0.000₀ m

GLM 80 Professional

BOSCH

GLM Professional

80 | 80+R 60

BOSCH

(i) (j)

(h)
(g)

4.873₁ m
34.892 m
10.873 m

(a)

(f)

(e)
(d)

10° ERROR

(b)

1848.76m³

(c)

(12)
(11)
(10)

BOSCH

GLM 80 Professional

0.000 m

(1)

Func.

(2)
(3)

(9)

(8)
(7)
(6)
(5)
(4)

(13)
(14)

(19)
(18)
(20)

(15)

(24)

(17)
(16)

(22)

(23)

(21)

GLM 80

F

G

H

CAL 1

CAL 2

CAL 3

CAL 4

CAL ✓
OK

180º 90º 180º

I

(25)

(26)

(25)

(2) (3)

❶ ❷ ❸ ❹

J

30.8°

K

1

2

180° 3

4

1

2

90°

3 180°

4
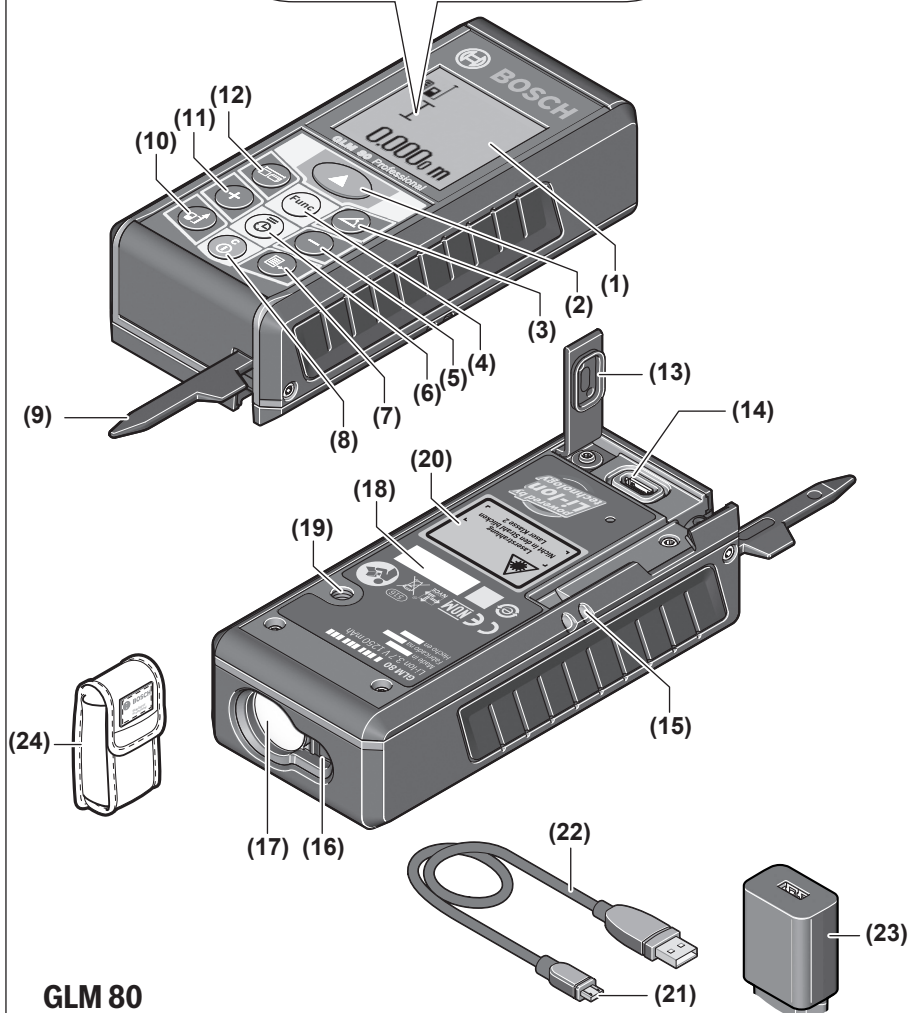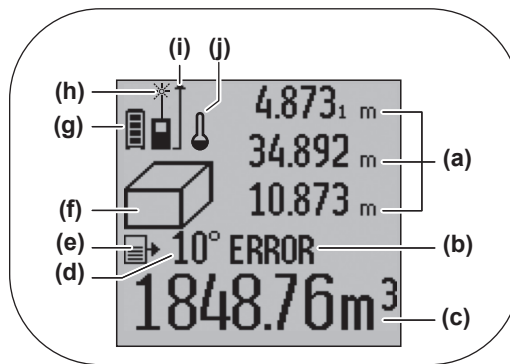
90°
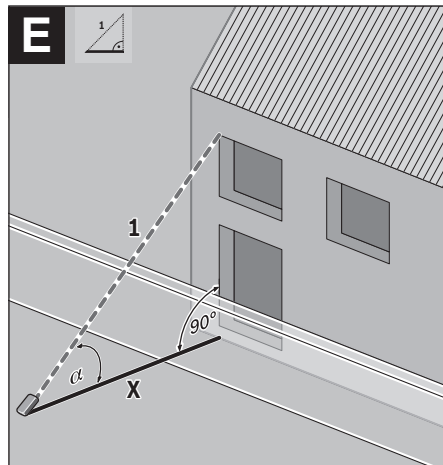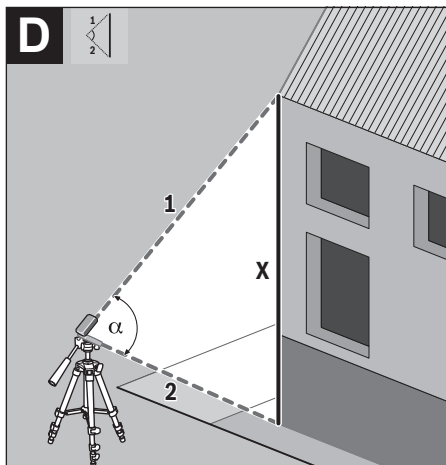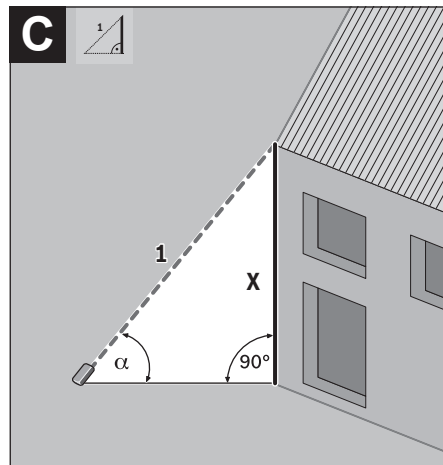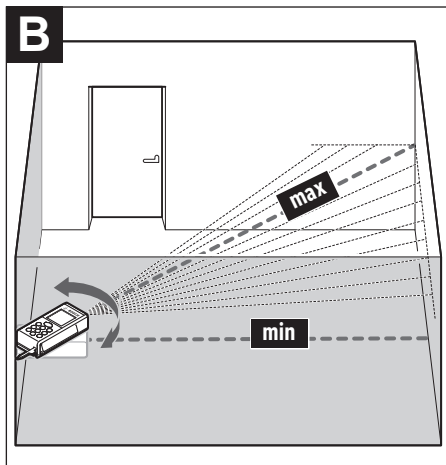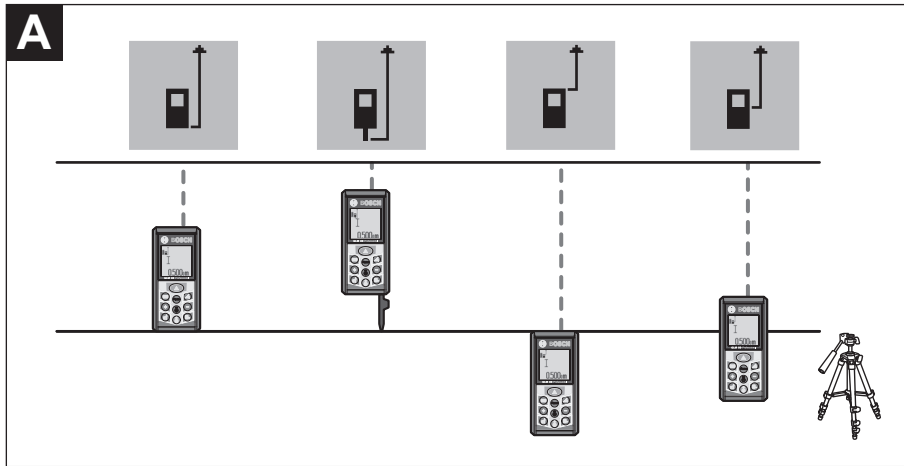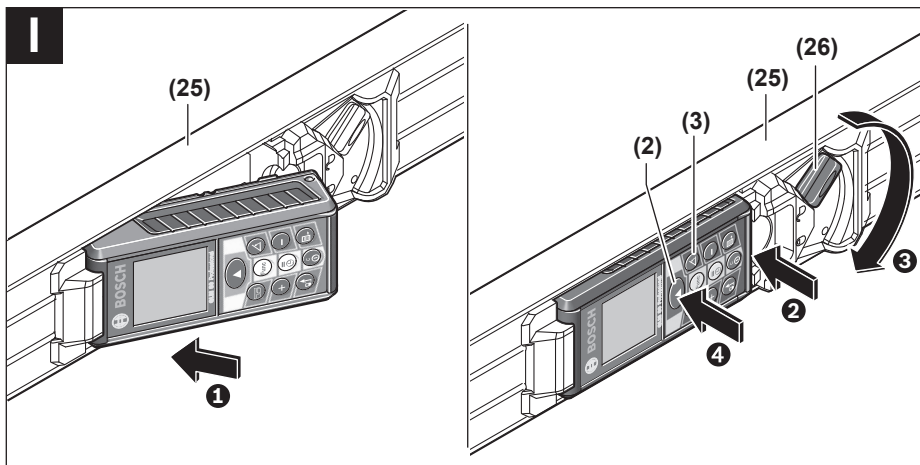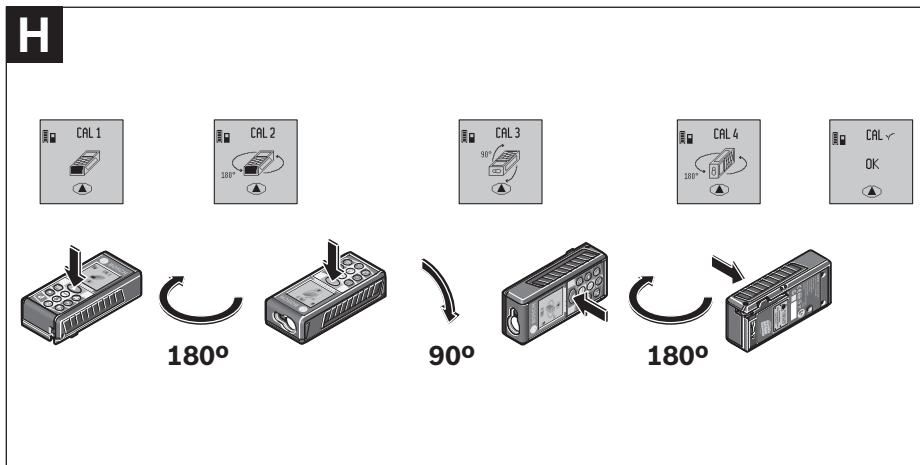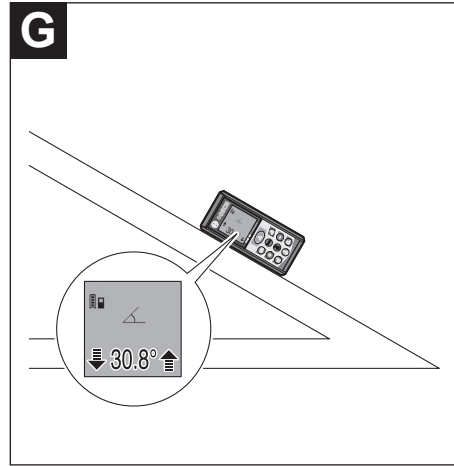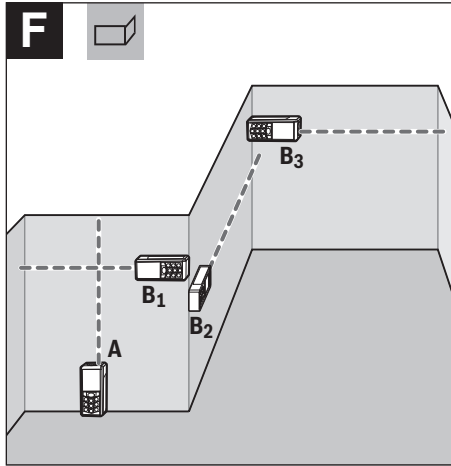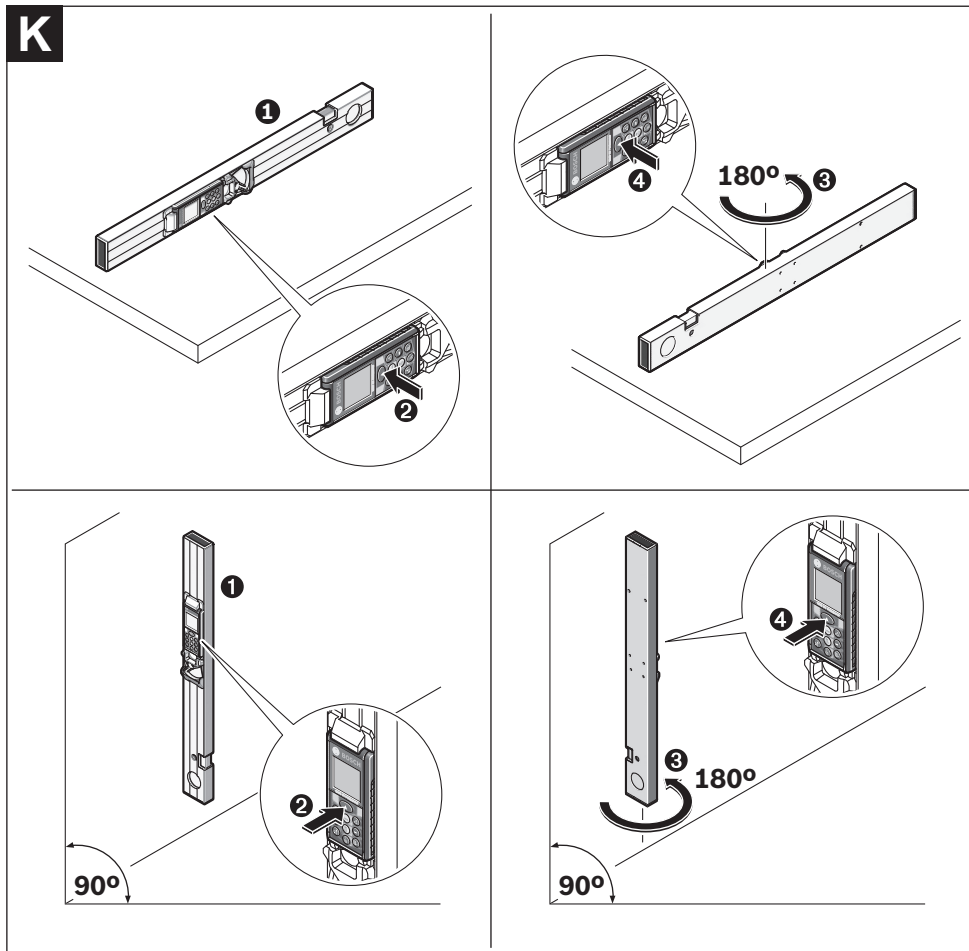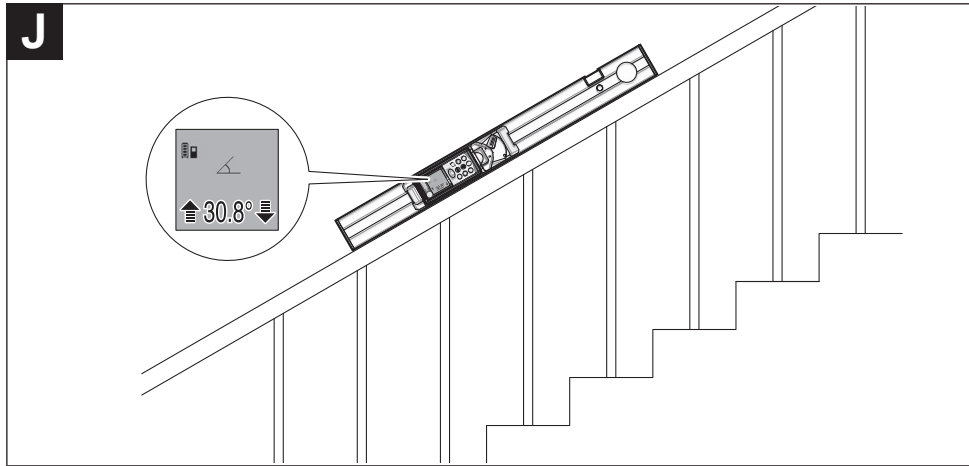
(27)
BT 150
0 601 096 B00

(28)
1 608 M00 05B

(29)
2 607 001 391

(25)
0 601 079 000

Safety Instructions

All instructions must be read and observed in order for the measuring tool to function safely. The safeguards integrated into the measuring tool may be compromised if the measuring tool is not used in accordance with these instructions. Never make warning signs on the measuring tool unrecognisable. SAVE THESE INSTRUCTIONS FOR FUTURE

REFERENCE AND INCLUDE THEM WITH THE MEASURING TOOL WHEN TRANSFERRING IT TO A THIRD PARTY.

▶ **Warning! If operating or adjustment devices other than those specified here are used or other procedures are carried out, this can lead to dangerous exposure to radiation.**

The measuring tool is delivered with a warning label (marked in the illustration of the measuring tool on the graphics page with number (20)).

IEC 60825-1:2014
<1 mW, 635 nm

Laser Radiation
Do not stare into beam
Class 2 laser product

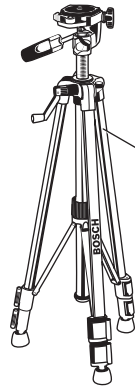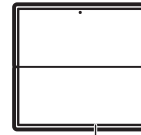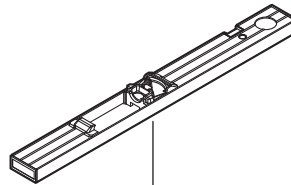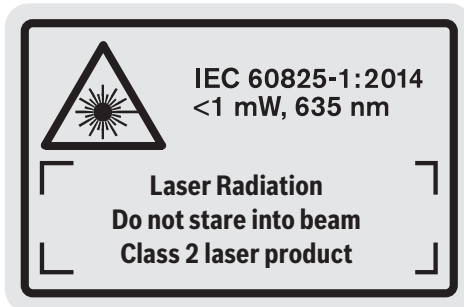▶ **If the text on the warning label is not in your native language, cover it with the label supplied, which is in your language, before initial commissioning.**

Do not direct the laser beam at persons or animals and do not look directly into the laser beam or at its reflection. Doing so could lead to blindless, or could cause accidents or damage to the eyes.

▶ **If laser radiation hits your eye, you must close your eyes and immediately turn your head away from the beam.**

▶ **Do not make any modifications to the laser equipment.**

▶ **Do not use the laser goggles as protective goggles.** The laser goggles make the laser beam easier to see; they do not protect you against laser radiation.

▶ **Do not use the laser goggles as sunglasses or while driving.** The laser goggles do not provide full UV protection and impair your ability to see colours.

▶ **Have the measuring tool serviced only by a qualified specialist using only original replacement parts.** This will ensure that the safety of the measuring tool is maintained.

▶ **Do not let children use the laser measuring tool unsupervised.** They could accidentally dazzle someone.

▶ **Do not use the measuring tool in explosive atmospheres which contain flammable liquids, gases or dust.** Sparks may be produced inside the measuring tool, which can ignite dust or fumes.

Protect the measuring tool against heat, e.g. including prolonged sun exposure, fire, water, and moisture. Danger of explosion.

▶ **Do not use the measuring tool with the Micro USB cable connected.**

Safety instructions for chargers

▶ **This charger is not intended for use by children or persons with physical, sensory or mental limitations or a lack of experience or knowledge. This charger can be used by children aged 8 or older and by persons who have physical, sensory or mental limitations or a lack of experience or knowledge if a person responsible for their safety supervises them or has instructed them in the safe operation of the charger and they understand the associated dangers.** Otherwise, there is a risk of operating errors and injuries.

▶ **Supervise children during use, cleaning and maintenance.** This will ensure that children do not play with the charger.

Do not expose the charger to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.

▶ **Charge the measuring tool only with the supplied charger.**

▶ **Keep the charger clean.** Dirt poses a risk of electric shock.

▶ **Always check the charger, cable and plug before use. Stop using the charger if you discover any damage. Do not open the charger yourself, and have it repaired only by a qualified specialist using only original replacement parts.** Damaged chargers, cables and plugs increase the risk of electric shock.

▶ **Do not operate the charger on an easily ignited surface (e.g. paper, textiles, etc.) or in a flammable environment.** There is a risk of fire due to the charger heating up during operation.

▶ **In case of damage and improper use of the battery, vapours may also be emitted.** Ensure the area is well-ventilated and seek medical attention should you experience any adverse effects. The vapours may irritate the respiratory system.

Product Description and Specifications

Intended Use

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

Product features

The numbering of the product features refers to the diagram of the measuring tool on the graphics page.

- **(1)** Display
- **(2)** Measuring button
- **(3)** Button for grade measurement/calibration[A]
- **(4)** Button for changing function/basic settings[A]
- **(5)** Minus button
- **(6)** Button for results/timer function[A]
- **(7)** Button for list of measured values/saving constant[A]
- **(8)** Button for memory deletion/switching on or off[A]
- **(9)** Measuring pin
- **(10)** Reference level selection button
- **(11)** Plus button
- **(12)** Button for distance, area and volume measurement
- **(13)** Charging socket cover
- **(14)** Micro USB port
- **(15)** Carrying strap lug
- **(16)** Laser beam output
- **(17)** Reception lens
- **(18)** Serial number
- **(19)** 1/4" thread
- **(20)** Laser warning label
- **(21)** Charging connector
- **(22)** Micro USB cable
- **(23)** Charger[B]
- **(24)** Protective bag
- **(25)** Measuring rail[B]
- **(26)** Locking lever for measuring bar[B]
- **(27)** Tripod[B]
- **(28)** Laser viewing glasses[B]
- **(29)** Laser target plate[B]

A) **Press and hold a button to activate its additional function.**
B) **Accessories shown or described are not included with the product as standard.**

Display elements

- **(a)** Measured value lines
- **(b)** **"ERROR"** indicator
- **(c)** Result line

| (d) | Digital spirit level/position of measured value list entry | | Double indirect height measurement |
(e)	Indicator for measured value list		Indirect length measurement
(f)	Measuring functions		Timer function
	⊥ Length measurement		Wall area measurement
	▭ Area measurement		Grade measurement
	▱ Volume measurement	(g)	Battery charge indicator
	⊥ Continuous measurement	(h)	Laser switched on
	◺ Indirect height measurement	(i)	Reference level of measurement
		(j)	Temperature warning

Technical data

Digital laser measure	GLM 80	GLM 80+R 60
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]
Measuring range (typical, unfavourable conditions)	35 m[B]	35 m[B]
Measuring accuracy (typical)	± 1.5 mm[A]	± 1.5 mm[A]
Measuring accuracy (typical, unfavourable conditions)	±2.5 mm[B]	±2.5 mm[B]
Smallest display unit	0.1 mm	0.1 mm
Indirect distance measurement and level		
Measuring range	−60° to +60°	−60° to +60°
Grade measurement		
Measuring range	0°−360° (4 x 90°)[C]	0°−360° (4 x 90°)[C]
Measuring accuracy (typical)	0.2°[D) E]	±0.2°[D) E]
Smallest display unit	0.1°	0.1°
General		
Operating temperature	-10 ℃ to +50 ℃[F]	-10 ℃ to +50 ℃[F]
Storage temperature	-20 ℃ to +50 ℃	-20 ℃ to +50 ℃
Permitted charging temperature range	+5 ℃ to +40 ℃	+5 ℃ to +40 ℃
Max. relative air humidity	90%	90%
Max. altitude	2000 m	2000 m
Pollution degree according to IEC 61010-1	2[G]	2[G]
Laser class	2	2
Laser type	635 nm, < 1 mW	635 nm, < 1 mW
Laser beam diameter (at 25 ℃) approx.		
– 10 m distance	6 mm[E]	6 mm[E]
– 80 m distance	48 mm[E]	48 mm[E]
Adjustment accuracy of the laser to the housing approx.		
– Vertical	±2 mm/m[H]	±2 mm/m[H]
– Horizontal	±10 mm/m[H]	±10 mm/m[H]
Automatic switch-off after approx.		
– Laser	20 s	20 s
– Measuring tool (without measurement)	5 min	5 min
Weight according to EPTA-Procedure 01:2014	0.14 kg	0.14 kg
Dimensions	51 x 111 x 30 mm	51 x 111 x 30 mm

Digital laser measure	GLM 80	GLM 80+R 60
Protection rating	IP 54 (dust and splash-proof)	IP 54 (dust and splash-proof)
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
Individual measurements per battery charge approx.	25000[I]	25000[I]
Charger		
Article number	**2 609 120 7..** **1 600 A01 3..**	**2 609 120 7..** **1 600 A01 3..**
Charging time	approx. 3 h	approx. 3 h
Battery charging voltage	5.0 V⎓	5.0 V⎓
Charge current	1000 mA	1000 mA
Protection class	▣ / II	▣ / II

A) For measurements from the front edge of the measuring tool, 100% reflectivity of the target (e.g. a white wall), weak backlighting and 25 ℃ operating temperature. In addition, a deviation influence of ± 0.05 mm/m needs to be taken into account.

B) For measurements from the rear edge of the measuring tool, 10–100 % reflectivity of the target, strong backlighting and 25 ℃ operating temperature. In addition, a deviation influence of ± 0.29 mm/m needs to be taken into account.

C) For measurements that use the back of the device as a reference, the max. measuring range amounts to ± 60°

D) After calibration in accordance with figure **H**. Additional pitch error of ± 0.01°/degree up to 45°.

E) The width of the laser line depends on the surface characteristics and on the ambient conditions.

F) In continuous measurement mode, the max. operating temperature is +40 ℃.

G) Only non-conductive deposits occur, whereby occasional temporary conductivity caused by condensation is expected.

H) At 25 ℃

I) For a new and charged battery without display illumination and sound.

The serial number **(18)** on the type plate is used to clearly identify your measuring tool.

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

Initial start-up

Charging the battery

▶ **Use only the chargers listed in the technical data.** Only these chargers are matched to the lithium-ion battery of your measuring tool.

▶ **The use of chargers from other manufacturers can lead to defects on the measuring tool; a higher voltage (e.g. 12 V) from a vehicle charger is not suitable for charging this measuring tool. The warranty is rendered void if these instructions are not followed.**

▶ **Pay attention to the mains voltage.** The voltage of the power source must match the voltage specified on the rating plate of the charger.

Note: The battery is supplied partially charged. To ensure full capacity of the battery, completely charge the battery before the first use.

The lithium-ion battery can be charged at any time without reducing its service life. Interrupting the charging process does not damage the battery.

If the lower segment of the battery charge indicator **(g)** flashes, only a few more measurements can be made. Charge the battery.

If the frame around the segments of the battery charge indicator **(g)** flashes, no more measurements are possible. The measuring tool can only be used for a short time (e.g. to check entries in the measured value list). Charge the battery.

Connect the measuring tool to the charger **(23)** using the micro USB cable **(22)** provided. Plug the charger **(23)** into the socket. The charging process will begin.

The battery charge indicator **(g)** indicates the charging progress. The segments flash successively during charging. When all segments of the battery charge indicator **(g)** are displayed, the battery is fully charged.

If you are not planning to use the power tool again soon, disconnect the charger from the mains.

The battery can also be charged at a USB port. To do so, connect the measuring tool to a USB port using the micro USB cable. In USB mode (charging mode, data transfer), the charging time can be noticeably longer.

The measuring tool cannot be used during the charging procedure.

▶ **Protect the charger against moisture.**

Recommendations for optimal handling of the battery in the measuring tool

Only charge the measuring tool in the permissible temperature range, (see "Technical data", page 20). As an example, do not leave the measuring tool in a vehicle during the summer.

A significantly reduced operating time after charging indicates that the battery has deteriorated and must be replaced by the Bosch after-sales service.

Follow the instructions on correct disposal.

Operation

Start-Up

▶ **Protect the measuring tool from moisture and direct sunlight.**

▶ **Do not expose the measuring tool to any extreme temperatures or variations in temperature.** For example, do not leave it in a car for extended periods of time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. The precision of the measuring tool may be compromised if exposed to extreme temperatures or variations in temperature.

▶ **Avoid substantial knocks to the measuring tool and avoid dropping it.** Always carry out an accuracy check before continuing work if the measuring tool has been subjected to severe external influences (see "Checking accuracy and calibrating the grade measurement (see figure **H**)", page 26) and (see "Accuracy check of the distance measurement", page 26).

Switching on/off

▶ **Never leave the measuring tool unattended when switched on, and ensure the measuring tool is switched off after use.** Others may be dazzled by the laser beam.

The following options are available for **switching on** the measuring tool:

– Pressing the on/off button **(8)**: The measuring tool is switched on in the length measurement function. The laser is not switched on.

– Pressing the measuring button **(2)**: Measuring tool and laser are switched on. The measuring tool will be in the length measurement function. When the measuring tool is inserted in the measuring rail **(25)**, the grade measurement function is activated.

▶ **Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself (even from a distance).**

To **switch off** the measuring tool, press and hold the on/off button **(8)**.

If no button on the measuring tool is pressed for approx. five minutes, then the measuring tool will automatically switch itself off to preserve battery life.

If the angle has not been changed for approx. five minutes while the measuring tool is in the "grade measurement" operating mode, the tool will automatically switch itself off to preserve battery life.

All saved values are retained when the tool is automatically switched off.

Measuring process

After the measuring tool has been switched on by pressing the measuring button **(2)**, the tool is always in the length measurement function by default, or in the grade measurement function if the tool has been inserted into the measuring rail **(25)**. Other measuring functions can be switched to by pressing the respective function button (see "Measuring functions", page 23).

Once the measuring tool has been switched on, the rear edge of the measuring tool is selected as the reference level for measurement. You can change the reference level by pressing the reference level selection button**(10)** (see "Selecting the reference level (see figure **A**)", page 22).

Apply the measuring tool with the selected reference level to the point at which you want to start the measurement (e.g. wall).

To switch on the laser beam, briefly press the measuring button **(2)**.

▶ **Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself (even from a distance).**

Aim the laser beam at the target surface. To initiate the measurement, briefly press the measuring button **(2)** again.

While the laser beam is continuously switched on, measurement will begin after the first press of the measuring button **(2)**. In the continuous measurement function, measurement begins as soon as the function is activated.

The measured value typically appears within 0.5 seconds and no later than 4 seconds. The duration of the measurement depends on the distance, the lighting conditions and the reflective properties of the target surface. The end of the measurement is indicated by an audio signal. Upon completion of the measurement, the laser beam is automatically switched off.

If no measurement has been performed within approx. 20 seconds of aim being taken, the laser beam is switched off automatically to preserve battery life.

Selecting the reference level (see figure A)

You can choose between four different reference levels for the measurement:

– The rear edge of the measuring tool or the front edge of the measuring pin **(9)** when it has been folded out by 90° (e.g. when applying the tool to outer corners)

– The tip of the measuring pin **(9)** when it has been folded 180° (e.g. when measuring from a corner)

– The front edge of the measuring tool (e.g. when measuring from a table edge)
– The centre of the thread **(19)** (e.g. for tripod measurements)

To select the reference level, press the button **(10)** until the required reference level is shown on the display. The rear edge of the measuring tool is pre-set as the reference level every time the measuring tool is switched on.

It is not possible to make a retrospective alteration to the reference level for measurements that have already been taken (e.g. when displaying measured values in the measured value list).

Basic settings menu

To enter the basic settings menu, press and hold the button for basic settings **(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 measuring button **(2)**.

Basic settings		
Audio signals	🔊	On
	🔇	Off
Display illumination	💡	On
	💡	Off
	💡 AUTO	Automatically on/off
Digital spirit level		On
		Off
Display rotation		On
		Off
Continuous laser beam		On
		Off
Unit of distance (depending on country version)		m, ft, inch, etc.
Unit for angle (depending on country version)		°, %, mm/m, inch/ft

All basic settings except for the continuous laser beam setting are saved when switching off the tool.

Continuous laser beam

▶ **Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself (even from a distance).**

In this setting, the laser beam remains switched on even between measurements; measurement simply requires one brief press of the measuring button **(2)**.

Measuring functions

Simple length measurement

For length measurements, repeatedly press the button **(12)** until the indicator for length measurement ⌶ appears on the display.

Briefly press the measuring button **(2)** once to switch on the laser and once to measure.

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

For multiple consecutive length measurements, the results of the last measurements are shown in the measured value lines **(a)**.

Area measurement

For area measurements, repeatedly press the button **(12)** until the indicator for area measurement ▭ appears on the display.

Then measure the width and length one after the other as with a length measurement. The laser beam remains switched on between the two measurements.

Once the second measurement has been completed, the area is automatically calculated and displayed in the result line **(c)**. The individual measured values can be found in the measured value lines **(a)**.

Volume measurement

For volume measurements, repeatedly press the button **(12)** until the indicator for volume measurement ▱ appears on the display.

Then measure the width, length and depth one after the other as with a length measurement. The laser beam remains switched on between the three measurements.

Once the third measurement has been completed, the volume is automatically calculated and displayed in the result line **(c)**. The individual measured values can be found in the measured value lines **(a)**.

Values over 999,999 m^3 cannot be displayed; **"ERROR"** will instead appear on the display. Divide the volume to be measured into individual measurements, the resulting values of which you can calculate separately and then combine into an overall total.

Continuous measurement and minimum/maximum measurement (see figure B)

In continuous measurement mode, the measuring tool can be moved relative to the target, during which the measured value will be updated every half a second. You can, for ex-

ample, move a desired distance away from a wall while reading off the current distance at all times.

For continuous measurements, repeatedly press the button for changing function **(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. For example, it can help in determining verticals or horizontals.

The maximum measurement is used to determine the greatest distance from a fixed reference point. For example, it can help in determining diagonals.
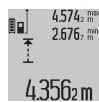
The current measured value is shown in the result line **(c)**. The maximum (**"max"**) and minimum (**"min"**) measured value appear in the measured value lines **(a)**. It is then always overwritten if the current length measurement value is smaller or larger than the previous minimum or maximum value.

Press the memory deletion button **(8)** to erase the previous minimum or maximum values.

Press the measuring button **(2)** to end the continuous measurement. The last measured value is displayed in the result line **(c)**. Pressing the measuring button **(2)** again starts a new continuous measurement.

Continuous measurement automatically switches off after five minutes. The last measured value remains displayed in the result line **(c)**.

Indirect distance measurement

The indirect distance measurement is used to determine distances that cannot be measured directly, due to an obstacle that would impede the path beam or the absence of a target surface that could serve as a reflector. This measuring procedure can only be employed vertically. Any horizontal deviation will lead to measurement 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 determining different distances.

a) Indirect height measurement (see figure C)

Repeatedly press the button for changing function **(4)** until the indicator for indirect height measurement appears on the display.

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

Once the measurement is complete, the result for the required distance **"X"** is displayed in the result line **(c)**. The measured values for distance **"1"** and angle **"α"** can be found in the measured value lines **(a)**.

b) Double indirect height measurement (see figure D)

Repeatedly press the button for changing function **(4)** until the indicator for double indirect height measurement appears on the display.

Measure distances **1** and **2** in succession as for a length measurement.
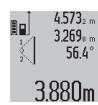
Once the measurement is complete, the result for the required distance **X** is displayed in the result row **(c)**. The measured values for distances **1** and **2** and angle **α** can be found in the measured value rows **(a)**.

Ensure that the reference level for the measurement (e.g. the rear edge of the measuring tool) remains in exactly the same place for all the individual measurements in a single measuring process.

c) Indirect length measurement (see figure E)

Repeatedly press the button for changing function **(4)** until the indicator for indirect length measurement appears on the display.

Ensure that the measuring tool is at the same height as the required measuring point. Then tilt the measuring tool around the reference level and measure distance **"1"** as for a length measurement.
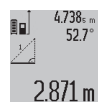
Once the measurement is complete, the result for the required distance **"X"** is displayed in the result line **(c)**. The measured values for distance **"1"** and angle **"α"** can be found in the measured value lines **(a)**.

Wall area measurement (see figure F)

The wall area measurement is used to determine the sum of multiple individual areas with a common height.

In the illustrated example, the total area of several walls that have the same ceiling height **A** but different lengths **B** is to be determined.

For wall area measurements, repeatedly press the button for changing function **(4)** until the indicator for wall area measurement appears on the display.

Measure the ceiling height **A** as with a length measurement. The measured value (**"cst"**) is displayed in the top measured value line **(a)**. The laser remains switched on.

Then measure the length B_1 of the first wall. The area is automatically calculated and displayed in the result line **(c)**. The last measured value for length can be found in the middle measured value line. **(a)**. The laser remains switched on.
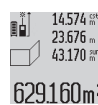
Now measure the length B_2 of the second wall. The individual measured value displayed in the middle measured value line **(a)** is added to the length B_1. The sum of the two lengths (**"sum"**, displayed in the bottom measured value line **(a)**) is multiplied by the saved height **A**. The total area value is displayed in the result line **(c)**.

You can measure any number of lengths B_x, which will be automatically added and multiplied by the height **A**.

The requirement for a correct area calculation is that the first measured length (for example the ceiling height **A**) is identical for all sub-areas.

Grade measurement (see figure G)

Press the button for grade measurement **(3)** to bring up the indicator for grade measurement ∠ on the display. The rear of the measuring tool serves as the reference level. Press the button for grade measurement **(3)** again to use the sides of the measuring tool as a reference level and rotate the display view by 90°.

Press the measuring button **(2)** to fix the measured value and transfer it to the measured value memory. Press the measuring button **(2)** again to continue the measurement.

If the display flashes during measurement, the measuring tool has been tipped too heavily to the side.

If the "digital spirit level" function is activated in the basic settings, the grade value is also displayed in the other measuring functions in line **(d)** of the display **(1)**.

Timer function

The timer function is useful when the measuring tool should be kept stationary during measurement, for example.

Press and hold the button for the timer function **(6)** to bring up the indicator ⏱ on the display.

The time period between triggering the timer and starting measurement is displayed in the measured value line **(a)**. The time period can be set between 1–60 seconds by pressing the plus button **(11)** or minus button **(5)**.

The measurement is made automatically after the set time period has expired.

The timer function can also be used for distance measurements within other measuring functions (e.g. area measurement). It is not possible to add or subtract measuring results or carry out continuous measurement.

List of the last measured values

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

To retrieve the saved measurements, press the button **(7)**. The result of the last measurement appears on the display, along with the indicator for the measured values list **(e)** and with storage space for the numbering of the displayed measurements.

If no further measurements are saved upon pressing the button **(7)** again, the measuring tool switches back to the last measuring function. Press one of the buttons for the measuring functions to exit the list of measured values.

To permanently save the currently displayed measured length value as a constant, press and hold the button for the list of measured values **(7)** until **"CST"** is shown on the display. An entry in the list of measured values cannot be retrospectively saved as a constant.

To use a measured length value in a measuring function (e.g. area measurement), press the button for the list of meas-

ured values **(7)**, select the desired entry and confirm it by pressing the results button **(6)**.

Deleting measured values

Briefly pressing the button **(8)** will delete the last measured value in all measuring functions. Repeatedly pressing the button briefly will delete the individual measured values in reverse order.

To delete the currently displayed entry in the list of measured values, briefly press the button **(8)**. To delete the complete list of measured values and the constant **"CST"**, press and hold the measured value list button **(7)** and at the same time briefly press the button **(8)**.

In the wall area measurement function, a brief first press of the button **(8)** will delete the last individual measured value; a second press will delete all lengths **B**$_x$; a third will delete the ceiling height **A**.

Adding measured values

To add measured values together, first perform any measurement or select an entry from the list of measured values. Next, press the plus button **(11)**. **"+"** will appear on the display as confirmation. Then perform a second measurement or select another entry from the measured value list.

Press the results button **(6)** to retrieve the sum of both measurements. The calculation is shown in the measured value lines **(a)** and the sum is displayed in the result line **(c)**.

When the sum has been calculated, you can add more measured values or measured value list entries to this result if you press the plus button **(11)** before each measurement. Press the results button **(6)** to end the addition.

Information on addition:

– Mixtures of length, area and volume values cannot be added together. For example, if a length value and an area value are added together, **"ERROR"** will appear briefly on the display when the results button **(6)** is pressed. The measuring tool will then switch back to the most recently active measuring function.

– The result of a measurement (e.g. volume value) is always added; for continuous measurements, the measured value displayed in the result line **(c)** is added. It is not possible to add individual measured values from the measured value lines **(a)**.

Subtracting measured values

To subtract measured values, press the minus button **(5)**; **"-"** will appear on the display as confirmation. The subsequent steps are the same as for the "Adding measured values" section.

Practical advice

General advice

The reception lens **(17)** and the laser beam output **(16)** must not be covered during the measuring process.

The measuring tool must not be moved during a measurement (with the exception of the continuous measurement

and grade measurement functions). For this reason, place the measuring tool against or on a firm surface whenever possible.

Influences on the measuring range

The measuring range depends on the lighting conditions and the reflective properties of the target surface. For better visibility of the laser beam when working outdoors and in bright sunlight, use the laser viewing glasses **(28)** (accessory) and the laser target plate **(29)** (accessory) or shade the target area.

Influences on the measurement result

Due to physical effects, the possibility of inaccurate measurements when measuring various surfaces cannot be excluded. These include:

– Transparent surfaces (e.g. glass, water)
– Reflective surfaces (e.g. polished metal, glass)
– Porous surfaces (e.g. insulating materials)
– Structured surfaces (e.g. roughcast, natural stone).

If necessary, use the laser target plate **(29)** (accessory) on these surfaces.

Inaccurate measurements are also possible where the laser is pointed at target surfaces diagonally.

Layers of air at different temperatures and indirectly received reflections can also influence the measured value.

Checking accuracy and calibrating the grade measurement (see figure H)

Regularly check the accuracy of the grade measurement. This is accomplished by means of a reverse measurement. To do this, lay the measuring tool on a table and measure the inclination. Turn the measuring tool by 180° and measure the inclination again. The difference between the displayed values must not exceed 0.3°.

In case of greater deviation, the measuring tool must be recalibrated. To do this, press and hold the grade measurement button **(3)**. Follow the directions on the display.

Accuracy check of the distance measurement

You can check the accuracy of the measuring tool as follows:

– Choose a measuring section of approx. 1–10 m in length that is permanently unchanged, the exact length of which is known to you (e.g. room width, door opening). The measuring section must be indoors, and the target surface of the measurement must be smooth and reflect well.
– Measure the section ten times in succession.

The deviation between the individual measurements and the mean value must not exceed ± 2 mm. Record the measurements in order to be able to compare the accuracy later on.

Working with the tripod (accessory)

The use of a tripod is particularly necessary for larger distances. Place the measuring tool with the 1/4" thread **(19)** on the quick-release plate of the tripod **(27)** or a conventional camera tripod. Tighten it using the locking screw of the quick-release plate.

Set the reference level for measurements with a tripod by pressing the button **(10)** accordingly (thread reference level).

Working with the measuring rail (see figures I–K)

The measuring rail **(25)** can be used for a more exact grade measurement result. Distance measurements are not possible with the measuring rail.

Insert the measuring tool into the measuring rail **(25)** as shown and lock the measuring tool in place with the locking lever **(26)**. Press the measuring button **(2)** to activate the "measuring rail" operating mode.

Regularly check the accuracy of the grade measurement by means of a reverse measurement or the levels on the measuring rail.

In case of greater deviation, the measuring tool must be recalibrated. To do this, press and hold the grade measurement button **(3)**. Follow the directions on the display.

To end the "measuring rail" operating mode, switch off the measuring tool and remove it from the measuring rail.

Errors – Causes and Corrective Measures

Cause	Corrective measures
Temperature warning(j) flashes, measurement not possible.	
The measuring tool is outside the operating temperature of −10 ℃ to +50 ℃ (in the continuous measurement function, up to +40 ℃).	Wait until the measuring tool has reached operating temperature.
Display shows "ERROR"	
Addition/subtraction of measured values with different units of measurement.	Only add/subtract measured values with the same units of measurement.
Angle between laser beam and target is too acute.	Increase the angle between the laser beam and the target
Target surface is too reflective (e.g. mirror) or not reflective enough (e.g. black material), or ambient light is too bright.	Use the laser target plate **(29)**.
The laser beam output **(16)** and/or reception lens **(17)** are fogged up (e.g. due to a rapid temperature change).	Wipe the laser beam output **(16)** and/or reception lens **(17)** dry with a soft cloth.
Calculated value is larger than 999,999 m/m^2/m^3.	Divide the calculation into intermediate steps.
Display shows "> 60°" or "< −60°"	
The grade measuring range for the measuring function or reference level has been exceeded.	Perform the measurements within the specified angle range.
Display shows "CAL" and "ERROR"	

Cause	Corrective measures
The calibration of the grade measurement has not been carried out in the right order or has not been carried out in the correct positions.	Repeat the calibration according to the instructions that appear on the display and in the manual.
The surfaces used for calibration were not precisely horizontal or vertical.	Repeat the calibration on a horizontal or vertical surface and check the surfaces beforehand if necessary using a spirit level.
The measuring tool has moved or tilted when the button was pressed.	Repeat the calibration and hold the measuring tool still against the surface when pressing the button.
Battery charge indicator (g), temperature warning (j) and "ERROR" shown in the display	
The temperature of the measuring tool is outside the permissible charging temperature range.	Wait until the charging temperature range has been reached.
Battery charge indicator (g) and "ERROR" shown in the display	
The battery charging voltage is not correct.	Check whether the connection has been established correctly and that the micro USB cable is working properly. If the device symbol flashes, the battery is defective and must be replaced by the Bosch after-sales service.
Battery charge indicator (g) and clock symbol (f) shown in the display	
Charging time significantly extended due to the charging current being too low.	Only use the original Bosch micro USB cable.
Measurement result implausible	
Target surface reflection not distinct (e.g. water, glass).	Cover the target surface.
Laser beam output **(16)** and/ or reception lens **(17)** are covered.	Keep the laser beam output **(16)** and/or reception lens **(17)** clear.
An incorrect reference level has been set.	Select a reference level that is appropriate for the measurement.
Obstruction in the path of the laser beam.	The laser point must be fully on the target surface.
The indicator remains unchanged or the measuring tool reacts unexpectedly when a button is pressed.	
Software error.	Press the measuring button **(2)** and the button for memory deletion/switching on or off **(8)** to reset the software.

Cause	Corrective measures
	The measuring tool monitors correct functioning in every measurement. If a defect is detected, the display will indicate only the symbol shown opposite. In this case, or if the above-mentioned corrective measures cannot rectify

an error, submit the measuring tool to the Bosch after-sales service via your dealer.

Maintenance and Service

Maintenance and Cleaning

Only store and transport the measuring tool in the protective bag provided.

Keep the measuring tool clean at all times.

Never immerse the measuring tool in water or other liquids.

Wipe off any dirt using a damp, soft cloth. Do not use any detergents or solvents.

Take particular care of the reception lens **(17)**, which must be handled with the same level of care you would give to a pair of glasses or a camera lens.

If the measuring tool needs to be repaired, send it off in the protective bag **(24)**.

Transport

The contained lithium-ion batteries are subject to the Dangerous Goods Legislation requirements. The batteries are suitable for road-transport by the user without further restrictions.

When shipping by third parties (e.g.: by air transport or forwarding agency), special requirements on packaging and labelling must be observed. For preparation of the item being shipped, consulting an expert for hazardous material is required.

Disposal

Measuring tools, chargers, batteries, accessories and packaging should be recycled in an environmentally correct manner.

Do not dispose of measuring tools, chargers or batteries with household waste.

Battery packs/batteries:

Li-ion:

Please observe the notes in the section on transport (see "Transport", page 28).

▶ **Integrated batteries may only be removed for disposal by qualified personnel.** Opening the housing shell can destroy the measuring tool.

Before you can remove the battery from the measuing tool, you will need to use the measuring tool until the battery is completely discharged. Unscrew the screws on the housing and remove the housing shell in order to remove the battery. To prevent a short circuit, disconnect the connectors on the battery one at a time and then isolate the poles. Even when fully discharged, the battery still contains a residual capacity, which can be released in case of a short circuit.