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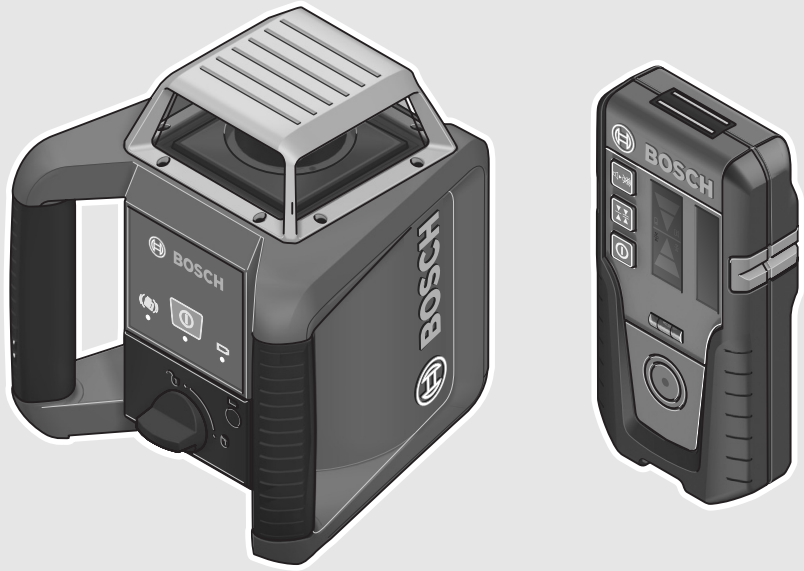

Robert Bosch GmbH
Power Tools Division
70745 Leinfelden-Echterdingen
Germany

www.bosch-pt.com

1 619 929 J22 (2011.06) T / 260 **UNI**

1 619 929 J22

GRL 400 H Professional
LR 1 Professional

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
ro Instrucţiuni originale
bg Оригинална инструкция
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 راهنمای طرز کار اصلی

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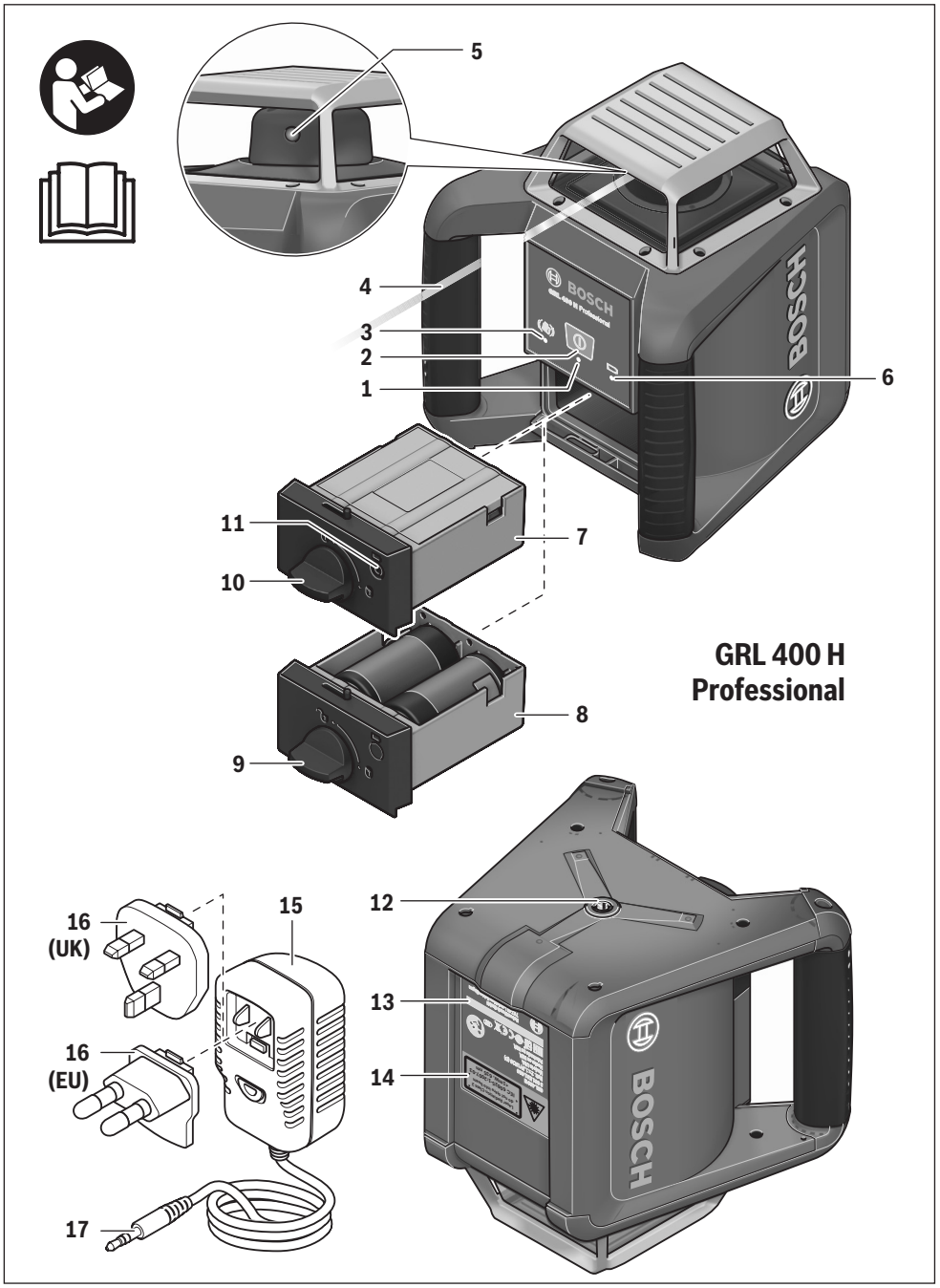

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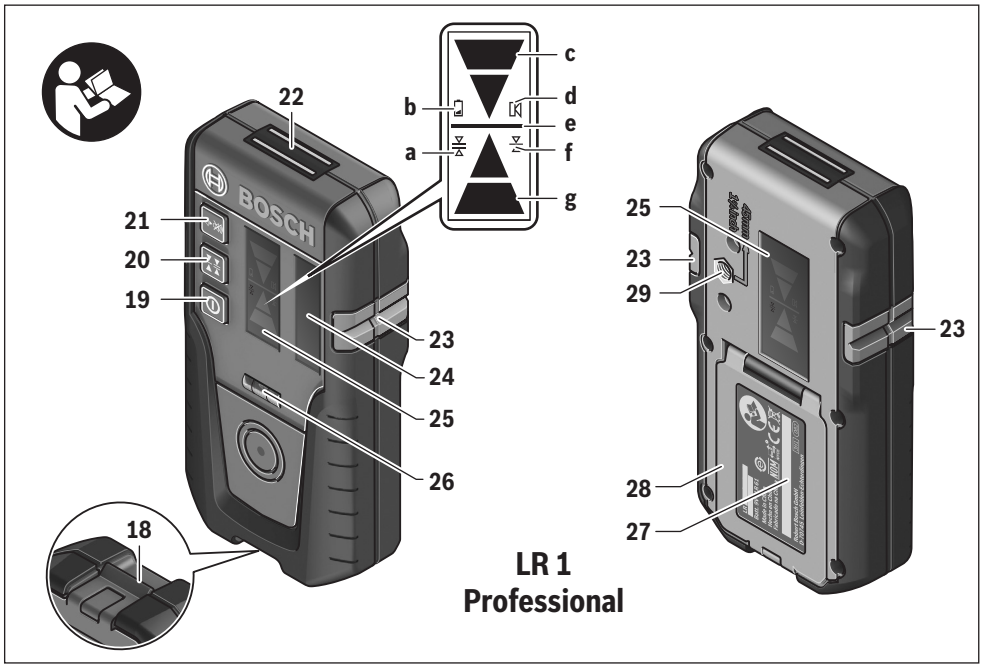

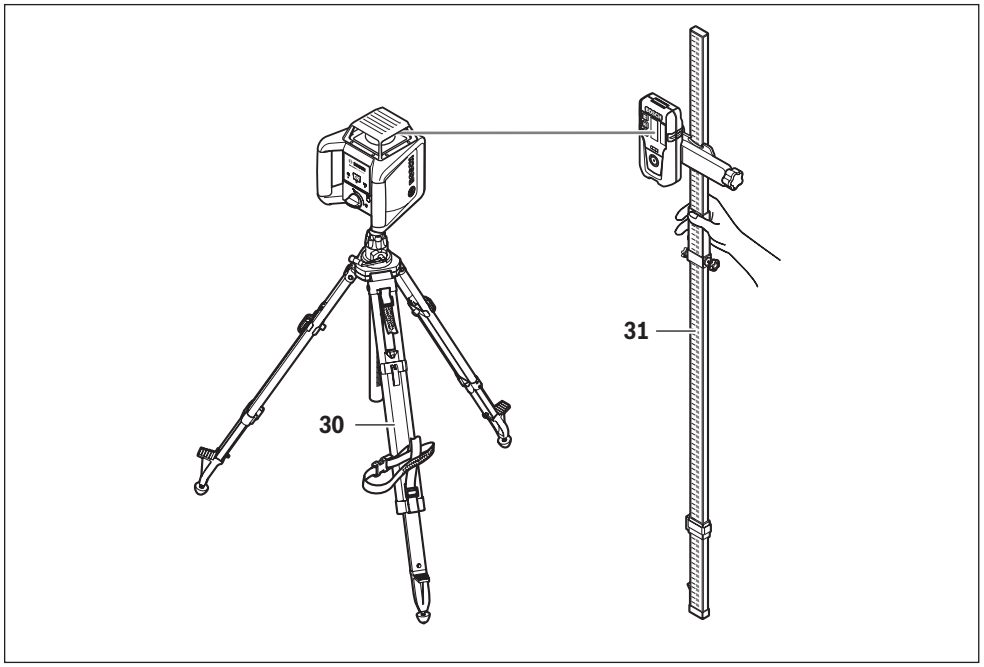

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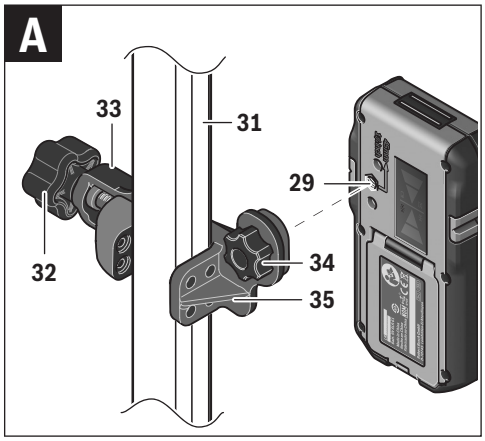

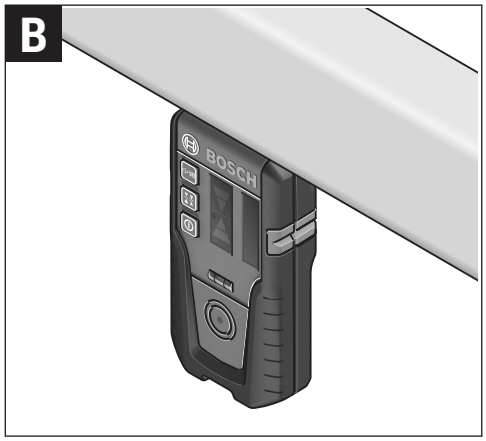

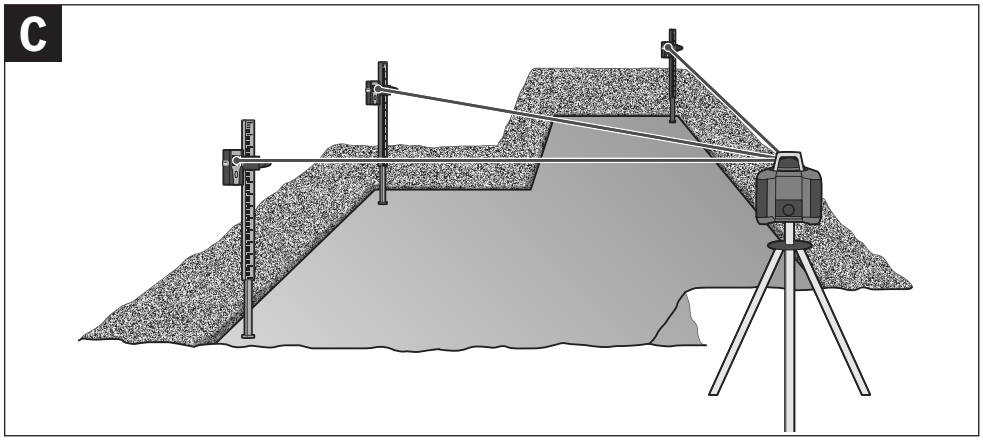

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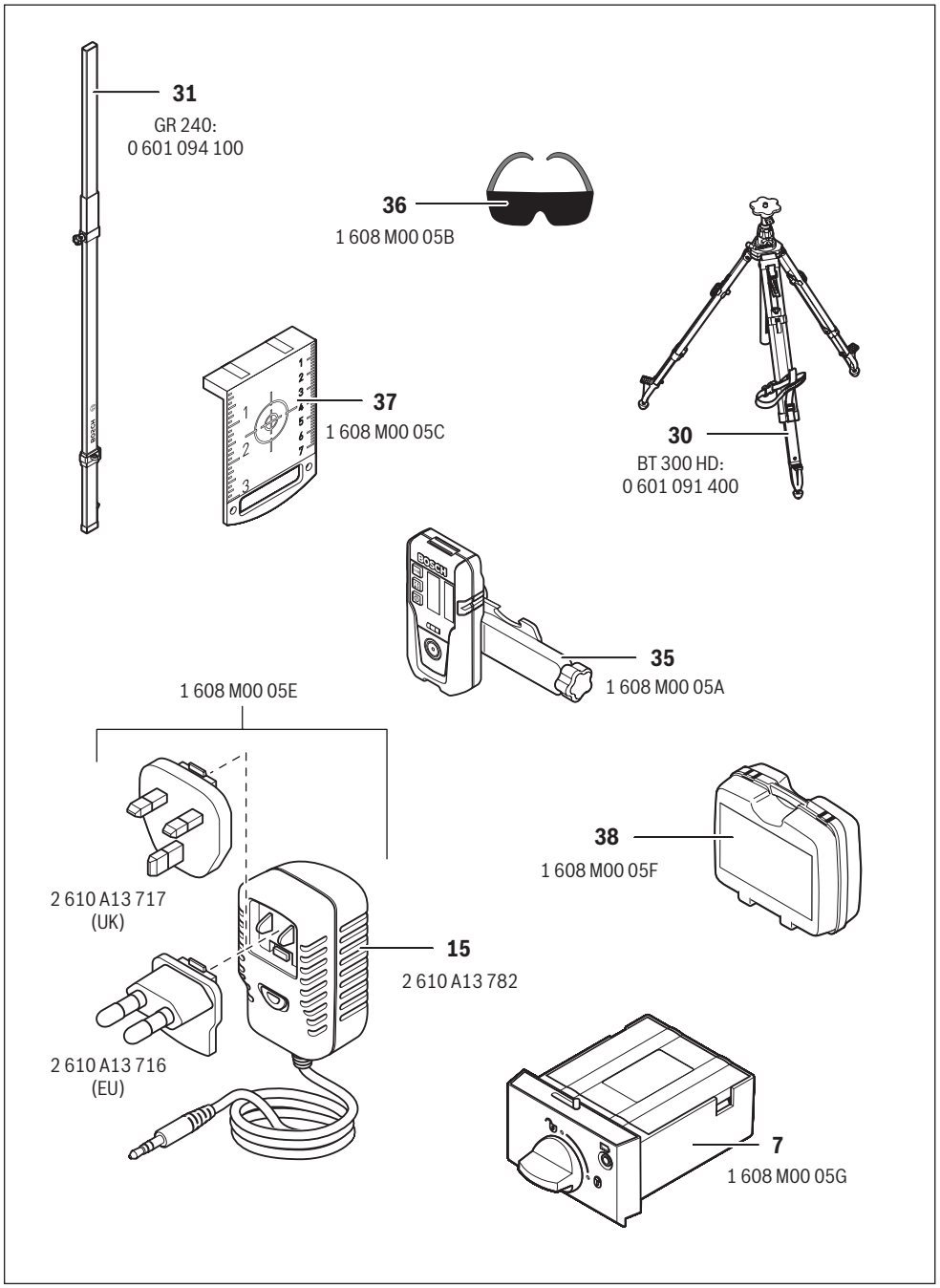

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Kundendienst und Kundenberatung

Der Kundendienst beantwortet Ihre Fragen zu Reparatur und Wartung Ihres Produkts sowie zu Ersatzteilen. Explosionszeichnungen und Informationen zu Ersatzteilen finden Sie auch unter:
www.bosch-pt.com
Das Bosch-Kundenberater-Team hilft Ihnen gerne bei Fragen zu Kauf, Anwendung und Einstellung von Produkten und Zubehören.

www.powertool-portal.de, das Internetportal für Handwerker und Heimwerker.
www.ewbc.de, der Informations-Pool für Handwerk und Ausbildung.

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Entsorgung

Rotationslaser, Ladegerät, Laserempfänger, Akkus, Zubehör und Verpackungen sollen einer umweltgerechten Wiederverwertung zugeführt werden.

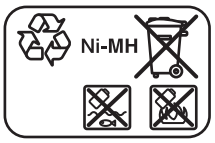
Werfen Sie Rotationslaser, Ladegerät, Laserempfänger und Akkus/Batterien nicht in den Hausmüll!

Nur für EU-Länder:

Gemäß der europäischen Richtlinie 2002/96/EG müssen nicht mehr gebrauchsfähige Elektrogeräte 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 Akkus/Batterien können direkt abgegeben werden bei:
Deutschland
Recyclingzentrum Elektrowerkzeuge
Osteroder Landstraße 3
37589 Kalefeld
Schweiz
Batrec AG
3752 Wimmis BE

Akkus/Batterien:



Ni-MH: Nickel-Metallhydrid

Änderungen vorbehalten.

English

Safety Notes

Rotational Laser Level

Working safely with the measuring tool is possible only when the operating and safety information are read completely and the instructions contained therein are strictly followed. Never make warning labels on the measuring tool unrecognisable. SAVE THESE INSTRUCTIONS.

- **Caution – The use of other operating or adjusting equipment or the application of other processing methods than those mentioned here, can lead to dangerous radiation exposure.**
- **The measuring tool is provided with a warning label in English (marked with number 14 in the representation of the measuring tool on the graphics page).**

- **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.

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- **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.
- **Do not open the battery pack.** Danger of short-circuiting.

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

- **Keep the battery pack not being used away from paper clips, coins, keys, nails, screws or other small metal objects that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.
- **Under abusive conditions, liquid may be ejected from the battery pack; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritations or burns.
- **Charge the battery pack only with the battery charger specified in these operating instructions.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- **Use only original Bosch battery packs with the voltage listed on the nameplate of your measuring tool.** When using other battery packs, e. g. imitations, reconditioned battery packs or other brands, there is danger of injury as well as property damage through exploding battery packs.

Keep the laser target plate 37 away from cardiac pacemakers. The magnets on the laser target plate generate a field that can impair the function of cardiac pacemakers.

- **Keep the laser target plate 37 away from magnetic data medium and magnetically-sensitive equipment.** The effect of the magnets on the laser target plate can lead to irreversible data loss.

Battery Charger

Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

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

- **Do not charge other batteries with the battery charger.** The battery charger is only suitable for charging the Bosch battery/battery pack inserted in the rotational laser level. Danger of fire and explosion when charging other batteries/battery packs.
- **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.
- **Do not operate the battery charger on easily inflammable surfaces (e. g., paper, textiles, etc.) or surroundings.** The heating of the battery charger during the charging process can pose a fire hazard.
- **Under abusive conditions, liquid may be ejected from the battery pack; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritations or burns.
- **Supervise children.** This will ensure that children do not play with the charger.
- **Children or persons that owing to their physical, sensory or mental limitations or to their lack of experience or knowledge, are not capable of securely operating the charger, may only use this charger under supervision or after having been instructed by a responsible person.** Otherwise, there is danger of operating errors and injuries.
- Products sold in **GB only**: Your 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.

Laser Receiver

Read and observe all instructions. SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

Keep the measuring tool away from cardiac pacemakers. The magnet plate **22** generates a field that can impair the function of cardiac pacemakers.

- **Keep the measuring tool away from magnetic data medium and magnetically-sensitive equipment.** The effect of the magnet plate **22** can lead to irreversible data loss.
- **Have the measuring tool repaired only through qualified specialists using original spare parts.** This ensures that the safety of the measuring tool is maintained.

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► **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.

Product Description and Specifications

Intended Use

Rotational Laser Level

The measuring tool is intended for determining and checking precise horizontal partitions. The measuring tool is not intended for vertical leveling.

The measuring tool is suitable for outdoor use.

Laser Receiver

The measuring tool is intended for swift finding of rotating laser beams in the wavelength listed in the "Technical Data".

The measuring tool is suitable for indoor and outdoor use.

Product Features

The numbering of the product features refers to the illustration of the rotational laser level, battery charger and laser receiver on the graphics page.

Rotational laser level/Battery charger

1 Automatic levelling indicator
2 On/Off button / shock-warning button
3 Shock-warning indicator
4 Variable laser beam
5 Exit opening for laser beam
6 Charge-control indicator
7 Battery pack
8 Battery compartment
9 Locking knob of the battery compartment
10 Locking knob of the battery pack
11 Socket for charge connector
12 Tripod mount 5/8"
13 Serial number of the rotational laser level
14 Laser warning label
15 Battery charger
16 Mains plug of the battery charger
17 Charge connector

Laser receiver*

18 Latch of battery lid
19 On/Off button of laser receiver
20 Button for adjustment of the measuring accuracy
21 Audio signal button
22 Magnet plate
23 Centre mark
24 Reception area for the laser beam
25 Display
26 Laser receiver spirit level
27 Serial number of laser receiver
28 Battery lid
29 Retainer openings for holder
32 Locking screw for holder
33 Holder upper edge
34 Fastening screw of holder
35 Holder

Indicator elements of laser receiver

a "Medium" adjustment indicator
b Battery low indicator
c Direction indicator, up
d Audio signal indicator
e Centre indicator
f "Fine" adjustment indicator
g Direction indicator, down

Accessories/Spare parts

30 Tripod*
31 Construction laser measuring rod*
36 Laser viewing glasses*
37 Laser target plate*
38 Case

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

Technical Data

Rotational Laser Level	GRL 400 H Professional
Article number	3 601 K61 800
Working range (radius) [1)] – without laser receiver, approx. – with laser receiver, approx.	 10 m 200 m
Levelling Accuracy [1) 2)]	±0.08 mm/m
Self-levelling range, typically	±8 % (±5°)
Levelling duration, typically	15 s
Rotational speed	600 min^{-1}
Operating temperature	– 10 ... + 50 °C
Storage temperature	– 20 ... + 70 °C
Relative air humidity, max.	90 %
Laser class	2
Laser type	635 nm, < 1 mW
Laser beam Ø at the exit opening, approx. [1)]	5 mm
Tripod mount (horizontal)	5/8"-11
Batteries (NiMH) Batteries (alkali-manganese)	2 x 1.2 V HR20 (D) (9 Ah) 2 x 1.5 V LR20 (D)

1) at 20 °C

2) alongside the axes

Please observe the article number on the type plate of your rotational laser level. The trade names of individual rotational laser levels may vary.

For clear identification of your rotational laser level, see the serial number **13** on the type plate.

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Rotational Laser Level	GRL 400 H Professional
Operating life time, approx. – Batteries (NiMH) – Batteries (alkali-manganese)	 30 h 50 h
Weight according to EPTA-Procedure 01/2003	1.8 kg
Dimensions (length x width x height)	183 x 170 x 188 mm
Degree of protection	IP 56 (protected against dust and powerful water jets)

1) at 20 °C

2) alongside the axes

Please observe the article number on the type plate of your rotational laser level. The trade names of individual rotational laser levels may vary.

For clear identification of your rotational laser level, see the serial number **13** on the type plate.

Battery Charger		
Article number		2 610 A13 782
Rated voltage	V~	100 – 240
Frequency	Hz	50/60
Output voltage	V=	7.5
Charging current	A	1.0
Allowable charging temperature range	°C	0 – 45
Charging time	h	14
Number of battery cells		2
Rated voltage (per battery cell)	V=	1.2
Weight according to EPTA-Procedure 01/2003	kg	0.2
Protection class		⧈/II

Laser Receiver	LR 1 Professional
Article number	3 601 K15 400
Receivable wavelength	635 – 650 nm
Working range[3)]	200 m
Receiving angle	120°
Receivable rotation speed	> 200 min^{-1}
Measuring accuracy[4)] – “Fine adjustment” – “Medium adjustment”	 ±1 mm ±3 mm
Operating temperature	– 10 °C ... + 50 °C

3) The working range (radius) can be reduced due to unfavourable ambient conditions (e. g. direct sunlight).

4) depends on clearance between laser receiver and rotational laser level

Please observe the article number on the type plate of your laser receiver. The trade names of individual laser receivers may vary.

For clear identification of your laser receiver, see the serial number **27** on the type plate.

Laser Receiver	LR 1 Professional
Storage temperature	– 20 °C ... + 70 °C
Battery	1 x 9 V 6LR61
Operating life time, approx.	50 h
Weight according to EPTA-Procedure 01/2003	0.36 kg
Dimensions (length x width x height)	148 x 73 x 30 mm
Degree of protection	IP 65 (dust-proof and protected against powerful water jets)

3) The working range (radius) can be reduced due to unfavourable ambient conditions (e. g. direct sunlight).

4) depends on clearance between laser receiver and rotational laser level

Please observe the article number on the type plate of your laser receiver. The trade names of individual laser receivers may vary.

For clear identification of your laser receiver, see the serial number **27** on the type plate.

Assembly

Power Supply of the Rotational Laser Level

Operation with Batteries/Rechargeable Batteries

Using alkali-manganese or rechargeable batteries is recommended for operation of the measuring tool.

To open the battery compartment **8**, turn the locking knob **9** to position 🔓 and pull out the battery compartment.

When inserting the batteries/rechargeable batteries, pay attention to the correct polarity according to the representation on the inside of the battery compartment.

Always replace all batteries/rechargeable batteries at the same time. Do not use different brands or types of batteries/rechargeable batteries together.

Shut the battery compartment **8** and turn the locking knob **9** to the 🔒 position.

In case the batteries/rechargeable batteries have been inserted incorrectly, the measuring tool cannot be switched on. Insert the batteries/rechargeable batteries with correct polarity.

- ▶ **Remove the batteries/rechargeable batteries from the measuring tool when not using it for longer periods.** When storing for longer periods, the batteries/rechargeable batteries can corrode and discharge themselves.

Operation with Battery Pack

Charge the battery pack **7** before using for the first time. The battery pack can only be charged with the battery charger **15** intended for it.

- ▶ **Observe the mains voltage!** The voltage of the power source must correspond with the data on the type plate of the battery charger.

Insert the appropriate mains plug **16** for your mains supply into the battery charger **15** and allow it to engage.

Insert the charge plug **17** of the battery charger into the socket connector **11** of the battery pack. Connect the battery

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charger to the mains supply. Charging the empty battery pack takes approx. 14 h. The battery charger and the battery pack are protected against overcharging.

A battery that is new or has not been used for a longer period does not develop its full capacity until after approx. 5 charging/discharging cycles.

Do not charge the battery pack **7** each time after using, otherwise its capacity will be reduced. Charge the battery pack only when the charge-control indicator **6** flashes or lights up continuously.

A considerably reduced operating period after charging indicates that the battery pack is used up and must be replaced.

If the battery pack is empty, the measuring tool can also be operated off of the battery charger **15** when connected to a power supply. Switch the measuring tool off, charge the battery pack for approx. 10 min and then switch the measuring tool on again with the battery charger connected.

To change the battery pack **7**, turn the locking knob **10** to position and pull out the battery pack **7**.

Insert a new battery pack and turn the locking knob **10** to the position.

- **Remove the battery pack from the measuring tool when not using it for longer periods.** When storing for longer periods, the rechargeable batteries can corrode and discharge themselves.

Charge-control Indicator

When the charge-control indicator **6** flashes red for the first time, the measuring tool can still be operated for approx. 2 h.

When the charge-control indicator **6** lights up red continuously, measurements are no longer possible. The measuring tool switches off automatically after 1 minute.

Power Supply of the Laser Receiver

Alkali-manganese batteries are recommended for the laser receiver.

Press the latch **18** of the battery lid outward and open the battery lid **28**.

When inserting the battery, pay attention to the correct polarity according to the representation on the inside of the battery compartment.

When the battery low indicator **b** appears for the first time on the display **25**, the laser receiver can still be operated for approx. 3 h.

- **Remove the battery from the laser receiver when not using it for longer periods.** When storing for longer periods, the battery can corrode and discharge itself.

Operation

Starting Operation of the Rotational Laser Level

- **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 longer periods. 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 dropping down of the measuring tool.** After severe exterior effects to the measuring tool, it is recommended to carry out an accuracy check (see “Levelling Accuracy of the Rotational Laser Level”, page 21) each time before continuing to work.

Setting Up the Measuring Tool

Position the measuring tool on a firm surface or mount it to a tripod **30**.

Due to the high levelling accuracy, the measuring tool reacts sensitively to ground vibrations and position changes. Therefore, pay attention that the position of the measuring tool is stable in order to avoid operational interruptions due to re-levelling.

Switching On and Off

- **Do not direct the laser beam at persons or animals (especially not at their eye level), and do not stare into the laser beam yourself (not even from a distance.)** Immediately after switching on, the measuring tool sends out the variable laser beam **4**.

For **switching on** the measuring tool, briefly press the On/Off button **2**. The indicators **3**, **1** and **6** light up briefly. The measuring tool immediately starts the automatic levelling. During the levelling, the levelling indicator **1** flashes green, the laser does not rotate and flashes.

The measuring tool is levelled in as soon as levelling indicator **1** lights up green continuously and the laser beam is steady. After the levelling is completed, the measuring tool automatically starts in rotational operation.

The measuring tool exclusively operates with fixed rotational speed in rotational operation, which is also suitable for use of a laser receiver.

When factory set, the shock-warning function is automatically switched on, and the shock-warning indicator **3** lights up green.

To **switch off** the measuring tool, briefly press the On/Off button **2**. When the shock warning has actuated (shock-warning indicator **3** flashes red), briefly press the On/Off button once to restart the shock-warning function, and then again to switch off the measuring tool.

- **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 save the batteries, the measuring tool is automatically switched off when not within the self-levelling range for more than 2 h or when the shock warning is actuated for more than 2 h (see “Automatic Levelling of the Rotational Laser Level”, page 20). Reposition the measuring tool and switch it on again.

Starting Operation of the Laser Receiver

- **Protect the laser receiver against moisture and direct sun light.**

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- ▶ **Do not subject the laser receiver to extreme temperatures or variations in temperature.** As an example, do not leave it in vehicles for longer periods. In case of large variations in temperature, allow the laser receiver to adjust to the ambient temperature before putting it into operation. In case of extreme temperatures or variations in temperature, the accuracy of the laser receiver can be impaired.

Position the laser receiver at least 50 cm away from the rotational laser level. Position the laser receiver in such a manner that the laser beam can reach the reception area **24**.

Switching On and Off

- ▶ **A loud audio signal sounds when switching on the laser receiver.** "The A-weighted sound pressure level of the audio signal is up to 95 dB(A) at a distance of 0.2 m."
- ▶ **Do not hold the laser receiver close to your ear!** The loud audio signal can cause hearing defects.

To **switch on** the laser receiver, press the On/Off button **19**. Two audio signals sound and all display indicators light up briefly.

To **switch off** the laser receiver, press the On/Off button **19** again.

When no button is pressed on the laser receiver for approx. 10 minutes and when no laser beam reaches the reception area **24** for 10 minutes, the laser receiver automatically switches off in order to save the battery. The switching off is indicated by an audio signal.

Selecting the Setting of the Centre Indicator

With button **20**, you can specify with which accuracy the position of the laser beam is indicated as central on the reception area:

– "Fine" adjustment, (indication **f** on the display),
– "Medium" adjustment, (indication **a** on the display).

An audio signal sounds when the accuracy setting is changed.

Whenever switching on the laser receiver, the accuracy level "medium" is set.

Direction Indicators

The bottom **g**, centre **e** and top **c** indicators (both on the front and rear side of the laser receiver) indicate the position of the rotating laser beam in the reception area **24**. Additionally, the position can be indicated with an audio signal (see "Audio Signal for Indication of the Laser Beam", page 20).

Laser receiver too low: When the laser beam runs through the top half of the reception area **24**, the bottom direction indicator **g** appears on the display.
When the audio signal is switched on, a slow-beat signal sounds.
Move the laser receiver upward in the direction of the arrow. When approaching the centre mark **23**, only the tip of the direction indicator **g** is indicated.

Laser receiver too high: When the laser beam runs through the bottom half of the reception area **24**, the top direction indicator **c** appears on the display.
When the audio signal is switched on, a fast-beat signal sounds.
Move the laser receiver downward in the direction of the arrow. When approaching the centre mark **23**, only the tip of the direction indicator **c** is indicated.

Laser receiver in centre position: When the laser beam runs through the reception area **24** at the centre mark **23**, the centre indicator **e** lights up. When the audio signal is switched on, a continuous signal sounds.

Audio Signal for Indication of the Laser Beam

The position of the laser beam on the reception area **24** can be indicated via an audio signal.

After the laser receiver has been switched on, the audio signal is always switched off.

When switching on the audio signal, you can choose between two volume levels.

To switch on the audio signal or change the volume level, push the acoustic signal button **21** until the requested volume level is indicated. At medium volume level, the audio signal indicator **d** in the display flashes; at high volume level, the indicator is continuously lit. When the audio signal is set to off, the indicator goes out.

Automatic Levelling of the Rotational Laser Level

After switching on, the measuring tool checks the horizontal position and automatically compensates irregularities within the self-levelling range of approx. 8 % (5°).

When the measuring tool is inclined by more than 8 % after switching on or after a position change, levelling in is no longer possible. In this case, the rotor is stopped, the laser flashes and levelling indicator **1** continuously lights up red. Reposition the measuring tool and wait for it to re-level. Without repositioning, the laser is automatically switched off after 2 minutes and the measuring tool after 2 hours.

When the measuring tool is levelled in, it continuously checks the horizontal position. Automatic re-levelling takes place after position changes. To avoid faulty measurements, the rotor stops during the levelling process, the laser flashes and the levelling indicator **1** flashes green.

Shock-warning Function

The measuring tool has a shock-warning function; after position changes or shock to the measuring tool, or in case of ground vibrations, it keeps the measuring tool from levelling in at changed heights, and thus prevents vertical errors.

When factory set, the shock-warning function is activated after switching on the measuring tool (shock-warning indicator **3** lit). The shock warning is activated approx. 30 s after switching on the measuring tool or switching on the shock-warning function.

When the levelling-accuracy range is exceeded after a position change of the measuring tool or when heavy ground vibrations are detected, the shock-warning function is actuated: The rotation is stopped, the laser flashes, the levelling indicator **1** goes out and the shock-warning indicator **3** flashes red.

When the shock-warning function has actuated, briefly press the On/Off button **2**. The shock-warning function is restarted and the measuring tool starts the levelling. As soon as the measuring tool is levelled in (the levelling indicator **1** continuously lights up green), it automatically starts in rotation operation. Now, check the height of the laser beam with a reference point and correct the height, if required.

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When, after the shock-warning function has actuated, the function is not restarted by pressing On/Off button **2**, the laser is automatically switched off after 2 minutes and the measuring tool after 2 hours.

To **switch off** the shock-warning function, press the On/Off button **2** for 3 seconds. When the shock-warning function has actuated (shock-warning indicator **3** flashes red), firstly press the On/Off button briefly, and then again for 3 seconds. When the shock-warning function is shut off, the shock-warning indicator goes out **3**.

To **switch on** the shock-warning function, press the On/Off button **2** for 3 seconds. The shock-warning indicator **3** continuously lights up green, and the shock-warning function is activated after 30 seconds.

The shock-warning function setting is stored when switching off the measuring tool.

Levelling Accuracy of the Rotational Laser Level

Influences on Accuracy

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

The deviations play a role in excess of approx. 20 m measuring distance and can easily reach two to four times the deviation at 100 m.

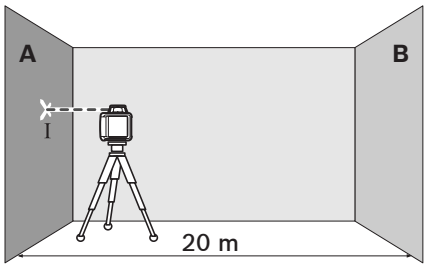
Because the largest difference in temperature layers is close to the ground, the measuring tool should always be mounted on a tripod when measuring distances exceeding 20 m. If possible, also set up the measuring tool in the centre of the work area.

Accuracy Check of the Measuring Tool

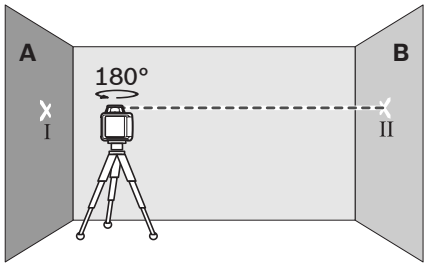
Apart from exterior influences, device-specific influences (such as heavy impact or falling down) can lead to deviations. Therefore, check the accuracy of the measuring tool each time before starting your work.

A free measuring distance of 20 m on a firm surface between two walls A and B is required for the check. A reversal measurement must be carried out over both axes X and Y (each positive and negative; 4 complete measurements).

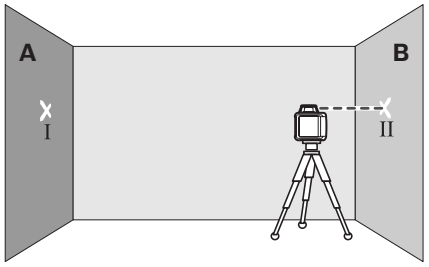
– Mount the measuring tool onto a tripod, or place it on a firm and level surface close to wall A. Switch the measuring tool on.



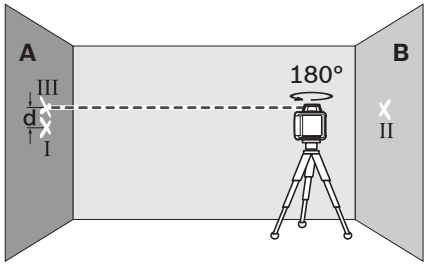
– After the levelling, mark the centre of the laser beam on wall A (point I).



– Rotate the measuring tool by 180°, allow it to level in and mark the centre point of the laser beam on the apposing 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 the tripod or by propping), so that the centre of the laser beam runs exactly against the previously marked point II on wall B.



– Rotate the measuring tool by 180° without changing the height. Allow it to level in and mark the centre point of the laser beam on wall A (point III). Take care that point III is as vertical as possible above or below point I.
– The difference **d** of both marked points I and III on wall A amounts to the actual deviation of the measuring tool for the measured axis.

Repeat the measuring procedure for the other three axes. For this, turn the measuring tool prior to each measuring procedure by 90°.

On the measuring section of 2 x 20 m = 40 m, the maximum allowable deviation is:
40 m x ±0.08 mm/m = ±3.2 mm.
Consequently, the difference **d** between points I and III for each of the four individual measurements may not exceed 3.2 mm max.

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If the measuring tool should exceed the maximum deviation in anyone of the four measuring procedures, have it checked at a Bosch after-sales service agent.

Working Instructions for the Rotational Laser Level

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

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.

Working with the Tripod (Accessory)

The measuring tool is equipped with a 5/8" tripod mount for horizontal operation on a tripod. Place the measuring tool via the tripod mount **12** onto the 5/8" male thread of the tripod and screw the locking screw of the tripod tight.

On a tripod **30** with a measuring scale on the elevator column, the height difference can be adjusted directly.

Working with the Laser Target Plate (Accessory)

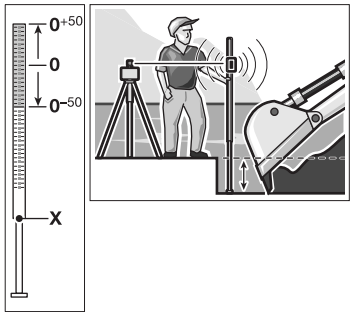
Using the laser target plate **37**, it is possible to transmit the laser height onto a wall.

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 laser target plate **37** has a reflecting coating which improves the visibility of the laser beam from a larger distance or in case of strong sun rays. The luminosity can be recognized only if you look to the laser target plate in parallel to the laser beam.

Working with the Measuring Rod (Accessory)

For checking irregularities or projecting gradients, it is recommended to use the measuring rod **31** together with the laser receiver.



A relative millimeter scale (±50 cm) is marked on the top of the measuring rod **31**. Its zero height can be preset at the bottom of the elevator column. This allows for direct reading of deviations from the specified height.

Working Instructions for the Laser Receiver

Marking

When the laser beam runs through the center of the reception area **24**, its height can be marked at the centre mark **23** right and left on the laser receiver. The centre mark is located 45 mm away from the top edge of the laser receiver.

Aligning with the Spirit Level

The laser receiver can be aligned vertically (plumb line) with the spirit level **26**. A laser receiver attached out-of-level leads to faulty measurements.

Attaching with the Holder (see figure A)

With the holder **35**, the laser receiver can be fastened to a construction laser measuring rod **31** (accessory) as well as to other auxiliary tools with a width of up to 65 mm.

Screw the holder **35** to the retainer opening **29** on the rear side of the measuring tool with fastening screw **34**.

Loosen the locking screw **32**, slide the holder onto the construction laser measuring rod **31**, for example, and retighten the locking screw **32**.

The upper edge **33** of the holder is located at the same height as the centre mark **23** and can be used for marking of the laser beam.

Attaching with the Magnet (see figure B)

When a positive-lock attachment is not absolutely required, the laser receiver can be attached to steel parts via the face side using the magnet plate **22**.

Work Examples

Checking the Depth of Building Pits (see figure C)

Position the measuring tool on a firm surface or mount it to a tripod **30**.

Working with tripod: Align the laser beam to the requested height. Project or check the height at the target location.

Working without tripod: Determine the height difference between the laser beam and the height at the reference point with the laser target plate **37**. Project or check the measured height difference at the target location.

When measuring over long distances, the measuring tool should always be set up in the centre of the work surface and on a tripod, in order to reduce interferences.

When working on unsafe ground, mount the measuring tool onto the tripod **30**. Take care that the shock-warning function is activated, in order to avoid faulty measurements in case of ground vibrations or shock to the measuring tool.

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Overview of Indications

	Laser beam	Rotation of the laser	green	red	green	red	
Switching on the measuring tool (1 s self-check)			●			●	●
Levelling in or re-levelling	2x/s	❍	2x/s				
Measuring tool levelled in/ready for operation	●	●	●				
Self-levelling range exceeded	2x/s	❍		●			
Shock-warning function activated					●		
Shock warning actuated	2x/s	❍				2x/s	
Battery voltage for ≤ 2 h operation							2x/s
Battery empty	❍	❍					●

2x/s Flashing frequency (twice per second)
● Continuous operation
❍ Function stopped

Maintenance and Service

Maintenance and Cleaning

Keep the rotational laser level, battery charger and laser receiver clean at all times.

Do not immerse the rotational laser level, battery charger and laser receiver into water or other fluids.

Wipe off debris using a moist and soft cloth. Do not use any cleaning agents or solvents.

Particularly clean the surfaces at the outlet opening of the rotational laser level regularly and pay attention for any lint.

If the rotational laser level, battery charger or laser receiver should fail despite the care taken in manufacture and testing, repair should be carried out by an authorised customer services agent for Bosch power tools. Do not open the rotational laser level, battery charger or laser receiver yourself.

In all correspondence and spare parts orders, please always include the 10-digit article number given on the type plate of the rotational laser level, battery charger and laser receiver.

After-sales Service and Customer Assistance

Our after-sales service responds to your questions concerning maintenance and repair of your product as well as spare parts. Exploded views and information on spare parts can also be found under:
www.bosch-pt.com
Our customer service representatives can answer your questions concerning possible applications and adjustment of products and accessories.

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