JABONI
POWER PRODUCTS

Solar Charge Controller 30A-MPPT-RVC
with optional Remote Display RD-MPPT-RVC

OWNER / OEM INSTALLATION MANUAL

CONTACT
jabonipowerproducts.com

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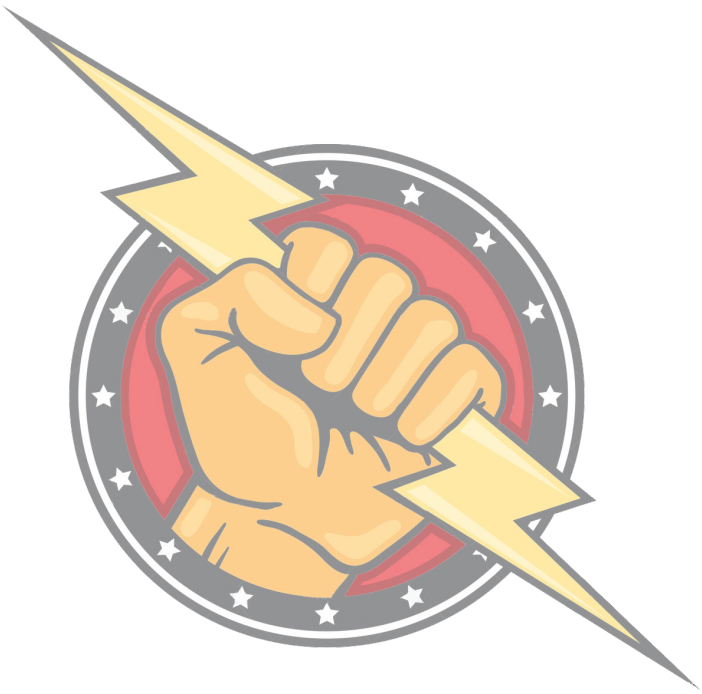
Introduction

NOTE: KEEP THIS GUIDE IN A SAFE PLACE FOR FUTURE REFERENCE. INSTALLATION MUST BE PERFORMED BY A TRAINED TECHNICIAN ACCORDING TO LOCAL AND NATIONAL STANDARDS.

THANK YOU for purchasing the state of the art, Jaboni Power Products (JPP) MPPT Solar Charge Controller. With proper maintenance, our product offers you a reliable means of converting solar energy to 12 VDC voltage to charge your low voltage battery system in an effective and efficient manner. Our controller also protects your battery from being overcharged by the solar panel.

The unit can communicate over the RVC-bus, displaying on a third party monitor, or an optional JPP remote display can be installed.



Safety

NOTE: THIS EQUIPMENT DOES NOT CONTAIN ANY SERVICEABLE PARTS. DO NOT OPEN. REMOVAL OF COVER WILL VOID WARRANTY.

⚠ EXPLOSION HAZARD:

DO NOT use the unit in the vicinity of flammable fumes or gasses such as propane tanks or battery compartments, exposure to high heat or prolonged freezing conditions. These may decrease the working life of the unit or void the warranty.

- Use only with 12 VDC battery systems.
- **DO NOT** exceed the voltage and current ratings of the controller.
- Use only a solar array rated for 12 VDC batteries (40 Voc max.).
- **DO NOT** short circuit the solar array and/or the load while connected to the unit. This will permanently damage the unit and not be covered under warranty.
- Protect the controller from direct sunlight.

Install the unit as close to the battery bank as possible. The battery acts as a low pass filter reducing the chance for electrical noise, ripple, and interferences that may get into the unit. We recommend using 10 awg wires (+ and -) no longer than 6 feet each way when possible.

Installation

NOTE: THIS UNIT WAS DESIGNED TO FUNCTION IN A PROTECTED ENVIRONMENT. EXCEEDING 45 VDC WILL DAMAGE CONTROLLER AND VOID WARRANTY.

INSTALLING YOUR DEVICE

Select a mounting location that is accessible and near the batteries. Mount the device in an area not used for storing items, as this could reduce clearance requirements, obstruct ventilation openings and affect the performance of the controller. Select a mounting location that will prevent excessive heat, water, moisture, dust and dirt entering the unit. The unit should be mounted on a non-flammable surface. The installation should be tested for overall performance.

ELECTRICAL LIMITS

Please verify that the voltages of the battery and DC-power system is 12 VDC and expected solar input between 16 and 40 VDC.

- Recommended fuse or breaker ratings: 40 A at Batt.
- Maximum in-put voltage: 45 VDC.
- Maximum in-put power: 550 Watts.

ORIENTATION

The Charge Controller Unit must be installed with the cooling fins vertically oriented. Ensure a minimum free space of two inches all around the unit. Wire ports should be facing down.

BATTERY AND SOLAR

All wires should be connected without voltage present (e.g. trip breaker, remove fuses, cover solar panels). Charger output wires in no circumstance should be hooked to a “buss” bar. The b+ output wire is required to be a dedicated wire ran to a properly rated fuse and then to + terminal of installed battery bank.

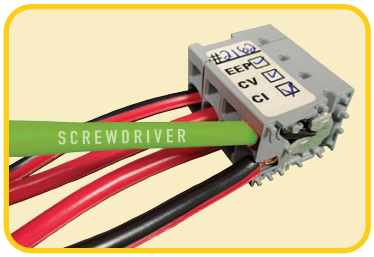
In the circumstance that the solar controller is installed without a battery present, the charger output wires should capped, secured and properly identified.

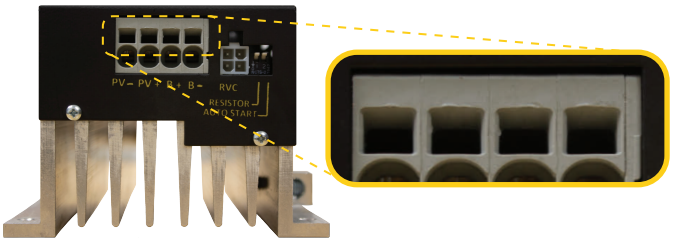
WARNING: WRONG WIRE CONNECTIONS WILL DAMAGE THE UNIT AND VOID ANY WARRANTY.

PUSH-IN CONNECTORS

Strip approximately 0.5 inches of insulation off the wire. Push the tab inside the rectangular hole of the connector using a small, flat screwdriver and plug the stripped wire into the circular hole. Then remove the screwdriver. The connector should hold the wire.

To disconnect the wire, use a flat screwdriver, as indicated below, and pull the wire out.





RVC CONNECTOR

The RVC port is directly next to the input and output terminals. Through the RVC port, the Charge Controller Unit can be connected to either the optional JPP Remote or to an on-board RVC network with its third party display. To use a third-party display, the system integrator needs to program the display.

GROUND LUG CONNECTOR

This connector is provided for required unit chassis ground connection. The unit must be connected to common system ground with a minimum of 14 AWG wire from this connector.

No additional adjustments are needed for the unit to function.

Operation

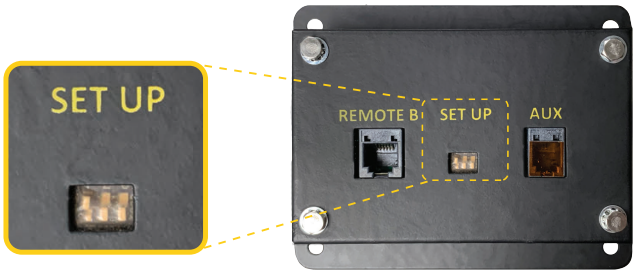
NOTE: THE DESCRIPTION OF OPERATION REFERS TO CONTROLS AND DISPLAY MESSAGES USING THE JPP REMOTE DISPLAY PANEL. IF ANOTHER DISPLAY IS USED ON THE RVC NET WORK, EQUIVALENT COMMANDS AND MESSAGES WILL BE AVAILABLE.

The Remote Display gives access to solar and battery status information and allows the user to modify some operating settings of the Charge Controller Unit.

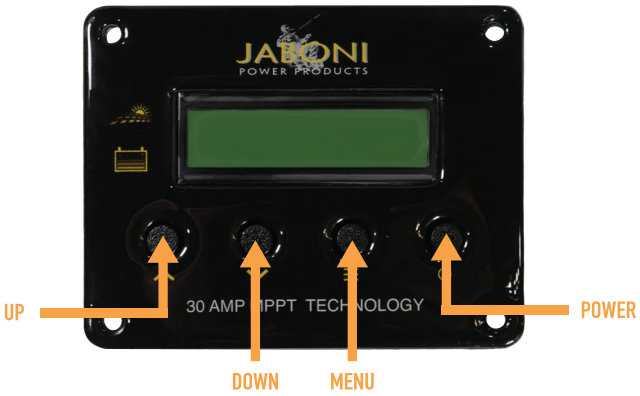
To use a third-party display, the system integrator needs to program the display.

Connect the RJ plug of the remote cable to the port identified as REMOTE on the back of the Remote Panel and the Molex connector to the Molex port labled RVC on the Charge Controller Unit.

The dip switches on the back of the remote should be "UP, DOWN, DOWN" from left to right.



Display Menu & User Controls



DISPLAY MENU AND USER CONTROLS

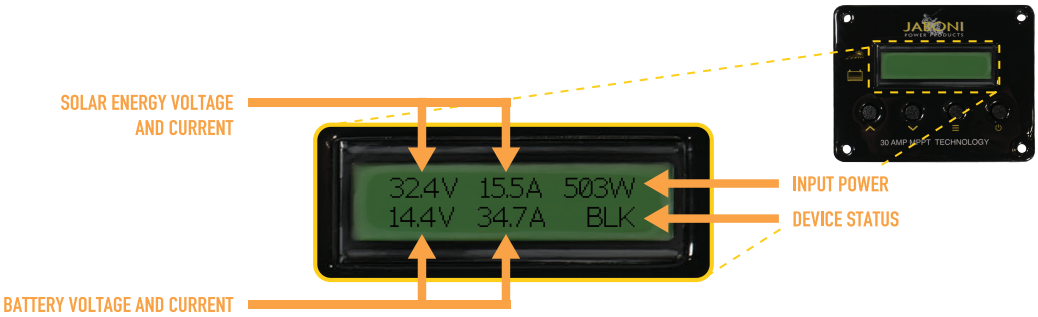
- Press the "MENU" button to show the first menu option (OPTION 1:).
- Press the "MENU" button again to show the next option (OPTION 2-6).

To change the value of the option, press the "UP" or "DOWN" buttons. After changing the value of the option shown, press the "POWER" button to save the new value. The display will return to the main screen (voltage, current and device status).

If no button is pressed for five seconds after changing a value or option, the display will return to the main screen without changing the value setting

Available options are:

- Charger RVC Instance OPTION 1: Selects the Charge Controller to be managed (range 1-4). Default: 1.
- Maximum Output Current OPTION 2: Configures the output current (range 1-30 amps). Default: 30.
- Battery Type OPTION 3: Sets the battery type (options are WET (wet lead-acid),
- AGM, GEL and LITH (lithium). Default: WET.
- LCD Contrast OPTION 4: Changes the contrast of the display (range 1-9). Default 5.
- Communication Port OPTION 5: Changes the configuration of the port to allow a technician to connect the Unit to a PC (options are CAN and PC). Default: Can.



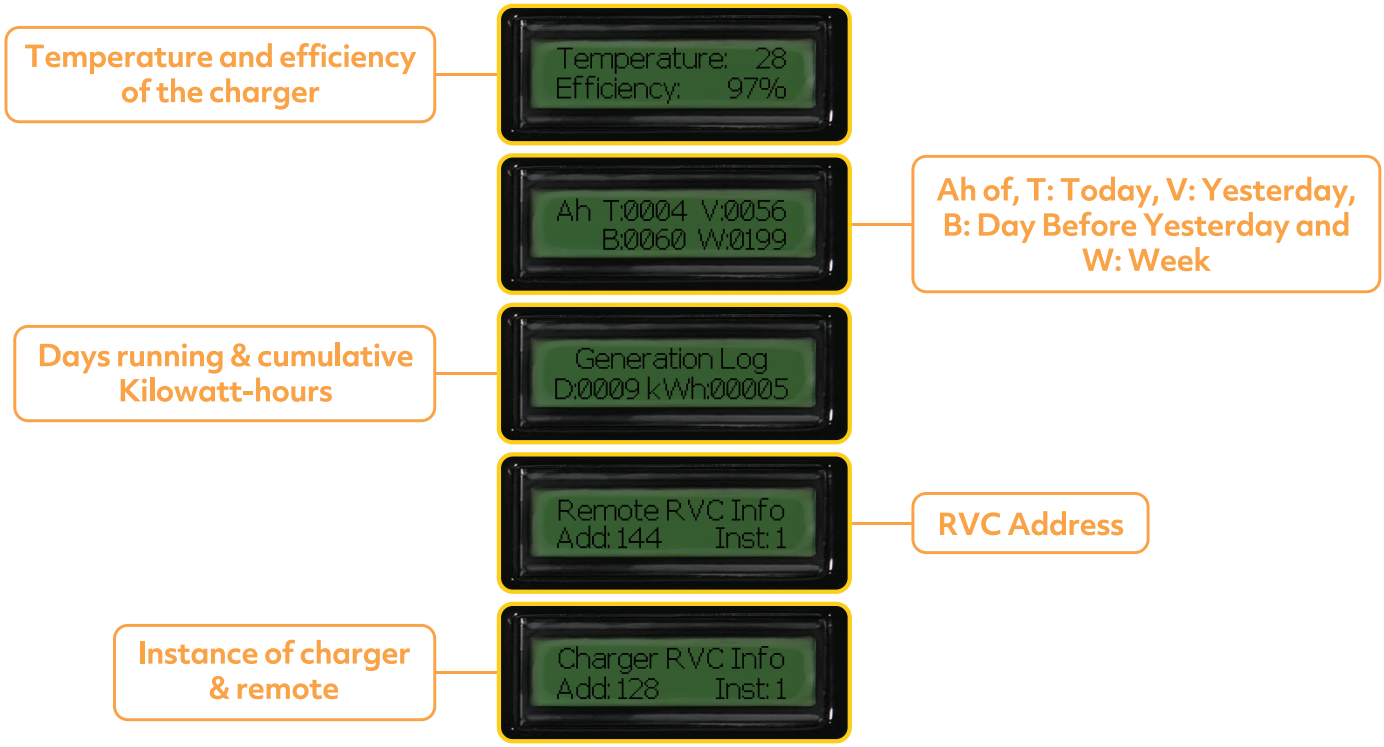
When the controller is powered up, the top line of the LCD display gives the voltage and the amperage coming in from the solar array, as well as the total power in watts. The bottom line of the display shows the battery voltage, and the amount of amperage the controller is sending to the battery bank, followed by what mode the charge controller is in.

With solar panels connected, the digital control system applies a 3-stage charging algorithm:

Bulk Charge (shown as BLK), Absorption Charge (shown as ABS) and Float charge (shown as FLT) in accordance with the state of charge of the battery and the type of battery selected.

The unit will enter standby mode (shown as STBY) if the solar panel voltage drops below 15VDC during the charge (for example, at night). The unit will return to charge mode when the solar panel voltage is greater than 15VDC.

From this screen, pressing the arrow keys will scroll through available stored information.



The DIP Switch located on the back of the Remote Unit enables (switch 1 on/in the down position) or disables (switch 1 off/in the up position) the terminator resistor and sets the RVC instance number of the display in case there are more displays sharing the same network as follows:

Switch 2 & 3 in ON postion	None	2	3	2,3
Instance	1	2	3	4

In case the Remote shows strange characters or does not respond to buttons, you can reset it without disconnecting it. Simply press briefly "UP", "DOWN" and "POWER" at the same time and the Remote will restart and retain the settings.

The Charge Controller Unit is intended to be used with a display, although the Unit can be disconnected from the Remote or display and it will operate autonomously after the Unit is on.

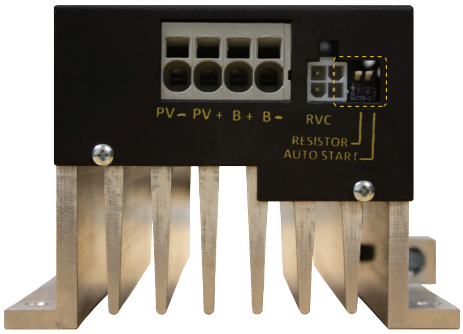
The Unit has a communication port, a RESET button, two sets of DIP switches and one LED indicator.

The communication port allows a qualified technician to do firmware upgrade and diagnosis if required. This is done using a special cable provided by the factory. The RESET button is used to reinitiate the unit (Hard-Reset) if something goes wrong and to upgrade the software with a new version.

The DIP switches labeled "SETUP" sets the RVC instance of the device, 1 by default. The options are:

Switch in ON postion	None	2	3	1,2
Instance	1	2	3	4

*Initiate any changes to DIP Switches after controller is powered up.



The DIP switch next to the RVC Plug on the bottom of the controller enables the terminator resistor and the auto start feature. The terminator resistor is needed when multiple charge controllers are hooked up to a single remote. If this applies to your install, see pg 12. If a single charge controller is being used, the terminator resistor should be in the DOWN (ON) position. The Auto Start feature enables the controller to automatically begin producing a charge voltage and current as soon as a solar panel is producing power, regardless of a battery being installed. This feature is intended to "wake up" a lithium battery if an over-discharge event occurs and the battery has "disconnected". THIS IS NOT INTENDED TO PROVIDE OPERATING CURRENT TO A DEVICE. USING IT IN THIS FASHION COULD PERMINATLY DAMAGE THE CONTROLLER AND WILL NOT BE COVERED UNDER WARRANTY.

If the auto start feature is enabled (in the up position), the charger will start charging after being powered on without the Remote or RVC connection. NOTE: Auto Start should only be used in conjunction with a lithium battery bank.

Switch 1 ON: Enables resistor
Switch 2 ON: No auto start option

The Charge Controller can be turned on or off using the remote or a third-party display programmed with the appropriate RVC commands. It can also be turned on by enabling the auto start feature and pressing the reset button. Also, the output current and the battery type of the Charge Controller Unit must be configured using these ways.

While the unit will operate without a display of any kind, a remote or third party display must be used to change any setting from default.

Testing Procedures

- ★ Ensure the charger output wires are directly connected to the proper location; (+) connected directly from controller to properly rated fuse, fuse to battery on a dedicated wire and (-) connected directly to the negative terminal of the battery or a negative "buss" that is also connected to the negative terminal of the battery.
- ★ Ensure the + and – wires of the output on the controller are coming from the battery bank and are connected to their respective polarity.
- ★ Unplug the coach from shore power.
- ★ Ensure the ground lug is connected (with a minimum of 14 AWG wire) to the frame.
- ★ Ensure the solar array is in full sunlight, with no obstructions to the array.
- ★ Check the blue status light on the controller, the blue light should be solid and stay lit.
    - If the blue status light is blinking slowly, this could mean the solar array has inadequate sunlight exposure or the state of charge of the bank is full.
        - Attempt running a load from the bank and recheck the blue status light to ensure it is solid.
        - Move the coach in to adequate sunlight.
- ★ If a remote display is present, make sure BLK, ABS or FLT is present in the lower right hand corner.
    - If OFF is displayed in the lower right-hand corner, press the "POWER/SELECT" button to turn the controller on.
    - If CHG? Is displayed in the lower left-hand corner, refer to the DIP switch chart on page 8 to select the correct controller in MENU OPTION:1. Or change the dip switches to match the selected controller in MENU OPTION: 1.
    - If STBY is displayed, the panels have inadequate sunlight or the bank's state of charge is full. Run a load on the bank to bring the batteries' voltage down, causing the controller to allow current to pass through to the bank.
- ★ The display (from left to right, top to bottom) will have varying values due to different solar arrays. Verify that the top left voltage reading is between 16 VDC & 40 VDC.
- ★ The lower left voltage matches the bank's voltage (A .1-.2V deviation is acceptable).
- ★ Both AMP readings in the center will also vary due to different size arrays. Verify that both AMP readings are actively refreshing.

Press the menu button to bring up the menu options. Highlighted below are the set menus that will appear. Pressing the menu button will scroll through the menu option screens:

1

MENU OPTION 01: OPTION CHG: 01
MENU OPTION 02: MAX AMPS: 30
MENU OPTION 03: BAT TYPE: WET

NOTE: IF THE BATTERY TYPE BEING USED IS DIFFERENT THAN THE WET DEFAULT SETTING, PRESS THE UP OR DOWN ARROW TO DESIRED BATTERY TYPE AND THEN PRESS POWER TO SAVE. DO NOT USE A DIFFERENT BATTERY SETTING THAN THE BATTERY TYPE BEING USED. THIS CAN CAUSE DAMAGE TO THE SOLAR SYSTEM AND BATTERIES.

2

MENU OPTION 04: CONTRAST 5
MENU OPTION 05: CLEAR LOG?: NO
MENU OPTION 06: COM TYPE: CAN

After confirming these settings, the screen will default back to the monitoring screen after a few seconds.

The LED indicates the unit status as shown:

LED	Off	Slow Blink	Steady	Fast blink
STATUS	Off or not energized	Standby mode	Charging	Faulty condition

Multiple Controllers

Each display is capable of monitoring up to four solar charge controllers. The display can be changed to view each controller individually (1-4). To view individual controllers press the MENU button on the display to go to MENU OPTION:1. Then, press the UP or DOWN button to select the desired controller. Next, press the POWER/SELECT button to save the value.

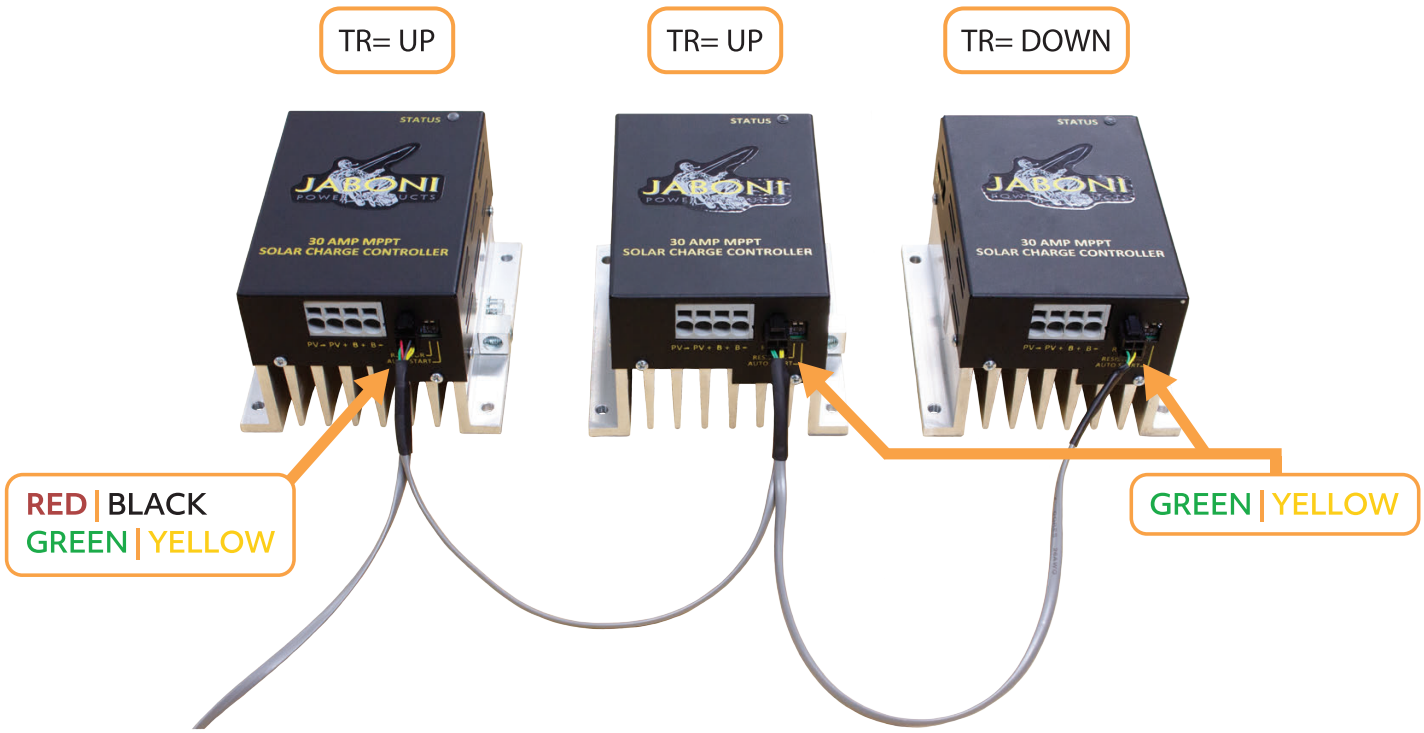
To connect up to four controllers, a Jaboni Power Products adapter is required.

NOTE: DO NOT USE A THIRD PARTY ADAPTER OR WARRANTY WILL BE VOID.

Each controller BEFORE the last controller in the string should have the terminator resistor in the OFF (UP) position.

While the last controller in the string should have the terminator resistor (TR) in the ON (DOWN) position.

Example: If three controllers are going to be used.



Care & Maintenance

The Charge Controller is maintenance free. Follow battery manufacturers instructions pertaining to battery maintenance.

Ensure the controller is installed INDOORS in a dry location and away from heat and moisture sources.

The following periodic inspections and maintenance tasks are highly recommended for best performance:

- Check for any rusting or corrosion around the battery terminals.
- Verify that the connected solar panels and loads do not exceed the unit rating.
- Tighten all the terminal screws and inspect for any loose, broken, corroded, humidity, and burned wire connections.
- Ensure solar panel is mounted properly, trying to avoid partial shadows on them.
- Check for any dirt, debris, or corrosion on the solar panels.
- Periodically clean the solar panels with water. **DO NOT** use chemicals.

It is recommended to verify the battery state of charge regularly, that the connected DC loads do not exceed the maximum rating of the unit, and that the average total power consumption of the DC loads is less than the one that can be produced by the solar panel array.

Troubleshooting

ERROR CODES

There are certain conditions that will shut down the unit and the remote display will show a fault message. These conditions and fault messages are:

MESSAGE	POSSIBLE CAUSE	ACTION TO TAKE
HIGH BAT VOLTAGE	The battery bank is receiving charge from another controller; battery cable loose or was disconnected while charging.	Check if another controller is charging/ equalizing the bank. Turn off unit and check connections.
LOW BAT VOLTAGE	Battery bank is discharged; one or more batteries are damaged.	Disconnect loads from battery bank before trying to charge again. Check battery conditions and replace if necessary.
HEATSINK TEMP	Poor ventilation around the unit High ambient temperature; continuous overload current.	Ensure the unit is mounted in the correct orientation and there is a minimum of 2 inches clearance on all sides of the unit.. Turn off unit and let it cool down. Check if loads are draining too much current from batteries. Disconnect unnecessary loads.
OVERCURRENT	A load was connected suddenly to battery bank; Short circuit at the output.	Check loads and battery connections.
Hi PANEL VOLTAGE	The solar array voltage is higher than the limit of the charger.	Verify the solar panel array configuration / connections

- When an error code occurs, the unit will interrupt charging and remain idle. After removing the cause, press the POWER button to reset the fault and press it again to reinitiate the unit.
- If the condition disappears but the fault code remains, the device may have problems and should be sent to a Repair Center.
- By default, the error will be reset after one minute and will return to the last normal status STANDBY, ON or OFF mode).
- If abnormal behavior is present, you can reset the Charge Controller Unit without disconnecting it— simply press briefly the RESET button. The unit will restart, keeping the battery type and maximum current configurations intact.

Warranty

Jaboni Power Products extends to the original owner a One Year Limited Product Warranty. This Warranty is in effect from the date of original purchase for a period of one (1) year. This Limited Warranty is extended specifically for and is limited to recreational vehicle or Specialty Vehicle application and is valid only within the continental United States, Alaska, Hawaii and the provinces of Canada. JPP warrants to the original owner that its products are free from defects in material and workmanship, under normal use and service, based on its intended use and function. This Warranty is limited to the repair or replacement, at JPP' s discretion, of any defective parts or defective assembly. Any implied warranties of merchantability or fitness for intended use are limited in duration unless applicable State Law provides otherwise. You may have other rights as specified by each individual state.

EXCLUSIONS

The OEM Warranty specifically does not apply to the following:
Any JPP product that has been repaired or altered by any unauthorized person. Any damage caused by misuse, faulty installation, testing, negligence, accident or any JPP product installed in a commercial vehicle. Any JPP product whose serial number has been defaced, altered, or removed. Any JPP product whose installation has not been in accordance with the JPP written instruction. Any consequential damages arising from the loss of use of the product including, but not limited to, inconvenience, loss of service, loss of revenue, loss or damage to personal property and cost of all services performed in removing or replacing the JPP product. Specifications are subject to change without notice or obligation.

CONSUMER WARRANTY CLAIM PROCEDURE

Upon determination and validation by an authorized OEM dealer that a JPP product has a defect, the dealer shall contact JPP warranty service and obtain a return goods authorization (RGA) number. This number must appear on all correspondence with warranty service. Upon validation of the warranty, JPP, at its discretion, shall either repair or replace the product with a like product. For ease of identification. The RGA number must be placed on the outside of the carton used to return the product.

Do not mark directly on the product. The product must be packaged properly to avoid further damage, which could cause a non-warrantable condition.

Data Sheet

SOLARCHARGE CONTROLLER FOR RECREATIONAL VEHICLES 30A-MPPT-RVC

ELECTRICAL AND PHYSICAL SPECIFICATIONS 30A-MPPT-RVC		
PARAMETER	**VALUE**	**UNIT**
Nominal system voltage	12	VDC
Minimum solar array voltage	15	VDC
Maximum solar array voltage	45	VDC
Maximum output current	30	ADC
Battery voltage range	8 - 16	VDC
Maximum input power	550	Watts
Peak efficiency	97	%
Operating consumption	30 - 40	mA
Dimensions	11.23x12.21x8.22	cm
Humidity (non-condensing)	95	%
Operating temperature	0 to 50	·c
Overall volume	1127	cm3
Weight	0.82	Kg
Wire gauge	8 - 12	AWG
Communication protocol	RVC (Can Bus)	

ELECTRICAL AND PHYSICAL SPECIFICATIONS JPP REMOTE DISPLAY		
PARAMETER	**VALUE**	**UNIT**
Display	2-line, 16 character LCD	
Communication protocol	RVC (Can Bus)	
Dimensions	9.53x12.07x2.94	cm
Weight	0.09	Kg

30A-MPPT-RVC CONDITIONS	PROTECTIONS
Solar array reverse polarity	Yes
Over temperature (maximum 40 amps)	Yes
Overcurrent	Yes
Reverse current from battery to panel	Yes
Short circuit	External fuse/breaker supplied by user
Battery reverse polarity	External fuse/breaker supplied by user

RE-INITIATE VOLTAGES	
Sealed / Gel Charge Restart	12.5 VDC
AGM Charge Restart	12.9 VDC
Flooded / Wet Charge Restart	13.0 VDC
Lithium Charge Restart	13.3 VDC

BATTERY CHARGER PROFILES		
TYPE	**STAGE**	**VALUE**
SEALED / GEL	Bulk	14.2 VDC
	Absorption	14.2 VDC
	Float	13.2 VDC
AGM	Bulk	14.6 VDC
	Absorption	14.6 VDC
	Float	13.5 VDC
FLOODED / WET	Bulk	14.4 VDC
	Absorption	14.4 VDC
	Float	13.4 VDC
LITHIUM	Bulk	14.4 VDC
	Absorption	14.4 VDC
	Float	13.6 VDC