

Robert Bosch GmbH

Geschäftsbereich Elektrowerkzeuge D-70745 Leinfelden-Echterdingen Germany

www.bosch-pt.com

1 609 929 R53 (2008.07) T / 342 XXX

DLE 70 Professional

BOSCH

- **de** Originalbetriebsanleitung **en** Original instructions
- fr Notice originale es Manual original
- pt Manual original
- Istruzioni originali it
- nl Oorspronkelijke
- gebruiksaanwijzing
- da Original brugsanvisning
- sv Bruksanvisning i original
- **no** Original driftsinstruks
- fi Alkuperäiset ohjeet
- Πρωτότυπο οδηγιών χρήσης el tr Orijinal işletme talimatı
- sk Pôvodný návod na použitie hu Eredeti használati utasítás

pl Instrukcją oryginalną cs Původním návodem k používání

- **ги** Оригинальное руководство по
- эксплуатации
- **ик** Оригінальна інструкція з
- експлуатації **ro** Instrucțiuni de folosire originale
- bg Оригинално ръководство за експлоатация
- **sr** Originalno uputstvo za rad
- sl Izvirna navodila

lv Oriģinālā lietošanas pamācība

hr Originalne upute za rad

et Algupärane kasutusjuhend

- lt 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



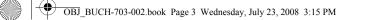
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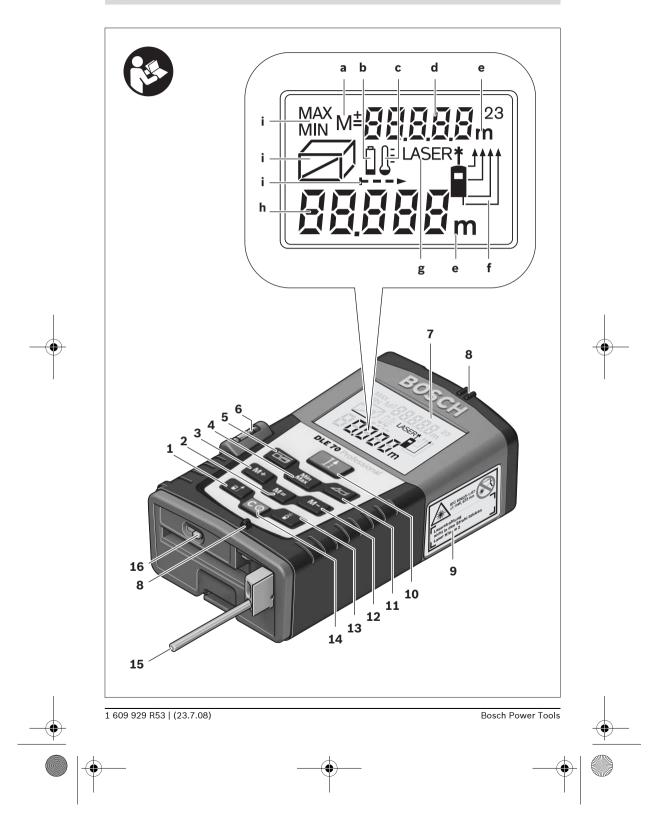
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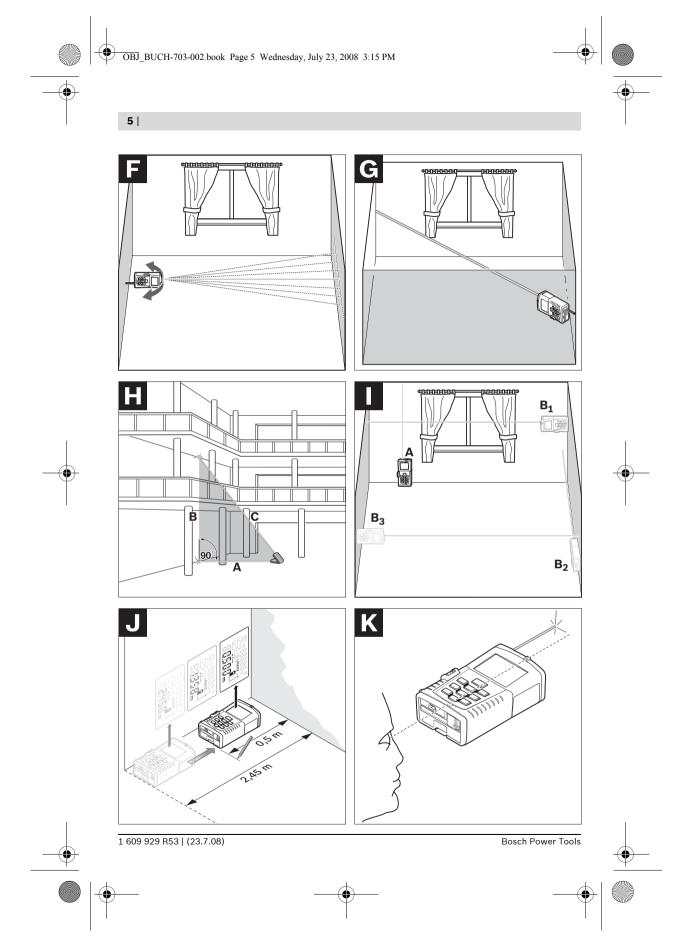


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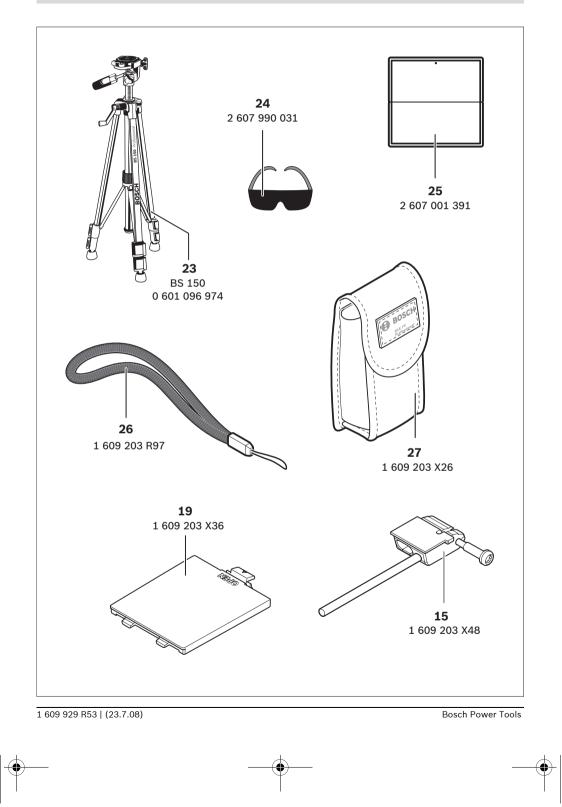
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4 | A 18 17 19 20 22 21 Β С 8500[¶] 051 05/11 D Ε _ 0500m^{∎j} 05m 0.5m

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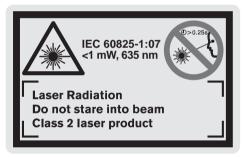
Safety Notes



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 9 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.
- Keep the positioning pin 15 away from "live" wires or parts. There is a risk of electric shock.

Functional Description

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 calculating areas and volumes. The measuring tool is suitable for interior and exterior construction site measuring.

Technical Data

Digital Laser Rangefinder	DLE 70 Professional
Article number	3 601 K16 60.
Measuring range	0.05-70 m ^{A)}
Measuring accuracy (typically)	±1.5 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) approx. – at 10 m distance – at 70 m distance	6 mm 42 mm
Batteries Rechargeable batteries	4 x 1.5 V LR03 (AAA) 4 x 1.2 V KR03 (AAA)
Battery live, approximately – Individual measurements – Continuous measurement	30000 ^{D)} 5 h ^{D)}
Automatic switch-off after approx. – Laser – Measuring tool (without measurement)	20 s 5 min
Weight according to EPTA-Procedure 01/2003	0.18 kg
Dimensions	59 x 100 x 32 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. when measuring outdoors at intense sunlight or an insufficiently reflecting surface), the maximum deviation is ± 10 mm per 70 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) 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 20 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 Reference level button
- 2 Memory retrieve button "M="
- 3 Memory add button "M+"
- 4 Button for minimum and maximum measurement
- **5** Button for length, area and volume measurement
- 6 Spirit level
- 7 Display
- 8 Alignment aid
- 9 Laser warning label
- **10** Button for measuring and continuous measuring
- **11** Button for indirect length measurement and measurement of wall surfaces
- 12 Memory subtraction button "M-"
- **13** Button for continuous laser beam
- **14** On/Off and memory delete button
- 15 Positioning pin
- 16 Latch of the positioning pin
- 17 1/4" thread
- 18 Latch of battery lid
- 19 Battery lid
- 20 Serial number
- 21 Laser beam outlet
- 22 Reception lens
- 23 Tripod*
- 24 Laser viewing glasses*
- 25 Laser target plate*
- 26 Carrying strap
- 27 Protective case

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

Display Elements

- a Measured values stored
- **b** Battery indication
- **c** Temperature indicator
- 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 Measuring functions
 - Length measurement
 - □ Area/surface measurement
- ☐ Volume measurement
- ∠ Indirect length measurement
- □ Wall surface measurement
- Continuous measurement
- MIN Minimum measurement

MAX Maximum measurement

Assembly

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 **19**, press the latch **18** in the direction of the arrow and remove the battery lid. Insert the batteries provided. Pay attention to the correct polarity of the batteries according to the representation in the battery compartment.

When the rightarrow 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 measuring tool when not using it for extended periods. When storing for extended periods, the batteries can corrode and discharge themselves.

Operation

Initial Operation

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

Switching On and Off

To **switch on** the measuring tool, briefly press the On/Off button **14** or measuring button **10**. 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 **14** 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 22).

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 **1**, the reference level can be changed (see "Selecting the Reference Level", page 21). Upon selection of the measuring function and the reference level, all further steps are carried

out by pushing the measuring button 10.

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

Briefly press the measuring button **10** 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 **10** again to initate the measurement.

When the laser beam is switched on permanently and in the minimum and maximum measurement modes, the measurement already starts upon first actuation of the measuring button **10**. In the continuous measurement mode, the measurement starts immediately upon switching on the function.

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 B-E)

For measuring, it is possible to select from four different reference levels:

- the rear edge of the measuring tool (e.g., when placing the measuring tool flush against a wall),
- the rear edge of the positioning pin **15** (e.g., for measurements out of corners).
- the front edge of the measuring tool (e.g., as when measuring from the edge of a table onward),
- the thread **17** (e.g., for measuring with the tripod).

To select the reference level, push button **1** repeatedly until the required reference level is indicated in the display. Each time after switching on, the rear edge of the measuring tool is preset as the reference level.

Continuous Laser Beam

If required, the measuring tool can also be switched to the continuous laser beam mode. For this, push the button for continuous laser beam **13. "LASER"** lights up continuously in the display.

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.

In this setting, the laser beam also remains switched on between measurements; for measuring, it is only required to press the measuring button **10** once.

To switch off the continuous laser beam, press button **13** again or switch the measuring tool off. When switching on again, the measuring tool is in the standard operation mode and the laser beam appears only after pushing the measuring button **10**.

Measuring Functions

Length Measurement

For length measurements, press button **5** until the indicator for length measurement — appears in the display.



Press the measuring button **10** 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 **5** until the indicator for area measurement \Box 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.



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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 **5** until the indicator for volume measurement \square 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 above 99999 m^3 cannot be indicated; **"Error"** and **"---"** appear on the display. Divide the volume to be measured into individual measurements; their values can then be calculated separately and then summarized.

Minimum Measurement (see figure F)

The minimum measurement is used to determine the shortest distance from a fixed reference point. It is used, as an example, for determining plumb lines or horizontal partitions.

For minimum measurements, press button **4** until **"MIN"** appears in the display.

To start the measurement, briefly press the measuring button **10**.

Move the laser back and forth over the requested target (e.g., the room ceiling for determining the plumb line) in such a manner that the reference point of the measurement (e.g., the tip of the positioning pin **15**) always remains at the same location.



During the measurement, the current length measurement value is indicated at the bottom of the display. The minimum value is indicated at the top right in

the display. It is always overwritten, when the current length measurement value is lower than the present minimal value.

To end the minimum measurement, briefly press the measuring button **10**. Pressing the measuring button again starts a new measurement.

Maximum Measurement (see figure G)

The maximum measurement is used to determine the greatest distance from a fixed reference point. It is used, as an example, for determining diagonals.

For maximum measurements, press button **4** until **"MAX"** appears in the display.

To start the measurement, briefly press the measuring button **10**.

Move the laser back and forth over the requested target (e.g., the room corner for determining the diagonal) in such a manner that the reference point of the measurement (e.g., the tip of the positioning pin **15**) always remains at the same location.



During the measurement, the current length measurement value is indicated at the bottom of the display. The minimum value is indicated at the top right in

the display. It is always overwritten, when the current length measurement value is larger than the present maximal value.

To end the maximum measurement, briefly press the measuring button **10**. Pressing the measuring button again starts a new measurement.

Indirect Length Measurement (see figure H)

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 **11** until the indicator for indirect length measurement rightarrow appears in 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.

Wall Surface Measurement (see figure I)

The wall surface measurement is used to determine the sum of several individual surfaces with a common length.

In the example shown, the total surface of several walls that have the same room height **A**, but different lengths **B**, are to be determined.

For wall surface measurements, press button **11** until the indicator for wall surface measurement \Box appears in the display.

Measure the room height **A** as for a length measurement. The measured value is indicated both at the top and bottom in the display. The laser remains switched on.



Afterwards, measure length $\mathbf{B_{i}}$ of the first wall. The surface is automatically calculated and indicated. The last length measurement value is indicated at the

bottom in the display, while the surface is indicated at the top. The laser remains switched on.



Now, measure length \mathbf{B}_2 of the second wall. The individual measuring value indicated at the bottom of the display is added to length \mathbf{B}_1 and the sum of

both lengths is multiplied with the stored length **A**. The total surface value is indicated at the top in the display.

In this manner, you can measure any number of further lengths $\mathbf{B}_{\mathbf{X}}$, which are added and multiplied with length \mathbf{A} .

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The condition for a correct area/surface calculation is that the first measured length (in the example the room height A) is identical for all partial surfaces.

To restart the wall surface measurement, press button **11** twice.

Continuous Measurement (Tracking) (see figure J)

The continuous measurement function (tracking) is used for the transferring of measurements, e.g., from construction plans. In continuous measurement mode, the measuring tool 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 the required distance, while the actual distance can be read continuously.

For continuous measurements, first select the length measuring function and then press button **10** until the indicator for continuous measurement \dots appears on the display. The laser is switched on and the measurement starts immediately.



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

Briefly pressing button **10** ends the continuous measurement. The last meas-

ured value is indicated at the bottom in the display. Pressing button **10** for several seconds restarts a continuous measuring run.

The continuous measuring automatically switches off after 5 min. The last measured value remains indicated in the display.

Deleting Measured Values

Briefly pressing button **14** deletes the last individual measuring value determined in all measuring functions. Briefly pressing the button repeatedly deletes the individual measured values in reverse order.

In the wall surface measurement mode, briefly pressing button **14** the first time deletes the last individually measured value; pressing the button a second time deletes all lengths B_x .

Memory Functions

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

In the wall surface measurement mode, the total surface value can be stored; in the minimum and maximum measuring mode, the minimum and maximum value can be stored correspondingly. Storing individual measuring values within these functions is not possible.

Storing/Adding Measured Values



Push the memory add button **3** 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 **12** 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 **2** 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 **3** or set to zero by pushing the memory subtract button **12**.

Deleting the Memory

To delete the memory contents, first push the memory retrieve button **2**, so that **"M="** is indicated in the display. Then briefly press button **14**; **"M"** is no longer indicated in the display.

Working Advice

General Information

The reception lens **22** and the laser beam outlet **21** 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 and the minimum/maximum measurement). 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 **24** (accessory) and the laser target plate **25** (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 **25** (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 C, F and G)

The positioning pin **15** 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 **16** 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 **1**.

The positioning pin **15** 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 **6** 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 **6** is not suitable for levelling.

Sighting with the Alingment Aid (see figure K)

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 measuring tool. The laser beam runs parallel to this line of sight.

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 **17** onto the quick-change plate of the tripod **23** 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 **1** (the reference level is the thread).

Troubleshooting – Causes and Corrective Measures

Cause	Corrective Measure
Temperature indicator (c) ment not possible	flashes; measure-
The measuring tool is out- side the operating tem- perature 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 temper- ature
Battery indication (b) is in	ndicated
Battery voltage decreas- ing (measurement still possible)	Replace batteries
Battery indication (b) flas not possible	hes, measurement
Battery voltage too low	Replace batteries
"Error" and "" indicated	ation in display
The angle between the laser beam and the target is too acute.	Enlargen the angle between the laser beam and the target
The target surface reflects too intensely (e.g. a mir- ror) or insufficiently (e.g. black fabric), or the ambi- ent light is too bright.	Work with the laser target plate 25 (accessory)
The laser beam outlet 21 or the reception lens 22 are misted up (e.g. due to a rapid temperature change).	Wipe the laser beam outlet 21 and/or the recep- tion lens 22 dry using a soft cloth
Calculated value is great- er than 99999 m/m²/m³.	Divide calculation into intermediate steps
"Error" indication flashes	at in display (top)
Addition/Subtraction of measured values with dif- ferent units of measure	Only add/subtract measured values with the same units of measure

Cause	Corrective Measure					
Unreliable measuring result						
The target surface does not reflect correctly (e.g. water, glass).	Cover off the target surface					
The laser beam outlet 21 or the reception lens 22 are covered.	Make sure that the laser beam outlet 21 or the recep- tion lens 22 are unobstructed					
Measuring result not plausible						
Wrong reference level set	Select reference level that corre- sponds to meas- urement					
Obstruction in path of laser beam	Laser point must be completely on target surface.					
correct functi urement. Whe mined, only th aside flashes i	g tool monitors the on for each meas- en a defect is deter- ne symbol shown n the display. In this the above men- cannot correct an					

tioned 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 measuring error must not amount to more than a maximum of ± 2.0 mm. 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 **22** 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 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 **27**.

Accessories/Spare Parts

Accessories

Construction tripod				
BS 150 23	0	601	096	974
Laser viewing glasses 24	2	607	990	031
Laser target plate 25	2	607	001	391

Spare Parts

Carrying strap 26	1	609	203	R97
Protective case 27	1	609	203	X26
Battery lid 19	1	609	203	X36
Positioning pin 15	1	609	203	X48

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 consultants answer your questions concerning best buy, application 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: SPT-Technical.de@de.bosch.com

Ireland

Origo Ltd. Unit 23 Magna Drive Magna Business Park City West Dublin 24 Tel. Service: +353 (01) 4 66 67 00 Fax: +353 (01) 4 66 68 88

Australia, New Zealand and Pacific Islands

Robert Bosch Australia Pty. Ltd. Power Tools Locked Bag 66 Clayton South VIC 3169 Customer Contact Center Inside Australia: Phone: +61 (01300) 307 044 Fax: +61 (01300) 307 045 Inside New Zealand: Phone: +64 (0800) 543 353 Fax: +64 (0800) 428 570 Outside AU and NZ: Phone: +61 (03) 9541 5555 www.bosch.com.au

People's Republic of China

Website: www.bosch-pt.com.cn

China Mainland

Bosch Power Tools (China) Co., Ltd. 567, Bin Kang Road Bin Jiang District 310052 Hangzhou, P.R.China Service Hotline: 800 8 20 84 84 Tel.: +86 (571) 87 77 43 38 Fax: +86 (571) 87 77 45 02

HK and Macau Special Administrative Regions

Robert Bosch Hong Kong Co. Ltd. 21st Floor, 625 King's Road North Point, Hong Kong Customer Service Hotline: +852 (21) 02 02 35 Fax: +852 (25) 90 97 62 E-Mail: info@hk.bosch.com www.bosch-pt.com.cn

Indonesia

PT. Multi Tehaka Kawasan Industri Pulogadung Jalan Rawa Gelam III No. 2 Jakarta 13930 Indonesia Tel.: +62 (21) 4 60 12 28 Fax: +62 (21) 46 82 68 23 E-Mail: sales@multitehaka.co.id www.multitehaka.co.id

Phillippines

Robert Bosch, Inc. Zuellig Building Sen. Gil Puyat Avenue Makati City 1200, Metro Manila Philippines Tel.: +63 (2) 8 17 32 31 www.bosch.com.ph

Malaysia

Robert Bosch (SEA.) Pte. Ltd. No. 8a, Jalan 13/6 46200 Petaling Jaya, Selangor, Malaysia Tel.: +6 (03) 7966 3000 Fax: +6 (03) 7958 3838 E-Mail: hengsiang.yu@my.bosch.com Toll Free Tel.: 1 800 880 188 Fax: +6 (03) 7958 3838 www.bosch.com.sg

Thailand

Robert Bosch Ltd. Liberty Square Building No. 287, 11 Floor Silom Road, Bangrak Bangkok 10500 Tel.: +66 (2) 6 31 18 79 – 18 88 (10 lines) Fax: +66 (2) 2 38 47 83 Robert Bosch Ltd., P. O. Box 2054 Bangkok 10501, Thailand

Bosch Service – Training Centre 2869-2869/1 Soi Ban Kluay Rama IV Road (near old Paknam Railway) Prakanong District 10110 Bangkok Thailand Tel.: +66 (2) 6 71 78 00 – 4 Fax: +66 (2) 2 49 42 96 Fax: +66 (2) 2 49 52 99

Singapore

Robert Bosch (SEA.) Pte. Ltd. 38 C Jalan Pemimpin Singapore 915701 Republic of Singapore Tel.: +65 (3) 50 54 94 Fax: +65 (3) 50 53 27 www.bosch.com.sg

Vietnam

Robert Bosch (SEA) Pte. Ltd – Vietnam Representative Office Saigon Trade Center, Suite 1206 37 Ton Duc Thang Street, Ben Nghe Ward, District 1 HCMC Vietnam Tel.: +84 (8) 9111 374 – 9111 375 Fax: +84 (8) 9111376

Disposal

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

Only for EC countries:



Do not dispose of measuring tools into household waste! According the European Guideline 2002/96/EC for Waste Electrical and Electronic Equipment and its implementation into national

right, measuring tools that are no longer usable must be collected separately and disposed of in an environmentally correct manner.

Battery packs/batteries:

Do not dispose of battery packs/batteries into household waste, fire or water. Battery packs/ batteries should be collected, recycled or disposed of in an environmental-friendly manner.

Only for EC countries:

Defective or dead out battery packs/batteries must be recycled according the guideline 91/157/EEC.

Batteries no longer suitable for use can be directly returned at:

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: SPT-Technical.de@de.bosch.com

Subject to change without notice.

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