

EN

ORIGINAL INSTRUCTIONS
LASER DISTANCE MEASURING
DEVICE



Table of contents

Notes regarding the instructions 2

Safety 2

Information about the device 4

Transport and storage 6

Operation 6


Maintenance and repair 12


Errors and faults 12


Disposal 13


Notes regarding the 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.

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 instructions must be observed.

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



TD120



<https://hub.trotec.com/?id=47208>

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.
- 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.
- 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).

Intended use

Only use the device 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.

Foreseeable misuse

Do not use the device 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 instructions, especially the Safety chapter.

Safety signs and labels on the device

Note

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. The power is less than 1.0 mW. The frequency range of the laser is 630 to 670 nm. Do not look directly into the laser beam or the opening from which the laser beam emerges!
	The warning sign is located next to the laser. 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.: <math>< 1\text{ mW}</math>,



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 TD120 is used to determine distances, areas and volumes in interior spaces. Indirect measurements (e.g. height measurements of walls or furniture) are carried out using the Pythagoras function.

With two built-in spirit levels, you can align the device horizontally and vertically. The tilt sensor allows to measure angles up to 90°.

The device is equipped with separate operating elements for the different measuring functions. The multi-line, backlit display indicates the determined values and measuring functions.

Measured values can be added or subtracted and up to 99 measurements can be retrieved from the data memory.

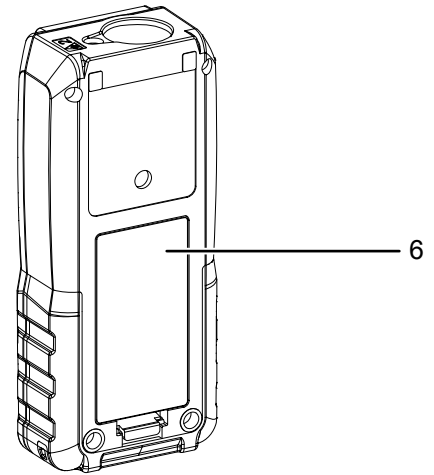
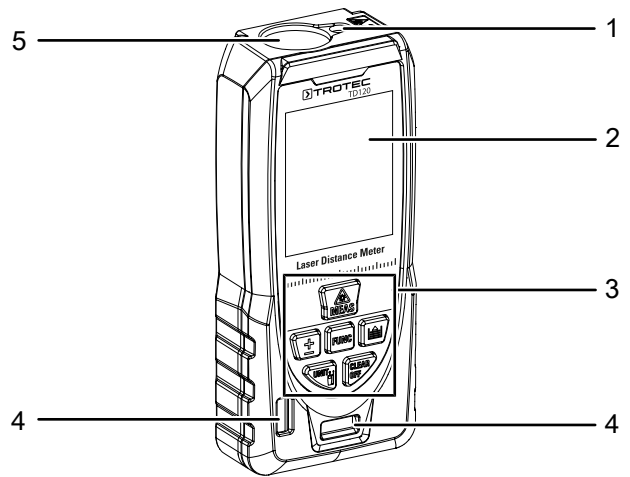
Measuring distance

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

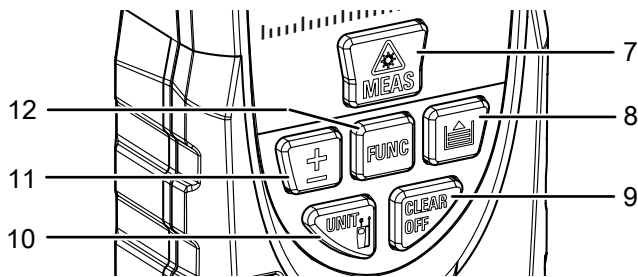
There might be measurement errors when the laser encounters colourless liquids (e.g. water), dust-free glass, styrofoam or other semi-permeable materials. The measurement result may also be falsified if the laser encounters a high-gloss surface and is deflected by it. Non-glossy, non-reflective or dark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

Device depiction



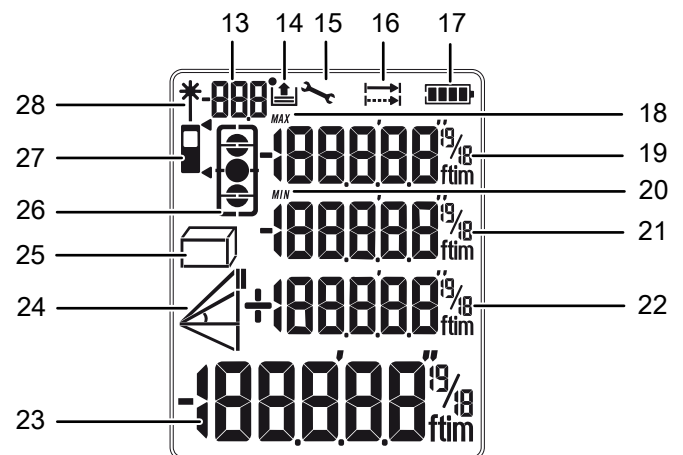
No.	Designation
1	Laser
2	Display
3	Operating elements
4	Spirit levels
5	Receiving lens
6	Battery compartment cover

Operating elements



No.	Designation	Function
7	button / <i>MEAS</i>	Press briefly: switching the device on / measuring Press and hold: starting continuous distance measurement
8	<i>Storage</i> button	Press briefly: call up history When in history: requests previous value in the history Press together with <i>CLEAR/OFF</i> button: clears data memory
9	<i>CLEAR/OFF</i> button	Press briefly: switches to the last measuring mode/deletes the last measured value Press together with <i>Storage</i> button: clears data memory Press and hold: Switching the device off
10	<i>UNIT</i> / button	Press briefly: change the reference point Press and hold: change units (m/ft/ft+in/in)
11	<i>+/-</i> button	When in measuring mode: add / subtract next measured value When in history: Request next value in the history
12	<i>FUNC</i> button	change measuring mode

Display



No.	Display element
13	Inclination angle indication
14	History indication
15	Fault indication
16	individual measurement continuous measurement
17	Battery status
18	MAX: highest measured value during continuous measurement
19	Indication of intermediate value 1 (incl. unit)
20	MIN: lowest measured value during continuous measurement
21	Indication of intermediate value 2 (incl. unit)
22	Indication of intermediate value 3 (incl. unit)
23	Measurement value display (incl. unit)
24	Indirect measurement (two auxiliary measurements) Indirect measurement (three auxiliary measurements) Indirect measurement of partial heights (three auxiliary measurements) Levelled distance/height and angle measurement
25	Area measurement Volume measurement
26	Digital spirit level indication
27	Front reference point Rear reference point
28	Laser active indication

Technical data

Parameter	Value
Model	TD120
Weight	110 g
Dimensions (H x W x D)	115 x 48 x 29 mm
Measuring range of laser	0.05 to 120 m / 0.2 to 394 ft**
Measuring units	m/in/ft/ft+in
Accuracy	± 2 mm
Measuring range resolution	1 mm
Tilt sensor measuring range	max. 90°
Tilt sensor accuracy	±0.5°
Number of recordings logged in the history	99
Operating temperature	-10°C to 50°C (14°F to 122°F)
Storage temperature	-20°C to 60°C (-4°F to 140°F)
Relative humidity	max. 75 %
Laser output	< 1 mW (635 nm)
Laser class	II
Type of protection	IP40
Device switch-off	After approx. 3 minutes of non-use
Automatic switch-off of the laser	After approx. 30 seconds of non-use
Power supply	2 x 1.5 V battery (type AAA)

* A target plate is recommended for distances > 30 m.

Scope of delivery

- 1 x Device TD120
- 2 x 1.5 V battery AAA
- 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

When transporting the device, ensure dry conditions 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
- the storage temperature complies with the values specified in the Technical data
- Batteries are removed from the device

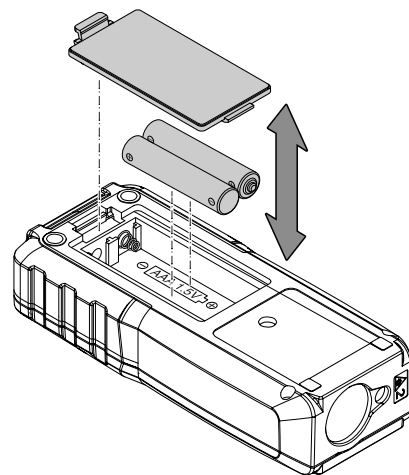
Operation

Inserting the batteries

Note

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

1. Open the battery compartment cover (6).
2. Insert two batteries of type AAA (1.5 V, included in the scope of delivery) into the battery compartment with correct polarity (+/-).



3. Refit the battery compartment cover onto the device.

Switch-on

- Briefly press the *MEAS* button (7).
⇒ The display will be switched on and the device ready for operation.

Basic settings

Aborting the measurement and deleting the display

- Press the *Clear/OFF* button (9) to delete the last action or the current measuring value.

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. Please proceed as follows:

- Press the *Unit/↔* button (10) to relocate the reference point to the front end of the device.
⇒ An acoustic signal is emitted each time the reference point is relocated. In addition, the reference point display (27) indicates the selected reference point.

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

Changing the units

Press and hold the *Unit/↔* button (10) to switch between the units for the measured values. You can set the following units one after the other:

Distance	Area	Volume
0.000 m	0.000 m ²	0.000 m ³
0.0 in	0.000 ft ²	0.000 ft ³
0 1/16 in	0.000 ft ²	0.000 ft ³
0,000 ft	0.000 ft ²	0.000 ft ³
0'00"1/16	0.000 ft ²	0.000 ft ³

Calling up a measured value in the device history

The device automatically saves the last 99 measured values. The saved measured values can be called up as follows:

- Briefly press the *Storage* button (8) to call up the history.
⇒ The number of the current measured value is indicated on the *History* display (14).
- Press the *+/-* button (11) to go to the next measured value.
- Press the *Storage* button (8) to return to the previous measured value.
- Simultaneously press and hold the *Storage* button (8) and the *Clear/Off* button (9) to clear the entire data memory.
- Press the *Clear/Off* button (9) to return to the last measuring mode.

Aligning the device

The device can be aligned horizontally and vertically using the spirit levels.

In addition, the *digital spirit level indication* (26) indicates whether the device is positioned horizontally on a surface or is tilted forwards or backwards.

The current inclination angle starting from the horizontal position is indicated on the *Inclination angle indication* (13).

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.

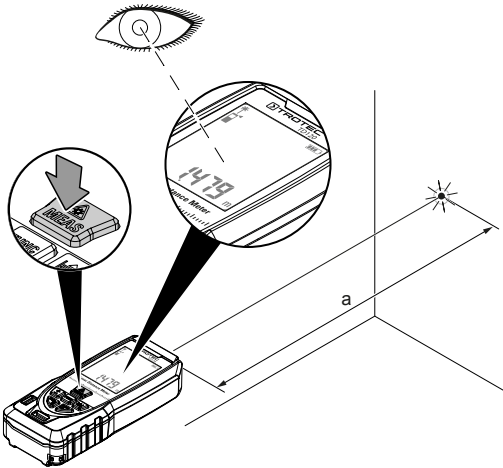
When working with a laser of class 2, observe the national regulations on wearing eye protection.

The device comes with the following measuring modes:

- Single distance measurement:
 - you can add or subtract measured values
 - you can perform a non-stop measurement with MAX- / MIN-/current value
- Area measurement
- Volume measurement
- Indirect height measurement
- Twofold indirect height measurement
- Indirect measurement of a partial height
- Levelled distance/height and angle measurements

Carrying out single distance measurement

1. Press the *MEAS* button (7) to switch the device on.
 2. Point the laser at the target area.
 3. Briefly press the *MEAS* button (7) again to perform a distance measurement.
- ⇒ The measured value is displayed on the measurement value display (23).



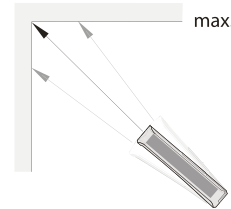
Adding / subtracting measured values

1. Carry out a single distance measurement.
 2. Press the +/- button (11) once to add the next measured value to the previous one.
Press the +/- button (11) twice to subtract the next measured value from the previous one.
 3. Press the *MEAS* button (7) to determine the next measured value.
- ⇒ The overall result will be indicated on the measurement value display (23). The individual measured values are indicated on the intermediate value display 2 (21) and 3 (22).

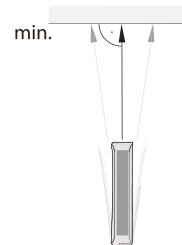
Performing a non-stop / min and max measurement

With this measurement method the device can be moved with the measured value being recalculated roughly every 0.5 seconds. You can use the non-stop measurement function with MAX/MIN/current value display for performing the following measurements, for example:

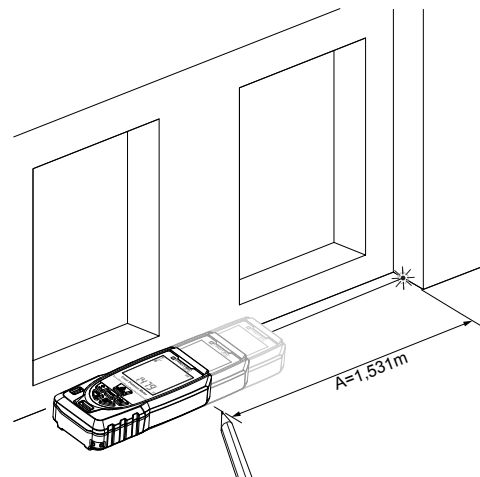
- **MAX value:** measuring a diagonal



- **MIN value:** determining the perpendicular length to a wall/ floor area



- **Actual value:** marking a defined value for a distance (e.g. a measurement from a ground plan)



1. Press and hold the *MEAS* button (7).
 ⇒ A recurring acoustic signal is emitted.
 ⇒ The maximum and minimum values are indicated on the intermediate value displays 1 (19) and 2 (21).
 ⇒ The current measured value is displayed on the measurement value display (23).
2. Depending on the desired measurement, move the device slowly back and forth or up and down (e.g. in the corner of a room).

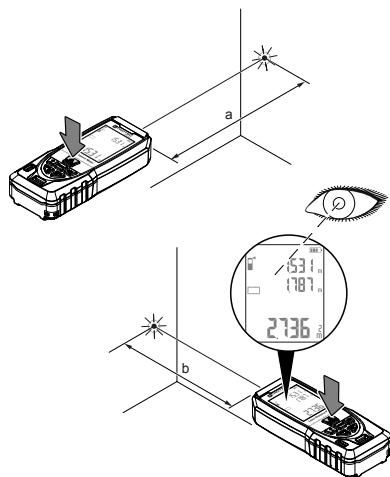
3. Briefly press the *MEAS* button (7) to terminate the continuous measurement.
 - ⇒ The maximum, minimum and last measured value are indicated on the display.
4. Press and hold the *MEAS* button (7) to return to the single measurement mode.

Note

The continuous measurement is automatically terminated after 500 individual values have been measured.

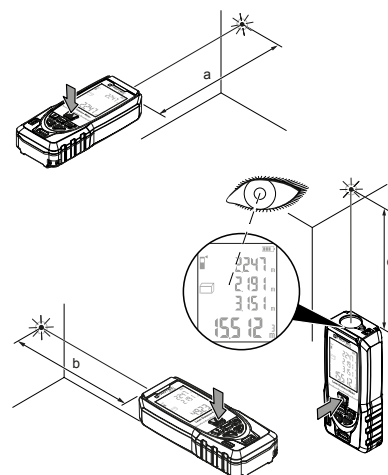
Performing an area measurement

1. Repeatedly press the *FUNC* button (12) until the symbol for the area measurement (\square , 25) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (25).
2. Briefly press the *MEAS* button (7) to carry out the first measurement (e.g. length).
 - ⇒ The first measured value will be indicated on the intermediate value display 1(19).
3. Briefly press the *MEAS* button (7) again to carry out the second measurement (e.g. width).
 - ⇒ The second measured value is displayed on the intermediate value display 2 (21).
 - ⇒ Upon pressing the *MEAS* button (7) for the second time the device independently calculates the area and displays this value in the measured value indication (23).



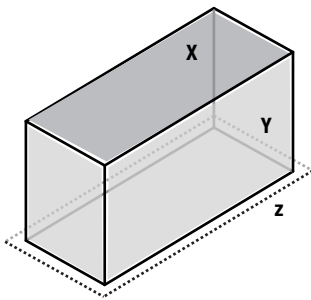
Performing a volume measurement

1. Repeatedly press the *FUNC* button (12) until the symbol for the volume measurement (\square , 25) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (25).
2. Briefly press the *MEAS* button (7) to carry out the first measurement (e.g. length).
 - ⇒ The first measured value will be indicated on the intermediate value display 1(19).
3. Briefly press the *MEAS* button (7) again to carry out the second measurement (e.g. width).
 - ⇒ The second measured value is displayed on the intermediate value display 2 (21).
4. Briefly press the *MEAS* button (7) again to carry out the third measurement (e.g. height).
 - ⇒ The third measured value is displayed on the intermediate value display 3 (22).
 - ⇒ Upon pressing the *MEAS* button (7) for the third time the device independently calculates the volume and displays this value in the measured value indication (23).



In addition to the measured individual lengths, the device can also calculate the ceiling area and total area of all walls as well as the perimeter of the floor:

1. Carry out a volume measurement.
2. Press and hold the *FUNC* button (12).
 - ⇒ The ceiling area (X) will be indicated on the intermediate value display 1 (19).
 - ⇒ The total area of all walls (Y) is displayed on the intermediate value display 2 (21).
 - ⇒ The perimeter of the floor (z) is displayed on the intermediate value display 3 (22).
 - ⇒ The volume will be indicated on the measurement value display (12).



3. Press and hold the *FUNC* button (12) to return to the single distance display.

Indirect height measurement (Pythagoras)

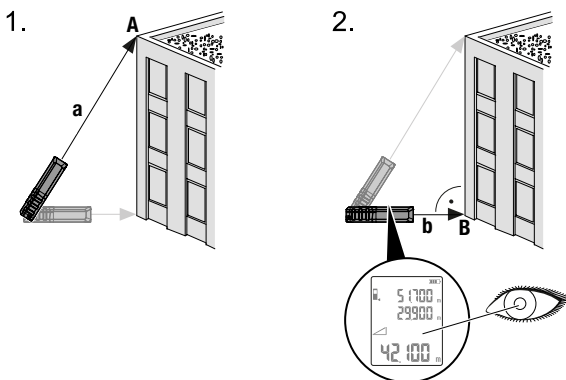


Info

The position at the two rear edges must not be changed during the measurements!

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.

The measurement result is calculated by determining the distances a and b.



1. Repeatedly press the *FUNC* button (12) until the symbol for the indirect measurement (\sphericalangle , 24) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (24).

2. First, aim the device at the highest point (A) and briefly press the *MEAS* 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 rear edge.
 - ⇒ The first measured value will be indicated on the intermediate value display 1 (19).
3. Using the spirit level, align the device horizontally to the lower measuring point (B) and briefly press the *MEAS* button (7) once to measure the horizontal distance.
 - ⇒ The second measured value is displayed on the intermediate value display 2 (21).
 - ⇒ The line segment to be determined is displayed as result in the measurement value display (23).

Twofold indirect height measurement

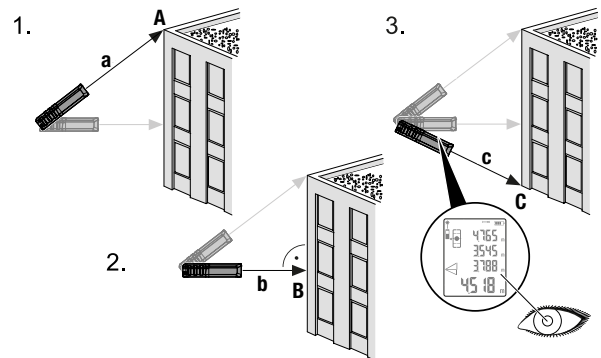


Info

The position at the two rear edges must not be changed during the measurements!

This method is suitable for e.g. height measurements when you are not at the same height as the base point.

The measurement result is calculated by determining the distances a, b and c.



1. Repeatedly press the *FUNC* button (12) until the symbol for the twofold indirect measurement (\sphericalangle , 24) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (24).
2. First, aim the device at the highest point (A) and briefly press the *MEAS* button (7) once to perform a measurement. In doing so, hold the device as steady as possible.
 - ⇒ The first measured value will be indicated on the intermediate value display 1 (19).
3. Using the spirit level, align the device horizontally (B) and briefly press the *MEAS* button (7) once to measure the horizontal distance.
 - ⇒ The second measured value is displayed on the intermediate value display 2 (21).

4. Align the device to the deepest point (C) and briefly press the **MEAS** button (7) once to perform a measurement.
 - ⇒ The third measured value is displayed on the intermediate value display 3 (22).
 - ⇒ The line segment to be determined is displayed as result in the measurement value display (23).

Indirect measurement of a partial height

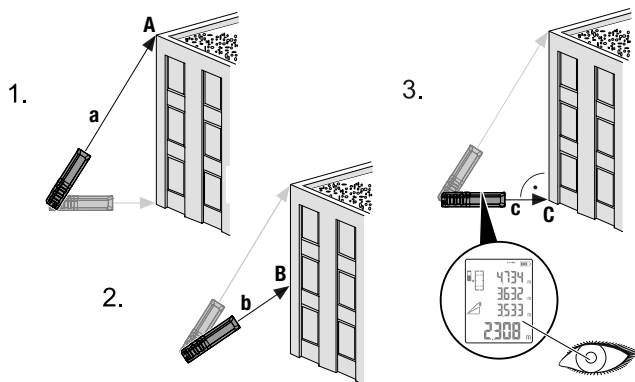


Info

The position at the two rear edges must not be changed during the measurements!

This method is suitable for measuring partial heights (e.g. storey heights, window heights, etc.).

The measurement result is calculated by determining the distances a, b and c.

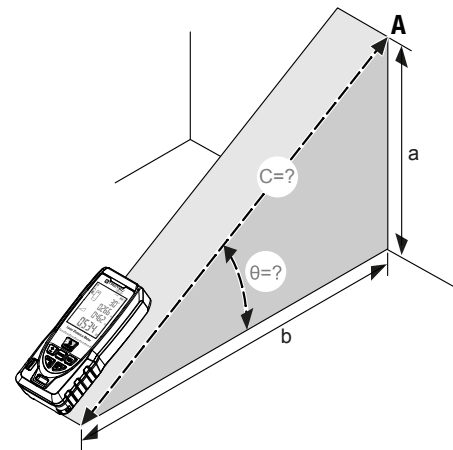


1. Repeatedly press the **FUNC** button (12) until the symbol for the measurement of a partial height (\sphericalangle , 24) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (24).
2. First, aim the device at the upper point (A) of the partial height to be measured and briefly press the **MEAS** button (7) once to perform a measurement. In doing so, hold the device as steady as possible.
 - ⇒ The first measured value will be indicated on the intermediate value display 1(19).
3. Now aim the device at the lowest point (B) of the partial height to be measured and briefly press the **MEAS** button (7) once to perform a measurement.
 - ⇒ The second measured value is displayed on the intermediate value display 2 (21).
4. Using the spirit level, align the device horizontally to the lower measuring point (C) and briefly press the **MEAS** button (7) once to measure the horizontal distance.
 - ⇒ The third measured value is displayed on the intermediate value display 3 (22).
 - ⇒ The partial height to be determined is displayed as result in the measurement value display (23).

Levelled distance/height and angle measurements

With the levelled distance/height and angle measurement you can, for example, determine the length and inclination of a roof slope from the ground. To do so, please proceed as follows:

1. Repeatedly press the **FUNC** button (12) until the symbol for the levelled distance/height and angle measurement (\sphericalangle , 24) appears on the display.
 - ⇒ The respective distance to be measured flashes next to the symbol (24).
 - ⇒ The angle will be indicated on the intermediate value display 1 (19).
2. First, aim the device at the upper point (A) of the partial height to be measured and briefly press the **MEAS** button (7) to perform the measurement. The device automatically calculates the distances a, b, and c.
 - ⇒ The length of line segment a is displayed on the intermediate value display 2 (21).
 - ⇒ The length of line segment b is displayed on the intermediate value display 3 (22).
 - ⇒ The length of line segment c is indicated on the intermediate value display (23).



Switch-off

1. Press and hold the **Clear/Off** button (9) for 3 seconds.
 - ⇒ The device is switched off.

Maintenance and repair

Battery change

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

A battery change is required when the battery status indication displays an empty battery symbol or when the device can no longer be switched on (see chapter Inserting the battery).

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 fault indication (15) lights up if the distance cannot be determined correctly. Repeat the measurement on another surface with better reflective properties. If necessary, use a target plate.

In addition, the following fault indications may appear in the lower measurement value display:

Display	Cause	Remedy
204	Calculation error	Repeat the measurement. Pay attention to the measurement sequence and position of the device.
208	The reception of the reflected signal is too weak; the measuring time is too long; the distance to the target is > 50 m.	Repeat measurement on another surface with better reflective properties or use a target plate.
252	The temperature is too high.	Allow the device to cool down. Observe the permissible operating temperature according to the Technical data chapter.
253	The temperature is too low.	Heat up the device. Observe the permissible operating temperature according to the Technical data chapter.
255	Hardware fault	Repeatedly switch the device on and off. If the indication continues to appear, please contact the Trotec customer service.

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 is taken from Directive 2012/19/EU. It states that this device 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.

Trotec GmbH

Grebener Str. 7
D-52525 Heinsberg

☎ +49 2452 962-400

☎ +49 2452 962-200

✉ info@trotec.com

www.trotec.com