

IMPORTANT:
Read Before Using

IMPORTANT :
Lire avant usage

IMPORTANTE:
Leer antes de usar



Operating/Safety Instructions

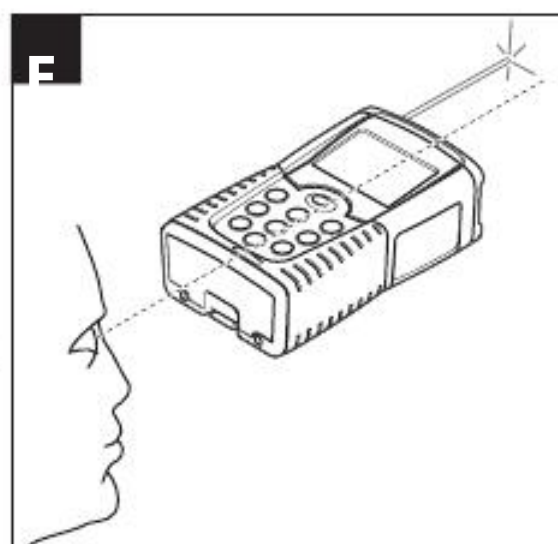
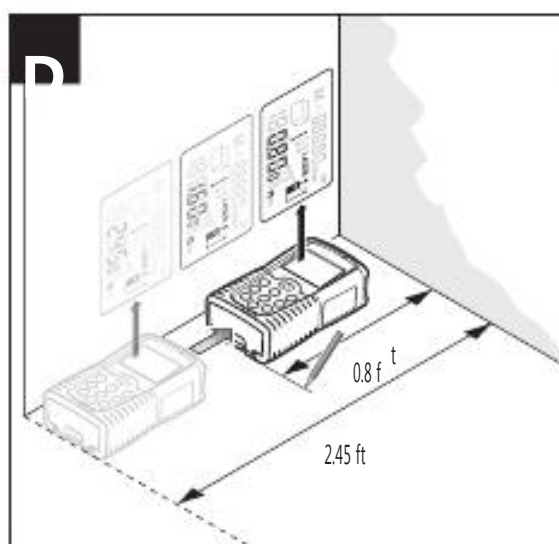
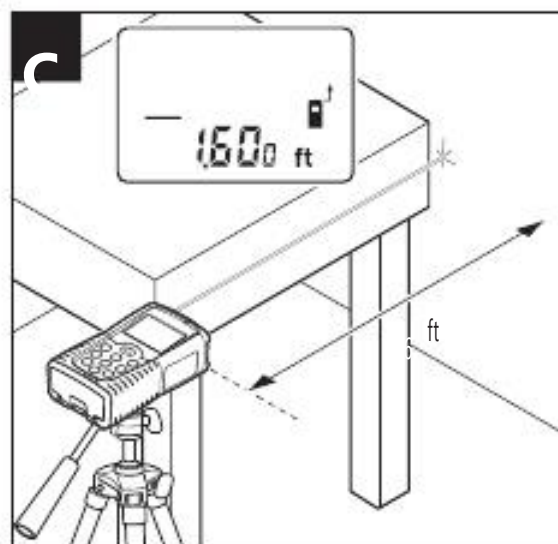
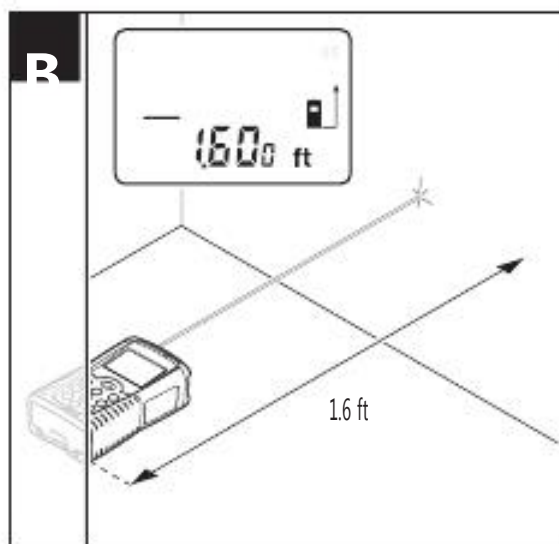
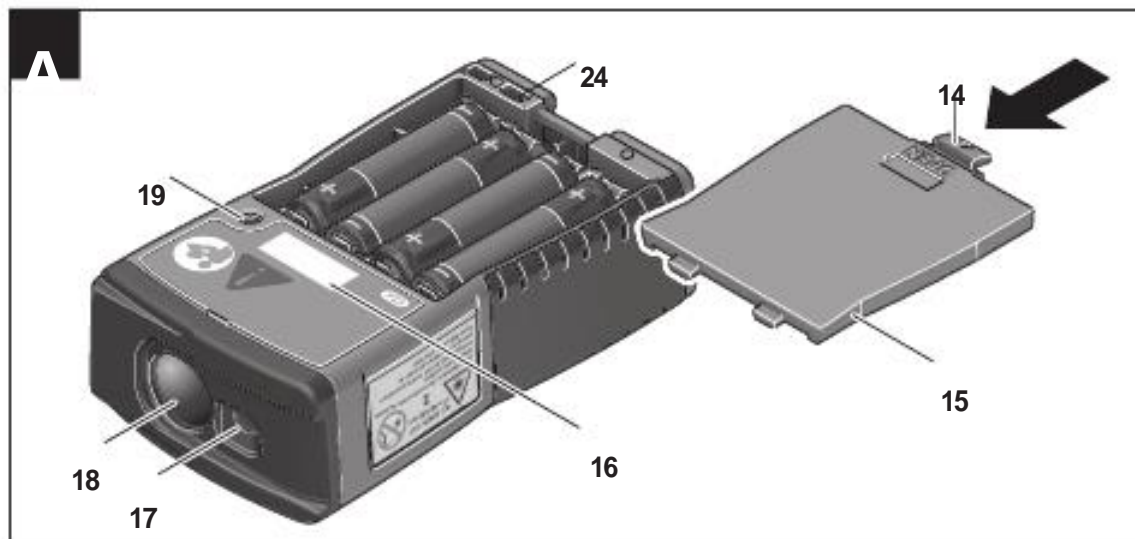
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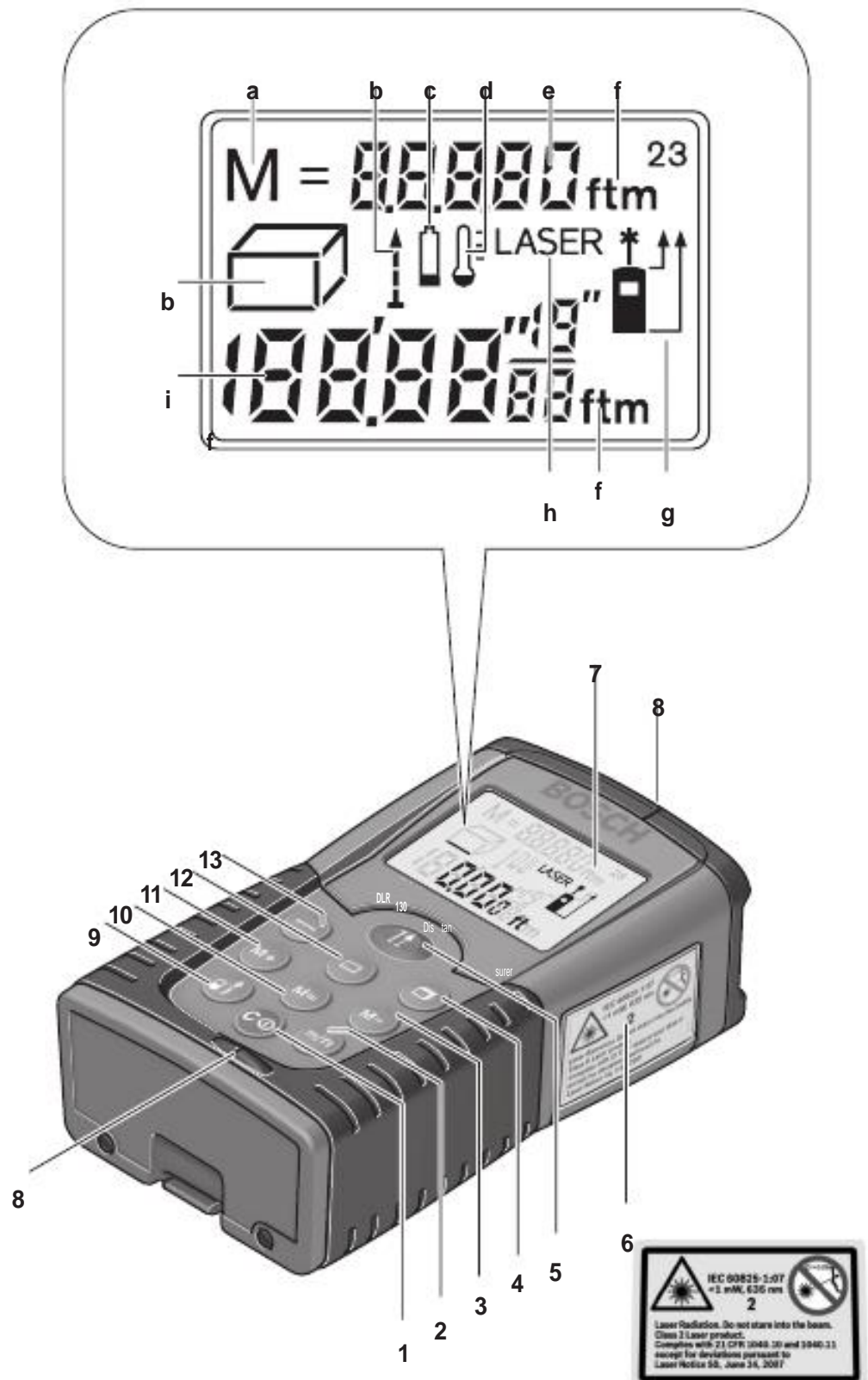
Instrucciones de funcionamiento y seguridad

DLR130



BOSCH

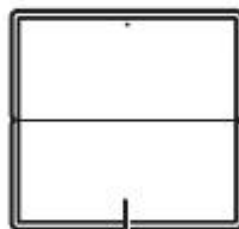




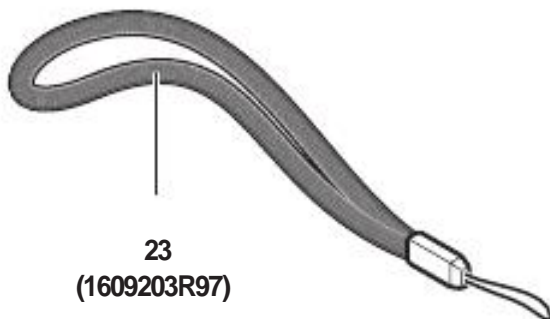
20
(DLA001)



21
(DLA002)



23
(1609203R97)



22
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General Safety Rules



WARNING: LASER RADIATION. AVOID DIRECT EYE EXPOSURE. DO NOT stare into the laser light source. Never aim light at another person or object other than the workpiece. Laser light can damage your eyes.



WARNING: Instructions listed below may result in electric shock, fire and/or serious injury. Read all instructions. Failure to follow all



Safety Rules for Distance Measurer

Working safely with the Distance Measurer 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 Distance Measurer unrecognizable.

Never aim the beam at a workpiece with a reflective surface. Bright shiny reflective sheet steel or similar reflective surfaces are not recommended for laser use. Reflective surfaces could direct the beam back toward the operator.

Take care to recognize the accuracy and range of the device.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The use of optical instruments with this product will increase eye hazards.

Have the Distance Measurer repaired only through qualified specialists using original spare parts. This ensures that the safety of the Distance Measurer is maintained.

Do not allow children to use the Distance Measurer without supervision. They could unintentionally blind other persons.

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.

Do not use the laser viewing glasses as safety goggles. The laser viewing glasses are used for improved visualization 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 color perception.

Safe Operating Procedures

WARNING: Be sure to read and understand all instructions in this manual before using this product. Failure to follow all instructions may result in hazardous radiation exposure, electric shock, fire, and/or bodily injury.

CAUTION: Use of controls or adjustments or performance of procedures other than those specified in this manual, may result in hazardous radiation exposure.

CAUTION: The use of optical instruments with this product will increase eye hazard.

IMPORTANT: The following labels are on your laser tool for your convenience and

safety. They indicate where the laser light is emitted by the level. ALWAYS BE AWARE of their location when using the level.

ALWAYS make sure that any bystanders in the vicinity of use are made aware of the dangers of looking directly into the laser tool.

DO NOT remove or deface any warning or caution labels. Removing labels increases the risk of exposure to laser radiation.

DO NOT stare directly at the laser beam or project the laser beam directly into the eyes of others. Serious eye injury could result.

DO NOT place the laser tool in a position that may cause anyone to stare into the laser beam intentionally or unintentionally. Serious eye injury could result.

DO NOT use any optical tools such as, but not limited to, telescopes or transits to view the laser beam. Serious eye injury could result.

ALWAYS remove the batteries when cleaning the laser light aperture or laser lens.

DO NOT operate the laser tool around children or allow children to operate the laser tool. Serious eye injury could result.

ALWAYS turn the laser tool "OFF" when not in use. Leaving the laser tool "ON" increases the risk of someone inadvertently staring into the laser beam.

DO NOT operate the laser tool in combustible areas such as in the presence of flammable liquids, gases or dust.

ALWAYS position the laser tool securely. Damage to the laser tool and/or serious injury to the user could result if the laser tool falls.

ALWAYS use only the accessories that are recommended by the manufacturer of your laser tool. Use of accessories that have been designed for use with other laser tools could result in serious injury.

DO NOT use this laser tool for any purpose other than those outlined in this manual. This could result in serious injury.

DO NOT leave laser tool "ON" unattended in any operating mode.

ALWAYS repair and servicing must be performed by a qualified repair facility. Repairs performed by unqualified personnel could result in serious injury.

DO NOT disassemble the laser tool. There are no user serviceable parts inside. Disassembling the laser will void all warranties on the product. Do not modify the product in any way. Modifying the laser tool may result in hazardous laser radiation exposure.

Electrical Safety Procedures

WARNING: Batteries can explode or leak, and can cause injury or fire. To reduce this risk:

ALWAYS follow all instructions and warnings on the battery label and package.

DO NOT short any battery terminals.

DO NOT charge alkaline batteries.

DO NOT mix old and new batteries. Replace all of them at the same time with new batteries of the same brand and type.

DO NOT mix battery chemistries.

DISPOSE of batteries per local code.

DO NOT dispose of batteries in fire.

KEEP batteries out of reach of children.

REMOVE batteries if the device will not be used for several months.

Environment Protection

Recycle raw materials & batteries instead of disposing of waste. The unit, accessories, packaging & used batteries should be sorted for environmentally friendly recycling in accordance with the latest regulations.

Functional Description

INTENDED USE




The Distance Measurer is intended for measuring distances, lengths, heights, clearances and for calculating areas and volumes. The Distance Measurer is suitable for interior and exterior construction site measuring.

PRODUCT FEATURES

The numbering of the product features shown refers to the illustration of the digital laser Distance Measurer on the graphic pages.

- 1 On/Off/Clear button "**C**"
- 2 Change "unit of measure" button
- 3 Memory subtraction button "**M-**"
- 4 Volume measurement button
- 5 Measuring and continuous measurement button
- 6 Laser warning label
- 7 Display
- 8 Alignment aid
- 9 Reference point button
- 10 Memory retrieve button "**M=**"
- 11 Memory add button "**M+**"
- 12 Area measurement button
- 13 Length measurement button
- 14 Latch of battery lid
- 15 Battery lid
- 16 Serial number
- 17 Laser beam outlet
- 18 Reception lens
- 19 1/4" threaded hole for mounting optional tripod *
- 20 Laser viewing glasses *
- 21 Laser target plate *
- 22 Protective case
- 23 Hand strap *
- 24 Hand strap mounting post

DISPLAY ELEMENTS

- a** Measured value stored
- b** Measuring mode indicators
- c** Battery indication
- d** Problem temperature indicator
- e** Measured value/result
- f** Unit of measure
- g** Measurement reference point
- h** Laser switched on
- i** Individual measured value (for length measurement: result)
-  Length measurement
-  Area measurement
-  Volume measurement

* Optional Accessories

Technical Data

DLR130 Distance Measurer

Article number	3 601 K16 310
Dimensions	2 1/4" x 4" x 1 1/4" (58 x 100 x 32 mm)
Measuring range	0.05 ... 40 m ^A (2 in ... 131 ft)
Distance measuring accuracy	
– typical accuracy	±1.5 mm (±1/16 in) ^B
Measuring duration	
– typical	<0.5 s
– maximum	4 s
Lowest indication unit	1/16 in; 0.005 ft; 1 mm
Operating temperature	(+14° F ... +122° F) ^C – 10 °C ... +50 °C
Storage temperature	(– 4 °F ... +158 °F) –20 °C ... +70 °C
Relative air humidity, max.	90 %
Laser class	2
Laser type	635 nm, <1 mW
Laser beam diameter (at 25 °C/77 °F), approx.	
– at 10 m (33 ft) distance	6 mm (1/4 in)
– at 40 m (131 ft) distance	24 mm (15/16 in)
Batteries	4 x 1.5 V LR03 (AAA)
Rechargeable battery	4 x 1.2 V KR03 (AAA)
Battery service life, approx.	
– Individual measurements, approx.	30000 ^D
– Continuous measurement mode, approx.	5 Hours ^D
Automatic switch-off after approx.	
– Laser	20 s
– Distance Measurer (without measurement)	5 min
Weight according to EPTA-Procedure 01/2003	0.18 kg (6.35 oz)
Protection class (excluding battery compartment)	IP 54 (dust and splashwater 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 40 m (±7/16 in per 131 ft). In favourable conditions, a deviation influence of ±0.05 mm/m (±1/64 in per 26 ft) must be taken into account.

C) In the continuous measurement function, the maximum operating temperature is +40 °C (+104 °F).

D) Fewer measurements are possible when using 1.2 V rechargeable batteries as compared 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 **16** on the type plate.

Preparation

INSERTING/REPLACING THE BATTERY

Use only alkali-manganese or rechargeable batteries.

Fewer measurements are possible when using 1.2 V rechargeable batteries as compared with 1.5 V batteries.

To open the battery lid **15**, press the latch of the battery lid **14** in the direction of the arrow and remove the battery lid. Insert the supplied 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 in the display for the first time, then at least 100 measurements are still possible. The batteries must be replaced when the battery symbol

flashes; taking measurements is no longer possible.

Always replace all batteries at the same time. Only use batteries from one brand and with the identical capacity.

- **Remove the batteries from the Distance Measurer when not using it for extended periods.** When storing for extended periods, the batteries can corrode and discharge themselves.

INSTALLING OPTIONAL HAND STRAP

Feed string loop on end of hand strap **23** under hand strap mounting post **24** and pull out on other side. Feed hand strap **23** through string loop end and pull tight.

Operation

INITIAL OPERATION

- Protect the Distance Measurer against moisture and direct sun irradiation.
- Do not expose the Distance Measurer to extreme temperatures or variations in temperature.

Switching On and Off

To **switch on** the Distance Measurer, either press the On/Off/Clear button **1** or the measuring button **5**. When switching on the Distance Measurer, the laser beam is not switched on yet.

To **switch off** the Distance Measurer, press and hold the On/Off/Clear button **1**.

To save the batteries, the Distance Measurer switches off automatically after approx. 5 minutes when no measurement is carried out.

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

Measuring Procedure

The Distance Measurer offers a variety of different measuring modes that can be

selected by pushing the corresponding mode button (see "Measuring Mode"). After switching on, the Distance Measurer is in the "length measurement mode".

Also, it is possible to select any of the two different reference points for the measurement by pushing the reference point button **9** (see "Selecting the Reference Point"). After switching on, the rear edge of the Distance Measurer is preset as the reference point.

Upon selection of the measuring mode and the reference point, all further steps are carried out by pushing the measuring button **5**.

With the reference point selected, place the Distance Measurer against the desired measuring line (e.g. a wall).

Briefly push the measuring button **5** to switch on the laser beam.



WARNING

Do not point the laser beam

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 **5** again to initiate the measurement.

In the continuous measurement mode, the measurement already starts upon first actuation of the measuring button **5**.

The measured value appears after 0.5 to 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 Point (see figures B–C)

For measuring, it is possible to select from two different reference points:

- The rear edge of the Distance Measurer (e.g., when placing the Distance Measurer flush against a wall),
- The front edge of the Distance Measurer (e.g., as when measuring from the edge of a table onward),

To select the reference point, push button **9** until the required reference point is indicated in the display. Each time after switching on, the rear edge of the Distance Measurer is preset as the reference point.

Changing the Unit of Measure

The unit of measure can be changed any time for display of the measured values, even for already measured or calculated values.

For display of the current length measurement values, the units of measure shown opposite are available.

Area and volume values as well as stored measured values can

only be displayed in “ft” or “m”.

To change the unit of measure, push button **2** until a new unit of measure is displayed.

The unit-of-measure setting is retained when switching the Distance Measurer on or off.

MEASURING MODES

Length Measurement

For length measurements, push button **13**. The indicator for length measurement appears in the display.

Push the measuring button **5** 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 measurements, push button **12**. The indicator for area measurement appears in 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, push button **4**. The indicator for volume measurement appears in 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.

Values exceeding 99990 ft³ cannot be displayed; "Err." is indicated in the display. In this case, switch the unit of measure to meters (see "Changing the Unit of Measure", page 9).

Area or Volume

Rounding of Large Calculations

For values larger than 9999 feet or meters the Distance Measurer rounds the calculated value to the nearest 10 feet or 10 meters. Accuracy in such situations is always 99.95% or better.

Continuous Measurement (Tracking) (see figure D)

The continuous measurement mode (tracking) is used for the transferring of measurements, e.g., from construction plans. In continuous measurement mode, the Distance Measurer can be moved relative to the target, whereby the measured value is updated approx. every 0.5 seconds. As an example, the user can move from a wall to "walk off" the required distance, while the actual distance can be read continuously.

For continuous measurement, push button **5** until the indication appears in the display.

Press the measuring button **5** to initiate the measuring procedure. Move the Distance Measurer until the required distance value is

indicated at the bottom of the display.

Pushing the measuring button **5** interrupts the continuous measurement. The current measured value is indicated in the display. Repeated pushing of the measuring button **5** starts the continuous measuring again.

The continuous measuring automatically switches off after 5 minutes. The last measured value remains indicated in the display. The continuous measuring can also be ended by pushing buttons **4** or **5**, also buttons **12** or **13**, which changes the measuring mode.

Deleting Measured Values

Briefly pushing the On/Off Clear button **1** deletes the last individual measuring value determined in all measuring modes. Pushing the button repeatedly deletes the individual measured values in reverse order.

MEMORY MODES

When switching off the Distance Measurer, the value in the memory is retained.

Storing/Adding Measured Values

Push the memory add button **11** in order to store the current measured value – a length, area or volume value, depending on the current measuring mode. As soon as a value has been stored, "M" is indicated in the display and "Add" is briefly indicated next to it.

If a value is already stored in the memory, the new value is added to the memory contents, however, only if it's the same type of measurement.

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. "Err." briefly flashes in the display.

However, values of the same type (e.g. length values) can be added no matter if they have been measured in feet and inches, decimal feet or meters.

Subtracting Measured Values

Push the memory subtraction button **3** 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 is briefly followed by "Sub."

If a value is already stored, then 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 **10** 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 **11** or set to zero by pushing the memory subtract button **3**.

The memorized values can only be displayed in decimal feet or meters.

Deleting the Memory

To delete the memory contents, first push the memory retrieve button **10** so that "**M=**" is indicated in the display. Then push the On/Off/Clear button **1**; "**M**" is no longer indicated in the display.

Operating Instructions

The reception lens **18** and the laser beam outlet **17** must not be covered when taking a measurement.

The Distance Measurer must not be moved while taking a measurement (with the exception of the continuous measurement mode). Therefore, whenever possible, place the Distance Measurer 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.

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 **20** and the laser target plate **21** (optional accessories), or shade off the target surface.

When measuring against transparent surfaces (e.g. glass, water) or reflecting surfaces, faulty measurements are possible. Also, porous or structured surfaces, air layers with varying temperatures or indirectly received reflections can affect the measured value. These effects are due to physical reasons and can therefore not be compensated for by the Distance Measurer.

Sighting with the Alignment Aid (see figure E)

With the alignment aid **8**, sighting over larger distances is a lot easier. For this, look alongside the aligning aid on the top side of the Distance Measurer. The laser beam runs parallel to this line of sight.

Working with Tripod

The use of a tripod (not included) is particularly advisable for larger distances because of the steadiness it provides. The Distance Measurer tool can be screwed onto a commercially available tripod using the 1/4" thread **19** on the bottom side of the housing.

When positioning the tripod, observe that the measurement will take place beginning from the rear or front edge of the measuring tool, depending on the selected reference level.

Trouble Shooting

Issue	Remedy
Problem temperature indicator d; measurement not possible.	
The measuring tool is not within the operating temperature of -10°C to $+50^{\circ}\text{C}$ ($+14^{\circ}\text{F}$ to $+122^{\circ}\text{F}$), in the continuous measurement function to $+40^{\circ}\text{C}$ ($+104^{\circ}\text{F}$).	Wait until the measuring tool has reached the operating temperature
Battery indication c is indicated	
Battery voltage decreasing (measurement still possible)	Replace batteries
Battery indication c flashes, measurement not possible	
Battery voltage too low	Replace batteries
The indications "Err." and "- - -" are indicated in the 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 21 (optional accessory)
The laser beam outlet 17 or the reception lens 18 are misted up (e.g. due to a rapid temperature change).	Wipe the laser beam outlet 17 and/or the reception lens 18 dry using a soft cloth
The calculated area or volume value is larger than 99990 ft^2 or ft^3 .	Change unit of measure to "m"
The indication "Err." flashes at the top in the display	
Addition/Subtraction of different types of measurements	Only add/subtract of the same type
Unreliable measuring result	
The target surface does not reflect correctly (e.g. water, glass).	Cover off the target surface
The laser beam outlet 17 or the reception lens 18 are covered.	Make sure that the laser beam outlet 17 or the reception lens 18 are unobstructed
Measuring result not plausible	
Wrong reference point set	Select reference point that corresponds to measurement
Obstruction in path of laser beam	Laser point must be completely on target surface



The measuring tool monitors the correct mode for each measurement. When a defect is determined, only the symbol shown aside flashes in the

display.

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 meters (10 to 33 feet); its length must be precisely known (e.g. the width of a room or a door opening).

- Measure the distance 10 times after another.

The difference in values must not amount to more than a maximum of ± 2 mm ($\pm 1/8$ in). Keep a record of the measurements in order to compare the accuracy at a later time.

Maintenance and Service

Maintenance and Cleaning

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

Keep the measuring tool clean at all times.

Do not immerse the measuring tool into 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 **18** in particular, with the same care as required for eye

If the measuring tool should fail despite the care taken in manufacturing and testing procedures, repair should be carried out by an authorized after-sales service centre for Bosch power tools.

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 case **22**.



