

Operating Instructions

Automatic Pipe Laser KL-80L/-81L

Tough and durable . . .



. . . strong on performance

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 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.

2. Pipe Laying made easy

Mount device over the point of reference in such a way that the banking arrows are no longer seen (see **8.**). 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.

3. 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.

4. Laser Description

4.1 Infrared Receiver

For short distance from the back.

4.2 Keyboard

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

4.3 Charging Socket

Behind the dust guard cap.

4.4 Central Fastening Thread 5/8"

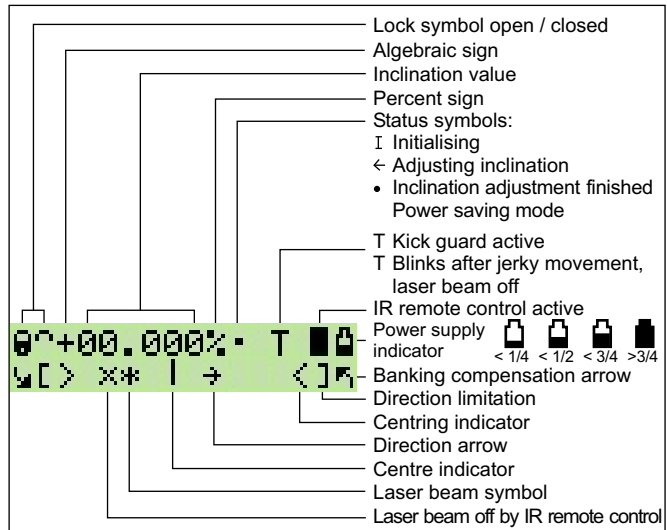
Bulging ground area, niro St.

4.5 Handle

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

4.6 LCD-Display

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



5. 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.

or = **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.

or = **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.

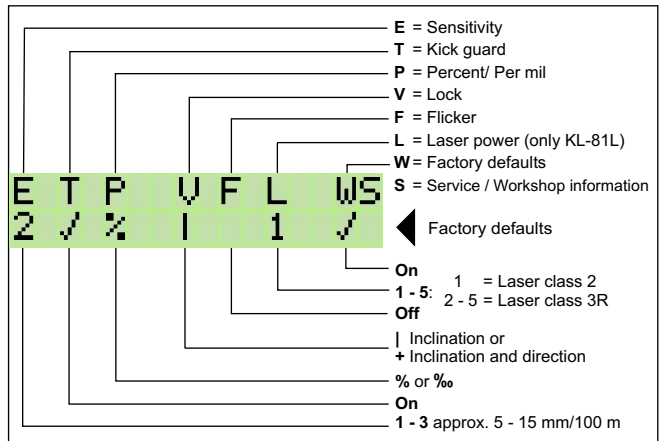
= **Button Lock**

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**

6. Automatic Laser Cut-Out

Is 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.

7. 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 %.

8. 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.

9. Flicker Mode

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

10. 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.

11. 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.

12. Power Supply

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

13. 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.

14. Troubleshooting

- No laser beam - check power supply. Low battery?
- Low range - clean laser beam exit window.
- Laser beam blinks slowly - move device into the levelling range by tilting forwards.
- Laser beam and direction limitation symbol blink slowly - reset laser from the limitation.
- 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.
- Laser switched off automatically (kick guard) - switch on the device again.

15. 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.

Notes:

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German Quality Product

CE Certified

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16. Transfer Possibilities

Axis transfer with the alignment line

Axis transfer by bearing over the plumb line

Height transfer

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17. Checking of Adjustment

Although the laser is adjusted precisely by the manufacturer, jolts and strong vibrations can lead to maladjustment. The laser should therefore be checked before use:

1. Select a measuring area of approx. 40 m that is as horizontal as possible and set up the laser with the counter at 0.000%.
2. Set up two control points, one directly in front of the laser and the other in a distance of approx. 40 m, and measure the distance on the centre of the laser beam "a" and "b".
3. Set up the laser behind the second measuring point and repeat the measuring process in reverse direction, this means measure "A" and "B".
4. If the adjustment is correct, $A - a = B - b$. This means, the laser beam of the first installation is parallel to the second one.
If the adjustment is incorrect, please contact your specialist dealer.

18. Technical Specifications

KL-80L laser class: 2, < 1 mW
KL-81L laser class: 3R, < 5 mW
Laser: Diode, visible red, 635 nm
Beam diameter: at laser 13 mm
Range depending on ambient conditions: . KL-80L up to 200/ KL-81 up to 500 m
Inclination range: - 10 % to + 40 %
Self-levelling range: - 5 % to + 40 %
Reading accuracy: 0.001 %
Permissible deviation: $\pm 5 \text{ mm}/100 \text{ m}$ %
Direction setting range: $\pm 5.000 \text{ }^\circ$
Banking compensation: $\pm 4^\circ$
Operating time with 7.4 V lithium ion rechargeable battery:
KL-80L/-81L: up to 60/45 hours
External power supply: 11 to 14 V DC with cable 0117.02
Undervoltage cut-out: yes
Watertight: to 0.35 bar
Temperature range: - 10° C to + 50 °C
Dimensions: $\varnothing 130 \text{ mm}$, length 265 mm
Weight: 3 kg
Range IR remote control: to 150 m from front
to 18 m from back
Guarantee: 24 months
CE: certified

19. Dimensional Sketch

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20. Standard Delivery Package

No.	Order no.	Type	Description
01	0001.105	KL-80L	Pipe laser
02	0077.36		Transport case
03	0016.07	KL-04	Target frame
03	0016.07.002		Plexi target DN 150 - 300
04	0037.18	NE-80	Power supply/Battery charger
05	0077.36.002		Double headed wrench 10/13
06	0019.07		Leg set DN 200 (2 x sliding leg/ 2 x fixing leg)
07	0019.08		Leg set DN 250 (2 x sliding leg/ 2 x fixing leg)
08	0019.09		Leg set DN 300 (2 x sliding leg/ 2 x fixing leg)
1 - 8	0001.105.1		KL-80L with standard delivery package
1 - 8	0001.115.1		KL-81L with standard delivery package

21. Optional Accessories

No.	Order no.	Type	Description
08	0016.07.003		Plexi target DN 400 - 500
09	0026.05	IF-80	IR remote control
10	0019.10		Leg set DN 400 (2 x sliding leg/ 2 x fixing leg)
11	0019.11		Leg set DN 500 (2 x sliding leg/ 2 x fixing leg)
12	0019.90		Leg adapter for mounting with 3 legs
8-12	0125.01.1	KP-IR	Comfort version for pipe laser

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22. Effects of the Refraction

The laser beam is deflected to cold air.
It is deformed and moved by atmospheric turbulences.

— laser beam
- - - laser beam after temperature influence

● laser beam
○ laser beam after temperature influence

Countermeasures:
Do not keep tubes in direct insolation. Store tubes in the shadow or cover them with a canvas.
Align the pipe in the ditch immediately. If the laser beam is deformed by temperature influences and/or in movement, define the centre by averaging.

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