VOLTECH

Installation and Operating Instructions

Solar System Controller

ISC1000

About this manual

These operating instructions come with the product and shall be kept along it for all the life of the product for a proper installation and usage of it.

- Read these operating instructions carefully before use,
- Keep them over the entire life of the product,
- And pass then on to any future owner or user of this product.

This manual describes the installation, function, operation and maintenance of the solar system controller ISC1000.

These operating instructions are intended for end customers. A technical expert must be consulted in cases of uncertainty.

Safety

1. The solar controller may only be used in PV systems for charging and controlling Lead-Acid batteries.
2. No energy source other than a solar generator may be connected to the solar charge controller.
3. Do not connect any defective or damaged measuring equipment.
4. Follow the general and national safety and accident prevention regulation.
5. Never alter or remove the factory plates and identification labels.
6. Keep children away from PV systems.
7. Never open the device.
8. One set solar module can connect with one controller only.
9. Never touch bare cables ends.

Other risks

Danger of fire and explosion

- ◆ Do not use the solar charge controller in dusty environments, in the vicinity of solvents or where inflammable gases and vapors can occur.
- ◆ No open fires, flames or sparks in the vicinity of the batteries.
- ◆ Ensure that the room is adequately ventilated.
- ◆ Check the charging process regularly.
- ◆ Follow the charging instructions of the battery manufacturer.

Battery acid

- ◆ Acid splashes on skin or clothing should be immediately treated with soap suds and rinsed with plenty of water.
- ◆ If acid splashes into the eyes, immediately rinse with plenty of water. Seek medical advice.

Fault behaviour

Operating the solar charge controller is dangerous in the following situations:

- The solar charge controller does not appear to function at all.
- The solar charge controller or connected cables are visibly damaged.
- Emission of smoke or fluid penetration.
- When parts are loose.

In these cases immediately remove the solar charge controller from the solar panels and battery.

Function

The solar system controller is designed to:

- Monitor the state of charge of the battery;
- Controls the charging process,
- Control the connection/disconnection of loads,
- Make sure solar system works at proper condition.
- Manual load switch with automatic re-start.

LED INDICATOR

LED PANEL	Illuminate green when solar panel is charging battery *LED off, PV voltage less than Battery voltage or solar input polarity is connected in wrong way, solar input is cut off.*
LED BATTERY	Illuminate green, battery is good and voltage of battery is 12.5-13.6V; Blink in green, battery is fully charge and in float charging mode, voltage of battery is 13.6-14.4V. Illuminate orange, battery is weak, voltage of battery is 11.5-12.5V Illuminate red, battery is empty, voltage of battery is below 11.5V
LED Question	Illuminate red, polarity of battery is connected in wrong way, Blink in red, ➢ Battery is over discharged, can't be charged again. ➢ Voltage of battery is higher than 14.4V or battery is broken, can't be charged ➢ If battery is over current charged(>10Amp) more than 3 second, controller will cut off input of battery and Red LED blink 3 minutes than Red LED turn off ➢ Over voltage of solar panel LED off No abnormality detected
LED Load	Illuminate white, system provide power to load in proper way; Blink in white, overload, more than 10Amp, last 3 second, controller will cut off output automatically. After 30 seconds blink, LED will turn off. LED off, no output of load.

Installation

Danger of explosion from sparking! Danger of electric shock!

- The solar charge controller may only be connected to the local loads and the battery by trained personnel and in accordance with the applicable regulations.
- Follow the installation and operating instructions for all components of the PV system.
- Ensure that no cables are damaged.
- Ensure that polarities of Solar panel/battery/load are connected in proper way.

1. Mounting the solar charge controller

1.1 Do not mount the solar charge controller outdoors or in wet rooms

1.2 Do not subject the solar charge controller to direct sunshine or other source of heat.

1.3 Protect the solar charge controller from dirt and moisture.

1.4 Maintain a minimum clearance of 10cm below and around the device to ensure unhindered air circulation

1.5 Mount the solar controller as close as possible to the batteries (with a safety clearance of at least 35cm).

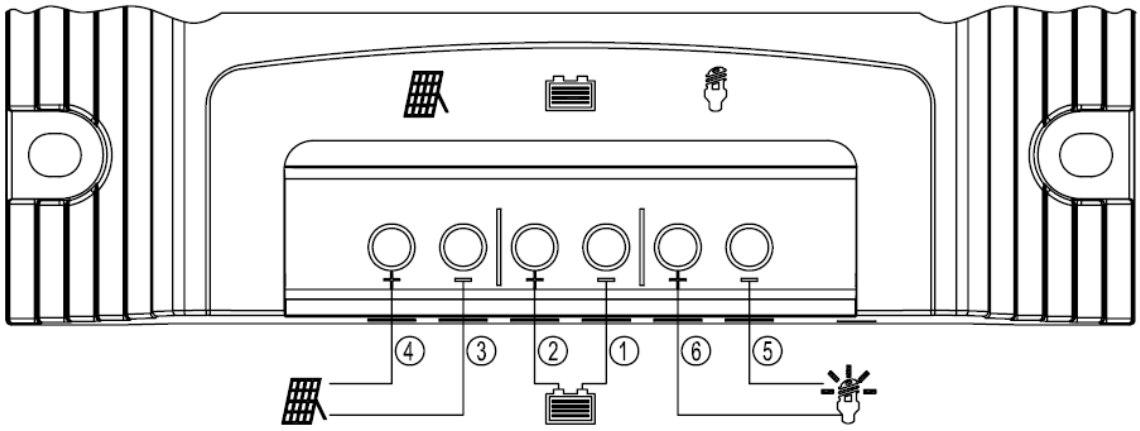
2. Fix the solar charge controller

2.1 Mark the position of controller fix holes on the walls;

2.2 Drill 4pcs Ø6mm holes and insert dowels.

2.3 Fix the controller to the wall with the cable openings facing downwards, using 4 oval head screws M4x35(DIN 7996).

Install the solar system and operating mode

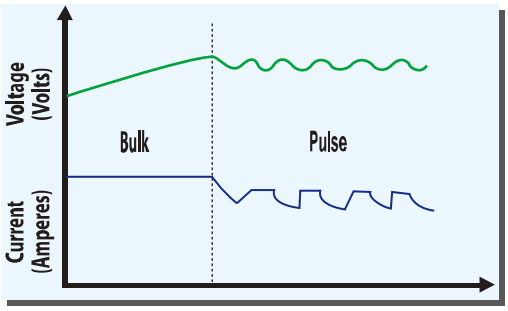


- Connect the wires in the sequence from 1 to 6 according the above diagram.
  Disconnect the wires in the REVERSE sequence from 6 to 1 according the above diagram.
- Use only with 12V batteries only.
- Never exceed the nominal ratings(see below technical date for reference).
- Suggested cable length, 10m solar panel connection cable/2m battery connection cable/5m load connection cable

TECHNICAL INFORMATION

Max. Input Current	10Adc
Max. Input Voltage (Voc)	29Vdc
Max. Load Current	10Adc
Over charge Voltage	14.4Vdc±2%
Over discharge Voltage	11Vdc±2%
Output Voltage	12Vdc
Typical idel Consuption	< 10mAdc
Operating temperature	-20°C/+50°C

Charging Curve



Bulk: This is the first charging stage where the battery at low charge stage, typically 10%, receives the majority of its charge. During this stage the battery brought to about 95% of its charger getting 100% of the available solar power.

Pulse (Maintenance): At the end of bulk stage, typically when the battery reach 14.4 Volts, a maintenance mode starts where the battery voltage can float between an high and low value fixed by the controller. These values are temperature compensated in order to keep the battery at 100% charge stage in any condition.

Protection functions

- ◆Overcharge protection
- ◆Deep discharge protection
- ◆Battery under voltage protection
- ◆Solar panel reverse current protection

The following installation faults do not destroy the controller. After correcting fault, the device will continue to operate correctly:

- ◆Overcharge protection
- ◆Deep discharge protection
- ◆Reverse polarity protection of load, panel and battery
- ◆Automatic electronic fuse
- ◆Short circuit protection of load and panel
- ◆Over voltage protection at panel input
- ◆Open circuit protection without battery
- ◆Reverse current protection at night
- ◆Overload protection
- ◆Battery over voltage shutdown

Maintenance

The controller is maintenance-free. We strong suggest that all components of the PV system must be checked at least annually,

- ◆Ensure adequate ventilation of the cooling element
- ◆Check the cable strain relief
- ◆Check that all cable connections are secure
- ◆Tighten screws if necessary
- ◆Terminal corrosion

FAQ

No LED display

- Battery is not connected

Remedy: unclamp connection of battery and reconnect to battery.

- Battery voltage too low

Remedy: Pre-charge the battery

- The external fuse in the battery connection cable has blown

Remedy: Replace the external fuse

- Battery is defective

Remedy: Unclamp all connections, connect a proper battery with correct polarity and reconnect the solar panel and loads.

Load can't be operated or only for a short time

- Load is not connected

Remedy: Reconnect loads

- Battery voltage too low to provide energy

Remedy: Wait till battery is charged.

- Load output is switched off due to excessive load current

Remedy: Reduce load current, if necessary switch off or disconnect loads
Check loads.

- Load output is switched off due to short circuit at load output

Remedy: Disconnect loads, correct the cause of the short circuit, reconnect loads.

Battery is not charged

- Solar panel is not connected

Remedy: Connect the solar panel.

- Solar panel connected with incorrect polarity

Remedy: Connect the solar panel with the correct polarity

- Short circuit at solar panel input

Remedy: Correct the cause of the short circuit

- Rainy or sunshine can't provide power for battery

Remedy: Wait for a sunshine day.

- Battery is not connected

Remedy: Reconnect battery.

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Waste electrical products should not be disposed of with household waste
Please recycle where facilities exist
Check with your local authority or retailer for recycling advice

FOR TECHNICAL
ADVICE OR HELP
PLEASE CONTACT:

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