INSTRUCTION MANUAL FOR GANZ ECO-ENERGY SOLAR MODULES

CPV-06, CPV-12, CPV-30, CPV-40 & CPV-55

1. Introduction

Thank you for choosing Ganz Eco-Energy Solar Modules. With proper operation and maintenance, our modules will provide you with clean renewable solar electricity for many years.

This Installation Manual contains essential information for the installation that you should know before installing our Modules. This Manual also contains safety information you need to be familiar with. Please read this Instruction Manual carefully before installing or using modules.

This Manual does not constitute a warranty, expressed or implied. CBC does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with installation, operation, use or maintenance of PV modules. CBC reserves the right to make changes to the product, specifications or Installation Manual without prior notice.

The guarantee of this product is two years from purchase. Before returning, please contact the Distributor where originally purchased and an RA # will be provided.

2. General Warning and Cautions

2-1 Warning

a) This installation manual should be read carefully and understood before attempting to install, wire, operate, and maintain the Ganz Eco-Energy Solar Module.
Contact with electrically active parts of the module such as terminals can result in burns, sparks, and electric shock whether the module is connected or disconnected.

b) Ganz Eco-Energy Solar Modules interconnects pass Direct Current (DC) and are sources of voltage when the module is under load and when it is exposed to light.
DC can arc across gaps and may cause injury or death if improper connection or disconnection is made, or if contact is made with module components that are damaged. Do not connect or disconnect modules when current from the modules or an external source is present.

c) To avoid electric shock, do not touch terminals while a module is exposed to light. Provide suitable guards to prevent yourself from DC with 30VDC or greater.

d) Although modules are light in weight and semi flexible, we do not recommend putting the solar panel in a high traffic area where walking will be consistent. Avoid dropping or allowing objects to fall on modules.

e) Children and unauthorized persons should not be allowed near the installation of modules to avoid electric shock and injury.

f) To avoid electric shock and fire do not puncture or damage the back sheet of a module.

g) Unauthorized persons, except the qualified licensed professional, should not open the cover of the junction box.

h) Ganz Eco-Energy Solar Modules produce electricity when sufficient sunlight or other source illuminates the module. When modules are connected in series, voltage is cumulative. When modules are connected in parallel, current is cumulative. Module systems can produce high voltage and current which could present an increased hazard

and may cause serious injury or death.

i) When solar modules are used to charge batteries, the battery must be installed in a manner which will protect the performance of the system and the safety of its users. Select a battery site that is protected from sunlight, rain, snow, debris, and is well ventilated. Most batteries generate hydrogen gas when charging, which is explosive. Do not light matches or create sparks near the battery bank. When a battery is installed outdoors, it should be placed in an insulated and ventilated battery case specifically designed for the purpose.

j) To avoid electric shock, fire, and injury, do not disassemble the module, or remove any part installed by the manufacturer.

k) To avoid electric shock, and injury, do not use or install broken modules.

l) Do not expose solar modules to sunlight concentrated with mirrors, lenses or other concentrated means.

m) Under normal conditions, a solar module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the values of Isc and Voc marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the solar output.

2-2 Cautions

a) Use a module for its intended purpose only.

b) Clearance between the installation surface and the back of the module is required to allow cooling air to circulate around the back of the module. It is recommended that 1/6" is needed. This also allows any condensation or moisture to dissipate. Install modules so that air can circulate between the surface and the module. You can use a heavy duty, adhesive cushion feet spacers –

c) Although solar panels will produce electricity in the shade, it is best to install module where there is less shade and more exposure to sunlight.

d) The modules may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage of 120V.

3. <u>Safety Information</u>

3-1 General

a) Turn off inverters and circuit breakers immediately, when a problem occurs.

b) Contact us at 1800-422-6707 if maintenance is necessary.

3-2 Handling

a) Remove all metallic jewelry prior to installing our modules to reduce the chance of accidental exposure to live circuits.

b) Use insulated tools to reduce your risk of electric shock.

c) Avoid prolonged exposure to saltwater as this may be a risk of permanent damage to the plastic surface, which may cause reduced output power. It is not recommended to clean modules with any chemicals but rather to clean properly with plain water. Modules should be cleaned periodically to remove salt deposits, dirt and seagull droppings. Use water and a soft cloth or sponge. Mild, non-abrasive cleaners may be used.

d) Never touch the end of output cables with bare hands when the module is illuminated.

e) Do not pull the output cable excessively. The output cable connection may become loose and cause electricity leakage or shock.

f) Do not scratch or hit the back sheet to avoid damage to the back sheet.

g) Do not strongly rub the plastic surface of the module because there is a possibility of the plastic film getting torn therefore causing an electric shock.

3-3 Installation

a) Cover all modules in the module array with an opaque cloth or material before making or breaking electrical connections.

b) Be careful when modules are wet or during periods of high wind.

c) As sparks may occur, do not install the module where flammable gases or vapors are present.

d) Only modules with the same cell size should be connected in series.

e) Do not touch the solar module unnecessarily during installation. The module surface may be hot. There is a risk of burns and electric shock.

f) Do not unplug a connector if the system circuit is connected to an operating load.

g) Due to the risk of electrical shock, do not perform any work if the terminals of the solar module are wet.

h) Use UV resistant materials, wire management hardware to secure cables. Drooping cables may cause various problems, such as electricity leakage.

i) Take proper measures for preventing the laminate (consisting of encapsulant, cells, back sheet, etc.) from dropping out of the frame in case the module is broken.

j) Modules should be firmly fixed in place in a manner suitable to withstand all expected loads, including wind and snow loads.

k) The modules may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage of 120V. There is no maximum for connecting panels parallel.

4. Installation

4-1 Site Selection

Ganz Eco-Energy modules should be installed in a location where there is no shading. In the northern hemisphere, modules should typically face south, and in the southern hemisphere, modules should typically face north.
Please make sure that there are no obstructions in the surroundings of the site of installation. Take proper steps in order to maintain reliability and safety in case the modules are installed in areas that have heavy snow, extreme cold and strong winds.
Avoid prolonged exposure to saltwater and properly clean with plain water if too much exposure.

4-2 Ganz Eco-Energy Module Components

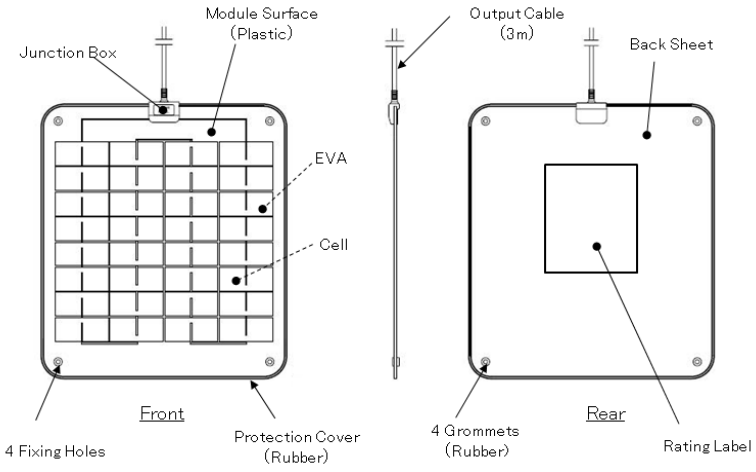


Figure 1
Ganz Eco-Energy Module Components

4-3 Module Tilt Angle

Ganz Eco-Energy modules produce the most power when they are pointed directly at the sun. For installations where the solar modules are mounted to a permanent structure, the solar modules should be tilted for optimum winter performance. As a rule, if the system power production is adequate in the winter, it will be satisfactory during the rest of the year. The module tilt angle is measured between the solar modules and the ground.

4-4 Wiring

To ensure proper system operation and maintain the warranty, be careful to observe the correct cable connection polarity when connecting the modules to a battery or to other modules. (Figure 2) Recommended cable is 18 AWG gauge

Red wire of output cable is positive, black wire of output cable is negative.
Hardware used must be compatible with the mounting structure material to avoid galvanic corrosion.

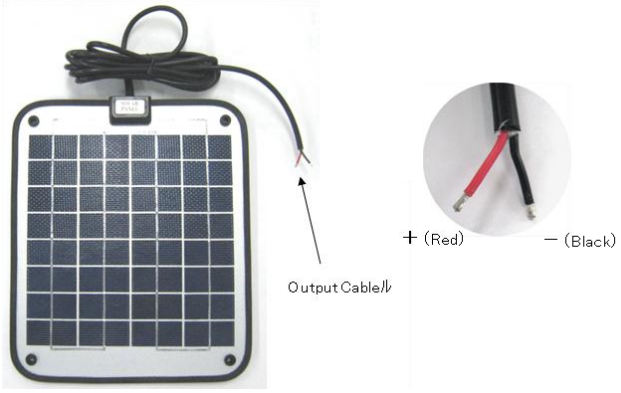


Figure 2 Polarity of Output Cable

Other recommended hardware connecting to a battery: not included and can be purchased from your local Distributor, Radio Shack, Best Buy, Home Depot or any other store that carries connectors. (see page 6 for diagram of connection to battery)

1) Nylon Ring Terminals:
Wire: 22-18 AWF (0.3-8mm)
Screw: #8 (4mm)
Double Crimp

Nylon Insulated W/Insulation grip Double Crimp, Funnel Entry. ANCOR TIP: “One of the most common electrical problems and potential sources of fire is a terminal that is loose on the terminal stud or loose on the wire. This creates a high resistance path and overheating. Be sure to use the proper size terminal and the proper crimp tool. Use double crimp to provide strain and fatigue relief. Install adhesive lined heat shrink tubing to water proof the connection”

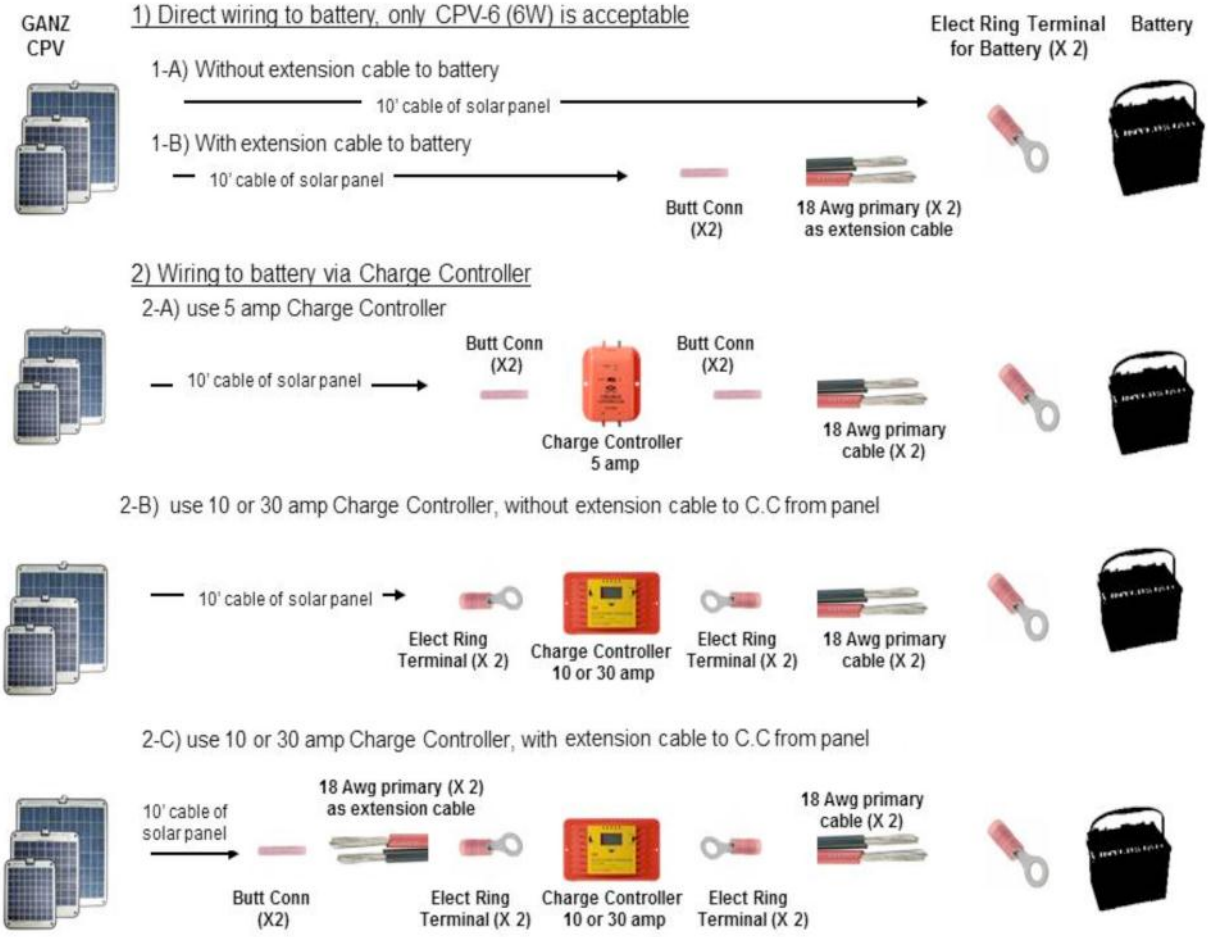
2) Nylon Ring Terminals
Wire: 22-18AWG (0.3-0.8mm)
Screw 5/16 (7.9mm)
double crimp

Nylon Insulated 22-18 AWG Ring Terminals features a red insulation grip with a double crimp, funnel entry.

3) 18 Gauge wiring (Marine Grade)

4) Nylon Butt Connector –
Wire: 22-18 AWG
(0.3-0.8MM)
Single Crimp Qnty 7

Premium nylon insulation won't split or crack like automotive grade vinyl (PVC) insulation and resists water, oil, chemicals, acids and ultra-violet rays. Manufactured from the highest-grade tin plated electrolytic copper, which provides greater corrosion resistance, and better conductivity, which equals less power loss. Tinned brass funnel entry sleeve provides secondary crimp location onto jacket of wire for added strain relief from vibration and flexing, also prevents strands from splitting or cracking during insertion of wire Color-coded nylon insulation for safety and ease of identification.



4-5 Mounting the Module

Since the use for these modules will be varied, from fixed to motion based applications, the actual mounting process will depend on the application.

The best method is to use the four mounting holes to be secured to some form of bracket or raised just above the surface to allow for circulation of air beneath the module.

The user can surface mount these modules; however it is best to allow for a minimum of 1/6" of space for circulation and prevention of water of pooling. One recommendation is to use Heavy-Duty, adhesive cushion feet or spacers. Number of spacers recommended: 6W = 5pcs, 12W = 9pcs, 30W = 12pcs, 40W = 14pcs and 55W = 16 pcs

Be aware of obstructions and heavy traffic areas, as they are not the best location for these modules.

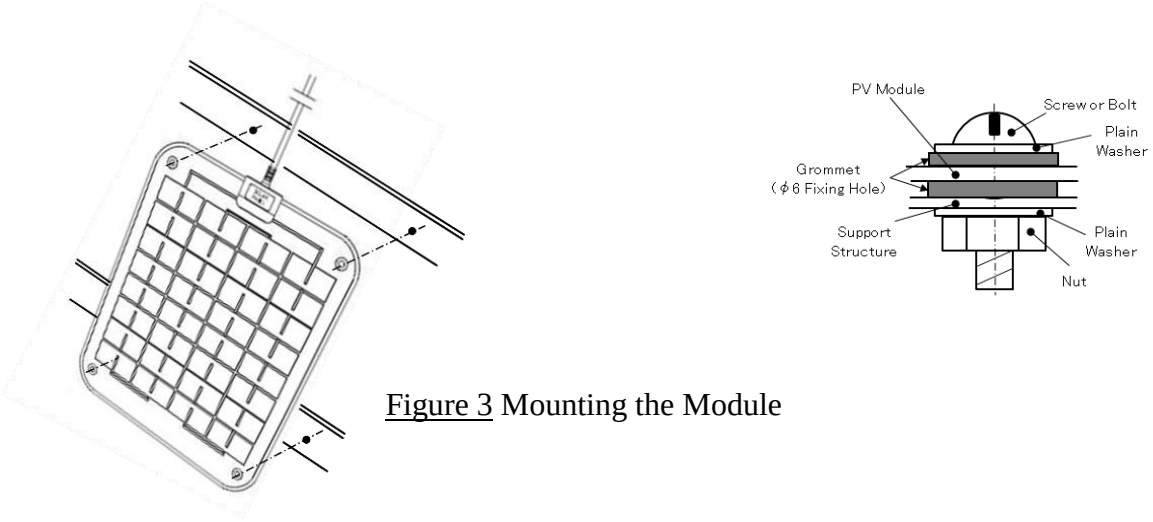


Figure 3 Mounting the Module

4-6 Charging the Battery

In case of using the electricity which charged from the module, please read carefully the instruction manual of the battery maker, and understand completely the usage, characteristic and instructions of the battery beforehand. Wrong usage may cause a serious accident by a severe current discharge.

Use a charge/discharge controller (sold separately) comprising the preventive function of the countercurrent to a solar module and the preventive function of overcharging the battery when you charge battery. (Figure 4)

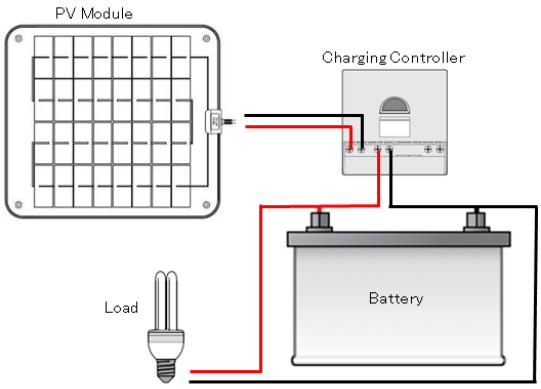


Figure 4 Charging with controller

When batteries are connected in Series or Parallel:
Connecting in Series: When batteries are connected in series the voltage is cumulative while the same capacity rating (amp hours) is maintained.

Connecting in Parallel: When connected in parallel the capacity (amp hours) of the battery is cumulative while the voltage of one of the individual batteries is maintained. Be sure to select the suitable charge controller to cover the amp hours.

Batteries should be same rating and same type of battery, ex flooded, gel or AGM.

5. Maintenance

Ganz Eco-Energy modules are designed for long life and require very little maintenance. If the angle of the module is 5 degrees or more, normal rainfall is usually sufficient to keep the module surface clean under most weather conditions. If dirt build-up becomes excessive, clean the surface only with a soft cloth using water. If cleaning the back of the module is required, take care not to damage the back side materials. In order to ensure proper operation of the system, please check all wiring connections and the condition of the wire insulation periodically.

SPECIFICATIONS

Model	CPV55	CPV40	CPV30	CPV12	CPV6
Maximum Output (Pm)	55 Watts	40 Watts	30 Watts	12 Watts	6 Watts
Maximum Output Current (lpm)	3.2 Amps	2.3 Amps	1.74 Amps	0.78 Amps	0.39 Amps
Maximum Output Voltage (Vpm)	17.2 Volts	17.2 Volts	17.2 Volts	15.3 Volts	15.3 Volts
ShortCircuit Current (Isc)	3.56 Amps	2.52 Amps	1.93 Amps	0.86 Amps	0.42 Amps
OpenCircuit Voltage (Voc)	21.6 Volts	21.6 Volts	21.6 Volts	19.3 Volts	19.2 Volts
Length	34.6” (878mm)	29.8” (758 mm)	22.1” (560mm)	15.8” (400 mm)	11.8” (300 mm)
Width	20.5” (520 mm)	18” (458 mm)	20.5” (520 mm)	14.1” (358 mm)	10.0” (253 mm)
Depth	0.6” (15 mm)	0.6” (15 mm)	0.6” (15 mm)	0.6” (15 mm)	0.6” (15 mm)
Weight	7.3 lbs (3.31 Kg)	5.2 lbs (2.36 Kg)	4.4 lbs (1.98 Kg)	2.3 lbs (1.06 Kg)	1.4 lbs (0.64 Kg)

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GANZ eco-energy

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