

FL 245HV +

USER MANUAL



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

- Rotating Laser Level FL 245HV +
- Receiver with clamp for levelling staff
- Remote control
- Rechargeable battery
- Charger
- Wall mount
- Floor support
- Box for alkaline batteries
- Laser intensive glasses
- Magnetic target
- Container
- User manual



FL 245HV + with receiver FR 45
FL 245HV + with receiver FR-DIST 30
FL 245HV + with receiver FR 77-MM

Art. no. 244045
Art. no. 244050
Art. no. 244077

CHARACTERISTICS

- Working range up to 1200 m diameter (depending on the receiver used)
- Dust / water protection IP 65 for exterior application
- Variable scanning and laser point mode
- Permanent 90° plumb beam
- Automatic TILT alarm function
- Auto-shut-off when out of level
- Manual slope setting of X and Y axis
- Remote control function (on/off)

Technical data

Self-levelling	horizontal / vertical
Self-levelling range	± 5°
Laser class	2
Accuracy	
· horizontal	± 0,75 mm / 10 m
· vertical	± 1,0 mm / 10 m
Working range with receiver Ø	
· with FR 45	1.200 m
· with FR-DIST 30	600 m
· with FR 77-MM	600 m
· w/o receiver	60 m
Scanning w/o receiver (radius)	60 m
Manual slope setting	
· X axis	± 5° (9%)
· Y axis	± 5° (9%)
Axis direction vertical	yes
Remote control range	IR 100 m
Rotating speed	300, 800 rpm
Power supply / operating time	26 h (NiMH)
Temperature range	-20°C - +50°C
Dust / water protection	IP 65

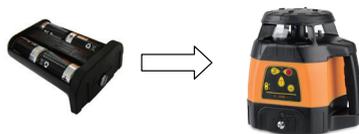
B POWER SUPPLY

Both the standard Li-Ion battery pack and alkaline batteries can be used.

1) Insert alkaline batteries into the alkaline battery box (ensure correct polarity) and fix the battery box into the instrument.

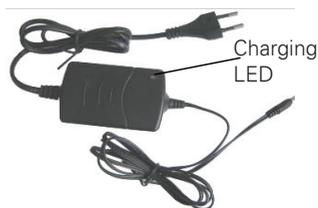
OR

2) Fix the rechargeable battery box into the instrument.



CHARGING THE BATTERY

Connect the charger with the charging plug of the instrument and the power source. If the charging LED is red the battery is being charged; if the LED is green the battery is fully charged.



ATTENTION

The rechargeable battery can be charged if it is in the instrument or if it is outside.

Battery status indication: If the ON/OFF LED flashes the battery has to be recharged.

C FEATURES

1. Laser emitting window
2. Rotating head
3. Receiving window remote control
4. Handle
5. Battery compartment
6. Keypad
7. Support for vertical use
8. 5/8" thread hole vertical
9. 5/8" thread hole horizontal
10. Charging plug



OPERATION

D

HORIZONTAL USE

Set up the instrument on an even surface or mount it onto a tripod.

After powering on the unit a flashing laser diode indicates that the automatic self-levelling procedure is working. The laser starts rotating when self-levelled. If not the laser was set up outside of its self-levelling range. In this case set up the instrument on a more even surface.



VERTICAL USE

- Unfold the datum point on the integrated floor mount and set up the laser in its vertical (lay-down) position.
- The laser automatically self-levels in this position.
- Set the circular bubble as accurately as possible by using the two thumb screws. This ensures that the instrument is set within its self-levelling range and the rotating beam is centered over its datum point.

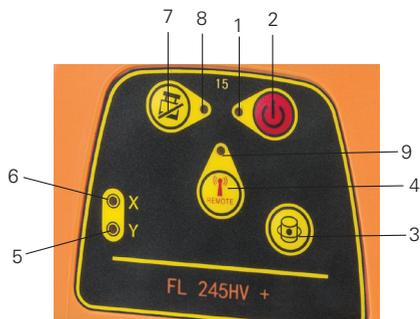


OPERATION - INSTRUMENT KEYPAD

POWER ON/OFF (2)

Power the laser on/off with button (2). If the red ON/OFF LED (1) is illuminated the laser is powered on. First the laser dot is flashing, then the self-levelling procedure starts automatically; meanwhile the TILT LED (8) is flashing. When the self-levelling procedure is completed the laser rotates with 600 rpm and the TILT LED (8) is illuminated permanently (= TILT function activated).

If in normal use the ON/OFF LED (1) flashes the battery has to be recharged.



ROTATING SPEED (3)

The instrument standardly rotates with max. speed (= 800 rpm). Press button (3) to change to 300 rpm.

ON / OFF REMOTE CONTROL FUNCTION - INSTRUMENT BUTTON ONLY (4)

With this button the remote control function can be disabled in order to avoid that several units on one construction site disturb each other. If the remote control LED is illuminated it is the remote control function is ready-to-receive.

LED REMOTE CONTROL (9)

If the LED is illuminated the the remote control function is ready-to-receive.

TILT MODE (7)

After completion of the self-levelling procedure the TILT mode is automatically enabled. If the level is now disturbed the rotation stops and the TILT LED is flashing.

1. Press the TILT button (7) once: The rotation of the laser starts - but the TILT mode is **disabled**.
2. Press the TILT button (7) twice: The rotation of the laser starts, the self-levelling procedure is completed and the laser restarts working with enabled TILT mode.

Press button (7) to disable the TILT mode after completion of the self-levelling procedure.

OPERATION WITH THE REMOTE CONTROL

SLOPE MODE (10) SLOPE SETTING (11)

Slopes can be set up to $\pm 5^\circ$ in X and Y direction.

Press button **(10)** to enter into this mode. To change between X and Y axis press button **(10)** again. The LEDs **(5)** and **(6)** show the axis chosen. To tilt the axis chosen press buttons **(11)**. To quit the slope mode press button **(10)** again.



SCAN FUNCTION (12)

Press button **(12)** to change from the rotation to the scan mode:

- Press button 1 x = long scan line
- Press button 2 x = short scan line
- Press button 3 x = dot mode

SCAN DIRECTION (13)

Change the direction of the scan mode with button **(13)**.

LED (14) - REMOTE CONTROL

This LED flashes if any button is used and a beep sounds.

ON / OFF REMOTE CONTROL FUNCTION (15)

With this button the remote control can be powered off - but not the instrument.

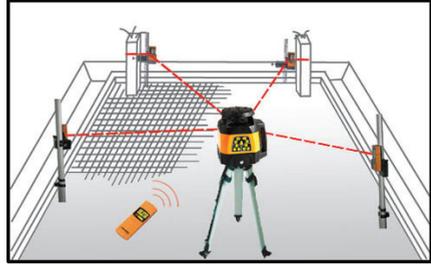
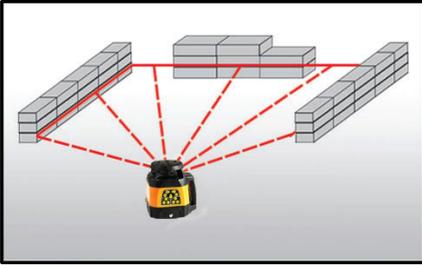
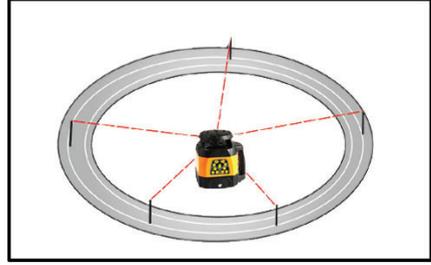
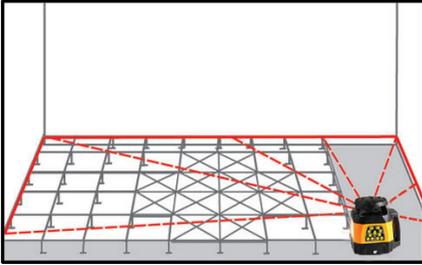
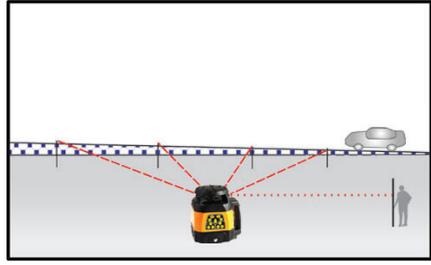
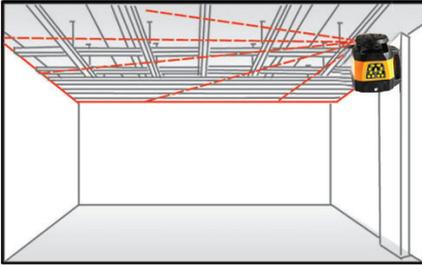
Press the ON/OFF button of the remote; the instrument will be in standby function. The ON/OFF LED of the laser flashes. The values set will remain.

ROTATING SPEED - REMOTE BUTTON (16)

The instrument standardly rotates with max. speed (= 800 rpm). Press button **(16)** to change to 300 rpm.

If the batteries of the remote are empty each key pressure will cause a permanent sound.

APPLICATION



RECEIVER FR 45

E

FEATURES

1. Vial (2)
2. Display
3. Reference indicator
4. Receiving window
5. ON / OFF switch
6. Loudspeaker
7. Battery compartment (back side)
8. Sound on / off
9. Accuracy coarse / normal / fine
10. Light on / off
11. Magnets (2)
12. 1/4"-thread for clamp (back side)



SUPPLIED WITH

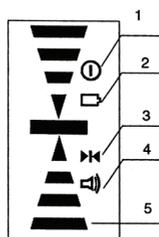
Receiver FR 45, battery, clamp, user manual

Technical Data

Indication	Front display
Accuracy coarse	± 10 mm
Accuracy normal	± 4 mm
Accuracy fine	± 2 mm
Tones	3
Operating time	400h
Power supply	1 x 9V

SYMBOLS

1. Power ON / OFF
2. Battery status indicator
3. Detection indicator
4. Sound ON / OFF
5. Detected position indicator



ACCURACY COARSE / NORMAL / FINE

The FR 45 is equipped with three precision modes. They can be chosen by pressing button (9):

Accuracy coarse ± 10 mm
Symbol on display: without symbol

Accuracy normal ± 4 mm
Symbol on display: 

Accuracy fine ± 2 mm
Symbol on display: 

INSTALLATION OF THE BATTERIES

- Open the battery compartment cover (7).
- Insert 1 x 9 V AA battery according to the installation symbol (ensure correct polarity!). Close the cover.
- In order to save battery power the receiver will automatically turn off if it has not received laser scanning signal for 5 minutes.

USE OF RECEIVER

Press the button (5) to switch the unit on.

Move the receiver up and down **carefully** to detect the laser beam.

A Move the receiver down
Acoustic signal : ultra-short requent beep

B Move the receiver up
Acoustic signal: short requent beep

C On level
Acoustic signal: continuous beep

A+B: The closer the distance to „on level“ (C) is,
the shorter the arrows become.

CLAMP FOR LEVELLING STAFF

If required the FR 45 can be attached to laser poles or any other equipment by means of the clamp supplied with.

RECEIVER FR 77-MM

SUPPLIED WITH

- Laser receiver FR 77-MM
- 4 x AA alkaline batteries
- Clamp for levelling rod
- Special mount
- User manual

Technical Data

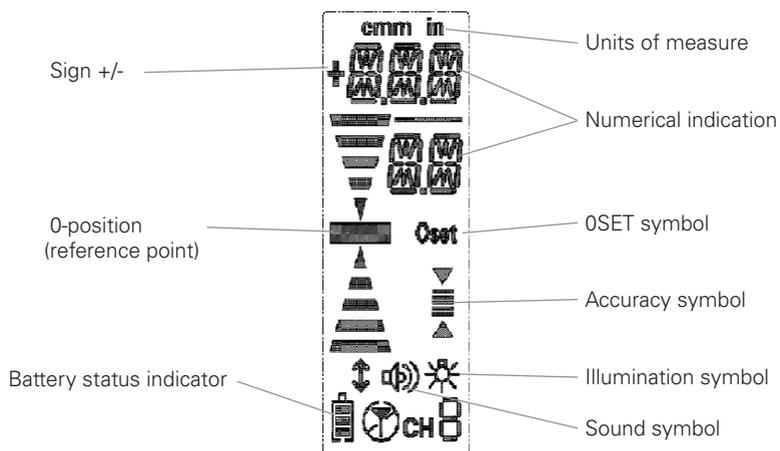
3 accuracy settings	$\pm 2 \text{ mm} / \pm 5 \text{ mm} / \pm 9 \text{ mm}$
mm-indication accuracy	$\pm 1 \text{ mm}$
Length of the receiving window	125 mm
Length of the receiving area for mm-indication	100 mm
Offset range (OSET) / from reference point	$\pm 20 \text{ mm}$
Measuring units	mm, cm, in, in-fraction
Signal tones	3
LCD display	front, rear
LED height indicators	front, side, rear
Power supply / Operating times	Alkaline / 110 h
Temperature range	-10°C to $+50^{\circ}\text{C}$
Display illumination	yes
Magnets	top, side
Bubble vials	top, side
Dust / water protection	IP 67
Dimensions	170 x 77 x 32 mm
Weight	0,5 kg

FEATURES

- Extra long receiving window
- mm-indication of height difference between the laser plane and the reference point
- The segments of the display increase / decrease proportionally
- The „0“ position can be changed (Offset)
- Display illumination (front and rear)
- Robust clamp
- Special mount for diverse connections, e. g. scaffolding

FEATURES





ON/OFF button

Power ON/OFF the receiver



Accuracy button

Select accuracy setting



UNITS button

Select units of measure



Sound/illumination button

Sound and/or illumination ON/OFF



OSET button

Set a relative ZERO position

POWER SUPPLY

INSERT / REPLACE BATTERIES

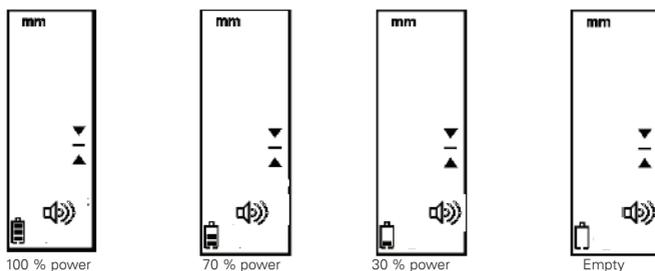
Open the battery compartment cover on the rear of the receiver and insert 4 x AA alkaline batteries. Refer to the battery compartment diagram to ensure correct polarity. Close the battery compartment cover.

Always remove the batteries if the receiver will not be used for a long period of time to avoid leakage.



BATTERY STATUS INDICATOR

The FR 77-MM front LCD display has four power status symbols. The receiver will automatically power off when the batteries are empty.



AUTOMATIC POWER-OFF

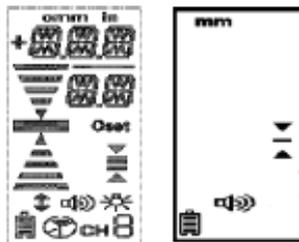
If the receiver does not receive a laser beam or is not operated for 10 minutes it will automatically power off.

OPERATION

POWER ON

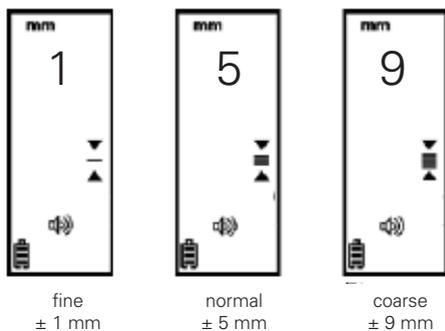
Press the ON/OFF button once to power on the receiver. The LCD display will initialise taking about 0.5 seconds when all the display symbols are illuminated (see diagram, left).

The receiver is now ready for use (see diagram, right).



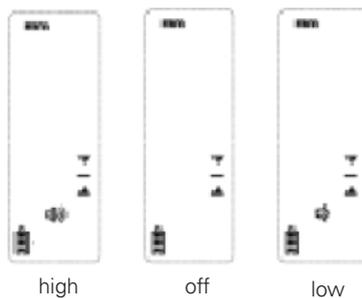
SELECT ACCURACY SETTING

Power on the unit and select the receiving accuracy fine, normal or coarse by pressing the „accuracy button“. The default accuracy setting following Power is „Fine“:



SWITCH ON /OFF THE SOUND

Power on the receiver and press the button „Sound/illumination“ to select the sound and volume required. The symbols in the LCD display show the status of the sound and volume.



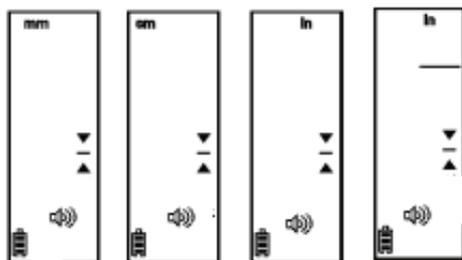
SWITCH ON/OFF THE DISPLAY ILLUMINATION

Power on the receiver and keep the button „Sound/illumination“ pressed until the illumination is on.



SELECT THE UNITS

Power on the receiver and press the „UNITS“ button successively until the required unit symbol appears in the display.



Millimetre

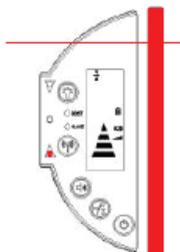
Centimetre

Inch

Inch (fraction)

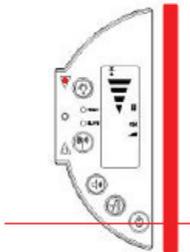
RECEIVE A LASER BEAM

Power on the receiver and make all required settings (i. e. accuracy fine, sound high). Carefully move the receiver up and down to detect the laser beam.



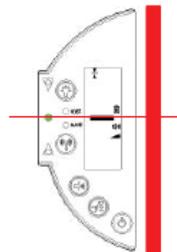
Indication 1

The laser beam is high
„arrow“ is illuminated.
Acoustic signal:
Slow beep.
->Move the receiver up.



Indication 2

The laser beam is low
„arrow“ is illuminated.
Acoustic signal:
Fast beep.
->Move the receiver down.



Indication 3

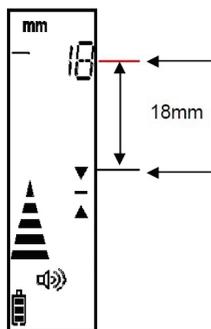
The LED „0-position“
bar is illuminated.
Acoustic signal:
Continuous beep.
-> On level.

PLEASE NOTE:

If the distance between the rotating laser and the receiver is less than 1 m erroneous measurements may occur.

MM INDICATION

If the reference level of the receiver is e. g. 18 mm below the laser beam this height difference will be displayed by an exact numerical value (see the left diagram).



further examples



The laser beam is exactly on-level.



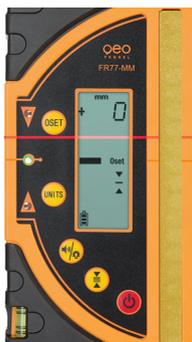
The laser beam is 19 mm above the reference point (move the receiver up).



The laser beam is 35 mm below the reference point (move the receiver down).

RELATIVE 0-POSITION (REFERENCE POINT)

Within the range of ± 20 mm of the standard reference point (0-position) a relative 0-position can be set. Press the „OSET“ button when the laser beam hits the receiving window (the „OSET“ symbol will flash on the display). This current position of the laser beam is now set as the relative 0-position on the receiver. Press the „OSET“ button to return to the default mode.



APPLICATION

Connect the clamp to the receiver for use with a laser pole, levelling staff or similar accessory. For optimum accuracy always level the bubble vials on the receiver before taking measurements.

SPECIAL MOUNT

To increase the versatility and scope of the receiver a special mount is provided (see illustrations).



F SAFETY NOTES

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.

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.

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

The instrument has the CE mark according to EN 61010-1:2001 + corrig. 1+2.

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.

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.

INTENDED USE OF INSTRUMENT

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

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.

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 aversion responses and the blink reflex.

The laser instrument is marked with class 2 warning labels.



Please note:

If you return instruments for repair / for adjustment to us please disconnect batteries or rechargeable batteries from the instrument - this is for safety reasons!

Thank you.

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



10/2019

Precision by tradition.

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F E N N E L