





English Manual

30A / 50A MPPT solar regulator / controller





compatible app download Eco Solar



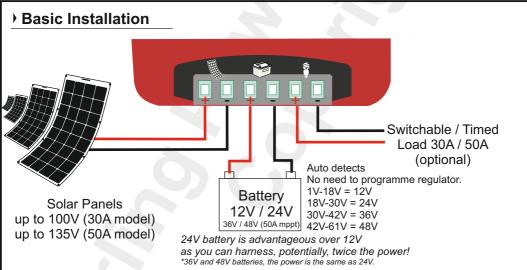
MPPT50 for 12V. 24V. 36V & 48V batteries

Part No: MPPT30 MPPT50

up to 100V (30A model) up to 135V (50A model)

MPPT30 for 12V or 24V batteries (30A) MPPT50 for 12V, 24V, 36V & 48V batteries (50A for 12V and 24V - 35A for 36V - 25A for 48V)

These solar regulators are designed to harness the maximum amount of energy from your solar panels and delivery a 3 stage charging cycle to your batteries @ 95% efficiency!



If you do not wish to delve into the manual and want a very brief installation diagram to quickly install the solar regulator please use this basic installation diagram. Simply wire the solar panel's (PV) positive and negative cable into the connector on the regulator (marked by the solar panel image). If you have the 30A model, do not exceed 100V. If you have the 50A model, do not exceed 135V. Likewise, wire up the battery's positive and negative terminals to the correct connector on the regulator (marked by the battery image). You can wire either a 12V, 24V, 36V or 48V battery bank to this connector. The regulator shall automatically detect which voltage scale it is connected to and charge appropriately at a 14.4V (x2 for 24V etc). The switchable output, marked as a bulb, is optional. This output is designed to run a modest load(s), such as lights. Read the manual for the full workings of the load connector as you can adjust timings as to when it switches on and off - ideal for something like security lighting.

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Dimensions

Turning on WiFi

Factory Reset

Changing time, 24 hour clock

30A MPPT

238mm Length 177mm Width 63mm Height Weight 1.5Kg

50A MPPT

238mm Length 177mm Width 73mm Height Weight 2.3Kg

STERLING POWER W= 177mm H= 63mm / 73mm

Customer Service & Warranty

Page 12

Do you have the correct regulator?

Ensuring you have the correct regulator is important in making the most of your solar panel array. Potentially, you can harness twice as much power from these Solar Regulators if your batteries are wired in a 24V configuration rather than 12V as the current remains the same, yet the voltage doubles P= I*V. Follow the chart below.

30MPPT@ 12V~500W

30MPPT @ 24V ~ 1000W 50MPPT @ 12V ~ 700W

50MPPT@24V/36V/48V~1400W 50A

50Aat 24V | 35Aat 36V | 25Aat 48V

Solar Panel(s) (W) ≤100V	12V Battery	24V Battery	36V Battery	48V Battery
up to 500W	30A MPPT	30A MPPT	50A MPPT	50A MPPT
up to 1000W	50A MPPT	30A MPPT	50A MPPT	50A MPPT
1000W+	50A MPPT	50A MPPT	50A MPPT	50A MPPT
(7)				
Solar Panel(s) (W) 100-135V	12V Battery	24V Battery	36V Battery	48V Battery
up to 1000W	50A MPPT	50A MPPT	50A MPPT	50A MPPT
1000W+	50A MPPT	50A MPPT	50A MPPT	50A MPPT

Legal and Safety

Using the Instruction Manual

This manual must be read throughout before installing this electronic device. Do not lose these instructions - keep them safe. The most up to date instructions can be found on the Sterling Power website. Please refer to the latest instruction manual before contacting Sterling. At Sterling, we endeavour to include all of the product information that we can think of into the manual.

Installation of the electronic device must be carried out by a qualified and trained personnel only. The personnel must be familiar with the locally accepted guidelines and safety measures.

Sterling Power's warranty statement

A comprehensive warranty statement is provide at the back of the instruction manual. A comprehensive warranty statement can also be found on sterling-power.com.

Copyright and plagiarism

Copyright © 2019 Sterling Power. All rights reserved. Reproduction, transfer, distribution or storage of part or all of the contents of this document is strictly prohibited. If you wish to use all of this document, or excerpts from it, Sterling Power must be contacted.

Liability

Sterling Power can not accept liability for:

- · consequential damage due to use of this device
- · possible errors in the manuals and the results thereof

Device modification

Please do not modify the device unless you have been instructed to do so by Sterling Power, directly. Product modification shall be done at Sterling, when needed. Warranty shall be voided if personal attempts are made to modify the device, without Sterling's approval.

Use the MPPT solar regulator only:

- For DC to DC conversion.
- For DC current limiting.
- With fuses protecting the DC cables.
- In a well ventilated, dry, dust-free and condensation free environment.
- When instruction manual has been read through.

Safety Symbols





 Example - WARNING. Never use the device in situations where there is danger of gas / dust EXPLOSION or potentially flammable products.

General maintenance and repair

The device must be switched off during maintenance. It must also be protected against unexpected switching off. Remove battery connections and ensure unit is off. If repair is required, only use original parts.

General safety and installation precautions

- Install device in well ventilated space. Do not expose device to: Rain, snow, spray, moisture, pollution, condensation. Do not cover or obstruct ventilation openings.
- Device connects to common negative.
 Common negative must be earthed.
- · In case of fire use a fire extinguisher.
- Ensure reverse polarity and short circuiting is avoided to prevent damage to battery.
- Protect DC wires with the appropriate sized fuse.
- · Check cabling annually-fix where needed.
- Avoid contact with device with damp hands.
- Ensure the device is adequately and securely mounted to prevent the unit from displacement.
- Use a professional to install device.

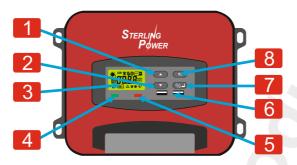
Battery safety

Excessive charge or discharge and high voltages can cause serious damage to batteries. Never exceed the recommended limits. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters the eye(s), immediately flood the eye(s) with running cold water for 20 minutes and seek medical attention.

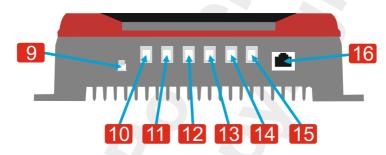
Give extra care to not drop metal tools or jewellery on to the battery terminals as short circuiting can take place.

Refrain from charging battery up to 4 hours prior of installation to avoid the formation of explosive gases.

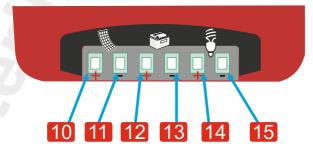
Never smoke / generate a spark around batteries.



- 1. UP (up button) for toggling through the menus
- 2. Down (down button) for togaling through the menus
- 3. LCD screen (see page 7 for more information)
- 4. Green LED light (off when not charging, flashing during charging, stay on when fully charged).
- 5. Red LED light (off when no error, on when error/alarms)
- 6. 2 x USB output (3.4A max)
- 7. Enter (OK button)
- 8. MENU (main menu button)



- 9. Temperature sensor / temperature probe connecting point
- 10. PV+ (connected to the positive electrode of the solar panel)
- 11. PV- (connected to the negative electrode of the solar panel)
- 12. Battery positive (connected to the positive terminal of the battery)
- 13. Battery negative (connected to the negative terminal of the battery)
- 14. Load positive (connected to the positive electrode of the load)
- 15. Load negative (connected to the negative electrode of the load)
- RJ45 port, connected to the remote control board through the network cable and synchronized with the LCD screen (this port is reserved, do not use)



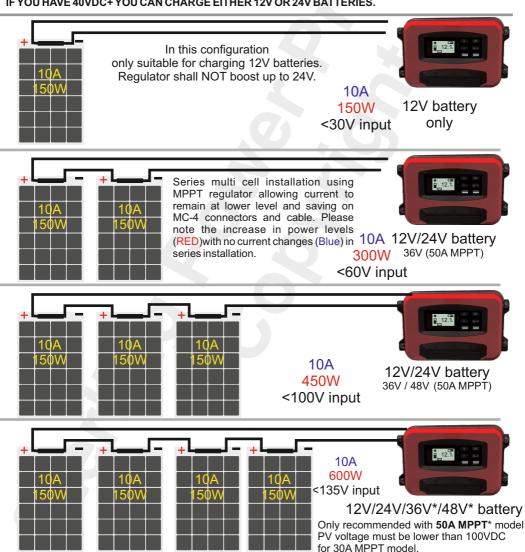
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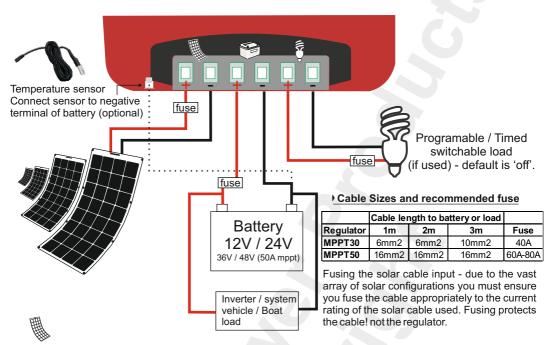
Configuration Options when using a good MPPT solar regulator (not a PWM regulator): Series install as opposed to parallel install:

The big advantage of a good MPPT solar regulator is that the input voltage can go as high as 135V (50A model) and 100V (30A model). For larger installations this means that the solar panels can be arranged in series rather than parallel. I.e. if you are fitting only 1 cell this is not any advantage, however, if you are fitting 2/3/4 then you can add the cells in series. Putting panels in series enables higher voltage and same current (perfect for MC-4 connectors). The max is 4-5 (voltage dependent) solar panels in series as any more than that will increase the input voltage above the safety threshold.

Please remember this MPPT solar regulator current limits. The maximum current that can be used to charge your batteries is the current rating of the regulator. MPPT30 = 30A and MPPT50 = 50A. The exception for the MPPT 50A is at 36V = 35A maximum and 48V = 25A maximum. Even with 10,000W of solar the MAXIMUM current through the 30A MPPT shall be 30A at 14.4V (432W) or 30A at 28.8V (864W). As you can see, arranging your batteries in a 24V format shall harness TWICE the power.

IF YOU HAVE ≤30VDC OF SOLAR, YOU CAN ONLY CHARGE 12V BATTERIES. IF YOU HAVE 40VDC+ YOU CAN CHARGE EITHER 12V OR 24V BATTERIES.





Solar panel installation. Please refer to the previous page regarding the solar panel installation configuration. We recommend installing panels in series (increasing voltage) rather than parallel to keep the current down the cables to a minimum. If you have 1x panel then simply connect the panel directly to the + and - at the solar panel connector on the regulator. If you have multiple panels to connect in series you shall need the appropriate connection block. Then feed this combined connection to the same + and - connector. The regulator requires 16.5V at this input terminal, or above, to activate. Below this voltage no charge shall take place.

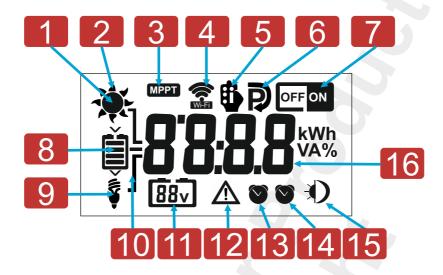


Battery installation. These MPPT solar regulators can charge both 12V, 24V, 36V and 48V batteries. However, in order to charge a 24V battery bank, your solar array must be in 24V format (40-60VDC) or higher. The solar input voltage needs to be above 33V+ to turn on and charge a 24V bank. The regulator shall auto detect whether you have connected a 12V or 24V battery. 1V-18V = 12V and 18V-30V = 24V. If the regulator has detected the wrong voltage scale (12V instead of 24V, for example), you shall need to charge your batteries with an independent charging source (alternator or battery charger) to bring the battery up to the auto detect voltage parameters. The regulator is powered by this battery, so the LCD screen shall light up and display a voltage the moment the battery is connected.

Please note, provided there is sufficient solar input power and sufficient battery voltage the solar regulator shall begin charging automatically at 14.4V (12V) or 28.8V (24V), 36V / 48V etc.... You do not need to press any buttons.



Load output. This output is optional. It is a programmable 12V or 24V output that can be on constantly, timer based, when solar power is present, manually engaged or never. The bulb is an example of what kind of loads could be used here - if you wanted to run a light during the evening from your 12V or 24V battery, for example. You could have the timer set to 6pm until 6am (12 hours). The load output would engage at 6pm for 12 hours and disengage at 6am. During the night the battery voltage shall drop due to the bulb load - there is a safety cut off voltage that can be adjusted to protect your battery(ies) from possible deep discharge. The 30A MPPT regulator has a 30A current rating for this output load at 12V and 24V. The 50A MPPT regulator has a 50A current rating (12V and 24V. Default position is OFF (no output) at this terminal. To toggle ON/OFF use this button, on device.



- 1. Sun icon, displayed when the solar panel is connected and detected.
- Sun icon flares. Each flare segment of the sun icon denotes 1/8th of the total maximum current.
 There are 8 flare segments in total (each flare is 1/8th). If only 1 segment is displayed then the
 current is approximately 4A (30A model) or 6A (50A model). 2 segments is 8A and 12A
 respectively. Etc.
- 3. MPPT icon indicates the MPPT charger.
- 4. WiFi icon; turn on WiFi through button settings, read product data and control load output through APP
- Remote control icon; displayed when the remote control is connected (remote control optional).
- 6. Settings icon; turn on when entering the setting parameters, and turn off when exit.
- 7. WiFi icon; WiFi ON/OFF optional, default ON.
- 8. Battery level icon; display the corresponding icon according to the battery voltage.
- Load icon: turn on when the load is turned on, synchronized with the load switch ON.
- Connections. 3 segments. the top segment correspond to PV. The middle corresponding to battery and down corresponding to load.
- 11. Currently identified battery type (12V / 24V / 36V / 48V).
- Protection icon. When this icon appears, it indicates that the machine has some protection, such as load. Over current, short circuit protection, undervoltage protection, etc. (Refer to the fault code).
- 13. Load timing clock 2 used in setting the timer for load.
- 14. Load timing clock 1 used in setting the timer for load.
- Daytime and night icons; PV voltage greater than 12V then the sun half will show. When the PV voltage is lower than 12V the half moon will display, after 5 minutes, to show solar is inactive. Below 5V the regulator switches to night mode.
- Numerical display (8888 characters). The current data of the machine can be switched by the MODE button, such as battery voltage / load voltage / PV voltage / time.



Press and hold. Then press again to toggle through:

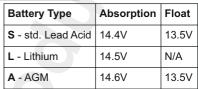
OFF ON

P OFF ON



Use the ENTER button to enter the menus and to confirm settings





x2 for 24V charging voltages x3 for 36V charging voltages x4 for 48V charging voltages

Battery Type Select. There are 3 battery types to select from. S = standard lead acid. L = lithium. A = AGM battery. Use the MENU button to toggle through the 3 battery types. Then use the ENTER button to confirm.

WiFi toggle on / off. Default setting is WiFi on. Use the MENU button to toggle between turning the WiFi on / off. Then press ENTER to confirm

P OFF ON U

Low voltage protection cutoff. This is the voltage that the battery shall work down to if you activate and use the load output - when this voltage is reached the load output turns off. The default is 10.0V for a 12V battery. If 24V battery is detected then the default is 20.0V. Use the UP and DOWN arrows to toggle through the voltages to select the required cutoff

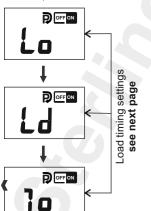
voltage. When you have selected the voltage that you require, press ENTER to confirm.

†

Low voltage recovery re-engage. After the cutoff voltage (above) has been reached and the load output stopped, a recovery re-engage voltage must be set so the load output can resume working. The default is 12.5V for a 12V battery. If 24V battery is detected then the default is 25.0V. If 36V battery is detected then 37.5V shall show. If 48V battery is detected then 50.0V shall show. Use the UP and DOWN arrows to toggle through the voltages to select the required cutoff voltage. When you have selected the voltage that you require, press ENTER to confirm.

21:05

Basic time of the day setting. This simply sets the time in a 24hour format. Press the UP and DOWN arrows to set. Use ENTER button to confirm. Please note it is a 24 hour timer.



Resetting to Defaults / Factory Reset

- 1) Remove the battery positive cable that connects the regulator to the battery. You can do this by physically removing the positive cable, using an isolation switch or removing the fuse. Screen should then turn off.
- 2) Then, press and hold the MENU button whilst reconnecting the positive battery cable. The unit shall then light up.
- 3) If successful, then this should appear on the screen:

FFFF

4) All settings should now be restored to default.

Load Settings

These settings are potentially complicated and confusing.

For the vast majority of vehicle and boat application these settings are not necessary. Do not connect large inverters to this load.

30A model can provide 30A (12V/24V) | The 50A model can provide 50A (12V/24V).

As default, all three of these load settings: Lo, Ld and To, are OFF. They need to be turned ON in order to set the parameters. To manually engage load, press:

Lo Mode

*for 24V, multiply these figures by 2. 36V x3, 48V x4...

Load Output



When the PV input voltage drops below 10V (during the evening / night / dark clouds) you can set the regulator to engage the load output automatically after a set period of time or immediately. To do this, set the OFF/ON bar to ON using the cursor keys and ENTER button.



A time display shall appear with Clock 1 symbol. The default is 60 minutes. This means that when the PV (solar panel) voltage drops below 10V a 60 minute timer shall begin. After 60 minutes the Load output connector shall be live and shall remain live until the PV voltage rises again (in the morning, for example). This time can be adjusted with up and down cursor keys to suit your requirements.

If you want the load to engage immediately set timer to 0 minutes. Max is 120 minutes (5 minute increments). Press enter to confirm time.



The next screen Clock 2 symbol shall appear. This clock allows you set to tell the regulator when you want the load output to turn off when the PV (solar panel) voltage turns on again 10.5V+. The default is 30 minutes. This time can be adjusted with up and down cursor keys to suit your requirements. If you want the load to disengage immediately set timer to 0 minutes. Max is 120 minutes (5 minute increments). Press enter to confirm time.

Ld Mode



If you only want the load output to come on for a set length of time when the PV voltage drops below 10V then activate this setting by turning OFF to ON using the up and down cursor keys and pressing ENTER to confirm. Clock 1 symbol shall appear and 3:00 hours (default). This means that the load output shall stay on for 3 hours when the PV voltage drops below 10.0V. This number can be adjusted using the cursor keys and the ENTER button, to confirm. Minimum 0 hours, maximum 12 hours.



The next screen, Clock 2 symbol shall appear. This timer shall begin when Clock 1 timer has expired. It is an OFF timer. So, if you have set Clock 1 to 3 hours and this clock to 4 hours the load output shall be live for 3 hours after the PV voltage has dropped below 10.0V. It shall then be off for 4 hours and come back on again after the 4 hours. It shall remain on again until the PV voltage rises above the 10.5V required.



To Mode

P OFF ON

To Mode. This means time operation mode. It simply allows you to set 2x Clocks. The first clock is set to engage the load output at a specific time and the second clock is set to disable the load output at a specific time. Please ensure the time is correct, first!



Firstly, this mode needs to be turned on. Use the up and down cursor keys and ${\sf ENTER}$ to confirm On.

The first clock icon appears along with 18:00. This is the time you wish for the load to become live. This can be adjusted using the cursor keys UP and DOWN, press ENTER to confirm time.



After pressing enter the second clock appears and 6:00am default. This is the time for the load output to turn OFF. This time can also be adjusted. Use cursor keys and press ENTER to confirm.



WiFi toggle on / off. **Default setting is WiFi on**. Use the MENU button to toggle between turning the WiFi on / off. Then press ENTER to confirm.

WiFi must be ON.

Obtain the **ECO Solar APP** from either the Play Store or APP Store depending on your Operating System.

Press Install.



Open the ECO Solar APP.

You may be prompted to 'allow' and 'give permission' by your phone - just allow it.

Press Local in the bottom left.



Functions

The App's function are simple, yet intuitive.

You can activate the 'load output' using the Load 'on/off' switch.

You can also switch between V, A &W.

- V shall display voltage (default)
- A shall display current
- W shall display power (VxA)

Direct WiFi (Local Mode)

Ensure you have Bluetooth enabled on your phone / tablet. Searching out the regulator's WiFi address, Password is 12345678, then open the App, enter the local mode. You can connect up to 4 devices. This allows you do directly connect to the regulator.

For WiFi SSID (Cloud Mode)

Ensure you have Bluetooth enabled on your phone / tablet. Searching out your WiFi SSID address. Input your password to connect WiFi. Then open the App, enter the Cloud Mode. Bind device (to Scan the MAC address QR code on the front of the regulator). device WiFi config (put the WiFi SSID address - input the WiFi SSID password). You can connect up to 4 devices. This allows you connect to the regulator with WiFi SSID.

For additional information about this APP and for 'cloud' WiFi information, please consult our website or use this link below.

https://cdn.shopify.com/s/files/1/0658/7343/files/ECO Solar APP.pdf?8

11

30A and 50A MPPT

PV input

PV maximum open circuit voltage (VDC)

MPPT voltage (VDC)

Maximum PV input power (W) 30A & 50A

Maximum MPPT current

DC output

Battery voltage (VDC)

Battery capacity (Ah)

Output current (A)
Load output

Output voltage (VDC)

Output current max (A)

USB output

Output voltage (VDC) Number of USB ports

Maximum output current (A)

Standby current

Separate MPPT charger MPPT charger + WiFi module

Protective function

PV/battery input high/low voltage protection PV/battery reverse connection protection

Load over current / short circuit protection

Temperature protection

Mechanical dimensions

Length x width x height (mm)

Weight

General data

Operating temperature (°C)

Cooling method Insulation class

Protection

Parameters

100V 30A | 135V 50A

16~80V

12V battery <500W; 24V battery <700W; (x1.6 for 50A model)

≤30A & 50A at 12V or 24V. 35A (36V) 25A (48V)

12V, 24V, 36V, 48V

50AH - 1000 AH 30A & 50A at 12V or 24V. 35A (36V). 25A (48V)

12V, 24V, 36V, 48V

30A & 50A at 12V or 24V. 35A (36V). 25A (48V)

5V 2

2x output 3.4A max Battery input 12V

<60 mA

<160 mA

Yes Yes Yes

Yes (90°C)

238L x 177W x 63 / 73H mm 1.5Kg / 2.3Kg

10~ +40

Heat sink CLASS 1 level IP20

Temperature Compensation

If the external temperature sensor is connected, then the float voltage shall change as follows:

If sensor temperature is <0 Deg C - float = 14.1V (28.2V)

If sensor temperature is 0-20Deg C - float = 13.8V (27.6V)
If sensor temperature is 20Deg C +/- float = 13.5V (27.0V)

If internal heat sink temperature exceeds 75 Deg C - the device shall go into approximately half power mode. Shall resume normal operation when internal heat sink drops below 70 Deg C.

If internal heat sink exceeds 90 Deg C- the device shall turn off. Shall resume charging again when temperature drops below 60 Deg C.

Fault Codes

- **E1** Battery reverse connection / reverse polarity (please correct).
- E2 Battery open circuit protection / low DC voltage (battery not connected / or battery voltage <8V/18V/27V/36V).
- E3 Battery over current protection (circuit has constant current function; the machine may be damaged if there is an problem).
- **E4** Load over current / short circuit protection (error 10S, turn on the load after eliminating the error).
- E5 Battery over voltage (battery damaged or battery voltage exceeds 15V / 31V / 45V / 60V).
- **E6** PV (solar) input over voltage protection (PV>100V).
- E7 Over temperature protection, automatically stop charging when heat sink temperature $\geq 90^{\circ}\text{C}$; resume when temperature $\leq 60^{\circ}\text{C}$.
- E8 PV reverse connection (please check voltage and fix) please ensure polarity is correct.

Remark: Please eliminate the fault according to the error code. If the regulator does not respond after the error is eliminated remove the power source (battery). If the error still persists the device may be damaged and may need after sales service.



Customer Service & Warranty

Your 100 % satisfaction is our goal. We realise that every customer and circumstance is unique. If you have a problem, question, or comment please do not hesitate to contact us. We welcome you to contact us even after the warranty and return time has passed.

Product Warranty:

Each product manufactured by Sterling Power comes with at least a 2 year limited factory warranty. Certain Products have a warranty period of time greater than 2 years. Each product is guaranteed against defects in material or workmanship from the date of purchase. At our discretion, we will repair or replace free of charge any defects in material or workmanship that fall within the warranty period of the Sterling Power product. The following conditions do apply:

- The original receipt or proof of purchase must be submitted to claim warranty. If proof cannot be located a warranty is calculated from the date of manufacture.
- Our warranty covers manufacture and material defects. Damages caused by abuse, neglect, accident, alterations and improper use are not covered under our warranty.
- Warranty is null and void if damage occurs due to negligent repairs.
- Customer is responsible for inbound shipping costs of the product to Sterling Power either in the USA or England.
- Sterling Power will ship the repaired or warranty replacement product back to the purchaser at their cost.

If your order was damaged in transit or arrives with an error, please contact us ASAP so we may take care of the matter promptly and at no expense to you. This only applies for shipping which was undertaken by our company and does not apply for shipping organised by yourself. Please do not throw out any shipping or packaging materials.

All returns for any reason will require a proof of purchase with the purchase date. The proof of purchase must be sent with the returned shipment. If you have no proof of purchase call the vendor who supplied you and acquire the appropriate documentation.

To make a claim under warranty, call our customer care line at (USA 1-(207)-226-3500, England 01905 771771). We will make the best effort to repair or replace the product, if found to be defective within the terms of the warranty. Sterling Power will ship the repaired or warranty replacement product back to the purchaser, if purchased from us.

Please review the documentation included with your purchase. Our warranty only covers orders purchased from Sterling Power. We cannot accept warranty claims from any other Sterling Power distributor. Purchase or other acceptance of the product shall be on the condition and agreement that Sterling Power USA LLC and Sterling Power LTD shall not be liable for incidental or consequential damages of any kind. Some states may not allow the exclusion or limitation of consequential damages, so, the above limitations may not apply to you. Additionally, Sterling Power USA and Sterling Power LTD neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product. This warranty is made in lieu of all other obligations or liabilities. This warranty provides you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.

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