

## 12 | English

Nicht mehr gebrauchsfähige Akkus/Batterien können direkt abgegeben werden bei:

**Deutschland**

Recyclingzentrum Elektrowerkzeuge

Osteroder Landstraße 3

37589 Kalefeld

**Schweiz**

Batrec AG

3752 Wimmis BE

Änderungen vorbehalten.

## English

### Safety Notes



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

- **Caution** – The use of other operating or adjusting equipment or the application of other processing methods than those mentioned here can lead to dangerous radiation exposure.
- The measuring tool is provided with a warning label (marked with number 10 in the representation of the measuring tool on the graphics page).



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



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

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

► **Do not use the laser viewing glasses as safety goggles.**

The laser viewing glasses are used for improved visualisation of the laser beam, but they do not protect against laser radiation.

► **Do not use the laser viewing glasses as sun glasses or in traffic.**

The laser viewing glasses do not afford complete UV protection and reduce colour perception.

► **Have the measuring tool repaired only through qualified specialists using original spare parts.** This ensures that the safety of the measuring tool is maintained.

► **Do not allow children to use the laser measuring tool without supervision.** They could unintentionally blind other persons or themselves.

► **Do not operate the measuring tool in explosive environments, such as in the presence of flammable liquids, gases or dusts.** Sparks can be created in the measuring tool which may ignite the dust or fumes.



**Keep the measuring tool away from cardiac pacemakers.** The magnet inside the measuring tool generates a field that can impair the function of cardiac pacemakers.

► **Keep the measuring tool away from magnetic data media and magnetically-sensitive equipment.** The effect of the magnet can lead to irreversible data loss.

## Product Description and Specifications

Please unfold the fold-out page with the representation of the measuring tool and leave it unfolded while reading the operating instructions.

### Intended Use

The measuring tool is intended for determining and checking horizontal and vertical lines.

### Technical Data

Cross-line Laser	GLL2-50
Article number	3 601 K63 1..
Working range	
– Standard	20 m
– With pulse function	15 m
– With laser receiver	50 m
Levelling Accuracy	± 0.3 mm/m
Self-levelling range, typically	± 4°
Levelling duration, typically	< 4 s
Operating temperature	– 10 °C...+ 50 °C
Storage temperature	– 20 °C...+ 70 °C
Relative air humidity, max.	90 %
Laser class	2
Laser type	635 nm, < 1 mW
C <sub>6</sub>	1

The measuring tool can be clearly identified with the serial number **9** on the type plate.

Cross-line Laser	GLL2-50
Shortest pulse duration	1/1 600 s
Tripod mount	1/4"
Batteries	3 x 1.5 V LR6 (AA)
Operating time, approx.	12 h
Automatic switch-off after approx.	30 min
Weight according to EPTA-Procedure 01:2014	0.45 kg
Dimensions	118 x 57 x 89 mm
Degree of protection	IP 54 (dust and splash water protected)

The measuring tool can be clearly identified with the serial number **9** on the type plate.

## Product Features

The numbering of the product features shown refers to the illustration of the measuring tool on the graphic page.

- 1 Exit opening for laser beam
- 2 Pulse-function indicator
- 3 Pulse-function button
- 4 Operating mode button
- 5 Battery indicator
- 6 Tripod mount 1/4"
- 7 On/Off switch
- 8 Battery lid
- 9 Serial number
- 10 Laser warning label
- 11 Latch of battery lid
- 12 Alignment plate\*
- 13 0° alignment aid on the alignment plate
- 14 90° alignment aid on the alignment plate
- 15 45° alignment aid on the alignment plate
- 16 Pin on the alignment plate
- 17 Protective pouch\*
- 18 Case\*
- 19 Laser viewing glasses\*
- 20 Measuring plate with stand\*
- 21 Laser receiver\*

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

## Assembly

### Inserting/Replacing the Batteries

Use only alkali-manganese batteries.

To open the battery lid **8**, press the latch of the battery lid **11** in the direction of the arrow and remove the battery lid. Insert the supplied batteries. When inserting, pay attention to the correct polarity according to the representation on the inside of the battery compartment.

When the battery indication **5** flashes red, the batteries must be replaced.

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

► **Remove the batteries from the measuring tool when not using it for extended periods.** When storing for extended periods, the batteries can corrode and self-discharge.

## Operation

### Initial Operation

- **Protect the measuring tool against moisture and direct sun light.**
- **Do not subject the measuring tool to extreme temperatures or variations in temperature.** As an example, do not leave it in vehicles for a long time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. In case of extreme temperatures or variations in temperature, the accuracy of the measuring tool can be impaired.
- **Avoid heavy impact or falling of the measuring tool.** After heavy exterior impact on the measuring tool, an accuracy check should always be carried out before continuing to work (see "Levelling Accuracy").
- **Switch the measuring tool off during transport.** When switching off, the levelling unit, which can be damaged in case of intense movement, is locked.

### Switching On and Off

To **switch on** the measuring tool, slide the On/Off switch **7** to the "on" position (when working without automatic levelling) or to the "on" position (when working with automatic levelling). Immediately after switching on, the measuring tool sends laser beams out of the exit openings **1**.

► **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, slide the On/Off switch **7** to the "off" position. When switching off, the levelling unit is locked.

### Deactivating the Automatic Shut-off

The measuring tool switches off automatically after an operating duration of 30 minutes. To deactivate the automatic switch-off, keep the operating mode button **4** pressed for 3 s while switching on the measuring tool. When the automatic switch-off is deactivated, the laser lines briefly flash after 3 s.

► **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.

To activate the automatic shut-off, switch the measuring tool off and then on again (without the operating mode button **4** pushed).

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**Operation Modes (see figures A – D)**

The measuring tool has three operating modes between which you can switch at any time:

- Horizontal operation “–”: Produces a horizontal laser line,
- Vertical operation “|”: Produces a vertical laser line,
- Cross-line operation “+”: Produces a horizontal and vertical laser line.

After switching on, the measuring tool is in cross-line operating mode. To change the operating mode, press the operating mode button **4**.

All three operating modes can be selected either with or without automatic levelling.

**Pulse Function**

When working with the laser receiver **21**, the pulse function must be activated, – independent of the selected operating mode.

In pulse function, the laser lines flash at very high frequency and thus become detectable by the laser receiver **21**.

To switch on the pulse function, press button **3**. When the pulse function is switched on, the pulse-function indicator **2** lights up green.

When the pulse function is switched on, the visibility of the laser lines is reduced for the human eye. Therefore, shut off the pulse function by pushing button **3** again when working without laser receiver. When the pulse function is switched off, the pulse-function indicator **2** is deactivated.

**Automatic Levelling****Working with Automatic Levelling (see figure C)**

Position the measuring tool on a level and firm support or attach it to a commercially available photographic tripod.

When working with automatic levelling, push the On/Off switch **7** to the “**on**” position.

After switching on, the levelling function automatically compensates irregularities within the self-levelling range of  $\pm 4^\circ$ . The measuring tool is levelled in as soon as the laser lines no longer flash.

If the automatic levelling function is not possible, e.g. because the surface on which the measuring tool stands deviates by more than  $4^\circ$  from the horizontal plane, the laser beams flash. In this case, bring the measuring tool to the level position and wait for the self-levelling to take place.

In case of ground vibrations or position changes during operation, the measuring tool is automatically levelled in again. To avoid errors, check the position of the horizontal and vertical laser line with regard to the reference points upon re-levelling.

**Working without Automatic Levelling (see figure D)**

For work without automatic levelling, push the On/Off switch **7** to the “**on**” position. When the automatic levelling is switched off, the laser lines flash continuously.

When the automatic levelling is switched off, the measuring tool can be held by hand or placed on an inclined surface. In cross-line operation, the two laser lines do not necessarily run at a right angle to each other.

**Levelling Accuracy****Influences on Accuracy**

The ambient temperature has the greatest influence. Especially temperature differences occurring from the ground upward can divert the laser beam.

Because the largest difference in temperature layers is close to the ground, the measuring tool should always be mounted on a tripod when measuring distances exceeding 20 m. If possible, also set up the measuring tool in the centre of the work area.

In addition to external influences, device-specific influences (e.g. falls or heavy impacts) can also lead to deviations. For this reason, check the levelling accuracy each time before beginning work.

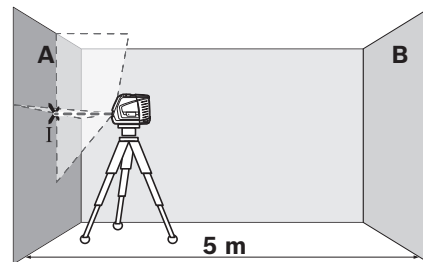
First, check both the height as well as the levelling accuracy of the horizontal laser line, then the levelling accuracy of the vertical laser line.

Should the measuring tool exceed the maximum deviation during one of the tests, please have it repaired by a Bosch after-sales service.

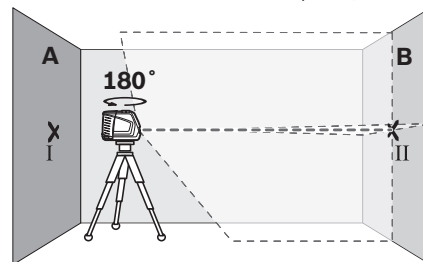
**Checking the Height Accuracy of the Horizontal Line**

For this check, a free measuring distance of 5 m on a firm surface between two walls A and B is required.

- Mount the measuring tool onto a tripod or place it on a firm and level surface close to wall A. Switch on the measuring tool. Select cross-line operation with automatic levelling.

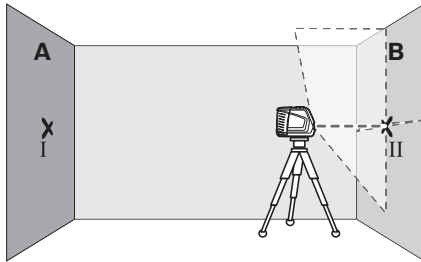


- Direct the laser against the close wall A and allow the measuring tool to level in. Mark the centre of the point where the laser lines cross each other on the wall (point I).

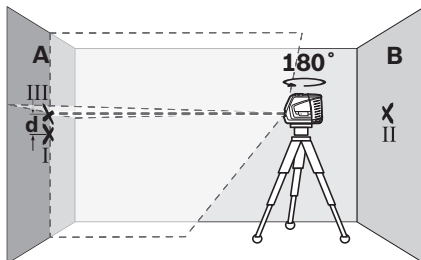


- Turn the measuring tool by  $180^\circ$ , allow it to level in and mark the cross point of the laser lines on the opposite wall B (point II).

- Without turning the measuring tool, position it close to wall B. Switch the measuring tool on and allow it to level in.



- Align the height of the measuring tool (using a tripod or by underlaying, if required) in such a manner that the cross point of the laser lines is projected against the previously marked point II on the wall B.



- Without changing the height, turn around the measuring tool by 180°. Direct it against the wall A in such a manner that the vertical laser line runs through the already marked point I. Allow the measuring tool to level in and mark the cross point of the laser lines on the wall A (point III).
- The difference **d** of both marked points I and III on wall A indicates the actual height deviation of the measuring tool.

The maximum permitted deviation  $d_{\max}$  is calculated as follows:

$$d_{\max} = \text{double distance of the walls} \times 0.3 \text{ mm/m}$$

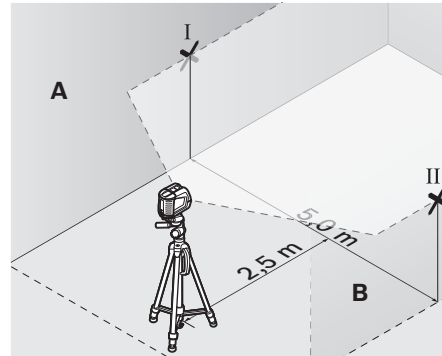
Example: With a 5 metre distance between the walls, the maximum deviation must not exceed

$$d_{\max} = 2 \times 5 \text{ m} \times 0.3 \text{ mm/m} = 3 \text{ mm. Thus, the marks must not be more than 3 mm apart.}$$

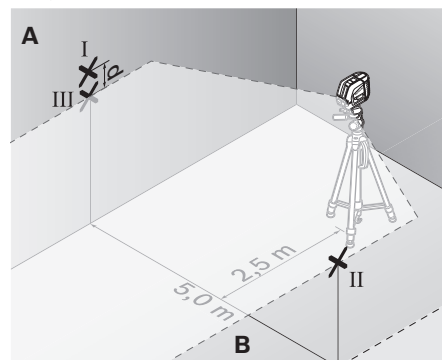
### Checking the Levelling Accuracy of the Horizontal Line

For the check, a free surface of approx. 5 x 5 metres is required.

- Set up the measuring tool on a firm, level surface between both walls A and B. Allow the measuring tool to level in while in horizontal operation.



- At a distance of 2.5 metres from the measuring tool, mark the centre of the laser line (point I on wall A and point II on wall B) on both walls.



- Set up the measuring tool 5 metres away turned by 180° and allow it to level in.
- Align the height of the measuring tool (using a tripod or by underlaying, if required) in such a manner that the centre of the laser line is projected exactly against the previously marked point II on wall B.
- Mark the centre of the laser line as point III (vertically above or below point I) on the wall A.
- The difference **d** of both marked points I and III on wall A indicates the actual deviation of the measuring tool from the level plane.

The maximum permitted deviation  $d_{\max}$  is calculated as follows:

$$d_{\max} = \text{double distance of the walls} \times 0.3 \text{ mm/m}$$

Example: With a 5 metre distance between the walls, the maximum deviation must not exceed

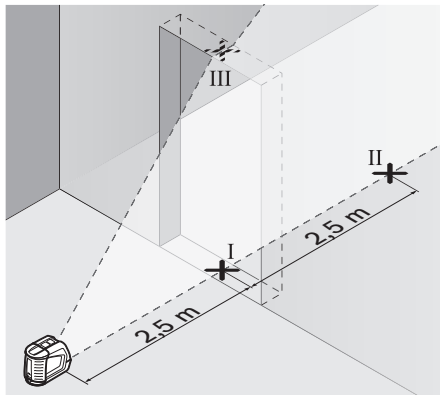
$$d_{\max} = 2 \times 5 \text{ m} \times 0.3 \text{ mm/m} = 3 \text{ mm. Thus, the marks must not be more than 3 mm apart.}$$

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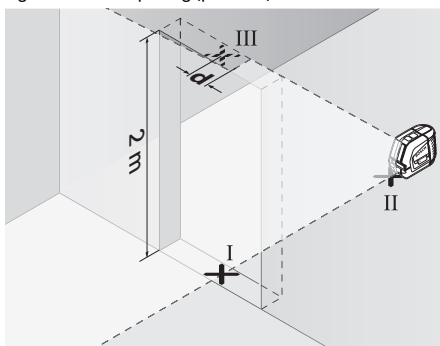
**Checking the Levelling Accuracy of the Vertical Line**

For this check, a door opening is required with at least 2.5 m of space (on a firm surface) to each side of the door.

- Position the measuring tool on a firm, level surface (not on a tripod) 2.5 m away from the door opening. Allow the measuring tool to level in while in cross-line operation mode, and direct the laser beams at the door opening.



- Mark the centre of the vertical laser line at the floor of the door opening (point I), at a distance of 5 m beyond the other side of the door opening (point II) and at the upper edge of the door opening (point III).



- Position the measuring tool on the other side of the door opening directly behind point II. Allow the measuring tool to level in and align the vertical laser line in such a manner that its centre runs exactly through points I and II.
- The difference  $d$  between point III and the centre of the laser line at the upper edge of the door opening results in the actual deviation of the measuring tool from the vertical plane.
- Measure the height of the door opening.

The maximum permitted deviation  $d_{\max}$  is calculated as follows:

$d_{\max} = \text{double height of the door opening} \times 0.3 \text{ mm/m}$

Example: With a door opening height of 2 metres, the maximum permitted deviation is

$d_{\max} = 2 \times 2 \text{ m} \times 0.3 \text{ mm/m} = 1.2 \text{ mm}$ . Thus, the marks must not be more than 1.2 mm apart.

**Working Advice**

- **Always use the centre of the laser line for marking.** The width of the laser line changes with the distance.

**Working with the Alignment Plate**

With the alignment plate **12**, the measuring tool can be aligned by a reference line or the vertical laser line can be indicated at an angle of 45° or 90° to a reference line.

Position the measuring tool via the tripod mount **6** onto the pin **16** of the alignment plate. Position it in such a manner on the alignment plate that the vertical laser line (depending on the requested angle) runs centrally through the alignment aid **13**, **14** or **15**.

Align the alignment plate **12** with the corresponding alignment aids **13**, **14** or **15** to the desired reference line.

**Working with the Measuring Plate (Accessory) (see figures E – F)**

With the measuring plate **20**, it is possible to project the laser mark onto the floor or the laser height onto a wall.

With the zero field and the scale, the offset or drop to the required height can be measured and projected at another location. This eliminates the necessity of precisely adjusting the measuring tool to the height to be projected.

The measuring plate **20** has a reflective coating that enhances the visibility of the laser beam at greater distances or in intense sunlight. The brightness intensification can be seen only when viewing, parallel to the laser beam, onto the measuring plate.

**Working with the Tripod (Accessory)**

A tripod offers a stable, height-adjustable measuring support. Place the measuring tool via the tripod mount **6** onto the 1/4" male thread of the tripod and screw the locking screw of the tripod tight.

**Working with the Laser Receiver (Accessory) (see figure G)**

Under unfavourable light conditions (bright environment, direct sunlight) and for larger distances, use the laser receiver for improved finding of the laser lines **21**. When working with the laser receiver, switch the pulse function on (see "Pulse Function", page 14).

**Laser Viewing Glasses (Accessory)**

The laser viewing glasses filter out the ambient light. This makes the red light of the laser appear brighter for the eyes.

- **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.

**Work Examples (see figures H – K)****Laying Flooring Plates at a 45° Angle (see figure J)**

Position the measuring tool via the tripod mount **6** onto the pin **16** of the alignment plate. Position it in such a manner on the centred protrusion of the alignment plate **12** that the ver-

tical laser line runs centrally through the alignment aid **15**. Then, align the alignment plate with the alignment aids **13** or **14** with regard to the reference line.

For cross line or in vertical operation, the vertical laser line on the floor indicates a 45° angle to the reference line. Align the flooring plates with regard to this line.

#### **Projecting Plumb Points to the Ceiling (see figure K)**

Draw two lines crossed at a right angle through the point that you want to project to the ceiling. Place the alignment plate **12** onto the crossed lines and align it with the alignment aids **13** and **14** on the cross.

Position the measuring tool via the tripod mount **6** onto the pin **16** of the alignment plate. Position it in such a manner on one of the two outer protrusions on the alignment plate that the vertical laser line runs centrally through the corresponding alignment aid **13** or **14**. Select vertical operation and draw the centre of the line running across the measuring tool to the ceiling. Turn the measuring tool on the alignment plate by 90°. Pay attention not to move the position of the alignment plate. After levelling in, draw the cross point of the vertical laser line to the already drawn line. The cross point of both lines is the projected plumb point.

## **Maintenance and Service**

### **Maintenance and Cleaning**

Store and transport the measuring tool only in the protective pouch **17** or in the case **18**.

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.

Regularly clean the surfaces at the exit opening of the laser in particular, and pay attention to any fluff or fibres.

For repairs, only send in the measuring tool in the protective pouch **17** or in the case **18**.

### **Accessories**

Protective Pouch <b>17</b> .....	1 609 203 X77
Case <b>18</b> .....	2 605 438 682
Laser Viewing Glasses <b>19</b> .....	2 607 990 031
Measuring plate with foot <b>20</b> .....	2 607 002 195
Laser Receiver <b>21</b> .....	0 601 069 100
Construction tripod BS 150 .....	0 601 096 B00
Universal holder BM 1 .....	0 601 015 A00
Telescopic rod BT 350 .....	0 601 015 B00

### **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 nameplate of the product.

#### **Great Britain**

Robert Bosch Ltd. (B.S.C.)  
P.O. Box 98  
Broadwater Park  
North Orbital Road  
Denham  
Uxbridge  
UB 9 5HJ

At [www.bosch-pt.co.uk](http://www.bosch-pt.co.uk) you can order spare parts or arrange the collection of a product in need of servicing or repair.

Tel. Service: (0344) 7360109

E-Mail: [boschservicecentre@bosch.com](mailto:boschservicecentre@bosch.com)

#### **Ireland**

Origo Ltd.  
Unit 23 Magna Drive  
Magna Business Park  
City West  
Dublin 24  
Tel. Service: (01) 4666700  
Fax: (01) 4666888

#### **Australia, New Zealand and Pacific Islands**

Robert Bosch Australia Pty. Ltd.  
Power Tools  
Locked Bag 66  
Clayton South VIC 3169  
Customer Contact Center  
Inside Australia:  
Phone: (01300) 307044  
Fax: (01300) 307045  
Inside New Zealand:  
Phone: (0800) 543353  
Fax: (0800) 428570  
Outside AU and NZ:  
Phone: +61 3 95415555  
[www.bosch.com.au](http://www.bosch.com.au)

#### **Republic of South Africa**

##### **Customer service**

Hotline: (011) 6519600

##### **Gauteng – BSC Service Centre**

35 Roper Street, New Centre  
Johannesburg  
Tel.: (011) 4939375  
Fax: (011) 4930126  
E-Mail: [bsctools@icon.co.za](mailto:bsctools@icon.co.za)

##### **KZN – BSC Service Centre**

Unit E, Almar Centre  
143 Crompton Street  
Pinetown  
Tel.: (031) 7012120  
Fax: (031) 7012446  
E-Mail: [bsc.dur@za.bosch.com](mailto:bsc.dur@za.bosch.com)

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**Western Cape – BSC Service Centre**

Democracy Way, Prosperity Park  
Milnerton

Tel.: (021) 5512577

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E-Mail: bsc@zsd.co.za

**Bosch Headquarters**

Midrand, Gauteng

Tel.: (011) 6519600

Fax: (011) 6519880

E-Mail: rbsa-hq.pts@za.bosch.com

**Disposal**

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

Do not dispose of measuring tools and batteries/rechargeable batteries into household waste!

**Only for EC countries:**

According to the European Guideline 2012/19/EU, measuring tools that are no longer usable, and according to the European Guideline 2006/66/EC, defective or used battery packs/batteries, must be collected separately and disposed of in an environmentally correct manner.

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

**Great Britain**

Robert Bosch Ltd. (B.S.C.)

P.O. Box 98

Broadwater Park

North Orbital Road

Denham

Uxbridge

UB 9 5HJ

At [www.bosch-pt.co.uk](http://www.bosch-pt.co.uk) you can order spare parts or arrange the collection of a product in need of servicing or repair.

Tel. Service: (0344) 7360109

E-Mail: [boschservicecentre@bosch.com](mailto:boschservicecentre@bosch.com)

**Subject to change without notice.**

**Français****Avertissements de sécurité**

Pour une utilisation sans danger et en toute sécurité de l'appareil de mesure, lisez attentivement toutes les instructions et tenez-en compte. Si l'appareil de mesure n'est pas utilisé conformément aux présentes instructions, les dispositifs de protection intégrés dans l'appareil sont susceptibles d'être endommagés. Faites en sorte que les étiquettes d'avertissement se trouvant sur l'appareil de mesure restent toujours lisibles. **CONSERVEZ CES INSTRUCTIONS DANS UN LIEU SÛR ET REMETTEZ-LES À TOUT NOUVEL UTILISATEUR DE L'APPAREIL DE MESURE.**

► **Attention – si d'autres dispositifs d'utilisation ou d'ajustage que ceux indiqués ici sont utilisés ou si d'autres procédés sont appliqués, ceci peut entraîner une exposition dangereuse au rayonnement.**

► **Cet appareil de mesure est fourni avec une plaque d'avertissement (dans la représentation de l'appareil de mesure se trouvant sur la page des graphiques elle est marquée du numéro 10).**



► **Avant la première mise en service, recouvrir le texte de la plaque d'avertissement par l'autocollant fourni dans votre langue.**



**Ne pas diriger le faisceau laser vers des personnes ou des animaux et ne jamais regarder soi-même dans le faisceau laser.** Vous risquez sinon d'éblouir des personnes, de causer des accidents ou de blesser les yeux.

► **Au cas où le faisceau laser frappe un œil, fermez immédiatement les yeux et déplacez la tête pour l'éloigner du faisceau. Ne jamais apporter de modifications au dispositif laser.**

► **Ne jamais apporter de modifications au dispositif laser.**

► **Ne pas utiliser les lunettes de vision du faisceau laser en tant que lunettes de protection.** Les lunettes de vision du faisceau laser servent à mieux visualiser le faisceau laser, elles ne protègent cependant pas du rayonnement laser.

► **Ne pas utiliser les lunettes de vision du faisceau laser en tant que lunettes de soleil ou en circulation routière.** Les lunettes de vision du faisceau laser ne protègent pas parfaitement contre les rayons ultra-violet et réduisent la perception des couleurs.

► **Ne faire réparer l'appareil de mesure que par une personne qualifiée et seulement avec des pièces de rechange d'origine.** Ceci permet d'assurer la sécurité de l'appareil de mesure.

► **Ne pas laisser les enfants utiliser l'appareil de mesure laser sans surveillance.** Ils risqueraient d'éblouir d'autres personnes par mégarde.

► **Ne pas faire fonctionner les appareils de mesure en atmosphère explosive, par exemple en présence de liquides inflammables, de gaz ou de poussières.** L'appareil de mesure produit des étincelles qui peuvent enflammer les poussières ou les vapeurs.



**Ne pas mettre l'appareil de mesure à proximité de stimulateurs cardiaques.** L'aimant génère un champ magnétique à l'intérieur de l'appareil de mesure qui peut entraver le fonctionnement des stimulateurs cardiaques.