WEU

WEU

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2 609 140 621 (2011.07) O / 129 **WEU**

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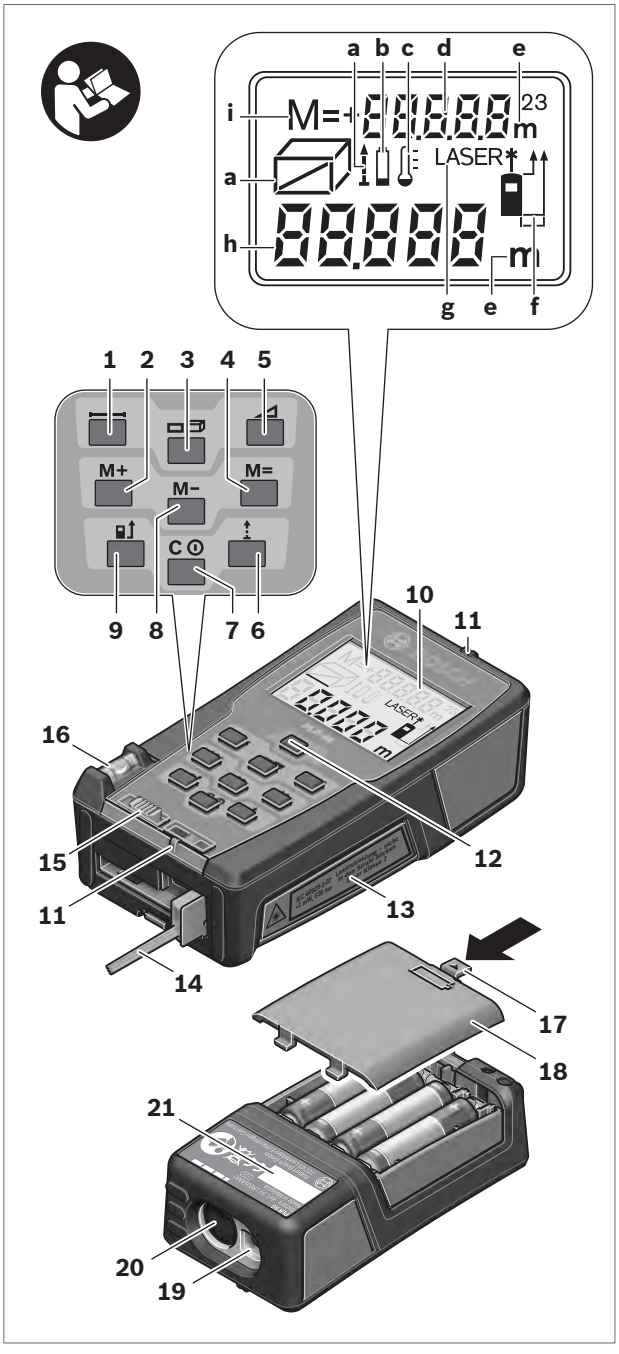
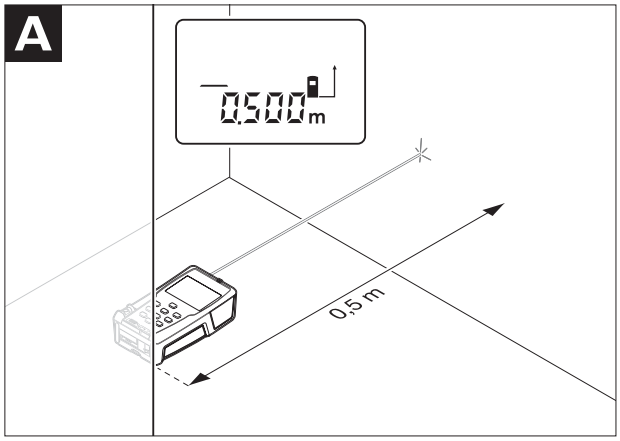
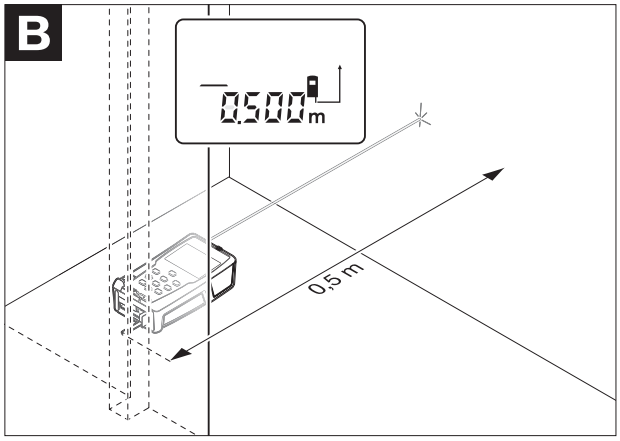
PLR 50

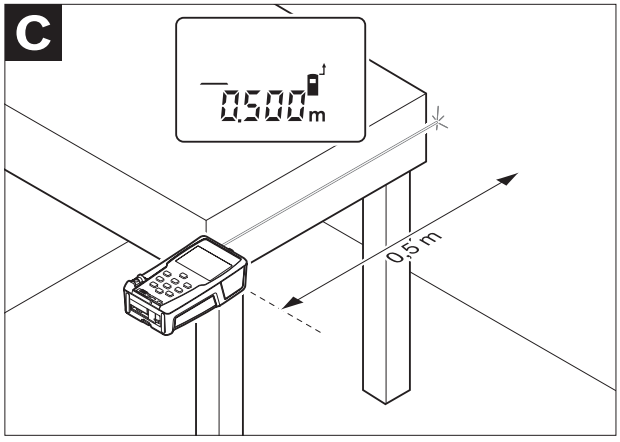
BOSCH

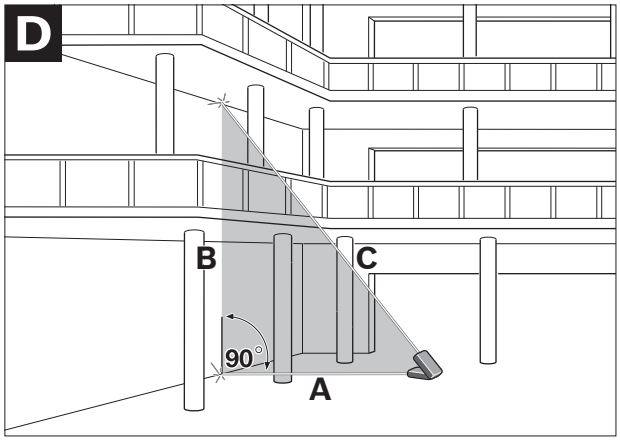
de Originalbetriebsanleitung
en Original instructions
fr Notice originale
es Manual original
pt Manual original
it Istruzioni originali
nl Oorspronkelijke gebruiksaanwijzing
da Original brugsanvisning
sv Bruksanvisning i original
no Original driftsinstruks
fi Alkuperäiset ohjeet
el Πρωτότυπο οδηγιών χρήσης
tr Orijinal işletme talimatı

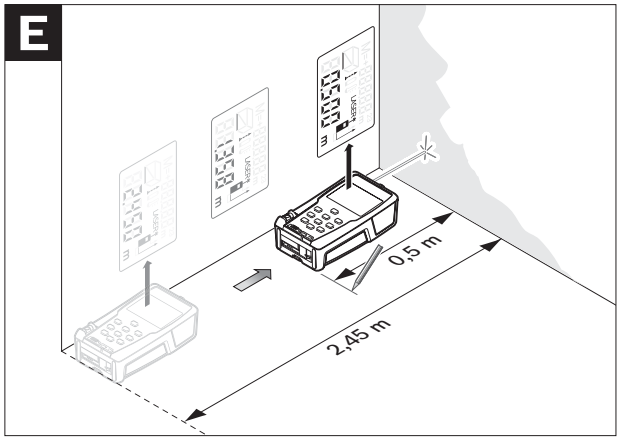


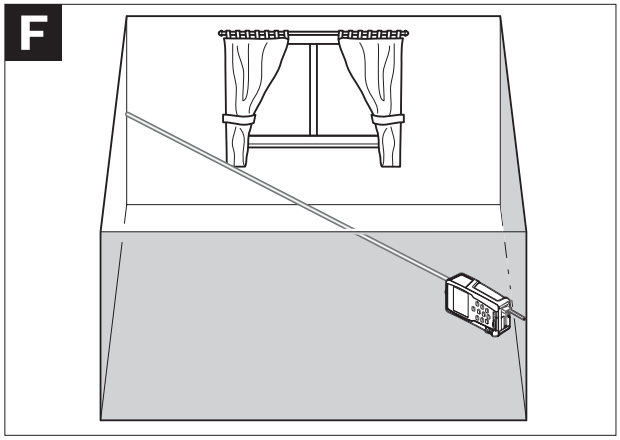












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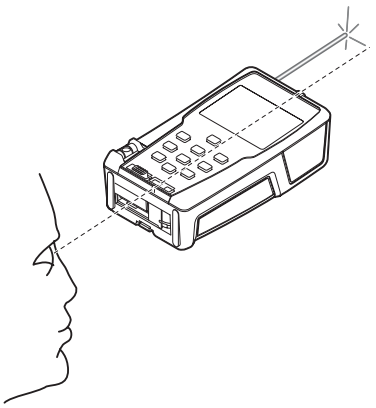

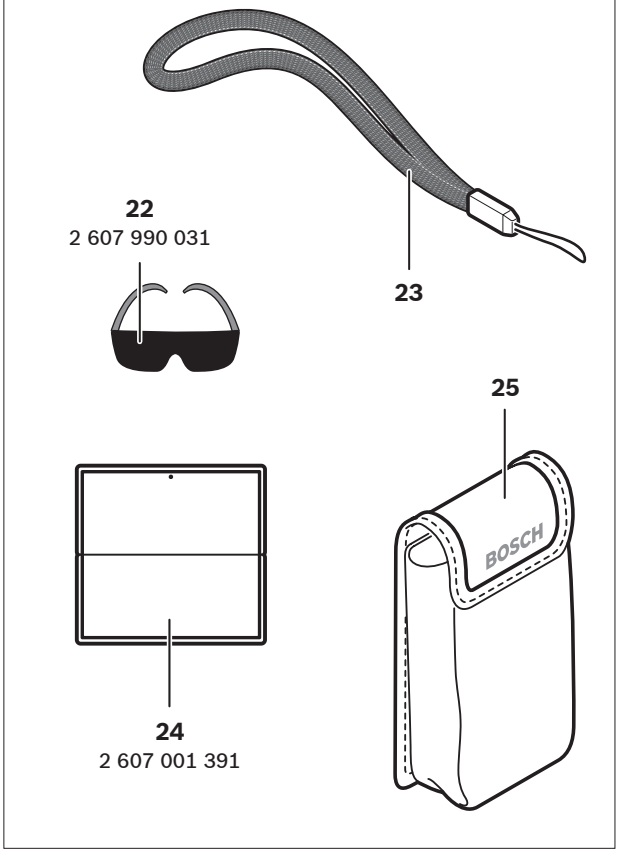

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Entsorgung

Messwerkzeuge, Zubehör und Verpackungen sollen einer umweltgerechten Wiederverwertung zugeführt werden.

Werfen Sie Messwerkzeuge und Akkus/Batterien nicht in den Hausmüll!

Nur für EU-Länder:

Gemäß der europäischen Richtlinie 2002/96/EG müssen nicht mehr gebrauchsfähige Messwerkzeuge und gemäß der europäischen Richtlinie 2006/66/EG müssen defekte oder verbrauchte Akkus/Batterien getrennt gesammelt und einer umweltgerechten Wiederverwendung zugeführt werden.

Nicht mehr gebrauchsfähige Akkus/Batterien können direkt abgegeben werden bei:
Deutschland
Recyclingzentrum Elektrowerkzeuge
Osteroder Landstraße 3
37589 Kalefeld
Schweiz
Batrec AG
3752 Wimmis BE

Änderungen vorbehalten.

English

Safety Notes

Working safely with the measuring tool is possible only when the operating and safety information are read completely and the instructions contained therein are strictly followed. Never make warning labels on the measuring tool unrecognisable. SAVE THESE INSTRUCTIONS.

- ▶ **Caution – The use of other operating or adjusting equipment or the application of other processing methods than those mentioned here, can lead to dangerous radiation exposure.**

- **The measuring tool is delivered with a warning label in German language (marked with the number 13 in the representation of the measuring tool on the graphic page).**

- **Before putting into operation for the first time, attach the supplied sticker in your national language over the German text on the warning label.**
- **Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself.** This measuring tool produces laser class 2 laser radiation according to IEC 60825-1. This can lead to persons being blinded.
- **Do not use the laser viewing glasses as safety goggles.** The laser viewing glasses are used for improved visualisation of the laser beam, but they do not protect against laser radiation.
- **Do not use the laser viewing glasses as sun glasses or in traffic.** The laser viewing glasses do not afford complete UV protection and reduce colour perception.
- **Have the measuring tool repaired only through qualified specialists using original spare parts.** This ensures that the safety of the measuring tool is maintained.
- **Do not allow children to use the laser measuring tool without supervision.** They could unintentionally blind other persons or themselves.
- **Do not operate the measuring tool in explosive environments, such as in the presence of flammable liquids, gases or dusts.** Sparks can be created in the measuring tool which may ignite the dust or fumes.

Product Description and Specifications

Intended Use

The measuring tool is intended for measuring distances, lengths, heights, clearances, and for the calculation of areas and volumes. The measuring tool is suitable for measuring indoors and outdoors.

Product Features

The numbering of the product features shown refers to the illustration of the measuring tool on the graphic page.

1 Length measurement button
2 Memory add button **“M+”**
3 Button for area and volume measurement
4 Memory retrieve button **“M=”**
5 Button for indirect length measurement
6 Tracking (continuous measurement) button
7 On/Off and memory delete button
8 Memory subtraction button **“M–”**
9 Button for selection of the reference level
10 Display
11 Alignment aid
12 Measuring button
13 Laser warning label

14 Positioning pin
15 Latch of the positioning pin
16 Spirit level
17 Latch of battery lid
18 Battery lid
19 Laser beam outlet
20 Reception lens
21 Serial number
22 Laser viewing glasses*
23 Carrying strap
24 Laser target plate*
25 Protective pouch

*** The accessories illustrated or described are not included as standard delivery.**

Display Elements

a Variable measuring functions
— Length measurement
Continuous measurement
Area measurement
Volume measurement
Indirect length measurement
b Battery low indicator
c Temperature warning
d Measured value/result
e Unit of measure
f Measurement reference level
g Laser switched on
h Individual measured value (for length measurement: result)
i Measured values stored

Technical Data

Digital Laser Rangefinder	PLR 50
Article number	3 603 K16 300
Measuring range	0.05 – 50 m[A)]
Measuring accuracy (typically)	±2.0 mm[B)]
Lowest indication unit	1 mm
Operating temperature	– 10 °C ... + 50 °C[C)]
Storage temperature	– 20 °C ... + 70 °C
Relative air humidity, max.	90 %
Laser class	2
Laser type	635 nm, < 1 mW
Laser beam diameter (at 25 °C) and at 10 m distance, approx.	6 mm
Batteries Rechargeable batteries	4 x 1.5 V LR03 (AAA) 4 x 1.2 V HR03 (AAA)
Battery live, approximately – Individual measurements – Continuous measurement	 30000[D)] 5 h[D)]
Weight according to EPTA-Procedure 01/2003	0.18 kg

Digital Laser Rangefinder	**PLR 50**
Dimensions	58 x 104 x 36 mm
Degree of protection (excluding battery compartment)	IP 54 (dust and splash water protected)

A) The working range increases depending on how well the laser light is reflected from the surface of the target (scattered, not reflective) and with increased brightness of the laser point to the ambient light intensity (interior spaces, twilight). In unfavourable conditions (e. g. when measuring outdoors at intense sunlight), it may be necessary to use the target plate.
B) In unfavourable conditions (e. g. at intense sunlight or an insufficiently reflecting surface), the maximum deviation is ±10 mm per 50 m. In favourable conditions, a deviation influence of ±0.05 mm/m must be taken into account.
C) In the continuous measurement function, the maximum operating temperature is + 40 °C.
D) Less measurements are possible when using 1.2 V rechargeable batteries than with 1.5 V batteries.
Please observe the article number on the type plate of your measuring tool. The trade names of the individual measuring tools may vary.
The measuring tool can be clearly identified with the serial number **21** on the type plate.

Assembly

Inserting/Replacing the Battery

Using alkali-manganese or rechargeable batteries is recommended for operation of the measuring tool.

Less measurements are possible when using 1.2 V rechargeable batteries than with 1.5 V batteries.

To open the battery lid **18**, press the latch **17** in the direction of the arrow and remove the battery lid. Insert the batteries/rechargeable batteries. When inserting, pay attention to the correct polarity according to the representation on the inside of the battery compartment.

When the battery symbol ▭ appears for the first time on the display, at least 100 measurements are still possible. When the battery symbol flashes, the batteries/rechargeable batteries must be replaced; measurements are no longer possible.

Always replace all batteries/rechargeable batteries at the same time. Do not use different brands or types of batteries/rechargeable batteries together.

- ▶ **Remove the batteries/rechargeable batteries from the measuring tool when not using it for longer periods.** When storing for longer periods, the batteries/rechargeable batteries can corrode and discharge themselves.

Operation

Initial Operation

- ▶ **Do not leave the switched on measuring tool unattended and switch the measuring tool off after use.** Other persons could be blinded by the laser beam.
- ▶ **Protect the measuring tool against moisture and direct sun light.**
- ▶ **Do not subject the measuring tool to extreme temperatures or variations in temperature.** As an example, do not leave it in vehicles for longer periods. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. In case of extreme temperatures or variations in temperature, the accuracy of the measuring tool can be impaired.
- ▶ **Avoid heavy impact to or falling down of the measuring tool.** After severe exterior effects to the measuring tool, it is recommended to carry out an accuracy check (see “Accuracy Check of the Measuring Tool”, page 24) each time before continuing to work.

Switching On and Off

To **switch on** the measuring tool, briefly press the On/Off button **7** or measuring button **12**. When switching on the measuring tool, the laser beam is not switched on yet.

To **switch off** the measuring tool, press the On/Off button **7** for a few seconds.

If none of the measuring tool buttons are pressed for approx. 5 minutes, the measuring tool switches off automatically in order to extend the service life of the battery.

When a measured value has been stored, it is retained in automatic switch-off mode. When switching on the measuring tool again, **"M"** is indicated in the display.

Measuring Procedure

After switching on, the measuring tool is in the length measurement mode. Other measuring modes can be switched to by pressing the respective function/mode button (see "Measuring Functions", page 20).

After switching on, the rear edge of the measuring tool is preset as the reference level for the measurement. To change the reference level, see "Selecting the Reference Level", page 20.

Upon selection of the measuring function and the reference level, all further steps are carried out by pushing the measuring button **12**.

With the reference level selected, place the measuring tool against the desired measuring line (e. g. a wall).

Push the measuring button **12** to switch on the laser beam.

► **Do not point the laser beam at persons or animals and do not look into the laser beam yourself, not even from a large distance.**

Aim the laser beam at the target surface. Push the measuring button **12** again to initiate the measurement.

In the tracking function, the measurement already starts upon first actuation of the measuring button **12**.

Typically, the measured value appears after 0.5 and latest after 4 seconds. The duration of the measurement depends on the distance, the light conditions and the reflection properties of the target surface. The end of the measurement is indicated by a signal tone. The laser beam is switched off automatically upon completion of the measurement.

When no measurement has taken place approx. 20 seconds after sighting, the laser beam is switched off automatically to save the batteries.

Selecting the Reference Level (see figures A – C)

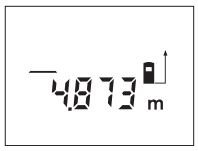
For measuring, you can select between three different reference levels:
- The rear measuring-tool edge (e. g. when measuring onward from a wall),
- The rear positioning-pin edge **14** (e. g. when measuring from a corner),
- The front measuring-tool edge (e. g. when measuring onward from a table edge).

To change the reference level, press button **9** until the requested reference level is indicated on the display. Each time after switching on the measuring tool, the rear end of the measuring tool is preset as the reference level.

Measuring Functions

Length Measurement

For length measurement, push button **1**. The indicator for length measurement appears in the display —.



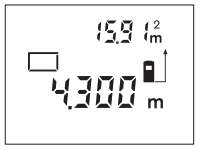
Push the measuring button **12** once for sighting and once more to take the measurement.

The measured value is indicated at the bottom in the display.

Area Measurement

For area/surface measurements, press button **3** until the indicator for area measurement ▭ appears on the display.

Afterwards, measure the length and the width, one after another, in the same manner as a length measurement. The laser beam remains switched on between both measurements.

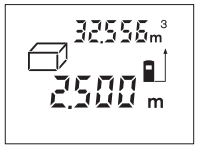


After taking the second measurement, the area/surface is automatically calculated and displayed. The last individual measured value is indicated at the bottom in the display, while the final result is shown at the top.

Volume Measurement

For volume measurements, press button **3** until the indicator for volume measurement ▱ appears on the display.

Afterwards, measure the length, width and the height, one after another, in the same manner as for a length measurement. The laser beam remains switched on between all three measurements.



After taking the third measurement, the volume is automatically calculated and displayed. The last individual measured value is indicated at the bottom in the display, while the final result is shown at the top.

Indirect Length Measurement (see figure D)

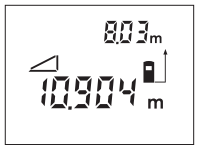
The indirect length measurement is used to measure distances that cannot be measured directly because an obstacle would obstruct the laser beam or no target surface is available as a reflector. Correct results are achieved only when the laser beam and the sought distance form an exact right angle (Pythagorean Theorem).

In the illustrated example, the length **B** is to be determined. For this purpose, **A** and **C** must be measured. **A** and **B** must form a right angle.

For indirect length measurements, press button **5**. The indicator for indirect length measurement appears on the display ◿.

Measure the distance **A** as for a length measurement. Pay attention that the line segement **A** and the sought distance **B** form a right angle. Afterwards, measure the distance **C**. The laser beam remains switched on between both measurements.

Pay attention that the reference point of the measurement (e.g., the rear edge of the measuring tool) is at the exact same location for both measurements.

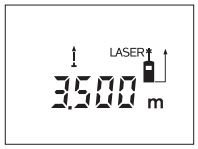


After completing the second measurement, the distance **B** is calculated automatically. The last individual measured value is indicated at the bottom in the display, while the final result **B** is indicated at the top.

Continuous Measurement (Tracking) (see figure E)

For continuous measurements, the measuring tool can be moved relative to the target, whereby the measuring value is updated approx. every 0.5 seconds. In this manner, as an example, you can move a certain distance away from a wall, while the actual distance can always be read.

For continuous measurements, push button **6**. The indicator for continuous measurement (tracking) appears in the display ⇢.



Press the measuring button **12** to initiate the measuring procedure. Move the measuring tool until the required distance value is indicated at the bottom of the display.

Pushing the measuring button **12** interrupts the continuous measurement. The current measured value is indicated in the display. Repeated pushing of the measuring button **12** starts the continuous measuring again.

Continuous measurement automatically switches off after 5 min. The last measured value remains indicated on the display. To cancel continuous measurement, you can change the measuring function by pressing button **1**, **3** or **5**.

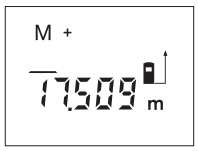
Deleting Measured Values

Briefly pressing button **7** deletes the last individual measuring value determined in all measuring functions. Briefly pressing the button repeatedly deletes the individual measured values in reverse order.

Memory Functions

When switching off the measuring tool, the value in the memory is retained.

Storing/Adding Measured Values



Push the memory add button **2** in order to store the current measured value – a length, area or volume value, depending on the current measuring function. As soon as a value has been stored, **“M”** is indicated in the display and the **“+”** behind it briefly flashes.

If a value is already stored in the memory, the new value is added to the memory contents, however, only when the measures of unit correspond.

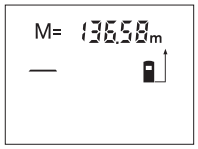
As an example, when an area value is in the memory and the current measured value is a volume value, the addition cannot take place. **“Error”** briefly flashes in the display.

Subtracting Measured Values

Push the memory subtraction button **8** in order to subtract the current measured value from the memory value. As soon as a value has been subtracted, **“M”** is indicated in the display and the **“–”** behind it briefly flashes.

If a value is already stored in the memory, the new measured value can be subtracted only when the measures of unit correspond (see “Storing/Adding Measured Values”).

Displaying the Stored Value



Push the memory retrieve button **4** in order to display the value stored in the memory. **“M=”** is indicated in the display. When the memory contents **“M=”** is indicated in the display, it can be doubled by pushing the memory add button **2** or set to zero by pushing the memory subtract button **8**.

Deleting the Memory

To delete the memory contents, first push the memory retrieve button **4**, so that **"M="** is indicated in the display. Then briefly press button **7**; **"M"** is no longer indicated in the display.

Working Advice

General Information

The reception lens **20** and the laser beam outlet **19** must not be covered when taking a measurement.

The measuring tool must not be moved while taking a measurement (with the exception of the continuous measurement function). Therefore, place the measuring tool, as far as this is possible, against or on the measuring points.

Measurement takes place at the centre of the laser beam, even when target surfaces are sighted at an incline.

Influence Effects on the Measuring Range

The measuring range depends upon the light conditions and the reflection properties of the target surface. For improved visibility of the laser beam when working outdoors and when the sunlight is intense, use the laser viewing glasses **22** (accessory) and the laser target plate **24** (accessory), or shade off the target surface.

Influence Effects on the Measuring Result

Due to physical effects, faulty measurements cannot be excluded when measuring on different surfaces. Included here are:

- Transparent surfaces (e.g., glass, water),
- Reflecting surfaces (e.g., polished metal, glass),
- Porous surfaces (e.g. insulation materials),
- Structured surfaces (e.g., roughcast, natural stone).

If required, use the laser target plate **24** (accessory) on these surfaces.

Also, air layers with varying temperatures or indirectly received reflections can affect the measured value.

Measuring with the Positioning Pin (see figures B and F)

The positioning pin **14** is suitable for measuring out of corners (diagonal within a space) or from hard to reach areas, such as from roller-shutter rails.

Slide the latch **15** of the positioning pin sideward in order to swivel out the pin.

Set the corresponding reference level for measurements with the positioning pin by pushing button **9**.

The positioning pin **14** swivels back in again by pushing it toward the housing to the stop. The pin automatically locks in place.

Aligning with the Spirit Level

The spirit level **16** allows for simple levelling of the measuring tool. This allows for easier sighting of target surfaces, especially over longer distances.

In combination with the laser beam, the spirit level **16** is not suitable for levelling.

Sighting with the Alingment Aid (see figure G)

With the alignment aid **11**, sighting over larger distances is a lot easier. For this, look alongside the aligning aid on the top side of the measuring tool. The laser beam runs parallel to this line of sight.

Troubleshooting – Causes and Corrective Measures

Cause	Corrective Measure
Temperature warning indicator (c) flashing; measurement not possible	
The measuring tool is outside the operating temperature range from – 10 °C to + 50 °C (in the function continuous measurement up to + 40 °C).	Wait until the measuring tool has reached the operating temperature
Battery low indicator (b) appears	
Battery voltage decreasing (measurement still possible)	Replace batteries/rechargeable batteries
Battery low indicator (b) flashing; measurement not possible	
Battery voltage too low	Replace batteries/rechargeable batteries
"Error" and "– – – –" indication in display	
The angle between the laser beam and the target is too acute.	Enlarge the angle between the laser beam and the target
The target surface reflects too intensely (e. g. a mirror) or insufficiently (e. g. black fabric), or the ambient light is too bright.	Work with the laser target plate **24** (accessory)
The laser beam outlet **19** or the reception lens **20** are misted up (e. g. due to a rapid temperature change).	Wipe the laser beam outlet **19** and/or the reception lens **20** dry using a soft cloth
Calculated value is greater than 99 999 $m/m^2/m^3$.	Divide calculation into intermediate steps
"Error" indication flashes at in display (top)	
Addition/Subtraction of measured values with different units of measure	Only add/subtract measured values with the same units of measure
Unreliable measuring result	
The target surface does not reflect correctly (e. g. water, glass).	Cover off the target surface
The laser beam outlet **19** or the reception lens **20** are covered.	Make sure that the laser beam outlet **19** or the reception lens **20** are unobstructed
Measuring result not plausible	
Wrong reference level set	Select reference level that corresponds to measurement
Obstruction in path of laser beam	Laser point must be completely on target surface.

The measuring tool monitors the correct function for each measurement. When a defect is determined, only the symbol shown aside flashes in the display. In this case, or when the above mentioned corrective measures cannot correct an error, have the measuring tool checked by an after-sales service agent for Bosch power tools.

Accuracy Check of the Measuring Tool

The accuracy of the measuring tool can be checked as follows:

– Select a permanently unchangeable measuring section with a length of approx. 3 to 10 metres; its length must be precisely known (e. g. the width of a room or a door opening). The measuring distance must be indoors; the target surface for the measurement must be smooth and reflect well.
– Measure the distance 10 times after another.

The deviation of the individual measurements from the mean value must not exceed ±3 mm (max.). Log the measurements, so that you can compare their accuracy at a later point of time.

Maintenance and Service

Maintenance and Cleaning

Store and transport the measuring tool only in the supplied protective pouch.

Keep the measuring tool clean at all times.

Do not immerse the measuring tool in water or other fluids.

Wipe off debris using a moist and soft cloth. Do not use any cleaning agents or solvents.

Maintain the reception lens **20** in particular, with the same care as required for eye glasses or the lens of a camera.

If the measuring tool should fail despite the care taken in manufacturing and testing procedures, repair should be carried out by an authorised after-sales service centre for Bosch power tools. Do not open the measuring tool yourself.

In all correspondence and spare parts orders, please always include the 10-digit article number given on the type plate of the measuring tool.

In case of repairs, send in the measuring tool packed in its protective pouch **25**.

After-sales Service and Customer Assistance

Our after-sales service responds to your questions concerning maintenance and repair of your product as well as spare parts. Exploded views and information on spare parts can also be found under:
www.bosch-pt.com
Our customer service representatives can answer your questions concerning possible applications and adjustment of products and accessories.

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Disposal

Measuring tools, accessories and packaging should be sorted for environmental-friendly recycling.

Do not dispose of measuring tools and batteries/rechargeable batteries into household waste!

Only for EC countries:

According to the European Guideline 2002/96/EC, measuring tools that are no longer usable, and according to the European Guideline 2006/66/EC, defective or used battery packs/batteries, must be collected separately and disposed of in an environmentally correct manner.