INSTALLATION MANUAL

Flexible Solar Panels

SUMMARY

Congratulations on the choice you have made in buying this SOLBIANFLEX panel for marine use. It has been manufactured with the most innovative technologies and with the highest quality components.

INTRODUCTION

A Solar Panel installation can be accomplished by any competent person, with simple tools. However, the installer takes responsibility for all accidents that may occur during the installation, including electric shocks

THE FOLLOWING INSTRUCTIONS ARE ONLY A GUIDE. WE HIGHLY RECOMMEND THAT YOU CONSULT A MARINE ELECTRICAL INSTALLER IF YOU HAVE ANY QUESTIONS REGARDING YOUR INSTALLTION.

www.solbian.eu

WARNINGS

These instructions must be carefully read and understood before proceeding with Solar Panel installation, connection, utilization and maintenance. Touching the electrically active parts of the panel, like terminals, may cause burning, sparks or low voltage discharges, even when the panel is disconnected.
A Solar Panel produces electricity when the front part is exposed to sunlight or to another light source. Even if the voltage produced by a single panel is not dangerous for health, when the panels are connected in series, voltages add up, and when they are parallel connected, currents are additive. So a system with more than one panel can produce a high voltage or high currents that can be dangerous and can cause injuries or death.

SAFETY

WARNINGS AND ELECTRICAL RISKS

- Before installing the panel verify the need of permission or licenses that may be requested by the law.
- If not specified, it is recommended that you follow the newer national and international laws.
- A bad installation can cause problems to the entire electrical system. Additional devices such as groundings, fuses, diodes, charger or power disconnector switch may be required.
- Do not use different types of panels on the same system.
- Avoid electrical risks during the installation, connection, utilization and maintenance.
- A Solar Panel produces continuous current when exposed to sunlight or other light sources. During the panel installation or connection, it's highly recommended to completely cover the front part of the panel with a soft, light-inhibiting material to avoid electricity production.

- The panel must stay in his original packaging until the moment of installation. Never touch terminals when the panel is exposed to light or during the installation. Use insulating gloves to avoid contact with the terminals. As a further precaution, use only properly isolated tools.
- Do not subject the panel to damage by unnecessarily rough treatment, or by dropping objects on it.
- Ensure that the system parts can't cause mechanical or electrical damage.
- Do not install the panel in the presence of inflammable gasses or steam, as sparks are always possible.
- Do not install or use a damaged panel.
- Installation must be accomplished only by qualified persons. Do not allow children to touch the panel.
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- Use the panel only for it's intended purpose. Follow all the manufacturers instructions. Do not disassemble or remove any part or label installed by the manufacturer.
- Do not put any paint or labels on the panel.
- Never focus sunlight on the panel.
- Preserve these instructions for future reference.

SOLBIANFLEX SOLAR PANELS

PACKAGING CONTENTS

The Packaging includes:

- One or more SOLBIANFLEX SP, SL or CP panels.
- Installation Instructions.
- Two pairs of heat-shrink tubing for the Connection Strips, for each panel supplied with that option.
  One pair of MC4 connectors for each panel supplied with Junction Boxes.

TECHNICAL DATA

SOLBIANFLEX Solar Panels utilize mono-crystalline silicon cells with high efficiency to convert energy from sunlight into electricity. The circuit of the cell assembly is laminated to a polymer formed by a sheet of transparent plastic in front, and an opaque plastic sheet on the back, which serves as protection against weathering and provides electrical insulation.

ACCESSORIES

Charge Regulators

Required to be able to safely connect your Solar Panel to a battery. We highly recommend Genasun controllers with MPPT technology. Solbian 40watt and 50watt panels have an 8v nominal output and must use a Genasun Boost controller for connection to 12v systems. All Genasun controllers are available from your Solbian dealer.

MC4 connectors

If your Solbian Solar Panel is supplied with the Junction Box option, a pair is supplied to be able to connect the panel to a controller. Extra sets of MC4 connectors are available from your Solbian dealer.

Cables

Various lengths are available from your Solbian dealer.

INSTALLATION

There are multiple ways of installing Solbian Solar Panels. The panels can be supplied a Junction Box or Terminal Strip for electrical connection, and with or without zippers. Grommets and other custom fasteners can be installed by your local canvas shop.



Installing a Solbian Solar Panel with Terminal Strips permanently to a hard surface requires special considerations. It is recommended that this type of installation be accomplished by a qualified and competent professional.

Solbian Solar Panels must not be bent to a chord height greater than 25% of the chord length.

i.e. The depth of bend must not exceed 25% of the length or width of the panel.

Panels must be properly installed, following the instructions. The support structure that the panel will be installed on, must be capable of full support, without deformation, in any weather condition, like wind, snow and, for marine applications, salt and storms. The support structure should not be subjected to excessive bending and flexing. Excessive and repetitive flexing or bending of the support structure may cause irreversible damage to the panel components, reducing the efficiency and possibly causing internal structural damage.

The mounting of the panel must permit air to freely circulate at least on the face exposed to sunlight. This reduces the temperature and results in better performance.

Electrical wiring size must be sufficient for a maximum voltage drop of 3%. Consult NEC tables, ABYC Standard E11, or your Solbian dealer for guidance.

It is recommended to use electrical cable designed for the marine environment if permanently exposed.

Purpose made electrical cables with MC4 connectors are available from your Solbian dealer .

When installing a Solbian Solar Panel with Terminal Strips permanently to a rigid structure like a cabin top or hard top on a bimini, etc., it is suggested to first mark the position with masking tape or a temporary frame. Then make a cardboard copy of the panel with holes cut where the wires to the Terminal Strips will exit.

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Lay the cardboard within the frame or tape and mark the holes for the wiring. Drill large enough holes so that short lengths of hose can be glued in place as a means of protecting the structure and wiring, and these can be filled with sealant after the panel is installed and the wiring has been soldered to the wiring ribbons and protected with heat-shrink tubing. Use a high-quality marine adhesive to secure the panel to the structure, and ensure that it is compatible with the material of the structure and that it can withstand constant exposure to harsh environments.

ELECTRICAL CONNECTIONS

There are several possible ways to connect multiple SOLBIAN Solar Panels to the batteries, either individually or by wiring them in series or paralell and sharing a common controller. However, it is not recommended to connect Solar Panels in marine applications in series.
Wherever possible, it is highly recommended that each Solar Panel has its own dedicated MPPT controller. This will ensure the maximum performance possible even if one panel becomes compromised by partial shading.
If two or more panels are wired in parallel, blocking diodes should be installed in the positive lead of each panel.

Selecting combinations of series/parallel and choice of regulators

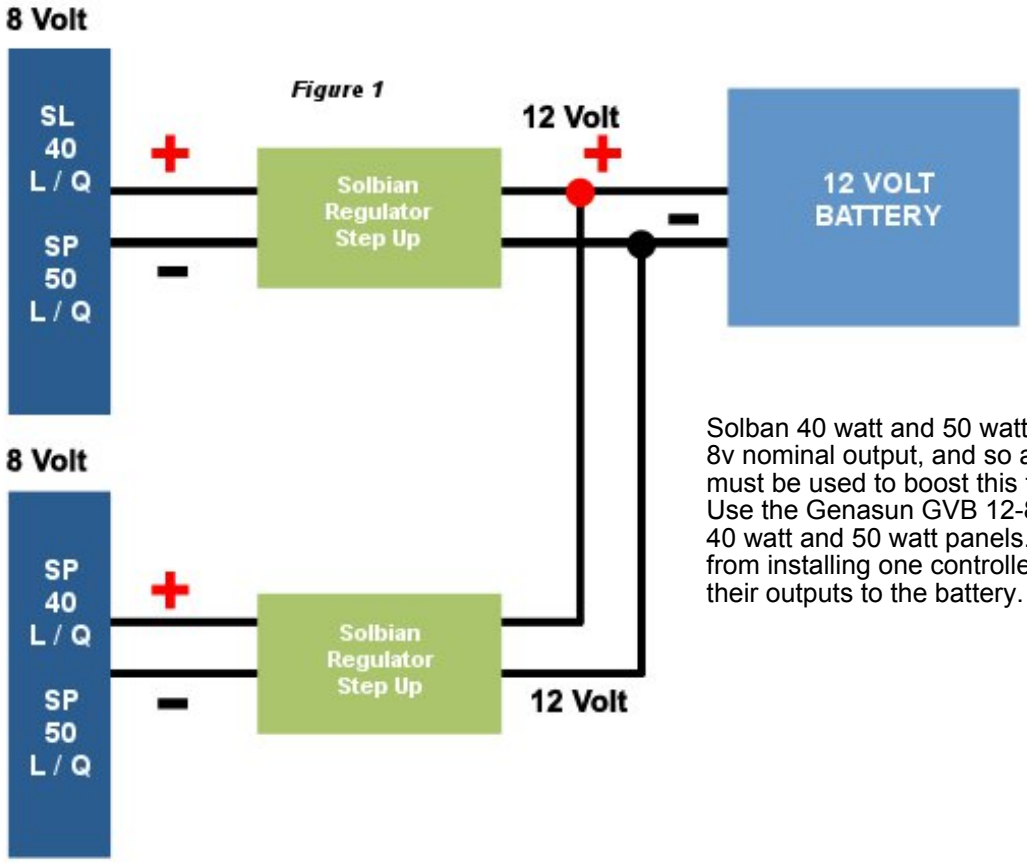
SOLBIANFLEX Solar Panels can be connected to each other and to the batteries in parallel, in series or in mixed series-parallel combinations. A solar controller of some type must always be used to ensure that the batteries receive the correct charging voltage and so are not subjected to dangerously high voltages. Simple volt-dropping controllers waste a lot of the Solar Panel's potential output and cannot compensate for the losses from shading. Good quality Maximum Power Point Tracking (MPPT) controllers, like those from Genasun, can give 30% more power and up to 50% better results in partially shaded conditions.

Ideally, each Solar Panel should have its own dedicated MPPT controller, as in Figure 1 below. This will ensure the maximum possible charging current when one or more panel is shaded.

If panels are connected in parallel, as in Figure 2, and then "share" a controller, a shaded panel(s) will seriously compromise the output of the unshaded one(s). If panels must be connected in parallel, a Blocking Diode must be installed in the positive lead from each panel.

For 24v systems it is recommended that each Solar Panel has it's own dedicated Genasun GVB 24-8 Boost controller, as shown in Figure 3. It is not recommended to wire the Solar Panels in series, as in Figure 4.

12 Volt system with MPPT Charge Controllers to 12 V



Solban 40 watt and 50 watt Solar Panels have an 8v nominal output, and so a special boost controller must be used to boost this to charge a 12v battery. Use the Genasun GVB 12-8 Boost controller on 40 watt and 50 watt panels. Best results are gained from installing one controller per panel, paralleling their outputs to the battery.

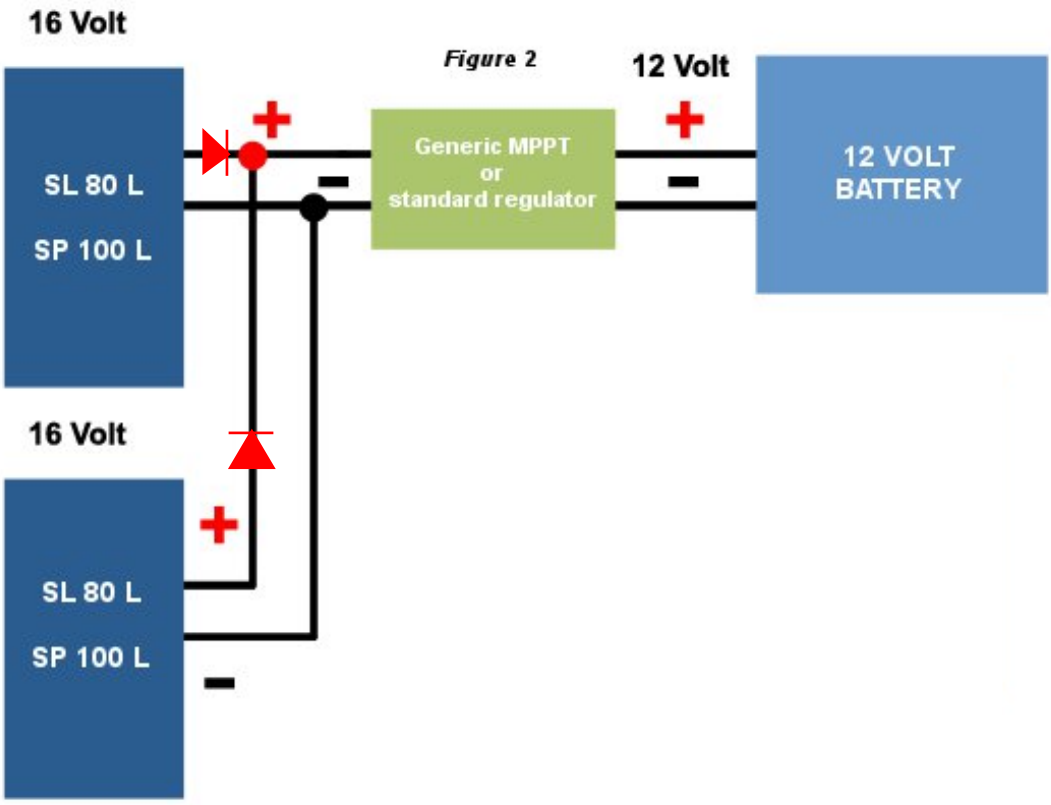
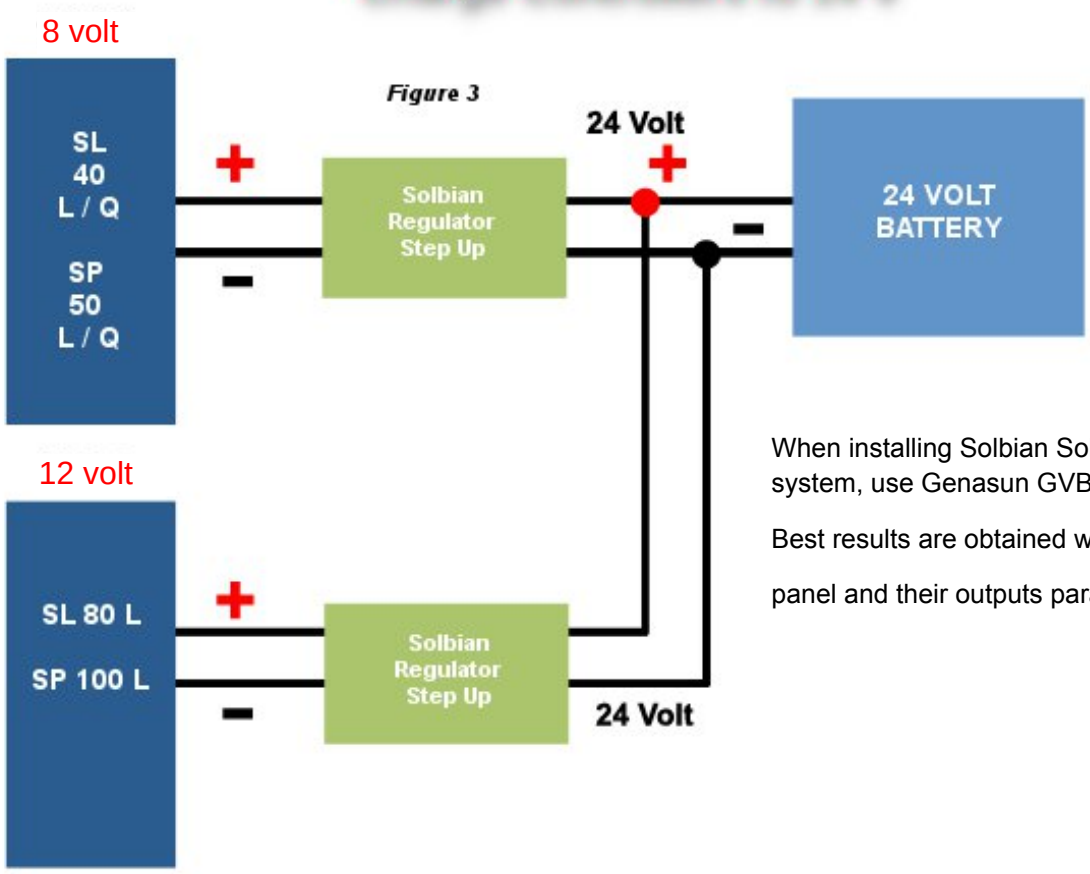


Figure 2

Two or more panels can be connected in parallel to one controller as long as the controller is rated to take the combined output. Blocking diodes must be installed in the positive lead of each panel, as shown.
NOTE: In this configuration, if one panel output is reduced by shading, it will compromise the output of the other panel also. Ideally, each panel should have it's own independent controller, as in figure 1.
For 80 watt and 100 watt panels, use the Genasun GV-10 controller.

24 Volt system with MPPT Charge Controllers to 24 V



When installing Solbian Solar Panels on a 24v system, use Genasun GVB 24-8 Boost controllers.

Best results are obtained with one controller per panel and their outputs paralleled to the battery.

24 Volt with MPPT
Standard Charge Controller

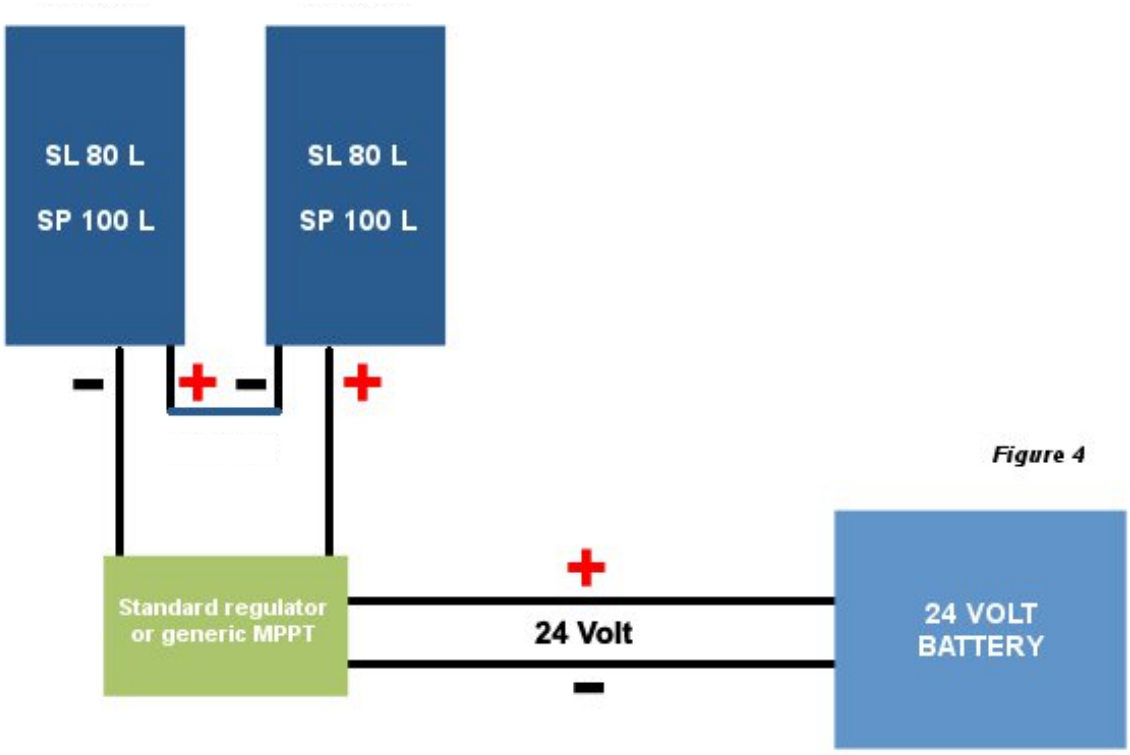


Figure 4

This configuration is not recommended. Use 2 x Genasun GVB 24-8 Boost controllers as shown in Figure 3

MAINTENANCE

Solar Panels do not require excessive maintenance, thanks to the absence of mechanical parts. Maintenance can be reduced to these simple procedures:

- Keep the panel clean. In a marine environment, wash the panel often with fresh water to avoid salt build-and reduce the possibility of damage;
- Check the panel often for signs of delamination, or problems with mounting or securing;
- Check electrical connections and wires periodically;
- Check the system occasionally for electrical efficiency and signs of deteriating output.

POSSIBLE BREAKDOWNS

Failures of Solbian Solar Panels are rare due to the stringent quality controls that each panel is subjected to before being released for sale. The following are among the possible causes of failure unrelated to the manufacturing process:

- Cells breaking due to excessive bending of the panel;
- Cells breaking due to mechanical stress or physical abuse of the panel;
- Cells breaking due to defective installation of a panel on a solid surface. (i.e. the presence of air bubbles between a panel and the solid surface may cause damage).
- Water infiltration and entrapment between the panel and a solid surface.
- The ingress of water into the Junction-Box.