Nipron GAZE into the future

Nipron Wave

Vol.77

Highlights

1 PV Oasis
Introducing Key Features and System Components

2 Rectifiers
Highly Reliable, Japan-Made Rectifiers

Self-Use / Storage / DC Supply of Solar Power

PV Oasis

This system enables flexible design of solar power generation and storage capacity tailored to your power usage, budget, and investment plan.

Introducing a self-consumption solar power generation and storage system.

Key Features of PV Oasis

1 Reduce CO_2 emissions

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 gaining attention.

2 Reduce electricity costs

Implementing the system will enable you to generate a significant amount of your electricity from renewable energy sources. This will reduce the amount of purchased electricity and lower your electricity bills.

3 Supports BCP during blackout

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

4 Off-grid operations become possible

In addition to the commonly disseminated in-house consumption system with the grid connection, construction of off-gird in-house consumption system is also possible. With a small-scale off-grid system, in-house consumption can be started with a small investment without the need for negotiation for grid connection.

5 Support EV charging

Since PV Oasis uses a unique power system to connect the PV power to batteries without converting the DC power, it reduces the power loss associated with power conversion compared to conventional systems.
Also, the system supports connection to DC-compatible EV chargers, allowing high-efficiency charging using 100% renewable energy.

PV Oasis 400 V System: Configuration and Components

Internal structure

Thermal insulation to keep internal temperature constant

Using heat insulators on the walls, ceilings and doors inside the system racks, the optimum temperature for lithium-ion battery operation is maintained.

- **Keeping the temperature constant**
- **Reducing losses in air conditioning**
- **Prevention of dew formation**

Thermal insulation

Density: 24 kg/m3

Thickness: 25 mm

Material: Glass wool

1 Energy storage system rack

This is a unit for storing electrical power. It employs highly reliable lithium-ion cell/system made in Japan.

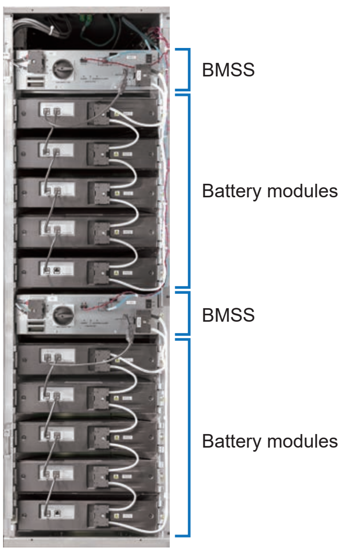
It features multi-layered protection via cell safeties, module safety mechanisms, and system safety controls.

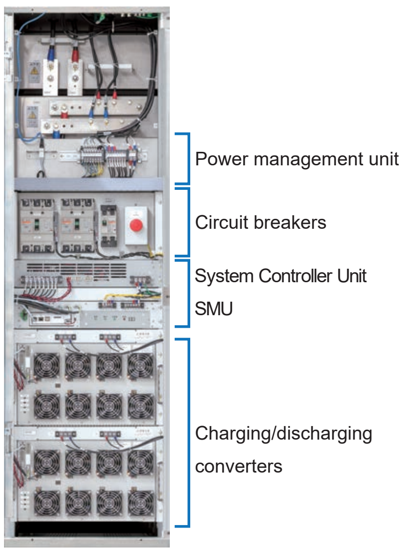
2 Charging/discharging rack

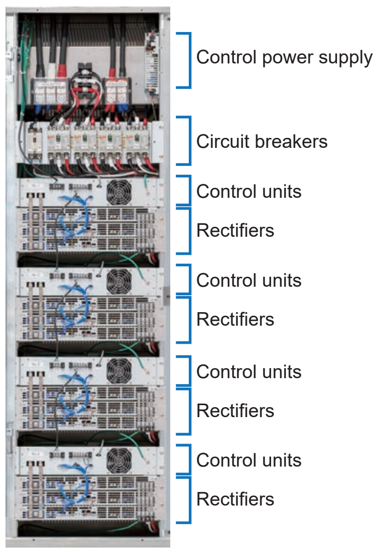
This is a unit that controls battery charging and discharging operation. It also monitors battery condition and performs remote control by communicating with a dedicated cloud server.

3 Rectifier rack

This is a unit for receiving power from the grid and converting it to a stable direct current. When the level of stored power drops due to some reason like bad weather, it prevents blackout by drawing power from the grid. It is possible to control it remotely using an external signal.







Highly Efficient and Reliable

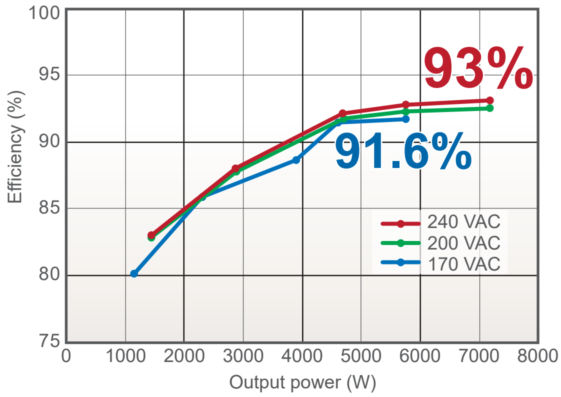
Rectifiers

GP1UT-6000-400-TES

High-capacity 1U-size AC/DC single-output power supply

- **Low-level heat generation by reducing power loss**

Achieves high efficiency of 93% with 240 VAC input, which reduces heat generation. Also helps to cut work and costs associated with heat management. (an example measurement)



- **1U size slim design**

1U size with 43mm height enables rack mounting.

- **Supports CVCC output**
- **Supports output voltage/output current signal**
- **Clears VCCI Class A for conducted emissions**
- **Supports three-phase harmonic current regulation (IEC 61000-3-12 compliant)**
- **Wide operating temperature range from -10 °C to 70 °C (derating required)**
- **Supports parallel operation of up to 3 units in parallel**

Items	Notes	
Output voltage	400 VDC	+12 VSB
Adjustable output voltage range	240-400 V	12 V
Rated current/power At rated voltage operation	16.5 A	0.4 A
	6600 W	4.8 W
Rated current/power At rated voltage operation	18 A typ	0.4 A
	7200 W typ	4.8 W
Minimum current	0 A	0 A
Input voltage	Three-phase 170-264 VAC	
Size (mm)	444×43×500 (W×H×D excluding the screw terminal blocks +22 mm)	

Rack Type

Also available as a rack-mounted model.

Front View

Internal View

*Rack manufactured by Nitto Kogyo Corp.

30 kW type:RFR-400V-R30
45 kW type:RFR-400V-R45
60 kW type:RFR-400V-R60

Control Communication Unit

Enables control and communication with the GP1UT-6000-400-TES via RS-485. (output voltage/current adjustment, output ON/OFF control, and fault signaling of input undervoltage etc.)

RCU-3PL

For Rectifier (GP1UT-6000-400-TES)

- **Built-in reverse-current protection diode**
- **Capable of controlling up to 3 GP1UT-6000-400-TES units**
- **Input (connect rectifier output) / Output**

Input/output voltage	340 VDC
Input/output voltage range	240-400 VDC

- **Control unit connection example**

2 units in parallel

3 units in parallel

http://www.nipron.com

GPRA-2000 Series Under development

Small size and large capacity 2 kW unit-type standard power supply

*Concept

Items	Specifications		Notes
Output voltage	24/48/100 VDC		Other voltages are planned for future release.
Adjustable output voltage range	75-115%	20-100%	1-5 V input
Adjustable output current range	(TBD) to 100%	20-100%	1-5 V input (at 200 VAC input)
Rated power	2000 W typ		At 200 VAC input
Input voltage	100-240 VAC		Derating required at 180 VAC or less
Input frequency	50/60 Hz		Frequency range: 47-63 Hz
Size (mm)	127×63×298 (W×H×D, Except for terminal blocks and other protrusions)		

Rated input voltage: **100-240 VAC**

Rated output voltage: **24 V / 48 V / 100 V**
Additional options, including 72 V and high-voltage types (240 V / 400 V), are planned for future release.

Rated power: **2000 W typ.** 48 V / 100 V type

Other features

- **Constant voltage and current operation**
- **Possible to control the output voltage (20%–100%) /output constant current (20%–100%) by external voltage input**
- **Possible to increase capacity by parallel operation (up to 3 units) Supports series operation to achieve higher output voltage. (up to 3 units)**
- **Equipped with standard signals: AC_FAIL / PWR_OK / PS_ON**
- **Built-in auxiliary power supply: 12V 0.1A**
- **Three-phase input model will be available (three-phase 200 VAC)**

GP6UT-10K-400-PES Under development

High voltage and large capacity power supply

*Concept

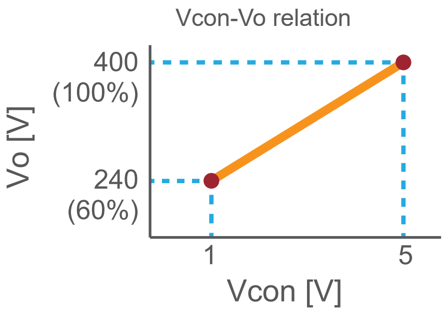
Items	Specifications	
Output voltage	400 VDC	+12 VSB
Adjustable output voltage range	240-400 V	12 V
Rated current/power 230 VAC	19.6A typ	0.4 A
	7560 W	4.8 W
Rated current/power 480 VAC	27A typ	0.4 A
	10800 W	4.8 W
Minimum current	0A	0A
Input voltage	Three-phase 180-528 VAC	
Size (mm)	255×145×460 (W×H×D excluding the screw terminal blocks +22 mm)	

Continuous max.: **7560-10800 W**

Input voltage: **three-phase 180-528 VAC**

Supports output voltage/output current signal

Output voltage (60%–100%)/output constant current (60%–100%) can be controlled by external voltage input.



Other features

- **Supports CVCC output**
- **Supports three-phase harmonic current regulation (IEC 61000-3-12 compliant)**
- **Supports three-phase 200–480 VAC input**
- **Low-level heat generation by reducing power loss**
  Achieves high efficiency of 94.5% with 480 VAC input, which reduces heat generation. Also helps to cut labor and costs associated with heat management.

* As for the models under development, the specifications and appearance shown here may change without notice.

The Nipron Story, as told by our Chairperson

CO_2 emissions reduction (up to 90% reduction possible.) Meeting the 2030 target. Cutting electricity costs. Recovering investments in 8 years. Driving EV with 100% renewable energy. Creating an effective BCP.

Now it's mid-October 2024 and we are still experiencing extreme weather; midsummer days are continuing with temperatures at around 28°C. I think this clearly indicates that global warming is progressing. In addition, the recent increase in inquiries for our GP (Green Power) business gives me a sense that the global movement toward decarbonization and carbon neutrality is rapidly advancing and is also rapidly spreading in Japan's political and business circles.
Since its founding, Nipron has gained a high reputation as a PSU manufacturer specializing in various switching power supplies, especially for its high reliability and high efficiency technology. For these 20 years or so, we have been boosting our strength in industrial computer power supplies and large capacity (3-20 kW) switching power supplies, and furthermore, have put ultra-high efficiency (90-95%) class products on the market. I believe that our efforts, with a strong awareness of high energy efficiency and improvement of the global environment, will surely be appreciated. Since about 10 years ago, global interest in issues to be addressed—the energy problem and CO_2 reduction efforts as a measure against global warming—has been heightening. With a definitive idea that Nipron should promote the spread and commercialization of photovoltaic power generation as a renewable energy source, we have been engaged earnestly in the Green Power (photovoltaic power generation) business by positioning it as a major business next to the switching power supply business. Against this backdrop, Nipron, as a company that is committed to becoming carbon neutral, will continue to work on improving the global environment as well, with a keen awareness of the SDGs. Aligning with the national goal of a 46% reduction (compared to FY 2013) in greenhouse gas emissions by FY 2030, Nipron has also begun working on concrete measures toward its carbon-neutral goal of a 70% reduction (compared to FY 2017) by FY 2030. An actual example is the construction of a PV Oasis Power Storage System (exclusively for in-house power consumption) and charging system capable of simultaneously charging six EVs with renewable energy at the Mie Factory. Following the Mie Factory, we plan to build the same system at our head office (Hanshin Factory).

Some might ask why we are willing to make such a large investment. Our Mie Smart Factory's grid electricity bill is 800,000 to one million yen per month, amounting to about 10 million yen per year. However, since the use of the PV Oasis system can improve the self-sufficiency rate of renewable energy power and significantly reduce the cost for the purchase of electricity, the investment is expected to be recovered in about eight years. The PV Oasis system brings the advantages of reducing manufacturing costs, enabling in-house production of renewable energy, and serving as an emergency power source as a BCP measure in

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