

Rugby 50

User Manual

Version 1.1
English

- when it has to be **right**

Leica
Geosystems

Introduction

Congratulations on the purchase of a new Rotating Laser product.

Product

The Rugby 50 is a laser tool for general construction and other leveling applications. It is engineered and built with the latest innovations in the laser tool industry. It is designed to be easy to set up, simple to operate and highly dependable.



This manual contains important safety directions as well as instructions for setting up the product and operating it. Refer to "7 Safety Directions" for further information.

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

Product Identification

The model and the serial number of your product are indicated on the type plate.





Enter the model and serial number in your manual and always refer to this information when you need to contact your agency or Leica Geosystems authorized service workshop.

Type: _____

Serial No.: _____

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.
 Caution	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury and/or 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.

Trademarks

All trademarks are the property of their respective owners.

Table of Contents

In this manual	Chapter	Page
	1 Description of the System	1-1
	2 Basic Operation	2-1
	3 Batteries	3-1
	4 Accuracy Adjustment	4-1
	5 Troubleshooting.....	5-1
	6 Care and Transport	6-1
	7 Safety Directions	7-1
	8 Technical Data	8-1
	Index	i-1

1 Description of the System

1.1 Features

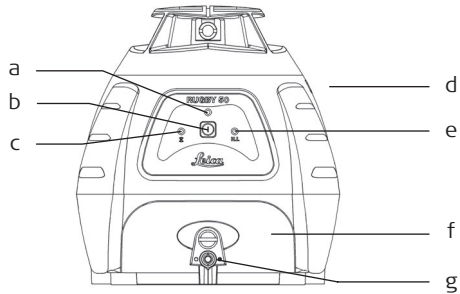
Precision Designed to maintain its accuracy over time and temperature, the Rugby 50 projects a rotating beam usable up to 150 meters (500 feet).

Simplicity The Rugby 50 is designed to be the simplest professional grade rotating laser available. Simple, one button operation; automatic self-leveling; and elevation alert (HI) combine to provide the most consistent value for the professional contractor.

Ruggedness Engineered as the economical “little brother” of the Rugby 100, the Rugby 50 will provide reliable accuracy day after day. It is built for construction environment, is completely sealed against elements, and provides exceptional battery life.

1.2

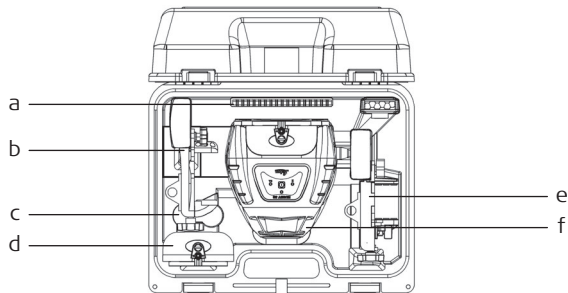
Rugby Components



- a) Emission Indicator LED
- b) Power Button
- c) Low Battery LED
- d) Carrying Handle (on back)
- e) Elevation Alert LED
- f) Battery Door
- g) Charge Port (rechargeable models)

1.3

Case Components



- a) User manual
 - b) Accessories and second receiver
 - c) Spare batteries, D-cells
 - d) Spare battery pack, NiMH
 - e) Receiver
 - f) Rugby
-

In this chapter	<i>Topic</i>	<i>Page</i>
2.1	Starting Up	2-2
2.2	The LED Display	2-3
2.3	The Elevation Alert (H.I.) Function	2-4



Press the POWER button to turn the Rugby on.

That's it!

If set up within The Rugby's wide self-leveling range it will automatically level to create an accurate horizontal plane of laser light.

Once leveled, the head will start rotating and work can begin.

After 30 second of completing the leveling, the H.I. Alert system becomes active to protect the Rugby against changes in elevation caused by movement or settling of the tripod.

The self-leveling system and H.I. alert function will continue to monitor the position of the laser beam to ensure consistent and accurate work is done throughout the day.

(a)



Emission Indicator (a)

This amber LED indicates that the Rugby has been turned on. It flashes when the Rugby is leveling. When leveled the LED is on solid and the head begins to rotate.

(b)



Low Battery Indicator (b)

When the LED is off, the battery is still good. When it is flashing slowly the battery is getting low. When the LED begins to flash rapidly it is time to change the batteries.

(c)



H.I.

H.I. Indicator (c)

Also called the Elevation alert monitors the laser and will begin flashing (and an audio signal sounds) if the unit is bumped or the tripod moves.

2.3

The Elevation Alert (H.I.) Function



H.I.

- The Elevation Alert or Height of Instrument function is designed to prevent incorrect work caused by sudden movement or settling of the tripod that would cause the laser to level at a lower height.
- The Elevation Alert function becomes active and monitors the movement of the laser 30 second after the unit has completely leveled and the head starts rotating.
- The elevation alert monitors the laser and will begin flashing and give an audio signal if disturbed.
- To stop the alert turn Rugby off and on again. Check the height of the instrument before beginning to work again.



The elevation alert features turns on automatically every time the Rugby is turned on. The feature can be disabled using a special procedure found in the Troubleshooting section.

In this chapter*Topic**Page*

3.1	Operating Principles	3-2
3.2	Replacing the Alkaline Batteries	3-3
3.3	Replacing the NiMH Batteries	3-4
3.4	Charging the NiMH Batteries.....	3-5



The Rugby 50 can be purchased with either alkaline batteries or a rechargeable NiMH battery pack. The following information is appropriate only to the model you have purchased.



Primary use/charging

- The battery must be charged prior to using it for the first time because it is delivered with an energy content as low as possible.
- For new batteries or batteries that have been stored for a long time (> three months), it is effectual to make 3 - 5 charge/discharge cycles.
- The permissible temperature range for charging is between 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 Leica Geosystems, it is not possible to charge the battery if the temperature is too high.

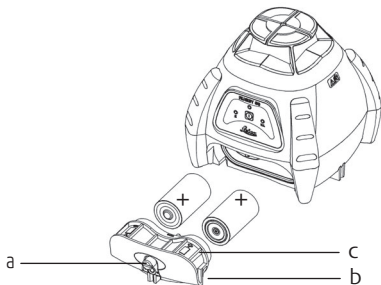
Operation/Discharging

- The batteries can be operated from -20°C to +50°C/-4°F to +122°F.
 - Low operating temperatures reduce the capacity that can be drawn; very high operating temperatures reduce the service life of the battery.
-

3.2

Replacing the Alkaline Batteries

The Rugby has an LED to the left of the Power button that will flash when the batteries are low and will soon no longer power the laser. When the batteries need replaced do the following:

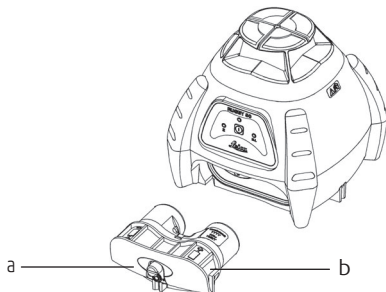


- Loosen the silver knob (a) and remove the battery door (b).
- Remove the dead batteries.
- Install two fresh batteries. Ensure they are installed correctly by noting the battery symbols (c) on the top of the battery door.
- Reinstall the battery door and tighten the silver screw securely to ensure a good seal.

3.3

Replacing the NiMH Batteries

The Rugby has an LED to the left of the Power button that will flash when the batteries are low and will soon no longer power the laser. When the batteries need replaced or charged do the following:

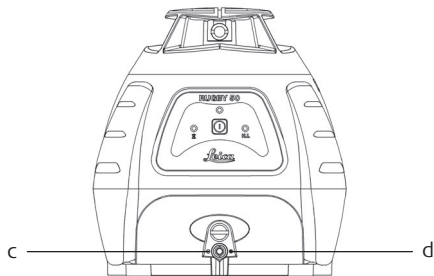


- The rechargeable pack can be recharged without being removed from the laser.
- To remove the rechargeable pack, loosen the silver knob (a) and remove the pack (b).
- Reinstall the battery pack and tighten the silver screw securely to ensure a good seal.

3.4

Charging the NiMH Batteries

The rechargeable NiMH battery pack on the Rugby can be charged without removing it from the. To charge your Rugby battery pack please note the following:



- Connect the charger plug into the charge jack (c) on the Rugby battery pack.
- Plug the AC connector into the appropriate AC power source.
- The small LED (d) next to the charge jack will turn on indicating that the Rugby is charging. The LED will blink when a full charge has been reached.
- The batteries will reach a full charge in approximately eight hours if completely drained.

4

Accuracy Adjustment



It is the responsibility of the user to follow operating instructions, and to periodically check the accuracy of the instrument and work as it progresses.



The Rugby is adjusted to the defined accuracy specification at the factory. It is recommended to check your laser for accuracy upon receipt and periodically thereafter to ensure accuracy is maintained. If your laser requires adjustment, contact your nearest authorized service center or adjust the laser using the following procedure.



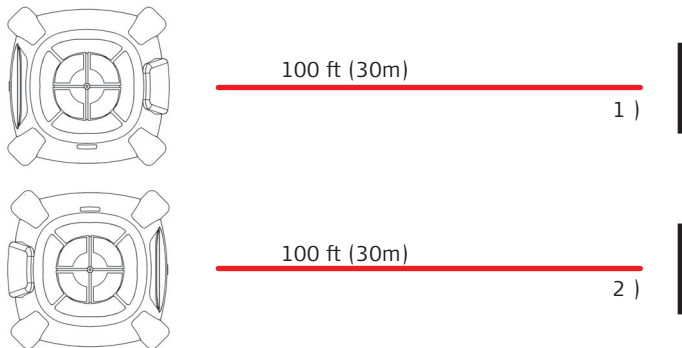
Do not enter this mode or attempt adjustment unless you plan to change the accuracy. Accuracy adjustment should only be performed by a qualified individual that understands basic adjustment principles.



This procedure is easier when performed with two people, on a relatively flat surface.

Checking Level Accuracy

To check the level accuracy of your Rugby laser, place the unit on a flat, level surface or tripod approximately 100 ft (30 m) from a wall.



- **Align the first axis** so that it is square to the wall. Allow the unit to self-level completely (approximately one minute after the unit begins to rotate), then mark the position of the beam (Position 1).
- Rotate the laser 180°, allow it to self-level and mark the opposite side of the first axis (Position 2).



100 ft (30m)

3)



100 ft (30m)

4)

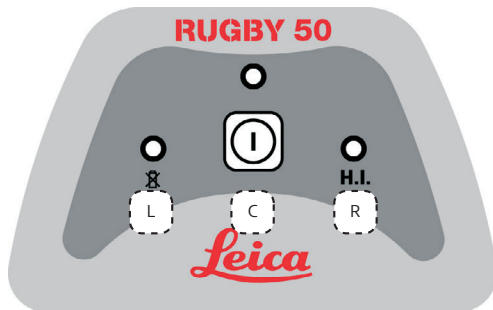
- **Align the second axis** of the Rugby by rotating it 90° so that this axis is now square to the wall. Allow the unit to self-level completely , then mark the position of the beam (Position 3)
- Rotate the laser 180°, allow it to self-level and mark the opposite side of the first axis (Position 4).

The Rugby is within its accuracy specification if the four marks are within $\pm 3/32"$ (± 2.6 mm) from the center.

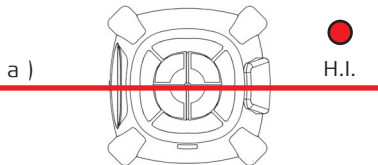
Adjusting Level Accuracy

There are three hidden buttons on the Rugby 50 membrane switch. These buttons are located as indicated on the membrane switch below.

- The buttons are identified as Left (L), Center (C) and Right (R).
- The buttons do not have domes and require a fine touch to activate.



In adjustment mode...

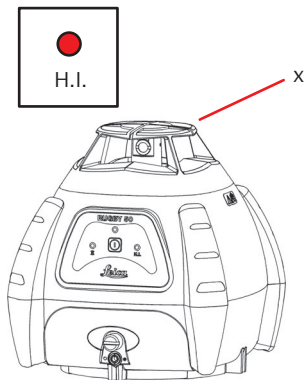


- The H.I. LED is used to indicate changes to the main axis (a).
- The LoBatt LED is used to indicate changes to the cross axis (b).

To enter adjustment mode perform the following steps:

- Turn the power off.
- With power off, press and hold both the LEFT and RIGHT hidden buttons, then press the ON button. The active axis is the main axis (a).
- If done correctly, the following sequence of events will occur:
 1. The LoBatt and H.I. LED's shall flash alternately three times.
 2. The H.I. LED shall flash three times, then turn ON, not flashing.
 3. The Emission LED shall continue to flash slowly until level.
 4. When leveled, the Emission LED shall turn ON (not blinking).

Adjusting the main axis.

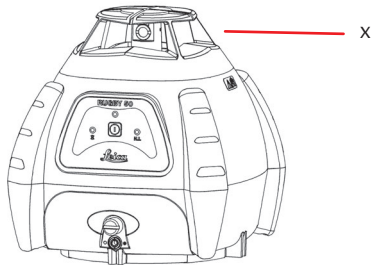
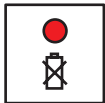


- Pressing the LEFT or RIGHT hidden buttons increments the laser beam up and down. Each increment shall be indicated by a flash of the H.I. LED and a beep from the audio indicator.
- Continue to press the buttons and monitor the spot until the unit is within its specified range.

Press the CENTER hidden button to switch to the cross axis.

1. The LoBatt and H.I. LED's shall flash alternately three times each.
2. The LoBatt LED shall flash three times, then turn ON, not flashing.
3. The Emission LED shall continue to flash slowly until level.
4. When leveled, the Emission LED shall turn ON (not blinking).



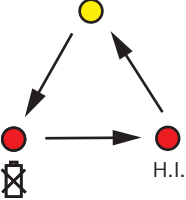
Adjusting the cross axis.

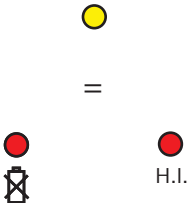



- Pressing the LEFT or RIGHT hidden buttons increments the laser beam up and down. Each increment shall be indicated by a flash of the H.I. LED and a beep from the audio indicator.
- Continue to press the buttons and monitor the spot until the unit is within its specified range.

Press and hold the CENTER hidden button for three seconds to exit adjustment mode and save the adjusted activity. The LoBatt and H.I. LED's shall flash alternately three times each, then the unit shall turn off.

Pressing the POWER button at any time while in adjustment mode shall exit the mode without saving any changes.

Alert	Symptom	Possible Causes and Solutions
	Low Battery Icon flashing red or on not flashing.	Flashing slowly - Low Battery Flashing quickly - Very Low Battery On, not flashing - Batteries will quit soon. <ul style="list-style-type: none"> • Replace alkaline batteries • Charge rechargeable batteries
	Elevation (H.I.) Alert	Flashing quickly with audio beep - Rugby has been bumped or tripod has moved. <ul style="list-style-type: none"> • Turn off Rugby to stop alert. Allow unit to relevel and check the height of the unit.
	Servo Limit	All three LED's flashing slowly in a counter-clockwise motion - The Rugby is tipped too far to reach a level position. <ul style="list-style-type: none"> • Relevel the Rugby within its wide five degree self-leveling range.

Alert	Symptom	Possible Causes and Solutions
	Temperature Alert	<p>All three LED's on, not flashing - The Rugby is in an environment where it cannot operate without causing damage to the laser. This could most often be the result of direct sunlight.</p> <ul style="list-style-type: none"> • Shade the unit.
	Head Stall Condition	<p>The Low Battery and H.I. LED's on, not flashing. The audio indicator will beep once - There is a problem that prevents the head from rotating.</p> <ul style="list-style-type: none"> • The Rugby must be returned to an authorized service center for service.
	Unit does not turn on	<p>This symptom may be caused by low or dead batteries.</p> <ul style="list-style-type: none"> • Check, change or charge the batteries. • If not the batteries, the Rugby must be returned to an authorized service center for service.

Alert	Symptom	Possible Causes and Solutions
	The Rugby's distance is reduced	Dirt may be reducing the output of the laser. <ul style="list-style-type: none"> • Clean the windows of the Rugby and the receiver to improve performance. • If not the windows, the Rugby must be returned to an authorized service center for service.
	There is no beam	The Rugby 50 has an infrared laser diode and is not visible to the human eye. <ul style="list-style-type: none"> • Check performance with a receiver.
	Elevation alert function is not working.	Elevation alert function may be disabled. <ul style="list-style-type: none"> • With unit turned on, press and hold the LEFT and RIGHT hidden buttons, then press the CENTER hidden button to enable or disable this function. The audio indicator will beep once to indicate the change.

6

Care and Transport

In this chapter	<i>Topic</i>	<i>Page</i>
	6.1 Transport	6-2
	6.2 Storage	6-3
	6.3 Cleaning and Drying	6-4

6.1

Transport

Transport in the field	<p>When transporting the equipment in the field, always make sure that you</p> <ul style="list-style-type: none">• either carry the product in its original transport container,• or carry the tripod with its legs splayed across your shoulder, keeping the attached product upright.
Transport in a road vehicle	<p>Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its transport container and secure it.</p>
Shipping	<p>When transporting the product by rail, air or sea, always use the complete original Leica Geosystems packaging, transport container and cardboard box, or its equivalent, to protect against shock and vibration.</p>
Shipping, transport of batteries	<p>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.</p>
Field Adjustment	<p>After transport inspect the field adjustment parameters given in this user manual before using the product.</p> <hr/>

6.2

Storage

Product

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

Field Adjustment

After long periods of storage inspect the field adjustment parameters given in this user manual before using the product.

NiMH Batteries

- Refer to section "8 Technical Data" for information about storage temperature range.
 - At the recommended storage temperature range, batteries containing a 10% to 50% charge can be stored for up to one year. After this storage period the batteries must be recharged.
 - Remove batteries from the product and the charger before storing.
 - After storage recharge batteries before using.
 - Protect batteries from damp and wetness. Wet or damp batteries must be dried before storing or use.
-

6.3

Cleaning and Drying

Product and Accessories

- Blow dust off optical parts.
- Never touch the glass with your fingers.
- Use only a clean, soft, lint-free cloth for cleaning. If necessary, moisten the cloth with water or pure alcohol.
- Do not use other liquids; these may attack the polymer components.

Damp Products

- Dry the product, the transport container, the foam inserts and the accessories at a temperature not greater than 40°C / 108°F and clean them.
- Do not repack until everything is completely dry.

Cables and Plugs

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

7

Safety Directions

In this chapter	<i>Topic</i>	<i>Page</i>
7.1	General.....	7-2
7.2	Intended Use.....	7-3
7.3	Limits of Use	7-5
7.4	Responsibilities	7-6
7.5	International Warranty.....	7-7
7.6	Hazards of Use.....	7-8
7.7	Laser Classification	7-14
7.8	Electromagnetic Compatibility (EMC)	7-16
7.9	FCC Statement, Applicable in U.S.	7-18

7.1

General

Description

The following directions should 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.

7.2

Intended Use

Permitted Use

- The product casts a horizontal laser plane for the purposes of alignment.
- The unit can be set up on its own base plate or on a tripod.
- The laser beam can be detected by means of a laser detector.
- The product, combined with machine control receivers, is also suitable for guiding construction machinery.

Adverse Use

- Use of the product without instruction.
- Use outside of the intended limits.
- Disabling safety systems.
- Removal of hazard notices.
- Opening the product using tools, for example screwdriver, unless this is specifically permitted for certain functions.
- Modification or conversion of the product.
- Use after misappropriation.
- Use of products with obviously recognizable damages or defects.
- Use with accessories from other manufacturers without the prior explicit approval of Leica Geosystems.
- Inadequate safeguards at the construction site, for example when using on or near roads.
- Deliberate dazzling of third parties.

- Controlling of machines, moving objects or similar monitoring application without additional control and safety installations.

 **Warning**

Adverse use can lead to injury, malfunction and damage. It is the task of the person responsible for the equipment to inform the user about hazards and how to counteract them. The product is not to be operated until the user has been instructed on how to work with it.

7.3

Limits of Use

Environment

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



Danger

Local safety authorities and safety experts must be contacted before working in hazardous areas, or in close proximity to electrical installations or similar situations by the person in charge of the product.

Manufacturers of the product

Manufacturer of the product Leica Geosystems AG, CH-9435 Heerbrugg, hereinafter referred to as Leica Geosystems, is responsible for supplying the product, including the user manual and original accessories, in a completely safe condition.

Manufacturers of non Leica Geosystems accessories

The manufacturers of non Leica Geosystems accessories for the product are responsible for developing, implementing and communicating safety concepts for their products, and are also responsible for the effectiveness of those safety concepts in combination with the Leica Geosystems product.

Person in charge of the product

The person in charge of the product has the following duties

- To understand the safety instructions on the product and the instructions in the user manual.
- To be familiar with local regulations relating to safety and accident prevention.
- To inform Leica Geosystems immediately if the product and the application becomes unsafe.

**Warning**

The person responsible for the product must ensure that it is used in accordance with the instructions. This person is also accountable for the training and the deployment of personnel who use the product and for the safety of the equipment in use.

7.5

International Warranty

International Warranty

The International Warranty can be downloaded from the Leica Geosystems AG home page at <http://www.leica-geosystems.com/internationalwarranty> or received from your Leica Geosystems dealer.

New - Register your product at www.leica-geosystems.com/registration to extend the warranty.

 **Warning**

The absence of instruction, or the inadequate imparting of instruction, can lead to incorrect or adverse use, and can give rise to accidents with far-reaching human, material, financial and environmental consequences.

Precautions:

All users must follow the safety directions given by the manufacturer and the directions of the person responsible for the product.

 **Caution**

Watch out for erroneous measurement results if the product has been dropped or has been misused, modified, stored for long periods or transported.

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 and before and after important measurements.

 **Danger**

Because of the risk of electrocution, it is very dangerous to use grade rods and staffs in the vicinity of electrical installations such as power cables or electrical railways.

Precautions:

Keep at a safe distance from electrical installations. If it is essential to work in this environment, first contact the safety authorities responsible for the electrical installations and follow their instructions.



 **Warning**

By working in a thunderstorm you are at risk from lightning.

Precautions:

Do not carry out field work during thunderstorms.

 **Warning**

Inadequate securing of the working site 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 and accident prevention and road traffic.

 **Caution**

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 may 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.

 **Caution**

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 of it, discharge the batteries by running 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**

Using a battery charger not recommended by Leica Geosystems can destroy the batteries. This can cause fire or explosions.

Precautions:

Only use chargers recommended by Leica Geosystems to charge the batteries.

 **Warning**

High mechanical stress, high ambient temperatures or immersion into fluids can cause leakage, fire or explosions of the batteries.

Precautions:

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

 **Warning**

Short circuited battery terminals can overheat and cause injury or fire, for example by storing or transporting in pockets if battery terminals come in contact with jewellery, keys, metallized paper or other metals.

Precautions:

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

 **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 unauthorized 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 unauthorized personnel.

Product specific treatment and waste management information can be downloaded from the Leica Geosystems home page at <http://www.leica-geosystems.com/treatment> or received from your Leica Geosystems dealer.

 **Warning**

Only Leica Geosystems authorized service workshops are entitled to repair these products.

General

This rotating laser, Rugby 50, produces an invisible laser beam which emerges from the rotating head.

The product is a Class 1 Laser Product in accordance with:

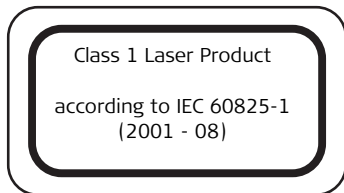
- IEC 60825-1 (2001-08): "Safety of Laser Products"
- EN 60825-1:1994 + A11:1996 + A2:2001: "Safety of Laser Products"

Class 1 Laser Products:



Class 1 laser products are safe under reasonable foreseeable conditions of operation and are not harmful to the eyes provided that the products are used and maintained in accordance with the instructions.

Maximum average radiant power	0.58 mW +/- 5%
Maximum peak radiant power:	1.8 mW +/- 5%
Pulse duration	1 ms
Pulse repetition frequency:	10 Hz
Beam divergence	< 1.5 mrad

Labeling, Laser Classification

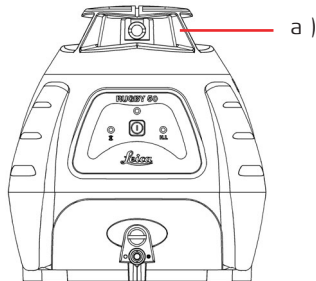


Type: R50
Art.No.: 753672
Power: 3.0V = / 1.5A
Leica Geosystems AG
CH-9435 Heerbrugg
Manufactured:
S.No.:
Made in Singapore



Complies with 21 CFR 1040.10 and 1040.11
except for deviations pursuant to Laser
Notice No.50, dated July 26, 2001.

This device complies with part 15 of the
FCC Rules. Operation is subject to the
following two conditions: (1) This device
may not cause harmful interference, and
(2) this device must accept any interference
received, including interference that may
cause undesired operation.

A rectangular box containing technical specifications, regulatory compliance information, and a warning. It includes a WEEE symbol (a crossed-out wheeled bin) and a CE mark. The text is arranged in a structured layout with bolded headings for "Type" and "Complies with".

a) Laser beam

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, Leica Geosystems 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 in conjunction 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 Leica Geosystems. 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 electromagnetic 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 within this respect, Leica Geosystems cannot completely exclude the possibility product may be disturbed by very intense electromagnetic radiation, near radio transmitters, two-way radios or diesel generators.

Precautions:

Check the plausibility of results obtained under these conditions.

 **Warning**

If the product is operated with connecting cables attached at one of their two ends, for example, external supply cables, interface cables, the permitted level of electromagnetic radiation may be exceeded and the correct functioning of other products may be impaired.

Precautions:

While the product is in use, connecting cables, for example product to external battery, product to computer, must be connected at both ends.

 **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 frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication.

However, there is no guarantee that interference will not occur in a particular installation.

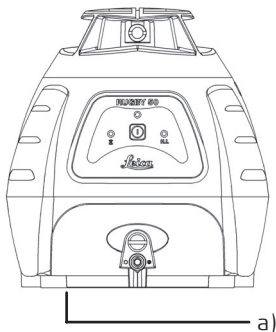
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 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.

 **Warning**

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

Labeling Rugby 50



a)

Type: R50

Art.No.: 753672

Power: 3.0V = / 1.5A

Leica Geosystems AG

CH-9435 Heerbrugg

Manufactured:

S.No.:

Made in Singapore



Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated July 26, 2001.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Rugby 50

Operating Range	300 m (1000 ft) Diameter
Self-leveling Accuracy*	±2.6 mm at 30 m (±3/32" at 100 ft)
Self-leveling Range	± 5°
Rotation Speed	10 rps (600 rpm)
Laser Diode Type	780 nm (infrared)
Dimensions (HWD)	158 x 163 x 166 mm (6.2 x 6.4 x 6.5")
Weight with Batteries	1.85 Kg (4.0 lbs)
Batteries	Two D-cells / NiMH Pack
Battery life - alkaline / NiMH**	60 hours / 35 hours
Operating temperature	-20 to +50°C (-4 to +122°F)
Storage temperature (without batteries)	-40 to +70°C (-40 to +158°F)
Protection against dust and water	IP55

NiMH Battery Pack

Input voltage	7.5 VDC
Input current	1.0 A
Charge time	8 hours

NiMH Charger/Adapter

Input voltage	100-240 VAC, 50-60 Hz
Output voltage	7.5 VDC
Output current	1.0 A
Polarity	Shaft - neg, Tip - pos

* Accuracy is defined at 25°C

** Battery life is dependent upon environmental conditions

Index

A

Accuracy

- Adjustment4-1
- Checking level accuracy4-2

B

Battery

- Charging the NiMH Batteries3-5
- Overview3-2
- Replacing the Alkaline Batteries3-3
- Replacing the NiMH Batteries3-4

C

- Care and Transport6-1
- Case Configuration1-3
- Cleaning and Drying6-4

D

- Description of the System1-1

E

Elevation Alert

- Description 2-4
- Enable/Disable 5-3

F

- Features 1-1

H

- Hazards of Use 7-8

L

- LCD indicators 2-3

S

Safety

- Electromagnetic Compatibility (EMC) 7-16
- FCC Statement 7-18
- Intended Use 7-3
- Labeling 7-15
- Laser Classification 7-14
- Limits of Use 7-5
- Responsibilities 7-6

Starting Up2-2

T

Technical Data8-1

Transport6-2

Troubleshooting5-1

W

Warranty7-7

Total Quality Management - Our commitment to total customer satisfaction.



Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Ask your local Leica Geosystems dealer for more information about our TQM program.



Leica Geosystems AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Switzerland
Phone +41 71 727 31 31

www.leica-geosystems.com

- when it has to be **right**

Leica
Geosystems

756706-1.1.1.en Original text
Printed in Switzerland © 2008 Leica Geosystems AG, Heerbrugg, Switzerland