

FEATURES

- In-line PV charge controller, eliminates the need for blocking diodes.
- Micro-controller for digital accuracy and reliability.
- Fully automatic operation on 12V or 24VDC systems.
- Built-in temperature compensation.
- Will handle up to 10 Amps @ 28VDC from PV panels.
- Sealed/ flooded batteries selectable.
- Pulse action reduces battery sulfation.

DESCRIPTION & OPERATION

The PVCM10 Photo Voltaic (PV) charge controller is used to connect PV panels to 12V or 24VDC storage batteries. The PVCM10 determines which mode to operate in, 12V or 24V, by measuring the battery voltage that powers it. When not charging the microprocessor goes to sleep and wakes every 4 minutes to check both battery and PV voltages to save battery power.

The PVCM10 performs four basic battery charging functions:

- It senses when the battery is fully charged and disconnects the PV charge current to avoid over-charging the battery.
- It resumes charging the battery when the battery voltage has dropped sufficiently to accept additional charge current.
- It checks the availability of PV charge current, by cycling the relay every 4 minutes. If there is insufficient charge current available, it's internal relay will disconnect the battery to prevent discharge through the PV panels at night.
- It also compensates for battery temperature and adjusts the charge threshold voltages when mounted in battery case.

The Temperature Compensation for lead acid batteries:

Below 0°C	On @ 13.3VDC	Off @ 15.0VDC
Between 0-5°C	On @ 13.3VDC	Off @ 14.8VDC
Between 5-10°C	On @ 13.1VDC	Off @ 14.6VDC
Between 10-15°C	On @ 12.9VDC	Off @ 14.4VDC
Between 15-30°C	On @ 12.7VDC	Off @ 14.2VDC
Between 30-35°C	On @ 12.7VDC	Off @ 14.0VDC
Between 35-40°C	On @ 12.6VDC	Off @ 13.8VDC
Between 40-45°C	On @ 12.6VDC	Off @ 13.6VDC

Temperatures > 45°C (the PVCM10 is mounted in the back of a solar panel) on @ 12.7VDC, off @ 14.2VDC.

The Temperature Compensation for gel cell batteries:

Below 0°C	On @ 13.1VDC	Off @ 14.7VDC
Between 0-5°C	On @ 13.0VDC	Off @ 14.5VDC
Between 5-10°C	On @ 13.0VDC	Off @ 14.3VDC
Between 10-15°C	On @ 12.9VDC	Off @ 14.1VDC
Between 15-30°C	On @ 12.9VDC	Off @ 14.0VDC
Between 30-35°C	On @ 12.8VDC	Off @ 13.8VDC
Between 35-40°C	On @ 12.7VDC	Off @ 13.6VDC
Between 40-45°C	On @ 12.6VDC	Off @ 13.4VDC
Above 45°C	On @ 12.4VDC	Off @ 13.4VDC



SPECIFICATIONS

SIZE:	0.75 x 3.0 x 1.5 inches
WEIGHT:	3 ounces
ENCLOSURE:	Epoxy potted in PVC plastic
MOUNTING:	2) #6 Screws – Not provided
POWER:	6 to 35VDC from storage battery
LOAD CAPACITY:	12 Amps @ 14V DC 10 Amps @ 28V DC (Minimum is a 5 watt panel)
VENTED BATTERY THRESHOLDS:	@ Room temperature 15-30°C On @ 12.7VDC, Off @ 14.2VDC On @ 25.4VDC, Off @ 28.4VDC Accuracy ± 0.15V DC
SEALED BATTERY THRESHOLDS:	*Blue Jumper clipped* @ Room temperature 15-30°C On @ 12.9VDC, Off @ 14.1VDC On @ 25.8VDC, Off @ 28.2VDC Accuracy ± 0.15V DC
CURRENT DRAW:	Micro awake = 2.75mA Micro a sleep = 2.25mA During charge = 35mA
LED INDICATION:	Charging Mode - RED
VOLTAGE DROP:	0.05V DC @ 10 Amps
MINIMUMS:	Charge current - 80mA Open PV Voltage - 16V or 32V DC
TEMPERATURE:	-30 to 75°C
RELAY LIFE:	100 million mechanical operations

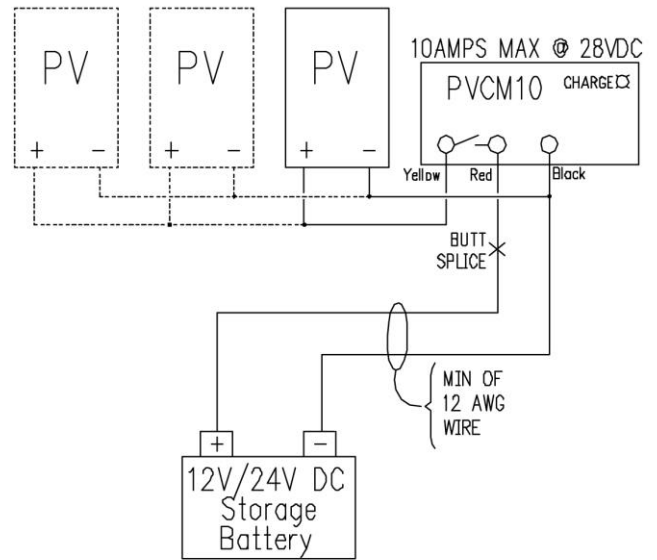
INSTALLATION TIPS

1. Exposed connections should be waterproofed. Grease or silicon will adequately protect connections such as splices.
2. When wiring the PV panel into the battery system, adequate wire size must be used. 12 AWG or larger wire is recommend. If smaller wire is used, the battery may not achieve full charge.
3. Check the battery fluid level occasionally (at least every 90 days) and add water as necessary.
4. Install the PVCM10 in the Battery enclosure for the temperature compensation to work properly.
5. Clip blue jumper wire loop for sealed AGM batteries.

TROUBLESHOOTING TIPS

- Problem:** Module doesn't click on and there is sunlight on the PV panels.
Solution: Verify that the battery voltage is less than 12.75V (or 25.5V on a 24VDC system) and that the open PV voltage is greater than 16V or (32V). If both conditions are met, then wait for 4 minute delay period.
- Problem:** Module clicks every several minutes.
Solution: This is the normal operating sequence.
- Problem:** Module charges for a few seconds then shuts off for 4 minutes.
Solution: The Batteries are fully charged and the charge current was at maximum output. It may also mean that the batteries have a poor connection or a bad cell with high internal resistance.
- Problem:** Module switches on for 1 or 2 minutes and then is off for a much longer period of time.
Solution: This is also normal if the battery is at or nearly fully charged and the PV charge current is at or near maximum.
- Problem:** The battery load has been left on and the storage battery has discharged below 6 V DC. The PV system is not charging when the load is turned off.
Solution: The PVCM10 needs at least 6 V DC from the battery to operate properly. Place panel in direct sunlight and jumper the red and yellow wires for a few minutes, thus bypassing the charge controller allowing the battery voltage to rise to at least 7 V DC. Disconnecting the jumper will allow the PVCM10 to charge the battery up to normal levels.

WIRING CONFIGURATION

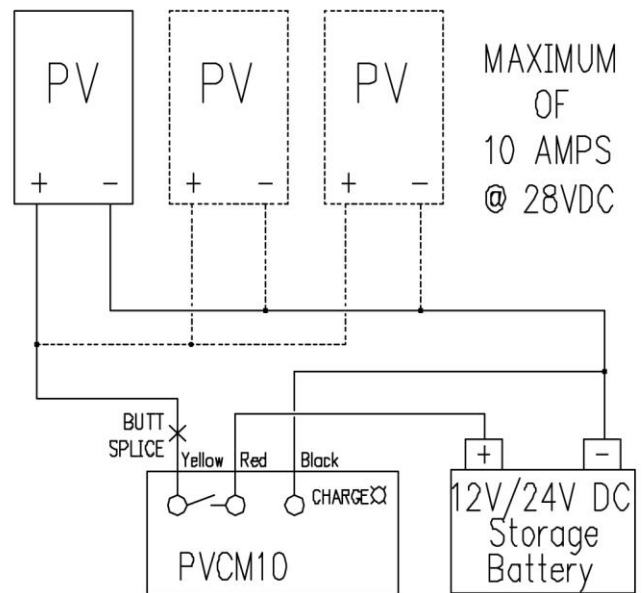


MOUNTING AT PHOTO VOLTAIC PANEL

PV panels with the new cable connectors use a lower profile junction box that will not allow the PVCM10 to mount inside. The PVCM10 should be mounted next to the box using double side tape and connection made in the box. The PV cables then wire to the battery.

Note: The temperature compensation function reverts to On @ 12.7VDC Off @ 14.2VDC for temps above 45°C.

MOUNTING AT BATTERY LOCATION



Connect the PVCM10 regulator wires to battery terminals and attach regulator to battery cables with a tie-wrap.