

EN

OPERATING MANUAL
LASER DISTANCE MEASURING
DEVICE



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Notes regarding the operating manual

Symbols



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.

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.



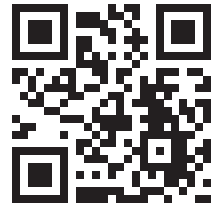
Follow the manual

Information marked with this symbol indicates that the operating manual must be observed.

You can download the current version of the operating manual 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.

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.
- 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 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.
- Avoid looking directly into the laser beam.
- Never point the laser beam at people or animals.
- 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 as given in the Technical data chapter.

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.

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 laser distance measuring device BD16 in potentially explosive atmospheres or for measurements in liquids. Never point it at people or animals. 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 working with laser measuring devices.
- have read and understood the operating manual, especially the Safety chapter.

Residual risks



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.

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 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.

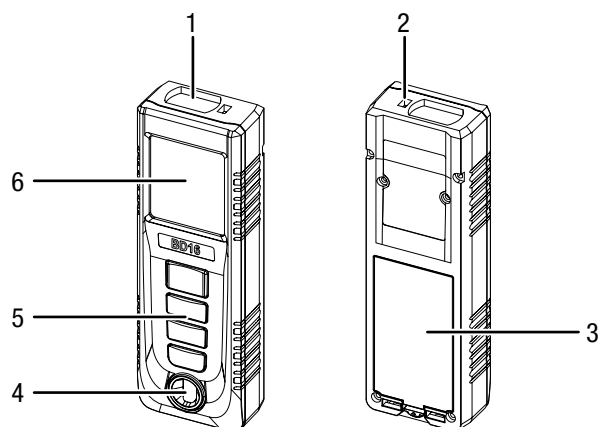
Measuring range

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

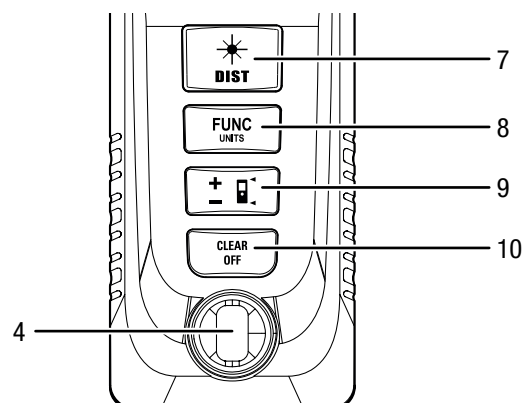
There might be measurement errors when the laser encounters colourless liquids (e.g. water), dust-free glass, styrofoam or other semi-permeable materials. The measurement result may also be falsified if the laser encounters a high-gloss surface and is deflected by it. Non-glossy, non-reflective or dark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

Device depiction



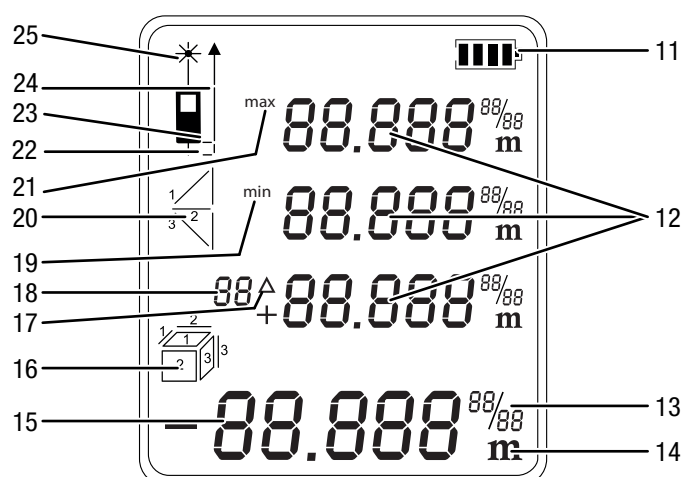
No.	Designation
1	Optical sensor
2	Laser
3	Battery compartment with cover
4	Spirit level
5	Operating elements
6	Display





Operating elements




No.	Operating element	
7	Press briefly:	Switch-on/measurement button
	Press for a long time:	Button for permanent distance measurements
8	Press briefly:	Function button (area, volume or indirect measurement)
	Press for a long time:	Unit button (ft, in, m)
9	Press briefly:	Plus / minus button
	Press for a long time:	Reference button
10	Press briefly:	Delete button
	Press for a long time:	Switch-off button

Display



No.	Display element
11	Battery status
12	Measurement value display top section: The three 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	Complementary display when using imperial units
14	Display of the selected unit. Possible units are: ft, ft ³ , ft ² , in, m, m ³ , m ²
15	Measurement value display bottom section: The lower measurement value display indicates the last measured value or the result of a calculation.
16	 Area measurement
	 Volume measurement
17	Delta = maximum minus minimum
18	History indication
19	Measured minimum value
20	 Indirect measurement (two auxiliary measurements)
	 Indirect measurement (three auxiliary measurements)
21	Measured maximum value
22	Reference value end piece
23	Reference value rear
24	Reference value front
25	Laser active

Technical data

Parameter	Value
Model:	BD16
Weight:	150 g
Dimensions (H x W x D):	120 x 42 x 24 mm
Messbereich:	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
Ø — 	10 mm / 10 m 12 mm / 20 m 20 mm / 40 m
Power supply:	2 x AA batteries, 1.5 V or NiMH 1.2 V to 1.5 V (rechargeable batteries) 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
- 2 x Battery AA, 1.5 V
- 1 x Wrist strap
- 1 x Belt clip
- 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 the bag included in the scope of delivery in order to protect the device 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
- The storage temperature is the same as the range given in the Technical data chapter.
- Remove the batteries from the device.

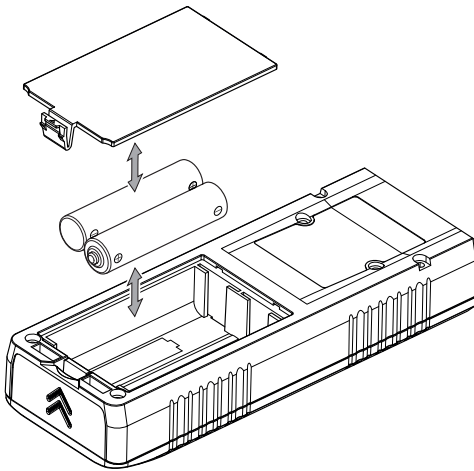
Operation

Inserting the batteries

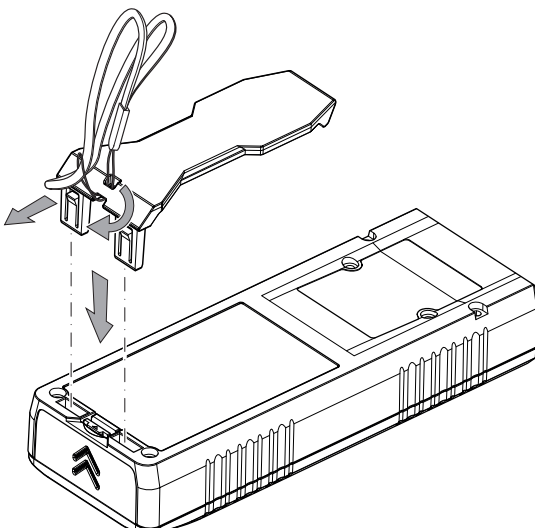
Insert the supplied batteries before first use.

Note

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



Attaching the belt clip and wrist strap (optional)



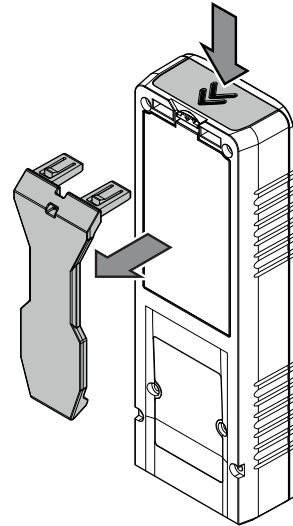
Info

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

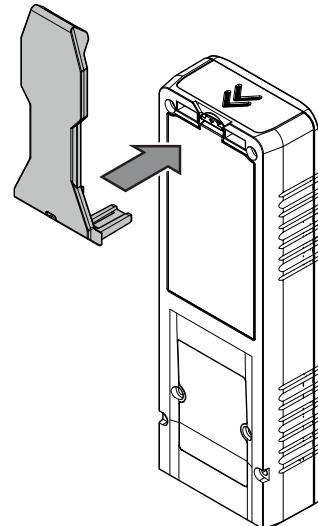
Using the belt clip as end piece

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.



2. Mount the belt clip as end piece.



3. Press the button for the reference value (9) until the Reference value end piece indication (22) is displayed.

Switch-on



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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 Switch-on/measurement button (7).
⇒ The display will be switched on and the device ready for operation.

Switch-off

1. Press the Switch-off button (10) for a long time.
⇒ The display is switched off.

Basic settings

Aborting the measurement and deleting the display

1. Briefly press the Delete 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.

Setting the reference value

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 the Reference button (9) for a long time to relocate the reference point to the front end of the device.
⇒ The Reference value front indication (23) 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

1. Press the Unit button (8) for a long time to switch between the units for the measured values. Available units are **ft**, **in** and **m**.

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 Function button (8) five times to call up the history.
⇒ The History indication (18) appears on the display.
2. Briefly press the Plus/Minus button (9) to navigate through the history and call up the saved measured values.
3. You can return to the normal measuring menu by briefly pressing the Delete button (10) or the Measurement button (7).

Carrying out measurements



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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.

Carrying out single distance measurement

1. Briefly press the Switch-on/measurement button (7) to activate the laser if it is switched off.
2. Point the laser at the target area.
3. Briefly press the Switch-on/measurement 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. To add a measured value, briefly press the Plus/Minus button (9) one time.
Um einen Messwert zu subtrahieren, drücken Sie die Plus-/Minus-Taste (9) zweimal kurz.
3. Press the Switch-on/measurement button (7) to determine the next measured value.
⇒ The overall result will be indicated in the lower measurement value display. The individual measured values will be indicated in the upper measurement value displays.



Info


If you want to add or subtract further measured values, please note that you first have to confirm the current measured values with the Switch-on/measurement button (7).

Performing an area measurement

1. Briefly press the Function button (8) one time.
⇒ The symbol  for area measurement appears on the display.

2. Briefly press the Switch-on/measurement button (7) to carry out the first measurement (e.g. length).
3. Briefly press the Switch-on/measurement button (7) again to carry out the second measurement (e.g. width).
 - ⇒ Upon pressing the Switch-on/measurement button (7) for the second time the device calculates the area and displays this value in the lower measurement value display. The most recently measured value will be indicated in one of the upper measurement value displays.

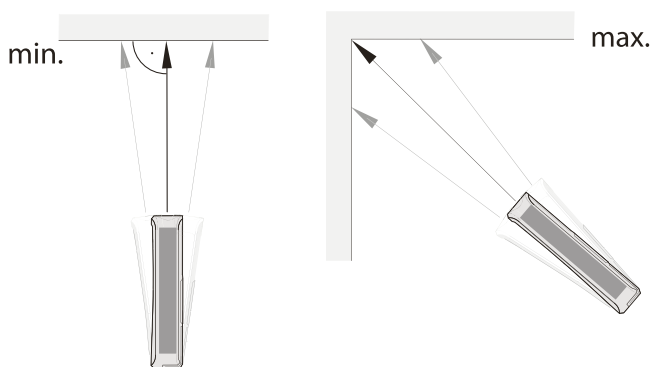
Performing a volume measurement

1. Briefly press the Function button (8) twice.
 - ⇒ The symbol  for volume measurement appears on the display.
 - ⇒ The side to be measured in each case is indicated on the display by flashing.
2. Briefly press the Switch-on/measurement button (7) to carry out the first measurement (e.g. length).
3. Briefly press the Switch-on/measurement button (7) again to carry out the second measurement (e.g. width).
4. Briefly press the Switch-on/measurement button (7) again to carry out the third measurement (e.g. height).
 - ⇒ Upon pressing the Switch-on/measurement button (7) for the third time the device independently calculates the volume and displays this value in the lower measurement value display.

Performing a non-stop / min and 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 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.

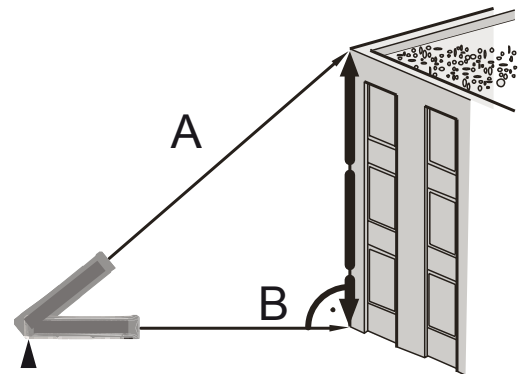


1. Press the Switch-on/measurement button (7) for a long time until the *max* (21), *min* (19) and Δ indications (17) appear on the display.


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 Switch-on/measurement button (7) to terminate the non-stop 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 bottommost line.

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.

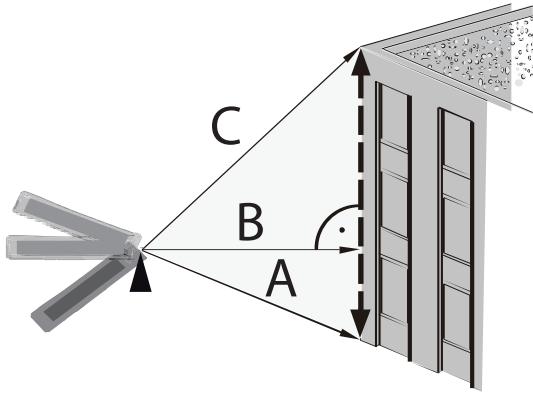



Measurement requirements:

- 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 Function 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 Switch-on/measurement 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!**
 - ⇒ Die Länge der Strecke wird in der oberen Messwertanzeige in der 1. Zeile angezeigt.
 3. Align the device horizontally (point B) and briefly press the Switch-on/measurement button (7) one time to measure the horizontal distance.
 - ⇒ The second measured value will be indicated in the second line of the upper measurement value display.
 - ⇒ 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.



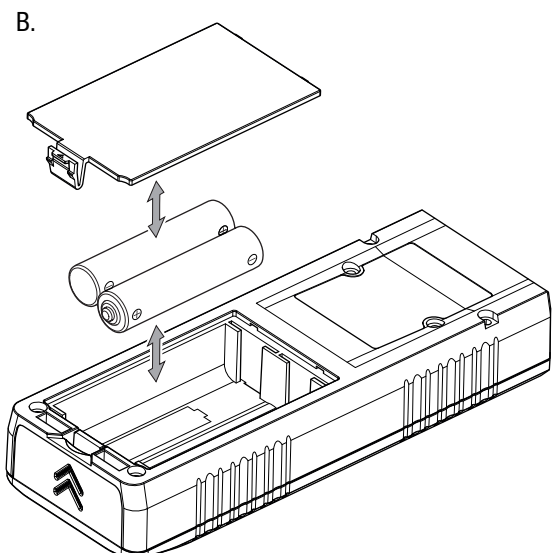
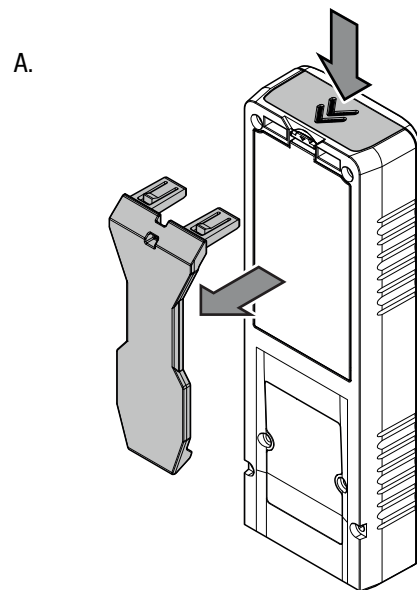
1. Briefly press the Function button (8) four times.
⇒ The symbol  for indirect measurements appears on the display.
2. First, aim the device at the highest point (C) and briefly press the Switch-on / measurement button (7) once to perform a measurement. In doing so, hold the device as steady as possible. **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 Switch-on/measurement button (7) one time 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 Switch-on/measurement button (7) once to perform a measurement.
⇒ The third measured value will be indicated in the third line of the upper measurement value display.
⇒ The line segment to be determined is displayed as result in the lower measurement value display (15).

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.



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 device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

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



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 <https://de.trotec.com/shop/>.

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.



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.

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