

Solar Module Installation User Manual

For Module Model Number:

CS-S-175-DJ

CS-S-180-DJ

CS-P-220-JT

CS-P-280-DJ

Rev. 01

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Thank you for selecting solar modules from Centron Solar. In order to use the modules properly, please read this Installation Manual carefully and completely before beginning work or installing the panels.

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About Solar Modules

What is a solar module?

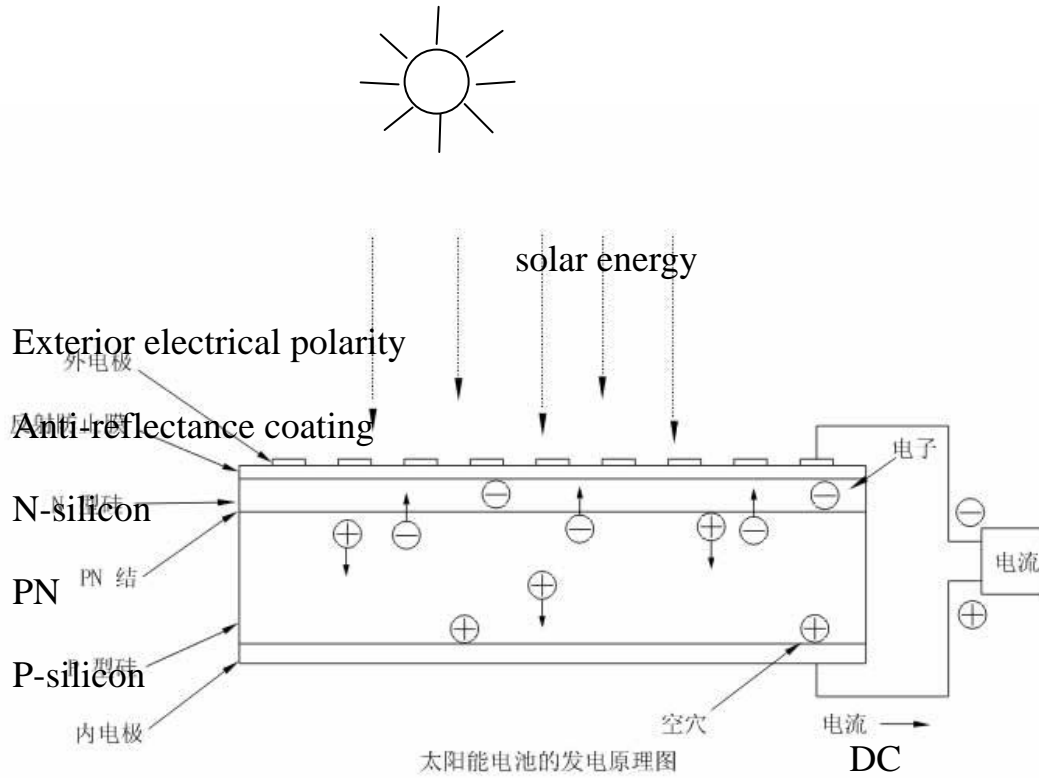
A solar module is a big semiconductor (PN diode) which can transfer sun energy into electrical energy without any help from mechanical energy. Solar modules produce “quiet” and “clean” energy generators which can create “direct current” (DC) electricity continuously under the sunlight.

Theory

Grape Solar can supply monocrystalline solar modules. Under the sunlight, the cells in mono modules will produce electrons and cavities by photo-emission which is influenced by an internal electrical field. The electrons will go towards and assemble at Negative-silicon and cavities will go towards and assemble at Positive-silicon. As a result, an electromotive force will occur. If they are connected with an exterior load, the DC electricity will be created.

Cell Function Diagram

Internal electrode



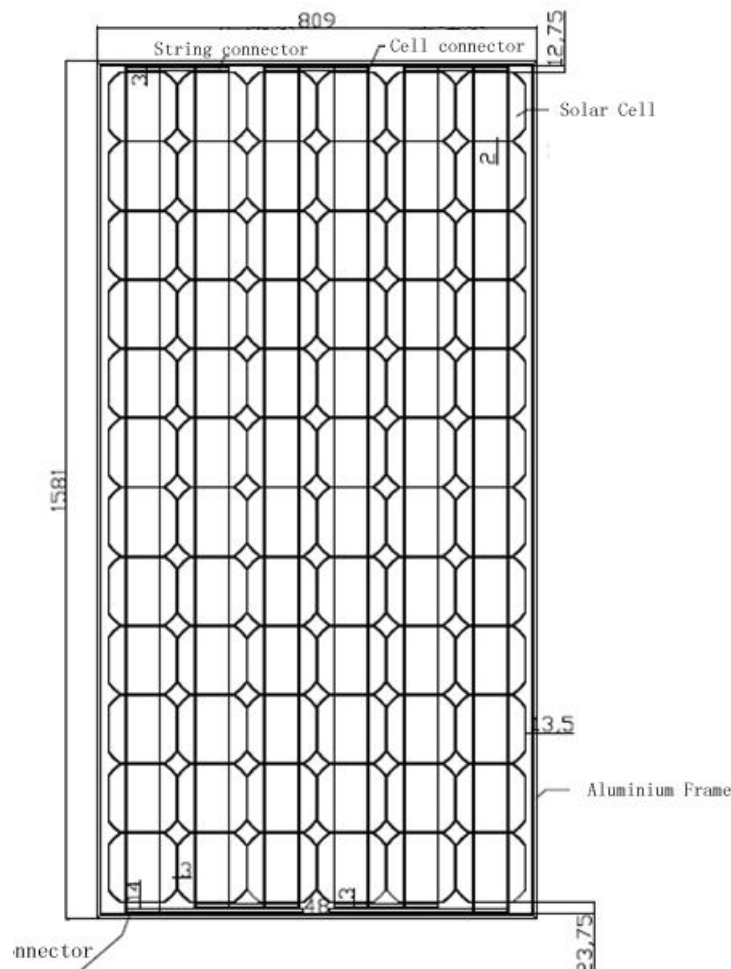
Characteristics and Names of Components

Key Factors

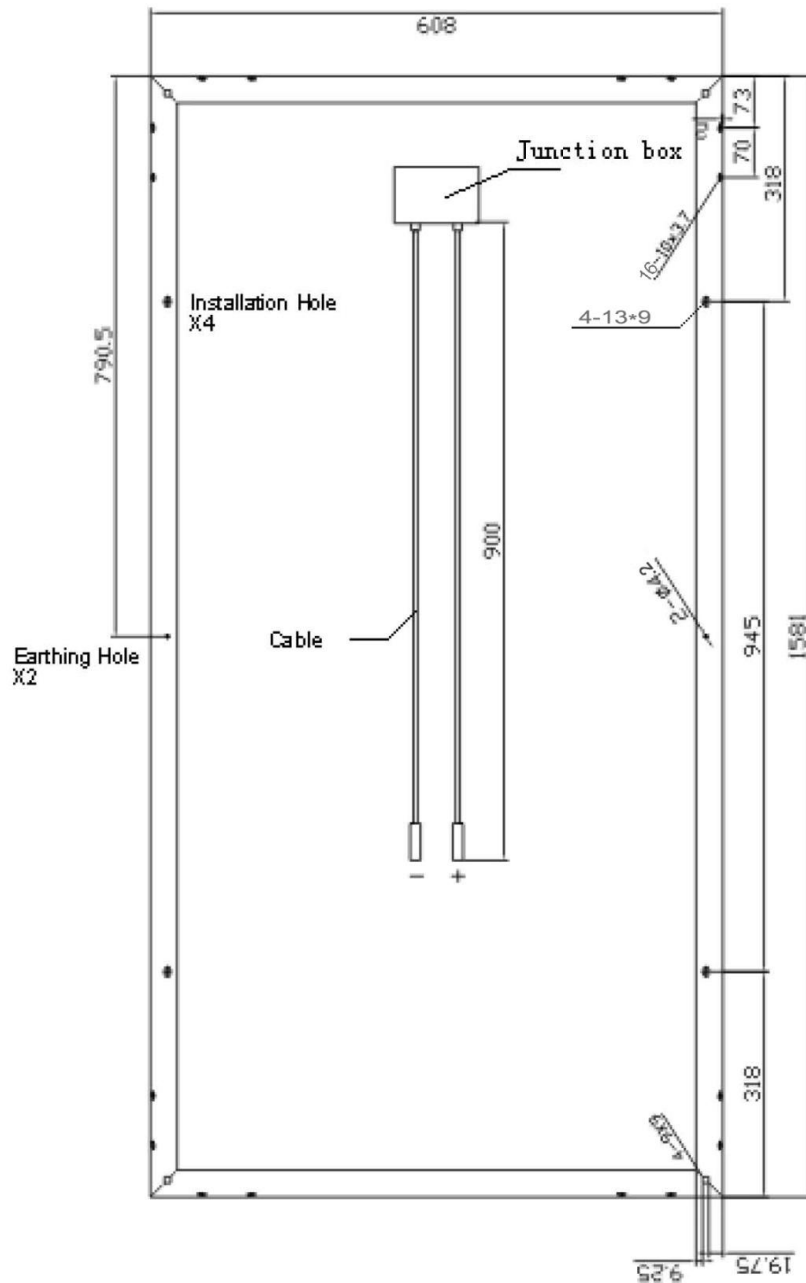
- The module is highly efficient due to adopting a high-efficiency cell
- The module is highly reliable due to adopting highly transparent tempered glass
- The structure of module is wind-resistant.

Component Names

(Front of Solar Module Example)



(Back of Solar Module Example)



Characteristics



Model	Open Circuit Voltage at STC, (V dc)	Rated Voltage at STC, (V dc)	Maximum System Voltage, (V dc)	Rated Current at STC, (A dc)	Short Circuit Current at STC, (A dc)	Rated Maximum Power at STC, (Watts)	Maximum Series Fuse, (A)
CS-S-180-DJ	44.2	36.2	600	4.97	5.36	180	10
CS-S-175-DJ	44.2	35.8	600	4.89	5.25	175	10

*Note: Rated electrical characteristics are within ± 10 percent of the indicated values of I_{sc} , V_{oc} , P_{max} under Standard Test Conditions. (Irradiance of 100 W/cm, Am 1.5 spectrum and a cell temperature of 25 °C (77 °F))




Safety Warning

In order to use the modules properly, avoid property losses, and avoid injury to the operator or anyone else, warnings and some other caution signs are printed on the solar modules and Manuals.

Sign Introduction

Sign	Introduction
 Warning	Means “Misoperation will cause a risk of lethal or personal serious injury ”
 Caution	Means “Misoperation will cause a risk of injuring or property loss”

Graph introduction

Graph	Introduction
	Prohibited (proceeding not permitted) The details will be described in the signs, graphs and texts
	Compulsion (proceeding is compulsory) The details will be described in the signs ,graphs and texts
	Caution (Warning included) The details will be described in the signs or graphs and texts

General warnings



Warning



Solar module installation, maintenance, removal and resetting shall only be done by distributor or professionals

- If there were defects, there is a risk of electrical shock or fire.

When installing, wiring, operating, removing and maintaining modules, pay attention to the risk of electrical shock

- If module is shined by sunlight or other illuminator, the DC electricity will be produced.
- Artificially concentrated sunlight shall not be directed on the module.
- Under normal conditions, a photovoltaic 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 ampacities, fuse sizes, and size of controls connected to the PV output. Please refer to Section 690-8 of the National Electrical Code for an additional multiplying factor of 125 percent (80 percent derating) which may be applicable.
- If modules are connected in series or parallel, the voltage and current will increase, the danger will be increased respectively
 - When installing, wiring, or maintaining modules, in order to prevent producing the DC electricity, please cover the module surface with sufficiently opaque material
- When installing, wiring, or maintaining modules, please use protective instruments such as rubber gloves








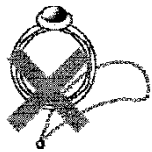



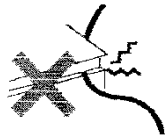









If high reliability is required (the machine is related to a person's life), please don't use those modules







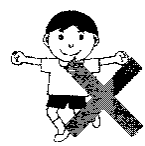



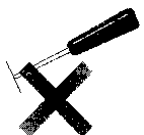
- If output is unstable, serious accidents such as lethal injury may occur.
- The modules are qualified for application class A: Hazardous voltage (IEC 61730: higher than 50V DC; EN 61730: higher than 120V), hazardous power applications (higher than 240W) where general contact access is anticipated (Modules qualified for safety through EN IEC 61730-1 and -2 within this application class are considered to meet the requirements for Safety Class II)





Installation Warnings

 Warning	
 <p>Installing, maintaining, removing and resetting modules shall only be done by distributor or professionals.</p>	 <p>Don't stand or step on the solar modules Because glass face of the module will be damaged and it is slippery which may injure someone.</p> 
 <p>Don't touch the terminals</p> <ul style="list-style-type: none"> There is a risk of electrical shock 	 <p>Don't wear steel material like rings</p> <ul style="list-style-type: none"> There is a risk of electrical shock 
 <p>Sharp objects prohibited They may puncture the back of Module There are risks of electrical shock ,electricity leakage and solar module's service life may be shortened</p> 	 <p>Don't put wires between Frame and prop.</p> <ul style="list-style-type: none"> The wire may be damaged and cause electrical shock and 
 <p>- When connecting modules with other controlling devices please entrust distributors or professionals</p>	 <p>Don't damage or process wiring Material.</p> <ul style="list-style-type: none"> It may cause a risk of electrical shock. 







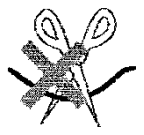


 Warning	
 <p>Grounding</p> <p>If not connected properly, it will cause a risk of electrical shock. Please don't connect the cable with any other pipes such as gas pipe, water pipe, thunder-avoiding rod etc. Each PV module has a hole on the each side with a grounding sign . The use of the listed grounding and bonding equipment (KDER), type 1954381-1, by Tyco Electronics Corp (E69905), is to provide a reliable grounding connection to the module frame.(Details: see Appendix A)</p>	 <ul style="list-style-type: none"> • Don't install solar modules on movable objects such as doors or vehicles. • The glass may be damaged and cause injury due to libration.

Operation Warning

 Warning	
 <p>Do not open cover of junction box, it may result in electric shock.</p> 	 <p>Don't let children approach modules There is risk of electric shock or injury.</p> 
 <p>Do not damage or process wiring material, which may cause electric shock.</p> 	 <p>Do not prick back of solar module with sharp objects as this may result in electric shock, electricity leakage, or damage the solar module</p> 
<p>Don't stand on or step on the solar modules because the solar module may be damaged and/or people can slip resulting in injury</p>	

 Caution	
	<p>  don't touch solar modules  The module will reach high temperatures under sunshine, and may cause a risk of scalding </p>

Maintenance Warning


 warning	
<p>  Don't open cover of junction box and clean inside with liquid, it may result in electrical shock. </p> <p style="text-align: right;">  </p>	<p>  Don't immerse the solar modules in liquid, it may result in electrical shock </p> <p style="text-align: right;">  </p>
<p>  Do not use damaged or abnormal solar modules which may cause risk of an electric shock. If module is damaged/abnormal please contact distributor or GRAPESOLAR. </p> <p style="text-align: right;">  </p>	<p>  Don't deform or bend solar module, it may result in electric shock or injury. </p> <p style="text-align: right;">  </p>
<p>Don't stand or step on solar module. The module may be damaged due to its glass surface and it may cause injury if slipping occurs.</p>	

Don't touch the cable of the solar module (cont'd)
since DC electricity will be produced when solar module is under
sunlight, please pay attention to this to avoid electrical shock.

Specification for bypass diode

Rated current	12A
Max reversing voltage	40V

Installation

 warning
Installing, repairing, removing and resetting solar modules shall only be done by distributor and professionals

Caution:	<ul style="list-style-type: none"> Don't put heavy objects on solar module Don't let optical lens and other spotlight objects to shine the modules directly. Don't toss or drop the solar modules
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Installation shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.

Attention for installation:

The modules shall be mounted so that the junction box shall be in the uppermost position to minimize water damage.

Site Selection

Please select a site without shadows from trees or buildings, enabling the module to be shined by sun frequently. Especially in very hot weather, make sure modules are not shaded. Remember! Shadow positions change with the season. Please take this into account

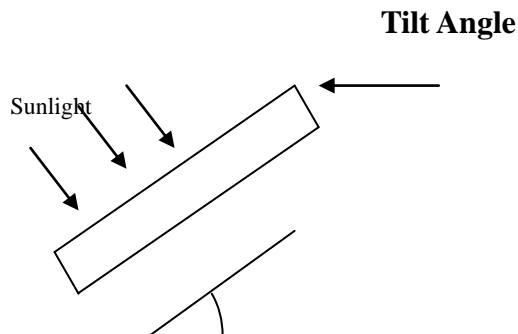
If you want to know the design for tilt angle of a support structure in a heavy snow area or littoral area please contact distributor

Installation direction

The module should face south to get sufficient sunlight and to optimize the output of the power generation.

Tilt angle

Irradiation each day will be different according to different latitudes all over the country. The optimum angle is equal to latitude but is also subject to the design conditions such as site and design angle etc.



PV module will get maximum output of power generation when sunlight irradiates on their surfaces vertically. But if operating time and operating purpose are limited, the above-mentioned design may not be optimum. You also can contact distributor about this.

Support Structure

In order to make PV modules have a long service life outside please pay attention the following items:

- Choosing a strong and safe structure
- Choosing appropriate materiel for solar modules
- Adopting appropriate method for anticorrosion
- Following all regulations concerned
- Don't damage any parts of modules for power generation.
- The site shall be in compliance with ambient and climate
- Site should be easily accessible
- The foundation shall be done by a professional designer or construction company

Contact distributor for details

PV module installation

Caution!

Use the long side of module frame as the top. Use the side with 4 installation holes as the bottom. The modules shall be mounted so that the junction box is in the uppermost position to minimize the ingress of water.

If PV modules are blow away, it will be very dangerous.

Applying M6 or M8 stainless steel screws with power about 5~8N.M

In salty area please take appropriate methods to prevent solar modules from corrosion

Wiring and connection

900mmx4mm² cable for DJ-160-----DJ-180 solar modules, Temperature for interior and exterior of the cable can't exceed 85 °C and 55°C separately.

Diodes were installed in the solar modules

If solar modules from GRAPESOLAR were connected with other solar modules, the output of power generation will be deteriorated and may cause bad effect to solar modules. So please avoid this.

When PV modules are generating DC electricity please use the diodes or other applicable methods to prevent reversed current. Diodes are not subsidiary components of the solar modules

Wiring

Please observe the correct cable connection polarity when installing the modules. If not connected properly, the bypass diode could be destroyed. Series fuse: 10A

PV modules can be wired in series to increase voltage as shown in figure 1. In this case, the maximum open circuit voltage must not be greater than the specified maximum system voltage. The voltage is proportional to the number of series.

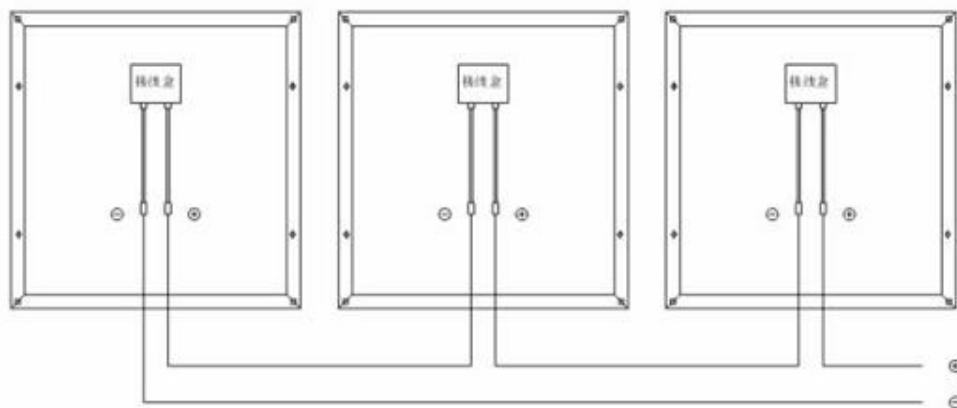


figure 1

PV modules can be wired in parallel to increase the current as shown in figure 2. In the case of parallel connection, please take proper measure to block the reverse current flow. The current may easily flow in a reverse direction.

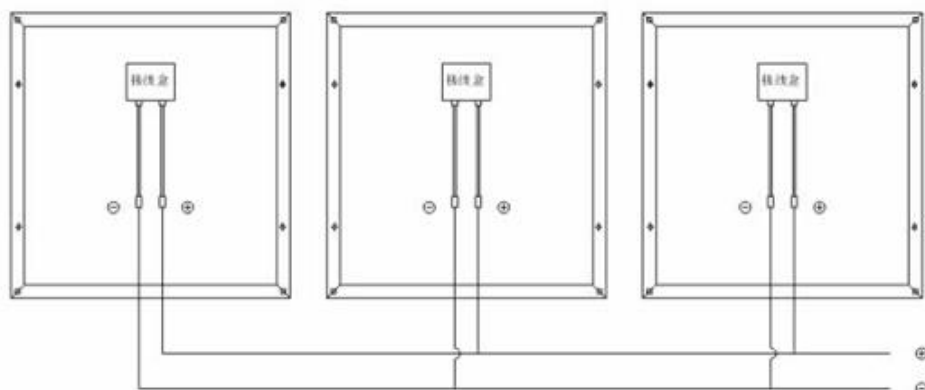


figure 2

Removal

Only professionals can disassemble or reinstall the solar modules.

Maintenance and Inspection

Routine Inspection

It is unnecessary to do inspection everyday; our suggestion is one time per year.

If the dirt is built-up please clean the surface with soft sponge with water.

Inspection for Wind and Rain Hazard or Earthquake

If wind and rain hazard or earthquake occurs, please check to make sure the modules were not damaged.

Inspection for Salt or Snow Hazard

Schedule an inspection to determine whether PV modules were corroded

After heavy snow, please check the condition of solar modules.

After-Sale Services

Warranty Issues

After filling the form, please contact the concerned distributor.

Name: _____

Address: _____

Model/ series number (printed in label): _____

Date of purchase: _____

Telephone Number: _____

Description of abnormal module: _____

If there was anything you want to know more please contact distributor.

GRAPE SOLAR reserve the right to revise the models/contents without notice.

Grape Solar reserves the right to revise the models/ contents without notice. Please see product warranty documentation for more details.

Website: www.GrapeSolar.com