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IPSE
Instituto de Planificación y Promoción de Soluciones Energéticas para las Zonas No Interconectadas

MANUALES DE EQUIPOS

ElectroHuila | DICOSELEC S.A.S. | TECNOCOL LTDA

FI Series 1000-3600VA Pure Sine Wave Inverter

Operational Manual



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I . Operating Instruction

1-1. Open-package inspection

1). After opening the package, please check the attached parts and components, including operation manual and checking whether the inverter is in good condition? If found any inverter broken or components missing, do not turn on the machine , feedback to the carrier or supplier.

Note:

1). Please keep the box and packing materials in case the use in future.
2). The product is very heavy (check attachment as reference), please be careful to carry.

1-2. Installation notice:

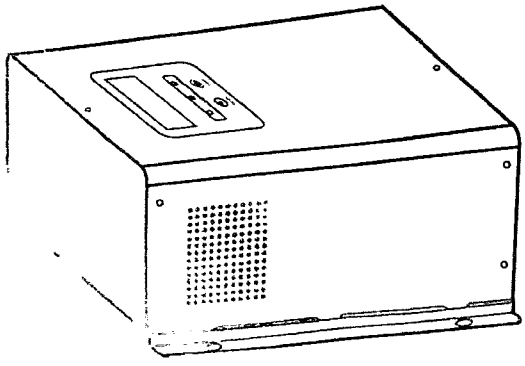
1). The products should be well-ventilated, away from water and the corrosive and combustible gases.
2). Do not set it in a corner, ensure the bottom of the front panel, the rear panel fan outlet and the side of the machine are well-ventilated.
3). The environment temperature should remain -0— 40 ℃.
4). If the machine operates under low temperature environment, it would cause water condense, only in a absolute dry condition can the machine would work normal, otherwise there will be a electric shock.
5). Install the inverter near the mains input socket or nearby the switch, to draw out plugs then cut off mains supply once there is an emergency.

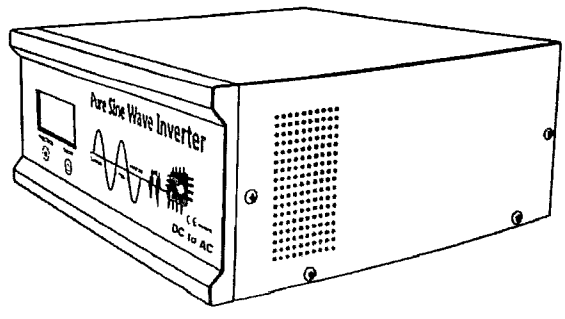
Attention:

1). Load should be turned off before connecting to inverter and turned on one by one after connecting completed.
2). The inverter should be connected to a socket with a corresponding current protection.
3). All power sockets should link with ground protection.
4). No matter input power cable inserts to mains socket or not, the inverter will also continue outputing possibly, turning off the inverter can not guarantee there is no current inside the machine. In order to make sure to cut off the output of inverter, you should turn off all the switches then turn off the main supply.
5). To load inductive appliances such as electromotor, displayer and laser printer, inverter capacity should be twice as loading machine's rated power at least.

II . Outlook drawing of inverter

1. 1000VA / 1500VA / 1800VA / 2000VA / 3000VA / 3600VA series

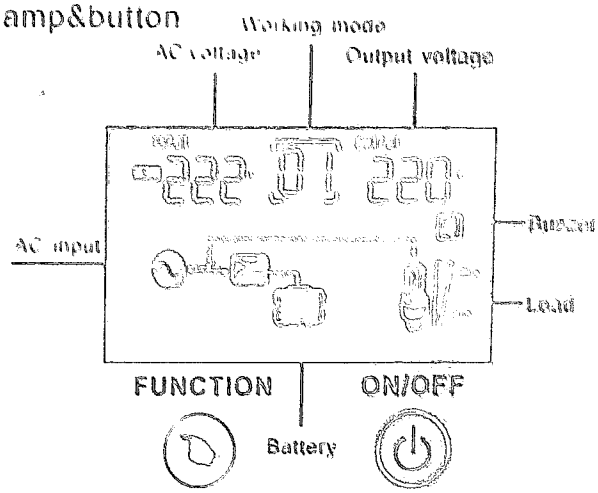




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III. Description of front board

Meaning of indicate lamp&button



IV. Function setting and meaning of the button

ON OFF Button: 3 sec.→ ON 3 sec.→ OFF

Function Button :

6 sec.→ working mode 01, 6 sec.→ working mode 02, 6 sec.→ working mode 03

Working Mode:

01 Normal Mode - AC input priority to supply the load and batteries, battery supply the loads without AC input.

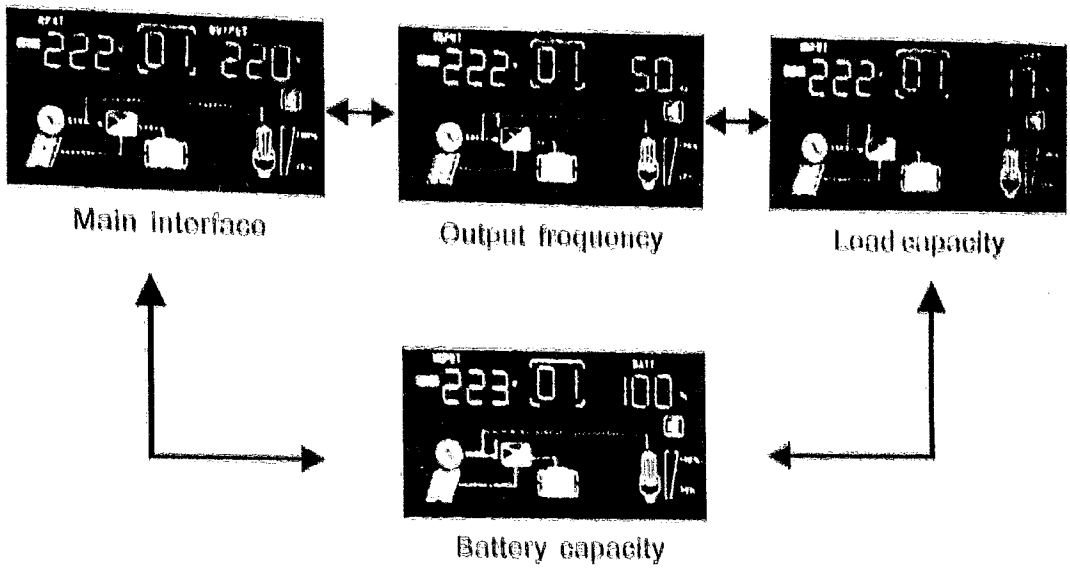
02 Saving Mode - AC input advanced to supply the load and the battery, battery supply the loads without AC input. But the load must >10% of the inverter capacity, otherwise the machine will continue to detect whether load is >10% inverter capacity or not without AC output.

03 Battery Mode - Battery priority to supply the load, when battery is low of power or voltage, will automatically switch to AC mains supply, when the battery full of charge, automatically transfer to the battery supply.

2 sec.→ buzzer mute ON, 2 sec.→ buzzer mute OFF

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Main interface data:



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V. Connection way of input & output

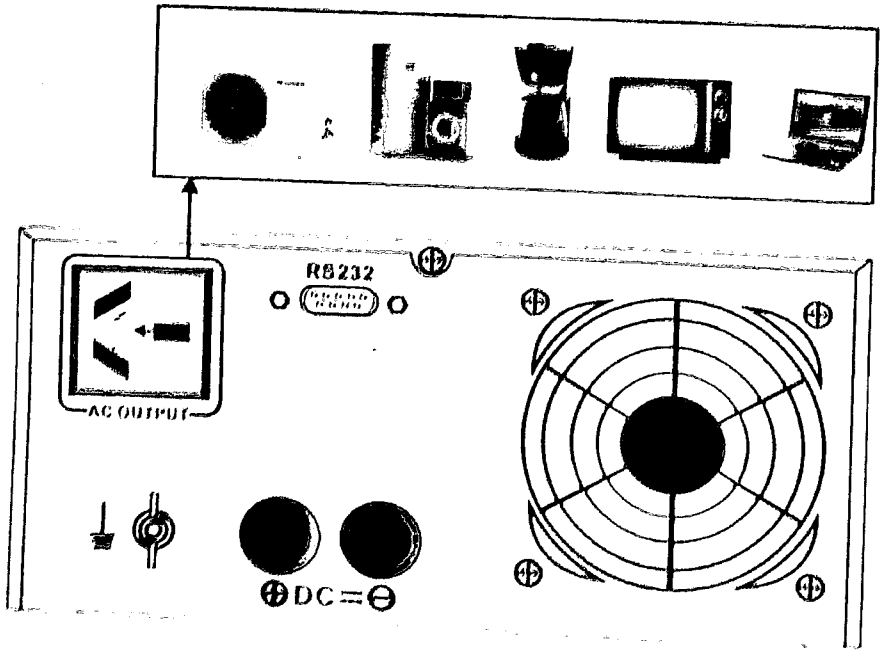
Connect with AC input and load output by connecting terminal, load output can connect both by terminal blocks and output plug.

Note: Output plug only can connect with each load less than 1500W.

Back panel desctription

DC⊖	Battery negative polarity connection
DC ⊕	Battery positive polarity connection
AC OUTPUT	Universal socket output

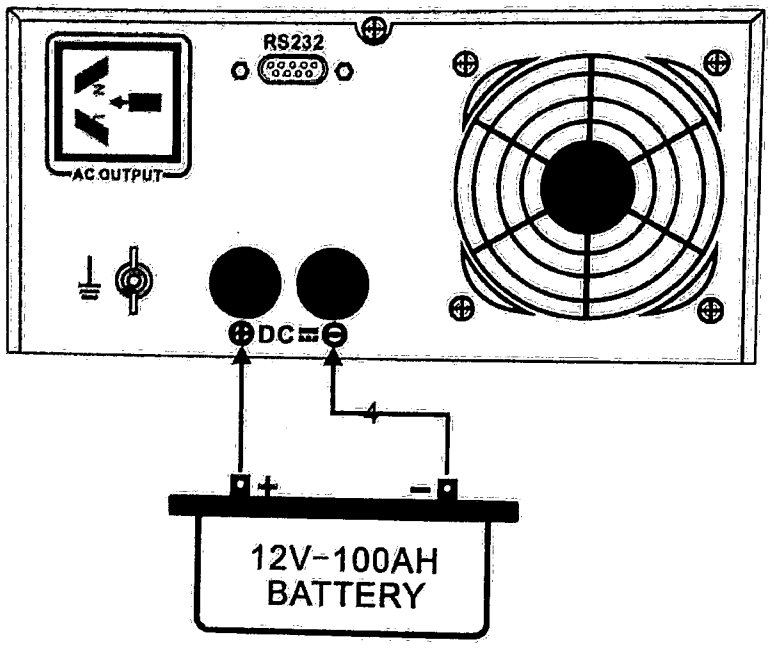
1. 1000VA / 1500VA / 1800VA / 2000VA / 3000VA / 3600VA series wiring diagram



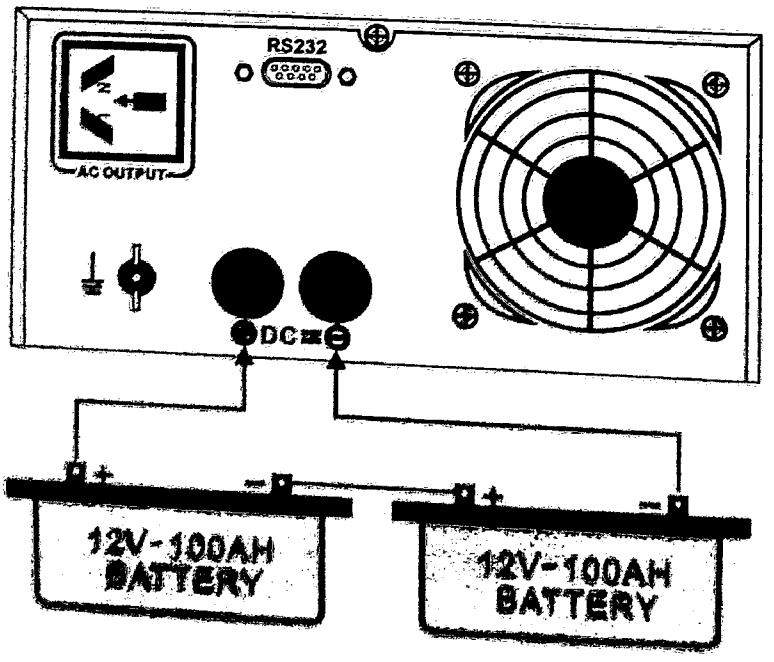
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VI. Battery wiring diagram

1. 12V series battery wiring diagram



2. 24V series battery wiring diagram



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Ⅶ. Care and maintenance

1). This inverter is low in repair rate. Battery of standard model is valve adjusting, low maintenance, ensuring better life only by charging often. when connecting to mains supply, no matter inverter on or off, it still keeps charging for battery, and provide over charge, over discharge protection.
2). If there has been long time no using, please discharging then charging the inverter each 4-6 months
3). Usually, the life span of battery is 3-5 years. If any wrong with it, please ask professionals for changing. And do not change it by yourself.
4). Don't change the single battery , changing the battery should according to the suppliers instructions.
5). Normally, the battery should discharge then recharge every four or six months , charging for it more than 12 hours after discharging.
6). At high temperature area, the battery should be discharging and charging every 2 months and the standard charging time is 12hours at least each time.

Note:
1). Before changing battery, must turn off inverter and disconnect the mains supply.
2). Remove metal object like ring, watch etc.
3). Please don't put the metal objects on the battery.
4). This is the normal phenomenon, when connecting the battery wire, the wiring will appear at a small spark.
5). Be attention to connecting between anode and cathode.

Ⅷ. Convenient method of maintenance & fixing:

Fault	Cause	Solution
No city power input	Recoverable fuse popup	Press fuse back
Terminal heating	Fault or loose connection	Fasten again
Switch off with loads	Battery no energy or overload	Charge battery or reduce loads
Switch on failure	Fault connection with city power or battery	Check connection with battery or connect again
Alarm when switch on	Battery no energy or overload	Charge battery or reduce loads
Buzzer scream 2 secs every 1 sec stop	Over temperature alarm (85 alarm-90 shut down)	Check if fan heat dissipation hole jammed
Fan twirls sometimes fast as well as slowly	Fan twirls fast when inside temperature reaches 45 degree, twirls slowly when 42 degree	Normal phenomenon, fan is under intelligent control

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IX. Technical Data

Standard		Colombia IPSE					
Series Number		FI					
Model Number		FI1000VA	FI1500VA	FI1800VA	FI2000VA	FI3000VA	FI3600VA
Rated Power		500W	800W	900W	1000W	1200W	1500W
Surge Power		1000VA	1500VA	1800VA	2000VA	3000VA	3600VA
Nominal battery voltage		12VDC / 24VDC					
Input	DC input range	11.5-15VDC (12V) / 23-30VDC (24V)					
Protection	Low battery alarm	≤11.5VDC for 12VCD system / ≤23VDC for 24VDC system (About 55% battery capacity), automatic alarm, DC input connected					
	Low battery protection	≤11VDC for 12VCD system / ≤22VDC for 24VDC system (About 50% battery capacity), automatic shutdown, DC input automatic disconnected					
	High battery alarm	≥15VDC for 12VCD system / ≥30VDC for 24VDC system (About 110% battery capacity), automatic alarm, DC input connected					
	High battery protection	≥17VDC for 12VCD system / ≥34VDC for 24VDC system (About 120% battery capacity), automatic shutdown, DC input automatic disconnected					
	Over load protection	10% more than rated capacity, automatic shutdown, DC input automatic disconnecte					
	High temperature protection	Built-in temperature real time sensor, ≥85℃ alarm, ≥90℃ automatic shutdown, DC input automatic disconnected					
	Short circuit protection	Automatic shutdown, DC input automatic disconnected					
Output	Transfer efficiency	>95%					
	Output voltage	(DC battery mode) 120VAC±3%					
	Output frequency	(DC battery mode) 60Hz±1%					
	Output wave form	Pure sine wave					
Other	Display	LCD Display with function buttons					
	Cooling system	Intelligent cooling fan control system					
		≤42℃ slow fan, ≥45℃ fast fan					
Working mode	02	Energy saving					
		Load≤10% inverter on and automatic in stand by mode without AC output and keep detecting loads, load≥11%-100% automatic provides AC output					
Total Harmonic Distortion		<3%					
Communication		RS-232					
Production Class		IP20					
Environment	Working Temperature	-20~+75℃					
	Humidity	<95%					
Appearance	Product size (mm)	280*275*120mm					
	Packing size (mm)	345*315*187mm					
	Net Weight (kg)	6.9kg	8.0kg	8.4kg	9.2kg	9.5kg	10.0kg
	Gross Weight (kg)	7.4kg	8.5kg	8.9kg	9.7kg	10.0kg	10.5kg
Warranty		2 years					

*Product specifications are subject to change without further notice, but will be confirmed before ordered.

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X. Error Code

Error Code	Status	Caused by	Solution (Turn off the inverter everytime)
E01	MOSFET over current	Overload or startup overload	Reduce the load power then restart the inverter
E02	Output short circuit	Output load power 3 times larger than rated power of inverter, or output load short circuit	Reduce the load power, or disconnect the short circuit load, then restart the inverter
E03	Overload	Output load power larger than rated power of inverter	Reduce the load power then restart the inverter
E04	Over temperature	Environment temperature too high, or no ventilation, or inverter temperature too high	Move the inverter to a cool and shady environment with ventilation then restart it
E05	High battery voltage	Wrong connection of battery, or wrong battery type	Reconnect the battery or change the battery then restart the inverter
E06	Low battery voltage	Low battery power, or wrong battery type, or battery aging, or battery capacity too small	Change the battery then restart the inverter
E07	Polarity reverse connecting	Input positive and negative electrode pole reverse connecting	(FI series already has anti-reverse polarity protection so it can be ignored)
E08	Output low voltage protection	Output voltage <50% of rated voltage	Change the load or the battery then restart the inverter

When the inverter is not working properly, it will automatically shut down with buzzer alarm and error code shown on the LCD display.

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ONE -SOLAR®

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Risen Energy Co., Ltd.

Crystal Silicon Solar Module Installation Manual

Meet Standards of IEC61215 (Second Version) & IEC61730

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1. Company Profile

Risen Energy CO., Ltd is a high-tech photovoltaic enterprise in Zhejiang Province, mainly engaged in R&D, production, sales of PV products, such as PV grid-connected power generation, independent PV power supply system, solar modules, and solar lamps etc. and successfully launched IPO in Shenzhen stock exchange market in 2010.

Risen Energy CO., Ltd has a complete and vertically integrated production line, including silicon, solar cells, mono and poly solar modules, among which the PV products have a good sale in domestic and abroad. Rely on excellent technology innovation ability and management team; Risen has become one of the leading in the international solar energy field, supplying excellent quality solar modules for domestic and global solar module users, providing green and clean energy for the world.

2. Solar Modules

Solar modules produced by Risen Energy are series connected of crystal silicon solar cells, being permanently encapsulated between glass and back sheet by hot melt adhesive, and installed around the modules the aluminum alloy frames which are oxidized by anodic oxidation, this structure can ensure that the solar cells can safely and normally operate in most harsh environment.

3. Application

Solar PV module produced by Risen is charged by DC power supply which have high reliability almost maintenance free when under the light. The modules can be ideally applied in remote areas power system, home power system, renewable energy, hydropower station, automobile water pump, communication system or directly compose solar pv plant, these systems can be with storage battery, or directly grid-connected without storage battery.

4. Installation Permits

Before the installation of solar PV power generation system, please contact the local relevant authorities to determine the installation methods is comply with the requirements of the local installation permits and installation inspection requirements.

5.Responsibilty Declaration

(1)Due to the installation,operation,application are beyond company control. Those

losses or expenses caused by wrong installation,operation,application and maintenance, solar modules damages, people casualties or any other extral expenses, which Risen will not responsile for.

(2) The patent infringement of third party rights or any other rights arising from the application solar modules, which Risen will not responsile for.

(3) Risen remain the rights to update the products, product specifications and installation manual specification or document rights, without prior statement.

6. safety precautions

1. The installation of solar modules requires qualified professionals to install.
2. Before installation, wiring, operation or maintenance, need a comprehensive understanding of solar modules or system's installation, operation or maintenance requirements.
3. Use properly insulated tools and appropriate protective equipment to reduce risk of electric shock.
4. Do not stand or step on the module.
5. Do not damage the back or front of the solar module.
6. Do not use solar module with broken glass or backsheet. Broken Modules can not be repaired,once contact with the module surface or frame can lead to electrical shock.
7. Do not disassemble the module or remove any part of the module.
8. Do not use unsafe solar module.
9. Prevent connector contamination; don't make any connection terminal plug dirty.
10. Install fire protection layer on the roof, when solar module is installed on the roof.
11. Do not handle or install modules when they are wet or during periods of high wind.

7. Climate Condition

Install Risen Energy solar modules in the following conditions:

No.	Environmental Condition	Range
1	Environmental Temperature	-40°C to+40°C.
2	Work Temperature:	-40°C to +85°C
3	Storage Temperature	-40°C to +40°C
4	Humidity	Below 85RH%
5	Mechanical Load Pressure	Below 5400Pa

Sheet 1: Environmental condition for Solar module working

Note: *Mechanical load bearing of each module is based on mounting methods. Professional solar system installers must be responsible for calculating mechanical loads when system design.*

8. Site Selection

1. In most applications, Risen Energy PV modules should be installed in a location where they will receive maximum sunlight throughout the year. If in the northern hemisphere, usually choose solar modules to be installed facing the south; While in the southern hemisphere, usually choose solar modules to be installed facing the North.
2. Modules should be free from shaded at any time of the day because of buildings, trees, chimney, etc. Due to these objects will form shadow on modules, especially when sun is in the lowest horizontal position in winter. Shadow will cause loss of power output of solar system. Do not ignore the factor of shadow although by-pass diode can reduce loss in certain limit.
3. Do not install PV modules near fire or inflammable & explosive goods, etc.
4. Do not install PV modules in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain, etc.
5. Do not install PV modules in corrosive salt areas within proximity of the ocean
6. Do not install PV modules in environment subject to corrosion, such as costal areas, or sulfurous areas, etc.

4.1. Module Tilt Angle

1. Risen Energy PV modules connected in series should be installed at the same orientation and angle. Differing orientations or angles may cause a loss of power output due to installation of modules will lead to mismatch of current and voltage caused by the total differences of light absorption, thereby reduce the system efficiency.

2. Maximum power generated when sunlight directly to the solar modules, for those solar modules installed in the permanent support, the power output of modules in winter should be considered when it selects the optimum installation angle. If the angle can ensure enough power output in the winter, it will make the entire solar

module system can have sufficient power output in the rest of time in a year.

Tilt angle refers to angle between solar modules and ground (Figure 1).

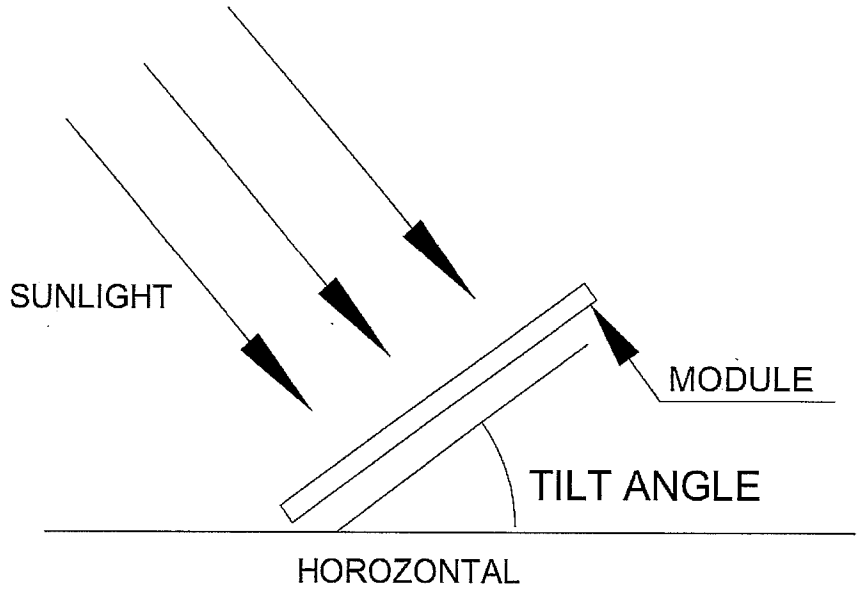


Figure: Module Tilt angle

Note: If it is just a simple estimate, the optimal tilt for a PV module is roughly the same as the latitude of installation location.

10. Solar Module Parameters

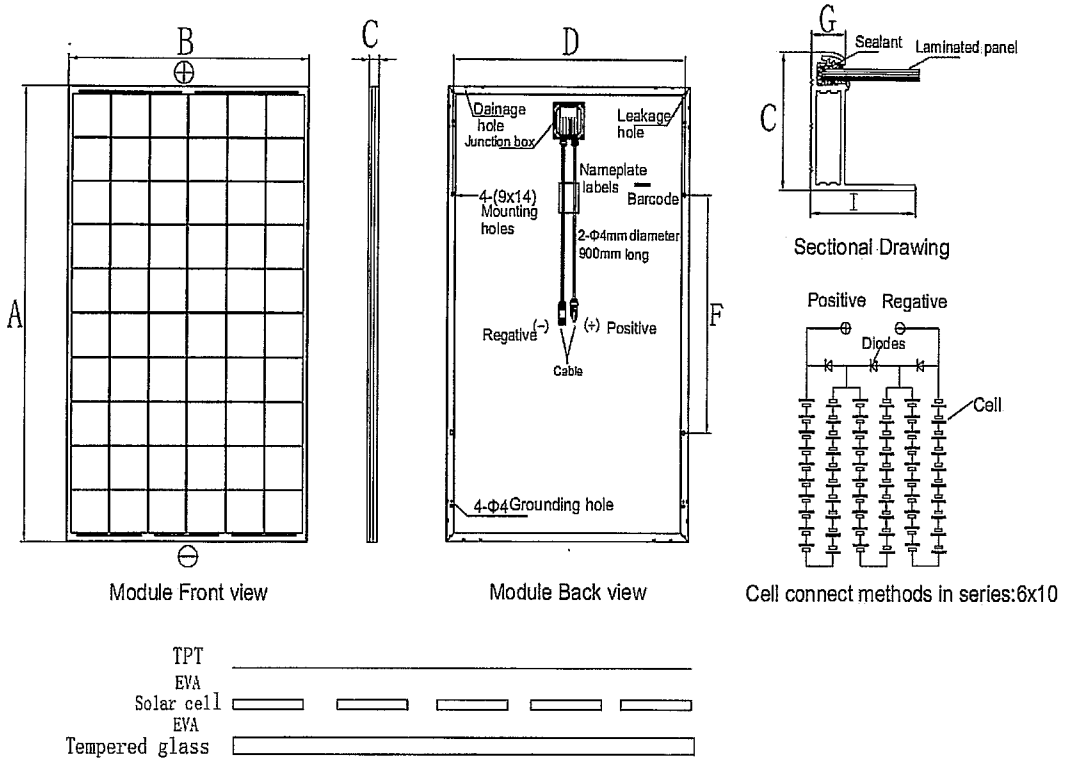


Figure2:1650 Solar Module Mechanical Drawing

Factory Address: Tashan Industrial Zone, Meilin, Ninghai, Ningbo, China
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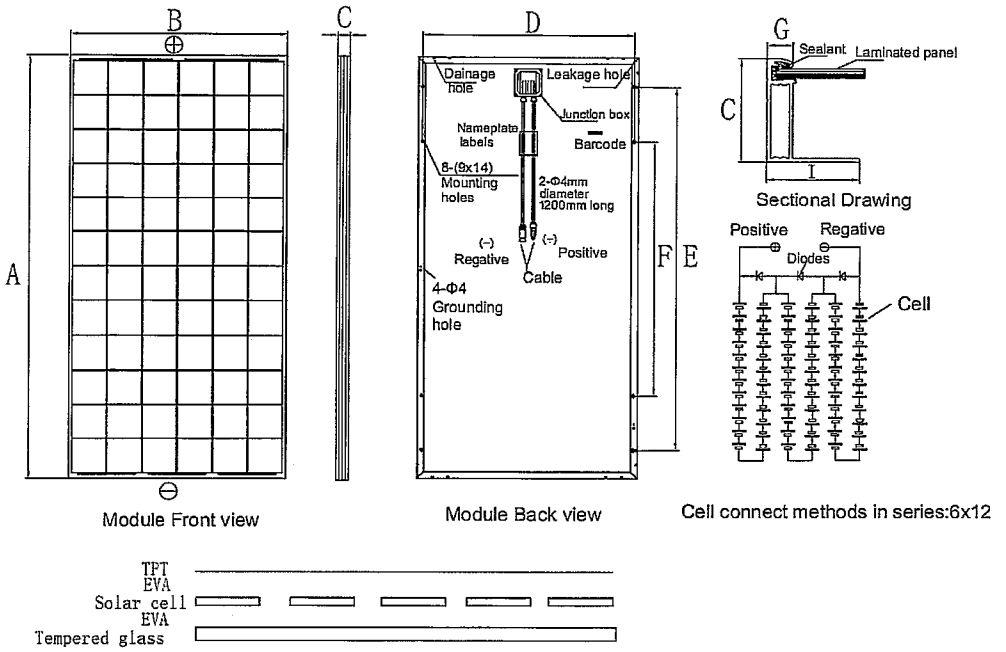


Figure3:1956 Solar Module Mechanical Drawing

	Module Type	Cells Type	Cells QTY	Module Dimension A*B*C（mm）	Mounting Hole D*E/D*F（mm）	Cable Length（mm）	Frame Dimensions C*I*G（mm）
Figure 2	SYP60-6(XXX)S	Poly	60	1650*992*35	952*870*	900mm	35*30*9.7
	RSM60-6(XXX)M	Mono	60	1650*992*35	952*870	900mm	35*30*9.7
Figure 3	RSM72-6(XXX)M	Mono	72	1956*992*40	942*1676/942*1176	1200mm	40*35*9.7
	RSM72-6(XXX)P	Poly	72	1956*992*40	942*1676/942*1176	1200mm	40*35*9.7

Table 2: Solar Module Dimensions

For Risen Energy's Solar Modules we can use follow methods to fix and install:

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1. Tools: screwdriver, wrench, stainless steel screw, nut and washer
2. According to the local climate conditions the system engineer make system load calculation and design and select the right mounting systems.
3、Installation::
4、Fixing with Bolt: using corrosion proof bolts (M8) fixed on the solar module trhough the mounting holes on the aluminum frames.
5、Fixing with clamp fixing: using correct clamps to fix the long frame side or short frame side of the solar modules.

(Note: The mechanical load bearing include wind and snow loades of the modules is based on the mounting methods. The professional system installer or skill person through professional trainings must be responsible for mechanical load calculation according to the system design.

1. Fixing with Bolts

The frame of each module has 8 or 4 mounting holes on the aluminum frames (Length X Width: 14mm*9mm),
can use M8 corrosion proof nut and configured nut cap, then with spring washer and flat washer to fasten the modules on the mounting racks.
The torque should be 20nm. The frame with 8 mounting holes fits for 72 pcs and 60 pcs modules, but with 4 mounting holes only fits for 60 pcs modules.
About the details please refer to the following figure for installation.

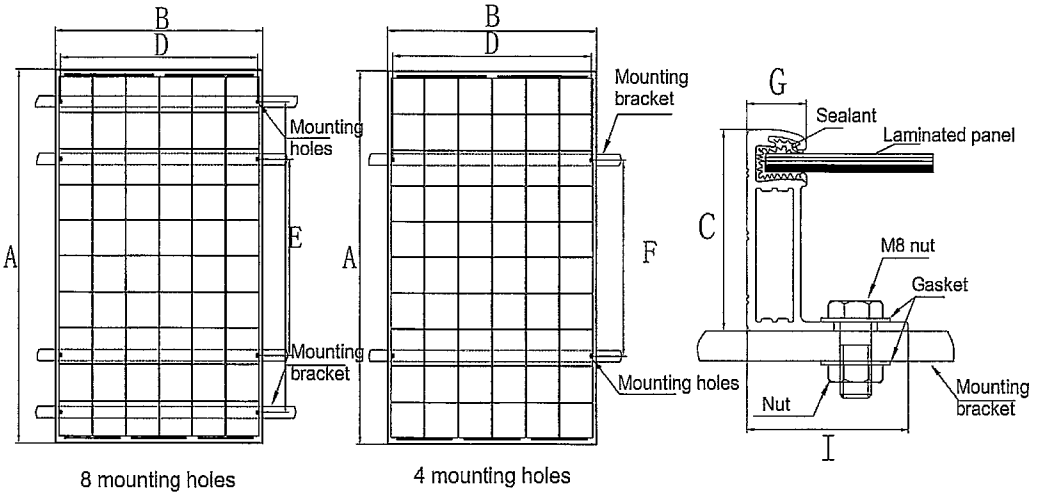


Figure4:Solar Module Installation with Bolts Fixing

	MODULE TYPE	CELL TYPE	QUANTITY OF CELL	Demension A*B (mm)	Mounting D*E/D*F (m)
Table 4	SYP60-6(XXX)S	poly	60	1650*992	952*870*
	RSM60-6(XXX)M	mono	60	1650*992	952*870
	RSM72-6(XXX)P	mono	72	1956*992	942*1676/942*1176
	RSM72-6(XXX)M	poly	72	1956*992	942*1676/942*1176

Table 3, solar PV modules mounted bolt size

2. Clamping fixed manner: make the panel on the mounting rack by using the certain clamping and M8 nut. The clamping can not touch the fornt of glass, also can not make the aluminum frame deformed, and try to avoid the shadow to the panel. If choose this fixation manner, every panel need at least 4 clamping to fix. According to actual situation of local wind load and snow load, can add the extra clamping number to make the panel and system to support the load. The application torque is around 20Nm.

1) The clamping fixing attachment to the long frame should be in the postion from corner to the 1/4 module length, 2 clampings each length, please see the details in the follow form
2) The clamping fixing attachment to the short frame should be in the postion from corner to the 1/4 module width , 2 clampings each width, please see the details in the follow form
3) According to actual situation of local wind load and snow load, can add extra the clamping number to make the panel and system to support the load. Extra clamping can be fixed in the postion between the length and wedith clamping, strengthen by using installing hole.

Remark: the aboved installation way just be for referene, the system installer or the professors should be resposble to the design, load, installation, maintenance and safety.

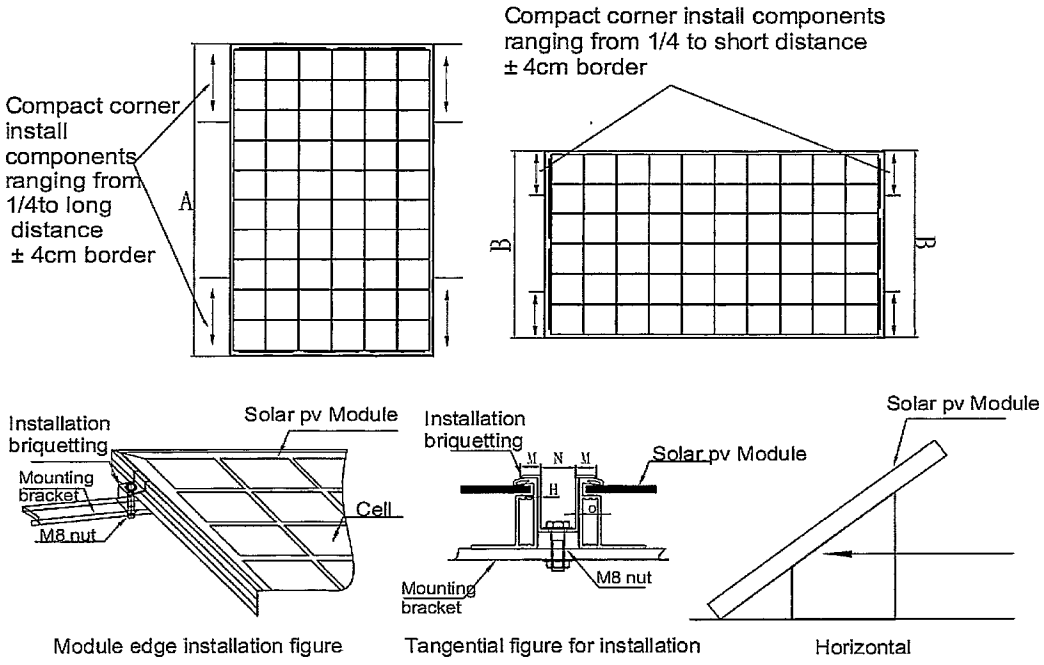


Figure5:Solar PV module clamps fixed way

Serial number	Module type	Cell type	Cell quantity	Demension A*B（mm）	M (mm)	N (mm)	H (mm)	O (mm)
1	SYP60-6(XXX)S	poly	60	1650*992	9.7	20	3~3.5	0.5~2
2	RSM60-6(XXX)P	poly	60	1650*992	9.7	20	3~3.5	0.5~2
3	RSM60-6(XXX)M	mono	60	1650*992	9.7	20	3~3.5	0.5~2
4	SYP72-6(XXX)S	poly	72	1956*992	9.7	20	3~3.5	0.5~2
5	SYP72-6(XXX)M	mono	72	1956*992	9.7	20	3~3.5	0.5~2
6	RSM72-6(XXX)M	mono	72	1956*992	9.7	20	3~3.5	0.5~2
7	RSM72-6(XXX)P	poly	72	1956*992	9.7	20	3~3.5	0.5~2

Table 4: Solar modules (fixing clamp mounting dimensions)

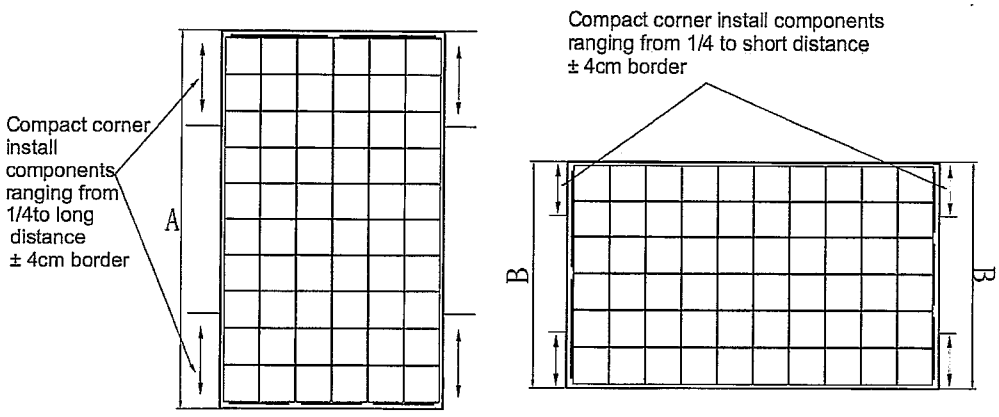
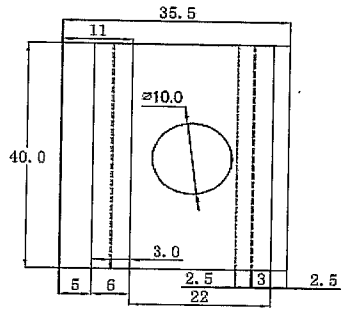
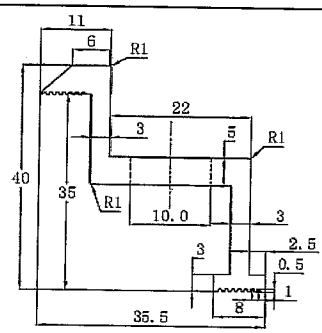


Figure6: Shuangbo components and solar PV installation position range briquetting schematic

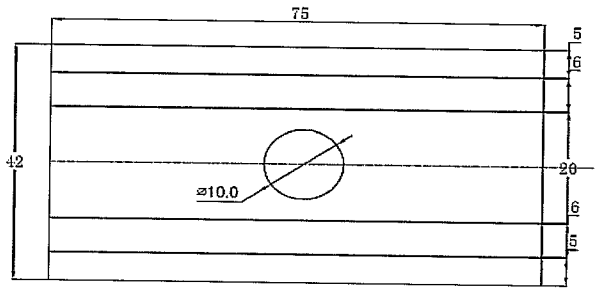
A B marked the length and width of modules, including the sizes of 1650*992mm、1956*992mm etc.



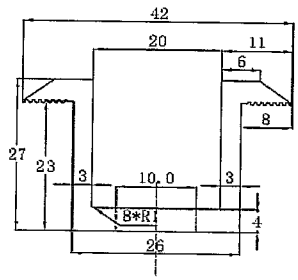
Vertical view of clamp on the edge



Left view of clamp on the edge



Vertical view of central clamp



Left view of central clamp

Figure7: Clamp Drawings

11. Installation and Precautions

1. Solar photovoltaic power generation system shall be installed by qualified professionals, for solar PV modules generating DC power under light conditions; otherwise, non-professionals may suffer electric shock as they are not familiar with the safety regulations.

2. We do not recommend the use of different types of solar modules in the same solar photovoltaic system. When the solar PV modules connect in series, each string voltage should not exceed the maximum system voltage. As a reference,the largest number of tandem solar PV modules (N) can be easily calculated by the maximum system voltage dividing related solar PV module open-circuit voltage. But in the design of solar photovoltaic systems, it must be taken into account that the voltage of the solar PV modules changes with temperature variation（Please refer to the PV module temperature coefficient, the open circuit voltage of the solar PV modules decreases as the temperature rises）; For example, in a particular place, taking into account the voltage fluctuations resulted from temperature drops in winter

(minimum temperature of -40 ° C), solar photovoltaic modules SYP/RSM60-6(XXX)S, SYP/RSM72-6(XXX)M series (maximum system voltage of 1000V)

3. When solar PV modules are in series, the output voltage of the entire string is equal to the sum of per PV module voltage; When the solar PV modules are in parallel, the output current of the whole string is equal to the sum of each branch of solar PV modules or solar PV module string current. We recommend that each string of PV modules string should be fused, then connected with other strings. Meanwhile, please refer to the criterion of the country or region or local to determine the fuse application requirements. When necessary, please install blocking diode to prevent solar photovoltaic modules or solar PV module strings against the effect and damage of reverse current.

12.Grounding

1.All PV module frame and mounting bracket must be properly grounded in accordance with the national laws and regulations related to the electrician,proper grounding method is to use a suitable ground wire to connect solar PV modules and stand together. Ground wire may be copper, copper alloy or other materials which can be used as wires and are in line with the corresponding electrical engineering regulation. Grounding wires also must be connected to ground via a suitable grounding electrode.

2. On the ground of φ4mm diameter hole, use a separate ground wire and related accessories to connect the solar photovoltaic module aluminum frame and connect the ground wire to ground, use M4 earth stud bolts with a M4 nut, tooth washer and cup washer, so as to ensure the modules are firmly grounded.

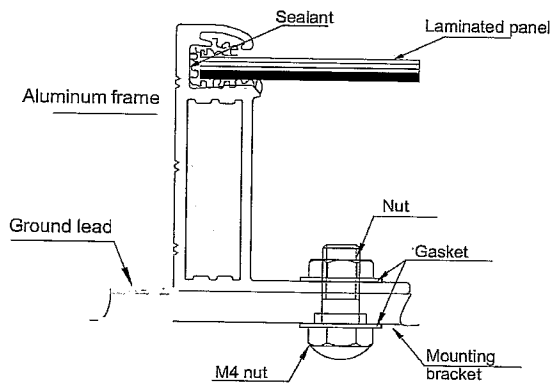


Figure8:Ground installation diagram

13. Diode

1. Bypass Diode

1).If one part of the solar panel is blocked by the shadow, it will lead to the related solar cells to form reverse voltage, The current from other unaffected cell string of the solar panel or from other solar panels will forced through the occlusion due to loss of power and heating the affected solar panels. When the current of system in parallel with the bypass diode in solar panels,it will through the diode directly,thereby bypassing the occluded part of the solar panel,and reduce the fever and power loss of solar panel to the minimum.

2).Current East Risen solar panels are equipped with bypass diodes in the junction box, Diode model,such as 15QS045/20SQ045 (PV-RS001junctionbox) or (PV-CY1202junctionbox)。Please don't try to open the box to replace diode, even when the diode appears problem, this work needs to be done by professionals.

2.count-attack diodes must meet the following performance:

1).For the solar photovoltaic system using the battery, you need to install an count-attack diode between solar panels and batteries, to prevent the battery discharge during the night.

2).The average rated forward current IF(AV) is greater than the maximum system current when the the solar panel operating temperature is maximum.

3).The rated repetitive peak reverse voltage VRRM is greater than the maximum system current when the the solar panel operating temperature is minimum.

14. Warning and cautions

- When solar PV modules exposed under the sun, it will generate currency. The electricity generated by solar PV system can cause deadly shock or fire danger. Only those who have been trained professionally or authorized can access to solar PV modules.
- In order to avoid electric shock or fire danger, opaque materials can be flocked on the solar PV modules when install.
- During installation, no electric terminal or component can be touched, and isolated tool will be used for electrical connections.
- Proper method will be used for the system's installation, a falling solar PV module from high place will cause casualty and property damage.
- Each solar PV module has a pair of male and female water-proof connection terminals. When electrical connect in series, the connection terminal with positive electrode of the first solar PV module should be connected to the next

module's negative electrode connection terminal.

- The positive and negative electrodes of the solar PV module cannot be short-circuit connected, and cannot be disconnected when the module is under loading. Make sure there is no gap between the insulators of connection terminals, or fire or short-circuit or electric shock will be caused.
- Sunlight cannot be manmade gathered on the solar PV modules. The peak power Pmax of the solar PV module is tested under standard testing circumstance (STC: 1000W/ m2 ; AM 1.5; temperature 25° C)
- Under normal sunlight, currency or voltage generated by solar PV module will be much more than under STC. The rated voltage, rated currency in connectors, size of fuse and connected to the PV output controller should be calculated by the rated number of Isc and Voc multiplied by a coefficient 0.8. Pls refer to each country's electrician formulation to confirm other applicable coefficient.

15. Wiring of solar PV module

1. 1. Each module has two 4mm2 diameter standard 90° C, sunlight resistant output cables each terminated with plug & play connectors. This cable is suitable for applications where wiring is exposed to the direct sunlight. Wiring and electrical connections need to comply with the appropriate national electrical code.

2. 2. For field connections, use the minimum 4mm2 diameter copper wires insulated for a minimum of 90° C and sunlight resistance as well. The outer diameter of wires should be 5mm-7mm.

16. Maintenance

1. Under most circumstances, normal rain fall will be enough to keep the glass suface of the solar PV module clean. If too much dirt, soft cloth with soft detergent and water will be used to get it clean. Do not use cold water to clean the solar PV module when it has higher temperature in a day, in case the heat exchange will damage the solar PV module.

2. When cleaning the back surface of the module, take care to avoid penetrating the substrate material. 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. Maintenance should be carried out at least once a year by trained personnel.

3. Replacement modules must be of same type. Do not touch live parts of cables and

connectors. Use appropriate safety equipment (insulated tools, insulating gloves, etc.) when handling modules.

4. Cover the front surface of modules by an opaque material when repairing. Modules when exposed to sunlight generate high voltage and are dangerous.

5. If the measured voltage only half of the rated value, that means the bypass idiot was broken.

6. In the case of normal irradiance, if the terminal voltage is more or less 5% than rated value that means the contacts of panel is not good.

7. Electrical inspect and Mechanical inspect should be carried out every six months.

8. Any questions, pls ask trained personnel to check.

9. Kindly note, please observe maintenance instruction of all the parts.

WARNING: For any electrical maintenance, the PV system must first be shut down. Improper maintenance can cause lethal electric shock and/or burns.

17. **Product Identification.**

1. **Every module is all have labels which including below info:**

1). Rating place: Model, Power rating, Rated current, Rated Voltage, Voc, Isc, Weight, Size and Maximum voltage.

2). Bar code: Every module is all have only one bar code, it is permanently fixed in the internal of module.

18. Solar model as below:

（1）SYP60-6(250W~285W)P
（2）RSM60—6(250W~290W)M
（3）SYP72-6(250W~345W)p
（4）RSM72—6(250W~350W)M

19. This manual is applied to the following product specifications

Module type	RSM/SY P-250W	RSM/SY P-255W	RSM/SY P-260W	RSM/SY P-265W	RSM/SY P-270W	RSM/SY P-275W	RSM/SY P-290W	RSM/SY P-295W	RSM/SY P-300W	RSM/SY P-305W	RSM/SY P-310W	RSM/SY P-315W	RSM/SY P-320W	RSM/SY P-330
electrical property(standard conditions of STC test: sunlight intensity 1000w/m^2、temperature: 25℃、air mass: AM1.5)														
maximum power output (Pmax)	250W	255W	260W	265W	270W	275W	290W	295W	300W	305w	310W	315W	320W	330W
solar cell type	poly	poly	poly	poly	poly	poly	poly	poly	poly	poly	poly	poly	poly	poly
Quantity(pcs)	60	60	60	60	60	60	72	72	72	72	72	72	72	72
maximum working voltage（V）	30.00	30.30	30.60	30.90	31.20	31.50	35.00	35.40	35.80	36.10	36.50	36.90	37.30	38.10
maximum operating current（A）	8.34	8.42	8.50	8.58	8.66	8.74	8.30	8.35	8.40	8.45	8.50	8.55	8.60	8.70
open-circut voltageVoc (V)	37.40	37.60	37.80	38.00	38.20	38.40	43.90	44.20	44.50	44.80	45.10	45.40	45.70	46.30
short-circut currentIsc (A)	8.88	8.96	9.04	9.12	9.20	9.28	8.85	8.90	8.95	9.00	9.05	9.10	9.15	9.25
Max tolerance of output power%	0~+3%													
Max system voltage（V）	1000V/1500V													
NOCT	45±2℃													
温度系数 temperature coefficientVoc	-0.33%/℃	-0.33%/℃	-0.33%/℃	-0.33%/℃	-0.33%/℃	-0.33%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃	-0.32%/℃
Isc	+0.033	+0.033	+0.033	+0.033	+0.033	+0.033	+0.034	+0.034	+0.034	+0.034	+0.033	+0.034	+0.034	+0.034

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	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃	%/℃
max	-0.39%/℃	-0.39%/℃	-0.39%/℃	-0.39%/℃	--0.39/℃	--0.39/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃	-0.40%/℃
module working temp℃	-40℃~+85℃													
mechanical properties														
module size（2）	1650x992x35	1650x992x35	1650x992x35	1650x992x35	1650x992x35	1650x992x35	1956x992x40	1956x992x40	1956x992x40	1956x992x40	1956x992x40	1956x992x40	1956x992x40	1956x992x40
weight（kg）	18kg	18kg	18kg	18kg	18kg	18kg	25kg	25kg	25kg	25kg	25kg	25kg	25kg	25kg
The surface maximum load capacity (pa)	5400Pa（IEC61215）													
the power of resisting hailstone	maximum diameter 25mm, impact speed 23m/s.													

Remark: standard of STC testing conditions: heliometric index 1000 w/m2 ,25℃ ,air mass AM1.5.

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20. To develop solar cell module power current four sort standard as follows

		stand ard of panels	module s type	Current Classificati on 1	Current Classification 2	Current Classification 3	Current Classificatio n 4
2	Sort standard of current 4	125 Mono	260	Im<5.4	5.4≤Im<5.5	5.5≤Im<5.6	Im≥5.6
			265	Im<5.5	5.5≤Im<5.6	5.6≤Im<5.7	Im≥5.7
			270	Im<5.6	5.6≤Im<5.7	5.7≤Im<5.8	Im≥5.8
		156 Poly	245	Im<8.1	8.1≤Im<8.2	8.2≤Im<8.3	Im≥8.3
			250	Im<8.2	8.2≤Im<8.3	8.3≤Im<8.4	Im≥8.4
			255	Im<8.3	8.3≤Im<8.4	8.4≤Im<8.5	Im≥8.5
			260	Im<8.4	8.4≤Im<8.5	8.5≤Im<8.6	Im≥8.6
			265	Im≤8.5	8.5≤Im<8.6	8.6≤Im<8.7	Im≥8.7
			280	Im<7.9	7.9≤Im<8.0	8.0≤Im<8.1	Im≥8.1
			285	Im<8.0	8.0≤Im<8.1	8.1≤Im<8.2	Im≥8.2
			290	Im<8.1	8.1≤Im<8.2	8.2≤Im<8.3	Im≥8.3
			295	Im<8.2	8.2≤Im<8.3	8.3≤Im<8.4	Im≥8.4
			300	Im<8.3	8.3≤Im<8.4	8.4≤Im<8.5	Im≥8.5
			305	Im<8.4	8.4≤Im<8.5	8.5≤Im<8.6	Im≥8.6
			310	Im≤8.5	8.5≤Im<8.6	8.6≤Im<8.7	Im≥8.7
			315	Im≤8.6	8.6≤Im<8.7	8.7≤Im<8.8	Im≥8.8
		156 Mono	250	Im<8.4	8.4≤Im<8.5	8.5≤Im<8.6	Im≥8.6
			255	Im≤8.5	8.5≤Im<8.6	8.6≤Im<8.7	Im≥8.7
			260	Im≤8.6	8.6≤Im<8.7	8.7≤Im<8.8	Im≥8.8
			265	Im≤8.6	8.6≤Im<8.7	8.7≤Im<8.8	Im≥8.8
			270	Im≤8.7	8.7≤Im<8.8	8.8≤Im<8.9	Im≥8.9
			300	Im<8.4	8.4≤Im<8.5	8.5≤Im<8.6	Im≥8.6
			305	Im≤8.5	8.5≤Im<8.6	8.6≤Im<8.7	Im≥8.7
			310	Im≤8.6	8.6≤Im<8.7	8.7≤Im<8.8	Im≥8.8
		Expecting to the special requirement.					

According to the rules of sort coad, Array or matrix components are installed by the cell modules power level four standard as reference. Providing clear information of the most efficient solar cell modules components for customers.

Current Classification 1 Current Classification 2
Current Classification 3 Current Classification 4

The sort code on the modules must keep same as outer box.

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SUNWAY
POWER

MPPT
PLUS SERIES
SOLAR CHARGE CONTROLLER

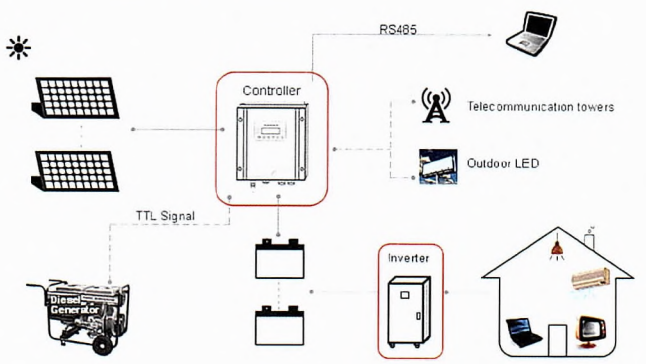


As a SME manufacture of solar controller, Sunway power using the MPPT technology to rise the efficiency of solar charging to the optimum level. The controller features a smart tracking algorithm inside that maximizes the energy from the solar PV module(s) and charge the battery. At the same time, the low voltage disconnect function (LVD) will prevent the battery from over discharging. MPPT Maximum Power Point Tracking technology increases the efficiency of your PV system and charges your battery much faster than a regular controller.

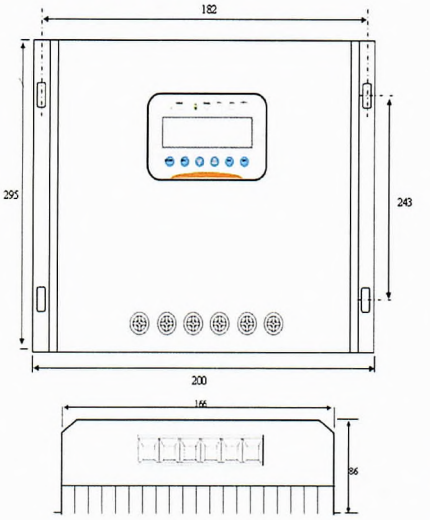
Product



Application Topology



Dimensions

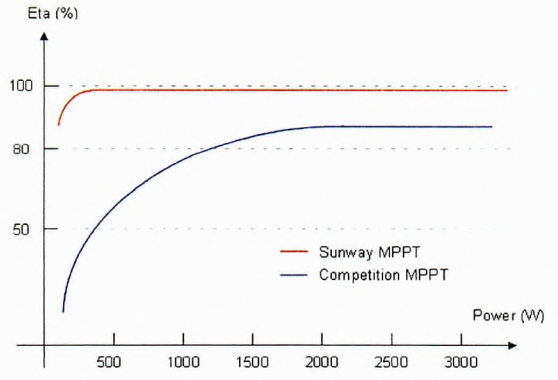


Features

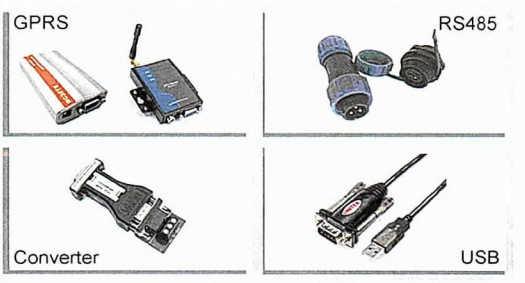
- MPPT technology increases the efficiency of your PV system
- Modular Central Unit (MCU) control
- 12/24/36/48V selectable and auto recognition
- Be suitable for Lead-Acid, GEL,AGM and Li-Fe various kinds of batteries
- Users can to modify the system parameters by setting keys
- Standard RS485 data transfer function
- TTL Control Signal is offered, suitable for PV&Diesel generator hybrid system(optional)
- Temperature compensation function (optional)
- Utility power backup function (optional)

Protection Functions

- Battery over-charge/discharge protection
- Over-current disconnect function
- Over-loading disconnect function
- Over-temperature protection
- Short circuit disconnect function
- Reverse polarity protection
- anti-reverse charging on night



Data Transfer Accessories



Technical Data

System Capability

Model type	SSCM- 12V / 24V / 36V / 48V
Max. PV input power [W]	900 / 1800 / 2250 / 3000 (12/24/36/48V system)
Rated charging current [A]	30 A / 40A
Min. input voltage (Vmp) [V]	15 / 28 / 43 / 58 (12/24/36/48V system)
Max. input voltage (Vmp) [V]	18 / 36 / 54 / 72 (12/24/36/48V system)
Max. PV input voltage (Voc) [V]	150
Float charge (be adjustable) [V]	14 / 28 / 42 / 56 (12/24/36/48V system)
Boost charge [V]	10 / 20 / 30 / 40 (12/24/36/48V system)
Deep discharge protection (be adjustable) [V] Load disconnect	10.5 / 21 / 31.5 / 42 (12/24/36/48V system)
Reconnect level (be adjustable) [V] With 10s delay	12 / 24 / 36 / 48 (12/24/36/48V system)
Over-voltage protection (be adjustable) [V] Cut-off charging 10s delay (be adjustable)	15 / 30 / 45 / 60 (12/24/36/48V system)
Reconnect charging [V] With 10minutes delay (be adjustable)	13.5 / 27 / 40.5 / 54 (12/24/36/48V system)

Performance

Consumption at standby [mA]	＜30
Conversion Efficiency	Up to 98%
Peak of conversion efficiency	99%
Topology	Inductor
Ambient Temperature	-40℃ to +50℃ (exceed 50℃ with derating)
Ambient Humidity	0%～98% Non-condensing
Cooling Method	Natural Convection
Temperature compensation	-4mV/K(2V cell)
Altitude [m]	＜2000 (without power derating)

General Data

LCD Display	LCD (16X2characters，green backlight)
Display Language	English
Data communication (option)	RS-485
Grounding	Negative
Ingress Protection Class	IP65
Dimensions (W*D*H) [mm]	200 *395 *86
Net weight [kg]	3.5

Contact Us

赛光电源
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Since 2008

Global Wind and Solar System control&Inverte Solution Supplier

Green Energy Manufacturer

MPPT Designed