EN

FKL 44

USER MANUAL



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Dear customer,

Thank you for your confidence in us having purchased a ***geo-FENNEL*** instrument.
This manual will help you to operate the instrument appropriately.

Please read the manual carefully - particularly the safety instructions. A proper use only guarantees a longtime and reliable operation.

geo-FENNEL
Precision by tradition.

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A SUPPLIED WITH

PIPE LASER FKL 44

- Target frame with targets DN 100 - 300
- Special target for pipe DN 100
  (also target frame for FR-FKL TRACKING)
- RF remote control
- Leg sets DN 125 / 150 / 200 / 250 / 300
- Li-Ion battery and charger



FR-FKL TRACKING (OPTIONAL)

- FR-FKL receiver
- Batteries



Technical Data

Laser class	2
Laser diode	red
Beam diametre	10 mm
Working range	up to 120 m
Grade range	-20 % to +30 %
Self-levelling range	± 5°
Minimum display reading	0,000%
Horizontal accuracy	± 5 mm / 100 m
Left / right scanning	± 10°
Operating time	24h
Power supply	8000 mAh Li-Ion
Remote control range front / back	100 m / 50 m
Temperature range	-20°C to +50°C
Dust/water protection	IP 68
Dimensions	Ø 96 mm, L = 332 mm
Weight (laser only)	2,8 kg

Technical data FR-FKL TRACKING (OPTIONAL)

Accuracy	± 2 mm / 10 m
Working range	50 m
Power supply	2 x AAA batteries
Temperature range	-10°C to +45°C
Dust/water protection	IP 67

FEATURES
- Robust aluminium housing
- Easy intuitive operation
- Fully automatic self-levelling
- Automatic beam centering
- Laser start point LED-indication
- Clear easy-to-read OLED display
- RF remote control with long working range

WITH FR-FKL TRACKING (OPTIONAL)
- TRACKING function for automatic detection of the horizontal target center

B POWER SUPPLY

The laser is supplied with a rechargeable Li-Ion battery pack.

During operation the display shows the battery status:

For charging the battery connect the charger with the charging plug of the instrument and the power source. Battery status:

- If the charging LED is red the battery is being charged.
- If the charging LED is green the battery is fully charged.



The battery can be charged inside or outside of the laser:

1) Charging the battery inside the laser.



2) Charging the battery outside the laser.



Connection on the bottom side of the battery.

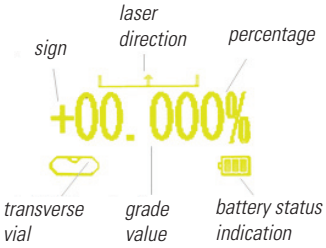
FEATURES

C

1. OLED display
2. Channel selection remote control
3. ON/OFF button
4. Rechargeable battery
5. Laser start point LED-indication
6. Housing mark of laser start point
7. Laser emitting window
8. Tripod connection thread
9. Legs
10. Charging plug
11. Handle



DISPLAY INDICATION



D OPERATION

SET UP THE LASER

Before setting up the laser select the appropriate legs for the tube diametre and mount them on the bottom of the laser (diametre DN 100: laser without legs!). If the vial shown in the display is centered and the direction arrow is in the middle (see page 19) the instrument is set up correctly. Now adjust the inclination and align the laser dot to the target. Continue aligning each pipe end to the target.

REMOTE CONTROL

The FKL 44 pipe laser is supplied with an RF remote control.
With the remote control all features can be controlled.
Exception: ON/OFF button:
The ON/OFF function can only be operated on the instrument!

Remote control range front: 100 m (laser emitting window)
Remote control range back: 50 m (end of the handle).



POWER ON/OFF THE LASER / REMOTE CONTROL

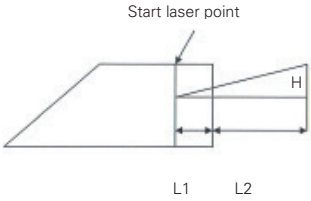
Power on the laser and the remote control with the ON/OFF button each; wait for the completion of the self-levelling procedure. The grade value set last will be displayed. Press the button again to power off the laser / remote control.

CHANNEL SELECTION

Select the required channel with this button (channel 1 to 9); the remote control channel must be set to the same channel as the laser.

INDICATION OF THE LASER START POINT

Press the button to activate the LED of the laser start point.
From this point on the grade of the laser dot will start (which influences the grade setting).
Press the button again to quit.



Grade = H / L1 + L2

LASER SPOT CENTERING

Keep both buttons pressed for one second simultaneously and release. Now the laser dot will center automatically. During the centering procedure the display indication is blinking. When the centering procedure is completed the display shows

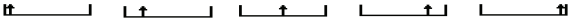
MOVE THE LASER DOT TO THE LEFT / RIGHT

With these buttons the laser dot can be shifted rightwards or leftwards.

Single pressing = slow shifting in the direction selected
Continuous pressing = quick shifting in the direction selected

When shifting the laser dot the below symbols are displayed:

Figure 1: the laser dot is in the most left position
Figure 2: the laser dot is in left position
Figure 3: the laser dot is centered
Figure 4: the laser dot is in right positon
Figure 5: the laser dot is in the most right position

DIRECTION ARROW 

GRADE SETTING SET

Grade setting range: -20 % ~ + 30%
Press the button to select the grade setting mode.
Display indication: "+00.000 %".
Select all digits for the grade setting with the button.

With the buttons the grade values can be set.

Lowest digit: 0
Maximum digit: 9
When the cursor is on the sign it can be changed from "+" to "-" with the button.
Slow pressing = slow setting of the grade values
Continuous pressing = quick setting of the grade values
Simultaneous pressing of both buttons sets the grade value to „0" again.

When the grade values required have been set press the ENT button to confirm.
When the laser levels the grade symbol is blinking. When the self-levelling procedure has been completed the blinking stops.

LOCK (MANUEL MODE)

Keep the buttons SET and ENT pressed until  is displayed; the grade value set last is now locked.

ATTENTION:
The self-levelling mode is powered off, the laser is in manual mode. Keep both buttons pressed again to quit the manual mode.

ALIGNMENT OF THE LASER

Banking
The laser is equipped with a digital vial that shows the alignment of the transvese axis. The laser is set up correctly if the vial is centered.

Display indication



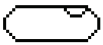
The laser is out of tolerance on the left side - correct the set up.

Display indication



The laser is perfectly levelled; most accuracte performance.

Display indication



The laser is out of tolerance on the rigtht side - correct the set up.

STAND-BY MODE SLEEP

Press the button to start the stand-by mode. The values set will be stored, the laser stops working. The laser dot is turned off and the laser start point LED blinks slowly. Press the button again to restart the working mode. If the laser is in stand-by mode for more than 30 min. it will automatically power off.

TARGETS

Target DN 100-200 with holder



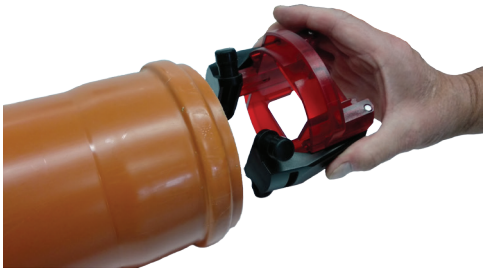
Target DN 250-300



Self-centering special target for pipe DN 100



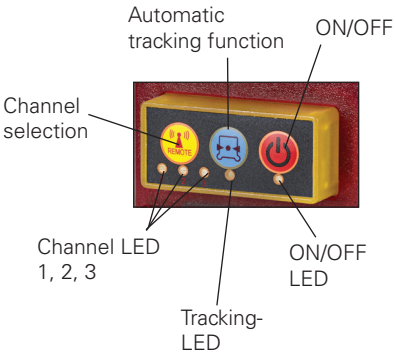




TRACKING FUNCTION
with the optional receiver FR-FKL TRACKING (art.-no. Nr. 454050)







When the FKL 44 has completed the self-levelling procedure power on the FR-FKL TRACKING and to start the automatic tracking function press button .

Now the laser automatically aligns to the horizontal center of the receiver. The activation of the tracking function is shown in the display of the remote control. The blue tracking LED of the receiver is blinking.



When the center of the target has been reached the LED changes to permanent green light. The tracking process has now been completed.

The FKL 44 and the receiver must work on the same channel which will be displayed by permanent light of the channel selection LED. In case the laser and the receiver do not work on the same channel the channel selection LED is blinking. Then, select the same channel with the channel selection button of the receiver and button 2 of the FKL 44 (channel 1,2 or 3) .

APPLICATION OF THE FR-FKL TRACKING WITH VARIOUS TARGETS



DN 100-200



DN 250-300



Self-centering special target for pipe DN 100

ACCURACY CHECK



Mark two points A and B which are about 30 m apart.
Set up the laser behind point A, turn it on and let it warm up for about 10 min.
Set the grade to 00,000 %.
Let the laser line go through points A and B and wait until the self-levelling procedure is completed.
Measure the height from the centre of the laser line to points A and B and mark them A1 and B1.
Set up the laser behind point B, let the laser beam go through points A and B and wait until the self-levelling procedure is completed.
Measure the height from the centre of the laser line to points A and B and mark the A2 and B2.

If (A2 - A1) - (B2 - B1) ≤ 3 mm, the accuracy is okay.

If (A2 - A1) > (B2 - B1), laser line is too high and must be adjusted.

If (A2 - A1) < (B2 - B1), laser line is too low and must be adjusted.

E SAFETY NOTES

INTENDED USE OF INSTRUMENT
The instrument emits a visible laser beam in order to carry out the following measuring tasks (depending on instrument): Setting up heights, horizontal and vertical planes, right angles and plumbing points.

CARE AND CLEANING
Handle measuring instruments with care. Clean with soft cloth only after any use. If necessary damp the cloth with some water. If the instrument is wet clean and dry it carefully. Pack it up only if it is perfectly dry. Transport in original container / case only.

SPECIFIC REASONS FOR ERRONEOUS MEASURING RESULTS
Measurements through glass or plastic windows; dirty laser emitting windows; after the instrument has been dropped or hit. Please check the accuracy.
Large fluctuation of temperature: If the instrument will be used in cold areas after it has been stored in warm areas (or the other way round) please wait some minutes before carrying out measurements.

ELECTROMAGNETIC ACCEPTABILITY (EMC)
It cannot be completely excluded that this instrument will disturb other instruments (e.g. navigation systems); will be disturbed by other instruments (e.g. intensive electromagnetic radiation nearby industrial facilities or radio transmitters).

CE-CONFORMITY
This instrument has the CE mark according to EN 610000-6-1:2007, EN 55011:2007.

WARRANTY
This product is warranted by the manufacturer to the original purchaser to be free from defects in material and workmanship under normal use for a period of two (2) years from the date of purchase. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or similar model at manufacturers option), without charge for either parts or labour. In case of a defect please contact the dealer where you originally purchased this product. The warranty will not apply to this product if it has been misused, abused or altered. Without limiting the foregoing, leakage of the battery, bending or dropping the unit are presumed to be defects resulting from misuse or abuse.

SAFETY INSTRUCTIONS
- Follow up the instructions given in the user manual.
- Do not stare into the beam. The laser beam can lead to eye injury. A direct look into the beam (even from greater distance) can cause damage to your eyes.
- Do not aim the laser beam at persons or animals.
- The laser plane should be set up above the eye level of persons.
- Use the instrument for measuring jobs only.
- Do not open the instrument housing. Repairs should be carried out by authorized workshops only. Please contact your local dealer.
- Do not remove warning labels or safety instructions.
- Keep the instrument away from children.
- Do not use the instrument in explosive environment.
- The user manual must always be kept with the instrument.

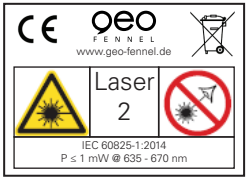
EXCEPTIONS FROM RESPONSIBILITY

1. The user of this product is expected to follow the instructions given in the user manual. Although all instruments left our warehouse in perfect condition and adjustment the user is expected to carry out periodic checks of the product's accuracy and general performance.
2. The manufacturer, or its representatives, assumes no responsibility of results of a faulty or intentional usage or misuse including any direct, indirect, consequential damage, and loss of profits.
3. The manufacturer, or its representatives, assumes no responsibility for consequential damage, and loss of profits by any disaster (earthquake, storm, flood etc.), fire, accident, or an act of a third party and/or a usage in other than usual conditions.
4. The manufacturer, or its representatives, assumes no responsibility for any damage, and loss of profits due to a change of data, loss of data and interruption of business etc., caused by using the product or an unusable product.
5. The manufacturer, or its representatives, assumes no responsibility for any damage, and loss of profits caused by usage other than explained in the user manual.
6. The manufacturer, or its representatives, assumes no responsibility for damage caused by wrong movement or action due to connecting with other products.

LASER CLASSIFICATION

The instrument is a laser class 2 laser product according to DIN IEC 60825-1:2014.
It is allowed to use the unit without further safety precautions.
The eye protection is normally secured by the aversion responses and the blink reflex.

The laser instrument is marked with class 2 warning labels.



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Technische Änderungen vorbehalten.
All instruments subject to technical changes.
Sous réserve de modifications techniques.

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Precision by tradition.

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