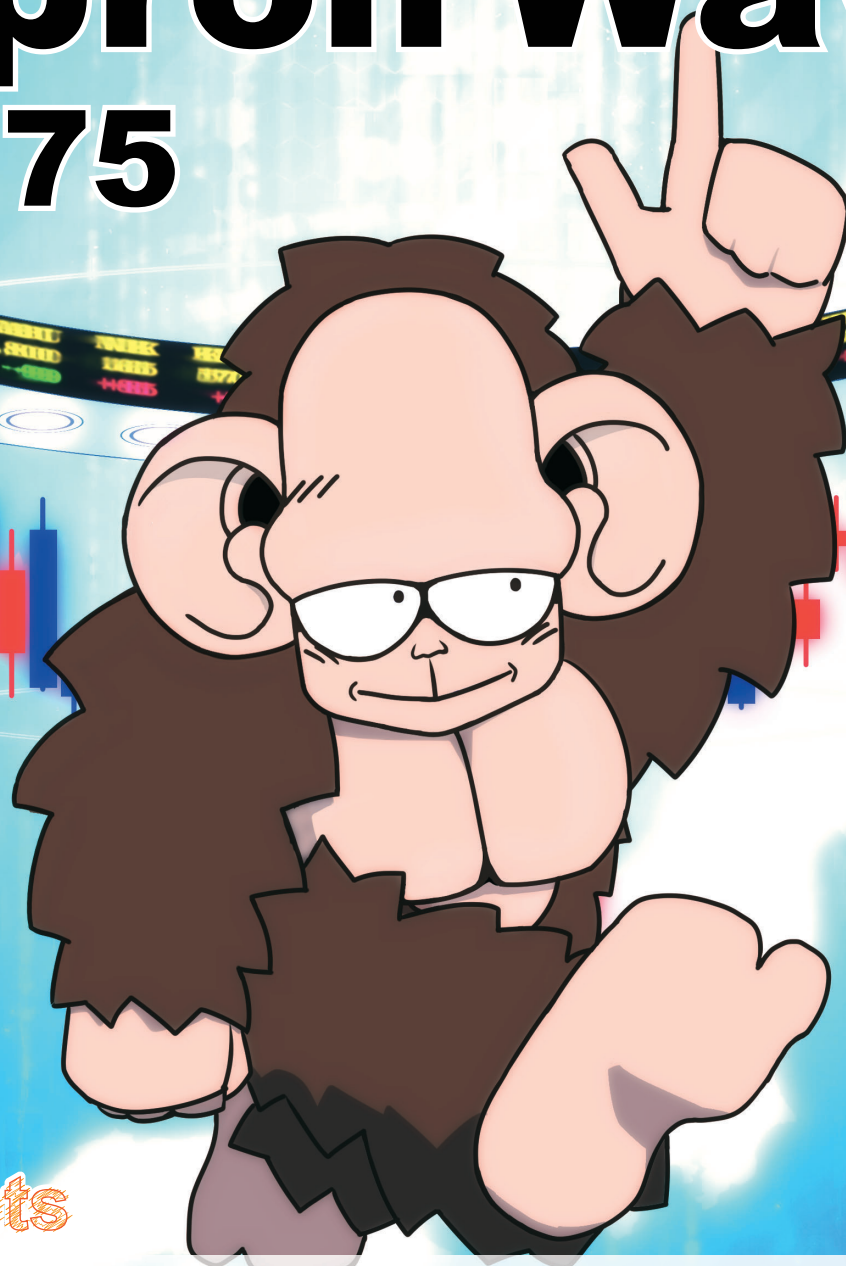


Nipron Wave

Vol.75



Highlights

① PV Oasis Special Feature

Take a closer look at the advantages of the PV Oasis lithium-ion power storage system
You can choose our PV Oasis to meet your various needs.

② Environmental Initiatives

How we address environmental issues through our business activities



PV Oasis utilizes power without wasting it by integrating PV power generation and batteries. In an emergency, the PV power generation and batteries will supply power to sustain business activity even in a prolonged blackout.

Our advantages of Installation

CO₂ Reduction

To achieve carbon neutrality, it is increasingly important for companies of all sizes to address environmental challenges more proactively. The initiative of "self-consumption of solar power," aiming to reduce dependence on thermal power generation, is expected to become even more important going forward.

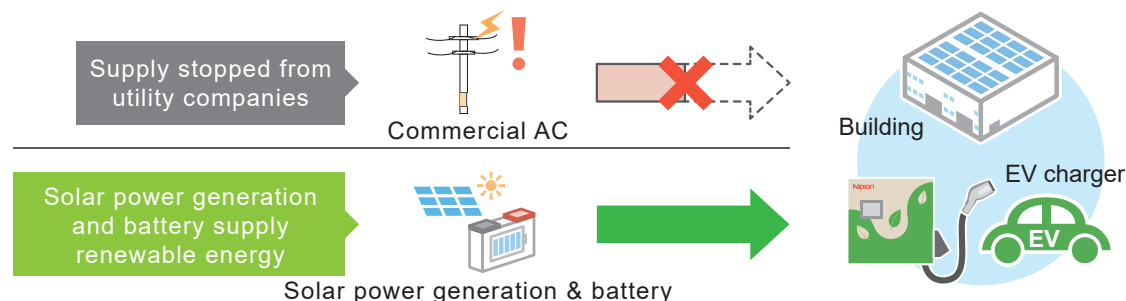
CO₂ emissions and reductions through solar power generation

	CO ₂ emissions per kWh
Thermal power generation from fossil fuel	about 690 g
Solar power generation	about 17-48 g

* References: National Institute of Advanced Industrial Science and Technology
PV technology R&D on Photovoltaic Technologies

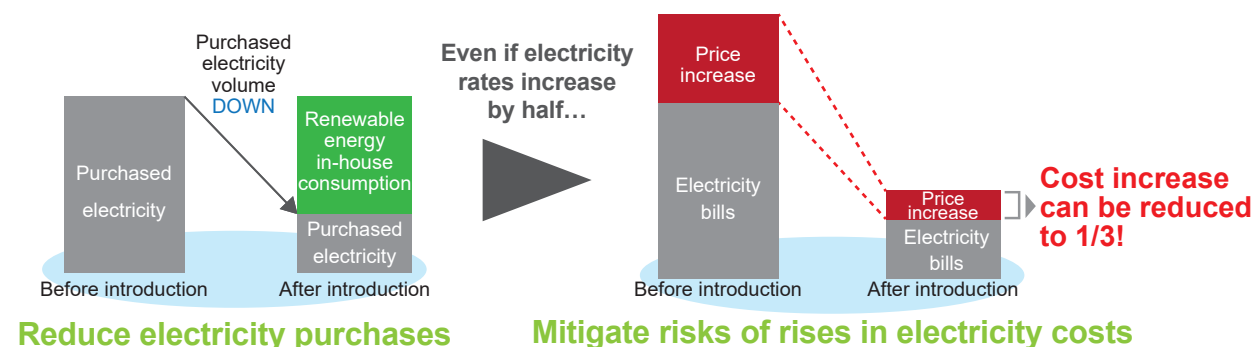
Use the power storage system as a backup system in emergencies like a power failure

In an emergency, the PV power generation and batteries will supply power to sustain production activity even in a prolonged blackout.



Reduce electricity costs and mitigate the risk of price increases

The introduction of PV Oasis will reduce the cost of electric power. Even when the electricity rate is raised, if the renewable electricity can manage 2/3 of power consumption, the impact of increase in the electricity rate will be reduced to 1/3.



<http://www.nipron.com>

Accelerate promotion of EV charging infrastructure

The establishment of charging systems is essential for the popularization of EVs. With the power supply from the solar power and battery, the introduction of PV Oasis in EV charging systems of 50 kW or larger is easy because it enables the use of low-voltage power feed systems.

Off-grid operations become possible

Advantages of off-grid operations system

■ No need to negotiate grid connections

For the introduction in an existing facility, it is not necessary to revise the power supply contract and, therefore, it saves the trouble of making applications to the electric power company.

■ RPR not required as inverse current will not occur

Because of an independent system without a grid connection, there will be absolutely no inverse current even if the power generated exceeded the power consumed, making it unnecessary to install an RPR.

This means that power generation is not stopped by the activation of RPR and the generated power will always be available for use.

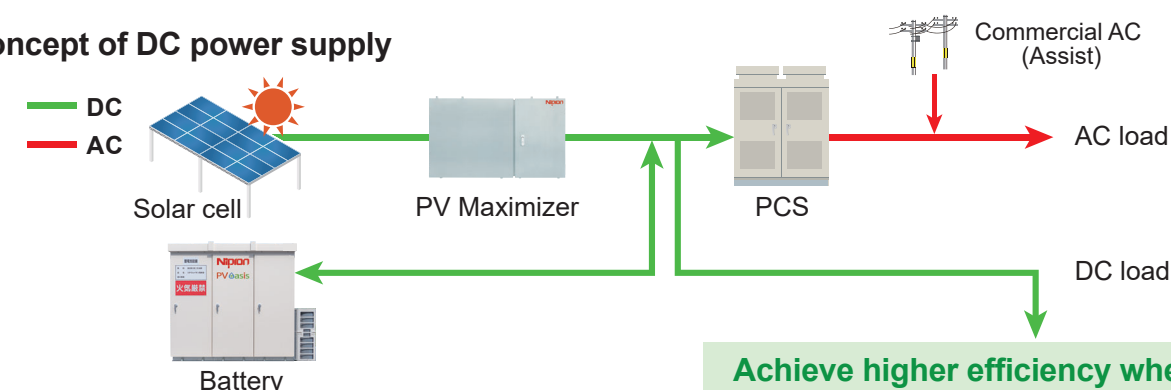
■ Cubicle modification not required

Because of no grid connection, devices for the connection (such as OVGR and RPR) will be unnecessary, eliminating the need for modifying the cubicle.

Supports DC supply

Because PV Oasis connects the solar power generation system and the battery in DC without conversion, it reduces the power loss associated with the power conversion in ordinary systems. With PV Oasis, it is possible to build a system with a considerable reduction in the power loss associated with power conversion since it facilitates the connection of devices supporting the use of DC power.

Concept of DC power supply



Achieve higher efficiency when connected to DC-compatible equipment



EV charger, lighting, etc.

Utilizes highly-reliable Japanese lithium-ion battery cell/system

Redundant protection with the safety of cell, safety mechanism of module and safe system control

- Safety-first design and manufacture of lithium-ion battery cell
- Safety module design with miniature cylindrical cell & fire-spread prevention construction
- Safety control by the system (overcharging, over-discharge and overcurrent detection, etc.)

<http://www.nipron.com>

PV Oasis Lithium-ion Power Storage System Lineup

With PV Oasis, the user can integrate an optimum system by choosing products suitable for the application

	Outdoor installation	Indoor installation	Concept of target facilities
For small scale	 ■ Battery capacity: select from 10 kWh 30 kWh ■ Charge and discharge capacity: 10 kW each ■ PCS: Integrated (10 kW, 20 kW), separate installation: option ■ Rectifier capacity: 10 kW, three-phase 200 V input	 ■ Battery capacity: select from 10 kWh 30 kWh ■ Charge and discharge capacity: 10 kW each ■ PCS (separate installation): Option ■ Rectifier capacity: 10 kW, three-phase 200 V input	Convenience store/Drugstore Gymnasium Town hall 
	 ■ Battery capacity: select from 60 kWh ■ Charge and discharge capacity: 25 kW each ■ PCS: Integrated (10 kW, 20 kW), separate installation: option ■ Rectifier capacity: select from no rectifier, 10 kWh, 15 kWh, three-phase 200 V input	 ■ Battery capacity: select from 60 kWh ■ Charge and discharge capacity: 25 kW ■ PCS (separate installation): Option ■ Rectifier capacity: select from no rectifier, 15 kWh, three-phase 200 V input	
For medium scale	 ■ Battery capacity: select from 90 kWh 120 kWh ■ Charge and discharge capacity: 50 kW each ■ PCS (separate installation): Option Rectifier is not included.	 ■ Battery capacity: select from 90 kWh 120 kWh ■ Charge and discharge capacity: 50 kW each ■ PCS (separate installation): Option Rectifier is not included.	Office building City hall 
	 ■ Battery capacity: select from 180 kWh ■ Charge and discharge capacity: 100 kW each ■ PCS (separate installation): Option Rectifier is not included.	 ■ Battery capacity: select from 180 kWh ■ Charge and discharge capacity: 100 kW ■ PCS (separate installation): Option Rectifier is not included.	
For large scale	 *The image is 360 kWh type ■ Battery capacity: select from 240 kWh 360 kWh ■ Charge and discharge capacity: 240 kWh type: 100 kW, 360 kWh type: 150 kW ■ PCS (separate installation): Option Rectifier is not included.	 *The image is 360 kWh type ■ Battery capacity: select from 240 kWh 360 kWh ■ Charge and discharge capacity: 240 kWh type: 100 kW, 360 kWh type: 150 kW ■ PCS (separate installation): Option Rectifier is not included.	Factory 
For EV solar carport	 ■ Battery capacity: select from 60 kWh 90 kWh 120 kWh 150 kWh 180 kWh ■ Charge and discharge capacity: 50 kW each ■ PCS (separate installation): Option ■ Rectifier capacity: 30 kW, three-phase 200 V input ■ Capacity for EV charging: 75 kW ■ EV charger (separate installation): Option	  	

PV Maximizer

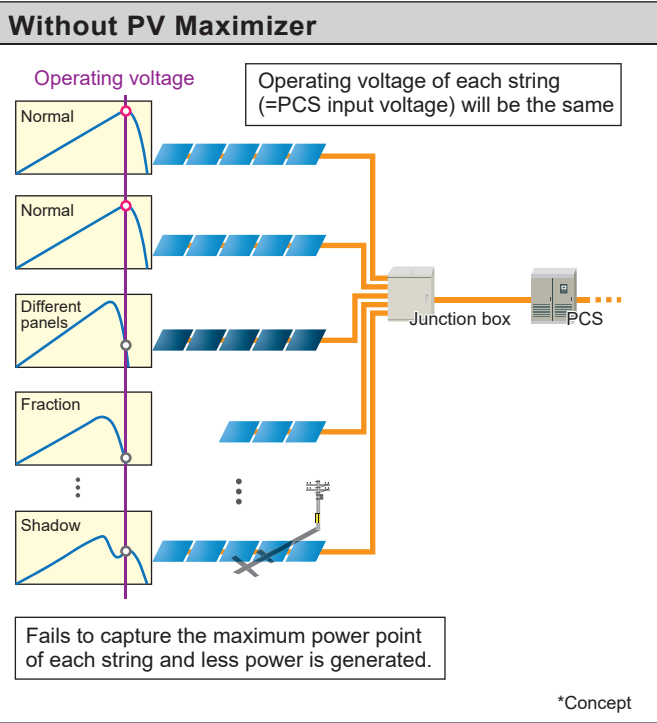
Essential for PV power generation



Features

Stable voltage by utilizing the full power generation capacity

Solar panels are susceptible to various factors like shadows of utility poles and trees, irregular orientation of arrays, irregular number of panels in series connection, mixture of different panel types, etc. resulting in a drop in the string voltage. The PV Maximizer can cancel the voltage gap between strings by raising the string voltage that has dropped while maintaining the maximum power point and can maximize the power from the panels available for power production.

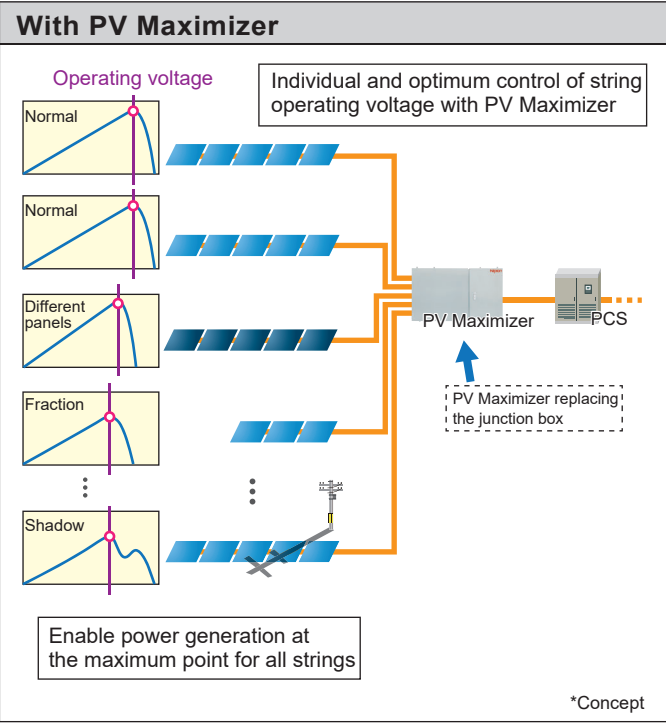


Variety of solar cells supported

Many mainstream solar cell modules are supported with the maximum input current (operation current) of 14 A

Designed with high reliability and long service life

High reliability and long life attained because of the elimination of limited life components like electrolytic capacitors and fans.



Monitor all strings remotely

By communicating with a dedicated cloud server and collecting and analyzing characteristic curve (I-V curve) reflecting the health condition of each string, it is possible to find problems and signs of abnormalities remotely.

Superior antirust property with high-corrosive-resistant plating steel panels

The use of high-corrosive-resistant plating steel panels has greatly enhanced the antirust property compared to our conventional products.

<http://www.nipron.com>

Lineup

■Model

8STB100-14A750VSD-600VSM

① Series Max. input current DC power supply spec. ② Max. input voltage ③ With SPD

① String number
3 3 String
4 4 String
5 5 String
6 6 String
7 7 String
8 8 String

② Output voltage range
300V 480V
330V 500V
360V 530V
380V 560V
400V 580V
430V 600V
460V

③ Communication
W Wireless communication
M Wired communication

■Lineup

3 string type (Voltage range 300-600 V)

Model	Communication
3STB100-14A750VSD-***VSW	Wireless communication
3STB100-14A750VSD-***VSM	Wired communication

4 string type (Voltage range 300-600 V)

Model	Communication
4STB100-14A750VSD-***VSW	Wireless communication
4STB100-14A750VSD-***VSM	Wired communication

5 string type (Voltage range 300-600 V)

Model	Communication
5STB100-14A750VSD-***VSW	Wireless communication
5STB100-14A750VSD-***VSM	Wired communication

6 string type (Voltage range 300-600 V)

Model	Communication
6STB100-14A750VSD-***VSW	Wireless communication
6STB100-14A750VSD-***VSM	Wired communication

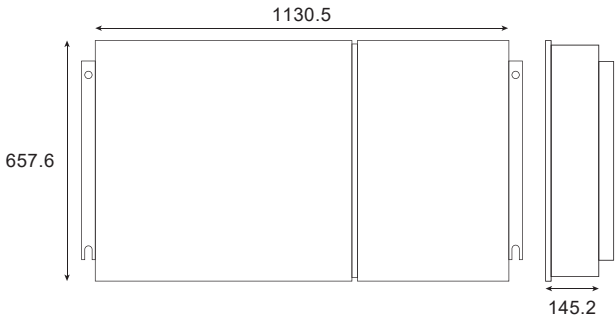
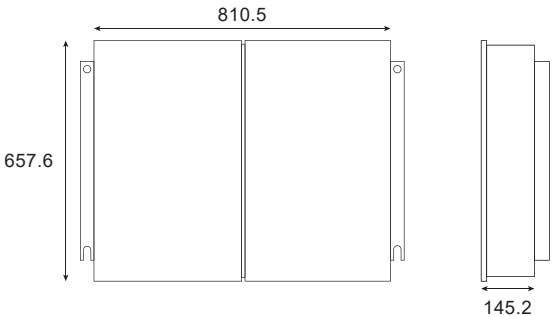
7 string type (Voltage range 300-600 V)

Model	Communication
7STB100-14A750VSD-***VSW	Wireless communication
7STB100-14A750VSD-***VSM	Wired communication

8 string type (Voltage range 300-600V)

Model	Communication
8STB100-14A750VSD-***VSW	Wireless communication
8STB100-14A750VSD-***VSM	Wired communication

Appearance/ External dimensions (Unit: mm)



<http://www.nipron.com>

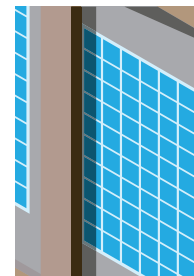
Concept of PV Maximizer Application

Mixture of different types of solar panels is possible

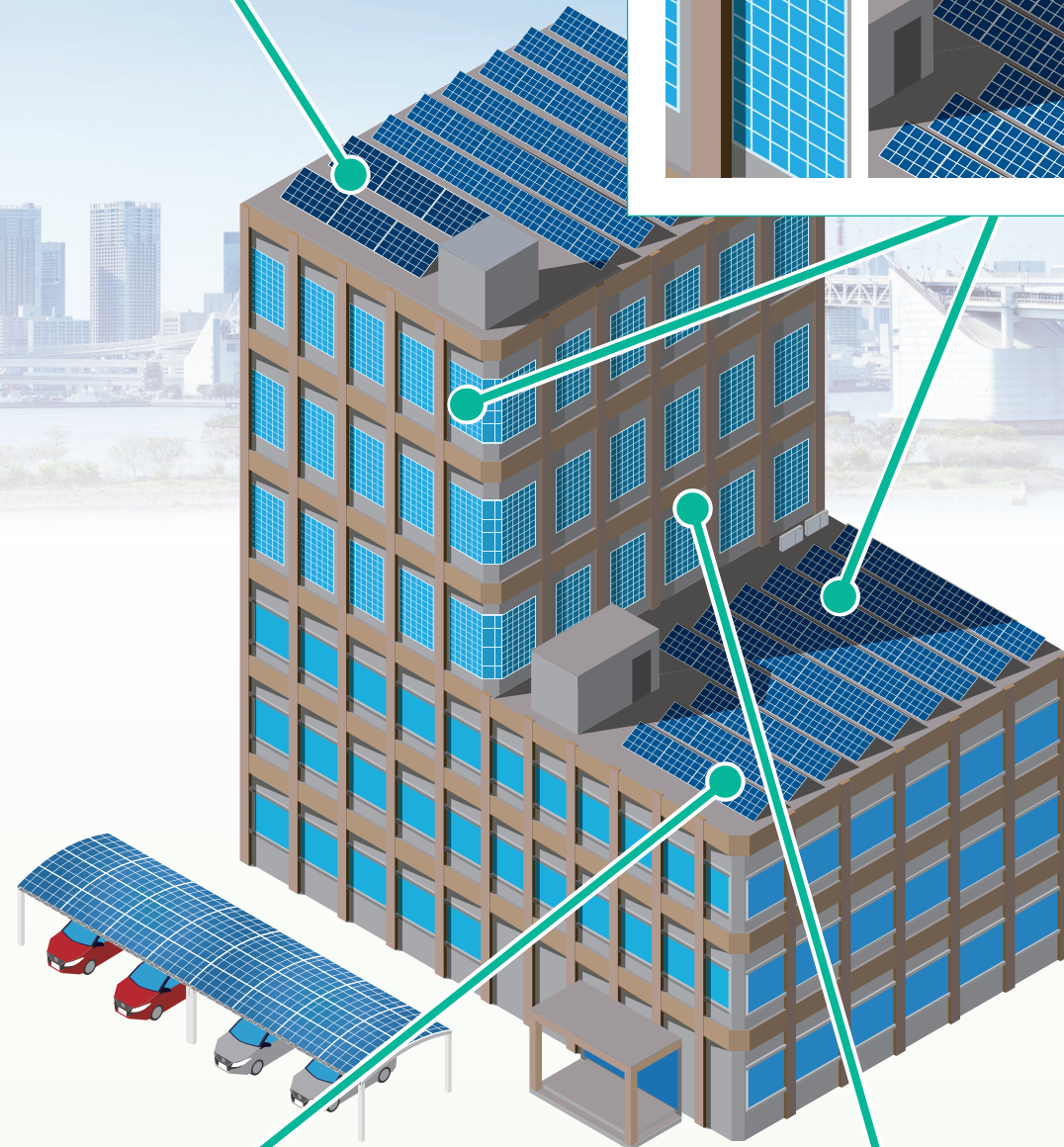
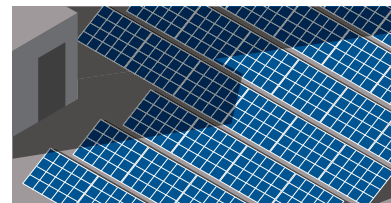
Mixed installation possible with panels of different properties or types (economical crystalline solar panels, thin film panels good for distributed lights, etc.).

Installation possible for areas with shadows

PV Maximizer draws out the maximum power from panels available even if shadows are cast over some panels depending on the time of day.



Panels can be installed next to each other even in the shadow



Install panels without worrying about odd numbers

Power generation is possible even if panels are installed in a narrow space which has been left open because of mismatch in the number of panels.

Solar panels can be installed in all directions

Because the loss in power generation can be held in check and the produced power can be maximized by the string-by-string control of PV Maximizer, panels can be installed on walls not facing the south, where the condition is not good, making efficient use of walls.

Our PV Maximizer Boosts Solar Power Generation Efficiency

On the rooftop of Nipron's Hanshin Factory, plots of PV string output and actual measurements of insolation were taken by switching the PV Maximizer ON and OFF every 24 hours. Approximate lines were drawn for actual measurements obtained in both periods in which the control was ON and OFF to compare the power generation amount under the same insolation condition.

Solar plant overview

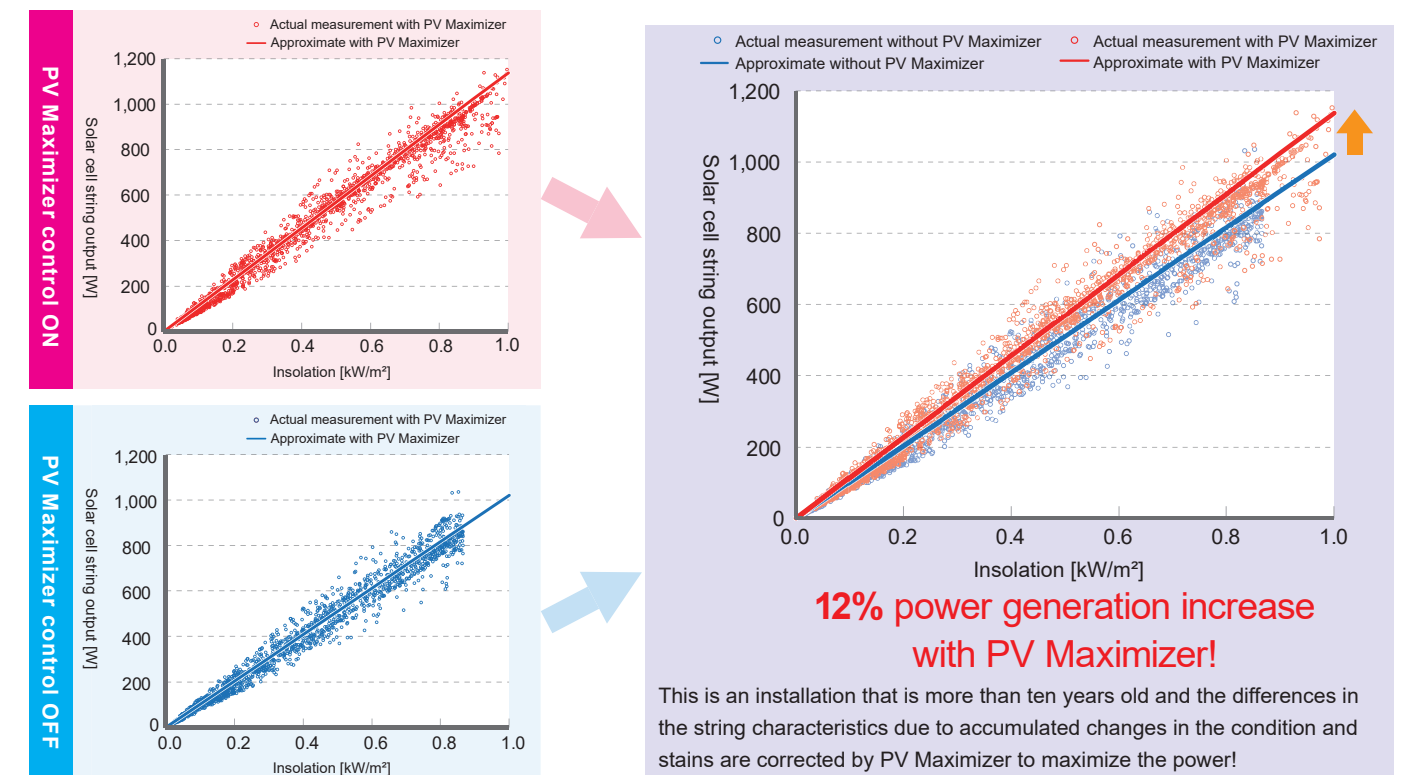
[Location] Hanshin Factory (Amagasaki, Hyogo)
[Total Generating Capacity] 123.5 kW [Total Number of Strings] 104 rows
[Installation] 2008 [Testing Period] April 1st to 30th, 2019
Mitsubishi Electric solar panel module (polycrystalline) Completed in September 2008 101.75 kW (550 panels)
Solar Frontier solar panel module (CIS) Completed in September 2015 (addition) 21.76 kW (128 panels)

Over ten years of operation as a solar power generation for roof installation



Solar Frontier (CIS)
Mitsubishi Electric (polycrystalline)

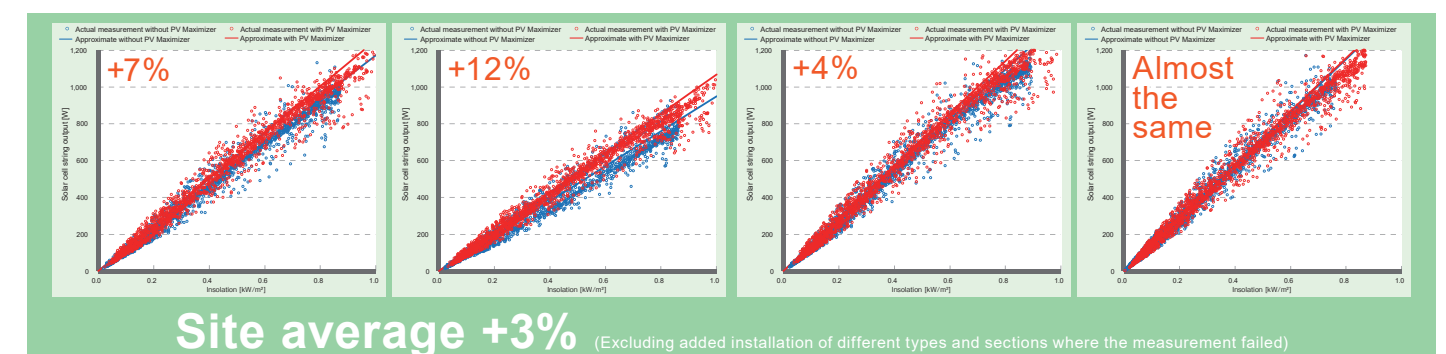
A case example of improved power generation with PV Maximizer (a typical example of string)



A case example of improved power generation with PV Maximizer (other examples of string)

The effectiveness depends on the condition of strings.

Especially for old installations, there is a big difference in the effect because of varying conditions of strings and it is assumed that PV Maximizer is more effective for strings with smaller power production.

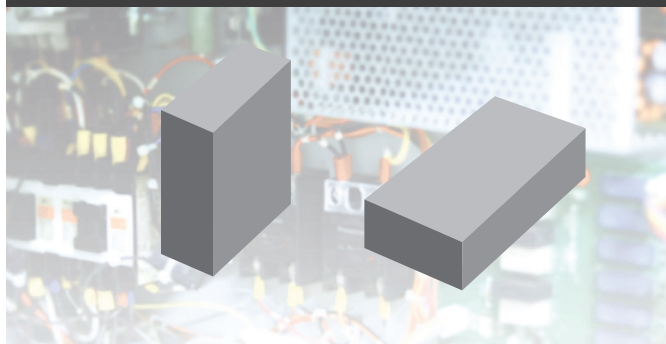


* The examples provided are based on actual measurements from field tests conducted by our company and calculated values derived from these measurements under specific conditions. We do not guarantee that similar results will be obtained in all environments and conditions.

Power Supply with Service Life Indicator

Our switching power supplies are equipped with service life indicator equipment to enable effective predictive maintenance and reduce costs and waste

Without service life indicator



Unexpected support required due to a sudden shutdown of power caused by expiration of service life

Increased maintenance cost due to the replacement of the PSU well before the expiration of service life

With service life indicator



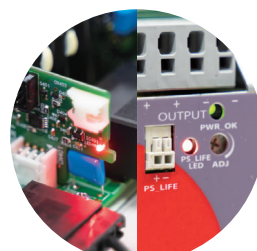
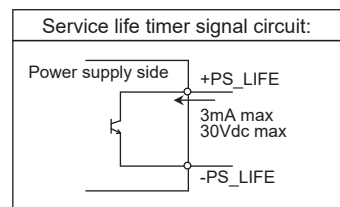
A signal is sent as the expected service life expiration nears. Planning maintenance work becomes possible.

An improvement in the accuracy of replacement makes it possible to eliminate unwanted early replacement, reducing the maintenance cost.

What is the service life indicator?

In general, the service life of fanless PSUs depends on the service life of electrolytic capacitors used.

The service life indicator is a feature to compute the level of degradation of electrolytic capacitors from the parts temperature and notify the user when the product service life is nearing its end with a signal and LED light if the estimated remaining life drops to 20% or the cumulative operating hours reaches fifteen years, excluding the period in which the system is not energized.



Concept of LED light

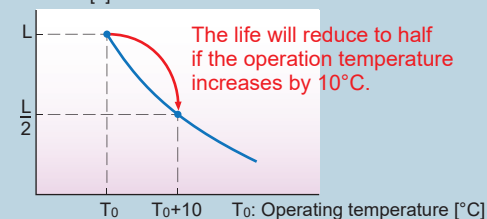
* The signal indicated the estimated time of PSU replacement based on the degradation (service life) of electrolytic capacitors and does not include failures caused by other factors.

Electrolytic capacitors

The formula used to estimate the service life of electrolytic capacitors is based on Arrhenius's 10°C rule.

If the ambient temperature increases by 10°C, the service life drops to half and, if the temperature drops by 10°C, the life becomes twice as long. However, it is also necessary to consider the degradation of sealing rubber on the electrolytic capacitor and the time it takes for the sealing rubber to deteriorate is generally considered to be fifteen years.

L: Expected service life [h]



UDP-***-A24-***X

Thin and high efficiency design DIN-rail-compatible power supply



UDP-120-A24
Continuous: 120W Output voltage: 24V
Peak: 200W/300W
(AC100V/200V)



UDP-180-A24
Continuous: 180W Output voltage: 24V
Peak: 200W/300W
(AC100V/200V)



UDP-240-A24
Continuous: 240W
Peak: 400W
Output voltage: 24V



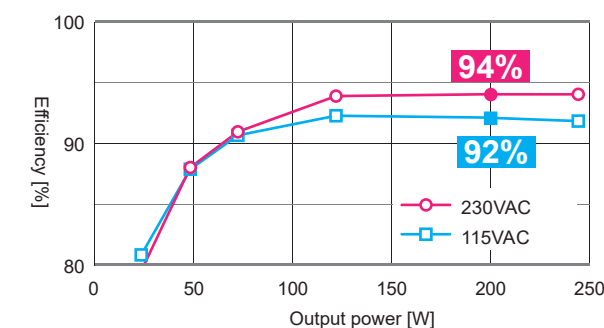
Service life notification by signal and LED light

Supports backup for momentary power failure and blackout (backup unit)

Backup with no interruption is possible by connecting DS02A-L24/2.5L-B.
(Compatible models: all 24V models of the UDP series)

High-efficiency design

Efficiency graph (UDP-240, an example measurement)



- Clears VCCI Class B for the conducted emissions without an external noise filter
- Wide operating temperature range from -20°C to 70°C (derating required)
- Able to start up in a -40°C environment
- Coating PCB as standard
- Built-in arrester to avoid/mitigate the risk of lightning damage
Common mode: actual performance ± 8 kV
- Able to support SEMI F47
- Available for European terminal type or screw terminal type as I/O terminals

UZP-600-A**-***X

Fanless power supply unit supporting the peak power output of 1200 W



Service life notification by signal and LED light

Continuous output: 600W Peak power: 1200W

Output power: 24V, 30V, 36V, 48V

I/O terminal blocks for different usage scenarios available

The PSU comes with screw terminal blocks or dividable nylon connectors as I/O terminals.



Horizontal connector type



Horizontal screw terminal block type



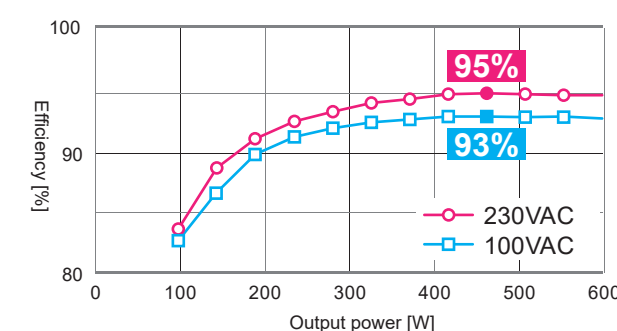
Vertical connector type



Vertical screw terminal block type

High-efficiency design

Efficiency graph (UZP-600-A24, an example measurement)



- Smaller size of 5×9 inches
- Comes with a +12 V standby output
- Equipped with blackout detection signal and remote ON/OFF feature
- Momentary power failures can be addressed by connecting capacitor units
- Built-in arrester to avoid/mitigate the risk of lightning damage
Common mode: actual performance ± 8 kV

We, Nipron, are shaping up a Sustainable Society!

Utilization of renewable energy

Nipron promotes the use of renewable energy while considering economic rationality and other factors. Solar panels have been installed at our major sites, Headquarters Factory, Mie Smart Factory, and Central R&D Laboratory, and we are actively using renewable energy. Additionally, as a next-generation energy project contributing to CO₂ emission reduction, we are engaged in a solar power generation project in Sanda, Hyogo. Nipron will continue to actively pursue environmentally conscious and sustainable business activities.



Pick Up

Construction of a new factory operating with 80% self-sufficiency in renewable electricity

At the Mie Smart Factory, which began operations in September 2023, we have implemented a solar power self-consumption system (solar panels: 485 kW / batteries: 540 kWh) that contributes to CO₂ emission reduction. This system is designed to provide approximately 80% of the factory's electricity consumption for production with solar power.



<http://www.nipron.com>

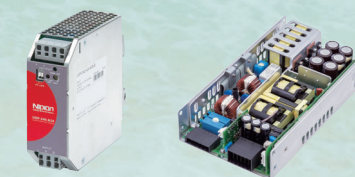
Environmental contribution through products

Nipron contributes to the reduction of energy consumption by supplying high-efficiency switching power supplies worldwide. We are also actively working to extend the life of our products, believing that this will reduce environmental impact while providing economic and social benefits. Additionally, as a solution to ensure the stable supply and high efficiency of renewable energy (solar power), we develop and offer green power products such as the PV Oasis (renewable energy DC power supply system).

Pick Up

Power supply with service life indicator

By notifying the user that the product's service life is nearing its end with a signal and LED light, this power supply makes it possible to eliminate unwanted early replacement, reducing the maintenance cost.

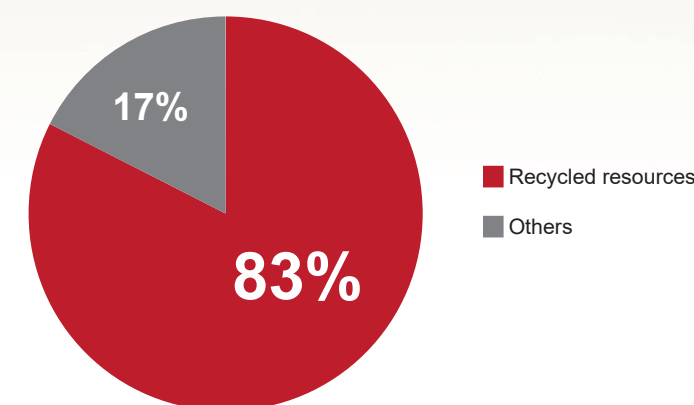


PP.9-10 for details of power supply

Reduction of waste emissions

By promoting the effective use of resources with an eye set on the future, the transformation to the recycling-oriented society is in progress. At Nipron, actions are taken to reduce wastes produced by the business and production activities. With the cooperation of waste treatment subcontractors, more than 80% of materials are recycled.

Percentage of recycled resources in 2023



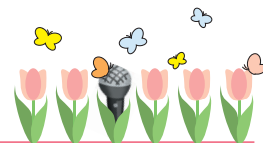
Introduced electric vehicles as company cars

Some of our company cars have been replaced with EVs and used for visiting customers and travelling between plants and offices. Also, the electric power consumed comes from in-house solar power generation system to charge EVs 100% with renewable energy.



<http://www.nipron.com>

Customer Interview: Reason to have adopted a Nipron power supply



Interview

The factor that led us to choose Nipron was the support network they have in place to earnestly respond if problems arise.

Toshiba Infrastructure Systems & Solutions Corporation, which supplies industrial computers used in a wide range of fields, starting with social infrastructures, is using many Nipron products.

Mr. Ryuki Nakamura, Mr. Tomotaka Sato,
Measurement and Control Instruments Department,

Toshiba Infrastructure Systems & Solutions Corporation

Please tell us the background for the adoption of our power supply units.

A while back, when we were selecting a new power supply unit for our industrial computer, we made comparisons of PSU specifications of different PSU manufacturers. After researching the possibility of customization, cost and support organization, not to mention the reliability in a prolonged use, we finally settled on Nipron. That Nipron products are made in Japan, making the communication easy, and they have an excellent product lineup and long-term supply program are also the deciding factors. We have been using their products ever since.

What are the priorities in selecting PSUs for your products?

We put the priority on the conformity to our own selectin standard. We have established standards for the durability for 24-hour uninterrupted operation and long-term usage, customization and support of various safety standards and products are checked against these standards in the selection process. A significant number of our products are operated in foreign countries and, therefore, it is especially important for the PSU to satisfy various safety standards. Nipron PSUs are satisfactory in that aspect as well.

What was the deciding factor in choosing our PSU?

While it is important to conform to the selection standard, the most important deciding factor is the support system. As you know, there will be a variety of problems in a long-term operation. If there was some problem, it is important that we can handle the situation by working together with the partner. In this sense, Nipron is very attentive and has prevented problems to last and, therefore, we feel it safe to use their products. In addition, whenever we request for an investigation or repair to solve a problem, they provide us a report clearly indicating the causes of failure or problem and that is also a big help.

Is there any advantage (relief, benefit, etc.) to your business by adopting our PSU?

In terms of long-term supply, we are thankful that the 500 W PSU we are using is still available even though we have been using it for a long time. One of the features of our industrial computers is that they are supplied and maintained for a prolonged period. If a PSU is discontinued during the supply and maintenance period, additional costs will be involved as it is necessary to select a succeeding or alternative product and evaluate the combination. In saving such a cost, the continued supply of same PSU model leads to our advantage. Also, in recent years, the heat generation within industrial computers is increasing in association with the improvement of CPU performance, resulting in a demand to improve the cooling performance. The cooling performance also depends on the internal arrangement of power cables. Therefore, if the PSU supplier can customize the power cable length, it is helpful to us as our freedom in the design will be improved. Additionally, the fact that Nipron PSUs are produced in Japan also helps us to reduce the transportation lead time and cost compared to foreign products.

Please tell us special features and strengths of your PC business.

Our industrial computers are used in a variety of fields and businesses, including social infrastructure systems, monitoring & control systems, automation machines, etc. To ensure the stable operation of these systems, we make our products more robust by improving the reliability of our design continuously in accordance with our unique design standard and by improving the resistance to interferences with the adoption of redundant design. We also try to enhance the ease of maintenance by adopting a structure that allows to replace expired components from the front of computer, and offer the same model for a prolonged period based on our long-term supply & long-term maintenance policy. Those are special features of our business. In addition, it is a great advantage that we can procure HDDs and RAID controllers manufactured within the Toshiba Group. Especially for the RAID controller, the availability is excellent with the advantages in the quality and support specific to the inhouse production. As the only industrial computer supplier that can produce these critical components within the group, we offer our customers the sense of security.



Industrial computers with Nipron PSUs

The Nipron Story, as told by our Chairperson

The iron law of issue and problem solving Think deeply about Moto (Source): “本 (Base),” “元 (Background),” “資/質 (Quality),” and “素 (Element).”

In April 2024, the cherry blossoms came into bloom later than usual across the nation this spring. Here in Amagasaki, many cherry blossoms started blooming around April 3 and will be in full bloom on April 6.

On April 1, many companies held their initiation ceremonies, and so did we at Nipron.

This year we had eight new hires: six university graduates (four science and two liberal arts) and two high school graduates, which is fewer than usual. The reason for this is that, while information flew around about base-pay increases of 30,000 to 50,000 yen at very large companies amid calls for pay raise under the backing of the government, we seem to have been late to make a decision because the new fiscal year starts in July at our company. Toward the new fiscal year, we will consider it immediately.

The political and business circles are now encouraging substantial wage hikes to create a political inflationary state this year and beyond to get out of the “lost 30 years” of deflation, invigorate the economy, and enter into a virtuous cycle. I totally agree to their approach of dramatically raising the evaluation of the current situation of Japan whose nominal GDP per capita is the lowest among the seven major countries, and thereby increasing the strength of the yen that is tumbling to new lows. However, I feel at a dead end with the current political situation, including the exchange between the Liberal Democratic Party and the Constitutional Democratic Party of Japan.

Let's switch to some other topic. As times change, companies naturally come up with new issues and difficulties. We must find out these issues and challenges ahead of changes and needs of the times, make the right decisions, and prepare for them so as not to get a late start, if possible. If we fall behind a curve, we will encounter troublesome problems, making the situation extremely dangerous. Ideally, regardless of the size of the company, management should be able to correctly predict what lies ahead, recognize the current capabilities and issues of the company, and harness the trends of the times to overcome these issues so the company can lead the way ahead in a direction that will break the status quo. To make this happen, we should make constant efforts to develop analytical skills to decipher the essence of issues and problems. Let me introduce the following “maxim” as a way to do so.

We will use the poster of the major policy for Quality Reform (because the same is true for issue and problem solving). The quick solution for a problem is to think deeply about and analyze the “Moto (source)” factors of the problem.

The kanji representing “Moto” includes the characters: “本 (Base),” “元 (Background),” “資/質 (Quality),” and the additional character of “素 (Element).” Looking at the meaning of each character, “本” means to think deeply about the root or essence of a problem and correct it. “元” means to rethink whether the original way of thinking was wrong; it is to reassess from a different perspective. “質” is to find out whether a chosen material or the material itself is wrong and improve it. “素” is to view the validity of the matter in question with skepticism in light of something (rules, regulations, standards, judicial precedents, etc.); discerning whether the matter is justified or not is also necessary.

Nipron's executives and managers are encouraged to put this maxim into action and promote a change in mindset to consistently guide our company in the right direction without making a wrong decision on issues and problems.



Setsuo Sakai
April 2024



Nipron Co., Ltd.

<http://www.nipron.com>

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