



OPARATING INSTRUCTIONS

PLANO 3D GREEN LINE LASER



OPERATING INSTRUCTIONS PLANO 3D GREEN

ABOUT THIS MANUAL

Congratulations on the purchase of your new PLANO 3D GREEN! You have acquired a SOLAFLEX measurement instrument, which can make your work easier, faster and more precise. To utilize the complete functionality range of this measurement instrument, and to ensure a safe operation, please observe the following instructions:

- ➔ Please read this operating manual before commissioning the device.
- ➔ Always keep the operating manual near the device.
- ➔ Only hand over the device to other persons together with the operating manual.
- ➔ Never render the attached warning signs unreadable.





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1. GENERAL INFORMATION

1.1 SIGNAL WORDS AND THEIR MEANING

DANGER

For an imminent danger that could lead to serious injury or death.

WARNING

For a possibly dangerous situation that could lead to serious injury or death.

CAUTION

For a possibly dangerous situation that could lead to slight injury or property damage.

NOTE

For application notes and other useful information.

1.2 PICTOGRAMS AND OTHER INFORMATION

1.2.1 WARNZEICHEN



Warning of dangers in general

1.2.2 SYMBOLS



Read the operating manual before use



Batteries and devices may not be disposed of with household waste



Do not look into the laser beam!



Do not throw batteries into the fire



Class 2 laser device



Do not heat battery above 60°C



Warning label on packages with Li-ion batteries



2. DESCRIPTION

2.1 DEVICE COMPONENTS, DISPLAY AND OPERATING ELEMENTS

1. Laser beam outlet opening
2. On/off switch, transport lock
3. Tripod screw connection 1/4" & 5/8"
4. Battery compartment cover



2.2 INTENDED USE

The PLANO 3D GREEN is a line laser that enables a single person to level and align items horizontally and vertically. The device is designed to be preferably used indoors. For outdoor applications, it must be ensured that the ambient conditions are similar to those indoors. The visibility range of the laser lines depends on the ambient conditions. In low light conditions or for long distances, the hand-held receiver can be used to locate the laser line position (the hand-held receiver is not included in the standard delivery, but can be ordered as an option). Follow the instructions contained in this manual. The device and accessories can present risks if they are operated improperly or not as intended by persons who have not been instructed in their use.



3. TECHNICAL DATA

3.1 PLANO 3D GREEN LINE LASER

Working range laser lines recipient	r = 30 m* r = 80 m*
Max. measurement tolerance laser lines	± 3 mm**
Protection class	IP54
Leveling range (typical)	± 3°
Leveling time (typical)	≤ 5 s
Power supply	2 x 3.6 V Li-ion batteries (3450 mAh)
Operating time (at 20°C)	8 hrs (all diodes)
Permissible temperatures Operating temperature Storage temperature	-10°C bis +50 °C -20°C bis +60 °C
Laser diode lines/points	505 - 520 nm < 1 mW
Laser class	2, DIN EN 60825-1 : 2014
Tripod adapter	1/4" & 5/8"
Weight without batteries	720 g
Dimensions H x W x L	150 x 95 x 125 mm

*... depending on the ambient conditions in the workplace.
Subject to modifications (drafts, descriptions and technical data)



4. SAFETY INSTRUCTIONS

4.1 AREA OF RESPONSIBILITY

4.1.1 MANUFACTURER

SOLAFLEX is responsible for the safe delivery condition of the product, including the operating manual and the original accessories

4.1.2 OPERATOR

The operator is responsible for using the product as intended, the deployment of personnel, their training and the operational safety of the product.

- The operator understands the safety information which is stated on the product and the instructions in the operating manual.
- The operator shall comply with the standard local regulations relating to safety and accident prevention regulations as well as worker protection laws and regulations.
- The operator shall immediately notify SOLAFLEX if safety-related issues should arise relating to the product or during its utilization.
- The operator shall ensure that the product is not utilized any further if defects become evident, and they will have the product repaired professionally.

4.2 IMPROPER USE

- Use of the device and the accessories without instruction.
- Use of third-party accessories or additional equipment.
- Use outside of the intended limits (see Chapter 3/Technical Data).
- Use under extreme temperature fluctuations without an adequate acclimatization.
- Disabling of safety devices and removal of hazard notices and labels.
- Unauthorized opening of the device.
- Performance of modifications or alterations to the device or the accessories.
- Deliberate blinding of third parties.
- Inadequate safeguarding at the installation site.

4.3 EINSATZGRENZEN

The PLANO 3D GREEN is suitable for continuous use in an atmosphere which can be inhabited by humans.

- Do not operate the product in explosion-prone or corrosive environments.
- Inform the local safety authorities and safety experts before working in hazardous environments, in close proximity to electrical installations or similar surroundings.

4.4 USAGE HAZARDS

4.4.1 GENERAL



WARNING

Missing or incomplete instructions may result in improper or incorrect use. This can cause accidents with serious damage to persons, property, assets and the environment.

- Follow the manufacturer's and operator's safety instructions.
- Protect equipment and accessories from being accessed by children.



WARNING

Blinding by laser radiation can indirectly lead to serious accidents, especially for people who are driving a vehicle or operating machinery. Do not look into the laser beam.

- Do not set up the laser beam and the laser plane at eye level or aim at people.



CAUTION

A fall, longer storage, transportation or other mechanical effects can lead to erroneous measurement results. Check the unit for damage before use. Do not use damaged equipment.

- Repairs must only be performed by Solaflex.
- Before using, check the accuracy of the device (see Chapter 8 / Checking the Accuracy)

4.4.2 CHARGER/BATTERIES/RECHARGEABLE BATTERIES



DANGER

There is a risk of mortal danger from electric shock.

- Never open the Li-ion battery charger or charging station.
- Only use the Li-ion battery charger and charging station in dry places and do not bring them into contact with liquids.



DANGER

Mechanical damage can cause batteries to leak, explode or catch fire or trigger the release of toxic substances

- Batteries and rechargeable batteries must not be opened or exposed to mechanical loads.
- Damaged batteries, chargers and charging stations may not be used.
- Repairs must only be performed by Solaflex.



WARNING

High ambient temperatures and immersion into liquids can cause batteries to leak, explode or catch fire or trigger the release of toxic substances.

- Protect batteries and rechargeable batteries from mechanical damage during transport.
- Never store the Li-ion battery in the sun, on radiators or behind glass windows.
- Do not overheat batteries and rechargeable batteries or expose them to fire.
- Avoid the ingress of moisture into batteries and rechargeable batteries.
- Do not use damaged batteries or rechargeable batteries. Perform a proper disposal (see Chapter 11/Disposal).



WARNING

A short-circuiting or improper use can cause batteries to overheat and create an injury or fire hazard.

- Do not transport or store batteries in the pockets of garments.
- Do not bring the battery contacts in contact with jewelry, keys, or other electrically conductive objects.
- Do not charge the batteries.
- Do not discharge the batteries through short-circuiting.
- Do not solder the batteries in the device.
- Do not mix old and new batteries, and do not mix batteries from different manufacturers or with a differing type designation.



WARNING

Using charging devices from other manufacturers can damage the Li-ion batteries. This can lead to a fire and explosion hazard.

- Only use original SOLAFLEX accessories..



WARNING

If disposed of improperly third parties can possibly be seriously injured and the environment polluted. Burning plastic components generates toxic fumes which may impair health. Batteries/rechargeable batteries may explode if they are damaged or heated excessively, and thereby cause poisoning, burning, corrosion or environmental contamination. If disposed of negligently, unauthorized persons are able to use the product improperly.

- The product must not be disposed of together with household waste. Dispose of the device and accessories properly (see Chapter 11/Disposal).
- Protect the product against access by unauthorized persons at all times and especially children.

4.5 ELECTROMAGNETIC COMPATIBILITY (EMC)

The electromagnetic compatibility is the ability of the product to function in an environment where electromagnetic radiation and electrostatic discharge are present, without causing electromagnetic interference to other devices.

4.5.1 INTERFERENCE WITH OTHER DEVICES BY PLANO 3D GREEN

Although the product meets the strict requirements of the relevant directives and standards, SOLAFLEX cannot completely exclude the possibility of interference with other devices (for example, when using the product in combination with third-party devices, such as field computers, personal computers, wireless devices, mobile phones, certain cables or external batteries).

- When using computers and radio equipment, be sure to observe to the vendor-specific information about electromagnetic compatibility
- Only use original SOLA equipment and accessories.

4.5.2 INTERFERENCE WITH THE PLANO 3D GREEN BY OTHER DEVICES

Although the product meets the strict requirements of the relevant directives and standards, SOLAFLEX cannot entirely exclude the possibility that intense electromagnetic radiation in the immediate vicinity of radio transmitters, two-way radios, diesel generators, etc. may distort the measurement results.

- When performing measurements under these conditions, check the plausibility of the results



5. LASER SAFETY / CLASSIFICATION

The PLANO 3D GREEN emits one 360° horizontal line and two 360° vertical lines.
The product corresponds to laser class 2 according to DIN EN 60825-1:2014.

Laser Class 2:

When using Class 2 laser devices, the eye is protected by the blink reflex or aversion reaction in the case of random and short-term exposure.



WARNING

Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be dangerous.



CAUTION

Looking into the laser beam may be hazardous to the eye

- Do not look into the laser beam..
- Do not aim the laser beam at other people.

Labeling on the device:



See cover page for the position of the label.

- Do not remove the type plate!



6. GETTING STARTED

6.1 BATTERIES

1. Open the battery compartment cover.
2. Insert batteries in the adapter with the correct polarity.
3. Close the battery compartment cover (audible click of the cover).

Only use type 18650 3.6 V Li-ion batteries (3450 mAh).
Remove the batteries if the instrument is not used for an extended period.



NOTE

The intensity of the laser lines can vary depending on the battery quality.





7. OPERATION

7.1 PLANO 3D GREEN

7.1.1 SWITCHING THE LASER ON/OFF

On

→ Turn the on/off switch, transport lock to the right (ON position) and the pendulum unit will be released. The device emits three 360° lines from the outlet openings. To turn the vertical and horizontal 360° lines on and off, press the H and V buttons. The instrument will level itself automatically within the specified inclination range (see Chapter 3/Technical data).

Off

→ Turn the on/off switch, transport lock to the left (OFF position) and the pendulum unit will be locked; the laser line will disappear.



NOTE

Magnets can affect the measurement instrument and lead to false results.

If the vertical laser line is not projected vertically to the wall or to the target surface, uneven surfaces can lead to erroneous measurement results.

→ Make sure that the vertical laser line is projected vertically on to the wall or the target surface..

Severe temperature fluctuations can lead to erroneous measurement results.

→ Before start-up, allow the device to acclimatize to the ambient conditions.

The laser lines will flash every 30 seconds when the battery capacity falls below 10%.

→ Recharge the battery regularly or ensure additional batteries are available.

7.1.2 PULSE-MODE

The REC LGD0 receiver can be used to detect the laser lines at even greater distances or in unfavorable environmental conditions. Pulse mode is active on the PLANO 3D GREEN when the MODE button is pressed. The laser lines flash three times to indicate the change

7.1.3 CREATING INCLINATIONS BEYOND THE RANGE OF AUTOMATIC LEVELING

On

- Turn the on/off switch, transport lock to the left (OFF position).
- Hold down the MODE button for at least 5 seconds.
To indicate that the self-leveling is switched off, the lines will blink every 4 seconds.

Off

- Hold down the MODE button for at least 5 seconds.



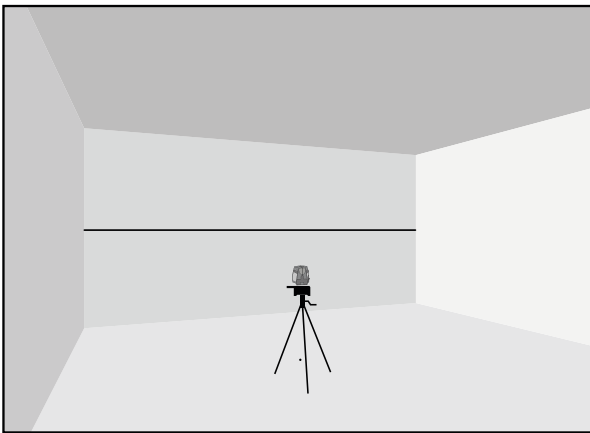
CAUTION

If the laser line is not projected vertically to the surface or the surface is uneven, this can lead to erroneous measurement results.

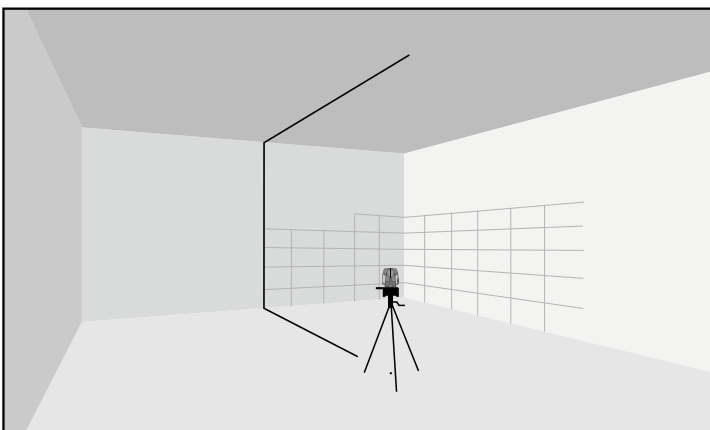
- Make sure that the laser line is projected vertically on to the wall or the target surface.

7.2 APPLICATIONS

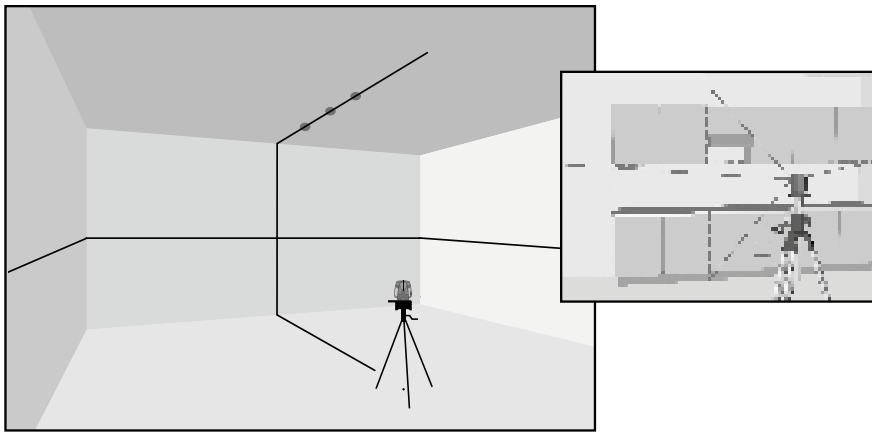
7.2.1 HORIZONTAL LEVELING 360°



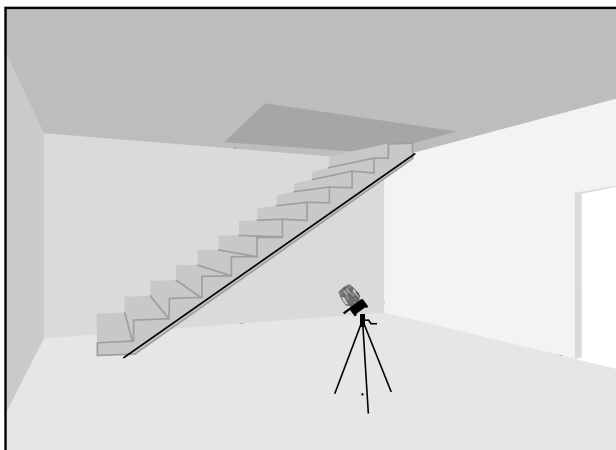
7.2.2 VERTICAL LEVELING



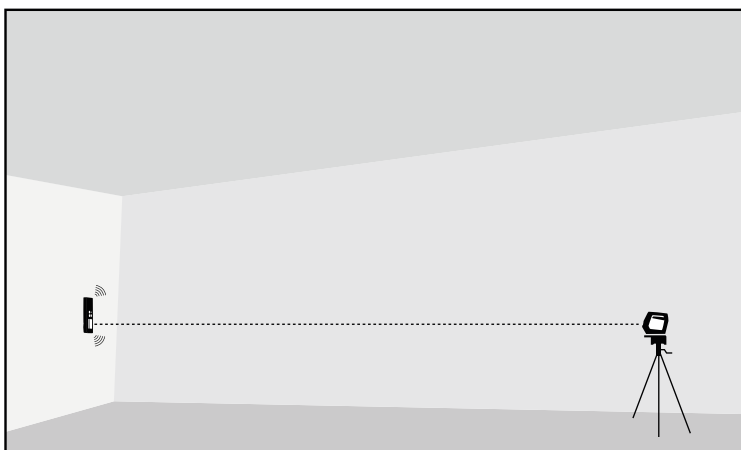
7.2.3 90° ANGLE



7.2.4 INCLINATION



7.2.5. WORKING AT DISTANCES

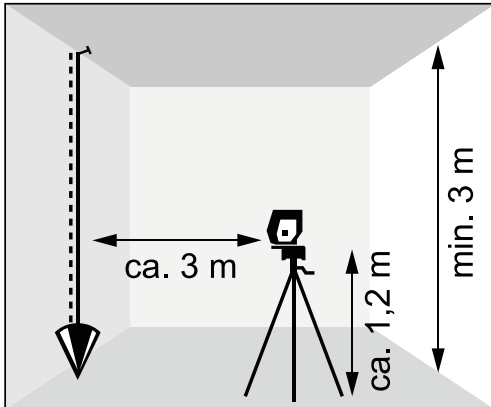


8. CHECKING THE ACCURACY

Check the accuracy of the PLANO 3D GREEN before each measurement.

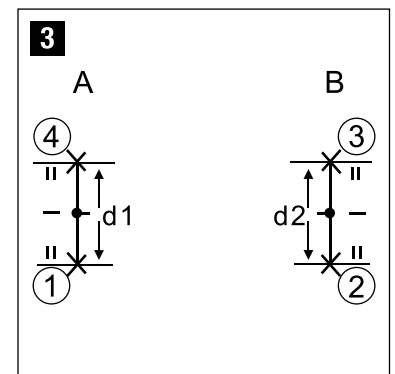
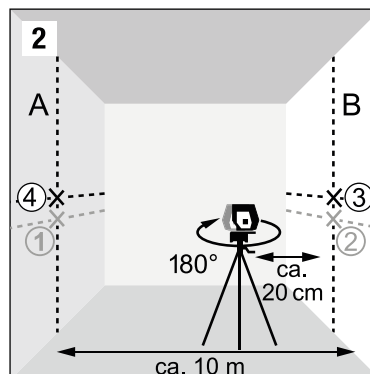
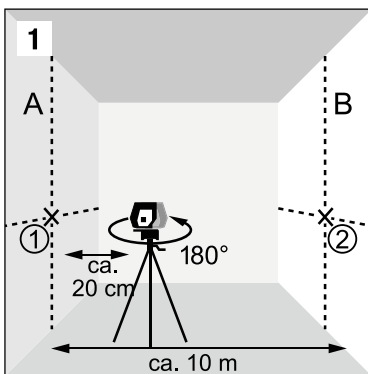
➔ Before starting the check, let the device acclimatize to the ambient conditions..

8.1 CHECKING THE ACCURACY OF THE VERTICAL LINE



- ➔ Attach a plumb line as close as possible to a wall that is at least 3 m high.
 - ➔ Mount the PLANO 3D onto a tripod adapter at a height of approx. 1.2 m.
 - ➔ Position the device approx. 3 m in front of the plumb line.
 - ➔ Switch on the PLANO 3D GREEN and project the vertical laser line onto the plumb line.
- If the deviation is greater than 4 mm, the device must be readjusted.
In this case, consult your dealer.

8. TESTING THE LEVELING ACCURACY OF THE HORIZONTAL LINE



1. Select two horizontal, level walls (A & B), which are approximately 10 m apart
 - ➔ Mount the PLANO 3D GREEN on a tripod adapter and position it at a distance of approx. 20 cm from wall A.
 - ➔ Mark the intersecting point (1) of the vertical and horizontal laser lines on wall A.
 - ➔ Rotate the PLANO 3D GREEN by 180° and mark point (2) on wall B.
2. Position laser at the same height and approx. 20 cm away from wall B.
 - ➔ mark point (3) on wall B.
 - ➔ Rotate the PLANO 3D by 180° and mark point (4) on wall A.
3. Measure vertical distance (d1) of the marked points (1)-(4) and vertical distance (d2) of points(2)-(3)
 - ➔ Mark center point of (d1) and (d2).
 - ➔ If reference points (1) and (3) are on different sides of the center point, (d2) must be subtracted from (d1).
 - ➔ If reference points (1) and (3) are on the same side of the center point, (d2) must be added to (d1).

If the result is greater than 4 mm, the device must be readjusted.
Please consult your retailer for this.



9. MAINTENANCE, STORAGE AND TRANSPORTATION

9.1 CLEANING

- Wipe off the dirt with a soft damp cloth.
- Check the outlet openings of the laser regularly, and thoroughly clean them if necessary. Do not touch the glass with your fingers.
- Do not use aggressive cleaning agents or solvents.
- Do not immerse the device in water!
- Clean and dry wet equipment, accessories and transport containers prior to packaging them. Only pack equipment again when it is completely dry.
- Keep plug connections clean and protected from moisture.

9.2 STORAGE

- The equipment may only be stored within the specified temperature limits (see Chapter 3/Technical Data).
- After prolonged storage, check the accuracy of the measuring device before using it.

9.3 TRANSPORT

9.3.1 GENERAL

The device may be damaged if it falls or is subjected to strong vibrations.

- Never transport the product loose. Always use the original packaging or an equivalent transport container.
- Switch off the measuring device before transporting it. During the shutdown the pendulum unit is locked in position and protected against damage.
- Check the unit for damage before use.
- Regularly check the leveling accuracy of the device (see Chapter 8/Checking the leveling accuracy).

9.3.2 BATTERIES

When transporting or shipping batteries, the operator is responsible for complying with the applicable national and international laws and regulations.

- Before shipping, remove the batteries from the device.



10. TROUBLESHOOTING

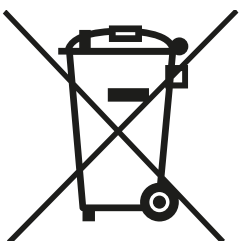
ERROR	POSSIBLE CAUSE	REMEDY
Laser lines blink in one second intervals	<ul style="list-style-type: none">→ Battery flat→ Battery empty	<ul style="list-style-type: none">→ Replace battery→ Charge battery
Rechargeable battery exhausted	<ul style="list-style-type: none">→ Device outside of self-leveling range	<ul style="list-style-type: none">→ Align device horizontally
Laser lines are flashing every 4 seconds	<ul style="list-style-type: none">→ Device is in manual inclination mode	<ul style="list-style-type: none">→ Turn the on/off switch, transport lock to the right (OFF position)
Laser lines blink every 30 seconds	<ul style="list-style-type: none">→ Battery capacity below 10%	<ul style="list-style-type: none">→ Replace the battery



11. DISPOSAL

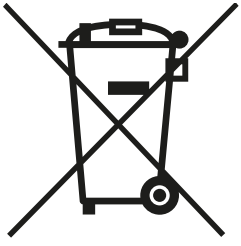
If disposed of improperly third parties can possibly be seriously injured and the environment polluted. Burning plastic components generates toxic fumes which may impair health. Batteries/rechargeable batteries may explode if they are damaged or heated excessively, and thereby cause poisoning, burning, corrosion or environmental contamination. If disposed of negligently, unauthorized persons are able to use the product improperly.

Measuring tools, accessories and packaging must be recycled in an environmentally friendly manner. The product as well as the accessories – especially the batteries and rechargeable batteries – must not be disposed of with household waste.



- Dispose of the device and the accessories properly.
- Only dispose of batteries when discharged.
- Observe the country-specific disposal requirements.

Your SOLAFLEX dealership will accept returned batteries as well as old equipment, and will ensure proper disposal.



ONLY FOR EU COUNTRIES

Electric tools must not be disposed of with household waste! According to European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its transposition into national law, electrical and electronic equipment that is no longer usable must be collected separately and recycled in an environmentally friendly manner.



12. MANUFACTURER'S GUARANTEE

“The manufacturer warrants to the original purchaser stated on the guarantee card, freedom from defects of the device for a period of two years, with the exception of batteries, from such time as the device is handed over. The guarantee is limited to repairs and/or replacements at the manufacturer’s discretion. Defects which are caused through improper handling by the purchaser or third parties, natural wear and optical flaws that do not affect the usability of the equipment, are not covered by this guarantee. Claims under this guarantee can only be invoked if the device is submitted along with the guarantee card, completely filled out by the dealer, dated and provided with the company stamp. If the guarantee claim is justified, the manufacturer shall bear the transport costs. The duration of the guarantee will not be extended through repair or spare parts work which is carried out within the scope of the guarantee.

Further claims are excluded, unless these are stipulated by the respective national legislation. In particular the manufacturer shall not be liable for any direct, indirect, incidental, or consequential damages, losses or expenses in connection with device’s use or because of the inability to use the tool for any purpose whatsoever. Implied warranties for the usage or suitability for a particular purpose are expressly excluded.”

EU Declaration of Conformity

Declaration of Conformity



We **Solaflex GmbH, A-6840 Götzis, Austria**

declare under our sole responsibility that the product(s)

PLANO 3D GREEN

to which this declarations relates is in conformity with the following standards

EN 60825-1:2014

EN 61326-1:2013

EN 61326-2-2:2013

following the provisions of Directive(s)

2014/30/EU Electromagnetic Compatibility Directive

2014/35/EU Low Voltage Directive

2011/65/EU RoHS Directive

Solaflex GmbH

Mag. Wolfgang Scheyer CEO

Götzis, 04/2018

