



Operating Instructions

Plumb-up Laser LL-90L/-91L

Plumb-down Laser LL-92L/-93L



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Designed, developed and
made in Germany

Congratulations on your new GEO laser

This operating instructions contain enclosed in addition to information on how to use the laser **important safety information**.

Please note: First read the **safety instructions** on the supplement page **1 - 3** and then the operating instructions carefully before using the laser.

1. Description

The laser emits an automatically levelled plumb laser beam as reference axis. This laser beam is, for example, represented as dot on a target. If the target is connected to sliding moulding, the moulding can be controlled according to the position of the laser dot. The LL is a special laser for all types of plumbing operations. Its possible uses are virtually unlimited. The pipe lasers of the 90 generation have a green laser beam which is much better visible, especially at daylight.

1.1 Robust Light Metal Housing, 100 % watertight

Plastic-coated, swept and filled with nitrogen

1.2 Handle

For easy handling, safe transport and simple set-up.

1.3 Laser Warning Sign

LL-90L/-92L: Laser class 2, 1 mW
LL-91L/-93L: Laser class 3R, < 5 mW

1.4 Keyboard

Clear layout. Big, user-friendly, self-explanatory keys.

1.5 Identification

1.6 Charging Socket

Behind the dust guard cap.

1.7 Box Level

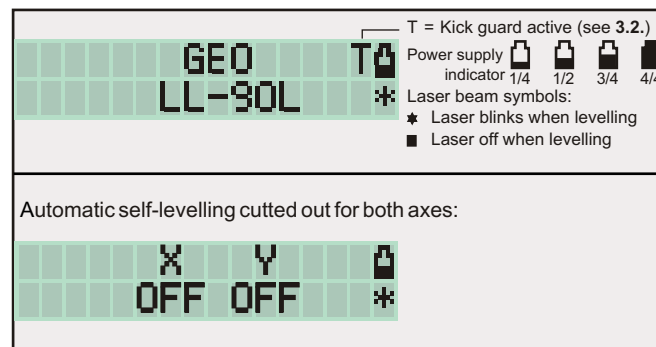
Build-up assistance LL-82L/-83L

1.8 Bulging Ground Area, niro St.

Protects against damages of coat and guarantees a secure stand. Central fastening thread 5/8".

1.9 LCD Display

Clearly legible, illuminated display for on/off, company data, device data, duty type and battery level.



1.10 Box Level

Build-up assistance LL-90L/-91L

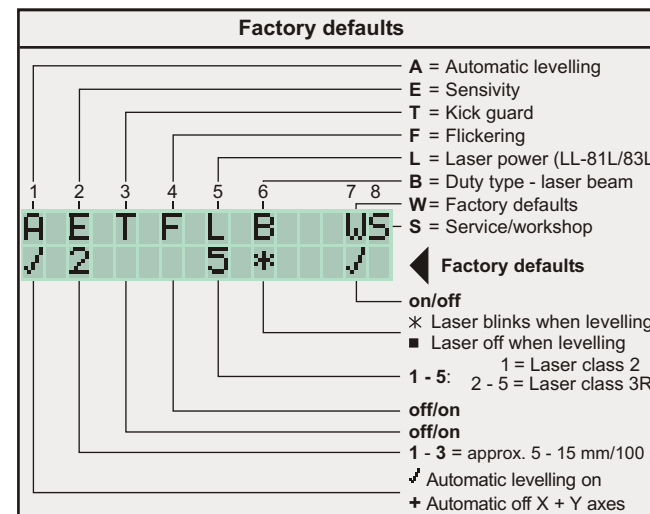
2. Buttons

2.1 = ON/OFF Button

The device is switched on by pressing this button. The device and company data are then shown, followed by the LCD main level (see 1.9). The device is then levelled automatically. After the levelling phase the laser beam and laser beam symbol stop blinking. If this does not happen, the device must be moved into the levelling range by tilting it forwards. The display illumination switches off after approx. 30 seconds automatically. The illumination is switched on again by pressing the ON/OFF button shortly. To switch off the device, press the ON/OFF button until "Auf Wiedersehen!" appears.

2.2 = Select Menu Level

Keep the button pressed until the adjustment menu is shown:



2.3 = Select Letter

The selected letter begins to blink.
Y axes inclination setting (see 3.1)

2.4 = Change Settings

X axes inclination setting (see 3.1)

Back to Operating Display

3. Device Settings

3.1 Automatic Levelling Cut-Out

- ✓ = Automatic levelling switched on (factory defaults)
- + = Automatic self-levelling cutted out for both axes. On the display **X-A OFF + Y-A OFF** is indicated.

When the automatic is cutted out, the laser can be positioned just as you like it. For electromotive fine/coarse adjustment of the laser beam, push the respective arrow buttons. Longer pushing changes the direction with increasing speed.

3.2 Sensivity Setting (Wind/Vibration)

The self-levelling function corrects even the smallest deviation. Additionally the laser beam and the laser beam symbol at the operating mode display blink when the limit values of step 1 to 3 are exceeded, i. e. by influence of wind and/or vibration.

- 1 = 0.005 % no effect
- 2 = 0.010 % weak effect (factory defaults)
- 3 = 0.015 % strong effect

3.3 Kick Guard (Automatic Laser Cut-Out)

✓ = Kick guard switched on. It is only active after 30 sec. Then a T appears in front of the battery symbol at the operating mode display. This means the laser is switched off automatically as a precautionary measure in the event of a jerky movement (bump). The T then begins to blink. The laser must be switched on again and the positioning checked and corrected if necessary.

■ = Factory defaults: Kick guard switched off.

3.4 Laser Beam Flickering

■ = Flickering off (factory defaults)

✓ = Flickering on. Flickering makes the laser beam significantly easier to see in unfavourable light conditions.

3.5 Laser Power

The laser power of the LL-90L/-92L can be regulated in 2 steps, the laser power of the LL-91L/-93L can be regulated in 5 steps.
LL-90L/-92L: 1 = approx. 0.5 mW, 2 = < 1 mW (default)
LL-91L/-93L: 1 = < 1 mW (default, laserclass 2),
2 = approx 2 mW, 3 = approx. 3 mW, 4 = approx. 4 mW,
5 = <5 mW

3.6 Operating Mode Laser Beam

- ★ = Laser beam and laser beam symbol blink at the operating mode display when levelling (factory defaults).
- = Laser beam is off when levelling. However the symbol blinks at the operating mode display.

3.7 Factory Defaults

✓ = All set to factory defaults.

3.8 Service/Workshop Notice

First off all a phone no. for service/help appears. Then authorized personnel can put in a numerical code to come to the adjustment mode.

4. Power Supply

7.4 V DC internal lithium ion rechargeable battery or 12 V DC external rechargeable battery via connection cable 0117.02.

4.1 Battery Charging

- Carry out charging only with the power and charging unit, type NE-80 or a 12 V DC external rechargeable battery via connection cable 0117.02.
- Keep charger dry and only use in rooms.
- For charging take the laser out of the transport case.
- Permissible charging temperature 0°C to + 40°C, as best + 10°C to + 25°C.
- After approx. 5 hours the charging time is finished. The display goes out or the battery symbol shows a full battery.
- Low ambient temperatures reduce the running time, high temperatures reduce the battery life.
- Damaged batteries must be disposed.

5. Inclination Works in x and/or y Axes

Please note: Inclination setting is only possible without automatic levelling.

- Align laser to the inclination axis.
- Switch off automatic levelling.
- Set inclination by points of reference, roughly more than ± 5 % by tilting forwards the device, finely with the arrow buttons.

6. Adjustment

6.1. Checking the Adjustment

Set up the laser standing upright and mark the laser beam at the required measuring distance. Turn the laser by 180° and mark again. If the adjustment is correct, the first marking does not deviate from the second.

If there is a deviation, the target axis lies in the middle between the first and second marking.

6.2. Adjustment

The laser can be adjusted in the field without having to open the device. For safety reasons, however, adjustment should only be carried out by authorized personnel. See the special adjustment instructions in this regard.

7. Troubleshooting

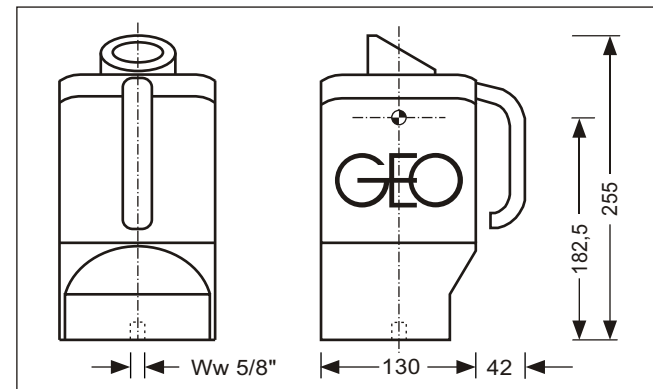
1. No laser beam - check battery charge.
2. Low range - clean laser beam exit window.
3. Laser beam blinks slowly - move device into the levelling range by tilting forwards. If the error is not corrected within 2 ½ minutes, the device is switched off automatically.
4. Laser switched off automatically (kick guard) - see 3.3.

8. Maintenance

The laser requires no special maintenance. Keep the electrical connections clean. Do not clean with water spray. Clean glass parts with a soft, clean cloth. Store dry. Always transport the laser in its original case.

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9. Dimensional Sketch

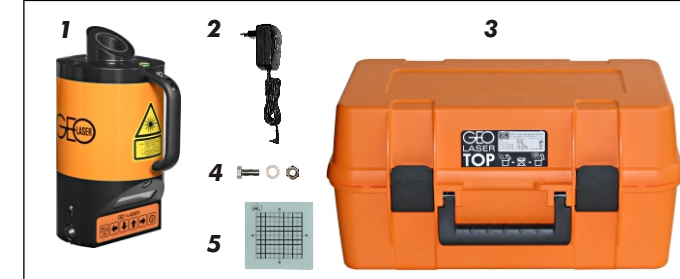


10. Technical Specifications

Laser class LL-90L/-92L: 2, < 1 mW
 Laser class LL-91L/-93L: 3R, < 5 mW
 Laser: diode laser, visible green, 520 nm
 Beam diameter: 13 mm at laser
 Range LL-90L/-92L: to 200 m
 Range LL-91L/-93L: to 500 m
 Self-levelling range: ± 5 %
 Permissible deviation: ± 5 mm/100 m
 Operating time with 7.4 V DC Li Ion recharge. battery:
 LL-90L/-92L: to 50 hours
 LL-91L/-93L: to 34 hours
 External power supply: 11 to 14 V DC with cable 0117.020
 Watertight: to 3.5 m
 Temperature range: - 10° C to + 50° C
 Weight: 3.4 kg
 Adjustment: . . . possible in the field without having to open the device
 Guarantee: 24 months
 CE: certificate

11. Standard Delivery Package

No.	Order No.	Type	Description
1	0001.4xx	LL-9x	Plumb laser
2	0037.18	NE-80	Power supply/Battery charger
3	0077.36		Transport case
4	0094.00.1		5/8"-hexagon bolt with nut and washer
5	0002.03	LL-ZT	Target with coordinates grid, green
1-5	0001.407.1	LL-90L	with standard delivery package
or	0001.417.1	LL-91L	with standard delivery package
or	0001.427.1	LL-92L	with standard delivery package
or	0001.437.1	LL-92L	with standard delivery package
-	8675.11		Extra Charge, Deviation: ± 2.5 mm/100 m



12. Optional Accessories

No.	Order No.	Type	Description
1	0117.02		12 V cable, 1.8 m, laser <-> battery connect.
2	0061.07	ST-08	Plumb tripod
3	0061.15	BS-20	Ground tripod
4	0056.00.2		Quick-Fix base plate
5	0056.00.1		Standard tripod adapter with centre spigot
6	8803.06	KA-84	Claw adaptor, swivelling, system Leica/Wild
7	8869.00	DF-TZ	Tribrach, system Trimble/Zeiss
8	0033.13		Plumb-down laser adaption



Notes:

GEO - partner of the construction industry for 50 years

Designed, developed and
made in Germany



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