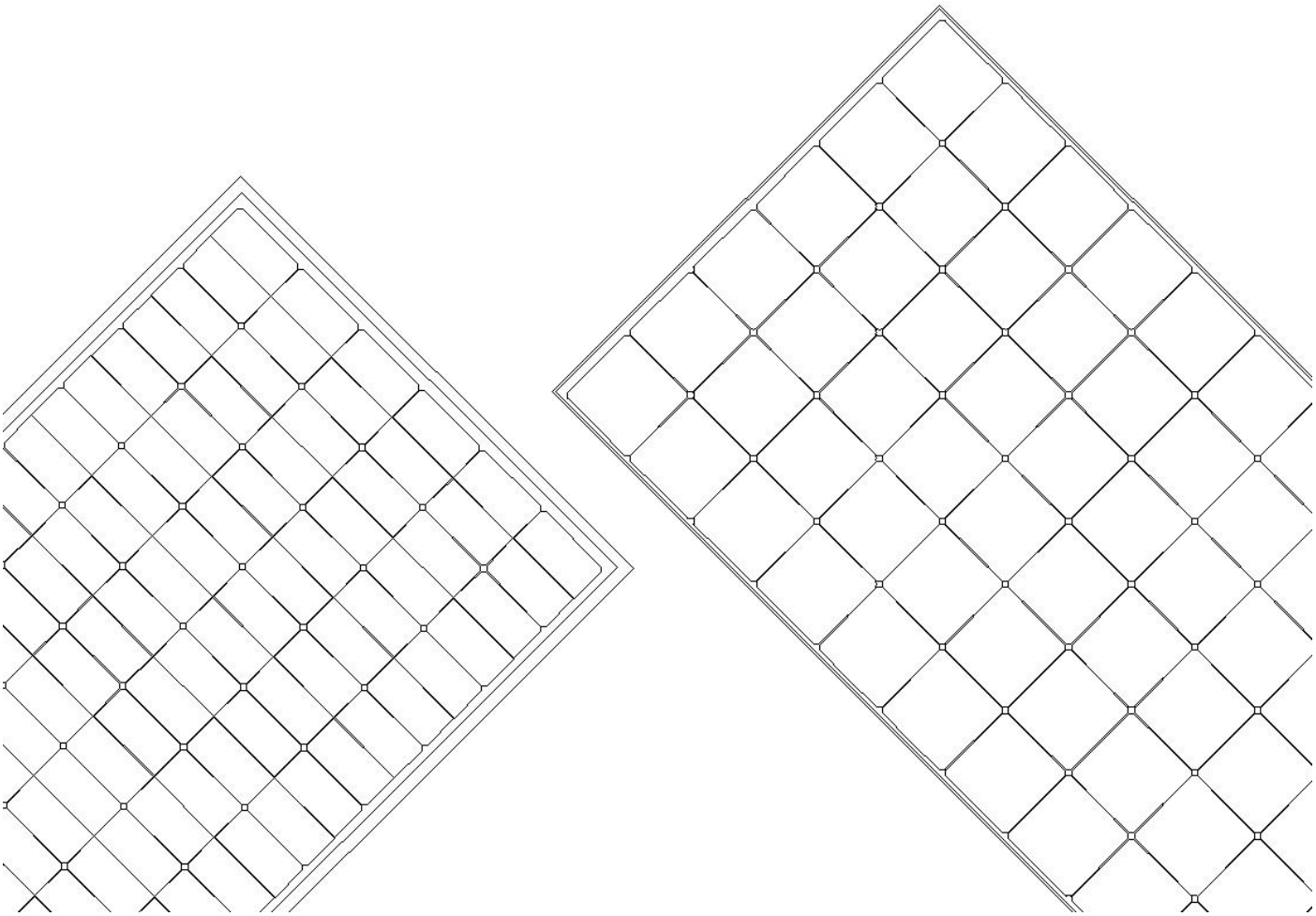
EURONERGY

Installation Manual

（For Flexible modules）



Contents

Euronergy PV Flexible Modules

Installation and User Manual

This manual applies to Solar Photovoltaic Flexible Modules (hereafter referred to as “Modules”) manufactured by Euronergy. Professional skills and knowledge are required for the installation. Only qualified installers after proper training can assume this job. Installers should follow all safety precautions described in this manual as well as local codes when performing installation and maintenance.

1.INTRODUCTION

Thank you for choosing Euronergy as your PV module provider. You must read carefully and be familiar with this manual before handling, installing, and/or maintaining. This manual contains important information such as safety, installation, maintenance of modules, and other relevant information.

This manual is not a form of warranty document, expressed or implied. It does not stipulate compensation scheme of any loss, damage or other expenses caused by or generated during module installation, operation or maintenance. Euronergy assumes no responsibility for any infringement of patents or other rights of third parties, which may result from using Euronergy modules. Euronergy reserves the right to make changes to its products or this manual without prior notice.

Euronergy is not liable for any damages caused by inappropriate installation, use, or maintenance of Euronergy modules, including without limitation damages, losses, and expenses caused by non-observance of the instructions of this manual or caused by or in connection with products of other manufacturers.

Failure to comply with the requirements listed in this manual will invalidate the Limited Warranty for modules as provided by Euronergy at the same time of sales to the direct customers. Additional recommendations are provided to enhance safety practices and performance results. Please provide a copy of this manual to the PV system owner for their reference, and inform them all relevant aspects of safety, operation and maintenance.

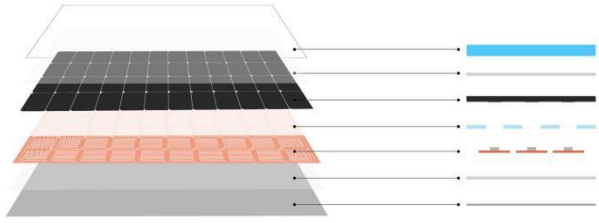
2.CODES AND REGULATIONS

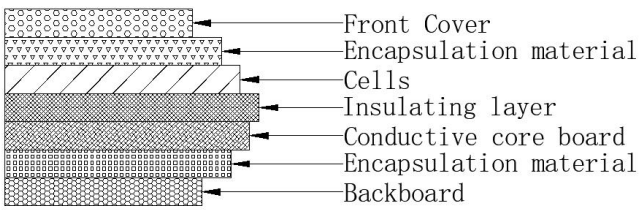
The mechanical and electrical installation of PV systems should be performed in accordance with all applicable codes, including electrical codes, building codes, and electric utility interconnect requirements. Such requirements may vary for different mounting location. Requirements may also vary with system voltage, and for DC or AC application. Contact local authorities for detailed governing regulations, acquire confirmation and relevant permissions.

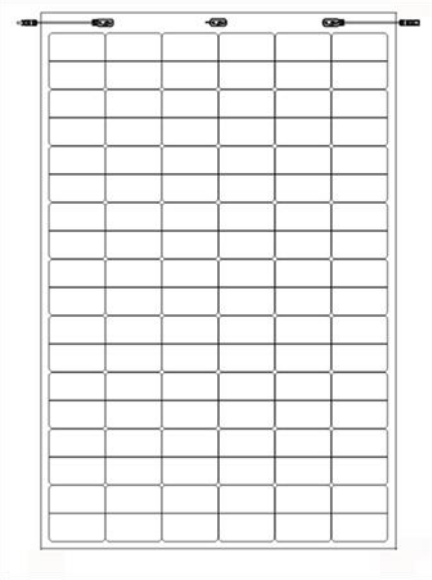
3.MODULE INFORMATION

3.1 Encapsulation structure

3.2Module







3.3 Nameplate

The nameplate describes the product type, peak power, the maximum power current, the maximum power voltage, open circuit voltage, short circuit current, the maximum system voltage and certification marks and etc. All of above are measured under standard test conditions.

4. SAFETY

Euronergy's Flexible modules are designed to meet with the requirements of IEC 61215 and IEC 61730. The application class is A, meaning the module can be used in systems of 50Vdc or 235W or higher, to which the general public may access. Euronergy's modules also meet the requirement of IEC61730-1 and ICE 61730-2 and qualified for Safety Class II.

4.1 Transportation & storage safety

Do not open the original package during transportation and storage until they are ready to be installed. Protect it against damage during transportation. Secure the pallets from falling over. Do not exceed the maximum stack height limit when stacking as indicated by the symbols outside the package. The package shall be stored in a cool and dry location until the modules are ready to be unpackaged. The modules shall be handled. Never use the junction box or cables as a grip. Do not exert mechanical stress on the cables. Never step on modules or drop or place heavy objects on them. Be cautious when setting the modules down onto a surface, especially on the corner of the modules.

4.2 Operating safety

When unpacking the modules from the original package, first remove the pallet lid (after removing securing straps, if provided). Remove one module at a time. You may need to secure the remaining modules in the original packaging and prevent them from falling over.

Check modules for damage due to transportation before they are installed. Do not install damaged modules. Contact with us if you believe a product is defective.

Do not attempt to remove any part from the modules; do not apply paint to or stick labels on the module surface; do not scratch module back sheets to avoid any damage. Do not drill holes on the frame, this may compromise the frame strength and cause corrosion of the frame. Do not attempt to disassemble or modify the modules for your safety. This may have a negative effect on the module quality and safety, even irreversible damage. Additionally, if this occurs, the warranty will not apply.

4.3 Electrical safety

In the case that no load or external circuit is connected, photovoltaic modules can produce DC electricity when exposed to light and therefore can produce an electrical shock or burn. DC voltage of 30 Volts or higher is potentially lethal. Please use insulated tools and rubber gloves when working with modules in sunlight.

Modules have no on/off switch. Modules can be rendered inoperative only by removing them from area with sunlight, or by fully covering their front surface with cloth, cardboard.

Faulty connections can result in electrical shocks. so please keep the connectors dry and clean, also ensure that they are in proper working condition. Never insert any other metallic objects into the connector, or modify them in any way.

Do not touch or handle modules with broken glass, separated frames or a damaged back sheet unless the modules are disconnected in advance and you are wearing proper PPE. Avoid handling modules when they are wet unless cleaning the modules as directed in this manual. Never touch electrical connections that are wet without PPE or insulated gloves. Reflection from snow or water can increase sunlight and therefore increase current and power. In addition, low

environmental temperature can also substantially increase voltage and power.

4.4 Fire safety

Consult your local authority for laws and regulations; follow the requirements for building and structural fire safety. Euronergy's modules have been listed as Class C according to IEC 61730-2 standard. Use appropriate components such as fuses, circuit breakers, grounding connectors, and so on as regulated by the local authority.

Roof constructions and installations may affect the fire safety of the building, it has to be covered by fire-proof material of the appropriate class with adequate ventilation between the back sheet and installation. In order to maintain the fire class rating, the distance between the module's frame surface and the roof surface shall be at least 100mm; modules are electrical devices that may affect the fire safety of a building.

Electric arc may occur when the4 module is working due to the wrong installation method or defective components. Please keep combustible liquids, gases and dangerous cargo away from the module. Please stop using the module if there is exposed combustible gas nearby.

In the event of a fire, modules may continue to produce a dangerous DC voltage, even if they have been disconnected from the inverter, and have been partly or entirely destroyed, or if the system wiring has been compromised. In the event of a fire, inform the fire crew about the particular hazards from the PV system, and stay away from the PV system during and after a fire until the necessary steps have been taken to make the PV system safe.

5.INSTALLATION

5.1 Installation condition

Euronergy modules must be mounted on buildings or other structures suitable for module installation (e.g. ground, vehicles, rooftop). Modules can be installed in seaside locations with a distance of 50m to 500m from the sea. Corrosion may happen to joints between the frame and supporter or grounding. Please use stainless steel or aluminum metal to directly contact modules in seaside locations and conduct antiseptic treatment on the joints to prevent corrosion; Modules must not be installed, nor operated in areas with strong corrosive matter, such as salt, salt mist, salt-water, active chemical vapors, acid rain, or any other type of corrosive matter. In addition, Modules must not be in locations where hail, snow, sand, smoke, air pollution, soot, etc. are excessive, this could affect the safety and/or performance of the modules.

The recommended ambient temperature should be within –20°C (-4°F) to 46°C (115°F), the temperature limits are defined as the monthly average lowest and highest of the installation site; The limit of the operating temperature should be -40°C (-40°F) and 85°C (185°F). Do not apply mirrored, magnifiers or other concentrated light onto the modules.

Euronergy recommends installing the modules with a tilt angle of at least 10 degrees, making it easier for dust to be washed off by rain and reduce the time of cleaning. In addition, this will help to drain the water out directly from the surface, avoid watermarks from trapping water on the glass surface and affect the appearance and performance of modules.

Partial or complete shading of a module or modules can significantly reduce system performance. Euronergy recommends installing modules in locations without shade throughout the year to increase the amount of energy produced by the modules; Lightning protection is recommended for PV systems that are to be installed in locations with high probability of lightning strikes.

In the northern hemisphere, modules should typically face south, and in the southern hemisphere, modules should typically face north. For detailed information on the best installation angle, please refer to standard solar photovoltaic installation guides or consult a reputable solar installer or systems integrator.

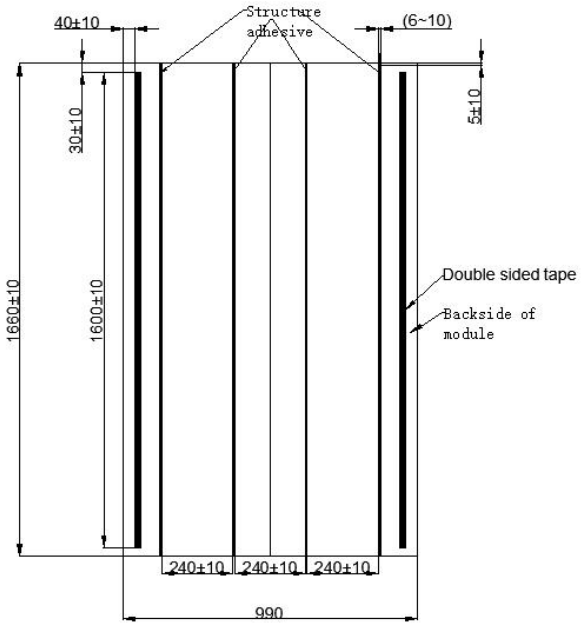
5.2 Mechanical installation

Ensure that the assembly is mounted in a manner that the bracket system is robust enough to withstand all predetermined load conditions, which is a guarantee that bracket installers must provide. The installed brackets must be inspected and tested by a third-party testing organization with static mechanical analysis capabilities, using local, national or international standards such as DIN 1055 or equivalent.

Flexible modules can be installed in different ways according to different installation conditions: The method of pasting installation can be directly used in Flat roof or

trapezoidal color steel tile. For irregular installation environments, such as angular type or standing seam color steel tile can be installed through a supporting system.

The supporting system is generally made of aluminum alloy which is corrosion resistant and hard to deform. For flexible components, the installation interval between two adjacent components is adjusted according to the component size. Component mounting brackets must be made of durable, corrosion-resistant, UV-resistant materials. The component must be firmly fixed on the mounting bracket. In areas with large snow cover in winter, choose a higher mounting bracket so that the lowest point of the component will not be covered by snow for long periods. In addition, the lowest point of the component should be high enough to avoid the component being shielded by plants and trees, or being damaged by flying creatures. The component will have the effect of thermal expansion and contraction, and the interval between two adjacent components should not be less than 10mm during installation.

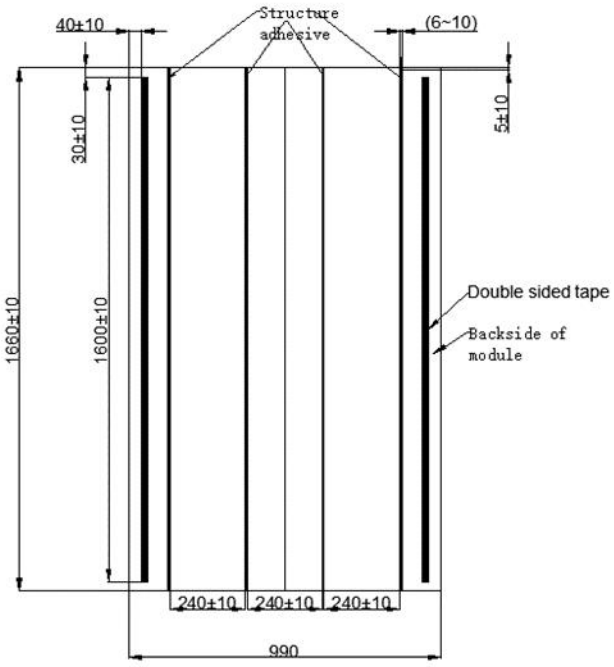


5.2.1 Flexible components mounted on curtain wall surfaces

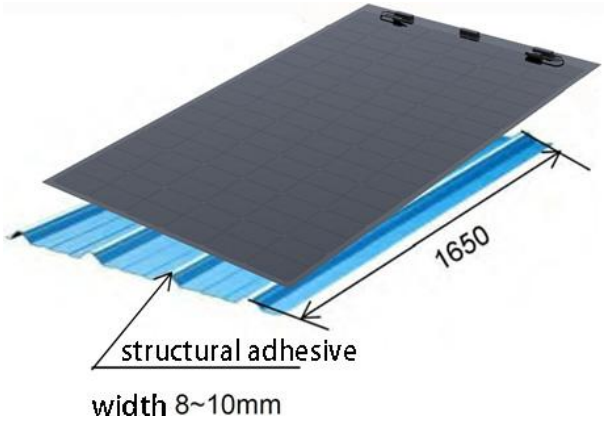
After the surface of the wall is wiped clean, on the surface of the wall along the longitudinal component of the length, width of 6~10mm, the height of 3~5mm, the length is 60mm shorter than the length of the component. The distance of 240mm, on the long edge of the component each attach a length of 1600mm, 17mm wide Roman double-sided tape (to prevent the component from falling off due to gravity before the silicone is cured). Install the components within 5 minutes to prevent silicone solidification from affecting the bonding performance. After installation, use a professional press tool to gently press the surface of the components in the direction of the adhesive. The distance between the two components should be 5 mm to 10mm.

5.2.2 Flexible components installed on flat roof surfaces

Clean the surface of the roof, the installation surface must be free of dust or other foreign matter. Clean the backside of the component. After ensuring that there is no dust or other foreign matter on the back of the component, attach a piece of double-sided tape with a length of 60mm shorter than the length of the component and a width of 17mm. Then apply structural adhesive along the component lengthwise, with a width of 6~10mm, a height of 3~5mm, a length of 1650mm, and a spacing of 240mm. Install the components within 5 minutes to prevent silicone solidification from affecting the bonding performance. After installation, use a professional press tool to gently press the surface of the components in the direction of the adhesive. The distance between the two components should be 5 mm to 10mm.

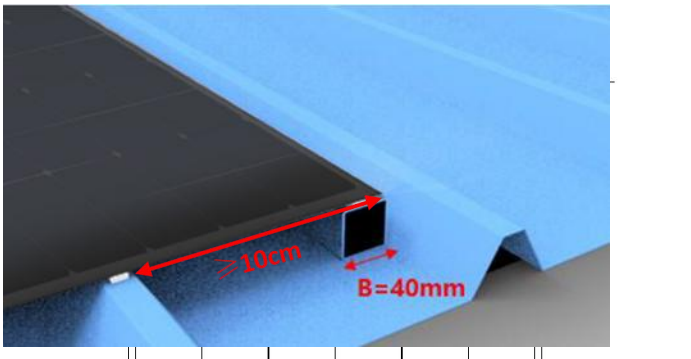


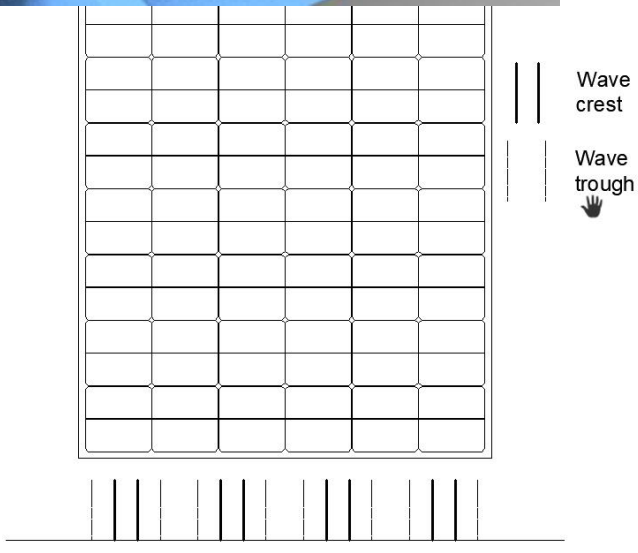
5.2.3 Flexible components installed on color steel tile roof (1)



Clean the surface of the color steel tile to ensure that there is no dust on the surface of the color steel tile. If necessary, you can use cleaning equipment. In the raised part of the color steel tile, attach 4 pieces of structural adhesive whose length is 10mm shorter than the length of the component, with a width of 8 to 10mm. After attaching the structural adhesive, the component should be laid within 5 minutes, otherwise the bonding performance will be affected. As shown in the figure above, after laying it, use a professional press tool to gently press in the direction of the adhesive, so that the component and the color steel tile are fully bonded. The distance between the two components should be 5 mm to 10mm.

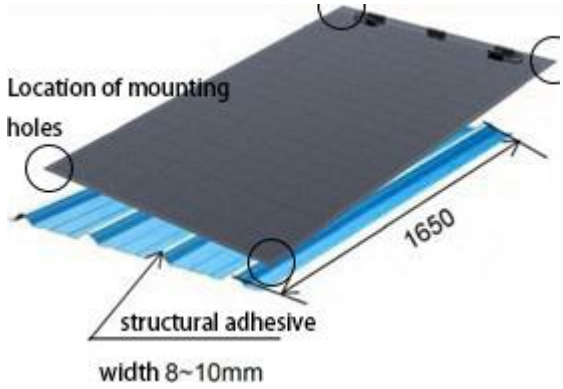
If the edge of the component is more than 10cm away from the raised position of the color steel, a flat aluminum strip needs to be placed on the edge. Two components may share a flat aluminum strip.



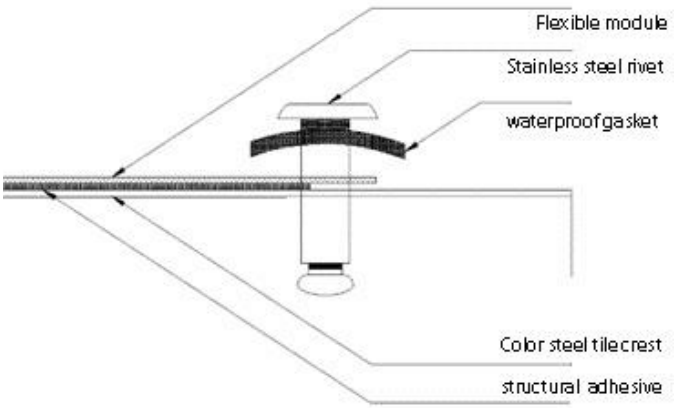


5.2.4 Flexible components installed on color steel tile roof (2)

Make 5.5mm diameter mounting holes on the two short sides of a component. Ensure that the distance between the center of the mounting holes and the edge of the component is 8 to 10mm. The number of mounting holes should be two on each side, for a total of four.



Clean the surface of the color steel tile to ensure that there is no dust on the surface of the color steel tile. If necessary, you can use cleaning equipment. In the raised part of the color steel tile, attach 4 pieces of structural adhesives with a length 10mm shorter than the component length and a width of 8 to 10mm. After attaching the structural adhesive, the component should be laid within 5 minutes, otherwise the bonding performance will be affected. As shown in the figure above, after laying it, use a professional press tool to gently press in the direction of the adhesive, so that the component and the color steel tile are fully bonded. After the bonding is complete, a 5.5mm diameter installation hole should be opened on the raised part of the color steel tile under the installation hole of



the component.

As shown in the figure above, the M5 stainless steel core-pulling rivet is passed through the waterproof washer, the installation hole in the component and the installation hole on the color steel tile. Then the rivet is fixed in place with

professional tools to complete the process. Finally fill appropriate amount of waterproof adhesive in the rivet core pulling part. Note 1: Adjust the length of the stainless-steel core pulling rivets according to actual situation. Note 2: Our recommendation for the waterproof washer: Inner diameter 5.5 mm, outside diameter of 25 mm 304 stainless steel EPDM compound waterproof pad.

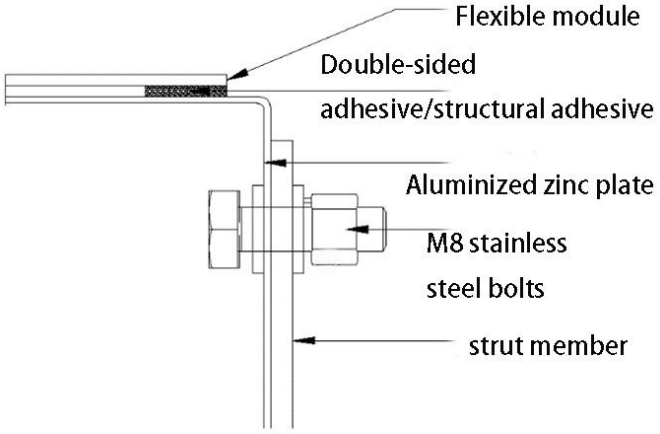
5.2.5 Flexible components installed with aluminum-plated zinc plates

For roofs that cannot be directly attached to (e.g., angular color steel tiles, household tile roofs, etc.), we recommend the installation of flexible components be combined with aluminized zinc plates.

Choosing the right aluminum zinc plate size (length 1800 mm or more, a width of 1200 mm or more, the thickness of 1 mm or more), near the edge fold down (width 30 mm or higher), ensure the plating on the surface after the aluminum zinc plate folding size is slightly larger than the component size.

According to the specific situation, determine the location of the installation site, then install supports (greater than or equal to 4). After the support structures are installed, install the aluminum-zinc plated plate, and secure the folding point of the aluminum-zinc plated plate with M8 stainless steel bolts.

Clean surface of the aluminum zinc plate. Clean the backside of the component. After ensuring that there is no dust or other foreign matter on the back of the component, attach a 1600mm long and 17mm wide Roman double-sided tape on each long edge of the component. Then apply structural adhesive along the component lengthwise, with a width of 6~10mm, a height of 3~5mm, a length of 1650mm, and a spacing of 240mm. Install the component on the surface of the aluminum-plated zinc plate within 5 minutes to prevent silicone solidification from affecting the bonding performance. After installation, use a professional press tool to gently press the surface of the component in the direction of the adhesive.



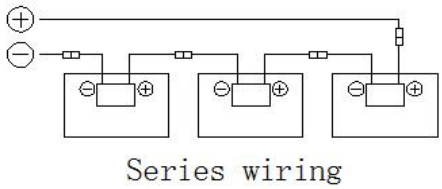
The distance between the two components should be 5 mm to 10mm.

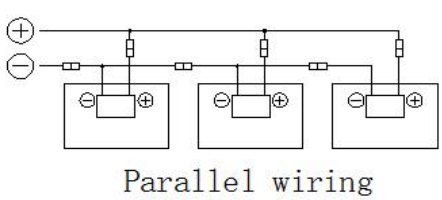
5.3 Electrical installation

The deviations always exist between the nominal value and test value in standard test condition of rated electrical characteristics of module such as Isc, Voc and Pmax, Standard Test Conditions: 1000 W/m2 Irradiance, 25°C Cell Temperature and 1.5 Air Mass, normally, the value of the current and voltage generated from the modules will be probably higher than values under the standard test condition. When determining module voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output on the basis of the highest local temperature, combine with temperature coefficient of the current in the manual. ISC can be calculated by multiplying by the coefficient of 1.25. On the basis of lowest local temperature, combine the temperature coefficient of voltage in the manual Voc. can be calculated. When modules are in series, voltage can be added up; when modules are in parallel, current can be added up. PV modules with different electrical properties can't be connected in series, different electrical components of modules may cause a mismatch of the electrical connection. Make sure to install them in accordance with the manual provided by manufacturer.

5.3.1 Connection type

The maximum number of modules that can be connected in a series string must be calculated in accordance to applicable regulations in such a way that the specified maximum system voltage (According to IEC61730 tests and appraisal, the maximum system voltage is 1000Vdc or 1500Vdc depending on the series and model.) of the modules and all other electrical DC components will not be exceeded in open circuit operation at the lowest temperature expected at the PV system location. Correction factor for the open-circuit voltage can be calculated based on the following formula: β T =1- β *(25-T). T is the lowest expected ambient temperature

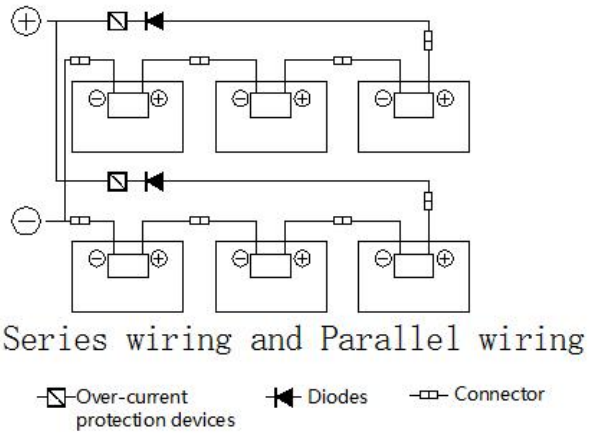




at the location. β (%/℃) is the temperature coefficient of the selected module Voc (Refer to corresponding datasheet).

An appropriately rated over-current protection device must be used when the reverse current could exceed the value of the maximum fuse rating of the modules. An over-current protection device is required for each series string if more than two series strings are connected in parallel.

These junction boxes have been designed to be easily interconnected in series for their good connected cable and the connector with IP67 protection grade. Each modules has two single conductor wires, one positive and one negative, which are pre-wired inside the junction box. The connectors at the opposite end of these wires allow easy series connection of Euronergy modules by firmly inserting the positive connector of a module into the negative connector of a Euronergy module until the connector is fully seated.



5.3.2 Cables

Use field wiring with suitable cross-sectional areas that are approved for use at the maximum short-circuit current of the module. Euronergy recommends installers use only sunlight resistant cables qualified for direct current (DC) wiring in PV systems. （Accord to the code TÜV 2 PfG 1169、4mm²、Temperature range:-40℃ to ＋90℃）; Cables should be fixed to the mounting structure in such a way that mechanical damage of the cable and/or the modules is avoided. Do not apply stress to the cables. For fixing, use appropriate means, such as sunlight resistant cable ties and/or wire management clips specifically designed to attach to the modules frame. While the cables are sunlight resistant and waterproof, where possible, avoid direct sunlight exposure and water immersion of the cables.

5.3.3 Connectors

Keep connectors dry and clean, and ensure that connector caps are hand tight before connecting the modules. Do not attempt to make an electrical connection with wet, soiled, or otherwise faulty connectors. Avoid sunlight exposure and water immersion of the connectors. Avoid allowing connectors to rest on the ground. Faulty connections can result in arcs and electrical shocks, ensure that all electrical connections are securely fastened. Make sure that all locking connectors are fully engaged and locked.

5.3.4 Bypass diodes

The junction boxes used with Euronergy modules contain bypass diodes wired in parallel with the PV cell strings. In the case of a partial hot spot, the diodes bypass the current generated by the cells with the hot spot, thereby limiting modules heating and performance losses. Bypass diodes are not over-current protection devices. In the event of a known or suspected diode failure, installers or maintenance providers should contact Euronergy. Never attempt to open the junction box by yourself.

6.MAINTENANCE AND REPAIR

Euronergy recommends that PV systems be periodically inspected by the installer or qualified persons.

6.1 Maintenance

Maintenance should take place if the glass is broken or there is burning vestige on the back sheet. Ensure that all cables and connector attachments are undamaged and properly secured. Mounting and grounding components should be tightly secured with no corrosion.

6.2 Repair

In order to reduce the potential for electrical and thermal shock, Euronergy recommends cleaning the modules during early morning or late afternoon hours when solar radiation is low and the modules are cool, especially in regions with high temperatures.

When modules are operating, there should not be environmental influence factors to cast shadows and cover part or even all of the modules. Such as other modules, system

support, bird drops, dust, clay or plant and so on. These may distinctly reduce the power output. Euronergy advises that there should be no obstruction objects over the modules' surface at any time.

The cleaning frequency depends on the accumulated frequency of the fouling. In many instances the front surfaces of the modules will be cleaned with rain water. Euronergy modules may contain a hydrophobic anti-reflective coating on the glass surface to enhance power output and reduce dirt and dust buildup. In order to avoid module damage, do not clean PV modules with a power washer or pressurized water. When cleaning, it is recommended to wipe the glass surface with a wet sponge or soft cloth. Please do not clean the glass with cleaning agents which contain acid or alkaline. However, if removing snow is required, use a brush to gently remove the snow. Do not try to remove frozen snow or ice from the modules.

7. DISCLAIMER

7.1 As the use of this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic products are beyond the control of Euronergy, Euronergy shall not be responsible for any loss, damage or expense arising from any operation related to such installation, operation, use or maintenance.

7.2 Any infringement of third-party patents or other rights that may result from the use of PV products does not fall within the scope of Euronergy's responsibility. The customer does not obtain any patent or patent rights authorization for the use of Euronergy products.

7.3 The information in this manual is based on the knowledge and proven experience of Euronergy. However, such information and advice, including (but not limited to) product specifications, does not constitute any warranty, express or implied. Euronergy reserves the right to change the contents of this installation manual without prior notice.

8.CONTACT

Euronergy B.V.
Address: Zuidplein132,1077XV Amsterdam, The Netherlands
E-mail: info@euronergysolar.com
www.euronergysolar.com