

MONITORING

1. LED Indicator

The 3 LEDs indicate charging status. These functions are described below.

Solar Power Indication (POWER LED - red)

ON: Indicates solar panel properly connected and solar power supplied normally.

OFF: No power available or insufficient voltage to active charge controller.

Charging status ("CHARGING" LED - yellow; "CHARGE COMPLETE" LED - green)

Status	LED		Conditions
	Charging	Charge Complete	
Solar power Weak	OFF	OFF	Indicates the solar panel voltage is too low when it is in Bulk charge mode. (insufficient daylight)
Bulk Charge	ON	OFF	Indicates the battery is charging, virtually all the power from the solar panel pass through to the battery.
Float Charge	OFF	ON	Indicates full charge reached, a small "Float" charge continues to optimize battery when needed

2. Digital LCD meter

A digital LCD meter is available on this controller, it will continuously display battery voltage.

MAINTENANCE

Ensure all wire connections sound good and free from corrosion. Tighten the terminal block screws of the panel connections and battery terminals.

Visual Check of Solar panel and battery output cabling for signs of overheating, damage and cracking.

If any wires damaged, replace with new one immediately.

Verify each LED status whether it meets the specifications or not.

The above maintenance should be done at least every 3 months

TROUBLE SHOOTING

The system of solar Panels – Controller - batteries is sized incorrectly - The batteries will be under-charged if the solar panel is too small, or if the battery bank is too small, or if the usage is too high.

Solar panel problems - Solar panel can be seriously affected by the angle of the panel (as in winter months), minor shading, high level haze (barely visible) and dust on the panel.

Battery problems - If the battery is going bad, a little charging or discharging will cause a large change in the battery voltage. A battery short somewhere can also reduce the battery voltage.

Incorrect connection of Controller - Includes reversing the polarity from the panels or batteries, or switching the panel and battery connections.

EWC-10

12 Volt 10 Amp Digital Solar Charge Controller
Installation & Operation Manual

IMPORTANT SAFETY INSTRUCTION: SAVE THESE INSTRUCTIONS

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS FOR 12V SOLAR CHARGE CONTROLLER. KEEP IT WITH OR NEAR THE CONTROLLER AT ALL TIMES.

The charge controller is designed to protect your 12Volt Lead-acid battery from being overcharged by solar panel, it also prevents discharging of battery during the night. This controller reduces overall system maintenance and prolongs your batteries life. It will display the charging current or battery voltage from the LCD digital meter. This controller is design to work with all kinds of 12 Volt solar panels for indoor installation.

WARNING: RISK OF EXPLOSIVE GAS- Working in the vicinity of a lead acid battery is dangerous. Batteries generate explosive gases during normal battery operation. Always work in a well-ventilated area.

• **DO NOT** smoke, strike a match, or cause a spark in the vicinity of batteries during charging.

• **CAUTION: DO NOT EXCEED THE UNIT'S VOLTAGE AND CURRENT RATINGS:**

Solar array voltage - **MAXIMUM** 23 Volts.

Charging current- **MAXIMUM** 10 Amps.

• **CAUTION: DO NOT DEVIATE FROM THE RECOMMENDED WIRING INSTRUCTIONS:**

• **DO NOT** reverse the Battery and Solar Panel connections to the controller.

• **DISCONNECT** the controller from the solar Panel and battery before attempting any maintenance or cleaning.

• **Do not** disassemble the controller. Take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of damage to the Solar system.

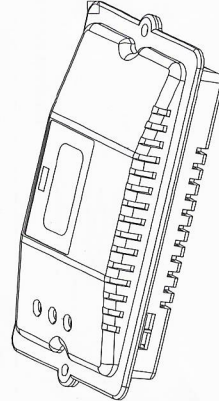
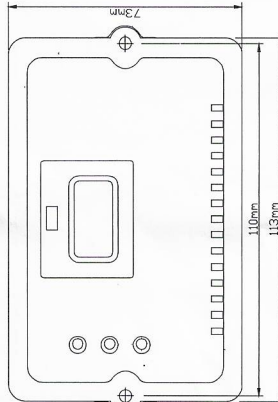
• **Installation** should be made by a qualified person.

PERSONAL PRECAUTION:

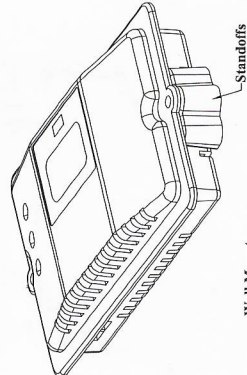
• If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flush eye with running cold water for at least 10 minutes and get medical attention immediately.

• In order to reduce the risk of sparks or short circuits that could result in an explosion be careful not to drop metal tools on any connections.

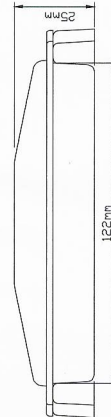
Controller Dimension



Panel Mount



Wall Mount



Features

- Digital Meter – Battery voltage is shown digitally.
- Protects and Maintains battery – Protect batteries from overcharging and maintains batteries in fully charged state.
- Safety circuit protection – Reverse polarity protection
- Reverse leakage protection – Protects batteries from being discharged by solar panel.
- Temperature Protection– Over temperature protection and auto-resume
- Status Lights – Easy reading LED indicators.
- Mounting Options – Panel mounting / wall mounting.

Installation and Operation

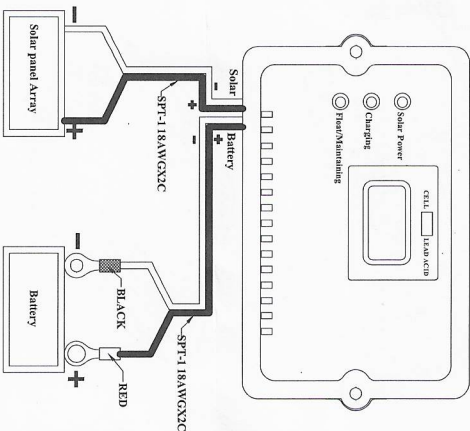
1. Mounting
- 1.1 Mounting Consideration: - The solar controller is designed to either be panel mounted or wall mounted.
- 1.2 Panel mounting: The flush mount unit requires a rectangular cutout in the mounting surface with sufficient space (1 inches) behind to accommodate the controller.
- 1.3 Wall mounting: The wall-mounted unit is installed onto a wall surface using two mounting screws. Electrical connections are made to the back of the controller. Wiring can be run down the wall or through a hole in the wall directly below the controller.
- 1.4 Recommended Battery Capacity : 12V 35AH minimum.
2. Connection Procedures (refer to Connection diagram)
- 2.1 Mount the solar controller panel.
- 2.2 Connect the battery positive side to the solar controller BATTERY POSITIVE + with a suitable wire.
- 2.3 Connect the battery negative side to the solar controller BATTERY NEGATIVE – with a suitable wire.
- 2.4 Connect the solar panel positive side to the solar controller (ARRAY) PANEL POSITIVE + with a suitable wire (Be careful DO NOT short circuit the solar array.)
- 2.5 Connect the solar panel negative side to the solar controller (ARRAY)PANEL NEGATIVE – with a suitable wire

Any wiring variation of size or length can affect the LCD meter performance

3. Wire size: - Refer to the "WIRE SIZE" chart below to determine the minimum size wire needed for each connection. When using heavy stranded wire, you may need to divide the ends into two groups and straddle the screw on the terminal block.

Length of Wire AWG	Battery Connection Distance round trip (meter)	Solar Panel Connection Distance round trip (meter)
	< 0.9m 18	<3m 18

4. Connection diagram



CAUTION: Do not attempt to change the battery type selector switch during charging, otherwise the LCD meter readings will be affected.

5. OPERATION

When connection is completed, the charge controller will start charging the battery automatically. The solar controller prevent over charging the battery.

6. Specifications

Technical Specifications		
PARAMETERS	UNITS	DATA
ELECTRICAL:		
Normal Input (solar Panel voltage)	Volt	17~22
Max. Input solar panel voltage	Volt	23
Peak charging current:	Amps	12
Charging start when Battery voltage not less than	Volt	5.0 +/-1.0
Current Consumption when connected 12V panel (Battery not present)	mA	55 max.
Current Consumption when connected 12V battery (Panel not present)	mA	10 max.
CHARGING CHARACTERISTICS		
Max. Bulk charging current	Amps	10
Cut-out voltage for Lead-acid battery	Volt	14.5 +/-0.3
Cut-in voltage for Lead-acid battery	Volt	13.5 +/-0.3
Cut-out voltage for Gel battery	Volt	14.1 +/-0.3
Cut-in voltage for Gel battery	Volt	13.2 +/-0.3
LCD METER DISPLAY:		
Min. LCD Display Voltage	Volt	6.0 +/-0.4
Max. LCD Display Voltage	Volt	19.0 +/-0.4
PROTECTION:		
Over temperature protection starting at (Stop charging)	°C	>85
Over temperature protection reset at (Restart Charging)	°C	<75
MECHANICAL		
Controller Dimension	mm	120 (L) x 75(W)
Controller overall Height	mm	Approx. 25
Input Lead (SPT1 18AWGX2C VW-1 105°C)#	mm	Approx. 900
Output Lead (SPT1 18AWGX2C VW-1 105°C)#	mm	Approx. 900
Net weight	g	Approx. 300
ENVIRONMENTAL CHARACTERISTIC:		
Operation temperature	°C	-5 to 50
Storage temperature	°C	-10 to70
Operation humidity range		0 to 80% RH

Remark : # With lettering wire is for positive. The other is for negative.