

Identification of Parts



Key Parts

1. LCD Screen
2. Select Button
3. Enter Button
4. USB Ports
5. Load Terminals
6. Battery Terminals
7. PV Terminals
8. RS232 Communication Port

Installation

Conned battery terminal wires to the charge controller FIRST, then conned the solar panel(s) to the charge controller. NEVER conned solar panel to charge controller before the battery.

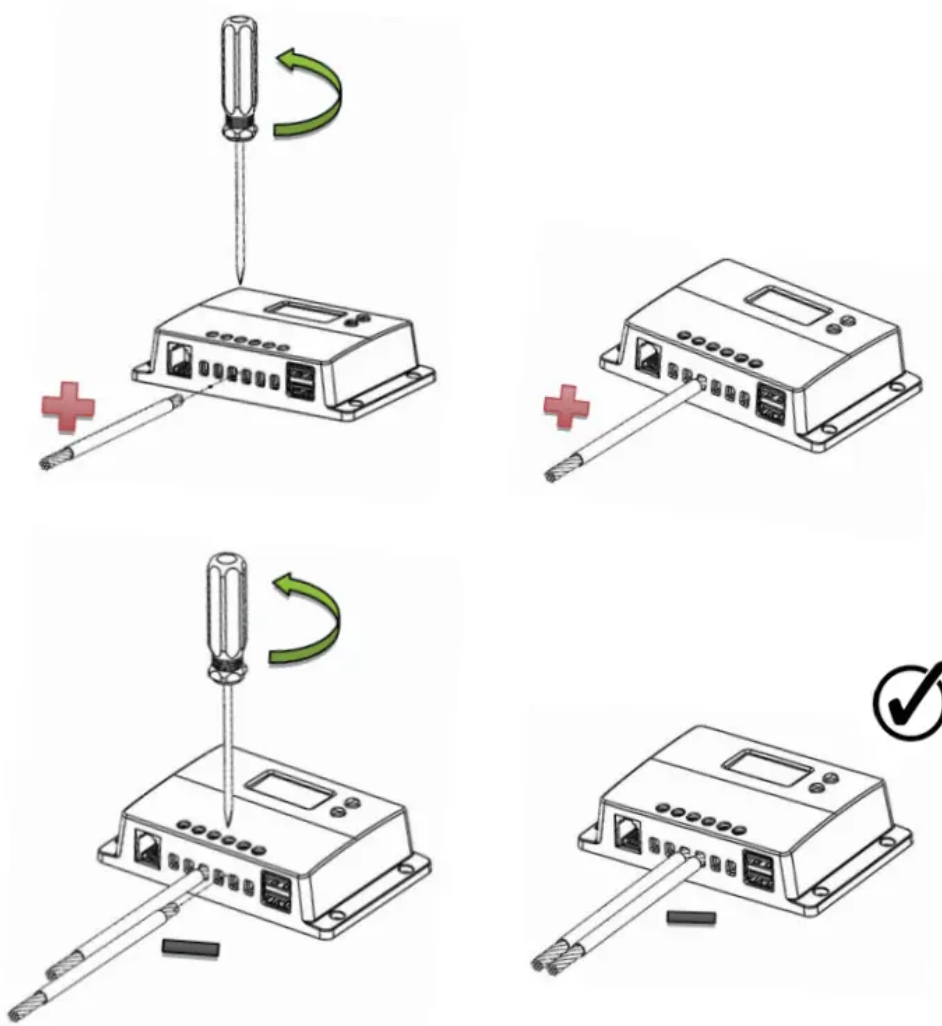
CAUTION

Do not over-torque or over tighten the screw terminals. This could potentially break the piece that holds the wire to the charge controller.

Refer to the technical specifications for max wire sizes on the controller and for the maximum amperage going through wires.

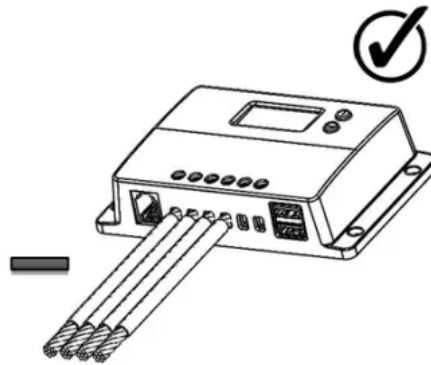
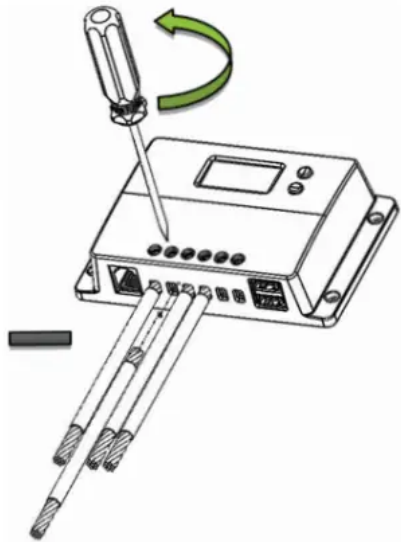
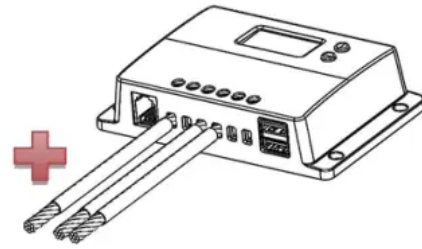
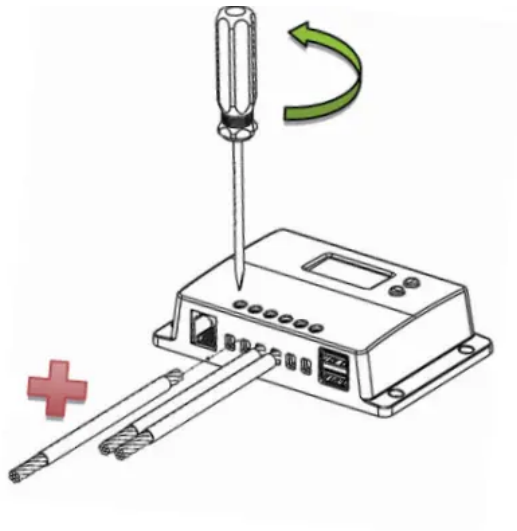
Wiring

- Battery



- Solar Panel

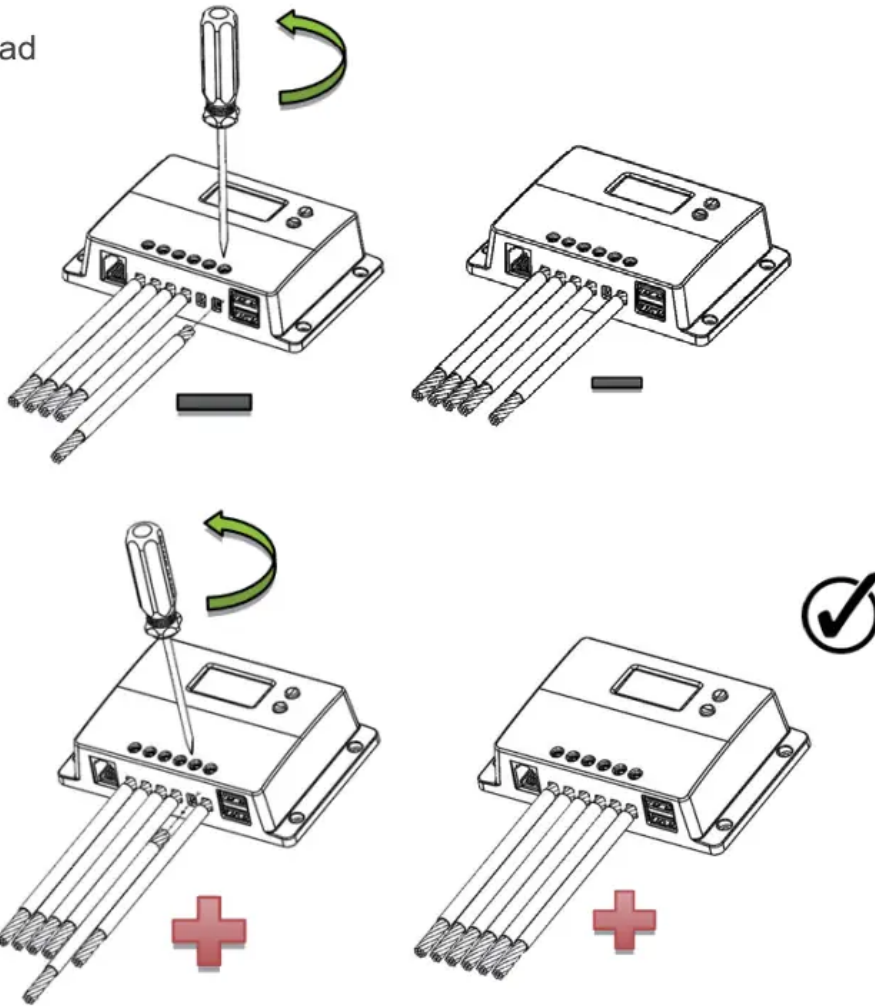




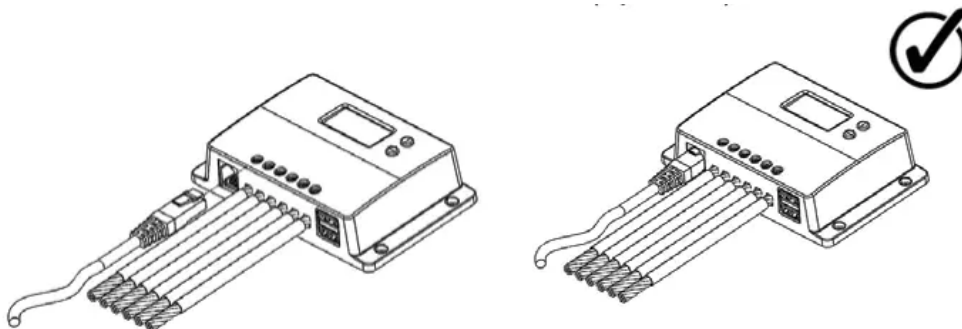
• Load



■ Load



- Bluetooth Module Communication (optional)

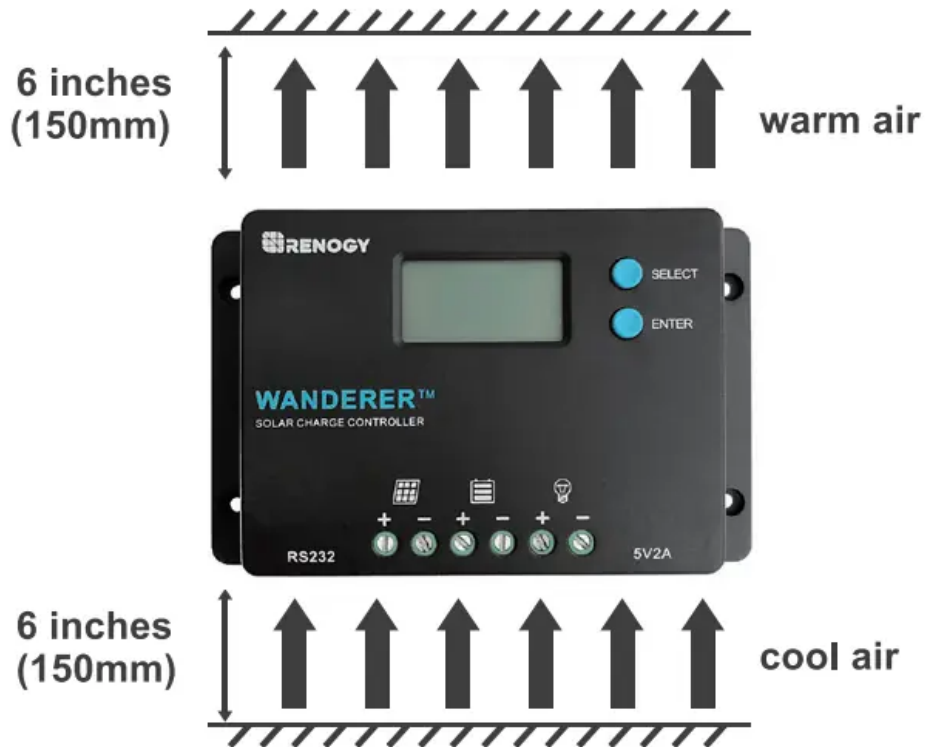


Mounting Recommendations

Never install the controller in a sealed enclosure with flooded batteries. Gas can accumulate and there is a risk of explosion.

1. **Choose Mounting Location**—place the controller on a vertical surface protected from direct sunlight, high temperatures, and water. Make sure there is good ventilation.

2. **Check for Clearance**—verify that there is sufficient room to run wires, as well as clearance above and below the controller for ventilation. The clearance should be at least 6 inches (150mm).
3. **Mark Holes**
4. **Drill Holes**
5. **Secure the charge controller.**

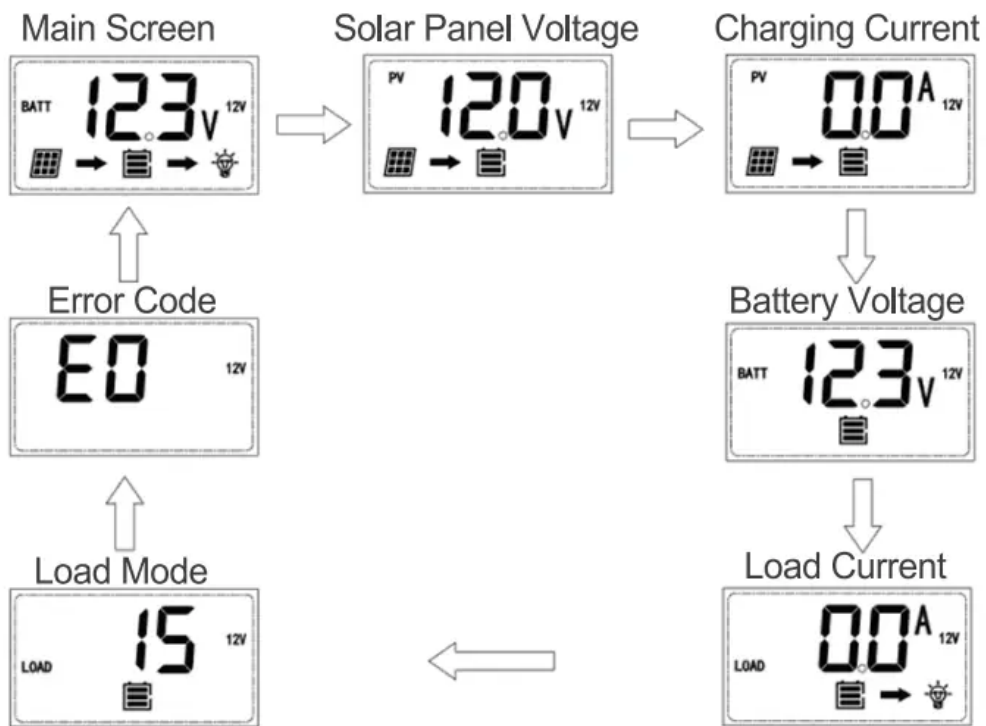


Operation

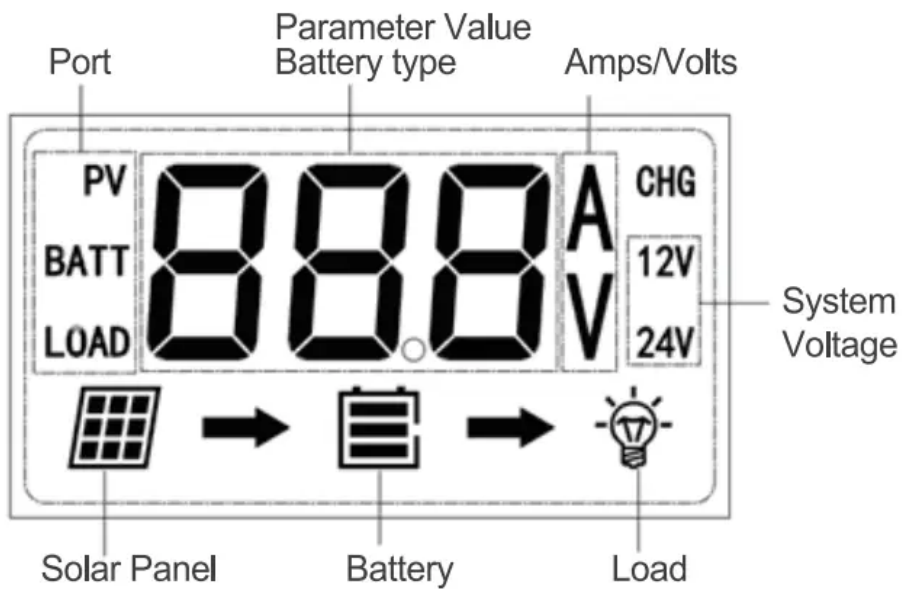
After connecting the battery to the charge controller, the controller will turn on automatically. Assuming normal operation, the charge controller will cycle through different displays. The user can adjust some parameters based on the display screen. The user can manually cycle through the display screens by using the “SELECT and “ENTER” buttons.




- **SELECT** Cycles forwards through the different display screens.
- **ENTER** Cycles backwards through the different select screens & Turn the load ON/OFF in the Manual Mode

Main Display



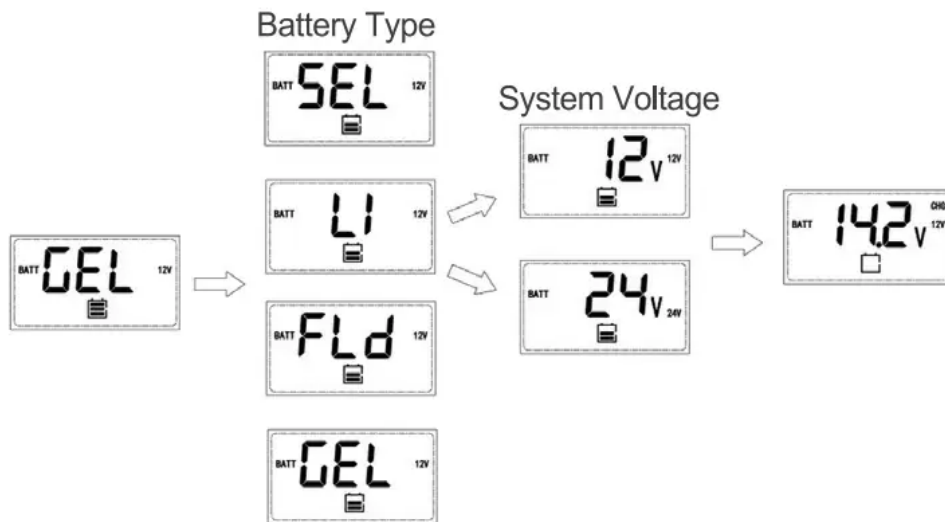
LCD Indicators



Icon or Value	State	Description
	Steady on	Solar Panels Charging Battery
	3 Bars Flashing	Battery Voltage (16.1V+)
	3 Bars	Battery Voltage (12.9V-16.0V)
	2 Bars	Battery Voltage (12.5-12.8V)
	1 Bar	Battery Voltage (11.6-12.4V)
	No Bars	Battery Voltage (11.5V and below)
	No Bars Flashing	Battery Voltage (10.9V and below)
	Steady on	Load is On

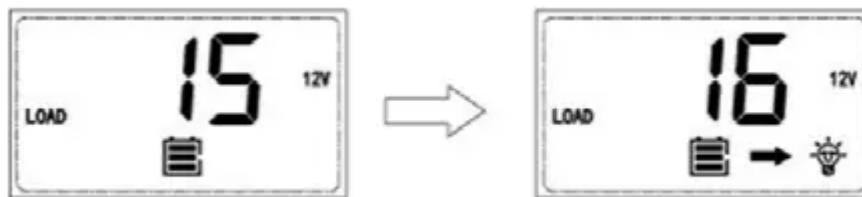
Programming Battery Type

To enter the battery programming settings hover over the Battery Voltage screen and press down the Enter button. When the battery type starts to flash press the Select button to cycle through the battery types and press Enter to finalize selection. When selecting the Lithium setting the user can change battery voltage from 12V to 24V and select the charging voltage.



Programming Load Terminal

To enter the load programming settings hover over the Load Mode screen and hold the Enter button. When the number starts to flash press the Select button to cycle through the load types and press Enter to finalize selection.



Setting	Mode	Description
0	Automatic (On/Off)	The load will turn on at night when the solar panel is no longer producing any power after a short time delay. The load will turn off when the panel starts producing power.
1-14	Time control	When the panel is no longer producing power, the load will be ON for 1-14 hours or until the panel starts producing power.
15	Manual	In this mode, the user can turn the Load On/Off by pressing the Enter button at any time.
16	Test	Used to troubleshoot load terminal (No Time Delay). When voltage is detected load will be off and when no voltage is detected load will be on.
17	24Hr	The load will be on for 24 hours a day.



Wanderer Protections

Protection	Behavior
PV Array Short Circuit	When PV short circuit occurs, the controller will stop charging. Clear it to resume normal operation
PV Over current	The controller will limit the battery charging current to the maximum battery current rating. Therefore, an over-sized solar array will not operate at peak power.
Load Overload	If the current exceeds the maximum load current rating 1.05 times, the controller will disconnect the load. Overloading must be cleared up by reducing the load and restarting the controller.
Load Short Circuit	Fully protected against the load wiring short-circuit. Once the load short (more than quadruple rate current), the load short protection will start automatically. After 5 automatic load reconnect attempts, the faults must be cleared by restarting the controller.
PV Reverse Polarity	The controller will not operate if the PV wires are switched. Wire them correctly to resume normal controller operation.
Battery Reverse Polarity	The controller will not operate if the battery wires are switched. Wire them correctly to resume normal controller operation.



Error Codes

Error Number	Description
E0	No error detected
E01	Battery over-discharged
E02	Battery over-voltage
E04	Load short circuit
E05	Load overloaded
E06	Controller over-temperature
E08	PV input over-current
E10	PV over-voltage
E13	PV reverse polarity
E14	Battery reverse polarity

Maintenance



Risk of Electric Shock! Make sure that all power is turned off before touching the terminals on the charge controller.

For best controller performance, it is recommended that these tasks be performed from time to time.

- Check that controller is mounted in a clean, dry, and ventilated area.

- Check wiring going into the charge controller and make sure there is no wire damage or wear.
- Tighten all terminals and inspect any loose, broken, or burnt up connections.
- Check to make sure none of the terminals have any corrosion, insulation damage, high temperature, or any burnt/discoloration marks.

Fusing

Fusing is a recommendation in PV systems to provide a safety measure for connections going from panel to controller and controller to battery. Remember to always use the recommended wire gauge size based on the PV system and the controller.

NEC Maximum Current for different Copper Wire Sizes									
AWG	16	14	12	10	8	6	4	2	0
Max. Current	10A	15A	20A	30A	55A	75A	95A	130A	170A

Fuse from Controller to Battery
<p>Controller to Battery Fuse = Current Rating of Charge Controller Ex. Wanderer 10 = 10A fuse from Controller to Battery</p>

Fuse from Solar Panel(s) to Controller
<p>Ex. 200W; 2 X 100 W panels</p> <p>Parallel Total Amperage = $I_{sc1} + I_{sc2} = (5.75A + 5.75A) * 1.56$ Fuse = minimum of $11.5 * 1.56 = 17.94 = 18A$ fuse</p>

Battery Charging Parameters

All the coefficient is referred to 25'C



Battery	GEL	SEALED	FLOODED	LI(LFP)
High Voltage Disconnect	16V	16V	16 V	16V
Over Voltage Reconnect	15.0 V	15.0V	15.0 V	15.0 V
Equalization Voltage	—	14.6 V	14.6 V	—
Boost Voltage	14.2 V	14.4 V	14.6 V	14.2 V (User: 12.6-16V)
Float Voltage	13.8V	13.8 V	13.8 V	
Boost Return Voltage	13.2V	13.2 V	13.2 V	13.2 V
Low Voltage Reconnect	12.6 V	12.6 V	12.6 V	12.6 V
Discharging Limit Voltage	10.8V	10.8 V	10.8 V	10.8V
Equalization Duration	—	2 hours	2 hours	—
Boost Duration	2 hours	2 hours	2 hours	—

Warning



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