

Nipron Wave Vol.64

<u>Highlights</u>



[New products] PV Oasis 400V

In-house consumption of power stored in a battery, a packaged PV Oasis is ready to go NOW! One room PV package solution can be offered for factories, offices, commercial facilities, or even in apartments.

[New products] UZP-400 series, mUZP-400 series Standard model", "High peak model", "Medical model" coming soon

Repowering Decade-old Systems

It has been ten years since the Feed-in Tariff (FIT) for renewable energies was introduced in July 2012. Since the service life of a power conditioner is commonly said to be ten to fifteen years and, therefore, it is time to consider overhauling or replacing power conditioners that have been operated since the early days of FIT introduction. Taking this opportunity, Nipron proposes repowering* of systems utilizing the PV Maximizer.

* Increasing the output power of aged PV power stations by replacing major components or adding new devices.

A great power upgrade by PV Maximizer



In general, the string voltage would drop if solar panels deteriorate. The progress of deterioration varies depending on the panel and strings with deteriorated panels affect other strings with less deterioration, reducing the power generated.



Normal PV power generation system

A centralized power conditioner, which is most used, performs the MPPT control for thirty to fifty strings. For this reason, the MPPT control is applied to equalize the power output between the strings. Because of this, strings with lower power will limit the power generated by strings that are otherwise capable of producing higher power

With PV Maximizer installation power generation system

Since the PV Maximizer performs the MPPT control for individual strings, it can maximize the power generated by all strings, making it possible to utilize the maximum capacity of each string, even if there are gaps in the power generation capacity among strings due to various reasons. Also, the PV Maximizer has a proven track record in systems using power conditioners from different suppliers.

Power plant concept



Power plant concept

(4)



Without PV Maximizer

600V system



Unlike a 600V system, a 1000V system allows you

to upgrade to a highly efficient power conditioner.

1000V system power conditioner cannot be used with the existing wiring because the minimum startup voltage of power conditioner cannot be attained.

High-Level Precise Monitoring system by PV Guardmyan

Irregular signs can be surely identified by measuring I-V curves simultaneously for 365 days a year.

PV Guardmyan reports irregular conditions or its signs remotely by managing and analyzing big data (power generation strings) stored on a cloud server and I-V curves show the strings' conditions. By recognizing power generation losses at an early stage, it allows the user to take preventive measures and achieve field maintenance cost reductions



Shadow on the panels

Burnout of the connector

Daily simultaneous remote diagnosis detects the power generation error at an early stage

Repowering by PV Maximizer

point

Concept image

with PV Maximizer

Enabling the use of 1000V system power conditioner without upgrading the system components

By using the PV Maximizer, a 600V low-voltage system can be operated as a 1000V high-voltage system without changing its panel layout. There are a variety of advantages for a 1000V system in comparison with a 600V system, such as the availability of more efficient power conditioners. Advantages of installing a 1000V upgraded type power conditioner.





Because the PV Maximizer increases the voltage up to the operating voltage of power conditioner, 1000V system power conditioners can be used without modifying the system layout. The power generation efficiency of PV Maximizer can also be expected.



A Solar Carport System that Charges Electric Vehicles with 100% Renewable Energy



PV Oasis for **Solar Carport EV charging station** Nipron provides features unmatched in the industry.

- Charges EVs with 100% renewable energy.
- Charges quickly without requiring a cubicle. 2.
- Provides power generated by the sun even 3. in an emergency.



Actively tackling decarbonization, SDGs and ESG

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EV charging using 100% renewable energy generated in a parking lot

EV charging stations, which use renewable energy from solar panels, can be set up in any parking space. Surplus electricity can also be stored in battery systems.



Are EVs worthy only if they were charged 100% with renewable energy?

Recently, it is required to reduce the environmental impact by evaluating the CO2 emission using the LCA (Life Cycle Assessment) method, which applies to the entire product life of procurement of materials, manufacturing, use, recycling and disposal. In the assessment of environmental impact using this method, the CO2 emission will be higher for EVs compared to gasoline powered vehicles. If EVs were charged using the commercial AC power supply, in which 75% of domestic power production depends on the thermal power, the advantage of EVs will be lost in terms of CO2 emission throughout their lifecycle. In other words, if EVs were used for the purpose of carbon-free operation, it becomes essential to charge them with electric power originating from renewable energies. The reduction of CO₂ will be important "throughout the product lifecycle" to realize a carbon-neutral society.



LCA comparison chart*



Even EVs are emitting a large amount of CO₂ if they were charged with the commercial AC power supply. Although the CO₂ emission due to the construction of PV power stations is not included, the CO₂ emission will be reduced significantly by charging EVs 100% with renewable energy, making it possible to improve the decarbonizing effect of EVs significantly.

Prepared based on the materials for the "study on the structural changes in mobility and future directions of automobile policies beyond 2030" by the Ministry of Economy, Trade and Industry

Changing the current parking lot into EV solar carport

2 Fast charging of multiple EVs at the same time without a cubicle

Even for a charging operation (quick charge or simultaneous multi-unit charging) with an aggregate capacity of 50 kW or larger, a low-voltage power feed system (of capacity less than 50 kW) will suffice with an assist of solar power and/or a stationary rechargeable battery. For the low-voltage power feed, the installation of an electrical cubicle and a contract with a licensed electrical service engineer is not required and, thus, it can be introduced and maintained easily.



3 Provides solar-generated electricity even in an emergency. The Solar Carport can also serve as a shelter, where electricity from solar power generation and stationary rechargeable batteries is available, in a wide-area power failure (blackout) caused by a natural disaster. Thus it is possible to use it as a renewable energy power plant & EV charging station in a normal situation and as a shelter in an event of a disaster, fulfilling the need of the country and local governments.

Even if the commercial AC power supply has stopped, the solar power generation and rechargeable batteries can be combined to stabilize the unstable solar power generation and store the surplus energy in the rechargeable batteries.



Even if there is a blackout at night, electricity can be supplied to EVs and emergency equipment from storage batteries.



The system can also be expanded in various other applications such as VPP (Virtual Power Plant).



The power can be supplied from EV to emergency equipment through the V2X system.





For factories, offices, public facilities, commercial facilities, and apartments.

Energy-storage type PV for in-house consumption starting with a single room

Start a Zero Energy Room in one package.

PV Oasis 400V Hybrid (solar power generation + battery) in-house consumption



Connection concept images (Single phase 3 wire 100/200V system)			
Solar power generation	Cloud servers Monitoring error check by I-V curve data analysis for solar power generation Status check of solar power generation Monitoring battery error Battery capacity fulfillment status check Allocation of the battery capacity for emergency use, etc.		
PV Maximizer	Stand-alone inverter System switching equipment DC input equipment 100/200VAC		

Zero Energy Room starting with single room

Item Specification Three phases Input three wires 200V 400VDC max. Output voltage Storage capacity 9.9kWh 5.7kW Rectification capacity 10kW (selectable) Charging rate 10kW 10kW Discharging rate

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Advantage without modifying cubicle

Common in-house power consumption

Requires cubicle modification. Heavy setting up procedure is required to replace it with a whole new system.



Advantage 2 You can select places to make use of renewable energy.



Advantage **3** Built-in storage battery

Under blackout conditions, electric power can be supplied continuously.

Because operations are always independent, the power supply will be maintained under blackout conditions.



Setting up allocation of battery capacity for emergency use

For emergency use, the battery system can contribute as a power source.



Nipron offers unique eco-solutions.

Features-

Connect to circuit breaker of distribution board

PV@asis

Select the lines in the circuit breaker to be used for renewable energy supply or continuous power supply under blackout conditions. You can change such lines selection at any time.



PV@asis

The use of renewable energy can be tracked, so it can be promoted PV Guardmvan offers a perfect real-time status view for the power generated and operating conditions



Solar energy created in the daytime can be utilized at night.

Surplus solar energy created in the daytime contributes to cutting out energy purchased from the grid. Store in the daytime, release in the early morning or at night.



UZP-400 series

Standard model

Advanced model in UZP series with higher capacity and smaller size

High peak power model

Supports the peak power 1200W output three times as high as the continuous power 400W

Medical graded model

To be medical grade UL60601 (MOPP) certified

The built-in arrestor and varistor enhances the resistance against lightning surges

By incorporating an arrestor and a varistor as a surge protector, the resistance to external surges due to lightning or other causes has been enhanced.

Arrestor



Common mode: actual performance ± 8kV

Small size and large capacity

Compared with Nipron past/current models of the OZP-350 series, the UZP-400 series keep a 50W larger capacity in continuous level and 30% smaller size.



Backup for instantaneous power failure

Backup with capacitor board connection avoids instantaneous power failures, which allows extension of the output holding time. (except for UZP-400/1200P)



Other features

• With chassis or with chassis and cover versions are available



with chassis and cover version *Product image

■ With remote ON/OFF feature

Standard model

UZP-400 Series

Continuous: **300~400W** Peak: **500~600W** Output voltage: 12/24/36/48V



Clears VCCI Class B for the conducted emission

The power supply unit clears VCCI Class B for the conducted emission. Because there is no need to install an external noise filter, it facilitates reductions in the cost and man-hours required.



Measurement condition Input: 230VAC Output: rated load (an example of measure

High peak model UZP-400/1200P Series

Continuous: **400W** Peak: **1200W** Output voltage: 24/30/36/48V



Small size, large capacity and high peak

Supports three times higher peak load (at 200VAC input) It supports 5-second output of peak power, which makes it optimum for devices requiring an inrush current, such as motors.

Medical grade certified model mUZP-400 Series

To be UL60601 (MOPP), UL(cUL)62368-1 certified, EN62477 (OVCIII) compliant

Larger capacity and smaller size compared with past/current models

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Output specifications

UZP-400-A	12	24	36	48
Output voltage	+12V	+24V	+36V	+48V
Continuous current	25A	16.7A	11.2A	8.4A
Continuous power	300W	400.8W	403.2W	403.2W
Peak current (within 10 s)	41.7A	25A	16.7A	12.5A
Peak power (within 10 s)	500.4W	600W	601.2W	600W
Input voltage	85-264VAC (worldwide range)			
Safety standards	To be UL(cUL)62368-1 certified, CE marking EN62477 (OVCIII) compliant			

High efficiency and low-heat-generation design

Achieved high efficiency of 94% typ with 230 VAC input, which allows less heat generation. It helps with cost reduction for heat management in the customer's system.



Output specifications

UZP-400/1200P-A	24	30	36	48
Output voltage	+24V	+30V	+36V	+48V
Continuous current	16.7A	13.4A	11.2A	8.4A
Continuous power	400.8W	402W	403.2W	403.2W
Peak current (within 5 s)	50A	40A	33.4A	25A
Peak power (within 5 s)	1200W	1200W	1202.4W	1200W
Input voltage	170~264VAC			
Safety standards	To be UL(cUL)62368-1 certified, CE marking EN62477 (OVCIII) compliant			



Medical grade certified PCB type single output high peak power supply



mUZP-220/520P-24S05 NEW

Medical grade: to be IEC60601-1 Ed3.1 MOPP certified

In applying for medical standards for customers' equipment, no further tests will be required for the power supply, it contributes to shortening the application term and costs.

Low leakage current and low noise

While it reduces leakage current down to 0.089 mA at 100 VAC and 0.175 mA at 200 VAC, with the enhancement of noise filter circuits and optimization of component arrangement, the conducted emission for the power supply unit alone clears VCCI Class B. Elimination of an external noise filter makes it possible to reduce the cost and man-hours required.

Low leakage current

	Min. load	Rated load	
100VAC	0.089mA	0.089mA	
200VAC	0.175mA	0.175mA	

The power supply unit clears VCCI Class B for the conducted emission. Measurement condition

Input: 100VAC Output: rated load (an example of measurement)



Small, large capacity, and high peak power achieved

Support around 130% higher peak load

Peak power is available for 5s. Optimum for equipment that requires an inrush current such as motors.



Equipped with standby output

Supports standby output (5V/1.5A)

No need to prepare a separate power supply for standby output, which contributes to small-sized design and cost cut off of the equipment.



Output specifications

Output voltage		+24V	+5VSB
Max. current/ Max. power (Continuous)	Natural air cooling	9.2A	1.5A
		220.8W	7.5W
		Total 220.8W	
	Forced air cooling	13.8A	1.5A
		331.2W	7.5W
		Total 331.2W	
Peak current/ Peak power (within 5 s)		21.7A	2A
		520.8W	10W
		Total 520.8W	
Min. current		0A	0A

Peak is around 130% higher than continuous power for instantaneous high-level loads

Concept image of the peak load



High efficiency

Low-level heat generation by reducing power loss

Achieved high efficiency of 93% typ with 200VAC input, which allows less heat generation. It helps for the cost cut off for heat management in the customer's system.



Other features

- Equipped with a variable resistor to adjust the output voltage.
- Worldwide range (85-264VAC)
- Built-in double fuse
- With chassis or with chassis and cover type lineup



* Since the product is under development, the specifications and appearance shown here may change without notice

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Exhibition report



Participated in the 36th TECHNO-FRONTIER

Nipron has participated in the 36th TECHNO-FRONTIER, which was held at Tokyo Big Sight for three days from 23th to 25th June.

This exhibition is the only exhibition specializing in power supply units in Japan, displaying the latest technologies in every field, e.g. power electronics, power conversion with power conditioners, and stable supply of power using UPS and capacitors.

At the Nipron booth, the display focused mainly on new products, such as the UDP series power supply units with DIN rail support and the ATX power supply unit HNSP5-350P with a blackout backup feature using a built-in lithium-ion battery, along with the UZP-400 series, in which large peak power and medical standard compliant models are planned in addition to standard models, miniature single output PSU FZP-040 and the single output PSU mFZP-075 expected to comply with the medical standard.

Among the demonstrations presented, the first ever demonstrations of backup system for instantaneous power failure using DS01A, a DIN rail support capacitor unit, and a blackout backup system using a lithium-ion battery pack DS02A, which also supports DIN rail, attracted visitors' eyes.

With the proposal of Solar Carport EV charging station, which utilizes renewable energy aiming at the realization of carbon-neutral society, the high level of interest in decarbonization was felt as it gained attention of a number of people larger than expected. We would like to express our heartiest appreciation to the visitors to the Nipron booth.



A wide range of power supply units is available. Call us to find out more.

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Customer Interview: Reason to have taken up a Nipron power supply



Interview

Nipron's PSU has been adopted as the standard power supply unit by Logitec INA Solutions Co, Ltd., which plans, develops and manufactures custom-made PCs at their domestic factory satisfying a variety of industrial needs.

What was the reason for adopting our power supply unit?

Besides appealing the reliability and the use of Japanese PSU from the perspective of development department, the sales department also wishes to take advantage of Japan-made Nipron's products, which have gained a high reputation among the customers for their reliability. We are also thankful to Nipron as they provide a solid customer support after the sale of our products.

Is there any difference in comparing the products with other PC power supply unit manufacturers?

In the first place, we do not use many products other than Nipron products.

The largest reason for using Nipron's PSU is because there is a sense of security provided by the four factors of "reliability, production in Japan, stable supply and after-the-sale support." As Logitec INA Solutions tries to offer a robust and thorough customer support for its PCs used by the customers, it is risky to sell PCs using components of manufacturers, who do not have a dependable support organization. In this viewpoint, the policy of component selection is the same as that of the development department and we think the fact that Nipron is a manufacturer satisfying our needs leads to the sense of security or the reliability it offers. It is a huge advantage for a PC to use components offering security especially for the PSU because it is a component defining the life of a PC.

As people say "if the motherboard is the brain, the PSU is the heart," the PC will not work unless those components were not supplied properly. Also, it is difficult to change the PSU because, in our company, it is so important that the entire product needs to be re-evaluated simply by changing the PSU.

We know that PSUs from foreign suppliers are cheaper, but how about the delivery and MOQ?

In adopting Nipron's PSU, although its price is higher than foreign products, its product quality is also higher, of course. Concerning products offered by foreign suppliers, there is a drawback that the supplier would not pay attention to our requests to modify the products to match the Japanese specifications or. even if they did, there is a limit of MOQ (e.g. the minimum quantity of 1000 units). Although Nipron's PSUs are expensive, they have the advantage that they can be used without any modification and smaller MOQ in terms of delivery.



The sense of security and reliability offered by domestic production is the decisive factor when choosing a Nipron power supply.

Logitec INA Solutions Co, Ltd.

Mineaki Kikushima, from the Ina Development Team, PC Development Dept. Toru Yoshizawa from the PC Sales Team

Was there any instance where you felt lucky about selling PCs using Nipron's PSUs?

Suppose there was a failure or problem with a single power supply unit, foreign manufacturers would not respond to our request to analyze it. But when we made a request to Nipron saying that we don't mind paying the cost to a certain level, they had accepted it courteously. In that sense, we thought a company like Nipron, who does business as a Japanese manufacturer, does make a difference. It is possible to make our customers feel safe saying "I see, we can send back the PSU alone to have it repaired or analyzed if it was the only unit that has failed; Works fine with us."

What is the satisfaction level for your PCs with Nipron's PSU built-in?

The number of complaints on the product is close to zero as Nipron products rarely cause problems. Looking back the past ten years, there were only a few problems, all of which were addressed properly.

What is the future prospect?

Concerning desktop PCs, we plan to intensify our efforts to address the image processing market. When it comes to processing images, the 24-hour non-stop operation is required and the quality and reliability are required for each component. For the PSU, and for other components as well, we do hope to select and use quality products and, therefore, we ask you for continued support.

As we take pride in producing our products in Japan at our Ina Plant, Nagano Prefecture, we hope to use the strength of dependability it brings in deploying our business.





LC-9AS62 Equipped with Xeon processor in Cascade Lake generation Middle tower type controller with excellent expandability

HPCSA-1000P-E2S 1000W peak power large capacity ATX PSU Highly reliable design enables continuous running for 24 hours, 365 days

The Nipron Story, The Our President by

Nipron's Aspirations

Through the prolonged COVID-19 pandemic and repeated declarations of a state of emergency, economic activities and workstyles are already undergoing drastic changes. DX (digital transformation) is causing revolutionary changes. After the pandemic, things will not return to what they were. We will experience further innovative changes.

The world will undergo a major transformation as well. We are seeing a major change called EX (energy transformation), which has been expected for some time but has been slow in progress. The keyword is decarbonization. The shift to EVs and the trend toward DC power supply which started in the EU has spread to Japan, and the standardization of LVDC has begun to make progress. For many years, NTT has led the efforts to promote this, but it did not become a major trend and did not spread. It is now expected to start moving as part of the trend of EX. Nipron foresaw this trend and has been preparing according to the business strategy we established, so we are now ready and waiting.

Anticipating a major change of the times, we have been strategically promoting commercialization of the GP (Green Power) business in preparation for the coming time. However, this field is dominated by major companies and we should not compete head-on with them. I think it would be ideal to offer PV Maximizer and PV Guardmyan, which Nipron commercialized ahead of other companies, as well as the Neo eXpander power storage system and rectifier to them as standard products, and have them use the products like in the power supply business.

In addition, we have been proposing EV solar carports to major companies as a package product for embedded systems and have had them incorporated in large-size VPP systems, building a win-win relationship. I imagine this kind of division of work is the way Japan's manufacturing industry should be in the future. I don't think we can afford to engage in futile competition. On the other hand, we are required to have production capacity, quality, and delivery capability, so we are currently working to strengthen them.

Nipron will not adhere to DX (because we understand the essence of DX and have been promoting it as appropriate to date). Instead, we will focus our resources on returning the supply chain of outsourced production of processed goods (pressed products, harnesses, and rolls) in China, which is considered to be a risk in the future, to Japan and their internal production, giving priority to stability of delivery and meeting the confidence and trust of our customers. In addition to the internal production of sheet metal and pressed products by a subsidiary (Cim Giken), Nipron has introduced many automated machines and devices and its production engineering division is developing labor-saving and personnel-saving systems for internal production by Nipron itself in order to thoroughly suppress cost increases due to the shift of production to Japan.

Our product strategy is to actively provide differentiated products in a timely manner based on our policy to create "Non broken," "Non destroyed" and "Non stop" power supply.

The GP (Green Power) business, which will be the mainstay of our business in the future, is as mentioned above. I hope we will continue to burn with the Nipron spirit, aiming for perpetuity with vitality, Nipron's aspirations, and to become a world-famous power supply specialist manufacturer with annual sales of 30 billion yen or 100 billion yen.

Setsuo Sakai July 2021

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