ⇨ The ⬚ symbol for volume measurement is displayed in the *Space* indication (16).
   ⇨ The side to be measured is displayed flashing in the *Space* indication.
2. Briefly press the *DIST* button (7) to carry out the first measurement (e.g. length).
3. Briefly press the *DIST* button (7) again to carry out the second measurement (e.g. width).
4. Briefly press the *DIST* button (7) again to carry out the third measurement (e.g. height).

⇨ Upon pressing the *DIST* button (7) for the third time the device independently calculates the volume and displays this value in the lower measurement value display (15). The most recently measured values will be indicated in the upper measurement value displays (12).

***Indirect height measurement (Pythagoras)***

Using this method the length of an unknown straight-line segment can be determined via the Pythagorean Theorem. This method is suitable for e.g. height measurements.



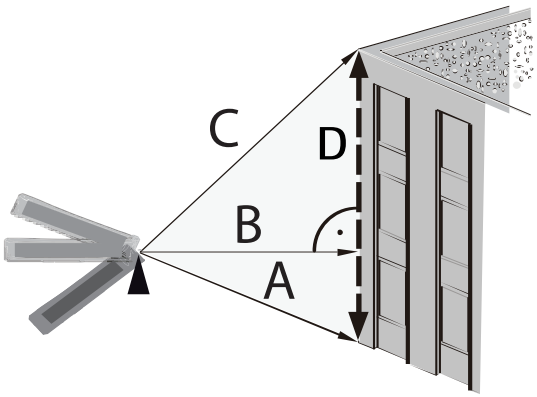

Measurement requirements:

- The device is aligned horizontally to the lowest point (B) of the line segment to be determined.
- The reference point is located at the rear of the device. See chapter Setting the reference value.

1. Briefly press the *FUNC/UNITS* button (8) three times.
   ⇨ The symbol ◿ for indirect measurements appears on the display.
   ⇨ The bar with number 1 (hypotenuse) flashes.
2. Aim the device at the highest point (A) and briefly press the *DIST* button (7) once to perform a measurement. Make sure to hold the device as steady as possible and place it level on the ground with the two rear edges. **The position at the two rear edges must not be changed during the measurements!**
   ⇨ The length of the line segment will be indicated in the 1st line of the upper measurement value display.
3. Align the device horizontally (point B) and briefly press the *DIST* button (7) once to measure the horizontal distance.
   ⇨ The second measured value will be indicated in the second line of the upper measurement value display (12).
   ⇨ The line segment to be determined is displayed as result in the lower measurement value display (15).

***Twofold indirect height measurement***

This method is suitable for e.g. height measurements.




1. Briefly press the *FUNC/UNITS* button (8) four times.
   ⇨ The symbol for indirect measurements appears on the display.
2. First, aim the device at the highest point (C) and briefly press the *DIST* button (7) once to perform a measurement. In doing so, hold the device as steady as possible. **The alignment of the device in relation to the reference point must not be changed during the measurements!**
   ⇨ The first measured value will be displayed in the upper measurement value display.
3. Align the device horizontally (point B) and briefly press the *DIST* button (7) once to measure the horizontal distance.
   ⇨ The second measured value will be indicated in the second line of the upper measurement value display.
4. Aim the device at the lowest point (A) and briefly press the *DIST* button (7) once to perform a measurement.
   ⇨ The third measured value will be indicated in the third line of the upper measurement value display (12).

⇨ The line segment to be determined is displayed as result in the lower measurement value display (15).

### Switch-off

1. Press and hold the *CLEAR/OFF* button (10).
   ⇨ The device is switched off.

The device automatically switches off after approx. 3 minutes of non-use.

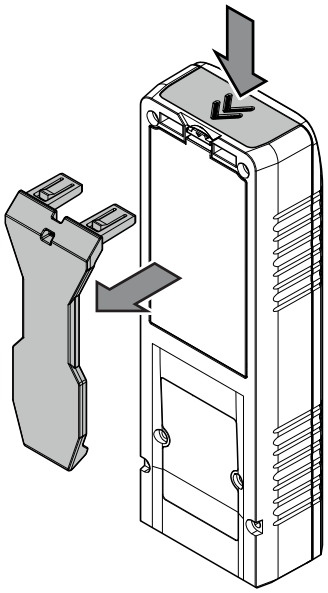
## Maintenance and repair

### Battery change

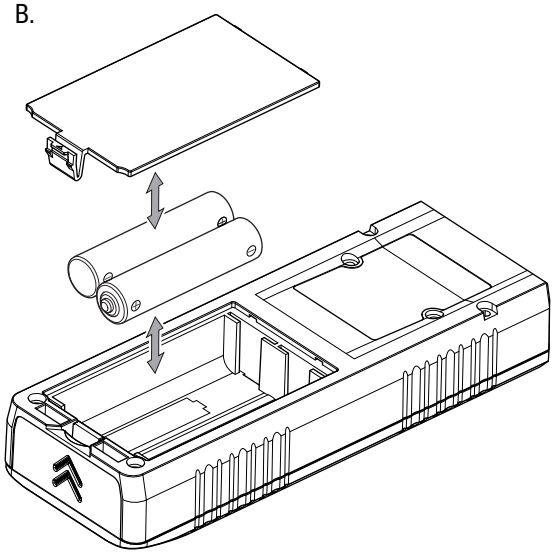
A battery change is required when the error message *INFO 101* appears on the display or when the device can no longer be switched on (see chapter Inserting the batteries).

Before changing the batteries, remove the belt clip if it is mounted.

A.



B.



### 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 following fault indications can appear in the lower measurement value display together with the word *INFO*:

| Indication | Cause | Remedy |
|---|---|---|
| 101 | The reception of the reflected signal is too weak. | Repeat measurement on another surface with better reflective properties or use a target plate. |
| 102 | The reception of the reflected signal is too strong. | |
| 201 | The ambient light is too intense. | Change the ambient light conditions for the measurement. |
| 203 | The batteries are almost empty. | Change the batteries, see chapter Battery change. |
| 301 | The temperature is too high. | Allow the device to cool down. Observe the permissible operating temperature according to the Technical data chapter. |
| 302 | The temperature is too low. | Allow the device to warm up. Observe the permissible operating temperature according to the Technical data chapter. |
| 401 | Hardware fault | Repeatedly switch the device on and off. If the symbol does not disappear, please contact your retailer. |
| 402 | Calculation error | Repeat the measurement. Pay attention to the measurement sequence and position of the device. |

## 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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