User Manual

English

Version 2.0

GeoMax Zeta125 Series

Introduction

About the instrument

The Zeta125 pipe laser series is built to withstand the harsh environment of the construction site.

The integrated Li-Ion battery with internal charge control provides a long operating time. The battery can be recharged while the instrument is working.

The functional range makes it easy to use and quick to align desired slope for all pipe laying applications.

The laser offers a large grade setting from –10% to +40%. The line control adjustment can be done with the remote control even at far distances.

The Zeta125S versions have an automatic cross axis levelling and an extra scan beam for aligning and to orientate the laser beam direction.

Models of the GeoMax Zeta125 Series

Model	Description
Zeta125	Red beam pipe laser, Laser class 2
Zeta125	Red beam pipe laser, Laser class 3R
Zeta125S	Red beam pipe laser with active cross axis compensation
Zeta125G	Green beam pipe laser, Laser class 2M
Zeta125G	Green beam pipe laser, Laser class 3R
Zeta125SG	Green beam pipe laser with active cross axis compensation

This manual contains important safety directions as well as instructions for setting up the product and operating it. Refer to 1 Safety Directions for further information.

Read carefully through the User Manual before you switch on the product.

The content of this document is subject to change without prior notice. Ensure that the product is used in accordance with the latest version of this document.

Available Documentation

Name	Description
User Manual	All instructions required in order to safely operate and handle the product throughout its life cycle can be found here.

☞ Read and follow the User Manual before using the product.

☞ Keep all documentation for future reference!

Table of Contents

1 Safety Directions

1.1 General

Description

The following directions enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

Symbols

The symbols used in this manual have the following meanings:

Type	Description
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.

Type	Description
⚠CAUTION	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in appreciable material, financial and environmental damage.
☞	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

1.2 Definition of Use

Intended use

- The instrument projects a collimated beam of laser light for the purposes of alignment of gravity flow pipelines
- The red laser beam can be detected by viewing it on an opaque red target
- The green laser beam can be detected by viewing it on an opaque blue target
- Remote control of product

Reasonably foreseeable misuse

- Use of the product without instruction
- Use outside of the intended use and limits
- Disabling safety systems
- Removal of hazard notices
- Opening the product using tools, for example screwdriver, unless this is permitted for certain functions
- Modification or conversion of the product
- Use after misappropriation
- Use of products with recognisable damage or defects
- Use with accessories from other manufacturers without the prior explicit approval of GeoMax
- Inadequate safeguards at the working site
- Controlling of machines, moving objects or similar monitoring application without additional control and safety installations

1.3 Limits of Use

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation. Not suitable for use in aggressive or explosive environments.

⚠WARNING

Working in hazardous areas, or close to electrical installations or similar situations

Life Risk.

Precautions:

- Local safety authorities and safety experts must be contacted by the person responsible for the product before working in such conditions.

☞ The following advice is only valid for battery charger, power adapter and car adapter.

Environment

Suitable for use in dry environments only and not under adverse conditions.

1.4 Responsibilities

Manufacturer of the product

GeoMax AG, CH-9443 Widnau, hereinafter referred to as GeoMax, is responsible for supplying the product, including the user manual and original accessories, in a safe condition.

Person responsible for the product

The person responsible for the product has the following duties:

- To understand the safety instructions on the product and the instructions in the User Manual
- To ensure that it is used in accordance with the instructions
- To be familiar with local regulations relating to safety and accident prevention
- To inform GeoMax immediately if the product and the application become unsafe
- To ensure that the national laws, regulations and conditions for the operation of the product are respected

1.5 Hazards of Use

NOTICE

Dropping, misusing, modifying, storing the product for long periods or transporting the product

Watch out for erroneous measurement results.

Precautions:

- Periodically carry out test measurements and perform the field adjustments indicated in the User Manual, particularly after the product has been subjected to abnormal use as well as before and after important measurements.

⚠WARNING

Inadequate securing of the working site

This can lead to dangerous situations, for example in traffic, on building sites and at industrial installations.

Precautions:

- Always ensure that the working site is adequately secured.
- Adhere to the regulations governing safety, accident prevention and road traffic.

⚠CAUTION

Not properly secured accessories

If the accessories used with the product are not properly secured and the product is subjected to mechanical shock, for example blows or falling, the product may be damaged or people can sustain injury.

Precautions:

- When setting up the product, make sure that the accessories are correctly adapted, fitted, secured, and locked in position.
- Avoid subjecting the product to mechanical stress.

For the AC/DC power supply and the battery charger:

⚠WARNING

Electric shock due to use under wet and severe conditions

If unit becomes wet it may cause you to receive an electric shock.

Precautions:

- If the product becomes humid, it must not be used!
- Use the product only in dry environments, for example in buildings or vehicles.

- Protect the product against humidity.

For the AC/DC power supply and the battery charger:

⚠WARNING

Unauthorised opening of the product

Either of the following actions may cause you to receive an electric shock:

- Touching live components
- Using the product after incorrect attempts were made to carry out repairs.

Precautions:

- ▸ Do not open the product!
- ▸ Only GeoMax authorised service centres are entitled to repair these products.

⚠WARNING

Inappropriate mechanical influences to batteries

During the transport, shipping or disposal of batteries it is possible for inappropriate mechanical influences to constitute a fire hazard.

Precautions:

- Before shipping the product or disposing it, discharge the batteries by the product until they are flat.
- When transporting or shipping batteries, the person in charge of the product must ensure that the applicable national and international rules and regulations are observed.
- Before transportation or shipping, contact your local passenger or freight transport company.

⚠WARNING

Exposure of batteries to high mechanical stress, high ambient temperatures or immersion into fluids

This can cause leakage, fire or explosion of the batteries.

Precautions:

- Protect the batteries from mechanical influences and high ambient temperatures. Do not drop or immerse batteries into fluids.

⚠WARNING

Short circuit of battery terminals

If battery terminals are short circuited e.g. by coming in contact with jewellery, keys, metallised paper or other metals, the battery can overheat and cause injury or fire, for example by storing or transporting in pockets.

Precautions:

- Make sure that the battery terminals do not come into contact with metallic objects.

☞ The following advice is only valid for battery charger, power adapter and car adapter.

⚠WARNING

Unauthorised opening of the product

Either of the following actions may cause you to receive an electric shock:

- Touching live components
- Using the product after incorrect attempts were made to carry out repairs

Precautions:

- ▸ Do not open the product!
- ▸ Only GeoMax authorised service centres are entitled to repair these products.

⚠WARNING

Wet or moisture conditions

The housing around the battery has wiring which may produce a short-circuit.

Precautions:

- ▸ Do not be place the battery system in water or expose it to moisture, lubricants, solvents or any other liquid.

⚠CAUTION

Before any cleaning procedure, ensure that the instrument is switched off and the battery has been removed.

⚠WARNING

If the product is improperly disposed of, the following can happen:

- If polymer parts are burnt, poisonous gases are produced which may impair health
- If batteries are damaged or are heated strongly, they can explode and cause poisoning, burning, corrosion or environmental contamination
- By disposing of the product irresponsibly you may enable unauthorised persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination

Precautions:

▸

The product must not be disposed with household waste.
Dispose of the product appropriately in accordance with the national regulations in force in your country.
Always prevent access to the product by unauthorised personnel.

Product-specific treatment and waste management information can be received from your GeoMax dealer.

1.6 Laser Classification

General

The following chapters provide instructions and training information about laser safety according to international standard IEC 60825-1 (2014-05) and technical report IEC TR 60825-14 (2004-02). The information enables the person responsible for the product and the person who actually uses the equipment, to anticipate and avoid operational hazards.

☞ According to IEC TR 60825-14 (2004-02), products classified as laser class 1, class 2 and class 3R do not require:

- laser safety officer involvement,
- protective clothes and eyewear,
- special warning signs in the laser working area

if used and operated as defined in this User Manual due to the low eye hazard level.

☞ National laws and local regulations could impose more stringent instructions for the safe use of lasers than IEC 60825-1 (2014-05) and IEC TR 60825-14 (2004-02).

⚠CAUTION

Reflected beams aimed at reflecting surfaces

Potential hazards are not only related to direct beams but also to reflected beams aimed at reflecting surfaces such as prisms, windows, mirrors, metallic surfaces, etc.

Precautions:

- Do not aim at areas that are essentially reflective, such as a mirror, or which could emit unwanted reflections.
- Do not look through or beside the optical sight at prisms or reflecting objects when the laser is switched on, in laser pointer or distance measurement mode. Aiming at prisms is only permitted when looking through the telescope.

1.6.1 Laser Class 1

General

The rotating laser built into the product produces a visible laser beam which emerges from the laser aperture.

The laser product described in this section, is classified as laser class 1 in accordance with:

- IEC 60825-1 (2014-05): “Safety of laser products”

These products are safe under reasonably foreseeable conditions of operation and are not harmful to the eyes provided that the products are used and maintained in accordance with this User Manual.

Zeta125G/Zeta125SG:

Description	Value
Wavelength	635 nm
Maximum average radiant power	<33 µW
Maximum pulse duration	2.6 ms
Rotation angle	90 degrees
Rotation frequency	31 Hz

1.6.2 Laser Class 2/Laser Class 2M

Laser class 2/ Laser class 2M

The laser source built into the product produces a visible laser beam which emerges from the laser aperture.

The laser product described in this section is classified as laser class 2 in accordance with:

- IEC 60825-1 (2014-05): "Safety of laser products"

These products are safe for momentary exposures but can be hazardous for deliberate staring into the beam. The beam may cause dazzle, flash-blindness and after-images, particularly under low ambient light conditions.

Red laser specifications (Laser class 2)

Description	Value
Wavelength	635 nm
Maximum average radiant power	<1.0 mW cw

Description	Value
Beam divergence	0.06 mrad

Green laser specifications (Laser class 2M)

Description	Value
Wavelength	520 nm
Maximum average radiant power	<1.2 mW cw
Beam divergence	0.024 mrad

⚠CAUTION

Class 2 laser product

From a safety perspective, class 2 laser products are not inherently safe for the eyes.

Precautions:

- Avoid staring into the beam or viewing it through optical instruments.
- Avoid pointing the beam at other people or at animals.

Labelling Zeta125

14508_004

Labelling
Zeta125G

1.6.3 Laser Class 3R

Laser class 3R

The laser source built into the product produces a visible laser beam which emerges from the laser aperture.

The laser product described in this section is classified as laser class 3R in accordance with:

- IEC 60825-1 (2014-05): “Safety of laser products”

Direct intrabeam viewing may be hazardous (low eye hazard level), in particular for deliberate ocular exposure. The beam may cause dazzle, flash-blindness and after-images, particularly under low ambient light conditions. The risk of injury for laser class 3R products is limited because of:

a) unintentional exposure would rarely reflect worst case conditions of (e.g.) beam alignment with the pupil, worst case accommodation,
b) inherent safety margin in the maximum permissible exposure to laser radiation (MPE)
c) natural aversion behaviour for exposure to bright light for the case of visible radiation.

Red laser specifications

Description	Value
Wavelength	635 nm
Maximum average radiant power	<5.0 mW cw
Beam divergence	0.06 mrad
NOHD (Nominal Ocular Hazard Distance) @ 0.25 s	110 m

Green laser specifications

Description	Value
Wavelength	520 nm
Maximum average radiant power	<5.0 mW cw
Beam divergence	0.02 mrad

⚠CAUTION

Class 3R laser products

From a safety perspective, class 3R laser products should be treated as potentially hazardous.

Precautions:

- Prevent direct eye exposure to the beam.
- Do not direct the beam at other people.

Labelling
Zeta125 US

15003_003

Labelling Zeta125S

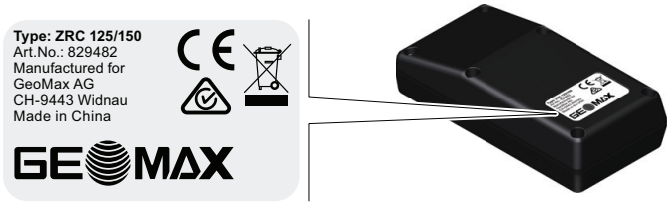
8382_004

Labelling Zeta125G

22359_002

Labelling Zeta125SG

Labelling



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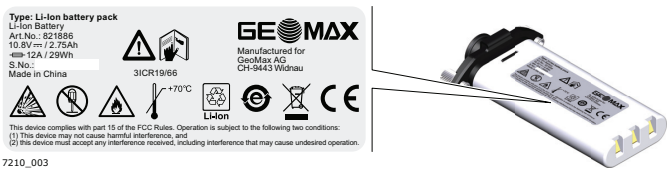
Labelling



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1.7 Electromagnetic Compatibility (EMC)

Description

The term Electromagnetic Compatibility is taken to mean the capability of the product to function smoothly in an environment where electromagnetic radiation and electrostatic discharges are present, and without causing electromagnetic disturbances to other equipment.

⚠ WARNING

Electromagnetic radiation can cause disturbances in other equipment.

Although the product meets the strict regulations and standards which are in force in this respect, GeoMax cannot completely exclude the possibility that other equipment may be disturbed.

⚠CAUTION

There is a risk that disturbances may be caused in other equipment if the product is used with accessories from other manufacturers, for example field computers, personal computers, two-way radios, non-standard cables or external batteries.

Precautions:

- Use only the equipment and accessories recommended by GeoMax. When combined with the product, they meet the strict requirements stipulated by the guidelines and standards. When using computers and two-way radios, pay attention to the information about electro-magnetic compatibility provided by the manufacturer.

⚠CAUTION

Disturbances caused by electromagnetic radiation can result in erroneous measurements.
Although the product meets the strict regulations and standards which are in force in this respect, GeoMax cannot completely exclude the possibility that the product may be disturbed by intense electromagnetic radiation, for example, near radio transmitters, two-way radios or diesel generators.

Precautions:

- Check the plausibility of results obtained under these conditions.

1.8 FCC Statement, Applicable in U.S.

⚠WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

⚠CAUTION

Changes or modifications not expressly approved by GeoMax for compliance could void the user's authority to operate the equipment.

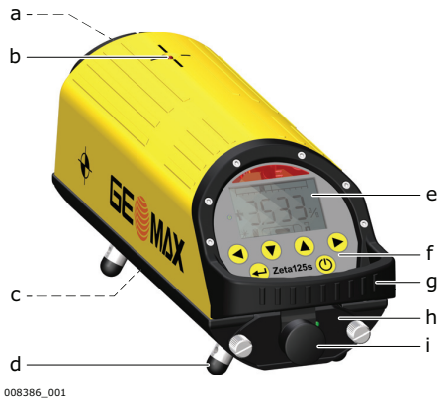
2 Container Contents

Container contens

a	Instrument
b	Universal target for 150/200/250 mm pipes
c	Charger
d	Leg depot
e	Manual
f	Target plate insert for universal target
g	Spare battery
h	Clip-in target plate for 125 mm pipes
i	Remote control
j	Universal compartment: Manuals, spare cables, target plate etc.

3 Product Overview

Instrument components



a	Laser aperture
b	Pivot LED
c	5/8" thread
d	Metal feet
e	Display
f	Keypad
g	Handle
h	Battery
i	Charge socket

Keypad

Key	Description
	Left arrow key
	Down arrow key
	Up arrow key
	Right arrow key
	Enter key
	ON/OFF key

3.1 Batteries

3.1.1 Operating Principles

First-time use/ charging batteries

- The battery must be charged before using it for the first time because it is delivered with an energy content as low as possible
- The permissible temperature range for charging is from 0 °C to +40 °C/+32 °F to +104 °F. For optimal charging, we recommend charging the batteries at a low ambient temperature of +10 °C to +20 °C/+50 °F to +68 °F if possible
- It is normal for the battery to become warm during charging. Using the chargers recommended by GeoMax, it is not possible to charge the battery once the temperature is too high
- For new batteries or batteries that have been stored for a long time (> three months), it is effectual to make only one charge/discharge cycle
- For Li-Ion batteries, a single discharging and charging cycle is sufficient. We recommend carrying out the process when the battery capacity indicated on the charger or on a GeoMax product deviates significantly from the actual battery capacity available

Operation/ discharging

- The batteries can be operated from –20 °C to +55 °C/–4 °F to +131 °F.
- Low operating temperatures reduce the capacity that can be drawn; high operating temperatures reduce the service life of the battery.

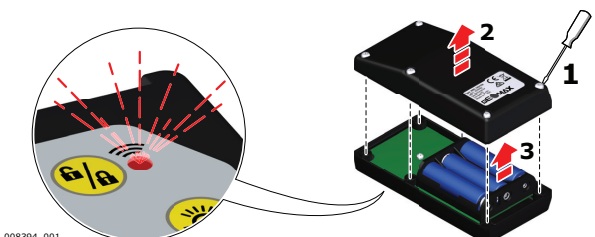
3.1.2 Changing the Battery

Insert and remove the battery of the Zeta125 Series

1. Turn off the laser and remove the two screws from the battery pack with a coin for example. The screws are captive at the battery pack to avoid losing them.

2.	Insert the new battery pack.
3.	Pull the screws tight. Otherwise water can come into the battery case and can damage the battery.
☞	To turn on the Zeta125 Series after long time storage without battery pack: Reinsert the battery pack and press the ON/OFF key for approximately 3 seconds.

Insert and remove the battery of the remote control



☞	If the LED on the remote control is flashing red while sending, the batteries are low.
1.	Loosen the six screws on the back case of the remote control to open the battery housing.
2.	Take the back case.
3.	Replace the batteries.
☞	Always use three new batteries size AA (LR6) of the same type.
☞	Do not mix new and old batteries. Mixing old and new batteries decreases the battery lifetime.
4.	Check • the correct position of the back case. • that the back case is free from dirt.
5.	Close the housing and tighten the six screws to make sure that the remote control is waterproof.

3.1.3 Charging the Battery

Charge internal battery

The instrument has integrated rechargeable batteries.

☞ To operate the instrument in case of an empty battery: Use the optionally available battery cable to connect the charge socket of the instrument with a 12 V car battery.

1.	Connect the charger to an AC outlet.
2.	Remove the protection cap onto the charge socket of the Zeta125 Series.
3.	Attach the plug to the charge socket of the Zeta125 Series.
4.	Plug the power cord into an external power supply. Charging starts.
☞	The charge LED right of the charge socket on the battery pack is: • red while charging is in progress. • green when charging is completed.
☞	The charging procedure stops automatically when the maximum charge is reached. The maximum charging time is five hours.
5.	After charging is completed, always place the protection cap onto the charge socket of the Zeta125 Series to protect it from dirt.

3.2 Basic Handling

Turning on

1. Press the ON/OFF key .

2. Each time the laser is switched on, the battery power level is tested. The display shows the start-up screen first and then the capacity of the battery.

3. After initialising the laser beam automatically, the system moves to the last entered grade.

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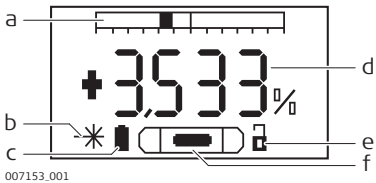
4. A flashing laser beam symbol indicates the active self levelling. When the symbol is lit, the laser is levelled and the laser beam is continuously on.

Display



a	Line control laser position
b	Laser beam status
c	Battery status
d	Laser beam grade
e	Key lock status
f	Electronic vial

Entering a grade

Refer to 4 Menu for instructions how to set the entry format to percent.

1.  Press the Enter key on the keypad.

2. Set positive/negative grade. Select and set individual digits for grade values:

    Use the right/left arrow key to select the digit that must be changed.

Use the up/down arrow key to change the value.

3. 

Press the Enter key to confirm the setting. The laser adjusts to the setting entered.

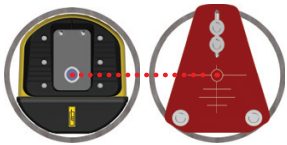
Setup preparation

Use in large diameter or water bearing pipes

1. Unscrew the standard 150 mm feet extensions and screw on the optional available base feet extensions.

Use in pipes with 125 mm diameter

1. Place the laser without metal feet and with the optional clip-in target plate.



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Use with standard, fixed target

1. Use the same base feet extensions for the laser and the target plate.

Use with universal target

1. Adjust the target plate to the pipe diameter.

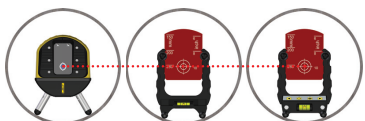
2. Move the target plate in the base until the mark is on the line of the feet length mounted at the laser.

3. Tighten the target plate in place.

150 mm diameter:

008398_001

200 mm diameter:



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250 mm diameter:

Setup

1.	Set up the laser in the pipe at the front side.
2.	Align the cross axis using the electronic level vial shown in the display.
3.	For Zeta125 Series: Wait until the electronic level vial moves to the middle position. The cross axis is aligned automatically.
4.	Place the target at the opposite side of the pipe. Align the target with the level vial.
5.	Adjust the line direction using the remote control. Refer to Keys.
6.	Move the pipe to the correct height and direction. When the beam is in the target sign the pipe is in the desired slope.

Aligning the laser line to the target

Press the corresponding arrow key on the laser or on the remote control.

The beam movement starts slowly and increases in speed while an arrow key is pressed.

☞ On the remote control: The direction of the arrow keys corresponds to the direction of the line movement if the remote control is used from the target side. If the remote control is used from the display side of the laser, the azimuth direction is opposite the arrow direction.

Refer to 3.3 Remote Control for a detailed description of the remote control.

Laser beam flashing frequency

Type	Description	To do
Permanently on	Levelling finished Grade value reached	Adjust the pipe

Type	Description	To do
Flashing constantly	Laser is levelling Laser symbol is flashing	Wait until level is reached
2 x short	Cross Axis Warning Angle error too large	Adjust laser position to the level vial
	Levelling range exceeded (+/-END)	Change inclination of the laser until END disappears
Flashing fast	Aligning function	After ending this mode the laser switches to normal function

Laser beam unstable and spot size changing

Refraction can be the reason for:

- An unstable laser beam on the target.
- Changes in the laser spot size.

Air turbulence in the pipe cause refraction. The effect occurs particularly, when a wet or cold pipe is heated up quickly through the sunlight. The rising air deflects the laser beam and causes a flicker.

Ventilate the pipe or place laser and target temporarily on top of the pipe. When the pipe is dry or heated up to the ambient level, the laser spot is stable again.

Resetting

Line control adjustment - right/left movement

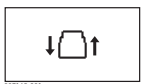
Press the right and left arrow keys on the keypad simultaneously for 2 seconds. The laser beam moves back to the centre position automatically.

Entered gradient to 0.000%

Press the up and down arrow keys simultaneously.

Warning messages

Possible warning messages, their reasons and necessary actions are:

Warning message	Description	To do
 007168_001	Self-levelling range exceeded	Change the tilt of the laser as shown in the display until warning message disappears. Self levelling starts again automatically.
Laser beam flashing 2 x short AND  007169_001	Cross axis range exceeded Example: Rotating the pipe while working.	Move the instrument so that the level vial in the instrument display is in middle position. Refer to SETTINGS menu for information on turning on/off the warning.
Service	Service Display 1500 h operating hours are reached.	Contact your service centre for checking the laser. The instrument can be used unrestricted in the meantime.

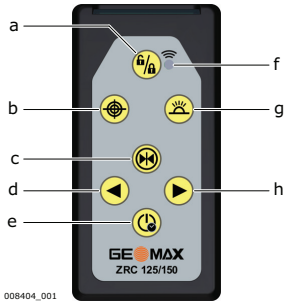
Warning message	Description	To do
Error 0	Data Error The instrument turns off auto-matically.	1. Turn laser off and on again. 2. Check calibration. 3. If the message appears again, contact your service centre.

3.3 Remote Control

Functions of the remote control

The laser can be used with the remote control.

LED and keypad on the remote control



a Key lock function
b Auto alignment function
c Line control adjustment (up movement in calibration mode)
d Left arrow key
e Sleep mode (down movement in calibration mode)
f LED
g Key for Pivot LED
h Right arrow key

LED on the Remote Control

Status	Description
LED is flashing green	A key on the remote control is pressed.
LED is flashing red	The batteries of the remote control are low.

Keys

Key	Description
	Use the left and right arrow keys for line control adjustment. The direction of the beam travel corresponds to the arrows, when the remote control is used from the target side.
	To reset the line control adjustment, press this key for 2 seconds. The laser beam automatically moves back to the centre position.
	Press this key to put the laser into sleep mode. The display shows **SLEEP** and the laser turns off. This saves power consumption. Press the key again to turn on the laser. All settings remain the same as when the unit was put into sleep mode.
	Press this key to activate the key lock function: The display shows a lock symbol. All keys on the remote control and on the laser are locked. Locked keys avoid unintentional change when the laser is in use. To deactivate the function press the lock key again.

Key	Description
	Press this key to turn on the Pivot LED on the upper housing of the instrument. The LED is used for correct alignment outside of the manhole. The LED automatically turns off after one minute.
	Alignment function: This function is used to align the laser beam above the pipe trench. Zeta125 Series: The laser beam moves to the maximum upper position. In this mode the laser beam flashes fast to avoid unintentional use. Use the up and down arrow keys to adjust the height of the laser beam. These keys can stop the upward movement of the beam, if the height of the measuring rod is reached earlier. Zeta125S versions: 1. Press the key to turn on a second, vertical rotating laser beam. This beam can be used in combination with a laser receiver to determine the direction of the main beam while above the trench. 2. The beam position can be aligned manually using the right/left arrow keys on the remote. 3. Press the key again to leave the mode.

Key	Description
	☞ Remark for Zeta125 Series without automatic cross axis levelling: While aligning, take care that the cross axis is levelled with the level vial in the display.

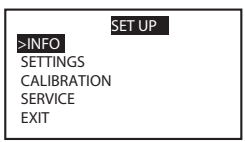
4 Menu

Access to the SET UP Menu

☞ The **SET UP** menu can also be accessed by using the keys on the remote control. The functions on the remote control are the same and the lock key on the remote control corresponds to the Enter key on the laser keypad.

1. Set the grade of the laser to 0.000% and turn off the laser.
2. Turn the laser on again. The start screen appears and the state of the battery is displayed.
3. Press the up arrow key and Enter key simultaneously until the **SET UP** screen appears.

☞ The active menu step is highlighted and **>** is displayed in front of the line.



007179_001

4. Press ↵ to open the menu option.

INFO menu

This screen shows:

- Software version
- Working hours of the instrument
- Internal adjustment values for authorised service centres

All fields are display-only fields.

Next step

Press ↵ to return to the **SET UP** menu.

SETTINGS menu

Cross warning settings

The settings on this screen define the behaviour of the cross axis warning. Refer to Warning messages for a description of the warning.

Option	Description
	Press the Enter key to change between **ON** and **OFF**.
ON	To activate the cross axis warning. The laser beam shortly flashes two times when the cross axis position is out of self-levelling range.
OFF	To deactivate the cross axis warning. The laser beam stays on continuously, even when the cross axis position is out of self-levelling range.

Next step

1. Move the cursor to **EXIT**.
2. Press the Enter key to return to the **SET UP** menu.

CALIBRATION menu

The settings on this screen change the adjustment of the laser.

Responsibilities and operation

The user can calibrate the instrument. Carry out the calibration attentively and carefully. The user takes full responsibility for failures at measurements and/or consequential damages through wrong calibration.

If you feel unsure about doing the calibration, contact your authorised dealer or GeoMax.

Test to see if a horizontal calibration is required

1. Define a horizontal 60 m distance between a reference point and target point.

   ☞ Defining a horizontal distance using an optical level: In a distance of 30 m from the level, define a reference point by a yardstick. Turn the level by 180 degrees. Define a target point in a distance of 30 m from the level.

2. Place the laser at 0.000% at the reference point.

3.	Measure the height difference between the reference and the target point. Write down the value.
4.	Move the laser beam to the target point.
5.	Measure the height difference between the target and the reference point. Write down the value.
6.	Subtract the values for the two height differences. Over a distance 60 m, the result must be less than 3 mm.
7.	If the value is larger, repeat step 2. to 6. to make sure that the measuring points are correct.
8.	If the failure is reproducible, calibrate the laser. Run through the steps in the next table.

Calibration

☞	The calibration has to be done by a qualified authority.
☞	Place the pipe laser on a horizontally aligned base.

1.	Press ↵ to select **MAIN AXIS**. **WAIT** is displayed.
2.	Wait until **SET** is displayed.
3.	Use the arrow up and down keys on the remote control to change the calibration value. The height of the laser beam changes with the calibration value.
4.	Wait until **SET** is displayed.
5.	Repeat step 3. and 4. if necessary.
6.	• To save the position: Press the lock symbol on the remote control. • To leave the calibration mode without storing the change: Turn off the laser.

SERVICE menu

The SERVICE menu is PIN protected. The menu is only accessible by authorised service centres.

Next step

1. Move the cursor to **EXIT**.
2. Press the Enter key ↵ to return to the **SET UP** menu.

5 Care and Transport

5.1 Maintenance

General information

All electronic components are enclosed in robust housings to safeguard them against mechanical damage. Servicing the system only requires a minimum of time.

Periodic checks

The user is responsible for regular checks of the instrument by the manufacturer or one of its authorised service centres. A calibration interval of one year is recommended.

Check the instrument before use. The manufacturer and its representatives are not responsible for any damages resulting from using a maladjusted instrument.

5.2 Transport

Transport in the field

When transporting the equipment in the field:

- always carry the product in its transport container and secure it.

Transport in a road vehicle

Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its container and secure it.

For products for which no container is available use the original packaging or its equivalent.

Shipping

When transporting the product by rail, air or sea, always use the complete original GeoMax packaging, container and cardboard box, or its equivalent, to protect against shock and vibration.

Field adjustment

Exposing the product to high mechanical forces, for example through frequent transport or rough handling, or storing the product for a long time may cause deviations and a decrease in the measurement accuracy. Periodically carry out test measurements and perform the field adjustments indicated in the User Manual before using the product.

5.3 Storage

Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to 6.1 Technical Data for information about temperature limits.

5.4 Cleaning and Drying

Basic Cleaning

Basic cleaning is recommended to ensure proper functionality of the instrument.

- Blow off dust.
- Use only a clean, soft, lint-free cloth for cleaning. If necessary, moisten the cloth with water or pure alcohol. Other liquids and solvents than water or alcohol may attack the polymer components.

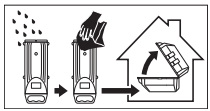
☞ Only use filtered, oilfree compressed air to blow off dust and for cleaning purpose.

Cables and plugs

Keep plugs clean and dry. Blow away any dirt lodged in the plugs of the connecting cables.

Damp products

Dry the product, the transport container, the foam inserts and the accessories at a temperature not greater than 40 °C/104 °F and clean them. Remove the battery cover and dry the battery compartment. Do not repack until everything is dry. Always close the transport container when using in the field.



6 Technical Data

6.1 Technical Data

Accuracy

Value
At 20 °C: ±10" / ± 4.8 mm at 100 m

Range

Description	Value
Levelling range	−15% / +45%
Grade range	Direction: ±10° Grade: −10% / +40%
Operation range	< 200 m

Instrument dimensions

Length [mm]	Height [mm]	Thickness [mm]
305	105	113

Weight

Value
2.1 kg

Power supply

Description	Value
Internal power supply	Li-Ion battery, controller charged
Internal supply voltage	• 230 V/110 V AC power supply with charger • Nominal voltage 24 V DC supply with accessories cable

Operating time

Value
up to 40 h

Charging time

Value
Maximum 5 h, when not in use

Environmental specifications

Temperature

Type	Operating temperature [°C]	Storage temperature [°C]
Instrument	−20 to +50	−20 to +70

Ingress protection against water, dust and sand

Type	Protection
Instrument	IP68 (IEC 60529)

Humidity

Type	Protection
Instrument	Max 95% non condensing The effects of condensation are to be effectively counteracted by periodically drying out the instrument.

Charger LDG125

Description	Value
Input	100 - 240 V AC / 47 - 63 Hz
Output	15 V / 2.0 A

6.2 Conformity to National Regulations

Conformity to National Regulations

For products without radio transmitter or receiver:

CE

- Hereby, GeoMax AG declares that the product/s is/are in compliance with the essential requirements and other relevant provisions of the applicable European Directives.
  The full text of the EU declaration of conformity is available at the following Internet address:
  https://geomax-positioning.com/partner-area.

6.3 Dangerous Goods Regulations

Dangerous Goods Regulations

The products of GeoMax are powered by Lithium batteries.

Lithium batteries can be dangerous under certain conditions and can pose a safety hazard. In certain conditions, Lithium batteries can overheat and ignite.

When carrying or shipping your GeoMax product with Lithium batteries onboard a commercial aircraft, you must do so in accordance with the **IATA Dangerous Goods Regulations**.

GeoMax has developed **Guidelines** on "How to carry GeoMax products" and "How to ship GeoMax products" with Lithium batteries. Before any transportation of a GeoMax product, we ask you to consult these guidelines on our web page (http://www.geomax-positioning.com/dgr) to ensure that you are in accordance with the IATA Dangerous Goods Regulations and that the GeoMax products can be transported correctly.

Damaged or defective batteries are prohibited from being carried or transported onboard any aircraft. Therefore, ensure that the condition of any battery is safe for transportation.

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