

Nipron Wave

Vol.81



Highlights

- 1 Mie Smart Factory: actual power generation of wall-mounted panels**
Power generation performance of the wall-mounted panels expanded in September 2025
- 2 High-capacity rectifier with 400 VDC output**
High-capacity/high-efficiency rectifier lineup
Output voltage and current can be controlled by external voltage input

An essential item for PV power generation, PV Maximizer



Maximize power generation efficiency

Support different orientations and directions

Support mixed use of different manufacturers

Match PCS voltage

Maximize power generation efficiency

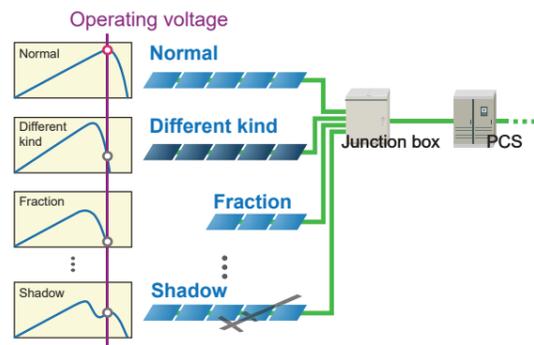
In power conditioners that perform centralized control, power generation is managed based on the overall average. As a result, it is not possible to optimize each string individually, which leads to power generation losses when strings have different characteristics. The PV Maximizer, however, controls power on a per-string basis, enabling maximum power generation even when different characteristics are present.

PV Maximizer controls solar power generation on a per-string basis

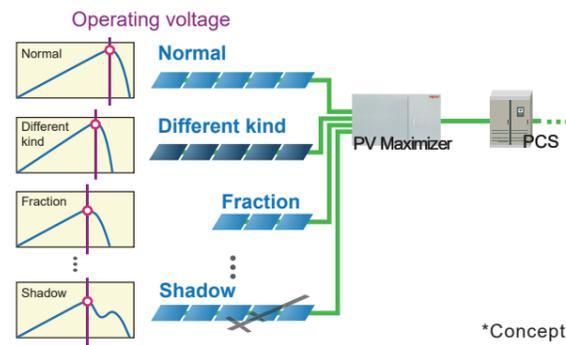
When a solar module malfunctions, its power generation characteristics change. If the issue is not addressed, the overall output decreases. Frequent replacement of faulty modules leads to costly and time-consuming construction work. Another option is to remove the faulty module, but this creates a voltage imbalance with the other strings and prevents sufficient power extraction.

The PV Maximizer controls power on a per-string basis. This allows it to compensate for the voltage shortfall when a module malfunctions and enables continued operation, even with incomplete strings.

Power conditioner Batch control



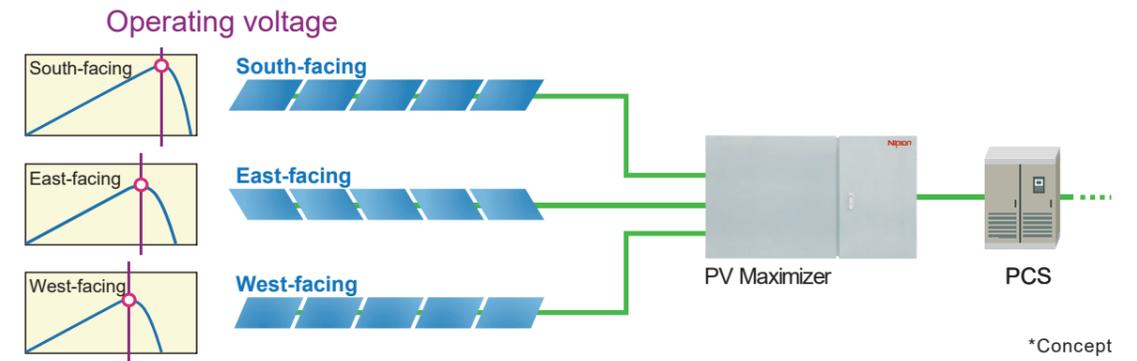
PV Maximizer Individual control



*Concept

Support different orientations and directions

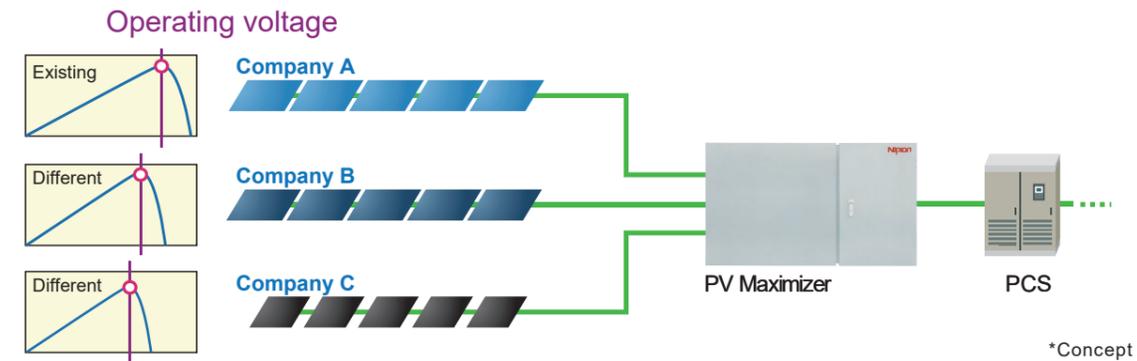
Even when the tilt angle or orientation of solar panels varies from string to string, installing a PV Maximizer enables optimal voltage control. This is particularly effective when panels are installed in different locations such as rooftops, walls, or parking areas.



*Concept

Support mixed use of different manufacturers

Even if there are voltage differences between strings, installing a PV Maximizer boosts each string to a preset voltage. This allows the connection of mixed panels, such as panels from different manufacturers. In addition, after around ten years of operation, replacing solar panels may be considered. With the PV Maximizer, old and new panels can be used together.

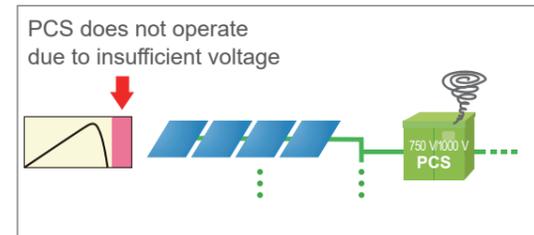


*Concept

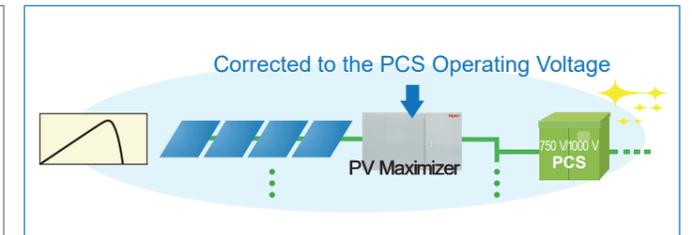
Match PCS voltage

The PV Maximizer boosts voltage to a preset level. In recent years, various types of solar panels have been developed, some with lower output voltages that may not match the input requirements of existing power conditioners (PCS). Installing the PV Maximizer boosts the voltage to fall within the PCS input voltage range. The PV Maximizer is also effective in systems with a small number of panels.

Without PV Maximizer



With PV Maximizer



*Concept

Mie Smart Factory Expanded wall-mounted panels



Expanded wall-mounted solar panels

At the Mie Smart Factory, decreased solar irradiance during the winter resulted in lower self-sufficiency rates for renewable energy. To address this issue and improve self-sufficiency rates further, additional solar panels were installed on the east, west, and south exterior walls of the building.

East-facing wall

Increased power generation from early morning



West-facing wall

Increased power generation in the evening



South-facing wall

Increased power generation during the day



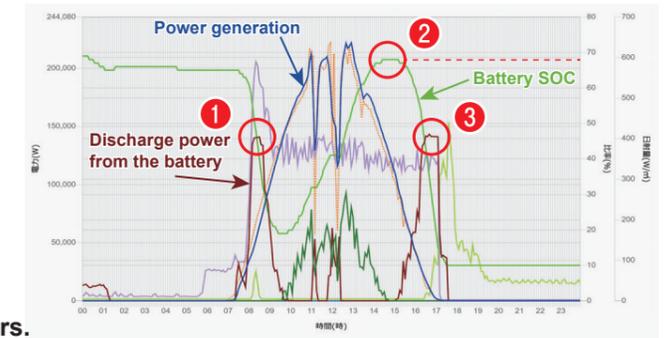
Specifications of the additional solar panels

East-facing capacity	33.32 kW
West-facing capacity	33.32 kW
South-facing capacity	33.32 kW
Total capacity	99.96 kW

Example of insufficient winter power generation before solar panel expansion

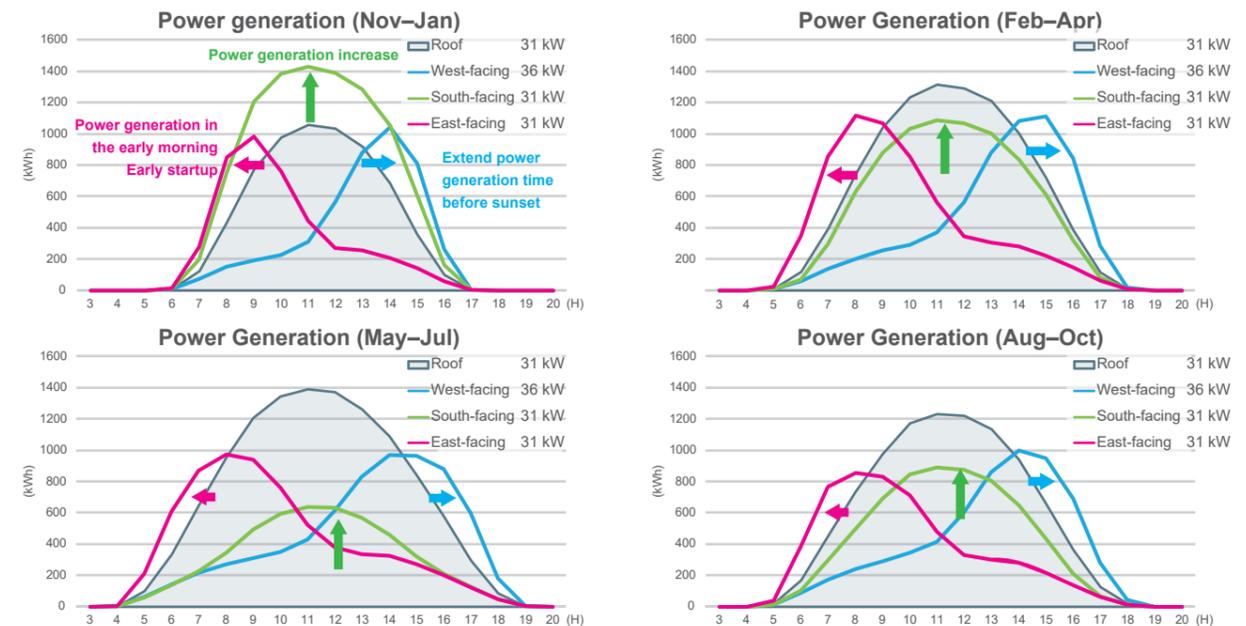
Issues

- 1 Slow generation startup in the early morning, resulting in significant battery discharge.
- 2 Insufficient power generation during the day limits the battery SOC to around 70%.
- 3 Short daylight hours cause the system to begin discharging around 3:00 p.m. during operating hours.



Mie Smart Factory wall power generation simulation by orientation and season

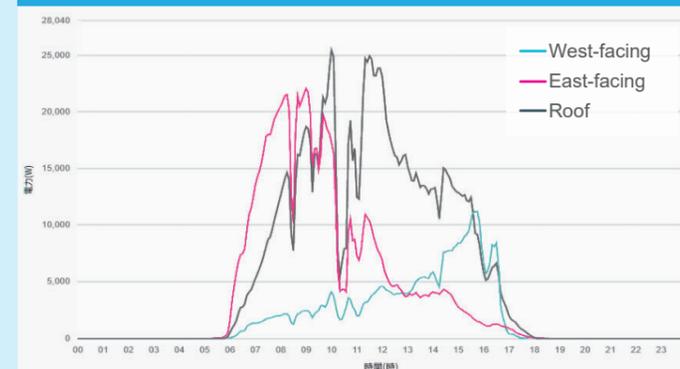
The simulation results confirmed that, even compared with solar panels on the rooftop, each wall surface can provide sufficient power generation during the winter season.



Confirmed actual power generation close to the simulation

The PV Maximizers generated more power in the morning on the east side and in the late afternoon on the west side. Overall, the actual generation closely matched the simulation results.

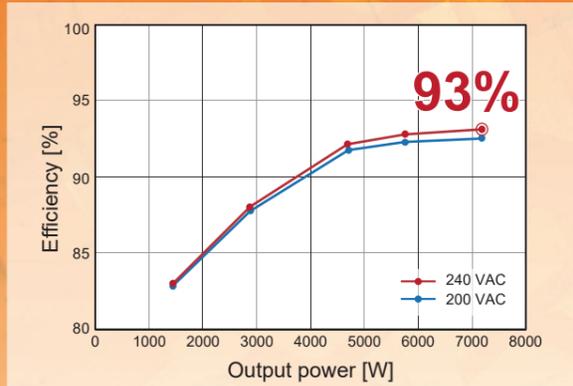
Power Generation Results on September 10, 2025



High-capacity rectifier with 400 VDC output

GP1UT-6000-400-TES

Rated output: 7200 W typ./6600 W min.



Item	Specification	
Output voltage	400 VDC	+12 VSB
Adjustable output voltage range	240-400 VDC	-
Rated current/power At constant voltage operation	16.5 A	0.4 A
	6600 W	4.8 W
Rated current/power At constant current operation	18 A typ.	0.4 A
	7200 W typ.	4.8 W
Input voltage	3φ3W 170-264 VAC	
Size (mm)	444×43×500 (W×H×D excluding the screw terminal blocks +22 mm)	

Features

- Clears VCCI Class A for conducted emissions
- Supports CVCC (Constant Voltage/Constant Current) output
- Support harmonic current regulation (IEC61000-3-12 compliant)
- Output voltage (60%–100%)/output constant current (60%–100%) can be controlled by external voltage input.
- 1U size slim design
1U size with 43 mm height enables rack mounting.

Control unit for GP1UT



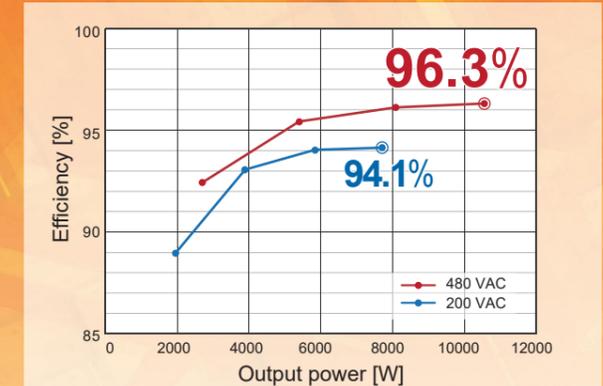
RCU-3PL

Control unit for the rectifier (GP1UT-6000-400-TES)

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

GP6UT-10K-400-PES

Rated output: (3φ3W 340-528 VAC) 10800 W typ./9600 W min.



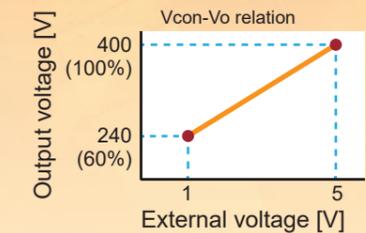
Item	Specification	
Output voltage	400 VDC	+12 VSB
Adjustable output voltage range	240-400 VDC	-
At constant voltage operation	Rated current/power (3φ3W 180-320 VAC)	17.7 A / 7080 W
	Rated current/power (3φ3W 320 ¹ -528 VAC)	24 A / 9600 W
At constant current operation	Rated current/power (3φ3W 180-320 VAC)	19.5 A typ. / 7800 W typ.
	Rated current/power (3φ3W 320 ¹ -528 VAC)	27 A typ. / 10800 W typ.
Input voltage ²	3φ3W 180-528 VAC	
Size (mm)	255×146×460 (W×H×D Except for protrusions)	

¹ Derating required

² For inputs exceeding 264 VAC, use a star connection and ground the neutral point. Refer to the specifications for further details.

Features

- Supports CVCC (Constant Voltage/Constant Current) output
- Support harmonic current regulation (IEC61000-3-12 compliant)
- Supports output voltage/output current signal
Output voltage (60%–100%)/output constant current (60%–100%) can be controlled by external voltage input. This enables flexible power control and allows the power supply to meet various control requirements and equipment environments.



Constant voltage/constant current are controlled by the voltage input to connector [CTRL IN1].

Rack type

Internal View



RFRO-400V-R60 (outdoor)

700×2008×800 mm
(W×H×D Except for protrusions)

30 kW type: RFRO-400V-R30

Rated output power	340 VDC
Adjustable output voltage range	240-400 VDC
Max. output current/power	88.2 A/30 kW
Rated input voltage	3φ3W 200-240 VAC

45 kW type: RFRO-400V-R45

Rated output power	340 VDC
Adjustable output voltage range	240-400 VDC
Max. output current/power	132.3 A/45 kW
Rated input voltage	3φ3W 200-240 VAC

60 kW type: RFRO-400V-R60

Rated output power	340 VDC
Adjustable output voltage range	240-400 VDC
Max. output current/power	176.4 A/60 kW
Rated input voltage	3φ3W 200-240 VAC

Rack type

Internal View



RFRO-400V-R100 (outdoor)

800×2008×800 mm
(W×H×D Except for protrusions)

100 W type: RFRO-400V-R100

Item	Specification
Output voltage	400 VDC
Adjustable output voltage range	240-400 VDC
Rated current/power (3φ3W 180-320 VAC)	175.5 A
	70200 W
Rated current/power (3φ3W 340-528 VAC)	243 A
	97200 W
Rated input voltage*	3φ3W 200-480 VAC

* For inputs exceeding 264 VAC, use a star connection and ground the neutral point. Refer to the specifications for further details.

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

Invitation to Exhibition

We will be exhibiting at the 13th Int'l Photovoltaic Power Generation Expo.

13th Int'l Photovoltaic Power Generation Expo

Period: Wednesday, November 19 – Friday, November 21, 2025
Venue: INTEX Osaka, Hall 6, Zone D, Booth No. SD1-5

We will be exhibiting at the 13th Int'l Photovoltaic Power Generation Expo, held at INTEX Osaka from November 19-21.

This exhibition is Japan's largest event dedicated to achieving carbon neutrality.

At the Nipron booth, our main display will feature our space-saving multi-EV charging system. A charging stand will be installed to help

visitors visualize real-world usage scenarios. In addition, we will showcase our self-consumption renewable energy storage system, PV Oasis, along with its demand-control functionality, and our PV Maximizer (including the repowering model). We will also present achievements from the Mie Smart Factory, using videos and actual equipment.

This year, we will again highlight products and solutions that address social challenges, such as EV deployment, the energy crisis, and BCP measures.



Simple PV Maximizer for repowering



Rectifier rack compatible with 400 VDC output



Space-saving multi-EV charging system

Invitation to Exhibition

21st Int'l Photovoltaic Power Generation Expo



We exhibited at the 21st Int'l Photovoltaic Power Generation Expo, held at Makuhari Messe from September 17 to 19, 2025. We were pleased to welcome many visitors from businesses and local governments.

Throughout the exhibition, we exchanged opinions with many attendees facing challenges such as decarbonization, energy self-sufficiency, and BCP measures. These interactions allowed us to effectively communicate the value of Nipron's solutions. We sincerely thank everyone who visited our booth.



**The Nipron Story,
as told by our Chairperson**

Nipron's green power solutions contributing to carbon-neutral policies!

Multi-EV charging system, PV Oasis, and PV Maximizer

On October 15, 2025, we will hold the 2nd Carbon Neutral Fair at our Head Office and factory, following last year when it was held at the Mie Smart Factory. This year's fair features demonstrations of products that have evolved beyond last year's models, along with explanations of further achievements and effects a year after the last fair.

The carbon neutral policy is an initiative declared by the Japanese government aiming to achieve net-zero greenhouse gas emissions by balancing emissions and removals by 2050, with an interim target of reducing emissions by 46% compared to fiscal 2013 levels by 2030. To meet these targets, companies in the industrial sector have made decarbonization pledges, each setting their own targets. Nipron also upholds the concepts of SDGs and ESG because it is only natural for us as a Japanese and a global enterprise. Positioning the carbon neutral policy as our fundamental management philosophy, we are committed to attaining net-zero emissions.

Our Green Power business (GP business) has been building a track record by widely selling PV Maximizer (a power supply that maximizes photovoltaic (PV) power output) for over a decade. Thereafter, we have delivered various products and systems featuring PV power generation and storage systems to numerous power plants in Japan. Alongside this, we are advancing the standardization of related products. Anticipating the arrival of an era of pressing need for decarbonization, we are standardizing products "to achieve lower cost, shorter production lead time, and faster delivery" as our motto. Furthermore, our product development concept is firmly rooted in the commitment to utilizing 100% renewable energy (PV power generation).

As part of our efforts to be carbon neutral, we have set a decarbonization target to reduce CO₂ emissions by 70% by fiscal 2030 from fiscal 2017 levels (on the basis of electricity consumption at all business sites) and are currently working on it. To achieve this target, we will lay out the rooftops of our

Setsuo Sakai
October 2025



Multi-EV charging system



PV Oasis



PV Maximizer



Mie Smart Factory

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