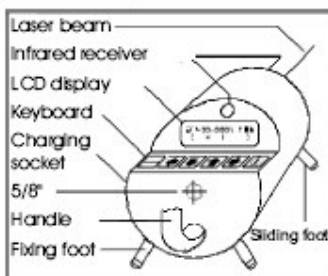


1. Safety Instructions

- Pay attention to the accident prevention regulations.
- Do not set up the laser at eye level.
- Do not look into the beam.
- Do not remove the warning signs on the laser.
- Check the laser before every use (control measurement). The manufacturer and its dealers accept no liability for damage caused by faults and consequential damages.
- Only use the battery charger in dry rooms.
- Do not open the laser yourself. **Note:** The laser power values in the device are far higher than prescribed for laser class 2 or 3 R.
- Repairs requiring the device to be opened may only be carried out by authorized persons.



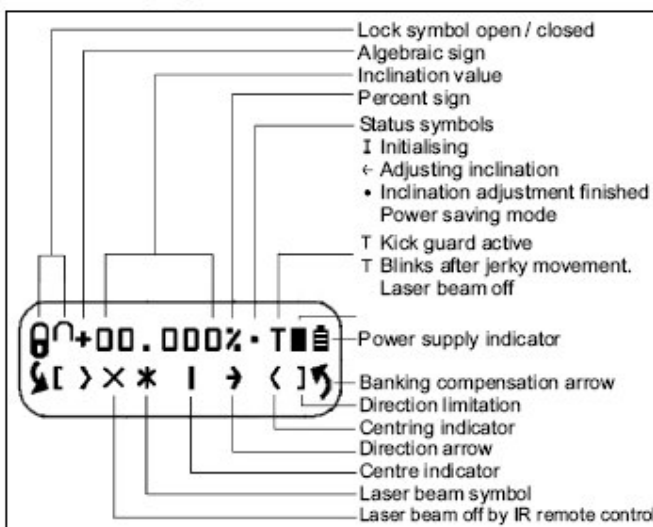
2. Description



The GEO pipe laser emits an automatically levelled or defined inclined laser beam as reference axis. It was specially designed for pipe laying, but can also be used for a variety of other purposes.

It can be set up centrally or at a constant distance above the pipe invert. Suitable legs, tripods and fastening systems are available for this.

2.1 LCD Display



3. Pipe Laying made easy

Mount device over the point of reference in such a way that the banking arrows are no longer seen. Adjust the inclination and align the laser beam to the point of aim. After that join pipe after pipe and align each end to the target.

4. Set-up

The laser can be set up centrally or at a constant distance above the pipe invert. Suitable legs, tripods and fastening systems are available for this.

Note: If the diameter indicated on the feet does not correspond with the pipe diameter, the target has to be set up directly in front of the laser and must be adjusted to the correct height ignoring the diameter marking.

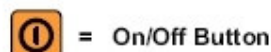
5. Power Supply

4.8 V DC internal rechargeable battery or 12 V DC external rechargeable battery using transformer cable 0117.00.

6. Battery Charging

- Carry out charging by using the charger LG-50.
- Keep charger dry and only use in rooms.
- For charging take the laser out of the transport case.
- Do not charge at minus temperature.
- After approx. 4 hours the charging time is finished, the charging light blinks.
- Only after several charging and discharging processes the battery obtains its total power.
- Faulty NiCd batteries have to be disposed.

7. Buttons



= On/Off Button

The device is switched on by pressing this button.

The device and company data are then shown, followed by the operating display with the last settings without button lock. The device is then levelled and referenced on the zero point 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.



= Inclination Setting

Pressing the arrow buttons changes the inclination value by 0.001 %. The value is changed with increasing speed if the button is kept pressed.



= Setting Inclination on Zero

The inclination value is set on 0.000 % by pressing the two arrow buttons at the same time.



= Direction Setting

After setting one of the two arrow buttons the laser beam symbol changes to an arrow. It indicates the direction of movement and the current position. When end position is reached, the laser beam and limitation symbol begin to blink. The setting must then be moved back within 2.5 minutes. If this is not done, the laser is switched off automatically.



= Direction Centering

After pressing the two arrow buttons the device is automatically centred in middle position.

Quick Setting

In addition to the respective arrow buttons also press the On/Off button.



= Button Lock

Press the button 2 x: Lock symbol, select and confirm. The buttons are protected against accidental adjustment. Press the Menu button 2 x again, the lock is lifted.



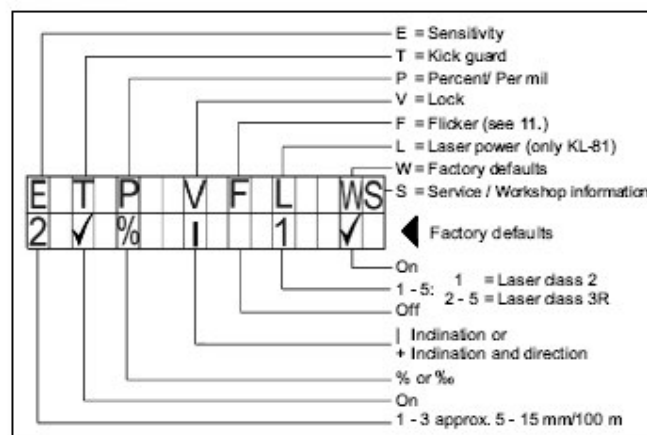
= Changing the Factory Defaults

Keep the button pressed until the adjustment menu is shown.



= Select Letter

The selected letter begins to blink.



= Change Settings



= Back to Operating Display

8. Automatic Laser Cut-Out

Is active, as soon as a T appears in the status 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.

9. Monitoring of Self-Levelling

The self-levelling function corrects even the smallest deviation. At a deviation of approx. 0.01 % the laser beam and laser beam symbol begin to blink. Depending on the setting, blinking can start earlier at approx. 0.005 % or later at approx. 0.015 %.

10. Banking Compensation

The height deviation caused by a banking compensation is levelled automatically. Arrows indicate the banking. When the banking increases, the arrows become larger. When the arrows start blinking, the final position is reached. Turn the laser in the direction of arrow as far as the arrows are no longer seen.

11. Flicker Mode

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

12. Infrared Remote Control

for direction setting and laser switch on/off. Additionally the flicker mode can be switched on/off by the On/Off button.

13. Calculating the Percentage

If the percentage value that is to be set is not known, it can be calculated as follows:

Example: Height difference between 2 points = 0.2 m
Length between 2 points = 50 m

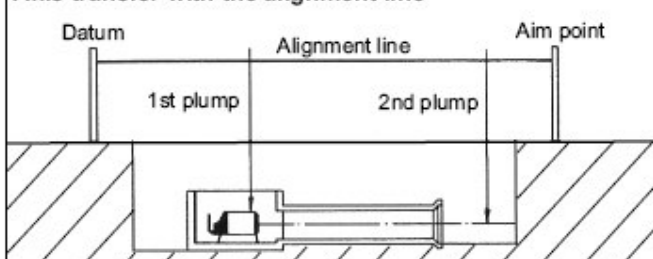
$$\frac{\text{Height difference} \times 100}{\text{Length}} = \frac{0.2 \times 100}{50} = 0.4 \%$$

Convert % in ‰ - move the decimal point one place to the right.

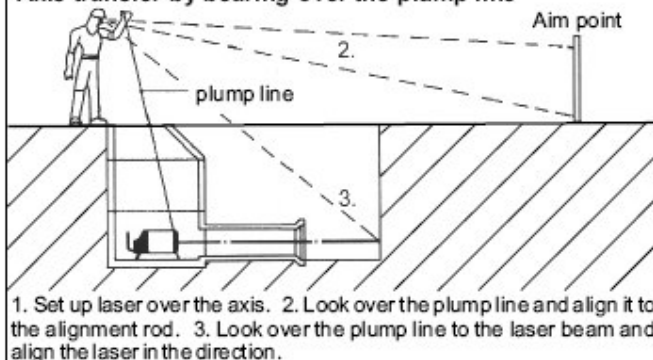
Convert ‰ in % - move the decimal point one place to the left.

14. Transfer Possibilities

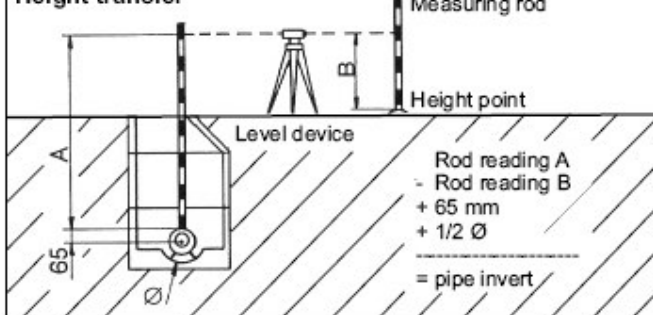
Axis transfer with the alignment line



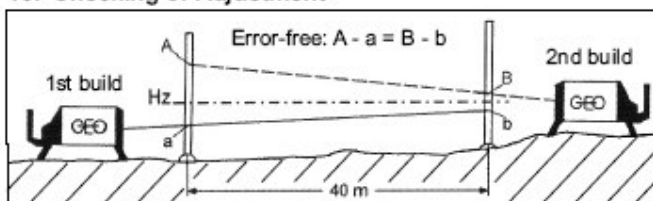
Axis transfer by bearing over the plump line



Height transfer



15. Checking of Adjustment



16. 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.

17. Troubleshooting

1. No laser beam - check power supply. Low battery?
2. Low range - clean laser beam exit window.
3. Laser beam blinks slowly - move device into the levelling range by tilting forwards.
4. Laser beam and direction limitation symbol blink slowly - reset laser from the limitation.
5. Laser beam + banking arrows blink slowly - twist laser in direction of arrow until the arrows are no longer seen. If the errors of point 3, 4 and 5 are not corrected within 2.5 minutes, the device is switched off automatically.
6. Laser switched off automatically (kick guard) - switch on the device again.

18. Technical Data

FKL-80 laser class: 2, < 1 mW
 FKL-81 laser class: 3R, < 5 mW
 Laser: Diode, visible red, 635 nm
 Beam diameter: at laser 13 mm
 Range depending on ambient conditions: FKL-80 up to 200/ FKL-81 up to 500 m
 Inclination range: - 10 % to + 40 %
 Self-levelling range: - 5 % to + 40 %
 Reading accuracy: 0.001 %
 Permissible deviation: ± 0.005 %
 Direction setting range: ± 5.000 %
 Banking compensation: ± 4°
 Operating time: internal 4.8 V DC NiCd rechargeable battery up to 28 hours
 External power supply: 10.5 to 15 V DC with cable 0117.00
 Undervoltage cut-out: yes
 Watertight: to 0.35 bar
 Temperature range: - 10° C to + 50 °C
 Dimensions: Ø 130 mm, length 265 mm
 Weight: 4.2 kg
 Range IR remote control: to 150 m from front to 18 m from behind
 Guarantee: 12 months

19. Accessories

Standard Delivery Package

Target frame
 Target DN 150 - 300
 1 leg set DN 150 (at device)
 1 leg set DN 200/250/300 each
 Battery charger

Comfort Version

IR remote control
 1 leg set DN 400/500 each
 Adapter for mounting with 3 legs
 Target DN 400/500

20. Service

Our devices are covered by a 12-month guarantee. Unauthorized opening of the devices invalidates the guarantee. Please always send the laser in for inspection or repair in its original case. Always specify the faults.



21. Disposal

The device must not be disposed together with the household rubbish (electric scrap).

Operating Instructions

Automatic Pipe Laser FKL-80/-81



Congratulations on your new GEO Laser

In addition to information on how to use the laser, these operating instructions also contain important safety instructions. Read the operating instructions carefully before using the laser.

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