Installation Manual for Conergy PV Modules

www.conergy.com.au

Please read this manual before installing the PV module

1. Introduction

This Installation Manual contains essential information for electrical and mechanical installation of the Conergy PV module. It also contains vital safety information you should be aware of.

Since the use of this manual and the conditions or methods of installation, operation, use and maintenance of the PV module are beyond Conergy's control, Conergy does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance. No responsibility is assured by Conergy for any infringement of patents or other rights of third parties that may result from use of this PV module.

Conergy reserves the right to make changes to the product, specification or installation manual without prior notice.

2. General information (including warnings and safety information)

The installation of PV modules requires a great degree of skill and should only be performed by a, accredited qualified licensed professional. Please be aware that there is a serious risk of various type of injury occurring during the installation including the risk of electric shock. All PV modules come with a junction box or multi-contact leads for ease of installation.

General warning

1. Before you attempt to install, connect, operate and maintain the PV module, please make sure that you completely understand the information contained in this installation manual.
2. Contact with electrically active parts of the PV module such as terminals can result in burns, sparks and lethal shock whether the module is connected or not.
3. PV modules produce electricity when there is sufficient sunlight or other sources illuminate the module surface. When the modules are connected in series, voltages are additive. When the modules are connected in parallel, current is additive. As a result, a medium to large scale PV system can produce high voltages and current that constitute an increased hazard and may cause serious injury or death.

General safety

1. Before installing a module, the qualified and licensed installer should contact appropriate authorities to determine permit, installation and inspection requirements that need to be followed.
2. No matter where the modules are installed, either roof mounted or on any other type of structures above the ground, appropriate safety practices should be taken and required safety equipments should be used in order to avoid possible safety hazards. Note that the installation of some modules on roofs may require the addition of fireproofing, depending on local building/fire codes.
3. Do not use modules of different configurations in the same system.
4. Follow all safety precautions of other used components.
5. Do not let anyone handle or work with the PV module who has little knowledge on PV modules.
6. If PV modules are damaged please be careful to avoid risk of injury or electrical shock.
7. Do not shade the module surface from the sunlight for a long time. The shaded cells may become very hot (hot spot phenomenon) which could result in solder joints peeling off.

8. Do not clean the glass surface with any alkaline detergent. The module if installed correctly (in an angle) will be be cleaned sufficiently rain water.
9. Do not install the PV modules flat as they need to be installed in an angle – facing north.
10. Do not cover the water drain holes of the frame.
11. If you install the module in areas that can experience snow, please consider the issue of snow load, which can bend and damage the module. It is recommended to use an appropriate mounting system such as the Conergy Sun Top III to provide adequate support and strength to the installed system.

Handling safety

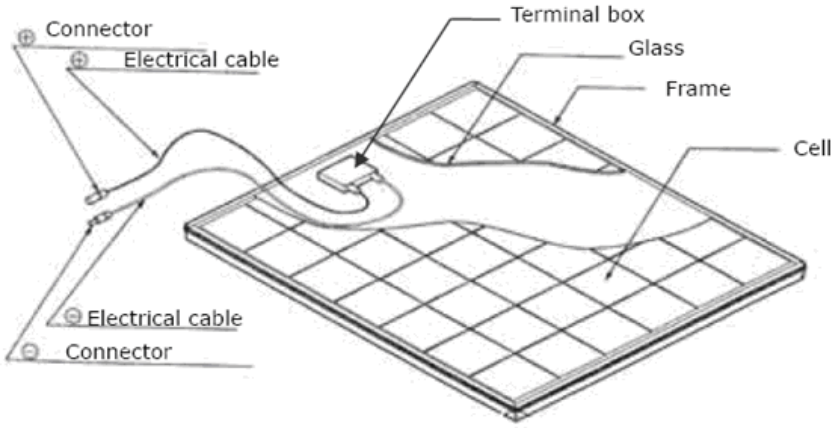
1. Do not cause an excessive load on the surface of PV module or twist the module as the glass can be easily broken.
2. Do not stand or step on the module, as this can cause the glass to break Also the surface glass of PV module can be slippery.
3. Do not hit or put excessive load at the glass or back film. The PV cell is very thin and can break easily.
4. Do not scratch and hit at the back of the module.
5. Do not hit at the terminal box or do not pull on the cables.
6. Do not scratch the output cable or bend it to extreme angles. There is a risk of breaking the insulation of the output cable which may result in electric leakage or shock.
7. Do not pull on the output cable with force. There is a risk of unplugging the output cable or connector which may result in electrical leakage or shock.
8. Do not drill holes in the frame. It may decrease frame strength and cause corrosion of the frame.
9. Do not scratch the insulation coating of the frame (except for grounding connection). It may cause corrosion of the frame or decrease the framework strength.
10. Do not loosen or remove the screws of the module. This will decrease the joint strength of the module and will cause corrosion.
11. When handling the PV module it is recommended to wear proper work gloves as the frame of the PV module has sharp edges and could cause scratches to ones hands.
12. Please do not drop the module or allow objects to fall down onto the module. Dropping objects onto the module edge, even from a short distance, can cause damage.
13. Please do not artificially concentrate sunlight on the module.

Installation safety

1. Keep the modules packed in the carton until the time of installation.
2. Do not touch the PV module unnecessarily when installing. The glass surface and the frames can get hot. There is a risk of burning when touching the hot surface. Also modules when hit by sunlight generate electricity so when handling modules be aware of the risk of electric shock.
3. Do not work in rain, snow or windy conditions.
4. Always use insulated tools.
5. Never use wet tools.
6. When installing modules far above ground, ensure all modules and tools are safely secured to avoid any possibility of these items falling from the roof and creating a safety hazard.

7. Completely cover the module surface with an opaque material when the module is being installed and when conducting wiring work.
8. Do not perform any work if the terminals of the PV module are wet , as this will create a high risk of electrical shock.
9. Do not touch the terminal box and cable ends (connectors) with bare hands during the installation or under the sunlight, no matter if the module is connected or disconnected with the system.
10. Do not unplug the connector if the system circuit is connected with load.
11. Do not step onto the glass of the panel. There is a risk of injury or electric shock when the glass is broken
12. It is recommended that you do not work alone (Please work always in a team of 2 or more people).
13. Please wear a safety belt if working far above ground.
14. Do not wear metallic jewelry which may increase the risk of receiving an electric shock during installation.

3. Components



4. Site selection

In all applications, the modules should be installed in a location where there is no shading throughout the year. In the Southern Hemisphere, the modules should typically face north.

Take proper steps in order to maintain reliability and safety, in case the modules are used in areas such as:

| Heavy snow areas;

| Extremely cold areas;

| Strong wind areas;

| Installations over, or near, water. *

| Areas where installations are prone to salt water exposure ,which can speed up corrosion

| Small islands or desert areas

(*) If you are planning to use the modules where salt water corrosion may be possible, please consult with Conergy's local agent to check the suitability of the components.

5. Setup angles

The angles of the PV module are measured between the PV module and the ground. The PV modules generate the maximum output power when they face the sun directly.

For a standalone system with battery where the PV modules are attached to a permanent structure, the tilt angles of the PV module should be set up considering the optimisation of the performance when the sunlight is the scarcest. In general, if the electric power generation is adequate in the time when the sunlight is the scarcest, then the angle chosen will be adequate during the rest of the year.

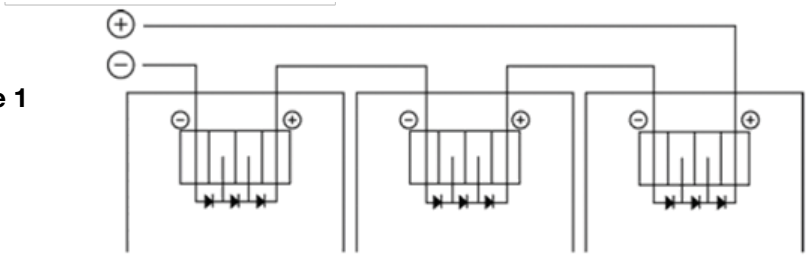
For grid-connected installations where the PV modules are attached to a permanent structure, it is recommended to tilt the PV module at the angles equal to the latitude of the installation site so that the power generation from the PV module will be optimum throughout the year.

6. Wiring

To ensure proper system operation and maintain your warranty, be sure to observe the correct cable connection polarity (Figure 1 & 2) when connecting the modules to a battery or to other modules. Always ensure compliance with AS/NZS 5033 when installing Conergy modules. If not connected correctly, the bypass diode could be destroyed.

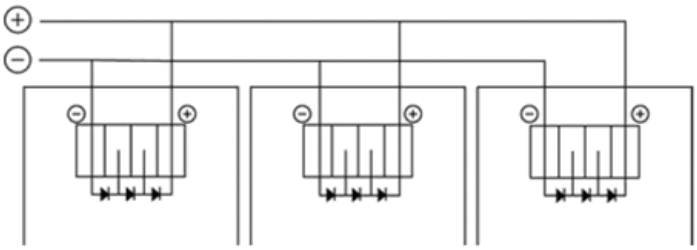
Modules can be wired in series to increase voltage. Connect wires from the positive terminal of one module to the negative terminal of the next module. Figure 1 shows modules connected in series.

Figure 1



Connect modules in parallel to increase current. Connect wires from the positive terminal of one module to thepositive terminal on the next module. Figure 2 shows modules connected in parallel.

Figure 2



NOTE: It is recommended that paralleling modules be performed using an external junction box.

Modules with junction boxes

When fixing the conduit and resealing the junction box, ensure correct and tight sealing. This ensures they remain waterproof and no insects or other foreign objects can interefere with the connections.

Always ensure correct polarity in relation to installing in series or parallel. We recommend testing the connections with a mulitmeter before connecting the system.

Modules with fly leads

The fly leads used in Conergy modules are MC3 or MC4 leads. For long leads, we recommend rolling up and securing them safely with cable tie to a fixed structure to ensure they do not come apart and do not present any obstruction or potential hazard.

7. Mounting

Conergy recommends the use of mounting systems that comply with AS/NZS 1170 (wind loading) and AS/NZS 5033 (photovoltaics array installations). Conergy's SunTop III, SunForte and SolarFamulus mounting systems are therefore the ideal systems to be used. For information on installation of these systems, please refer to the relevant installation manual. In relation to grounding, please always ensure compliance with AS/NZS 5033.

During installation, ensure that the drain holes in the frame of the photovoltaic module are not blocked.

8. Maintenance

The modules are designed for long life and require very little maintenance. Under most weather conditions, normal rainfall is sufficient to keep the module glass surface clean. If dirt build-up becomes excessive, clean the glass surface only with a soft cloth using water. If cleaning the back of the module is required, take utmost care not to damage the back side materials. In order to ensure the operation of the system, please check the connection of wiring and the state of the jacket of wires every now and then.

LIMITED PRODUCT AND POWER OUTPUT WARRANTY FOR SOLAR MODULES

Conergy Pty Ltd, ACN 57 112 387 569; ("Conergy") has the highest quality standards for its products. They are manufactured according to stringent quality regulations. This allows us to offer the warranties below to customers purchasing the following solar modules:

1. Conergy C 123 P
2. Conergy C 175 M
3. Conergy C 125 PI
4. Conergy C 167 P
5. Conergy S 170 M
6. Conergy S 175 M

1. Limited Product Warranty

Conergy warrants the module to be free from defects in workmanship and materials under normal application, use and installation, and service conditions for two (2) years from the date of sale to the original user / purchaser. If the module malfunctions or becomes inoperable due to a defect in workmanship or material during the two year period of this warranty, Conergy will, at its option, either repair or replace the module. This warranty transfers from the original user / purchaser to subsequent user / purchaser, but is void if the module is moved from its originally installed location.

2. Limited Warranty on Power Output

a) Conergy warrants that any module provides not less than 90% of the minimum performance (referred to as the lower tolerance value) for a duration of ten (10) years as of shipment from the plant and not less than 80% of the lower tolerance value for a duration of twenty-five (25) years as of delivery from the plant. The performance warranty shall only apply if the modules concerned show no further defects other than the loss of performance and if the loss of performance lies within the sphere of responsibility of Conergy.
b) The power output must have been assessed at Standard Test Conditions (irradiance 1,000 W/m2, air mass 1.5 AM and cell temperature of 25 °C) in an authorised testing process conducted by a testing body authorised by Conergy.
c) The aforementioned solar modules are supplied with a performance tolerance of +/- 5 %.

3. Exclusion and limitation of liability

a) If in Conergy's sole judgment, the module has been subject to misuse, neglect, or accident or has been damaged through abuse, alteration, improper installation or application, or negligence in use, transportation, handling or storage, or repaired by anyone other than an authorised representative of Conergy, this warranty will be considered void.
b) The warranty does not include any transportation cost for returns of modules or for costs associated with removal, installation or reinstallation of repaired or replaced modules.
c) The warranty does neither include material flaws, processing and production errors or functional disturbances or other damage to connection cables.
d) The warranty does not include indirect damage, in particular no secondary or resulting damages including damage to persons or property, lost profit, damage to reputation, loss of data, advertising or manufacturing costs, overhead costs and loss of customers as well as costs resulting from business interruption, removal and / or re-installation or purchasing of new items.
e) The prerequisite for the specified services being granted is that the module concerned has been used correctly. This is only the case where it has been used in a stationary application on the mainland. The guarantee does not cover maritime or mobile uses in particular.
f) No warrantee services will be performed, if the module is modified from its delivery condition as a result of neglect, improper operation, installation, use, storage, transport, handling or by failure to observe the warnings in the data sheet or similar documents, the base on which the module is secured, connections to modules by other manufacturers, and events which could not have been prevented with the technology available at the time of purchase, or in any other way, even by repair. No warrantee service will be performed if the module is modified / damaged as a result of force majeure (storm, hail, fire, power failure, lightning strike, flooding, infestation with insects and pests, exhaust fumes etc.) and as a result of vandalism or comparable causes resulting from the actions of third parties. Warrantee services are also excluded if a module has been damaged through misuse, accident or conversion or has been repaired by a third party dealer/engineer not authorised by Conergy. Establishment of the existence of the above-mentioned prerequisites lies within the discretion of Conergy.
g) If the originally supplied module type is no longer produced, Conergy will supply the current nearest equivalent module type as replacement.
h) Conergy's liability will in no event exceed the purchase price of the modules.
i) Conergy provides no explicit or implied warranties apart from those expressly made herein.

4. General information

a) The warranty does not extend to supplying new or as-new products. Conergy retains the right to use new, overhauled or specially manufactured parts or products. Each module replaced becomes the property of Conergy.
b) Claims granted on the warranty cause neither a new warranty period to be started nor the warranty to be extended.
c) Should these terms of warranty differ from the information supplied in the data sheet, these terms of warranty shall prevail.

5. Warranty claim Procedure

a) Claims under this warranty will be considered if submitted in writing to Conergy Pty Ltd, PO Box 909, Strawberry Hllls NSW 2012 within 14 days following the discovery of any defect covered by this warranty, with specific details, and provided Conergy or its agents are permitted a commercially reasonable opportunity to examine and analyze the material or workmanship claimed to be defective. An authorised representative of Conergy must approve any claim in writing.
b) For a claim to be made, the original dealer invoice and this warranty certificate should be sent to Conergy or the dealer with details of the module type, the module serial number, the date of delivery and the defects which have arisen.
c) The customer is entitled to return modules only with prior permission from Conergy.

Conergy Pty Ltd
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For more information, please contact us:

1300 551 303 (cost of local call)

Conergy Pty Ltd
Unit 6
44-48 O'Dea Avenue
Waterloo NSW 2017

Email: sales@conergy.com.au
Fax: +61 (0) 2 8507 2220
www.conergy.com.au