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Germany

www.bosch-pt.com

2 609 141 088 (2013.08) O / 310 **EURO**

2 609 141 088

GLM Professional

80 | 80+R60

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 používání
sk Pôvodný návod na použitie
hu Eredeti használati utasítás
ru Оригинальное руководство по эксплуатации
uk Оригінальна інструкція з експлуатації
kk Пайдалану нұсқаулығының түпнұсқасы
ro Instrucţiuni originale
bg Оригинална инструкция
mk Оригинално упатство за работа
sr Originalno uputstvo za rad
sl Izvirna navodila
hr Originalne upute za rad
et Algupärane kasutusjuhend
lv Instrukcijas oriģinālvalodā
lt Originali instrukcija
ar تعليمات التشغيل الأصلية
fa دفترچه راهنمای اصلی

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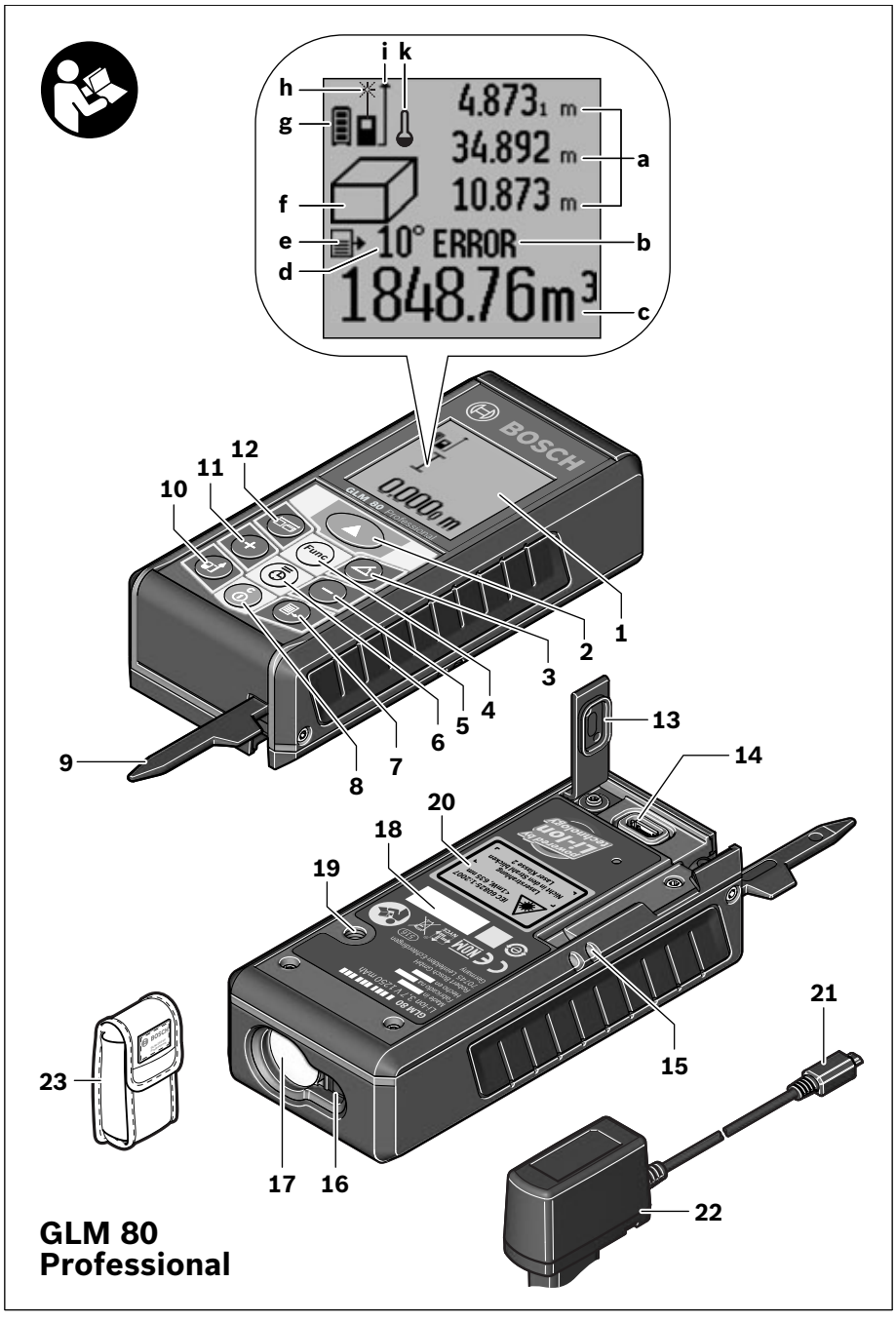

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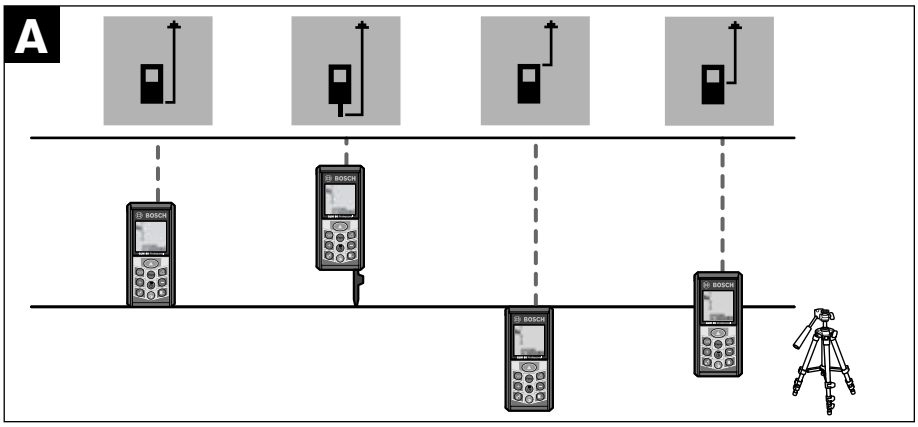

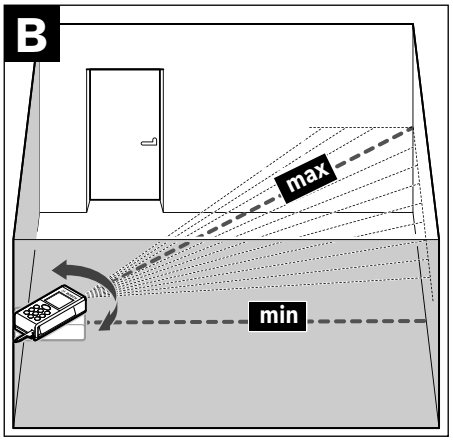

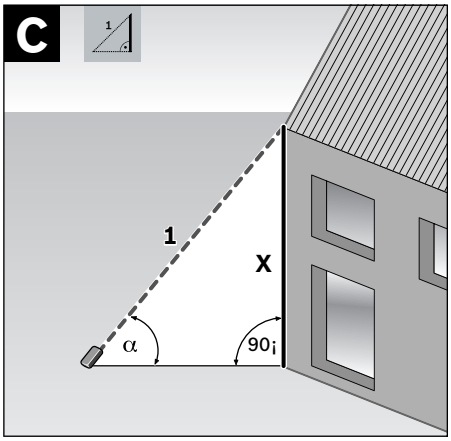

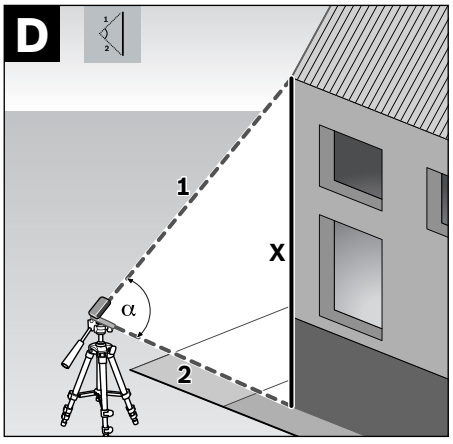

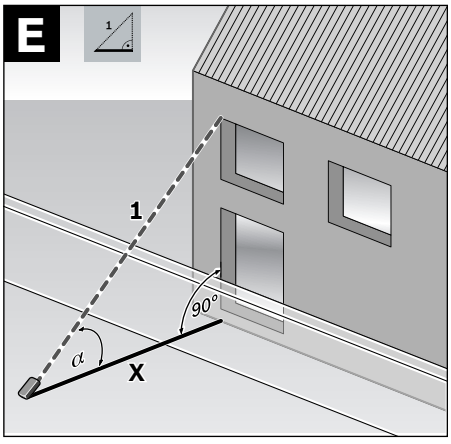

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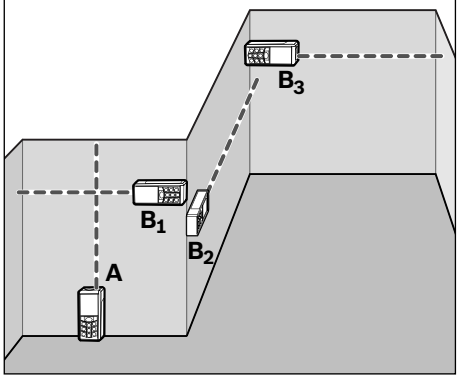

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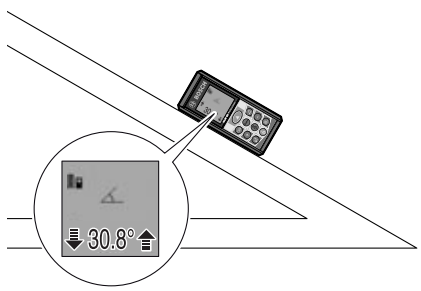

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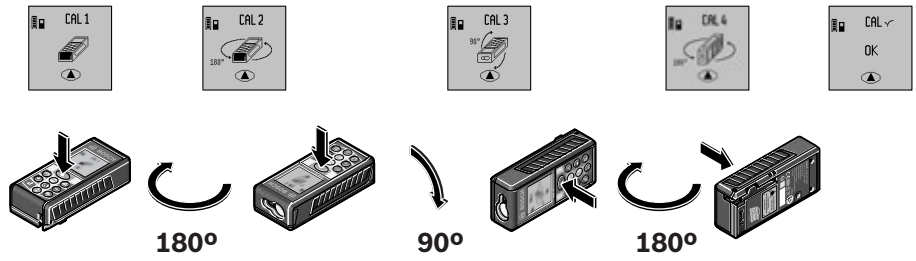

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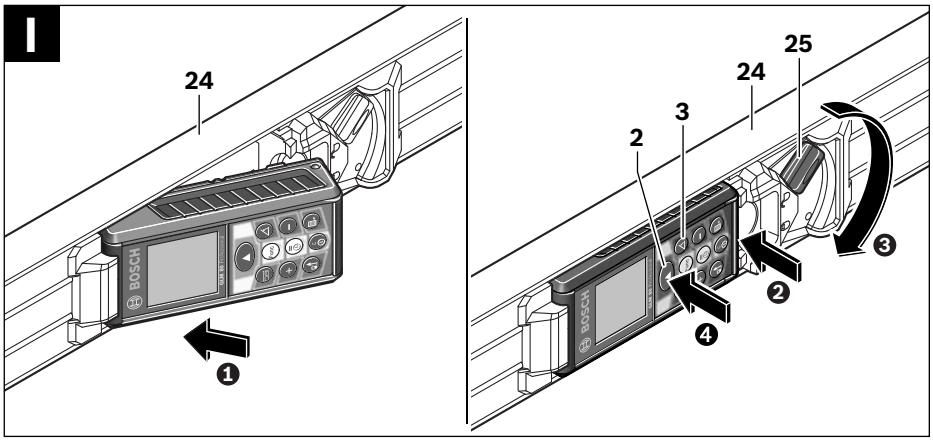

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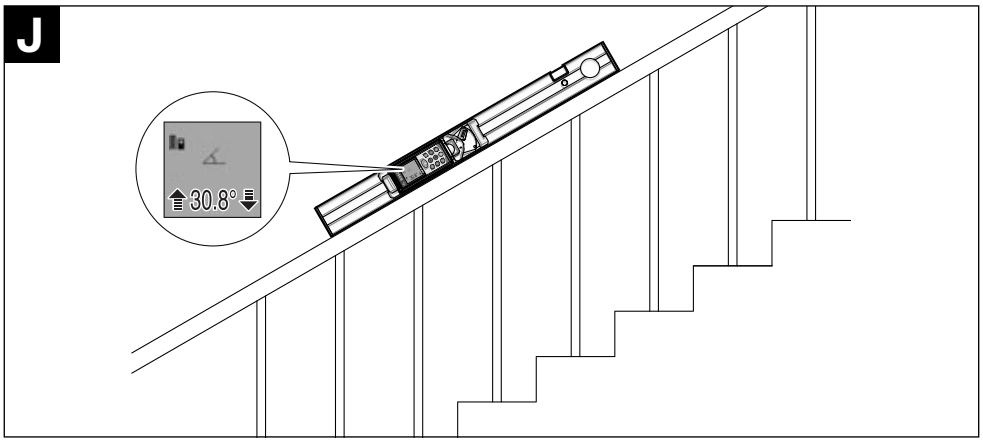

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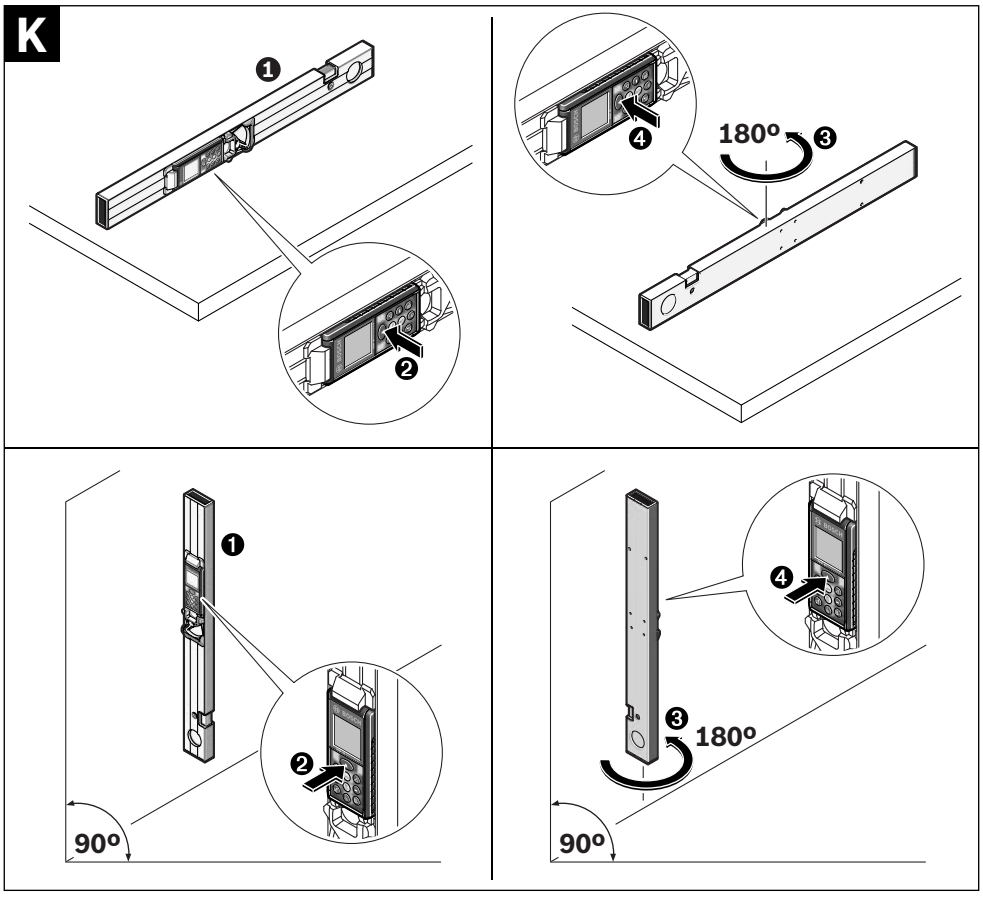

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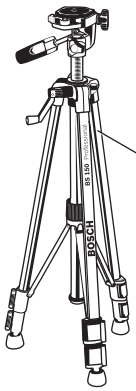

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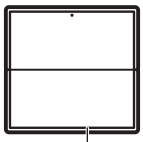

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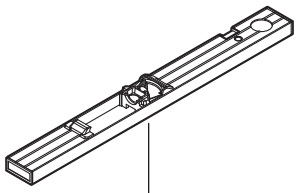

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Wischen Sie Verschmutzungen mit einem feuchten; weichen Tuch ab. Verwenden Sie keine Reinigungs: oder Lösemittel.

Pflegen Sie insbesondere die Empfangslinse **17** mit der glei: chen Sorgfalt; mit der Brille oder Linse eines Fotoapparats behandelt werden müssen.

Senden Sie im Reparaturfall das Messwerkzeug in der Schutz: tasche **23** ein.

Kundendienst und Anwendungsberatung

Der Kundendienst beantwortet Ihre Fragen zu Reparatur und Wartung Ihres Produkts sowie zu Ersatzteilen. Explosions: zeichnungen und Informationen zu Ersatzteilen finden Sie auch unterQ

www.bosch-pt.com

Das Bosch:Anwendungsberatungs:Team hilft Ihnen gerne bei Fragen zu unseren Produkten und deren Zubehör.

www.powertool-portal.de; das Internetportal für Handwer: ker und Heimwerker.

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

Deutschland

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Entsorgung

Messwerkzeuge; Zubehör und Verpackungen sollen einer um: weltgerechten Wiederverwertung zugeführt werden.

Werfen Sie Messwerkzeuge nicht in den Hausmüll

Nur für EU-Länder:

Gemäß der europäischen Richtlinie 2012 19 EU müssen nicht mehr ge: brauchsfähige Messwerkzeuge und gemäß der europäischen Richtlinie 2006 66 EG müssen defekte oder verbrauchte Akkus Batterien getrennt gesammelt und einer umweltgerechten Wiederverwendung zugeführt werden.

Nicht mehr gebrauchsfähige Akkuzellen Batterien können di: rekt abgegeben werden beiQ

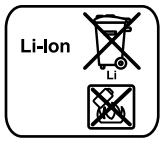
Deutschland
Recyclingzentrum Elektrowerkzeuge
Osteroder Landstraße 3
37589 Kalefeld

Schweiz
Batrec AG
3752 Wimmis BE

Akkus/Batterien:

- ▶ **Integrierte Akkus dürfen nur zur Entsorgung entnom- men werden.** Durch das Öffnen der Gehäuseschale kann das Messwerkzeug zerstört werden.

Entladen Sie den Akku komplett. Drehen Sie alle Schrauben am Gehäuse heraus und öffnen Sie die Gehäuseschale. Tren: nen Sie die Anschlüsse am Akku und nehmen Sie den Akku he: raus.



Werfen Sie Akkus Batterien nicht in den Hausmüll; ins Feuer oder ins Was: ser. Akkus Batterien sollen; wenn möglich entladen; gesammelt; recy: celt oder auf umweltfreundliche Weise entsorgt werden.

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 instruc- tions 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 meth- ods than those mentioned here, can lead to dangerous radiation exposure.**

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- **The measuring tool is provided with a warning label (marked with number 20 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 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.

Protect the measuring tool against heat, e.g., against continuous intense sunlight, fire, water, and moisture. Danger of explosion.

- **In case of damage and improper use of the battery, vapours may be emitted. Ventilate the area and seek medical help in case of complaints.** The vapours can irritate the respiratory system.

Safety Warnings for Battery Chargers

Keep the battery charger away from rain or moisture. Penetration of water in the battery charger increases the risk of an electric shock.

- **Only charge Bosch lithium ion batteries or lithium ion batteries installed in Bosch products. The battery voltage must match the battery charging voltage of the charger.** Otherwise there is danger of fire and explosion.
- **Keep the battery charger clean.** Contamination can lead to danger of an electric shock.
- **Before each use, check the battery charger, cable and plug. If damage is detected, do not use the battery charger. Never open the battery charger yourself. Have repairs performed only by a qualified technician and only using original spare parts.** Damaged battery chargers; cables and plugs increase the risk of an electric shock.
- **This battery charger can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the battery charger in a safe way and understand the hazards involved.** Otherwise; there is danger of operating errors and injuries.
- **Supervise children.** This will ensure that children do not play with the charger.
- **Cleaning and user maintenance of the battery charger shall not be made by children without supervision.**

Products sold in GB onlyQ our product is fitted with a BS 1363 A approved electric plug with internal fuse (ASTA approved to BS 1362).
If the plug is not suitable for your socket outlets; it should be cut off and an appropriate plug fitted in its place by an authorised customer service agent. The replacement plug should have the same fuse rating as the original plug.
The severed plug must be disposed of to avoid a possible shock hazard and should never be inserted into a mains socket elsewhere.

Product Description and Specifications

Intended Use

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

Technical Data

Digital Laser Rangefinder	GLM 80 Professional	GLM 80+R60 Professional
Article number	3 601 K72 3..	3 601 K72 3..
Distance measurement		
Measuring range (typical)	0;05 ..80 m[A)]	0;05 ..80 m[A)]

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Digital Laser Rangefinder	GLM 80 Professional	GLM 80+R60 Professional
Measuring range (typical under unfavourable conditions)	45 m[B)]	45 m[B)]
Measuring accuracy (typical)	± 1.5 mm[A)]	± 1.5 mm[A)]
Measuring accuracy (typical under unfavourable conditions)	± 2.5 mm[B)]	± 2.5 mm[B)]
Lowest indication unit	0.1 mm	0.1 mm
Indirect Distance Measurement and Vial		
Measuring range	..60° ...<60°	..60° ...<60°
Grade measurement		
Measuring range	0° ..360° (4x90°)[C)]	0° ..360° (4x90°)[C)]
Measuring accuracy (typical)	± 0.2°[D)F)]	± 0.2°[D)F)]
Lowest indication unit	0.1°	0.1°
General		
Operating temperature	..10 °C... < 50 °C[E)]	..10 °C... < 50 °C[E)]
Storage temperature	..20 °C... < 50 °C	..20 °C... < 50 °C
Allowable charging temperature range	<5 °C... < 40 °C	<5 °C... < 40 °C
Relative air humidity; max.	90 =	90 =
Laser class	2	2
Laser type	635 nm; 1 mW	635 nm; 1 mW
Laser beam diameter (at 25 °C) approx. ... at 10 m distance ... at 80 m distance	 6 mm 48 mm	 6 mm 48 mm
Setting accuracy of the laser to the housing; approx. ... Vertical ... Horizontal	 ± 2 mm m[F)] ± 10 mm m[F)]	 ± 2 mm m[F)] ± 10 mm m[F)]
Automatic switch:off after approx. ... Laser ... Measuring tool (without measurement)	 20 s 5 min	 20 s 5 min
Weight according to EPTA:Procedure 01 2003	0.14 kg	0.14 kg
Dimensions	51 x 111 x 30 mm	51 x 111 x 30 mm
Degree of protection	IP 54 (dust and splash water protected)	IP 54 (dust and splash water protected)
Measuring rail		
Article number	...	3 601 K79 000
Dimensions	...	58 x 610 x 30 mm
Battery	**Li-Ion**	**Li-Ion**
Rated voltage	3.7 V	3.7 V
Capacity	1.25 Ah	1.25 Ah
Number of battery cells	1	1
Single measurements per battery charge; approx.	25000[G)]	25000[G)]
Battery Charger		
Article number	2 609 120 4..	2 609 120 4..
Charging time	approx. 3 h	approx. 3 h
Output voltage	5.0 V⎓	5.0 V⎓
Charging current	500 mA	500 mA
Protection class	⧈ II	⧈ II

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A) For measurements from the rear measuring:tool edge; 100 = reflectance of the target (e. g.; a white:painted wall); weak backlight and 25 °C oper: ating temperature. Additionally; a deviation influence of ± 0.05 mm m must be taken into account.

B) For measurements from the rear measuring:tool edge; 10 ...100 = reflectance of the target; strong backlight and ...10 °C to < 50 °C operating tem: perature. Additionally; a deviation influence of ± 0.29 mm m must be taken into account.

C) For measurements with the rear side of the unit as reference; the max. measuring range is ± 60°

D) After calibration at 0 ° and 90 ° with an additional grade error of ± 0.01 ° degree to 45 ° (max.).

E) In the continuous measurement function; the maximum operating temperature is < 40 °C.

F) at 25 °C

G) For a new and charged battery without display illumination and tone signal.

Please observe the article number on the type plate of your battery charger. The trade names of individual battery chargers may vary.

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 **18** on the type plate.

Product Features

The numbering of the product features shown refers to the il: lustration of the measuring tool on the graphic page.

1 Display
2 Measuring button
3 Button for grade measurement calibration @@
4 Button for function mode basic settings @@
5 Minus button
6 Button for result timer function @@
7 Button for measured:value list storage of constant @@
8 Button for clearing the internal memory On Off @@
9 Positioning pin
10 Button for selection of the reference level
11 Plus button
12 Button for length; area and volume measurement
13 Charge socket cover
14 Socket for charge connector
15 Fixture for carrying strap
16 Laser beam outlet
17 Reception lens
18 Serial number
19 1 4J thread
20 Laser warning label
21 Charge connector
22 Battery charger
23 Protective pouch
24 Measuring rail
25 Locking lever for measuring rail
26 Tripod@
27 Laser viewing glasses@
28 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 **ERROR** indication
c Result line
d Digital vial position of measured:value list entry
e Measured:value list indicator
f Measuring functions
- Length measurement
- Area surface measurement
- Volume measurement
- Continuous measurement
- Indirect height measurement
- Double indirect height measurement
- Indirect length measurement
- Timer Function
- Wall:surface measurement
- Grade Measurement

g Battery charge:control indicator
h Laser; switched on
i Measurement reference level
k Temperature warning

Assembly

Battery Charging

- ▶ **Do not use a different battery charger.** The battery charger provided is matched to the lithium ion battery in: stalled in your measuring tool.
- ▶ **Observe the mains voltage!** The voltage of the power source must correspond with the data on the type plate of the battery charger.

Note: The battery is supplied partially charged. To ensure full capacity of the battery; completely charge the battery in the battery charger before using your power tool for the first time.

The lithium ion battery can be charged at any time without re: ducing its service life. Interrupting the charging procedure does not damage the battery.

When the bottom segment of the battery charge:control indi: cator **g** flashes; only a few more measurements can be carried out. Charge the battery.

The charge procedure begins as soon as the mains plug of the battery charger is plugged into the socket outlet and the charge connector **21** is plugged into socket **14**.

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The battery charge:control indicator **g** indicates the charging progress. During the charging procedure; the segments flash one after the other. When all segments of battery charge:control indicator **g** are displayed; the battery is completely charged.

Disconnect the battery charger from the mains supply when not using it for longer periods.

The measuring tool cannot be used during the charging procedure.

► **Protect the battery charger against moisture!**

Recommendations for Optimal Handling of the Battery

Store the battery only when within the allowable temperature range; see Technical Data . As an example; do not leave the battery in a vehicle in summer.

A significantly reduced working period after charging indicates that the battery is used and must be replaced.

Observe the notes for disposal.

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 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 and Calibration of the Grade Measurement and Accuracy Check of the Distance Measurement on page 25) each time before continuing to work).

Switching On and Off

For **switching on** the measuring tool; the following possibilities are givenQ

... Pressing the On Off button **8**QThe measuring tool is switched on and is in length measurement mode. The laser is not activated.

... Pressing the measuring button **2**QMeasuring tool and laser are switched on. The measuring tool is in length measurement mode. When the measuring tool is inserted in the measuring rail **24**; the grade measurement function is activated.

► **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 **8** 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.

When the angle is not changed for approx. 5 minutes when in the Grade measurement operating mode; the measuring tool automatically switches off to save the batteries.

When switching off automatically; all stored values are retained.

To save energy; only switch the measuring tool on when you are using it.

Measuring Procedure

When the measuring tool is inserted in the measuring rail **24**; it is always in the length measurement or grade measurement function after switching on by pressing the measuring button **2**. 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 10; the reference level can be changed (see Selecting the Reference Level ; page 21).

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 **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.

When the laser beam is switched on permanently; the measurement already starts after the first actuation of the measuring button **2**. In continuous measurement mode; the measurement starts immediately upon switching on.

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 takes place approx. 20 seconds after collimating; the measuring tool automatically switches off to save the battery.

Selecting the Reference Level (see figure A)

For the measurement; you can select between four reference planesQ

... The rear edge of the measuring tool or the front edge of the 90° folded:out positioning pin **9** (e.g. when measuring onward from outer corners);

... The tip of the 180° folded:out positioning pin **9** (e.g. when measuring from a corner);

... The front measuring:tool edge (e.g. when measuring onward from a table edge);

... The centre of thread **19** (e.g. for tripod measurements).

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To select the reference level; press button **10** 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.

Subsequent changing of the reference level for measurements that have already been carried out (e.g. when indicating measuring values in the measured:value list) is not possible.

Basic Settings

To access the Basic settings menu; press and hold the basic settings button **4**.

Briefly press the basic settings button **4** to select the individual menu items.

Press the minus button **5** or the plus button **11** to select the setting within the menu items.

To exit the Basic settings menu; press the measurement button **2**.

Basic Settings		
Tone Signals		On
		Off
Display Illumination		On
		Off
		Auto on off
Digital vial		On
		Off
Display rotation		On
		Off
Permanent laser beam		On
		Off
Unit of measure; distance (depending on country version)		m; ft; inch; ...
Unit of measure; angle		°; = ; mm m

With exception of the Permanent laser beam setting; all basic settings are retained when switching off.

Continuous 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.**

In this setting; the laser beam also remains switched on between measurements for measuring; it is only required to press the measuring button **2** once.

Measuring Functions

Simple Length Measurement

For length measurements; press button **12** until the length measurement indication appears on the display.

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

The measured value is displayed in the result line **c**.

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

Area Measurement

For area surface measurements; press button **12** until the indicator for area measurement appears on the display.

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

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

Volume Measurement

For volume measurements; press button **12** until the indicator for volume measurement appears on the display.

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

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

Values above 999 999 m^3 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) / Minimum/Maximum Measurement (see figure B)

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 ex:

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ample; you can move a certain distance away from a wall; while the actual distance can always be read.

For continuous measurements; press function mode button **4** until the indicator for continuous measurement appears on the display. To start the continuous measurement; press the measuring button **2**.

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

The maximum measurement is used to determine the greatest distance from a fixed reference point. It is used; as an exam: ple; for determining diagonals.

The current measuring value is displayed in the result line **c**. The maximal (**max**) and the minimal (**min**) measuring value are displayed in the measured:value lines **a**. It is always overwritten; when the cur: rent length measurement value is less than the present minimal or larger than the present maximal value.

The previous minimal and maximal values are deleted by pressing the button for clearing the internal memory **8**.

Pressing the measuring button **2** ends the continuous meas: urement. The last measured value is displayed in the result line **c**. Pressing the measuring button **2** again restarts a con: tinuous measuring run.

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

Indirect Distance Measurement

The indirect distance measurement is used to measure dis: tances 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.

The laser beam remains switched on between the individual measurements.

For indirect length measurements; three measuring modes are available. Each measuring mode can be used for deter: mining different distances.

a) Indirect height measurement (see figure C)

Press the function:mode button **4** until the indication for indi: rect height measurement appears on the display.

Pay attention that the measuring tool is positioned at the same height as the bottom measuring point. Now; tilt the measuring tool around the reference plane and measure dis: tance **1** as for a length measurement.

Upon completion of the measurement; the result for the sought distance **X** is displayed in the result line **c**. The measur: ing values for the distance **1** and the an: gle are displayed in the measured: value lines **a**.

b) Double indirect height measurement (see figure D)

Press the function:mode button **4** until the indication for dou: ble indirect height measurement appears on the display.

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 **c**. The measur: ing values for the distances **1** ; **2** and the angle are displayed in the meas: ured:value lines **a**.

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 E)

Press the function:mode button **4** until the indication for indi: rect length measurement appears on the display.

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 dis: tance **1** as for a length measurement.

Upon completion of the measurement; the result for the sought distance **X** is displayed in the result line **c**. The measur: ing values for the distance **1** and the an: gle are displayed in the measured: value lines **a**.

Wall Surface Measurement (see figure F)

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

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 the function:mode but: ton **4** until the indicator for wall surface measurement ap: pears on the display.

Measure the room height **A** as for a length measurement. The measured value (**cst**) is displayed in the top measured:val: ue line **a**. The laser remains switched on.

Afterwards; measure length $\mathbf{B_1}$ of the first wall. The surface is automatically calcu: lated and displayed in the result line **c**. The length measurement value is dis: played in the centre measured:value line **a**. The laser remains switched on.

Now; measure length $\mathbf{B_2}$ of the second wall. The individually measured value dis: played in the centre measured:value line **a** is added to the length $\mathbf{B_1}$. The sum of both lengths (**sum** ; displayed in the bottom measured:value line **a**) is multi: plied with the stored height **A**. The total surface value is displayed in the result line **c**.

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In this manner; you can measure any number of further lengths **BX**; which are automatically added and multiplied with height **A**.

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.

Grade Measurement (see figure G)

After pressing the grade measurement button **3**; the indication for grade measurement appears on the display ∠. The backside of the measuring tool is used as the reference plane. By pressing the grade measurement button **3** again; the side surfaces of the measuring tool are used as reference plane and the display view is shown turned by 90°.

Press the measuring button **2** to lock the measuring value and accept it in the measured values memory. Pressing the measuring button **2** again continues the measurement.

When the indication flashes during the measuring procedure; then the measuring tool was tilted too much in lateral direction.

If the digital vial function is activated in the basic settings; the grade value is also displayed in the other measuring functions in line **d** of display **1**.

Timer Function

The timer function is helpful; when; for example; movements of the measuring tool during measuring are to be prevented.

To activate the timer function; press and hold button **6** until the ±/sec indicator appears in the display.

The time period from the actuation until the measurement takes place is displayed in the measured:value line **a**. The time period can be adjusted between 1 s and 60 s by pressing the plus button **11** or the minus button **5**.

The measurement takes place automatically after the set time period has elapsed.

The timer function can also be used for distance measurements within other measuring modes (e. g. area surface measurement). Adding and subtracting measuring results as well as continuous measurements are not possible.

List of the last Measuring Values

The measuring tool stores the last 20 measuring values and their calculations; and displays them in reverse order (last measured value first).

To recall the stored measurements; press button **7**. The result of the last measurement is indicated on the display; along with the indicator for the measured:value list **e** and the memory location of the displayed measurements.

When no further measurements are stored after pressing button **7** again; the measuring tool switches back to the last measuring function. To exit the measured:value list; press one of the measuring:mode buttons.

To continuously save the currently displayed length measurement value as a constant; press and hold the measured:value list button **7** until **CST** is indicated on the display. A measured:value list entry cannot be subsequently saved as a constant.

To use a length measurement value in a measuring mode (e. g. area surface measurement); press the measured:value list button **7**; select the desired entry and confirm by pressing the result button **6**.

Deleting Measured Values

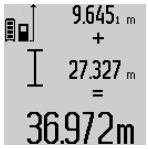
Briefly pressing button **8** deletes the last individual measuring value determined in all measuring functions. Briefly pressing the button repeatedly deletes the individual measured values in reverse order.

To delete the currently displayed measured:value list entry; briefly press button **8**. To delete the complete measured:value list and the constant **CST** ; press and hold the measured:value list button **7** and at the same time briefly press button **8**.

In wall surface measurement mode; briefly pressing button **8** the first time deletes the last individually measured value pressing the button a second time deletes all lengths $\mathbf{B_X}$; and pressing the button a third time deletes all room heights **A**.

Adding Measured Values

To add measured values; firstly carry out any measurement or select an entry from the measured:value list. Then press the plus button **11**. For confirmation; **+** appears on the display. Then carry out a second measurement or select another entry from the measured:value list.



To call up the sum of both measurements; press the result button **6**. The calculation is indicated in the measured:value lines **a**; and the sum in the result line **c**.

After calculation of the sum; further measured values or measured:value list entries can be added to this result when pressing the plus button **11** prior to each measurement. Pressing the result button **6** ends the addition.

Notes on the additionQ

- ... Mixed length; area 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 result button **6**. 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 **c**. 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 .

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Working Advice

General Information

The reception lens **17** and the laser beam outlet **16** must not be covered when taking a measurement.

The measuring tool must not be moved while taking a meas: urement (with the exception of the continuous measurement and grade measurement functions). 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 **27** (ac: cessory) and the laser target plate **28** (accessory); or shade off the target surface.

Influence Effects on the Measuring Result

Due to physical effects; faulty measurements cannot be ex: cluded when measuring on different surfaces. Included here areQ

- ... 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 **28** (accessory) on these surfaces.

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

Also; air layers with varying temperatures or indirectly re: ceived reflections can affect the measured value.

Accuracy Check and Calibration of the Grade Measure- ment (see figure H)

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 case of greater deviation; the measuring tool must be recal: ibrated. For this; press and hold the grade measurement but: ton **3**. Follow the directions on the display.

Accuracy Check of the Distance Measurement

The accuracy of the distance measurement can be checked as followsQ

- ... 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 open: ing). 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 ± 2 mm (max.). Log the measure: ments; so that you can compare their accuracy at a later point of time.

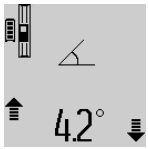
Working with the Tripod (Accessory)

The use of a tripod is particularly necessary for larger distanc: es. Position the measuring tool with the 1 4J thread **19** onto the quick:change plate of the tripod **26** 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 **10** (the reference level is the thread).

Working with the Measuring Rail (see figures I K)

The measuring rail **24** can be used for a more accurate grade measurement result. Distance measurements are not possi: ble with the measuring rail.



Place the measuring tool into the measur: ing rail **24** as shown and lock the measur: ing tool with locking lever **25**. Press the measuring button **2** to activate the Meas: uring rail operating mode.

Regularly check the accuracy of the grade measurement by carrying out a reversal measurement or with the spirit levels of the measuring rail.

In case of greater deviation; the measuring tool must be recal: ibrated. For this; press and hold the grade measurement but: ton **3**. Follow the directions on the display.

To end the Measuring rail operating mode; switch the meas: uring tool off and remove it from the measuring rail.

Troubleshooting Causes and Corrective Meas- ures

Cause	Corrective Measure
Temperature warning indicator (k) flashing; measure- ment not possible	
The measuring tool is outside the operating temperature range from ...10 °C to < 50 °C (in the function continuous measurement up to < 40 °C).	Wait until the measuring tool has reached the op: erating temperature
ERROR indication in the display	
Addition Subtraction of measured values with different units of meas: ure	Only add subtract measured values with the same units of meas: ure
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 **28** (accessory)
The laser beam outlet **16** or the re: ception lens **17** are misted up (e. g. due to a rapid temperature change).	Wipe the laser beam out: let **16** and or the recep: tion lens **17** dry using a soft cloth
Calculated value is greater than 999 999 m m^2 m^3.	Divide calculation into intermediate steps

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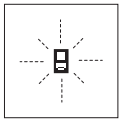
Cause	Corrective Measure
Indication >60 ° or < 60 ° on the display	
The inclination measuring range for the measuring mode and or the reference plane has been exceeded.	Carry out the measurement within the specified angle range.
CAL and ERROR indication in the display	
The calibration of the grade measurement was not carried out in the correct sequence or in the correct positions.	Repeat the calibration according to the instructions on the display and in the operating instructions.
The surfaces used for the calibration were not accurately aligned (horizontal or vertical).	Repeat the calibration on a horizontal or vertical surface if required; check the surface first with a level.
The measuring tool was moved or tilted while pressing the button.	Repeat the calibration and hold the measuring tool in place while pressing the button.
Battery charge-control indicator (g), temperature warning (k) and ERROR indication in the display	
Temperature of the measuring tool not within the allowable charge-temperature range	Wait until the charge-temperature range is reached.
Battery charge-control indicator (g) and ERROR indication in the display	
Battery charging voltage not correct	Check if the plug-in connection has been established correctly and if the battery charger is operating properly. When the unit symbol is flashing, the battery is defective and must be replaced by a Bosch after-sales service.
Battery charge-control indicator (g) and clock symbol (f) in the display	
Charge duration clearly too long, as charging current too low.	Only use the original Bosch charger.
Measuring result not plausible	
The target surface does not reflect correctly (e. g. water, glass).	Cover off the target surface
The laser beam outlet **16** or the reception lens **17** are covered.	Make sure that the laser beam outlet **16** or the reception lens **17** are unobstructed
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	Press the measuring button **2** and the button for clearing the internal memory On Off **8** to reset the software.



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

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

In case of repairs, send in the measuring tool packed in its protective pouch **23**.

After-sales Service and Application Service

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

Bosch s application service team will gladly answer questions concerning our products and their accessories.

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

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