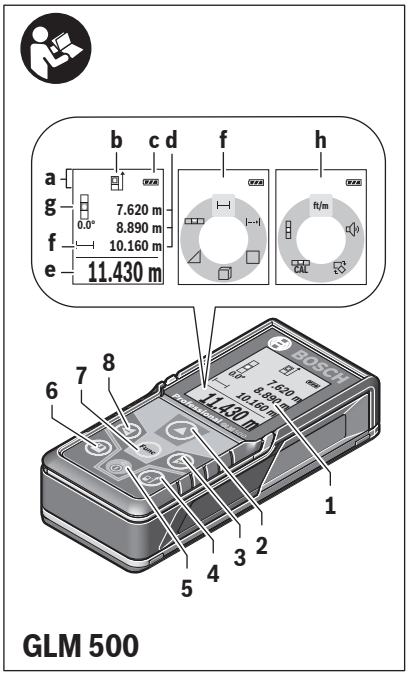
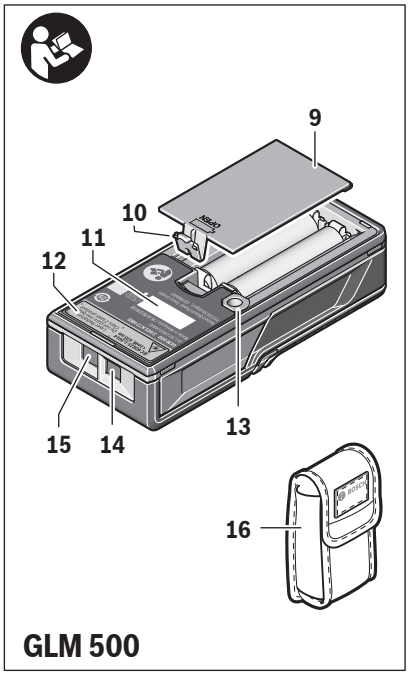
DISTANCE METER LASER 50M BOSCH

USER MANUAL

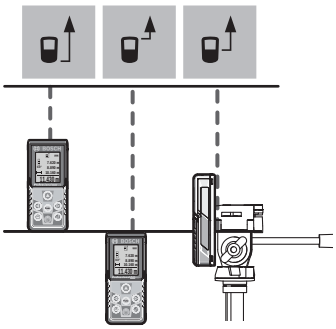


GLM 500

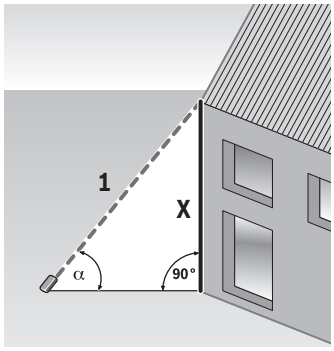


GLM 500

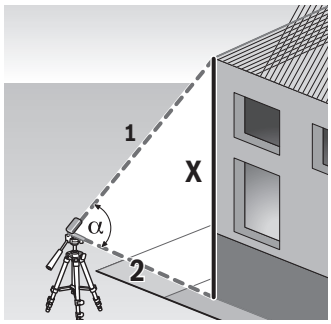
A



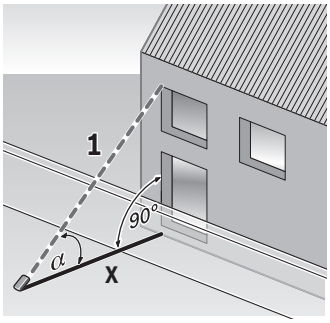
B



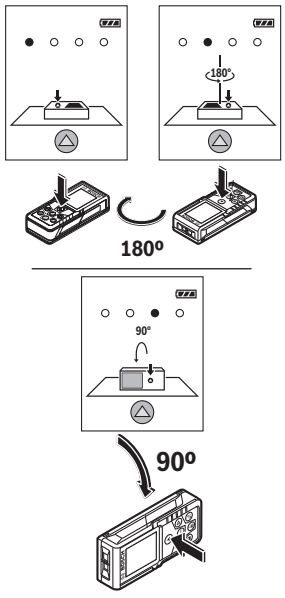
C



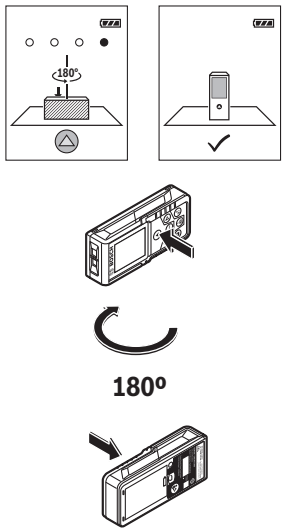
D



E 1



E 2



Safety Notes

All instructions must be read and observed in order to work safely with the measuring tool. The integrated protections in the measuring tool may be compromised if the measuring tool is not used in accordance with the instructions provided. Never make warning signs on the measuring tool unrecognisable. STORE THESE INSTRUCTIONS IN A SAFE PLACE AND INCLUDE THEM WITH THE MEASURING TOOL WHEN GIVING IT TO A THIRD PARTY.

- ▶ **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 provided with a warning label (marked with number 12 in the representation of the measuring tool on the graphics page).**

- ▶ **If the text of the warning label is not in your national language, stick the provided warning label in your national language over it before operating for the first time.**

Do not direct the laser beam at persons or animals and do not stare into the direct or reflected laser beam yourself, not even from a distance. You could blind somebody, cause accidents or damage your eyes.

- ▶ **If laser radiation strikes your eye, you must deliberately close your eyes and immediately turn your head away from the beam.**
- ▶ **Do not make any modifications to the laser equipment.**
- ▶ **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.

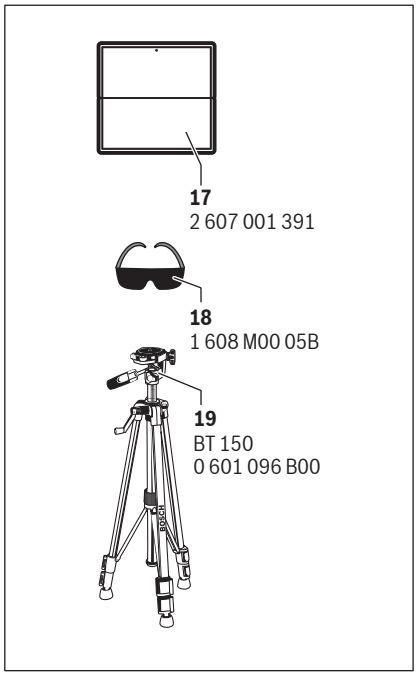
Product Description and Specifications

Intended Use

The measuring tool is intended for measuring distances, lengths, heights, clearances and inclines, and for calculating areas and volumes.

Technical Data

Digital Laser Measure	GLM 500		
Article number 3 601 K72 …	… H50	… HK0	… HC0



17
2 607 001 391

18
1 608 M00 05B

19
BT 150
0 601 096 B00

Digital Laser Measure	GLM 500		
Setting the unit of measure	m, cm	m, cm, ft, in (fractions), ft/in (fractions)	m, cm, Taiwan ft
Measuring range (typical)	0.05 – 50 m[A)]		
Measuring range (typical under unfavourable conditions)	20 m[B)]		
Measuring accuracy (typical)	± 1.5 mm[A)]		
Measuring accuracy (typical under unfavourable conditions)	± 3.0 mm[B)]		
Lowest indication unit	0.5 mm		
Indirect Distance Measurement and Vial			
Measuring range	0° – 360° (4x90°)		
Gradient measurement			
Measuring range	0° – 360° (4x90°)		
Measuring accuracy (typical)	± 0.2°[C)/D)/G)]		
Lowest indication unit	0.1°		
General			
Operating temperature	– 10 °C … + 45 °C[E)]		
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 – at 50 m distance	 9 mm[D)] 45 mm[D)]		
Automatic switch-off after approx. – Laser – Measuring tool (without measurement)	 20 s 5 min		
Weight according to EPTA-Procedure 01:2014	0.10 kg		
Dimensions	106 x 45 x 24 mm		
Degree of protection	IP 54 (dust and splash proof)[F)]		
Batteries	2 x 1.5 V LR03 (AAA)		
Rechargeable batteries	2 x 1.2 V HR03 (AAA)		
Setting the sound	●		

A) For measurements from the front edge of the measuring tool, applies to high reflectivity of the target (e.g. a white-painted wall), weak backlighting and 25 °C operating temperature. In addition, a deviation of ± 0.05 mm/m must be taken into account.

B) For measurements from the rear measuring tool edge, applies to high reflectivity of the target (e. g. white cardboard), strong backlighting and – 10 °C to + 45 °C operating temperature. In addition, a deviation influence of ± 0.15 mm/m must be taken into account.

C) After user calibration at 0 ° and 90 °; An additional grade error of ± 0.01 °/degree to 45 ° (max.) has to be taken into account. The left-hand side of the measuring tool serves as the reference level for grade measurement.

D) At 25 °C operating temperature

E) In the continuous measurement function, the maximum operating temperature is + 40 °C.

F) except battery compartment

G) The left-hand side of the measuring tool serves as the reference level for grade measurement.

The measuring tool can be clearly identified with the serial number **11** 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 Plus button [**+**]
4 Button for selection of the reference level
5 On/Off button [⏻]
6 Menory button [💾]
7 Function button [**Func**]
8 Minus button [**–**]
9 Battery lid
10 Latch of battery lid
11 Serial number
12 Laser warning label
13 1/4"- Tripod socket
14 Reception lens
15 Laser beam outlet
16 Protective pouch*
17 Laser target plate*
18 Laser viewing glasses*
19 Tripod*

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

Display Elements (selection)

a Status bar
b Measurement reference level
c Battery indicator
d Measured-value lines
e Result line
f Measuring functions
g Display tilt angle
h Basic configurations

Assembly

Inserting/Replacing the Batteries

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

With 1.2-V-rechargeable batteries fewer measurements could be possible than with 1.5-V-batteries.

To open the battery lid **9**, press the latch **10** 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 empty battery symbol appears on the display, then approx. 100 measurements are still possible. When the battery symbol is empty and flashes red, no further measurements are possible. Change the batteries or rechargeable batteries.

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 self-discharge.

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 a long time. 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 Distance Measurement”, page 36) each time before continuing to work.

Switching On and Off

– To **switch on** the measuring tool and the laser, briefly press the measuring button **2** [▲].
– To **switch on** the measuring tool without the laser, briefly press the On/Off button **5** [⏻].

► **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 and hold the On/Off button **5** [⏻].

The measured values and device settings in the memory are retained when you switch the tool off.

Measuring Procedure

Once switched on, the measuring tool is in the length measurement function. For a different measuring function, press the button **7** [**Func**]. Select the desired measuring function with the buttons **3** [**+**] or the button **8** [**–**] (see “Measuring Functions”, page 24). Activate the measuring function with button **7** [**Func**] or with the measuring button **2** [▲].

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 23.

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

Note: If the measuring tool has been switched on using the On/Off button **5** [⏻], briefly press the measuring button **2** [▲] to switch the laser on.

To initiate the measurement, briefly press the measuring button **2** [▲]. Then the laser beam is switched off. For a further measurement, repeat this process.

► **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.**

Note: The measured value typically appears within 0.5 s and no later than approx. 4 s. The duration of the measurement depends on the distance, the lighting conditions and the reflective properties of the target surface. Upon completion of the measurement the laser beam is automatically switched off.

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 **13** (e. g. for tripod measurements).

To select the reference level, press button **4**. Use button **3** [**+**] or button **8** [**–**] or button **4** to select the desired reference level. The rear edge of the measuring tool is pre-set as the reference level every time the measuring tool is switched on.

“Basic Settings”

To enter the “basic configurations” menu (**h**) press and hold the button **7** [**Func**].

Select the respective basic configuration and your setting.

To exit the “basic configurations” menu, press the On/Off button **5** [⏻] again.

Display Illumination

The display illumination is continuously switched on. When no button is pressed, the display illumination is dimmed after approx. 20 seconds to preserve the batteries/rechargeable batteries.

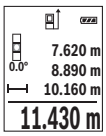
Measuring Functions

Length Measurement

Select the length measurement ⊢⊣ .

To switch on the laser beam, briefly press the measuring button **2** [▲].

To measure, briefly press the measuring button **2** [▲]. The measured value will be shown at the bottom of the display.



Repeat the above-mentioned steps for each subsequent measurement. The last measured value is at the bottom of the display, the penultimate measured value is above it, and so on.

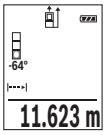
Continuous Measurement (Tracking)

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.

Select the continuous measurement ⊢⋯⊣ .

To switch on the laser beam, briefly press the measuring button **2** [▲].

Move the measuring tool until the required distance value is indicated in the bottom of the display.



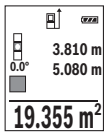
Briefly pressing the measuring button **2** [▲] interrupts the continuous measurement. The current measured value will be shown at the bottom of the display. Pressing the measuring button **2** [▲] once more restarts the continuous measurement.

Continuous measurement automatically switches off after 5 mins.

Area Measurement

Select the area measurement ▭ .

Then measure the width and length one after the other as with a length measurement. The laser beam remains switched on between the two measurements. The distance to be measured flashes in the indicator for area measurement ▭ .

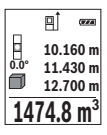


The first measured value is shown at the top of the display.
After the second measurement has been completed, the area will be automatically calculated and displayed. The end result is shown at the bottom of the display, while the individual measured values are shown above it.

Volume Measurement

Select the volume measurement ⬚ .

Then measure the width, length and depth one after the other as with a length measurement. The laser beam remains switched on between the three measurements. The distance to be measured flashes in the indicator for volume measurement ⬚ .



The first measured value is shown at the top of the display.
After the third measurement has been completed, the volume will be automatically calculated and displayed. The end result is shown at the bottom of the display, while the individual measured values are shown above it.

Indirect Distance Measurement

For indirect length measurements, three measuring modes are available. Each measuring mode can be used for determining different distances.

The indirect distance 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. This measuring procedure can only be used in vertical direction. Any deviation in horizontal direction leads to measuring errors.

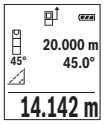
Note: Indirect distance measurement is always less accurate than direct distance measurement. Depending on application, greater measuring errors are possible than with direct distance measurement. To improve the measuring accuracy, we recommend using a tripod (accessory).

The laser beam remains switched on between the individual measurements.

a) Indirect Height Measurement (see figure B)

Select the indirect height measurement .

Ensure that the measuring tool is at the same height as the lower measuring point. Then tilt the measuring tool around the reference level and measure the distance **“1”** as for a length measurement (displayed as a red line).



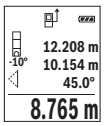
Upon completion of the measurement, the result for the sought distance **“X”** is displayed in the result line **e**. The measuring values for the distance **“1”** and the angle **“α”** are displayed in the measured-value lines **d**.

b) Double indirect Height Measurement (see figure C)

The measuring tool can indirectly measure all distances, which lie in the vertical level of the measuring tool.

Select the double indirect height measurement .

Measure distances **“1”** and **“2”** in this sequence as for a length measurement.



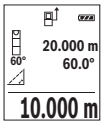
Upon completion of the measurement, the result for the sought distance **“X”** is displayed in the result line **e**. The measuring values for the distances **“1”**, **“2”** and the angle **“α”** are displayed in the measured-value lines **d**.

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.

c) Indirect Length Measurement (see figure D)

Select the indirect length measurement .

Pay attention that the measuring tool is positioned at the same height as the sought measuring point. Now, tilt the measuring tool around the reference plane and measure distance **“1”** as for a length measurement.



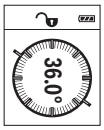
Upon completion of the measurement, the result for the sought distance **“X”** is displayed in the result line **e**. The measuring values for the distance **“1”** and the angle **“α”** are displayed in the measured-value lines **d**.

Gradient Measurement/Digital Spirit Level

Select the gradient measurement/digital spirit level .

The measuring tool automatically switches between two states.

The digital spirit level is used to check the horizontal or vertical alignment of an object (e. g. washing machine, refrigerator, etc.).
When the inclination 3° exceeds, the ball in the display lights red.



Gradient measurement is used to measure a slope or incline (e. g. of stairs, railings, when fitting furniture, laying pipes, etc.).
The left-hand side of the measuring tool serves as the reference level for grade measurement. If the display flashes during measurement, the measuring tool has been tipped too heavily to the side.

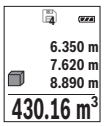
Memory Functions

The value or end result of each completed measurement is automatically saved.

Memory Value Display

Maximum 20 values (measured values or end results) can be retrieved.

Press the memory button **6** [ ].



The number of the memory value is shown at the top of the display, the corresponding memory value is shown at the bottom and the corresponding measuring function is shown on the left. Press button **3** [**+**] to browse forwards through the saved values.

Press button **8** [**–**] to browse backwards through the saved values.

If there is no value available in the memory, **“0.000”** is shown at the bottom of the display and **“0”** at the top.

The oldest value is located in position 1 in the memory, while the newest value is in position 20 (when 20 memory values are available). When a further value is saved, the oldest value in the memory is always deleted.

Deleting the Memory

Press the memory button **6** [ ] to delete the contents of the memory. Then briefly press the On/Off button **5** [ ] to delete the displayed value.

To delete all values in the memory, press the **4** button and the On/Off button **5** at the same time, [ ] then release the On/Off button **5** [ ].

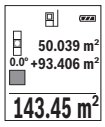
Adding/Subtracting Values

Measured values or end results can be added or subtracted.

Adding Values

The following example describes the addition of areas:

Measure an area as described in section “Area Measurement”, see page 25.



Press the button **3** [**+**]. The calculated area and the symbol **“+”** will be displayed.

Press the measuring button **2** [▲] to start another area measurement. Measure the area as described in section “Area Measurement”, see page 25. Once the second measurement is completed, the result of the second area measurement is displayed below.To show the end result, press the measurement button **2** [▲] once more.

Note: With a length measurement, the end result is displayed immediately.

To exit addition, press button **7** [**Func**].

Subtracting Values

To subtract values, press button **8** [**–**]. The subsequent steps are the same as for “Adding Values”.

Deleting Measured Values

Briefly pressing the On/Off button **5** [ ] will delete the last measured value in all measuring functions. Repeated brief pressing of the On/Off button **5** [ ] will delete the measured values in reverse order.

Changing the Unit of Measure

Unit of measure **“m”** (metres) is set by default.

Switch the measuring tool on.

Press and hold the **7** [**Func**] button to enter the “basic configurations ”menu. Select the type of measuring device you use:

- **“m/cm”** (3 601 K72 H50)
- **“ft/m”** (3 601 K72 HK0)
- **“尺/m”** (3 601 K72 HC0)

Press button **3** [**+**] or button **8** [**–**], to change the unit of measure.

Press the On/Off button **5** [⏻] to exit the menu item. The selected setting remains saved after you switch off the measuring tool.

Switching the Sound On and Off

The sound is switched on by default.

Switch the measuring tool on.

Press and hold the **7** [**Func**] button to enter the “basic configurations ”menu. Select 🔊 . Press the **3** [**+**] button or the **8** [**–**] button to switch the sound on and off.

To exit the menu item, press the measuring button **2** [▲] or the On/Off button **5** [⏻]. The selected setting remains saved after you switch off the measuring tool.

Working Advice

General Information

The reception lens **14** and the laser beam outlet **15** must not be covered when taking a measurement.

The measuring tool must not be moved while taking a measurement. 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 on the lighting conditions and the reflective properties of the target surface. For better visibility of the laser beam in extraneous light, use the laser viewing glasses **18** (accessories) and the laser target plate **17** (accessories) or shade the target area.

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 **17** (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 and Calibration of the Grade Measurement (Tilt Calibration) (see figures E1 – E2)

Regularly check the accuracy of the grade measurement. This is done by carrying out a reversal measurement. For this, place the measuring tool on a table and measure the grade. Turn the measuring tool by 180 ° and measure the grade again. The difference of the indicated reading may not exceed by more than 0.3 ° (max.).

In the event of larger deviations, you have to recalibrate the measuring tool. For this, select CAL . Follow the instructions on the display.

After severe temperature changes and impact, we recommend an accuracy check and, if required, to recalibrate the measuring tool. After a temperature change, the measuring tool must acclimate for a while before calibrating.

Accuracy Check of the Distance Measurement

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 measurement should be carried out under favourable conditions, meaning, the measuring distance must be indoors and the target surface for the measurement must be smooth and reflect well.
- Measure the distance 10 times in succession.

The deviation of the individual measurements from the average value must not exceed ± 4 mm over the entire measuring section in favourable conditions. Record the measurements in order to be able to compare the accuracy at a later date.

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 **13** onto the quick-change plate of the tripod **19** 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 **4** (the reference level is the thread).

Error Message

If a measurement cannot be performed correctly, the error message “Error” appears in the display. Switch the measuring tool off and back on, and start the measurement again.

The measuring tool monitors correct functioning in every measurement. If a defect is detected, the display will indicate only the symbol shown opposite and the measuring tool switches itself off. In this case, have the measuring tool checked by an after-sales service agent for Bosch power tools.

Maintenance and Service

Maintenance and Cleaning

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

If you discover a fault or require a repair, send the measuring tool to an authorised Bosch after-sales service agent.