



RIBBLE VALLEY
BOROUGH COUNCIL

For office use only

Application No: 320120934P

Date received

Fee paid £

Receipt No:

Council Offices, Church Walk, Clitheroe, Lancashire. BB7 2RA Tel: 01200 425111 www.ribblevalley.gov.uk

Application for Planning Permission. Town and Country Planning Act 1990

Publication of planning applications on council websites

Please note that with the exception of applicant contact details and Certificates of Ownership, the information provided on this application form and in supporting documents may be published on the council's website.

If you have provided any other information as part of your application which falls within the definition of personal data under the Data Protection Act which you do not wish to be published on the council's website, please contact the council's planning department.

Please complete using block capitals and black ink.

It is important that you read the accompanying guidance notes as incorrect completion will delay the processing of your application.

1. Applicant Name and Address

Title: First name:

Last name:

Company (optional):

Unit: House number: House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Country:

Postcode:

2. Agent Name and Address

Title: First name:

Last name:

Company (optional):

Unit: House number: House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

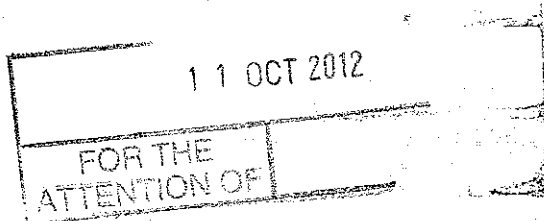
Country:

Postcode:

3. Description of the Proposal

Please describe the proposed development, including any change of use:

NEW 10 KWp SOLAR PHOTOVOLTAIC FREE STANDING INSTALLATION



Has the building, work or change of use already started? Yes No

If Yes, please state the date when building, work or use were started (DD/MM/YYYY): (date must be pre-application submission)

Has the building, work or change of use been completed? Yes No

If Yes, please state the date when the building, work or change of use was completed: (DD/MM/YYYY): (date must be pre-application submission)

4. Site Address Details

Full postal address of the site (including full postcode where available)

Description:

House:	<input type="text"/>	Suffix:	<input type="text"/>
House name:	Ribblesdale Hall		
Street address:	Sawley Road		
	Chatburn		
Town/City:	Clitheroe		
County:	<input type="text"/>		
Postcode:	BB7 4LD		
Description of location or a grid reference (must be completed if postcode is not known):			
Easting:	377069		
Northing:	444793		

5. Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application? Yes No

6. Pedestrian and Vehicle Access, Roads and Rights of Way

- Is a new or altered vehicle access proposed to or from the public highway? Yes No
- Is a new or altered pedestrian access proposed to or from the public highway? Yes No
- Are there any new public roads to be provided within the site? Yes No
- Are there any new public rights of way to be provided within or adjacent to the site? Yes No
- Do the proposals require any diversions/extinguishments and/or creation of rights of way? Yes No

7. Waste Storage and Collection

- Do the plans incorporate areas to store and aid the collection of waste? Yes No
- Have arrangements been made for the separate storage and collection of recyclable waste? Yes No

8. Authority Employee/Member

With respect to the Authority, I am:

- (a) a member of staff
- (b) an elected member
- (c) related to a member of staff
- (d) related to an elected member

Do any of these statements apply to you? Yes No

9. Materials

Please state what materials (including type, colour and name) are to be used externally (if applicable):

Walls - description:

Description of existing materials and finishes:

N/A

Description of proposed materials and finishes:

N/A

Roof - description:

Description of existing materials and finishes:

N/A

Description of proposed materials and finishes:

N/A

Windows - description:

Description of existing materials and finishes:

N/A

Description of proposed materials and finishes:

N/A

9. (Materials continued)

Doors - description:

Description of *existing* materials and finishes:

N/A

Description of *proposed* materials and finishes:

N/A

Boundary treatments - description:

Description of *existing* materials and finishes:

N/A

Description of *proposed* materials and finishes:

N/A

Vehicle access and hard standing - description:

Description of *existing* materials and finishes:

N/A

Description of *proposed* materials and finishes:

N/A

Lighting - add description

Description of *existing* materials and finishes:

N/A

Description of *proposed* materials and finishes:

N/A

Others - description:

Type of other material:

SOLAR PHOTOVOLTAIC PANELS

Description of *existing* materials and finishes:

N/A

Description of *proposed* materials and finishes:

TOUGHENED NON REFLECTIVE ANTI GLARE GLASS WITHIN ALUMINIUM FRAME. BLACK TINT AND BLACK POWDER COATING

Are you supplying additional information on submitted plan(s)/drawing(s)/design and access statement?

Yes No

If Yes, please state references for the plan(s)/drawing(s)/design and access statement:

SOLAR PV SPECIFICATIONS
EXAMPLE PHOTOGRAPHS
SITE PHOTOGRAPHS
DESIGN AND ACCESS STATEMENT

10. Vehicle Parking

Please provide information on the existing and proposed number of on-site parking spaces:

Type of vehicle	Existing number of spaces	Total proposed (including spaces retained)	Difference in spaces
Cars	0	0	0
Light goods vehicles/public carrier vehicles	0	0	0
Motorcycles	0	0	0
Disability spaces	0	0	0
Cycle spaces	0	0	0
Other (e.g. Bus)	0	0	0
Short description of Other			

11. Foul Sewage

Please state how foul sewage is to be disposed of:

Mains sewer Package treatment plant Unknown
 Septic tank Cess pit

Other
N/A

Are you proposing to connect to the existing drainage system?

Yes No Unknown

12. Assessment of Flood Risk

Is the site within an area at risk of flooding? (Refer to the Environment Agency's Flood Map showing flood zones 2 and 3 and consult Environment Agency standing advice and your local planning authority requirements for information as necessary.) Yes No

If Yes, you will need to submit an appropriate flood risk assessment to consider the risk to the proposed site ...

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)? Yes No

Will the proposal increase the flood risk elsewhere? Yes No

How will surface water be disposed of?

Sustainable drainage system

Main sewer

Pond/lake

Soakaway

Existing watercourse

13. Biodiversity and Geological Conservation

To assist in answering the following questions refer to the guidance notes for further information on when there is a reasonable likelihood that any important biodiversity or geological conservation features may be present or nearby and whether they are likely to be affected by your proposals.

Having referred to the guidance notes, is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, OR on land adjacent to or near the application site:

a) Protected and priority species

Yes, on the development site Yes, on land adjacent to or near the proposed development No

b) Designated sites, important habitats or other biodiversity features

Yes, on the development site Yes, on land adjacent to or near the proposed development No

c) Features of geological conservation importance

Yes, on the development site Yes, on land adjacent to or near the proposed development No

14. Existing Use

Please describe the current use of the site:

Residential and agricultural use

Is the site currently vacant? Yes No

Does the proposal involve any of the following?

If yes, you will need to submit an appropriate contamination assessment with your application.

Land which is known to be contaminated? Yes No

Land where contamination is suspected for all or part of the site? Yes No

A proposed use that would be particularly vulnerable to the presence of contamination? Yes No

15. Trees and Hedges

Are there trees or hedges on the proposed development site? Yes No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character? Yes No

If Yes to either or both of the above, you may need to provide a full Tree Survey, at the discretion of your local planning authority. If a Tree Survey is required, this and the accompanying plan should be submitted alongside your application. Your local planning authority should make clear on its website what the survey should contain. In accordance with the current 'BS5837: Trees in relation to construction - Recommendations'.

16. Trade Effluent

Does the proposal involve the need to dispose of trade effluents or waste? Yes No

17. Residential Units

Does your proposal include the gain or loss of residential units? Yes No

18. All Types of Development: Non-residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace? Yes No

19. Employment

If known, please complete the following information regarding employees:

	Full-time	Part-time	Equivalent number of full-time
Existing employees	0	0	0
Proposed employees	0	0	0

20. Hours of Opening

If known, please state the hours of opening for each non-residential use proposed:

Use	Monday to Friday		Saturday		Sunday and Bank Holidays		Not Known
	Start Time	End Time	Start Time	End Time	Start Time	End Time	

21. Site Area

What is the site area?

09.32

hectares

22. Industrial or Commercial Processes and Machinery

Please describe the activities and processes which would be carried out on the site and the end products including plant ventilation or air conditioning. Please include the type of machinery which may be installed on site:

SOLAR PHOTOVOLTAIC PANELS ON GALVANISED STRUCTURE WITH ALUMINIUM RAILS

Is the proposal for a waste management development?

Yes No

23. Hazardous Substances

Is any hazardous waste involved in the proposal?

Yes No

24. Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land?

Yes No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact? (Please select only one)

The agent The applicant Other person

25. Certificates (Certificate A)

Certificate of Ownership - Certificate A

Town and Country Planning (Development Management Procedure) (England) Order 2010 Certificate under Article 12

I certify/The applicant certifies that on the day 21 days before the date of this application nobody except myself/ the applicant was the owner (owner is a person with a freehold interest or leasehold interest with at least 7 years left to run) of any part of the land or building to which the application relates.

Title: First name: Surname:

Person role: Declaration date: Declaration made

25. Certificates (Agricultural Land Declaration)

Agricultural Land Declaration

Town and Country Planning (Development Management Procedure) (England) Order 2010 Certificate under Article 12

Agricultural Land Declaration - You Must Complete Either A or B

(A) None of the land to which the application relates is, or is part of an agricultural holding.

(B) I have/The applicant has given the requisite notice to every person other than myself/the applicant who, on the day 21 days before the date of this application, was a tenant of an agricultural holding on all or part of the land to which this application relates, as listed below:

If any part of the land is an agricultural holding, of which the applicant is the sole tenant, the applicant should complete part (B) of the form by writing 'sole tenant - not applicable' in the first column of the table below

Title: First Name: Surname:

Person role: Declaration date: Declaration Made

26. Declaration

I/we hereby apply for planning permission/consent as described in this form and the accompanying plans/drawings and additional information. I/we confirm that, to the best of my/our knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the person(s) giving them.

Date

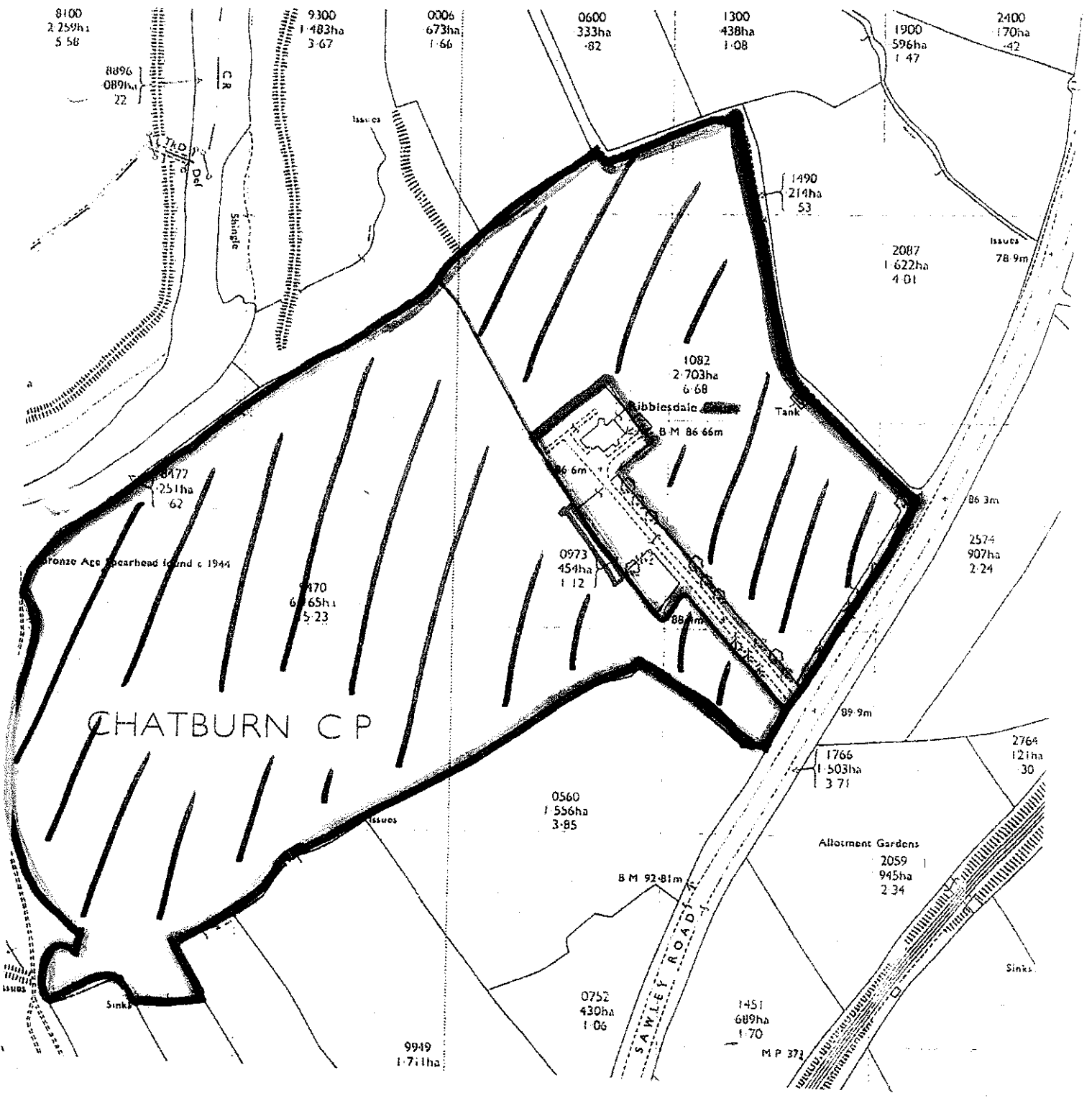
Ribblesdale Hall.

320120934A



1:2500

H.M. LAND REGISTRY		TITLE NUMBER LA79550
NCE SURVEY REFERENCE	SD7744	Scale 1/2500
COUNTY LANCASHIRE	RIBBLE VALLEY DISTRICT	© Crown Copyright



DESIGN AND ACCESS STATEMENT

FIELD MOUNTED SOLAR PV INSTALLATION
RIBBLESDALE HALL
SAWLEY ROAD
CHATBURN
LANCASHIRE

320120934P

Site information

The application site is within the ownership boundaries of an established dwelling on the outskirts of Chatburn. The residential complex includes Ribblesdale Hall, annexe accommodation and related outbuildings. The application site is approximately a quarter of a mile from Chatburn village centre and the conservation area, and is positioned outside of the Bowland Area Of Outstanding Natural Beauty in open countryside with direct access off Sawley Road. There is a public right of way 500 yards south of the site and to the north on the far bank of the Ribble. Ribblesdale Hall is not a listed building and has been developed and extended over the years including the annexe accommodation and a new leisure room extension which incorporates an indoor swimming pool. The location of the proposed solar panel array is within a field primarily used for sheep pasture adjacent to a mature natural hedgerow and trees to the south of the main dwelling and behind the detached garage which is within the residential curtilage of Ribblesdale Hall.

Design Proposal

The proposal is for new field mounted 10 kWp Solar PV installation facing south west within the field adjacent to the boundary of the residential curtilage but within the ownership boundaries of Ribblesdale Hall

There are 40 x 250W panels aligned in a single row, mounted on a galvanised steel frame cast into the ground and to a height not exceeding 1.8m. They will be located close to the existing telegraph pole which provides a mounting for the transformer (ref Ribblesdale CT 455228 -11,000 volts) and approximately 1.5m from the wire fence and mature hedgerow.

The full length of the installation will be 42m in total

The inverter will be positioned within the garage behind the array and will ensure that all the power generated by the Solar panels will be used for any electricity demands by the Hall and associated buildings. The annual carbon reduction achieved by the installation will be approximately 5 tonnes.

Impact On The Surrounding Area

After carrying out a detailed survey of Ribblesdale Hall and its immediate surroundings the proposed location is deemed to be the most appropriate location for a solar pv installation serving the dwelling.

The Hall is not clearly visible from the public highway as it is shielded by mature trees which frame the access drive leading to the property. To the north and east of the site there are open garden areas and fields. To the south and west of the dwelling there are large mature trees and hedgerows before it opens out to the pasture.

A ground mounted solar pv array located to the north or east of the site either within the residential curtilage or in pasture would impact upon the setting of the Hall and be subject to shading risk from the building stock and the trees.

Locating the system to the south means that the array is close to the inverter position and there is no risk of shading

The installation cannot be seen from the Hall and is approximately 500m away from the highway (Sawley Road) to the south east of the site.

The panel specification sheet is attached to this statement and I confirm that they will be finished in an anti glare glass. The black frames of the panels also assist with minimising any concerns regarding visual impact.

As the panels are only as high as the field fence itself and being in close proximity to the hedgerow and surrounding trees they will blend back into the surroundings and be seen to be an ancilliary installation for the dwelling providing valuable green energy which will all be utilised on site.

Refer also to :-

drawings PH/RH/100

Site photographs

Specification sheets

320120934P



VIEW FROM THE GARDEN AREA LOOKING TOWARDS THE REAR OF THE GARAGE
AND THE HEDGE ROW AT ADJACENT TO THE LOCATION FOR THE SOLAR ARRAY



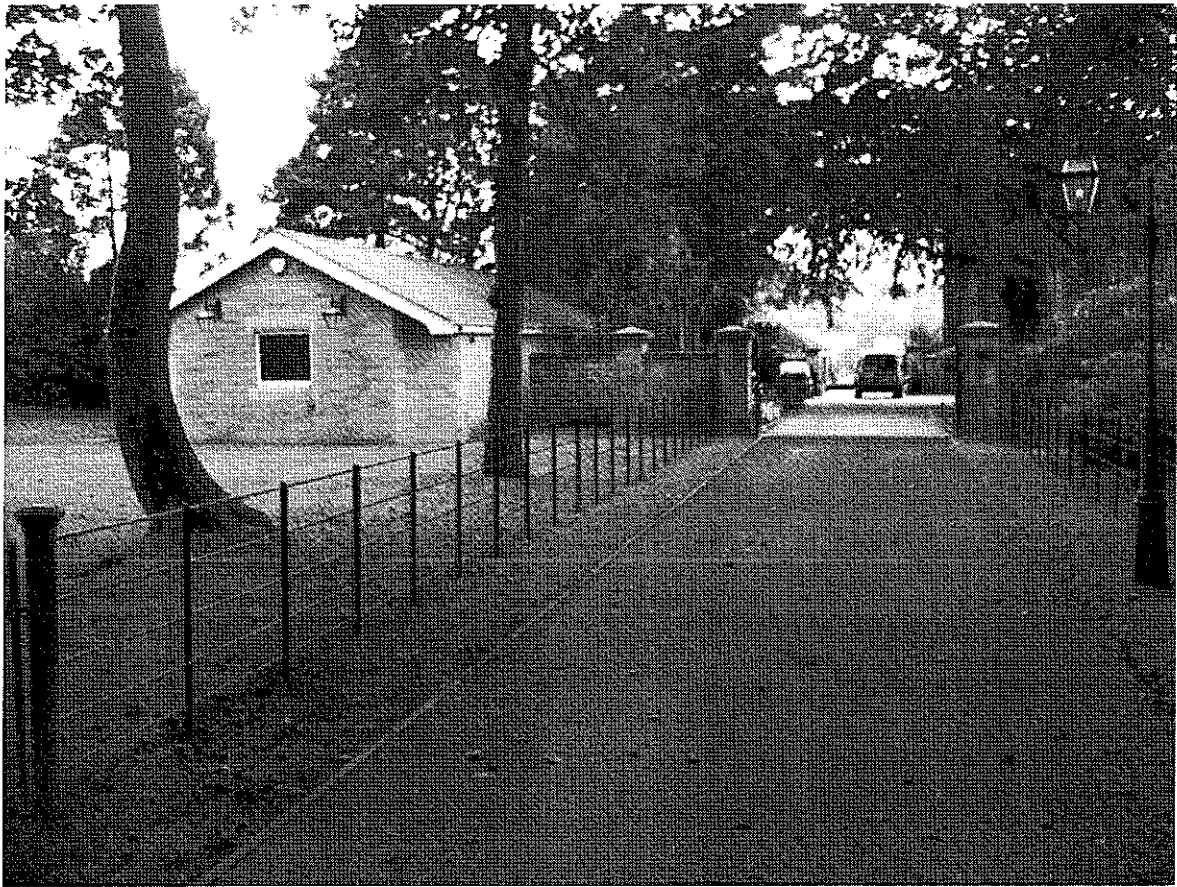
VIEW LOOKING TOWARDS SAWLEY ROAD FROM THE SITE LOCATION



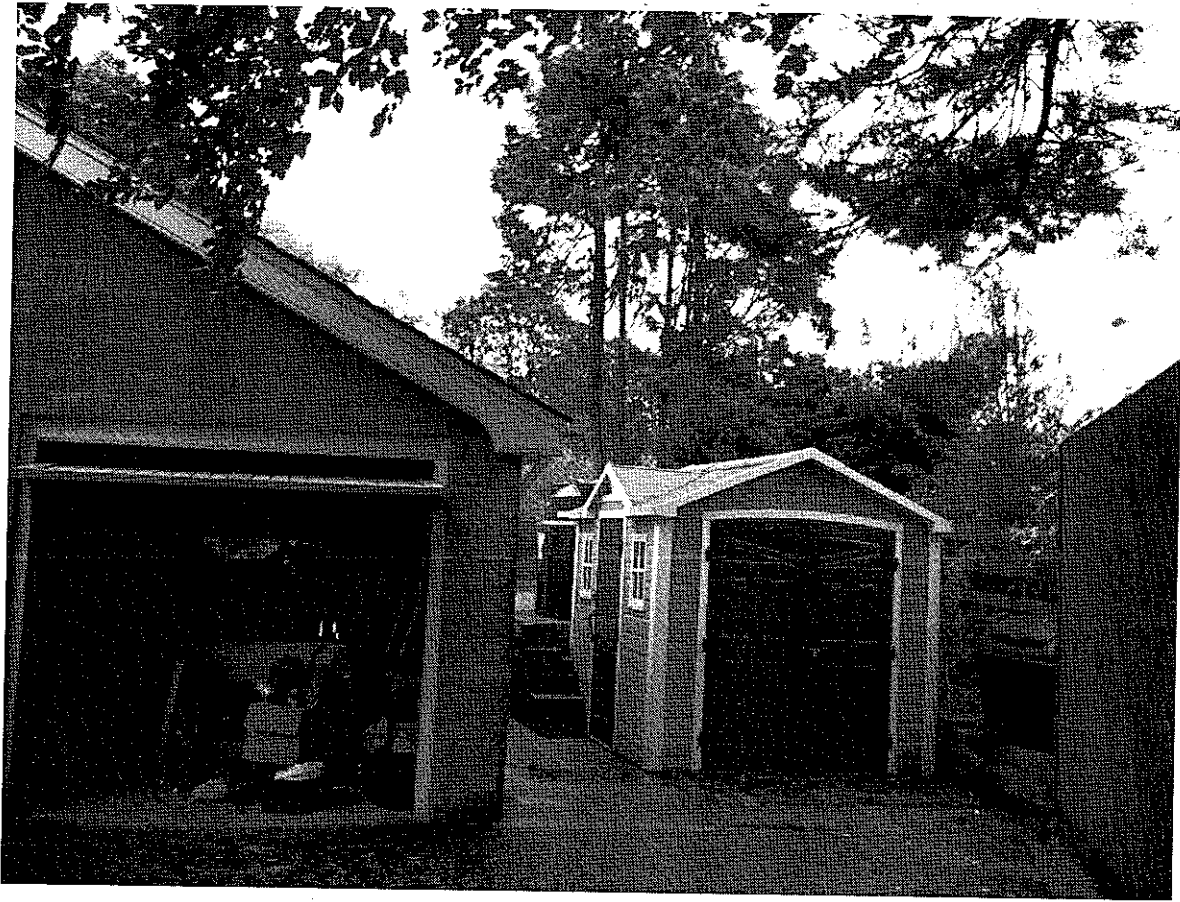
VIEW LOOKING TOWARDS THE SITE LOCATION FROM THE FIELD GATE ON SAWLEY ROAD LOOKING NORTH ACROSS THE PASTURE LAND



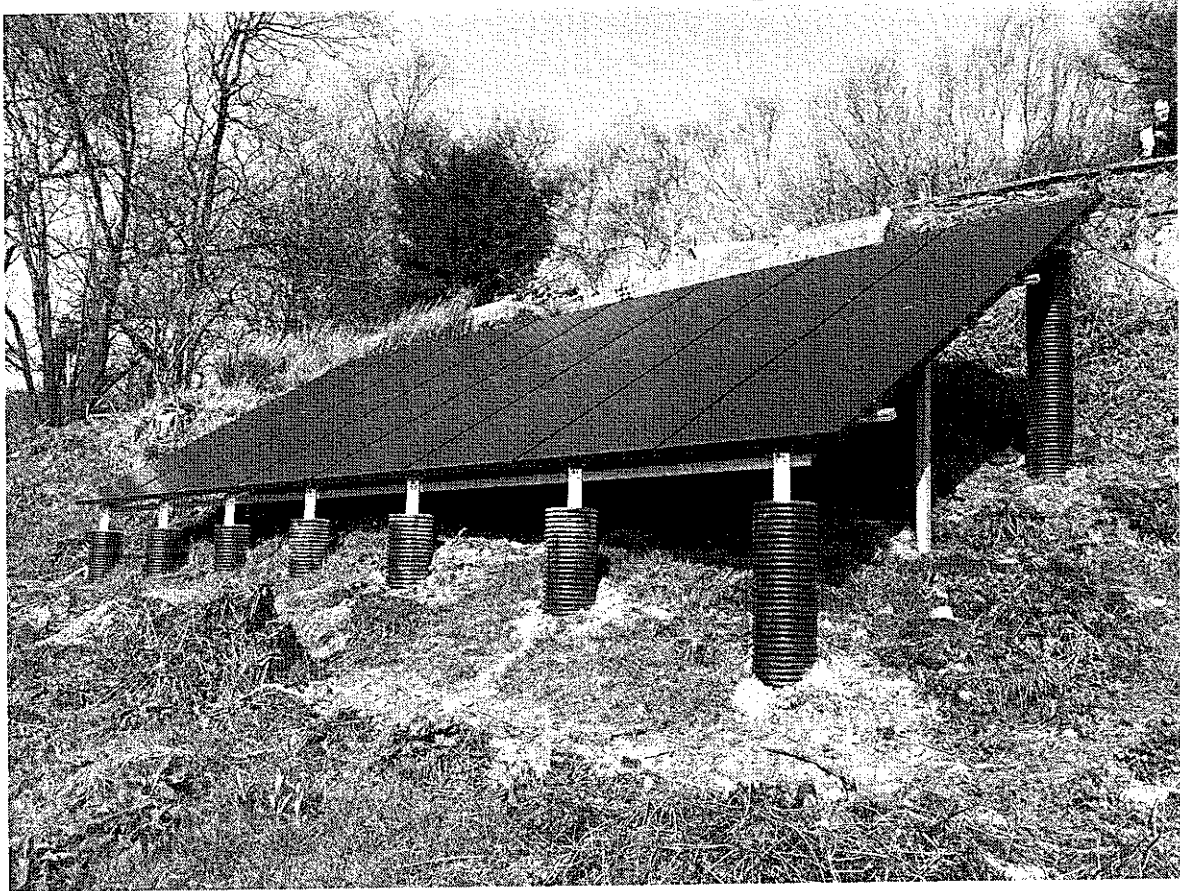
VIEW OF THE SITE LOCATION LOOKING NORTH FROM WITHIN THE PASTURE.



VIEW OF THE DRIVE ON THE APPROACH TO RIBBLESDALE HALL



VIEW OF THE AREA TO THE SIDE OF THE GARAGE BEHIND THE LOCATION FOR THE SOLAR PV ARRAY POSITIONED BEHIND THE HEDGE ROW



VIEW OF A SIMILAR BLACK FRAMED SOLAR PV ARRAY IN DUTTON APPROVED IN 2011 SHOWING THE METHOD OF FIXING THE FRAME INTO THE GROUND.

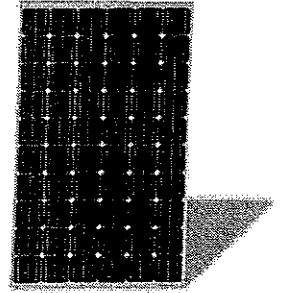
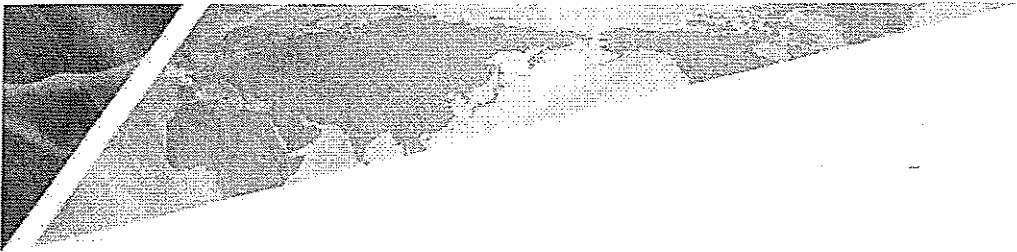


High Performance 60 Cell Mono crystalline 156x156mm Solar Photovoltaic Module

Model Number: CNPV-230M to CNPV-255M / Power Range : 230Wp to 255Wp

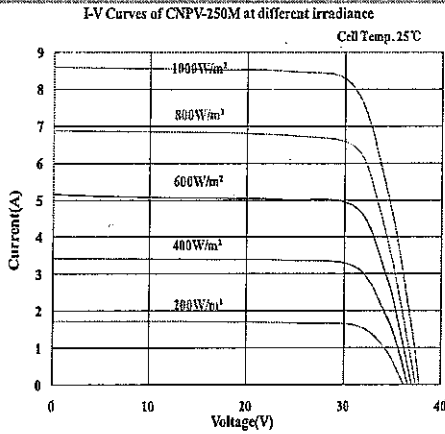
Typical Electrical Characteristics							
Model Number	UOM	Standard PV Modules			Premium PV Modules		
		CNPV-230M	CNPV-235M	CNPV-240M	CNPV-245M	CNPV-250M	CNPV-255M
Rated Maximum Power-Pmax	Wp	230	235	240	245	250	255
Power Tolerance	%	0/+3	0/+3	0/+3	0/+3	0/+3	0/+3
Maximum Power Voltage-Vmp	V	30.3	30.7	30.8	30.9	31.0	31.3
Maximum Power Current-Imp	A	7.60	7.65	7.80	7.93	8.05	8.15
Open Circuit Voltage-Voc	V	37.2	37.5	37.6	37.7	37.8	37.9
Short Circuit Current-Isc	A	8.20	8.30	8.40	8.50	8.60	8.70
Maximum System Voltage-VDC	V	1000					
Encapsulated Solar Cell Efficiency-ηc	%	16.0	16.4	16.7	17.1	17.4	17.8
Module Efficiency-ηm	%	14.1	14.4	14.7	15.0	15.3	15.6
Solar Cell and Configuration		60 cells(156×156mm/6"×6") in a 6×10 matrix connected in series					
Solar Cell Technology & Size	mm	Mono Crystalline, 156×156mm(6"×6")					
Cable Type,Diameter		4mm ² (12AWG), TÜV Certified					
Type of Connector		IP67, Type IV					
Junction Box		IP65, 1000VDC, Certified TÜV&UL Certified					
Number of Bypass Diodes & Type		3Nos. Schottky by-pass diodes					
Maximum Series Fuse Rating	A	20					
Temperature coefficient of Power	%/°C	- 0.40%/°C(-0.22%/°F)					
Temperature coefficient of Voc	%/°C	- 0.30%/°C(-0.17%/°F)					
Temperature coefficient of Isc	%/°C	0.05%/°C(0.028%/°F)					
Nominal Operating Cell Temperature-NOCT	°C	45± 2°C(113±3.6°F)					
Standard Test Conditions	STC	STC:AM=1.5, 1000W/m ² , Cells Temperature 25°C(77°F)					
Operating Temperature	°C	-40~+85°C(-40~+185°F)					
Product Certifications		IEC61215, IEC61730, UL1703&CE					

Mechanical & Packaging Characteristics		
Dimensions A×B×C	mm	1650×992×40mm(64.96"×39.06"×1.57")
Installation Hole Dimensions E×F	mm	990×941mm(38.98"×37.05")
Cable Length G	mm	1200mm(47.24")
Weight	Kg	20Kg(44lb)
Number of Draining Holes in Frame		8
Construction		Superstrate:High transmission 3.2mm tempered low iron glass;Substrate:White Back Sheet; Encapsulant: Fast Cure EVA
Frame		Clear anodized aluminium alloy type 6063T5; Color:silver
Packing Configuration and Quantity per Pallet		24 pcs per carton and one carton per pallet
Container Loading Capacity		624 pcs per 40 ft high cubic container

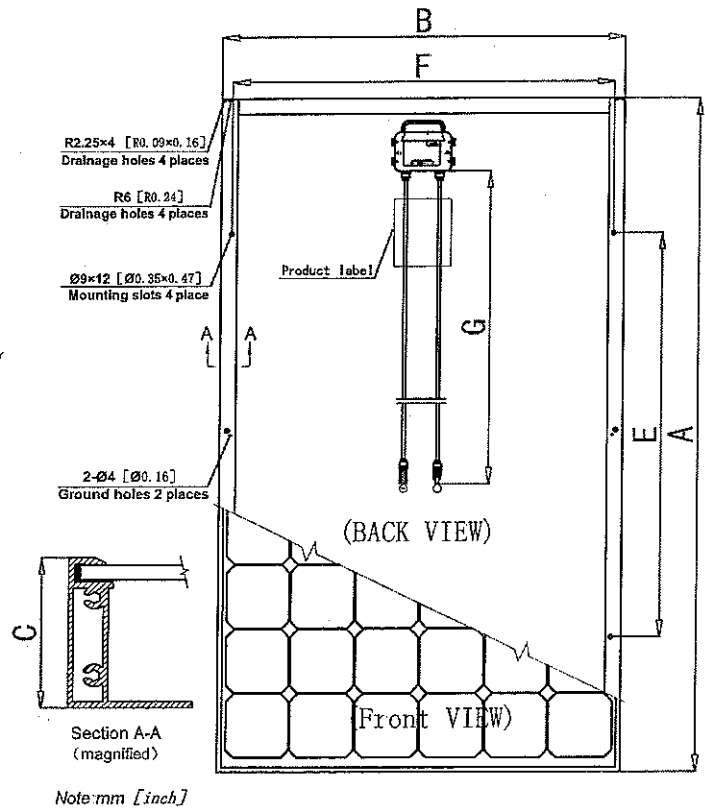


High Performance Mono Crystalline SPV Module

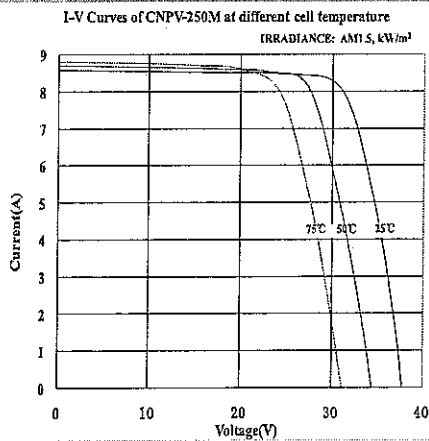
I-V Characteristics at Different Irradiance



Dimensional Characteristics



I-V Characteristics at Different Temperature

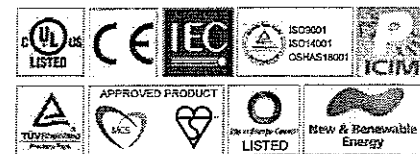


Note: This publication summarizes product warranty and specifications, which are subject to change without notice. Additional information may be found on our website: www.cnpv-power.com

SALIENT FEATURE

- 3% Positive Tolerance
- ARC Glass
- 78% Fill Factor
- Triple Busbar
- Larger Diameter
- Cell & Module Matching
- Smart Junction Box
- 100% Electro Luminescence
- Unique Frame
- Mechanical Strength-8000 Pa
- International Bankability
- Degradation Resistance
- 10 years Workmanship Warranty
- 25 years True Linear Warranty


GERTIFICATIONS





UL INSTALLATION INSTRUCTION & MAINTENANCE MANUAL FOR CRYSTALLINE SOLAR PHOTOVOLTAIC MODULE

REVISIONS					CNPV Dongying Solar Power Company Limited, China	
REV	ECO/ NPA	DESCRIPTION OF CHANGE	CHK'D/DATE	APP'D/DATE	TITLE:	
A	08-2008	Release to Market for 72cell Module with 125x125mm Mono Crystalline	Jane Liu 21 st Aug 2008	Chaudary 21 st Aug 2008	UL INSTALLATION INSTRUCTION & MAINTENANCE MANUAL FOR CRYSTALLINE SOLAR PHOTOVOLTAIC MODULE	
B	09-2008	Added 60cell Module with 156x156mm Mono and Poly Crystalline	Jane Liu 12 th Sep 2008	Chaudary 12 th Sep 2008		
C	06-2009	Added 72cell Module with 156x156mm Mono and Poly Crystalline	Yang Xiaowu June 1 st , 2009	Chaudary June 1 st 2009	SPECIFICATION NO: CNPV-PS-M-S0010	PART NO: N/A
D	10-2009	Update of 72-156M module	Yang Xiaowu Oct. 30 th , 2009	Chaudary Oct. 30 th , 2009	DRAWN BY: Chaudary	REV: F
E	12-2009	Add description of grounding system	Yang Xiaowu Dec. 10 th , 2009	Chaudary Dec. 10 th , 2009	SHEET 1 OF 1	
F	01-2010	Add 54cell Module with 156x156mm Mono and Poly Crystalline	Yang Xiaowu Jan. 4 th , 2009	Chaudary Jan. 4 th , 2009		

		TECHINICAL SPECIFICATION
TITLE: UL INSTALLATION INSTRUCTION & MAINTENANCE MANUAL FOR THE CRYSTALLINE SOLAR PHOTOVOLTAIC MODULE	SPEC. NO.:	CNPV-PS-M-S0010
	REVISION:	F
	EFFECTIVE DATE:	Jan. 2010
AUTHOR(S):	B V Chaudary	Page 1 of 12

1. INTRODUCTION

This installation instruction manual provides information about CNPV Crystalline Solar Photovoltaic Modules. CNPV Dongying Photovoltaic Power Company Limited has a history of successful innovation within the Solar Industry. The company was founded in 2006 and has made significant investments in research and development, creating over 10 patents during the company's history.

The company has several fully integrated product lines including ingots, casting, wafers, Cells and Modules of Mono and Polycrystalline Silicon Solar Photovoltaic (SPV) Modules and those products are also exported to overseas markets. With an experienced international management team and a strong reputation for innovation, CNPV is one of the leaders in China's Solar Energy Sector and provides the highest quality SPV Modules in a range of sizes designed to meet the requirements of the most demanding energy and power users worldwide.

2. POWER MODULE

CNPV Solar Photovoltaic Modules consist of a series of electrically interconnected crystalline silicon solar cells. Which are permanently encapsulated between a low iron toughened glass superstrate and substrate. The entire laminate is secured within an anodized aluminum frame for structural strength; ease of installation and to protect the cells from the most severe environmental conditions.

3. APPLICATIONS

CNPV SPV Modules are a highly reliable, virtually maintenance-free direct current (DC) power source, designed to operate most efficiently in sunlight. CNPV series Modules are ideal to power remote homes, recreational vehicles, water pumps, telecommunication systems and many other applications either with or without the use of storage batteries.

4. PERMIT

Before installing your system, contact local authorities to determine the necessary permit, installation and inspection requirements.

5. CLIMATE CONDITION

Install the CNPV Solar Photovoltaic Crystalline series Modules in the following conditions:

- Ambient temperature: -20°C to +40°C
- Operating temperature: -40°C to +85°C.
- Storage temperature: -40°C to +40°C,
- Humidity: below 85RH%
- Wind pressure: below 50 12lb / ft² (2400Pa).
- Snow Load Pressure: below 112.76lb / ft² (5400Pa).
- Corrosion resistance: except for corrosive salt area and sulfurous area

CNPV^{POWER}		TECHINICAL SPECIFICATION
TITLE: UL INSTALLATION INSTRUCTION & MAINTENANCE MANUAL FOR THE CRYSTALLINE SOLAR PHOTOVOLTAIC MODULE	SPEC. NO.:	CNPV-PS-M-S0010
	REVISION:	F
	EFFECTIVE DATE:	Jan. 2010
AUTHOR(S):	B V Chaudary	Page 2 of 12

6. SITE SELECTION

In most applications, CNPV SPV Modules should be installed in a location where they will receive maximum sunlight throughout the year. In the Northern Hemisphere, the Module should typically face south, and in the Southern Hemisphere, the Modules should typically face north. Modules facing 30 degrees away from true South (or North) will lose approximately 10 to 15 per cent of their power output. If the Module faces 60 degrees away from true South (or North), the power loss will be 20 to 30 per cent.

When choosing a site, avoid trees, buildings or obstructions, which could cast shadows on the solar photovoltaic Modules especially during the winter months when the arc of the sun is lowest over the horizon. Shading causes loss of output, even though the factory fitted bypass diodes of the SPV Module will minimize any such loss.

Do not install the SPV Module near naked flame or flammable materials.

Do not install the SPV Module in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain etc.

7. MODULE TILT ANGLE

CNPV SPV Modules connected in series should be installed at same orientation and angle. Different orientation or angle may cause loss of output power due to difference of amount of sunlight exposed to the Module.

CNPV SPV Modules produce the most power when they are pointed directly at the sun. For installations where the SPV Modules are attached to a permanent structure, the SPV Modules should be tilted for optimum winter performance. As a rule, if the system power production is adequate in winter, it will be satisfactory during the rest of the year. The Module tilt angle is measured between the solar Modules and the ground (Figure 1). Optimal tilting of SPV Module is almost the same as the latitude of installation location.

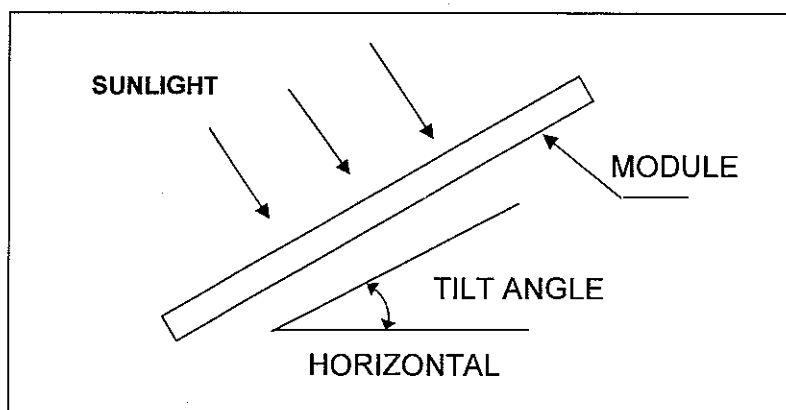


Figure 1 SPV Module Tilt Angle

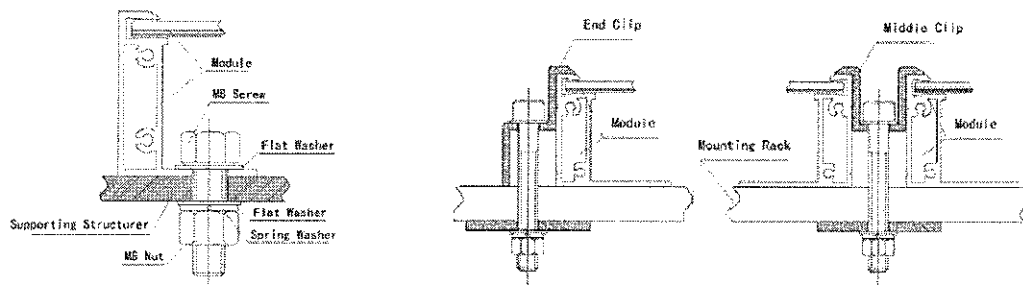
CNPV^{POWER}		TECHINICAL SPECIFICATION
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8. MOUNTING AND NOTES

Systems should be installed by qualified personnel only. It involves electricity, and can be dangerous if the personnel are not familiar with the appropriate safety procedures.

The Module frame is made of anodized aluminum, and therefore corrosion can occur if the Module is subject to a salt water environment with contact to a rack of another type of metal (Electrolysis Corrosion). If required, PVC or stainless steel washers can be placed between the SPV Module frame and support structure to prevent this type of corrosion. Module support structures that are to be used to support SPV Modules at correct tilt angles should be wind and snow load rated for use by the appropriate local and civil codes prior to installation.

CNPV SPV Modules can be mounted as following method:



Method a: Using corrosion-proof screws on existing Installation

Method b: Using suitable module clamps on the module frame

Figure 2 Mounting Method a and b

- a) Using corrosion-proof screws (M8) on the existing installing holes (see drawing 1, 3, 5 & 7) in the Module frame. The frame of each Module has 4 or 8 mounting holes (12mm*9mm) used to secure the Modules to supporting structure. The Module frame must be attached to a supporting rack using M8 stainless steel hardware together with spring washers and flat washers in four places symmetrical on the SPV Module. See method a of figure 2. The applied torque is about 8 Newton-meters.
- b) Using suitable Module clamps on the Module frame, see figure 2, method b. The module frame must be attached to supporting rack using M8 stainless steel hardware together with corrosion-proof clips in four places on the SPV module. See drawing 2, 4, 6 & 8, with *clamping clip*. for positioning of clamping clips. The applied torque is about 8 Newton-meters.

NOTES:

- (1) The Module clamps must not come into contact with the front glass and must not deform the frame. Avoid shadowing effects from the Module clamps and the insertion systems. It is not permitted to modify the Module frame under any circumstances. Recommended distance between 2 Solar Modules is 5mm considering linear thermal expansion of the Module frames.
- (2) Clearance between the Module frame and mounting surface may be required to prevent the junction box from touching the surface, and to circulate cooling air around the back of the Module.

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(3) The Modules are not designed for integral mounting as part of a roof or wall. The mounting design may have an impact on the fire resistance. If the Modules are to be installed on the roof or wall of a building, the fire resistance of roof covering or wall should be rated for the application. Here the standoff method or the rack method is recommended. The Modules are supported parallel to surface of the building wall or roof. Clearance between the Module frames and surface of the wall or roof is required to prevent wiring damage and to allow air to circulate behind the Module. The recommended stand-off height is 115mm, if other mounting means are employed this may affect the UL Listing. Any slope less than 5in/ft (127mm/305mm) required to maintain a fire class rating. Do not mount SPV Module in such way that the drain holes of SPV Module are intended to block up.

(4) Do not step on the Module, although SPV Modules are quite rugged, the glass can be broken (and the Module will no longer work properly) if it is dropped or hit by tools or other objects

(5) The modules have been evaluated by UL for mounting using the 4 provided mounting holes in the frame.

(6) The modules have been evaluated by UL for a maximum positive or negative design loading of 30 lbs/ft².

9. GROUNDING

All Module frames and mounting racks must be properly grounded in accordance with the National Electrical Code. Proper grounding is achieved by connecting the Module frame(s) and structural members contiguously one to another using a suitable grounding conductor. The grounding conductor or strap may be copper, copper alloy, or other material acceptable for use as an electrical conductor per NEC. The grounding conductor must then make a connection to earth using a suitable earth ground electrode.

CNPV recommend Grounding Clip Assembly 1954381-2 (UL category & file No : KDER E69905) from Tyco Electronics for grounding. Installation process is as follows:

(1) Find the grounding hole in the frame with 'GR' mark.

(2) Place the grounding clip onto the frame, making sure that the screw straddles the grounding hole. Using a No.2 cross-recessed screwdriver, thread the screw into the hole until the head is flush with the base and the base is flush with the frame, then tighten the screw with another 1/4 to 1/2 turn. Recommended torque is between 2.3 and 2.8Nm.

(3) Thread the hex nut onto the end of the screw, then using a 3/8-in. wrench, tighten the nut.

(4) Insert the wire into the wire slot. Press down on both ends of the wire (the wire slot will cause the wire to form a slight curve).

(5) Manually, or using channel lock pliers, push the slider over the base until it covers the base. This will terminate the wire.

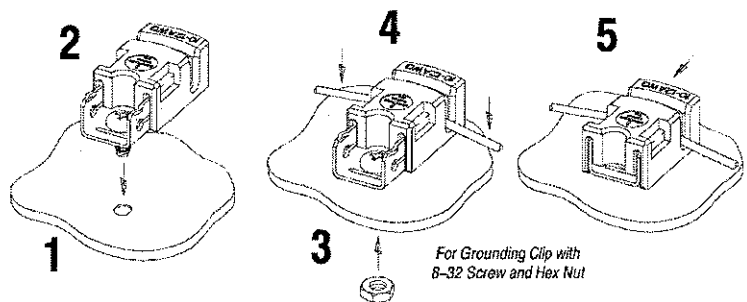



Figure 3 Schematic drawing for SPV Module

The rack must also be grounded unless they are mechanically connected by nuts and bolts to the grounded SPV Modules. The array frame shall be grounded in accordance with NEC Art250.

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10. BYPASS DIODES AND BLOCKING DIODES

Partial shading of an individual Module can cause a reverse voltage across the shaded SPV Module. Current is then forced through the shaded area by the other Modules.

When a bypass diode is wired in parallel with the series string, the forced current will flow through the diode and bypass the shaded SPV Module, thereby minimizing Module heating and array current losses.

In system utilizing a battery, blocking diodes are typically placed between the battery and the SPV Module output to prevent battery discharge at night.

Diodes that are used as blocking diodes must: Have a Rated Average Forward Current [$I_{F(AV)}$] **above** maximum system current at highest Module operating temperature. Have a Rated Repetitive Peak Reverse Voltage [V_{RRM}] **above** maximum system voltage at lowest Module operating temperature

11. WARNING AND NOTES

The SPV Modules generate electricity when exposed to light. Array of many Modules can cause lethal electrical shock and burn hazards. Only authorized and trained personnel should have access to these Modules. To reduce the risk of electrical shock or burns, modules maybe covered with an opaque material during installation to avoid electrical shocks or burns. Do not touch live terminals with bare hands. Use insulated tools for electrical connections

Use appropriate methods to mount SPV Modules. Fall of Modules from high place will cause death, injury or damage. The SPV Module has a pair of male and female waterproof connectors. For a series electrical connection, connect positive (+) connector of first SPV Module to negative (-) connector of the following Module.

Do not short the positive and the negative. Do not disconnect under load. Be sure connectors have no gap between the insulators. In case there is a gap, a fire and/or an electrical shock may occur.

NOTES:


(1) Artificially concentrated sunlight shall not be directed on the SPV Module. The rated electrical characteristics are within 10 percent of measured values under standard test conditions (Irradiance of 1000W/m², AM 1.5 spectrum, and cell temperature of 25°C).

(2) Under normal conditions, a solar photovoltaic Module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly the value of I_{sc} and V_{oc} marked on this Module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and sizes of controls connected to the SPV output. Refer to Section 690-8 of the National Electrical Code for an additional multiplying factor of 1.25 which may also be applicable.

(3) The installation in Canada shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.

(4) Details for wiring in accordance with the NEC.

(5) If you install modules in parallel electrically, each module (or series string of modules so connected) shall be provided with the maximum series fuse as specified.

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12. MODULE WIRING

Each Module has two #12 AWG type standard 90°C sunlight resistant output cables each terminated with plug & ply connectors. This cable is suitable for applications where wiring is exposed to the direct rays of the Sun. We recommend that all wiring and electrical connections comply with the National Electrical Code (NEC).

For field connections, use the minimum No. #12 AWG copper wires insulated for a minimum of 90°C and Sunlight resistant as well. The minimum and maximum outer cable diameters of the cable are 5 to 7mm. Refer to table 1 for the maximum electrical rating of series fuse.

13. TYPE OF PRODUCT APPLICATION

“The modules are qualified for application class A: Hazardous voltage (IEC61730: higher than 50V DC; EN61730: higher than 120V), hazardous power applications (higher than 240W) where general contract access is anticipated (Modules qualified for safety through EN IEC61730-1 and EN IEC61730-2 within this application class are considered to meet the requirements for Safety class II)”

14. MAINTENANCE

Under most weather conditions, normal rainfall is sufficient to keep the SPV Module glass surface clean. If dirt build-up becomes excessive, clean the glass only with a soft cloth using mild detergent and water. USE CAUTION WHEN CLEANING THE BACK SURFACE OF THE MODULE TO AVOID PENETRATING THE SUBSTRATE MATERIALS. SPV Modules that are mounted flat (0° tilt angle) should be cleaned more often, as they will not "self clean" as effectively as Modules mounted at a 15° tilt or greater. Once a year, check the tightness of terminal screws and the general condition of the wiring. Also, check to be sure that mounting hardware is tight. Loose connections will result in damage for array. Changed SPV Module must be the same kind and type. Do not touch live parts of cables and connectors. Use appropriate safety equipment (insulated tools, insulating gloves, etc), when touching them

Cover the front surface of the SPV Module by an opaque or other material when repairing. The SPV Modules when exposed to sunlight generate high voltage and are dangerous.

15. SPECIFICATIONS:

See Table I

Notes

1. Standard Test Condition(SIT) of Irradiance of 1000W/m², AM1.5 Solar Spectrum & 25°C cell temperature
2. Nominal Operating Cell Temperature (NOCT): 45±2°C
3. The tolerance of Voltage and Current within ±10%
4. Temperature coefficient of Current is 0.05%/°K
5. Temperature coefficient of Voltage is -0.35%/°K
6. See SPV Module drawing for mounting and grounding holes locations

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Table 1: Electrical and Mechanical Specifications.


Module Series	Model	Dimensions (mm)	Weight (kg)	Electrical Performance @ STC					Max-System Voltage (VDC)	Max-Series Fuse (A)
				P _{max} (W)	V _{Pm} (V)	I _{Pm} (A)	V _{oc} (V)	I _{sc} (A)		
72pcs 125×125mm SPV Module (Mono-Crystalline Silicon)	CNPV-160M	1581×809×40	15.5	160	34.5	4.65	43.0	5.15	IEC61215/IEC61730:1000VDC & UL1703: 600VDC	90
	CNPV-165M			165	35.2	4.70	43.4	5.20		
	CNPV-170M			170	35.8	4.75	43.8	5.25		
	CNPV-175M			175	36.6	4.80	44.2	5.30		
	CNPV-180M			180	37.2	4.85	44.6	5.35		
	CNPV-185M			185	37.8	4.90	45.0	5.40		
	CNPV-190M			190	37.8	5.05	45.1	5.55		
	CNPV-195M			195	37.9	5.15	45.2	5.60		
	CNPV-200M			200	38.0	5.25	45.3	5.65		
54pcs 156×156mm SPV Module (Mono-Crystalline Silicon)	CNPV-205M-54	1482×992 ×46	18.0	205	27.2	7.55	33.2	8.20	IEC61215/IEC61730:1000VDC & UL1703: 600VDC	140
	CNPV-210M-54			210	27.4	7.65	33.4	8.30		
	CNPV-215M-54			215	27.6	7.80	33.6	8.40		
54pcs 156×156mm SPV Module (Poly-Crystalline Silicon)	CNPV-200P-54	1482×992 ×46	18.0	200	26.7	7.50	33.1	8.15	IEC61215/IEC61730:1000VDC & UL1703: 600VDC	140
	CNPV-205P-54			205	26.9	7.63	33.3	8.25		
	CNPV-210P-54			210	27.1	7.75	33.5	8.35		
60pcs 156×156mm SPV Module (Mono-Crystalline Silicon)	CNPV-200M	1650×992×46	19.5	200	28.6	7.00	36.0	7.60	IEC61215/IEC61730:1000VDC & UL1703: 600VDC	140
	CNPV-205M			205	28.9	7.10	36.2	7.70		
	CNPV-210M			210	29.2	7.20	36.4	7.80		
	CNPV-215M			215	29.5	7.30	36.6	7.90		
	CNPV-220M			220	29.8	7.40	36.8	8.00		
	CNPV-225M			225	30.0	7.50	37.0	8.10		
	CNPV-230M			230	30.3	7.60	37.2	8.20		
	CNPV-235M			235	30.7	7.65	37.6	8.30		
	CNPV-240M			240	30.8	7.80	37.6	8.40		
	CNPV-245M			245	30.9	7.93	37.7	8.50		
	CNPV-250M			250	31.0	8.00	37.8	8.60		
60pcs 156×156mm SPV Module (Poly-Crystalline Silicon)	CNPV-190P	1650×992×46	19.5	190	28.0	6.80	35.6	7.40	IEC61215/IEC61730:1000VDC & UL1703: 600VDC	140
	CNPV-195P			195	28.3	6.90	35.8	7.50		
	CNPV-200P			200	28.6	7.00	36.0	7.60		
	CNPV-205P			205	28.9	7.10	36.2	7.70		
	CNPV-210P			210	29.2	7.20	36.4	7.80		
	CNPV-215P			215	29.5	7.30	36.6	7.90		
	CNPV-220P			220	29.8	7.40	36.8	8.00		
	CNPV-225P			225	30.1	7.50	37.0	8.10		
	CNPV-230P			230	30.3	7.60	37.2	8.20		
	CNPV-235P			235	30.5	7.70	37.3	8.30		
	CNPV-240P			240	30.8	7.80	37.4	8.40		

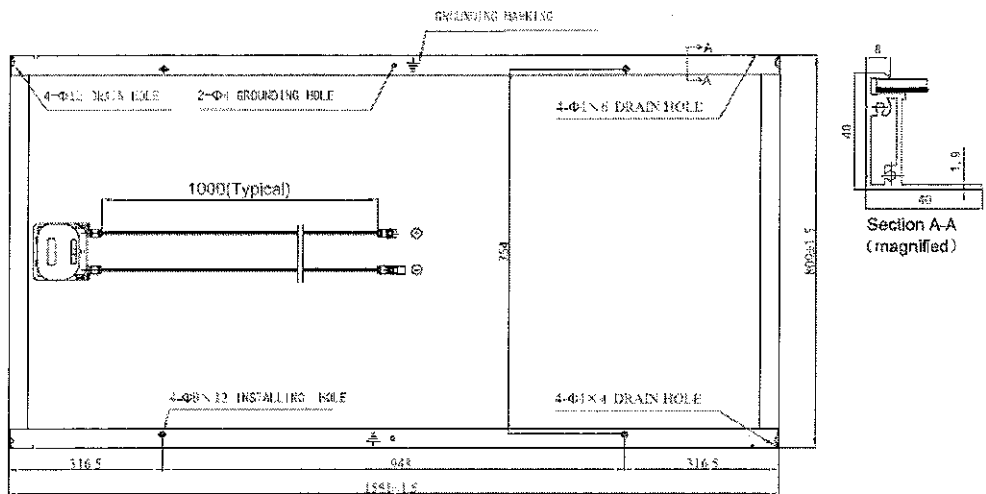


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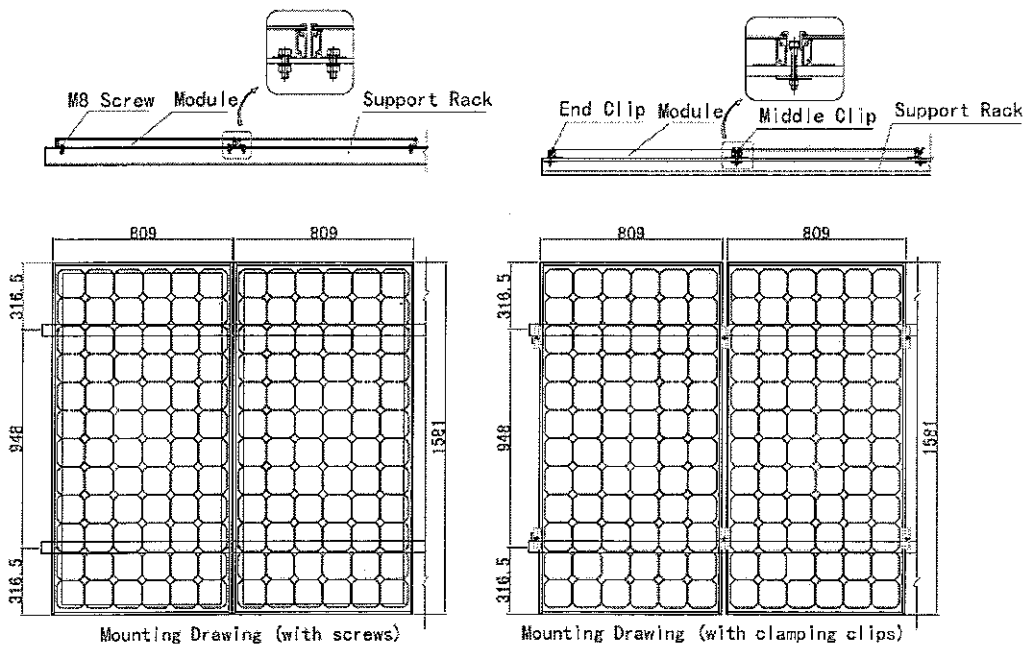
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Module Series	Model	Dimensions (mm)	Weight (kg)	Electrical Performance @ STC					Max-System Voltage (VDC)	Max-Series Fuse (A)
				V _{oc}	V _{mp}	I _{sc}	I _{mp}	P _{max}		
72 pcs 156×156mm SPV Module (Mono-Crystalline Silicon)	CNPV-260M	1965×992×46	25.0	260	36.1	7.20	43.4	7.80	IEC61215/IEC61730:1000VDC & ULI 703: 600VDC	14.0
	CNPV-265M			265	36.3	7.30	43.6	7.90		
	CNPV-270M			270	36.5	7.40	43.8	8.00		
	CNPV-275M			275	36.7	7.50	44.0	8.10		
	CNPV-280M			280	36.9	7.60	44.2	8.20		
	CNPV-285M			285	37.0	7.70	44.4	8.30		
	CNPV-290M			290	37.2	7.80	44.6	8.40		
	CNPV-295M			295	37.3	7.90	44.8	8.50		
	CNPV-300M			300	37.5	8.00	45.0	8.60		
	72 pcs 156×156mm SPV Module (Poly-Crystalline Silicon)			CNPV-250P	1965×992×46	25.0	250	35.8		
CNPV-255P		255	36.0	7.10			43.6	7.70		
CNPV-260P		260	36.2	7.20			43.8	7.80		
CNPV-265P		265	36.4	7.30			44.0	7.90		
CNPV-270P		270	36.6	7.40			44.2	8.00		
CNPV-275P		275	36.7	7.50			44.4	8.10		
CNPV-280P		280	36.9	7.60			44.6	8.20		
CNPV-285P		285	37.1	7.70			44.8	8.30		
CNPV-290P		290	37.2	7.80			45.0	8.40		

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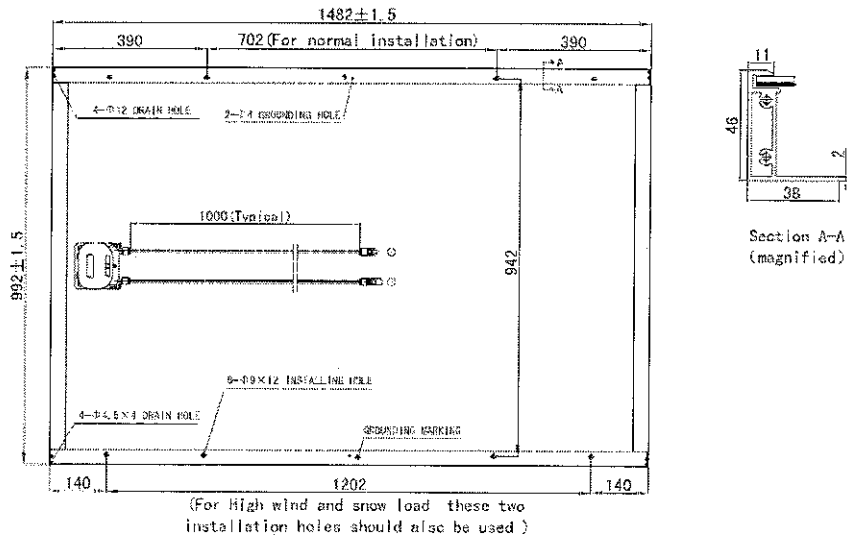


Drawing 1 Back View of 6*12-125mm- 72cell SPV Module

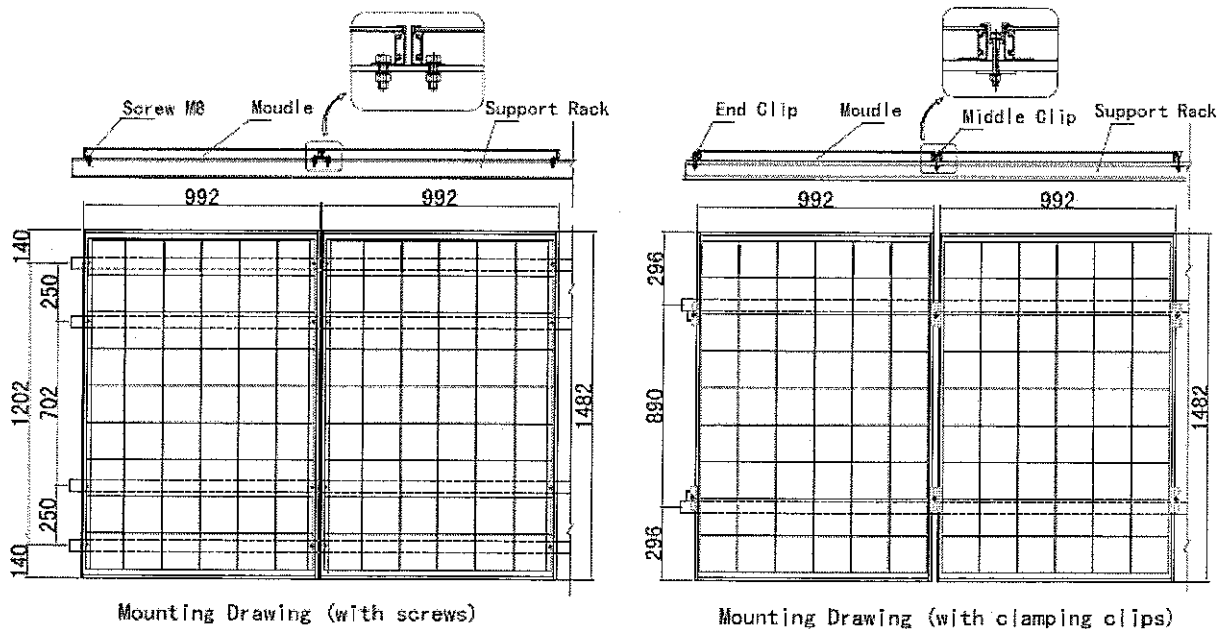


Drawing 2 Mounting Drawing for 6*12-125x125mm 72cell SPV Module (with clamping clips and screws)

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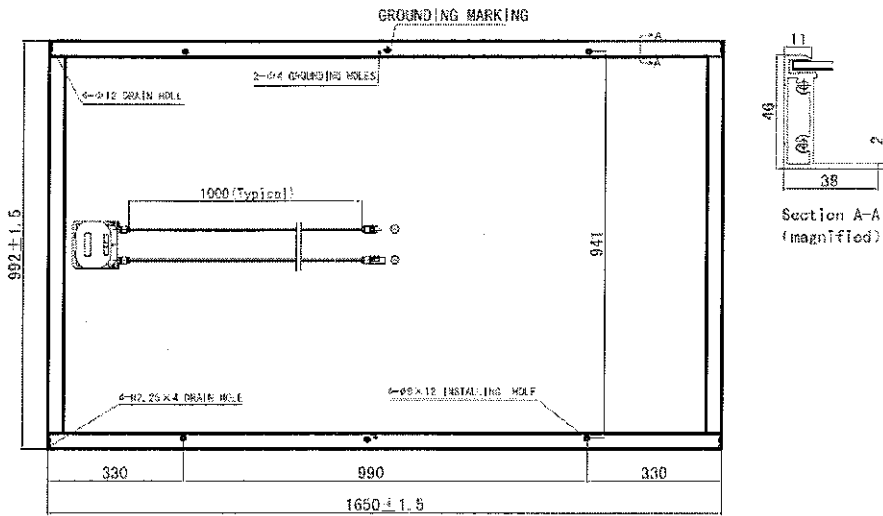


Drawing 3 Back View of 6*9-156x156mm 54cell SPV Module

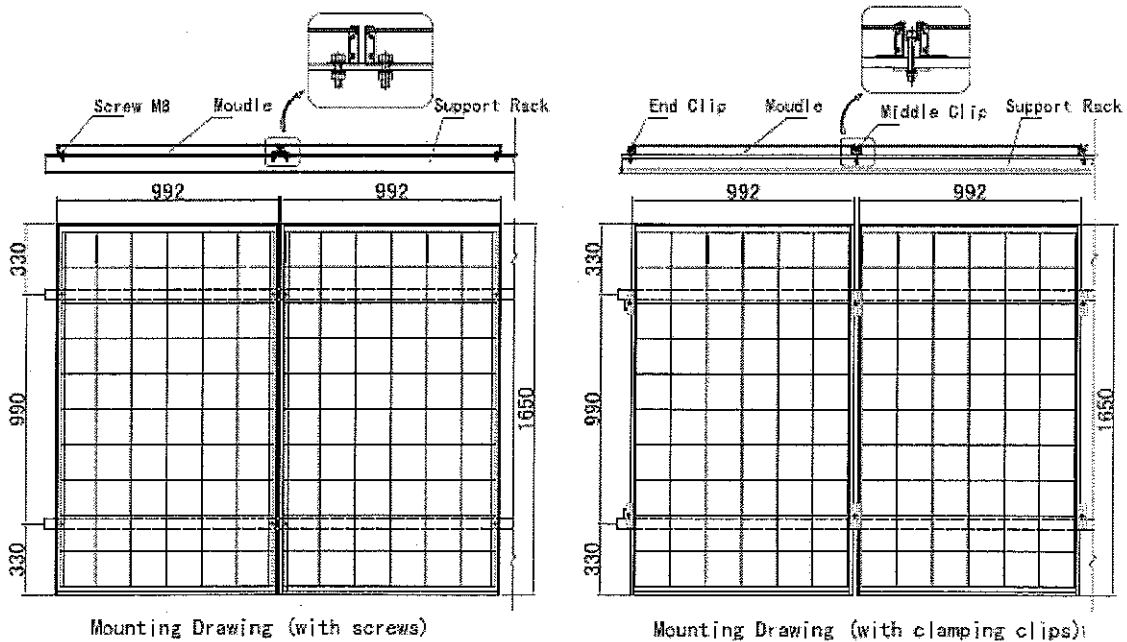


Drawing 4 Mounting Drawing for 6*9-156x156mm 54cell SPV Module (with clamping clips and screws)

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Drawing 5 Back View of 6*10-156x156mm 60cell SPV Module



Drawing 6 Mounting Drawing for 6*10-156x156mm 60cell SPV Module (with clamping clips and screws)



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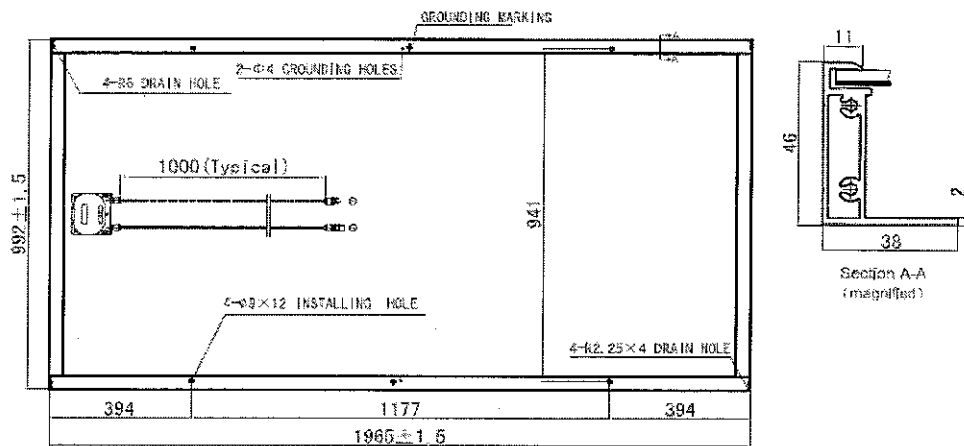
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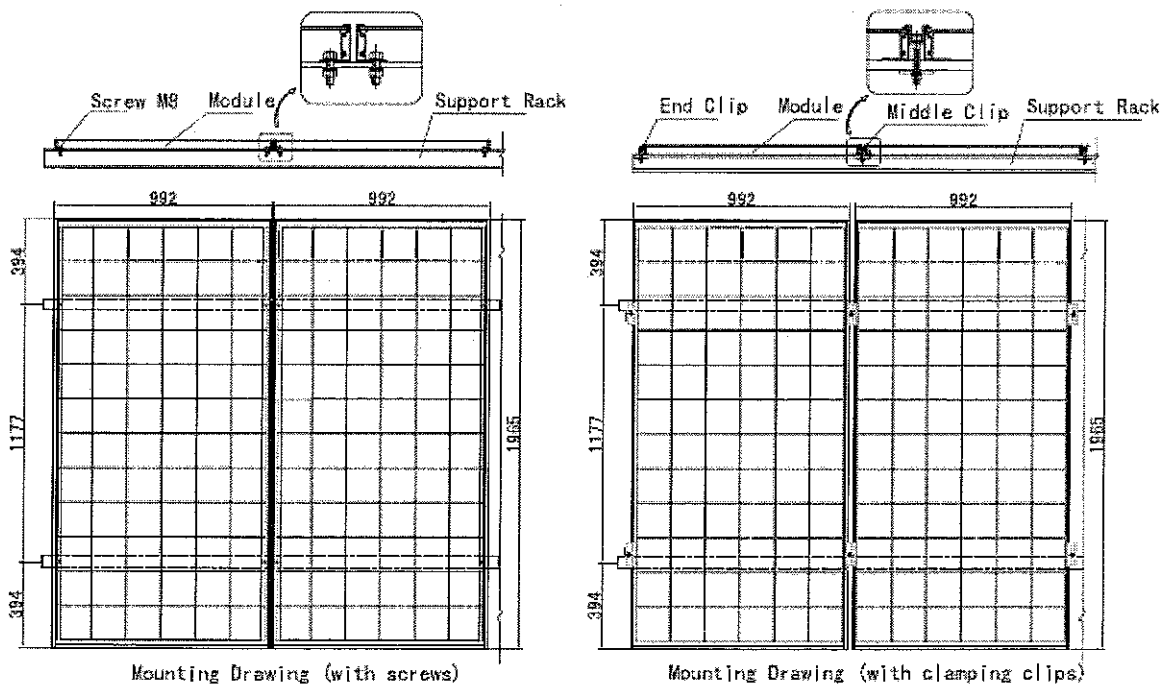
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Drawing 7 Back View of 6*12-156x156mm 72cell SPV Module



Drawing 8 Mounting Drawing for 6*12-156x156mm 72cell SPV Module (with clamping clips and screws)