

GFE 32 / GFE 32-L

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

- Engineers' Automatic Level GFE 32, 360°
 - Adjustment pin
 - Screw driver
 - Dust brush
 - Plumb bob
 - User manual
 - Container
- Engineers' Automatic Level GFE 32-L, 360°
 - 2 x AA Alkaline batteries (for the power supply of the laser)
 - Adjustment pin
 - Screw driver
 - Dust brush
 - Plumb bob
 - User manual
 - Container

Technical data, GFE 32, 360°

Magnification	32 x
Clear objective aperture	45 mm
Field of view	1°
Shortest focusing distance	2 m
Mean error per 1 km double levelling	± 2 mm
· using the index mark	< 1 mm
Multiplication constant	100
Working range of compensator	± 15'
Levelling accuracy compensator	2"
Circular bubble	8' / 2 mm
Horizontal circle	360°
Dust / water protection	IP 54
Weight	2,5 kg
Dimensions	280 x 160 x 140 mm
Temperature range	-25°C up to + 50°C

Additional technical data GFE 32-L, 360°

Laser beam switchable / class	635 -670 nm / 2
Beam diameter	2 mm
Laser working range	120 m (during day) 300 m (twilight)
Deviation	5"
Operating time / power supply	8h / 2 x AAA Alkaline
Laser filter for eyepiece	yes

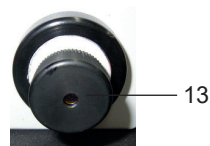
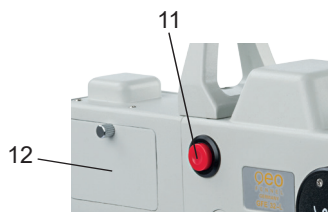
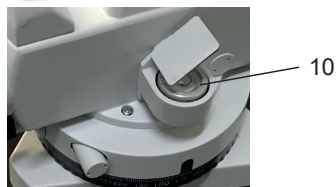
B FEATURES

1. Telescopic eyepiece
2. Objective cover
3. Optical sight
4. Focussing knob
5. Objective
6. Horizontal clamp
7. 360° circle reading
8. Tangent screws
9. Footscrew
10. Circular level



Additional accessory GFE 32-L:

11. ON/OFF laser
12. Battery compartment cover
13. Laser filter



The power supply of the laser is run with 2 x AA Alkaline batteries supplied with the kit. In case the laser beam becomes weak the batteries must be exchanged.

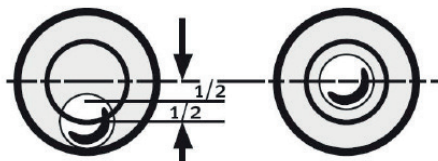
CHECK OF THE CIRCULAR LEVEL

The user is expected to carry out periodic checks of the instrument's accuracy.

Set up the instrument and level it in horizontal direction. Rotate the instrument exactly by 180° and check if the bubble of the circular level is still centered.

ADJUST THE CIRCULAR LEVEL

If the bubble of the circular level is not centered the level must be adjusted. Remove half of the deviation by means of the footscrews and half of the deviation with the adjusting pin of the tool kit.



OPERATION

C

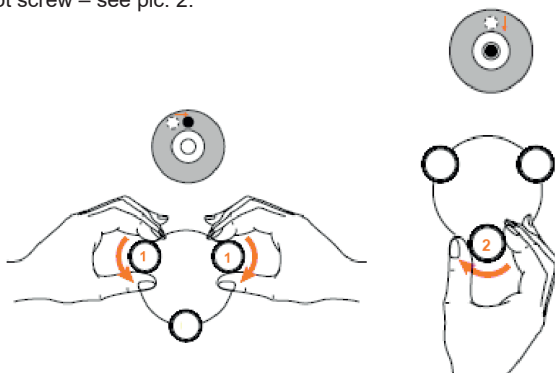
SET UP THE INSTRUMENT

Set up a tripod as upright as possible and take care of good stability.

Position the level carefully on the tripod and fix it with the retaining bolt of the tripod.

Use the footscrews to center the bubble of the circular level. Rotate the instrument by 180° and re-check if the bubble is still centered. If necessary adjust it again. Optimum precision can only be achieved if the bubble is perfectly level.

1. Center the bubble with two foot screws – see pic. 1.
2. Center the bubble with the third foot screw – see pic. 2.

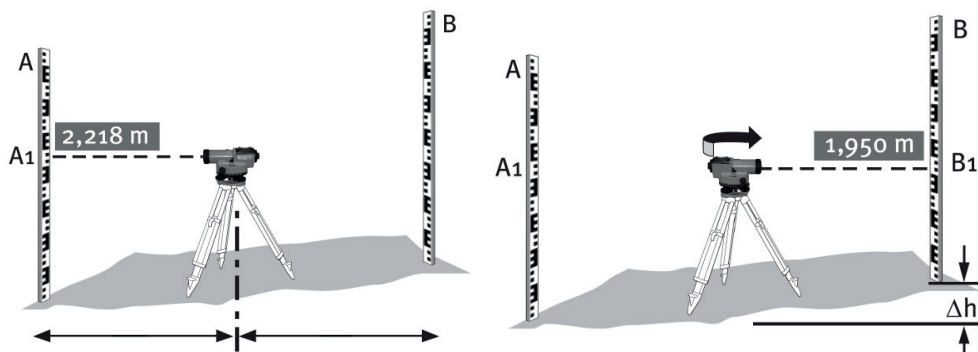


MEASURE WITH THE INSTRUMENT

HEIGHT MEASUREMENT

1. Set up the instrument in the middle between two measuring points A and B. Level the instrument.
2. Aim the instrument at point A and read the height A1 at the levelling rod (A1 = 2,218 m).
3. Aim the instrument at point B and read the height B1 at the levelling rod (B1 = 1,950 m).
4. The height difference Δh is defined as follows:

$$\Delta h = A1 - B1 = 2,218 \text{ m} - 1,950 \text{ m} = 0,268 \text{ m}$$



DISTANCE MEASUREMENT

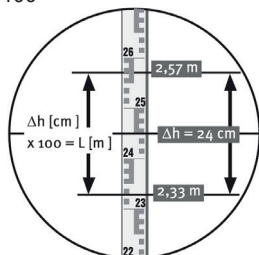
Distance measurement with the upper and lower cross hair short lines

For distance measurements the cross hair of the instrument is equipped with upper and lower short lines. The sector of the levelling staff that is between those two short lines is multiplied by 100 which yields the distance between instrument and rod.

In other words:

The distance in centimeters between the short lines on the levelling rod is equal to the distance in meters.

$$L \text{ (m)} = \Delta h \text{ (cm)} \times 100$$



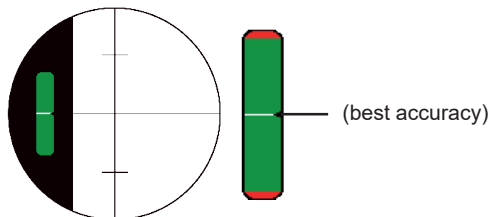
$$\begin{aligned} \Delta h &= (2,57 \text{ m} - 2,33 \text{ m}) * 100 \\ \Delta h &= 24 \text{ cm} * 100 \\ \Delta h &= 2400 \text{ cm} / 100 = 24 \text{ m} \end{aligned}$$

or

$$\begin{aligned} \Delta h &= (2,57 \text{ m} - 2,33 \text{ m}) * 100 \\ \Delta h &= 0,24 \text{ m} * 100 \\ \Delta h &= 24 \text{ m} \end{aligned}$$

INDEX MARK

By mirroring an index mark into the eyepiece (pendulum position of the compensator) compensation errors can be eliminated and the accuracy can be increased.



Measurements should only be carried out if the black arrow is in the horizontal center of the white line in the index mark.

Note:

The highest accuracy can only be achieved with the black arrow being centered in the white area.

USE OF THE LASER

(only model GFE 32-L)

With the built-in laser beam the target can be aimed at and marked. By focussing the laser dot can be adjusted. Such, the marking of the target can be accomplished by one person only.

Power on the laser beam with the laser knob.

The smallest diameter of the laser dot will be achieved if the laser beam is focussed.

By means of the laser beam all measuring tasks can be accomplished and will be visualized to the user.

The transmission of the laser dot is exactly adequate to the accuracy indication of the unit GFE 32-L.

D SAFETY NOTES

INTENDED USE OF THE INSTRUMENT

The instrument is only appropriate to carry out the following measuring tasks (depending on instrument): Setting up heights, horizontal and vertical planes, right angles.

SPECIFIC REASONS FOR ERRONEOUS MEASURING RESULTS

Measurements through glass or plastic windows; dirty eyepiece or objective; 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.

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 manufacturer's 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.

SAFETY INSTRUCTIONS

- Follow up the instructions given in the user manual.
- 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.
- The user manual must always be kept with the instrument.

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.

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

(model GFE 32-L only)

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.



geo-FENNEL GmbH

Kupferstraße 6

D-34225 Baunatal

Tel. +49 561 / 49 21 45

Fax +49 561 / 49 72 34

info@geo-fennel.de

www.geo-fennel.de

All instruments subject to technical changes.



Precision by tradition.

