

350W Power Optimizer User Manual



Introduction

Shenzhen Jaton Technology Limited is a New Energy company which focuses on R&D, manufacture and sales of solar power products. We have established a leading position among all domestic Chinese companies in the Off-Grid solar power system and Micro-grid since our establishment in 2006. Jaton fully participate in wind and solar hybrid power system for communication base station construction since 2006 and more 2000 base station systems operate normally at present. We are now providing not only general but also customized products and solutions for our customers.

Jaton is a national-level high-tech company with nine subsidiaries, whose business involves on-grid solar power generation system, off-grid solar power generation system, wind-solar hybrid power system, power optimizer, solar pump, solar lamps, etc. It strictly complies with ISO and CE standards and has successively passed the IEC, TUV, JET, MSC, EY105YS, SGS fire tests and gained the CQC Golden Sun Certificate and so on.

Certificates





Preface

Relying on the comprehensive application of high efficient electronic converting technology, express DSP and controlling technology, advanced semiconductor integrated circuit technology, data acquisition and monitoring technology, network communication and data processing technology, etc., JATON New Energy features the solar power optimizer with high efficiency, reliability, flexibility and lower cost.

The JATON optimization solution enables solar arrays to harvest more energy, and provides distinct advantages in design, installation and operation.

Working principle

- 1.Solar power optimizer connects with PV module directly without additional panel wiring. By using a smart algorithm for JATON solar power optimizers, each module constantly performs at its maximum power point, therefore maximizes the energy generated per module in any light condition, and consequently the total solar energy is produced. PV modules perform individually to eliminate the power loss caused by module mismatching, aging, shading, coverings and any other factors.
- 2.JATON solar power optimizers are connected with each other in series to achieve the proper bus voltage required by the grid-tied inverter. This work facilitates the optimizer's implementation within a system as each optimizer outputs low voltage. Consequently, higher efficiency, increased reliability and lower cost could be possible.
- 3.Due to PV strings formed by the modules and optimizers connected in parallel, it can eliminate the quantity limitation of each string and keep the PV arrays more flexible in installation.
- 4.The output power from all optimizers is aggregated at the DC side of grid-tied inverter and converted to AC.

5.Solar Power Optimizer supports the function of data acquisition and wireless data transceiving, gathering the information of output voltage, current and power in real-time. It operates module-level data acquisition and performance measurement to achieve higher reliability, rapid fault detection automatic alerts localized on a virtual site map for accurate troubleshooting.

6.The collected data of JATON solar Power Optimizer is transmitted wirelessly via JATON Data Acquisition Unit to the JATON Data Aggregation Device. DAU sends the data via Ethernet to Cloud Data Center (JATON Monitoring Server).

7.Cloud Data Center (JATON Monitoring Server) stores and analyzes the working information of PV modules, deliveries early warning of abnormal data/status to the data acquisition unit via Internet. Then, the data acquisition unit would operate feedback information to solar power optimizer. Simultaneously, users or operators would receive notification such as SMS and Email from Cloud Data Center once serious failure taken place.

8.This monitoring system allows module-level visibility and provides insight into the performance of any system. User can login the web-based monitoring system, measure current energy production and status of the entire solar system. Meanwhile, user can access the historical data to analyze the performance of solar system.

Contents

1 About This Manual	5
1.1 Validity	5
1.2 Target Group.....	5
1.3 Additional Information.....	5
1.4 Symbols Explanation	5
2 Safety Instructions	6
2.1 Appropriate Usage.....	6
2.2 Safety Instructions.....	6
2.3 Explanation of Symbols.....	7
3 Installing the Model Power Optimizers	8
3.1 Warnings and Notes	8
3.2 Transport and Storage.....	9
3.3 Package Contents	9
3.4 Preparation	9
3.5 Mounting the Optimizers	9
4 Connecting the Power Optimizers	11
4.1 Connecting Model JATON to PV Module	11
4.2 Connecting Model JATON Power Optimizers into Strings.....	12
4.3 Verifying Proper Power Optimizer Connection.....	12
5 Maintenance and Cleaning	15
5.1 Cleaning.....	15
5.2 Adding, Removing or Replacing 350W	15
6 Troubleshooting	16
7 Technical Specifications.....	17
8 Recycling and disposal	18
9 Service	19
Contact Jaton.....	19

1 About This Manual

Thank you for purchasing our power optimizer 350W and hope that the device will meet with your satisfaction. We also hope that you can put forward more valuable suggestions on the functions and performance, which will encourage us to get the products improved continually.

1.1 Validity

This manual describes the assembly, installation, commissioning and maintenance of the Jaton Power Optimizers. Keep this guide in a convenient place for future reference, it should be stored near the installation and would be available at all times.

1.2 Target Group

This manual is for the qualified electricians. The tasks described in this manual may be performed by electrically qualified persons only.

1.3 Additional Information

Refer to the Installation Guide before operating the Jaton Power Optimizers. You will find further information such as technical parameters and product certificates at www.jatontec.com

1.4 Symbols Explanation

The following safety symbols are used throughout this manual. Familiarize yourself with the symbols and their meaning before installing or operating the instrument.



WARNING

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.



CAUTION

Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.



NOTICE

Denotes additional information, emphasized contents or tips about the current subject, which can help you solve problems or save time.

2 Safety Instructions

2.1 Appropriate Usage

Grid-Connected PV system consists of PV modules, power optimizers, grid-connected inverters, data communicator and metering device (as shown in Fig.1).

Jatont power optimizers are DC-DC converters connected to PV modules in order to maximize the energy harvested from each module. It can achieve module-level maximum power point tracking (MPPT) and plays a critical part in the whole power system.

Each power optimizer transmits its module's performance data to a shared data communicator. The signals from the distributed power optimizers and inverters are received by the data communicator and can be used for remote monitoring and maintenance.

The power optimizers have widely used in grid-tied PV power system applications, from pilot power sites to mega solar parks.

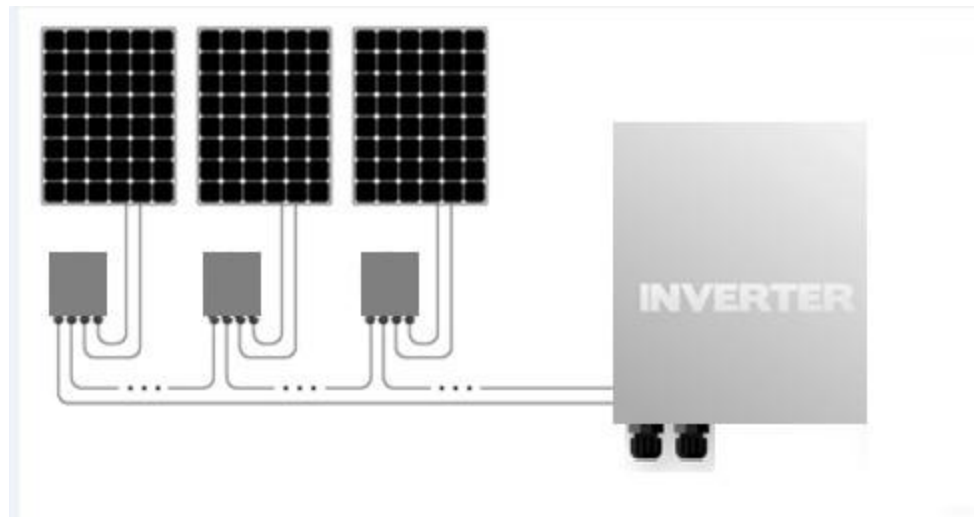


Figure 1 -- PV Power System with 350W

2.2 Safety Instructions



WARNING

Danger to life due to high voltages in the inverter.

All work on the inverter may only be carried out by qualified personnel.

The appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

Children should be supervised to ensure that they do not play with the appliance.



WARNING

Do not disassemble the case of 350W, unless they have been given supervision or instruction.

2.3 Explanation of Symbols

This section gives an explanation of all the symbols found on the type label.

Symbol	Explanation
	TÜV SÜD certification, Model Jatón conform the corresponding European standards.
	CE attestation of compliance, Model Jatón conform the corresponding CE directive.
	Important safety information, Violation of warning may cause injury or Model Jatón damage.
	Beware of dangerous electrical voltage, Model Jatón operates at high voltages. All work on the power optimizer may only be carried out by qualified personnel.
	Beware of hot surface, Model Jatón can become hot during operation. Avoid contact during operation.
	Capacitor discharge. Do not disconnect DC input or DC output connectors after disconnecting from all power sources until 30S later.
	Observe all documentation that accompanies 350W
	Model Jatón must not be disposed of together with household waste
	Model Jatón is Class II appliance

3 Installing the Model Power Optimizers

3.1 Warnings and Notes

The following warnings and notes apply when installing the 350W Power Optimizers:



WARNING

The installation and maintenance of the power optimizer must be operated by a professional electrical engineer. Improper operation has a risk of fatal electric shock on people!



CAUTION

If installing directly on the module or module frame, first consult the module manufacturer for guidance regarding location and the impact on the module warranty.



NOTICE

when the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE.



NOTICE

The protection level of the power optimizer is IP65. The optimizer is waterproof and has no need for shelter, and it can be placed in any orientation, which means, it has no upside.



NOTICE

The power optimizer should be installed in the space where is ventilative and shady for heat dissipation.



NOTICE

Completely shaded PV modules may cause the affected Model Jatontec optimizers to temporarily shut down. This will not affect the performance of the other optimizers in the string.



NOTICE

Keep the power cables from water and other conductive objects during installation.



NOTICE

Position the power optimizer close enough to its module so that their cables can be connected. The length of the input cable (from PV module to the power optimizer) should not exceed 30m.



NOTICE

To allow for heat dissipation, maintain a 2.5 cm clearance distance between the power optimizer and other objects.

3.2 Transport and Storage

The Model Jaton Power Optimizer should be transported in its original packaging and without exposing it to unnecessary shocks. If the original package is no longer available, a similar box can be used which can withstand the weight of the power optimizer.

Store the Model Jaton Power Optimizer should be transported in its original packaging and without exp Power Optimizer in a dry place where ambient temperatures are always between -40°C and +75°C, relative humidity between 0% and 100%.

3.3 Package Contents

- Power Optimizer
- Washers
- This manual

3.4 Preparation

3.4.1 Unpacking

The Model Jaton Power Optimizer has been inspected before packaging and transport; however, it may still be damaged during transport. Check the delivery for completeness and visible external damage. The delivery should include the power optimizer and the hex bolt combo.



350W



Hex Bolt Combo

Figure 2 PV Power System with 350W

Any completeness or damage, please contact with Jaton Service Team and keep the original package in case to send the product or accessories back.

E-mail: support@jatontec.com

3.4.2 Equipment List

Standard tools can be used during the installation of the Model Jaton Power Optimizer, which are prepared by the user. The following is a recommendation of the equipment to be used:

- Screw Driver
- Megohmmeter and Multimeter
- Drill (optional)

3.5 Mounting the Optimizers

To ensure a safe, quick and easy installation procedure of the solar installation using

Jatont Power Optimizer, we advise to follow the below installation sequence:

STEP 1: Determine the mounting location of each power optimizer. The power optimizer can be directly mounted to the mounting hole in the module frame with one Combo Hex Nut, or Installed onto the scaffold. The hole must also be located near enough so that the power optimizer can be connected to a single PV module.



CAUTION

Do not drill holes through the Power Optimizer. Before installing directly on the module or model frame, first consult the module manufacturer for information about the proper positioning and its impact on the module warranty.



NOTICE

Once attached to the solar module, the Power Optimizer should not be removed.



NOTICE

The area demanded for the Power Optimizer is 149×137×23.5 mm (W×L×H).



NOTICE

Do not attach the Power Optimizer behind the beams of the mounting material. In most cases the height of Power Optimizer is higher than that of the solar module's frame.

STEP 2: Slide two flat washer over the bolt.

STEP 3: Push the power optimizer to Insert the bolt into the hole and pre-lock a Hex nut.

STEP 4: Lock the bolt with a screw driver. Verify that the power optimizer is securely attached.

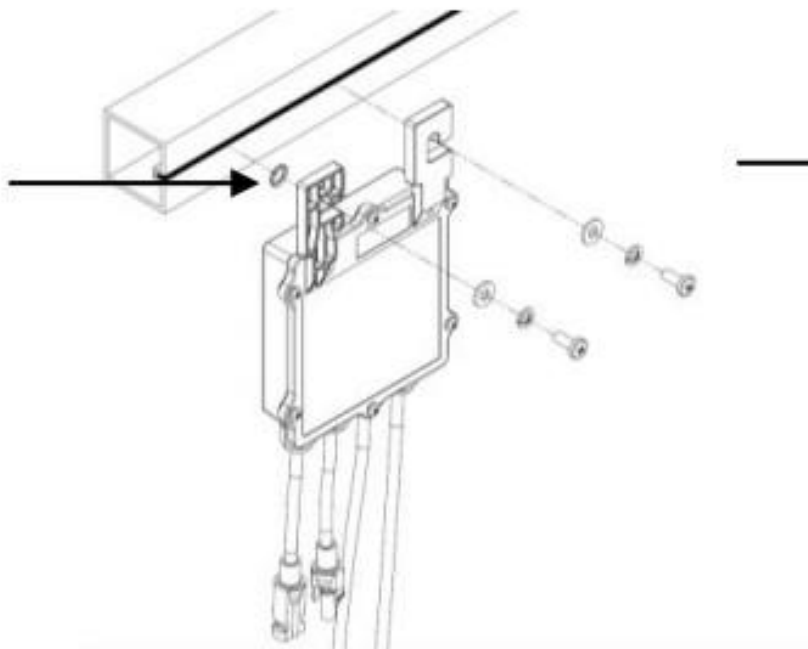


Figure 3 Lock the Bolt

4 Connecting the Power Optimizers



WARNING

Verify that power of single PV module connected to 350W not exceed the Max output power.

Verify the panels are disconnected with the inverter before perform the following operations.



NOTICE

The input and output cables of the power optimizer are labeled with “+” and “-”.



NOTICE

The input cables of the power optimizer are the short ones, while the output cables are the long ones, prepared for connecting to other power optimizers or inverter.

4.1 Connecting Model JATON to PV Module

The 350W connects to a single PV module via its two inputs (a plus and a minus). Connect the Plus (+) output connector of the solar module to the Plus (+) input connector of the power optimizer. Connect the Minus (-) output connector of the solar module to the Minus (-) input connector of the power optimizer



WARNING

Verify that you have identified the inputs and outputs correctly. Do not connect solar modules to 350W outputs.



Figure 4 Power Optimizer connectors



NOTICE

The 350W has reverse polarity protection. Even so, you must still verify the correct polarity by checking the PV module's polarity with a voltmeter.

4.2 Connecting Model JATON Power Optimizers into Strings

Power optimizers must be connected in series in order to construct strings, to generate the desired voltage level of inverter interfaced with the strings.



NOTICE

The full string can either be directly connected to the inverter or connected in parallel to other strings and then connected to the inverter together, according to the capacity of the inverter used.



NOTICE

The difference between the length of the paralleled strings is allowed, meaning that the number of Model JATON power optimizers in each string does not have to be the same.



NOTICE

Consider the working direction of the strings. It should be determined from the solar module mounted most distant from the inverter (the first) towards the solar module mounted most close to the inverter (the last).

Connect the Plus (+) connector of the output wire of the first Model JATON power optimizer in the string to the Minus (-) connector of the second one. Connect the rest of the power optimizers in the string in the same way. This procedure is similar to the standard procedure for connecting solar modules to form the PV strings.

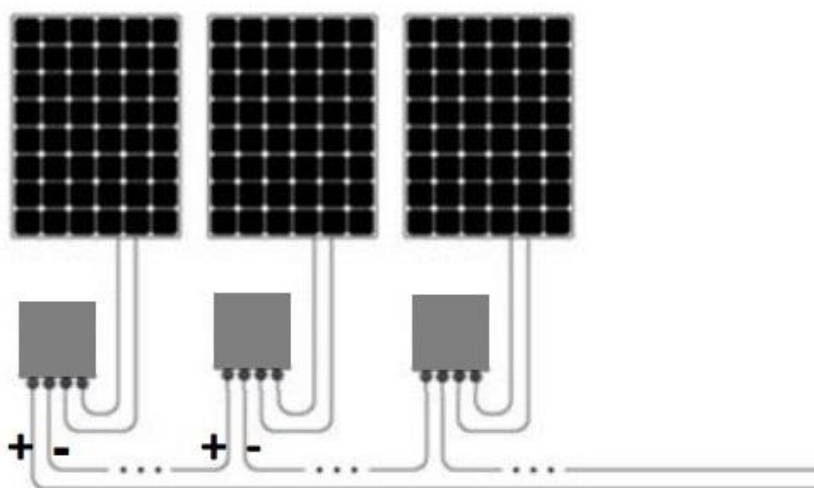


Figure 5 Power Optimizer connected in series



CAUTION

Make sure that the Plus (+) and the Minus (-) connector cables are firmly and totally inserted.

4.3 Verifying Proper Power Optimizer Connection

4.3.1 Measuring

When connected to a PV module, the power optimizer will output a default voltage.

Therefore, the total string voltage should be equal to the default voltage times the number of power optimizers connected in series in the string. The correctness of the power optimizer connection can be verified by measuring the polarity and magnitude of the total string output voltage.

**CAUTION**

Every string should be verified individually before connected to other strings or to the inverter. Incorrect polarity or value of the total string output may damage the power optimizers in other strings or the inverter.

**NOTICE**

Make sure the PV modules are exposed to sunlight during this verifying process. Otherwise, the power optimizers may not be powered.

Each 350W connected to a PV module initially produces a certain voltage of $52\pm 2V$. For example, if ten 350W optimizers are connected in a string, and then $520\pm 10V$ should be produced. Use a voltmeter with at least 0.1V measurement accuracy to verify that the total voltage produced is in accordance with the number of 350W power optimizers in the string.

4.3.2 Troubleshooting

If the voltage is zero, it may be caused by that one or more of the power optimizers are unconnected or skipped during the string connection process.

Solution: Connect all the power optimizers.

If the voltage is not zero but lower than the quantity of 350W power optimizers, it may be caused by one of the following reasons:

(1) one or more of the PV modules are not connected properly to their power optimizer.

Solution: Connect all the PV modules to their power optimizers securely.

(2) one or more of the power optimizer are not connected properly to their polarity.

Solution: Check if all the power optimizer are connected properly to their polarities.

If the voltage is not zero but higher than the quantity of 350W power optimizers, it may be caused by one of the following reasons:

(1) an extra power optimizer is connected in the string;

Solution: Check if an extra power optimizer is connected in the string.

(2) the output of a PV module may be connected in the string instead of the output of its power optimizer;

Solution: Check if a PV module is connected in the string without its power optimizer.

(3) a malfunction of one of the Honeybee 300B power optimizers.

Solution: Check and determine the position of the malfunction.

**CAUTION**

Perform the following if the total string voltage is too high:

1. Disconnect the wires that connect the optimizers in the string.
2. Measure the voltage for each individual optimizer in order to locate the one that does

not output the proper voltage.

3. If the malfunctioning optimizer is located, check its connections, polarity, PV module and voltage.

4. If the malfunction cannot be bypassed or resolved, skip the malfunctioning optimizer, thus connecting a shorter string.

Do not continue unless the problem is found and the malfunctioning power optimizer is removed.

5 Maintenance and Cleaning

5.1 Cleaning

The Model Jaton Power Optimizers usually don't need special maintenance and cleaning. Personnel lack of qualified skills cannot disassemble the case of Model Jaton in case of any risk of electrical shock.

The cleaning intervals depend on the ambient conditions. If the case is covered with loose dust or snow, you can clean them with a soft brush or a damp cloth. Never use solvents, abrasives or corrosive materials for cleaning.

5.2 Adding, Removing or Replacing 350W

STEP 1: Disconnect the inverter AC switch and the inverter DC switch in sequence.



WARNING

Wrong sequence may cause equipment damage or fire hazard.



WARNING

Need to wait for more than 30s to operate after the cable disconnected in case the internal capacitance discharged not completely makes loss or damage.

STEP 2: Add or remove the necessary Model JATON Power Optimizers.



NOTICE

Dispose the Model Jaton Power Optimizers according to the local regulations.

STEP 3: Verify the connection according to the description in Chapter 4.3.



NOTICE

The layout on Honeypot (JATON monitoring system) will be changed after the replacement of the Model Jaton Power Optimizers. Please login the Honeypot and reset the system.

6 Troubleshooting

The Power Optimizer sizzling during operation

The slight sizzle during operation is normal. However, if the sizzle of one power optimizer is significantly higher than those of others, please contact with JATON Service Team for further troubleshooting.

The Power Optimizer heating during operation

The slight heat during operation is normal. However, if the heat of one power optimizer is significantly higher than those of others, please contact JATON Service Team for further troubleshooting.

No current output

Refer to Chapter 4.3 to check connections. If all the terminals are firmly connected, the device may be faulty or damaged, please change it.

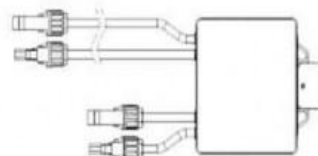
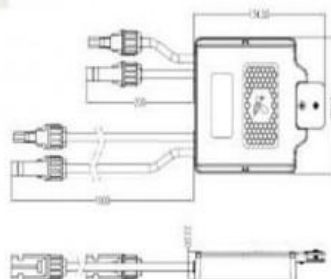
Abnormal string open circuit voltage

Refer to Chapter 4.3 to check connections. If all the terminals are connected firmly and correctly, please contact with JATON Service Team for further troubleshooting.

7 Technical Specifications

INPUT	Max. Input Power	350 W
	Input Voltage Range	14 ~ 60 Vdc
	MPPT Voltage Range	16 ~ 50 Vdc
	Max. Input Current	10 Adc
	Short Circuit Current	15 Adc
	Reverse Connection Protection	YES
	Night Power Consumption	0 W
OUTPUT	Max Output Current	11 Adc
	Output Voltage Range	0 ~ 60 Vdc
	System Voltage	1000 Vdc
EFFICIENCY	Max. Converter Efficiency	99.50%
	Europe Efficiency	98.50%
	CEC Efficiency	98.30%
INSTALLATION SPECIFICATION	Size	115X106X22 mm
	Weight	550 g
	Input Linker	MC4
	Output Linker	MC4
	Working Temperature	-40 ~ +85 ℃
	Inbreking Protection	IP65
	Relative Humidity	0~100%
STANDARD COMPLIANCE	EMC	FCC Part15 class B, IEC61000-6-2, IEC61000-6-3 CSA C22.2 No. 107, 1-01, UL 1741
	Safety Regulations	IEC62109-1 (Class II safety)
	Overvoltage Category	III
	Certificate	CQC/TUV/CSA

Sketch



8 Recycling and disposal

Both the power optimizer and its transport packaging are predominantly made from recyclable raw materials.

Do not dispose of the faulty Power Optimizer and its accessories with household waste. Ensure the faulty Power Optimizer, its accessories and transport packaging are disposed properly.



NOTICE

If you are permanently disassembling and disposing the Model Jaton Power Optimizers, make sure to use the disposal methods dictated by local regulations.

9 Service

Jaton grants a warranty of 25 years as standard, starting from the date of the purchase invoice date marked. Jaton will only perform warranty services when the faulty unit is returned back together with a copy of the invoice and warranty card which were issued by the dealer to the user. And the unit should be returned in its original or equivalent packaging, please preserve the original packaging. In addition, the serial number label on the unit must be fully legible. If these requirements are not fulfilled, JATON reserves the right to deny warranty services.

Warranty claims are excluded for direct or indirect damages due to:

Beyond warranty date, and if the original identification markings (including trademark or serial number) of such Module Maximizer have been defaced, altered, or removed.

That has been misused, neglected, tampered with, altered, or otherwise damaged, either internally or externally;

That has been improperly installed, operated, handled or used, including use under conditions for which the product was not designed, use in an unsuitable environment, or use in a manner contrary to the Jaton User Manual or applicable laws or regulations; Improper use, operation and refitting;

Transport damage;

Non-observance to the relevant safety instruction and work in the severe environment out of the recommended ones in this manual;

That has been subjected to incidental or consequential damage caused by defects of other components of the PV system;

That has been subjected to fire, water, generalized corrosion, biological infestations, acts of God, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Module Maximizer specifications, including high input voltage from generators or lightning strikes.

Contact Jaton

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