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applied Solar and Wind Energy

SOLARPOWER Series

XUNZEL Solar Module - SOLARPOWER Series

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING OR USING THE MODULES

POR FAVOR, LEA DETENIDAMENTE ESTE MANUAL ANTES DE USAR O INSTALAR ESTE MÓDULO

STIL VOUS PLAÎT LIRE ATTENTIVEMENT CE MANUEL AVANT D'UTILISER OU INSTALLER CE MODULE

LEIA ATENTA E INTEGRALMENTE ESTE MANUAL ANTES DE PROCEDER A INSTALAÇÃO OU AO USO DOS MÓDULOS



GENERAL INSTALLATION MANUAL
MANUAL DE INSTALACIÓN
MANUEL D'INSTALLATION
MANUAL DE INSTALAÇÃO



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GENERAL INSTALLATION MANUAL

1. INTRODUCTION

PLEASE READ THIS GUIDE COMPLETELY BEFORE INSTALLING OR USING THE SOLAR ELECTRIC MODULES

This manual contains essential information of electrical and mechanical installation and safety information which you should know before using Xunzel photovoltaic modules. The information in this manual is described on the basis of Xunzel's knowledge and experience. But such information and suggestions do not constitute a warranty.

Limitation of warranty scope: Xunzel disclaims all liability from damages or malfunctions if the module (I) has been altered or modified by non authorized persons, (II) has not been installed, operated, repaired or maintained in accordance with instructions supplied by Xunzel, (III) has been exposed to abnormal physical, thermal or electrical negligence or accident.

Xunzel reserves the right to make changes to the product, specifications or to the manual without prior notice.

2. GENERAL INFORMATION

The installation of PV modules requires a great degree of skill and should only be performed by a qualified licensed professional, including licensed contractors and licensed electricians. Please be aware that there is a serious risk of various types of injury occurring during the installation including the risk of electric shock.

All Xunzel PV modules are equipped with a permanently attached junction terminal box that will accept variety of wiring applications or with a special cable assembly for ease of installation, and they do not require special assembly.

< GENERAL WARNING >



1. Before you attempt to install, wire, operate and maintain the PV modules, please make sure that you completely understand the information described in this installation manual.
2. Contact with electrically active parts of a PV module such as terminals can result in burns, sparks and lethal shock whether the PV modules is connected or not.
3. PV modules produce electricity when the sufficient sunlight or other sources illuminate the module surface. When the modules are connected in series, voltage is cumulative. When the modules are connected in parallel, current is cumulative.
4. Do not connect the PV modules directly to the loads such as motor since the variation of the output power depending on the solar irradiation causes damage for the connected motor.

IMPORTANT < WARRANTY AND GENERAL SAFETY INSTRUCTIONS >



1. Consult local codes and other applicable laws concerning required permits on regulations concerning installation and inspection requirements.
2. Before installing a PV module, contact appropriate authorities to determine admit, installation and inspection requirements that should be followed.
3. Install PV modules and ground frames in accordance with applicable rules and regulations.
4. PV modules should be installed and maintained by qualified personnel. Only installer/service personnel should have access to the PV module installation site.
5. No matter where the PV modules are installed, either roof mounted construction or any other type of structures above the ground, appropriate safety practices should be followed and required safety equipment should be used in order to avoid possible safety hazards. Note that the installation of some PV modules on roofs may require the addition of fireproofing depending on local building/fire codes.
6. Please use PV modules with same cell size within series.
7. Follow all safety precautions of other components used in the system.
8. In order to avoid a risk of injury or electrical shock, do not allow anyone to approach the PV module if the person has little knowledge on PV module or on the measures that should be taken when PV modules are damaged.
9. Do not shade portions of the PV module surface from the sunlight for a long time. The shaded cell may become hot (hot spot phenomenon) which results in solder joints peeling off.
10. Do not clean the glass surface with chemicals. Do not let water stay on the glass surface of PV modules for a long time. This creates a risk of white efflorescence (glass disease) which may result in the deterioration of energy generation.
11. Do not install the PV module horizontally. It may cause dirt or white efflorescence (glass disease) due to water.
12. Do not cover the water drain holes of the frame. There is a risk of frost damage when the frame is filled with water accumulation.
13. When sliding snow load has to be considered, an appropriate measure has to be taken so that PV module frames lower edge of PV modules will not be damaged.
14. Do not expose PV module to sunlight concentrated with mirrors, lenses or similar means.
15. Turn off inverters and circuit breakers immediately should a problem occur.
16. In case the glass surface of a PV module is broken, wear goggles and tape the glass to keep the broken pieces in place.
17. A defective PV module may generate power even if it is removed from the system. It may be dangerous to hit the PV module while exposed to sunlight. Place a defective PV module in a carton so PV cells are completely shaded.
18. In case of series connection, the maximum open circuit voltage must not be greater than the specified maximum system voltage. The voltage is proportional to the number of series. In case of parallel connection, please be sure to take proper measure to block the reverse current flow. The current may easily flow in a reverse direction.

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IMPORTANT < WARRANTY AND HANDLING SAFETY INSTRUCTIONS >

1. Do not cause an excessive load on the surface of the PV module or twist the frame. The glass surface can easily break.
2. Do not stand or step on the PV module. The surface glass of PV module is slippery.
3. Do not hit or put excessive load on the glass or back film. The PV cells is very thin and can be easily broken.
4. Do not scratch or hit at the back film. The back film is vulnerable.
5. Do not hit on the terminal box or do not pull the cables. The terminal box can crack and break.
6. Never touch terminal box or the end of output cables with bare hands when the PV module is irradiated. Cover the surface of the PV module with cloth or other suitable sufficiently opaque material to isolate the PV module from incident light and handle the wires with rubber-gloved hands to avoid electric shock.



7. Do not scratch the output cable or bend it with force. The insulation of output cable can break and may result in electricity leakage or shock.
8. Do not pull the output cable excessively. The output cable may unplug and cause electricity leakage or shock.
9. Do not drill holes in the frame. It may compromise the frame strength and cause corrosion of the frame.
10. Do not scratch the insulation coating of the frame (except for grounding connection). It may cause corrosion of the frame or compromise the framework strength.
11. Do not loosen or remove the screws of the PV module. It may compromise the joint strength of PV module and cause corrosion.
12. Do not touch the PV module with bare hands. The frame of PV module has sharp edges and may cause injury.
13. Do not drop PV module or allow objects to fall down on the PV module.
14. Do not try artificially to concentrate sunlight on the PV module.



< INSTALLATION SAFETY >

1. Always wear protective head gear, insulating gloves and safety shoes (with rubber soles).
2. Keep the PV module packed in the carton until installation.
3. Do not touch the PV module unnecessarily during installation. The glass surface and the frames get hot. There is a risk of burn, or you may collapse because of electric shock.
4. Do not work under rain, snow or windy conditions.
5. Use insulated tool.
6. Do not use wet tool.
7. Do not drop tools or hard objects on PV modules.
8. When installing PV modules far above ground, do not drop any object (e.g. PV module or tool).



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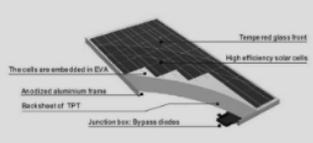
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9. Make sure flammable gases are not generated near the installation site. Pay attention to the information attached with your batteries in case the installation requires them.
10. Completely cover the PV module surface with an opaque material during PV module installation and wiring.
11. Plug in the connector tight and ensure the wiring work.
12. Due to the risk of electrical shock, do not perform any work if the terminals of PV module are wet.
13. Do not touch the terminal box and the end of output cables (connectors) with bare hands during installation or under sunlight regardless of whether the PV module is connected to or disconnected from the system.
14. Do not unplug the connector if the system circuit is connected to a load.
15. Do not unplug the connector if the system circuit is connected to a load.
16. Do not work alone (always work as a team of 2 or more people).
17. Wear a safety belt if working far above the ground.
18. Do not wear metallic jewelry which can cause electric shock during installation.
19. Do not damage the surrounding PV modules or mounting structure when replacing a PV module.
20. Bind cables by the insulation locks. Drooping down of cables from the terminal box could possibly cause various problems such as animal biting, electricity leakage in puddle.
21. PV modules should be installed and maintained by qualified personnel. Only installer/service/personnel should have access to the PV module installation site. Be aware kids have no access to the installation site.

3. GENERAL DESCRIPTION AND ELECTRICAL SPECIFICATIONS OF THE PV MODULE

Xunzel PV modules are designed and manufactured under the most strict international standards. Xunzel PV module design assure the best performance under the most extreme conditions.

Module Construction



You can find more technical specifications for this module in our website www.xunzel.com or mailing us at info@xunzel.com.

Note: electrical specifications are obtained under the following conditions: (STC) irradiance of 1000W/m² light spectrum of 1.5 MA, and cell temperature of 25°C.

Important Note: Xunzel reserves the right to make changes to the product, specifications or to the manual without prior notice.

Please, do not try artificially to concentrate sunlight on the PV module.

Under field conditions, a PV module may experience conditions that produce more current and voltage than reported at standard component test conditions. Regarding the fact that the voltage is related to the temperature, the higher the temperature the lower the current, and the current is related to the irradiance, the higher the irradiance the higher the current. It can be stated that each PV module can perform differently depending on its location and its environment. Therefore, physical characteristics of the locations should be taken into account to foresee the output of the PV modules.

4. INSTALLATION

Xunzel PV modules can be installed both in series and in parallel. 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. Illustration 4.1 shows four modules connected in series.

SERIES for more voltage



Fig-4.1 Series mounting for more voltage V

PARALLEL for more current

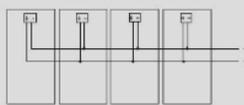


Fig-4.2 Parallel mounting for more current A

Modules can be wired in parallel to increase current. Connect wires from the positive terminal of one module to the positive terminal on the next module. Illustration 4.2 shows four modules connected in parallel.

Note, it is recommended that all the connections should be performed using watertight junction boxes. An inadequate connection may affect seriously the performance of the entire system, even wasting all the energy generated by the PV modules. Keep in mind that the connection should be durable.

AIR CIRCULATION UNDER MODULE

Sufficient clearance between the module frame and the mounting surface is required to allow cooling air to circulate around the back of the module. This also allows any condensation or moisture to dissipate.

MOUNTING OPTIONS

There are many types of mounting systems used to install Xunzel modules. Modules should be firmly fixed in place in a manner suitable to withstand all expected loads, including wind and snow loads. Module mounting holes are provided for easy installation and proper mechanical loading. Do not drill additional mounting holes in the module frame as it will void the warranty. The use of proper mounting hardware is recommended to minimize the mounting structure, and hardware possibility of corrosion of the module frame.

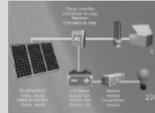
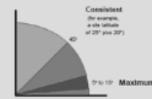
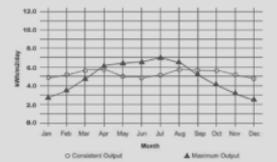


Mounting examples: ground mounting, roof installation and on pole mounting.

4. INSTALLATION

Modules should be mounted with the orientation and tilt angle required for consistent performance (seasonally/yearly). The location should be selected to have direct access to sunlight from 9:00 a.m. to 3:00 p.m. on the shortest day of the year. Keep in mind that trees and other plants grow every year so what it is not an object which shades your panels today may do it in the future. Avoid locations where new buildings are expected to be in the future.

Calculate the tilt angle by using the site latitude plus 20 degrees, with modules facing south in the northern latitudes and north in the southern latitudes. This will result in consistent energy output throughout the year. A tilt angle of 10 to 15 degrees will result in maximum energy output in the summer but less in the winter. You should choose the best option depending on your use of the installation.



Xunzel PV solar modules are especially design for battery charging purposes. Therefore it is strongly recommended to use a charge controller to protect the battery from overcharging. Follow the suggestions and recommendations given by Xunzel in order to choose the best controller for your installation. You can visit our web site www.xunzel.com for more information.

The charge controller is an essential device which assures a correct charge of the battery avoiding overcharging from the PV modules. The charge controller is connected between solar PV modules and the battery. Respect always polarity connections (positive wire connected to the positive poles and viceversa). Follow always the instructions of the charge controller manual.

WARNING: it is strongly recommended the use of a protection fuse in the positive terminal of the battery.

5. WARRANTY

The limited warranty described herein is in addition to whatever implied warranties may be granted to purchasers by law. The warranty period of Xunzel for material defects and workmanship is two years from the date of purchase. Proof of purchase will be required. This product can be only repaired by the Authorized/Repair Center of Xunzel Soluciones SL. Xunzel disclaims all liability for damages or malfunctions if the module it has been altered or modified by non authorized people. It has not been installed in accordance with instructions supplied by Xunzel. It has been exposed to abnormal physical, environmental (acid rain), thermal or electrical negligence or accidents. Warranty coverage does not extend to other components of the solar system such as batteries, inverters, or other devices or components not provided by Xunzel.

Warranty coverage does not apply to damages caused by the use or the installation of the PV modules. Warranty service is available at the nearest Xunzel Authorized Dealer. It is also possible to contact Xunzel. Defective parts must be returned to the address indicated below. Be sure it is insured and packaged securely. Xunzel will not be responsible neither for the costs of the shipment nor the costs of de-installation or reinstallation. For more information you can visit us in our web site www.xunzel.com, send us an e-mail to info@xunzel.com or give us a call in the next phone number (+34) 902540361. Remember to keep your proof of purchase!



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ESPAÑOL

MANUAL DE INSTALACIÓN

1. INTRODUCCIÓN

LEA ATENTAMENTE E INTEGRAMENTE ESTE MANUAL ANTES DE PROCEDER A LA INSTALACIÓN O AL USO DE LOS MÓDULOS. Este manual contiene información esencial para la instalación mecánica y eléctrica que debe conocer antes de instalar los módulos fotovoltaicos de Xunzel. Contiene también información de seguridad con la que debe familiarizarse. Toda la información aquí descrita es propiedad intelectual de Xunzel y está basada en la tecnología y experiencia que han sido adquiridas y acumuladas a lo largo de la historia de Xunzel. Este documento no constituye una garantía, expresa o implícita. Xunzel no asume responsabilidad alguna.

Exclusiones y limitaciones de la garantía. Estarán exentos de los derechos de la garantía establecidos los daños y fallos de funcionamiento o de servicio de los módulos que tengan su origen en accidentes o uso negligente, imprudente o inadecuado, no respetar los usos de instalación, uso y mantenimiento, modificaciones, instalaciones o empleos erróneos, daños por sobretensiones, descargas atmosféricas, inundaciones, plagas, terremotos, acciones de terceros partes o cualesquiera otros rasgos ajenos a las normas de funcionamiento. Xunzel se reserva el derecho a realizar modificaciones al producto, a sus especificaciones, o al manual sin previo aviso.

2. INFORMACIÓN GENERAL

La instalación de los módulos fotovoltaicos requiere un alto grado de habilidad y debería realizarse por personal cualificado. Sea consciente del peligro serio de potenciales daños que pudiesen ocurrir durante la instalación, incluso de shock eléctrico. Todos los módulos fotovoltaicos de Xunzel están equipados con un terminal de conexión de cables para que la instalación resulte fácil, y que no requieren realización de conexiones especiales para su mayor seguridad.

<PRECAUCIONES GENERALES>

1. Antes de la instalación, cableado, funcionamiento o mantenimiento del módulo fotovoltaico, asegúrese que lee e entiende completamente la información descrita en este manual de instalación.
2. El contacto con componentes eléctricos activos de un módulo fotovoltaico tales como terminales, puede resultar en quemaduras, chispas o shock letal, tanto si el módulo está conectado o no.
3. El módulo fotovoltaico produce electricidad cuando inciden suficientes rayos de sol o cualquier otra fuente de iluminación en su superficie. Cuando se conectan los módulos en serie, la tensión se acumula. Cuando los módulos se conectan en paralelo se acumula la corriente. Como resultado, un sistema de módulos fotovoltaicos de gran escala pueden producir alto voltaje y alta tensión, lo que podría representar un alto peligro y causar daños serios o incluso muerte.
4. No conecte directamente los módulos fotovoltaicos a motores debido a la variación de la energía producida, dependiendo de la radiación solar pueda causar daños al motor conectado.

<ADVERTENCIAS IMPORTANTES DE GARANTÍA Y SEGURIDAD>

1. Consulte las leyes locales que regulan los permisos de instalación y de inspección requeridos.
2. Antes de instalar un módulo fotovoltaico, contacte con las autoridades apropiadas para determinar los requerimientos de permisos, instalación e inspección que deberían respetarse.
3. Instale los módulos y los marcos según las reglas y regulaciones correspondientes.
4. Los módulos fotovoltaicos deberían ser instalados y mantenidos por personal cualificado. Solo el personal cualificado debería tener acceso al lugar de instalación.
5. Independientemente del lugar donde se instalen los módulos fotovoltaicos, en soportes en tejado o en cualquier otro tipo de estructura en el suelo, deberían seguirse pautas de seguridad y utilizarse el equipamiento de seguridad requerido, de modo que se eviten posibles daños potenciales. Tenga en cuenta que la instalación de módulos fotovoltaicos en tejados puede requerir pruebas de fuego adicionales, dependiendo de las leyes locales de construcción y leyes para prevención de incendios.
6. Utilice siempre módulos iguales, con el mismo tamaño de células, en la misma serie.
7. Sign todos los pasos de seguridad de los otros componentes utilizados en el sistema.
8. Para evitar riesgo de daños o shock eléctrico, no permita que nadie se acerque al módulo fotovoltaico si dicha persona no conoce el módulo fotovoltaico o las medidas a tomar cuando estos módulos están dañados.
9. No cubra partes de la superficie del módulo de los rayos del sol durante largo tiempo. La célula en la sombra puede recalentarse (fenómeno del "punto caliente") y producir daños en las juntas soldadas.
10. No limpie el cristal de la superficie con productos químicos. No deje agua en la superficie del módulo durante mucho tiempo. Puede provocar eflorescencias blancas (blanco en el cristal) que pueden causar el deterioro en la generación de la energía.
11. No instale el módulo horizontalmente. Puede acumular suciedad o provocar eflorescencias blancas a causa del agua.
12. No cubra los agujeros de drenaje de agua del marco. Hay riesgo de helada cuando se acumula agua en el marco.
13. En caso de nieve, debe tomar medidas para no dañar la parte inferior del marco del módulo.
14. No esponja los módulos los rayos de sol concentrados en espesa, lentos o superficies similares.
15. Desconecte los inversores o los interruptores de circuito en caso de que ocurra algún problema.
16. En caso de que se rompa el cristal de la superficie de un módulo, póngase gafas y coloque una cinta reparadora en el cristal para que las piezas rotas se mantengan en su lugar. Retíelo inmediatamente para evitar accidentes.
17. Un módulo defectuoso puede generar electricidad incluso si se retira del sistema. Puede ser peligroso manipular el módulo mientras esté expuesto a los rayos del sol. Coloque el módulo defectuoso dentro de un cartón de modo que todas las células fotovoltaicas estén completamente a la sombra.
18. En caso de conexión en serie, la tensión máxima del circuito no debe superar la tensión máxima especificada del sistema. La tensión es proporcional al número de series. En caso de conexión en paralelo, asegúrese de tomar las medidas apropiadas para bloquear el flujo de corriente inversa. La corriente puede fluir fácilmente en sentido inverso.