

#### **Robert Bosch GmbH**

Power Tools Division 70745 Leinfelden-Echterdingen Germany

#### www.bosch-pt.com

**2 609 140 773** (2011.08) 0 / 190 XXX



# **GLM 50** Professional

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

- pl Instrukcja oryginalna
- cs Původní návod k používánísk Pôvodný návod na použitie
- hu Eredeti használati utasítás
- ru Оригинальное руководство по эксплуатации
- **ик** Оригінальна інструкція з експлуатації
- ro Instrucțiuni originale
- **bg** Оригинална инструкция
- sr Originalno uputstvo za rad
- sl Izvirna navodila
- hr Originalne upute za rad
- et Algupärane kasutusjuhend

- lv Instrukcijas oriģinālvalodā
- It Originali instrukcija
- cn 正本使用说明书
- tw 正本使用說明書
- ko 사용 설명서 원본
- تعليمات التشغيل الأصلية ar
- راهنمای طرز کار اصلی fa

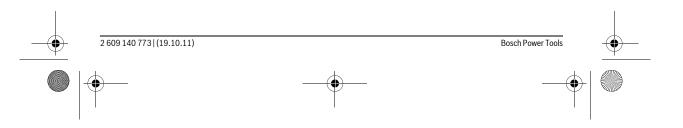


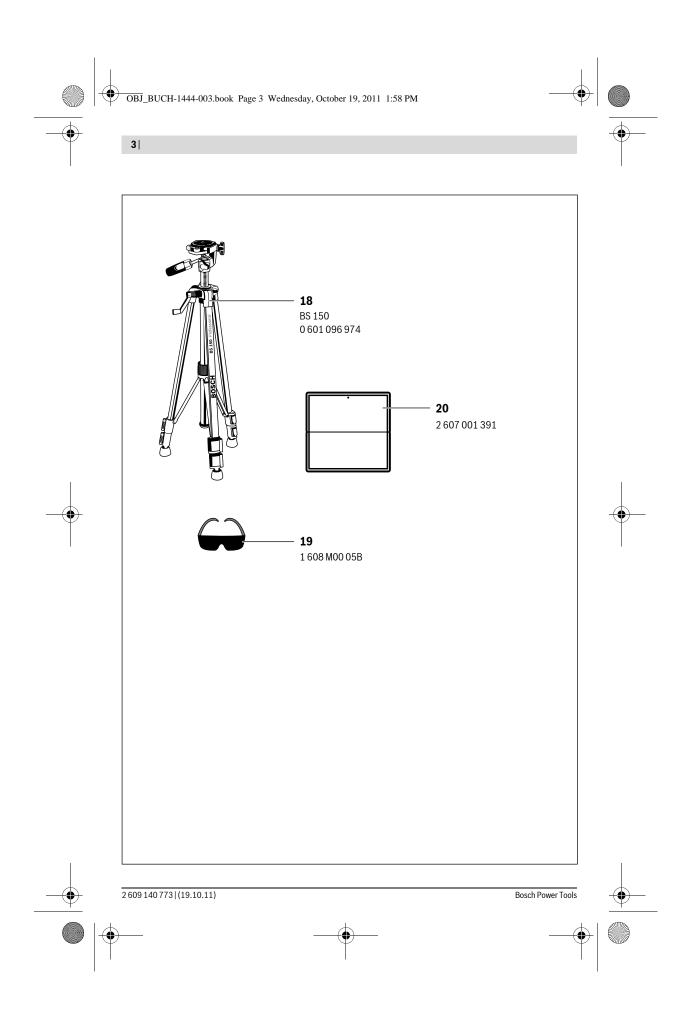
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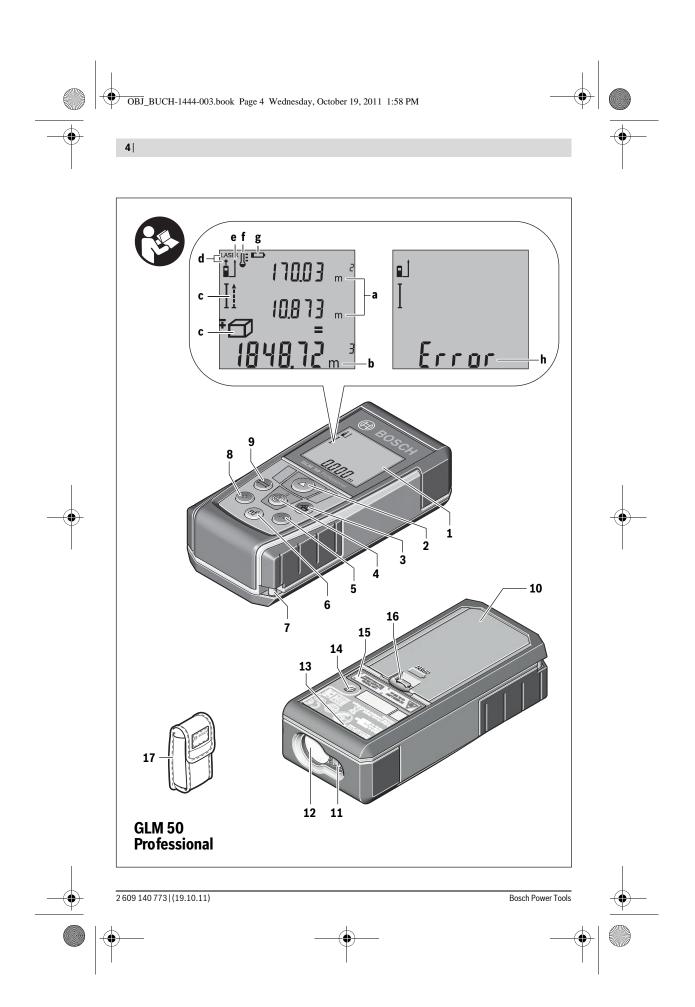


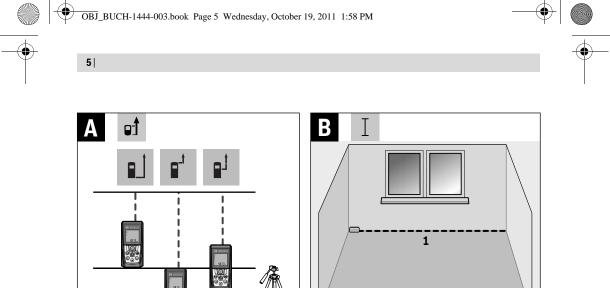
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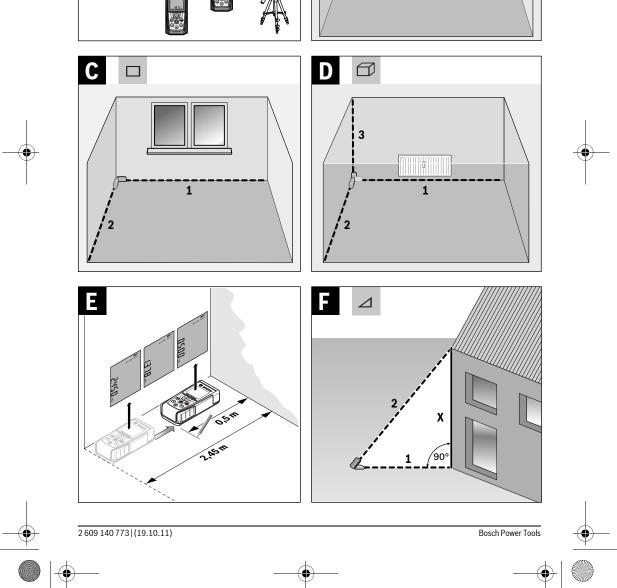
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# Wartung und Service

#### Wartung und Reinigung

Lagern und transportieren Sie das Messwerkzeug nur in der mitgelieferten Schutztasche.

Halten Sie das Messwerkzeug stets sauber.

Tauchen Sie das Messwerkzeug nicht ins Wasser oder andere Flüssigkeiten.

Wischen Sie Verschmutzungen mit einem feuchten, weichen Tuch ab. Verwenden Sie keine Reinigungs- oder Lösemittel. Pflegen Sie insbesondere die Empfangslinse **12** mit der glei-

chen Sorgfalt, mit der Brille oder Linse eines Fotoapparats behandelt werden müssen.

Sollte das Messwerkzeug trotz sorgfältiger Herstellungs- und Prüfverfahren einmal ausfallen, ist die Reparatur von einer autorisierten Kundendienststelle für Bosch-Elektrowerkzeuge ausführen zu lassen. Öffnen Sie das Messwerkzeug nicht selbst.

Geben Sie bei allen Rückfragen und Ersatzteilbestellungen bitte unbedingt die 10-stellige Sachnummer laut Typenschild des Messwerkzeugs an.

Senden Sie im Reparaturfall das Messwerkzeug in der Schutztasche **17** ein.

#### Kundendienst und Kundenberatung

Der Kundendienst beantwortet Ihre Fragen zu Reparatur und Wartung Ihres Produkts sowie zu Ersatzteilen. Explosionszeichnungen und Informationen zu Ersatzteilen finden Sie auch unter:

#### www.bosch-pt.com

Das Bosch-Kundenberater-Team hilft Ihnen gerne bei Fragen zu Kauf, Anwendung und Einstellung von Produkten und Zubehören.

**www.powertool-portal.de**, das Internetportal für Handwerker und Heimwerker.

www.ewbc.de, der Informations-Pool für Handwerk und Ausbildung.

#### Deutschland

Robert Bosch GmbH Servicezentrum Elektrowerkzeuge Zur Luhne 2 37589 Kalefeld – Willershausen Tel. Kundendienst: +49 (1805) 70 74 10\* Fax: +49 (1805) 70 74 11\* (\*Festnetzpreis 14 ct/min, höchstens 42 ct/min aus Mobilfunknetzen) E-Mail: Servicezentrum.Elektrowerkzeuge@de.bosch.com Tel. Kundenberatung: +49 (1803) 33 57 99 (Festnetzpreis 9 ct/min, höchstens 42 ct/min aus Mobilfunknetzen) Fax: +49 (711) 7 58 19 30 E-Mail: kundenberatung.ew@de.bosch.com

#### Österreich

Tel.: +43 (01) 7 97 22 20 10 Fax: +43 (01) 7 97 22 20 11 E-Mail: service.elektrowerkzeuge@at.bosch.com

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#### Schweiz

Tel.: +41 (044) 8 47 15 11 Fax: +41 (044) 8 47 15 51

#### Luxemburg

Tel.: +32 2 588 0589 Fax: +32 2 588 0595 E-Mail: outillage.gereedschap@be.bosch.com

#### 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 ei-

ner umweltgerechten Wiederverwendung zugeführt werden. Nicht mehr gebrauchsfähige Akkuzellen/Batterien können direkt abgegeben werden bei:

#### Deutschland

Recyclingzentrum Elektrowerkzeuge Osteroder Landstraße 337589 Kalefeld **Schweiz** Batrec AG

3752 Wimmis BE

Änderungen vorbehalten.

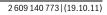
# English

### 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.



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The measuring tool is delivered with a warning label in English language (marked with the number 15 in the representation of the measuring tool on the graphic page).



- 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

Please unfold the fold-out page with the representation of the measuring tool and leave it unfolded while reading the operating instructions.

#### **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.

#### **Technical Data**

Digital Laser Rangefinder	GLM 50
	Professional
Article number	3 601 K72 2
Measuring range	0.05-50 m <sup>A)</sup>
Measuring accuracy (typically)	±1.5 mm <sup>B)</sup>
Lowest indication unit	1 mm
Operating temperature	– 10 °C + 50 °C <sup>C)</sup>
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) approx.	
– at 10 m distance	6 mm
– at 50 m distance	35 mm
Automatic switch-off after approx.	
- Laser	20 s
<ul> <li>Measuring tool (without measurement)</li> </ul>	5 min
Batteries	2 x 1.2 V LR03 (AAA)
Rechargeable batteries	2 x 1.2 V HR03 (AAA)
Battery live, approximately	
<ul> <li>Individual measurements</li> </ul>	10000 <sup>D)</sup>
<ul> <li>Continuous measurement</li> </ul>	2.5 h <sup>D)</sup>
Weight according to EPTA-Procedure 01/2003	0.14 kg
Dimensions	53 x 114 x 30 mm
Degree of protection	IP 54 (dust and splash water protected)

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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) For measurements from the rear measuring-tool edge. In unfavourable conditions (e. g. at intense sunlight or an insufficiently reflecting surface), the maximum deviation is  $\pm 10$  mm per 50 m. In favourable conditions, a deviation influence of  $\pm 0.05$  mm/m must be taken into account.

C) In the continuous measurement function, the maximum operating temperature is + 40  $^\circ$ C.

D) Less measurements are possible when using 1.2 V rechargeable batteries than with 1.5 V batteries. The battery life listed refers to measurements without display illumination.

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 **13** on the type plate.

#### **Product Features**

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

- 1 Display
- 2 Measuring button
- **3** Button for area/surface, volume and indirect height measurement (Pythagoras)
- 4 Delete / On/Off button \*\*
- 5 Minus button
- 6 Button for selection of the reference level
- 7 Fixture for carrying strap
- 8 Plus button
- 9 Length and continuous measurement button
- 10 Battery lid
- 11 Laser beam outlet
- 12 Reception lens
- 13 Serial number
- 14 1/4" thread
- 15 Laser warning label
- 16 Latch of battery lid
- 17 Protective pouch
- 18 Tripod\*
- 19 Laser viewing glasses\*
- 20 Laser target plate\*
- \* The accessories illustrated or described are not included as standard delivery.
- \*\* Keep button pressed to call up the extended functions.

#### **Display Elements**

- a Measured-value lines
- b Result line
- c Measuring functions
  - Length measurement
  - Continuous measurement
- Area/surface measurement
- Volume measurement
- ∠ Simple Pythagoras Measurement
- d Laser, switched on
- e Measurement reference level
- f Temperature warning

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- **g** Battery low indicator
- h "ERROR" indication

#### 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  $1.2\,\rm V$  rechargeable batteries than with  $1.5\,\rm V$  batteries.

To open the battery lid **10**, press the latch **16** 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 inserting the batteries/rechargeable batteries, pay attention to the correct polarity according to the representation on the inside of the battery compartment.

When the battery symbol  $\square$  appears for the first time on the display, at least 100 individual measurements are still possible. The continuous measurement mode is deactivated.

When the battery symbol  $rac{}$  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 oper-

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ation. 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 Distance Measurement", page 16) each time before continuing to work.

#### Switching On and Off

For **switching on** the measuring tool, the following possibilities are given:

- Pressing the On/Off button 4: The measuring tool is switched on and is in length measurement mode. The laser is not activated.
- Pressing the measuring button 2: Measuring tool and laser are switched on. The measuring tool is in length measurement mode.
- 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.

To **switch off** the measuring tool, press the On/Off button **4** for a few seconds.

When no button on the measuring tool is pressed for approx. 5 minutes, the measuring tool automatically switches off to save the batteries.

#### **Measuring Procedure**

After switching on by pressing the measuring button **2**, the measuring tool is always in length measurement mode. Other measuring modes can be switched to by pressing the respective function/mode button (see "Measuring Functions", page 14).

After switching on, the rear edge of the measuring tool is preset as the reference level for the measurement. By pressing the reference level button **6**, the reference level can be changed (see "Selecting the Reference Level", page 14).

Place the measuring tool with the selected reference plane against the desired starting point of the measurement (e.g. a wall).

Briefly press the measuring button  ${\bf 2}$  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. Briefly press the measuring button **2** again to initate the measurement.

In the continuous measurement mode, the measurement begins immediately upon switching on the function.

Typically, the measured value appears after 0.5 seconds 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 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 figure A)

For the measurement, you can select between three different reference planes:

- The rear measuring-tool edge (e.g. when measuring onward from a wall),
- The front measuring-tool edge (e.g. when measuring onward from a table edge),
- The centre of thread **14** (e.g. for tripod measurements).

To select the reference level, press button  $\mathbf{6}$  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.

#### **Display Illumination**

The display illumination is automatically activated, depending on the ambient brightness. When no button is pressed after the display illumination switches on, it is dimmed to save the batteries.

#### **Measuring Functions**

#### Simple Length Measurement (see figure B)

For length measurements, press button  ${\bf 9}$  until the "length measurement" indication  $\underline{I}$  appears on the display.



To switch the laser on and for measuring, briefly press the measuring button **2** once each time.

**4813** The measured value is displayed in the result line **b**.

For several subsequent length measurements, the last measured results are displayed in the measured-value lines **a**.

#### Area Measurement (see figure C)

For area/surface measurements, press button  ${\bf 3}$  until the indicator for area/surface measurement  $\square$  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.



Upon completion of the second measurement, the surface is automatically calculated and displayed in the result line **b**. The individual measured values are displayed in the measured-value lines **a**.

#### Volume Measurement (see figure D)

For volume measurements, press button  $\mathbf{3}$  until the indicator for volume measurement  $\square$  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.

Upon completion of the third measurement, the volume is automatically calculated and displayed in the result line **b**. The individual measured values are displayed in the measured-value lines **a**.

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Values above 999999 m<sup>3</sup> cannot be indicated; "ERROR" appears on the display. Divide the volume to be measured into individual measurements; their values can then be calculated separately and then summarized.

#### 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, press button 9 until the indicator for continuous measurement 1 appears on the display. To start the continuous measurement, press the measuring button 2.



The current measured value is displayed in the result line **b**.

Pressing the measuring button 2 ends the continuous measurement. The last measured value is displayed in the result line **b**. Pressing the measuring button 2 again restarts a continuous measuring run.

Continuous measurement automatically switches off after 5 min. The last measured value remains indicated in the result line b.

#### Indirect height measurement / Simple Pythagoras Measurement (see figure F)

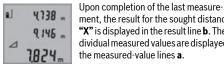
The indirect height measurement is used to measure distances that cannot be measured directly because an obstacle would obstruct the laser beam or no target surface is available as a reflector. Correct results are achieved only when the right angles required for the respective measurement are exactly adhered to (Pythagorean Theorem).

Pay attention that the reference plane of the measurement (e.g. the rear edge of the measuring tool) remains exactly at the same location for all individual measurements within a measuring sequence.

The laser beam remains switched on between the individual measurements

Press button 3 until the indication for simple Pythagoras measurement ightarrow appears on the display.

Measure distances "1" and "2" in this sequence as for a length measurement. Pay attention that a right angle exists between distance "1" and the sought distance "X".



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ment, the result for the sought distance "X" is displayed in the result line b. The individual measured values are displayed in the measured-value lines a.

#### **Deleting Measured Values**

Briefly pressing button 4 deletes the last individual measuring value determined in all measuring functions. Briefly pressing the button repeatedly deletes the individual measured values in reverse order.

#### **Adding Measured Values**

To add measuring values, firstly carry out a measurement. Then press the plus button 8. For confirmation, "+" appears on the display.

To add volumes or areas/surfaces, press the plus button 8 after the first completed measuring process. For confirmation, **'+"** appears on the display left of the volume/area symbol. Then carry out a second measurement.



To call up the sum of both measurements, press the plus button 8 again. The calculation is indicated in the measured-value lines **a**, and the sum in the result line **b**. After calculation of the sum, further

measured values can be added to this result when pressing the plus button 8 prior to each measurement.

Notes on the addition:

- Mixed length, area/surface and volume values cannot be added together. For example, when a length and area value are added, "ERROR" briefly appears on the display after pressing the plus button 8. Afterwards, the measuring tool switches back to the last active measuring mode.
- For each calculation, the result of one measurement is added (e.g. the volume value): for continuous measurements, this would be the displayed measured value in result line **b**. The addition of individual measured values from the measured-value lines a is not possible.

#### **Subtracting Measured Values**



To subtract measuring values, press minus button 5; For confirmation, "-" is indicated on the display. The further procedure is analog to "Adding Measured Values".

#### Working Advice

#### General Information

The reception lens 12 and the laser beam outlet 11 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 a firm stop or supporting surface.

#### 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 19 (accessory) and the laser target plate 20 (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),

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- Structured surfaces (e.g., roughcast, natural stone).

If required, use the laser target plate **20** (accessory) on these surfaces.

Furthermore, faulty measurements are also possible when sighting inclined target surfaces.

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

#### Accuracy Check of the Distance Measurement

The accuracy of the distance measurement can be checked as follows:

- Select a permanently unchangeable measuring section with a length of approx. 1 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  $\pm 2$  mm (max.). Log the measurements, so that you can compare their accuracy at a later point of time.

#### Working with the Tripod (Accessory)

The use of a tripod is particularly necessary for larger distances. Position the measuring tool with the 1/4" thread **14** onto the quick-change plate of the tripod **18** or a commercially available camera tripod. Tighten the measuring tool with the locking screw of the quick-change plate.

Set the corresponding reference level for measurement with a tripod by pushing button **6** (the reference level is the thread).

#### Troubleshooting - Causes and Corrective Measures

# Cause Corrective Measure Temperature warning indicator (f) flashing; measurement not possible

The measuring tool is outside the Wait until the measuring operating temperature range from tool has reached the op-  $10 \degree$ C to +  $50 \degree$ C (in the function erating temperature continuous measurement up to +  $40 \degree$ C).

#### "ERROR" indication in the display

	•
Addition/Subtraction of measured values with different units of measure	
The angle between the laser beam and the target is too acute.	Enlarge the angle be- tween the laser beam and the target
The target surface reflects too in- tensely (e.g. a mirror) or insuffi- ciently (e.g. black fabric), or the ambient light is too bright.	Work with the laser tar- get plate <b>20</b> (accessory)

Cause	Corrective Measure	
The laser beam outlet <b>11</b> or the re- ception lens <b>12</b> are misted up (e.g. due to a rapid temperature change).	Wipe the laser beam out- let <b>11</b> and/or the recep- tion lens <b>12</b> dry using a soft cloth	
Calculated value is greater than $999999 \text{ m/m}^2/\text{m}^3$ .	Divide calculation into intermediate steps	
Measuring result not plausible		
The target surface does not reflect correctly (e.g. water, glass).	Cover off the target sur- face	
The laser beam outlet <b>11</b> or the reception lens <b>12</b> are covered.	Make sure that the laser beam outlet <b>11</b> or the re- ception lens <b>12</b> are un- obstructed	
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 indication remains unchanged or the measuring tool reacts unexpected after pressing a button		
Software error	Remove the batteries	

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

ing them.

and start the measuring

tool again after reinsert-

measuring tool checked by an after-sales service agent for Bosch power tools.

# **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 **12** 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 **17**.

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#### 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.

#### **Great Britain**

Robert Bosch Ltd. (B.S.C.) P.O. Box 98 Broadwater Park North Orbital Road Denham Uxbridge UB 9 5HJ Tel. Service: +44 (0844) 736 0109 Fax: +44 (0844) 736 0146 E-Mail: boschservicecentre@bosch.com

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