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Nipron

Nipron Wave

Special Edition 2011 Spring

Nipron Co.,Ltd.

Nipron Guard www.nipron.co.jp

Brand new 600W model in single output power supply GPSA series!

Series: GPSA-600-24P-TP

Continuous 600W
Peak 1440W

Continuous 600W brand new model is here in single output power supply GPSA series equipped with high cost performance and multiple functions. Needless to say about high peak load response and 12V equipped with standby, it has brought more powerful functions such as low standby power support, triple units in parallel operation, etc. in comparison with existing models.

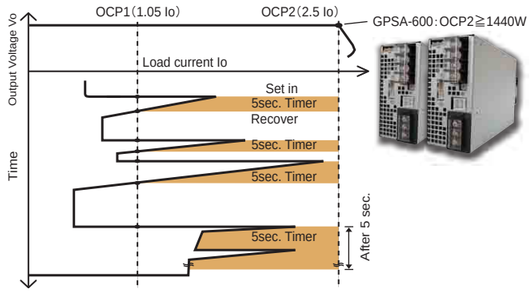
Feature1 High peak power

Peak power gives 240% of rated power for 5 seconds, and more at AC200V input.

Rating	Peak Max
600W	1200W (AC100V)
	1440W (AC200V)

GPSA series has two sets of over current protection (OCP1, OCP2) best for motor rating

GPSA has two sets of over current protection of 5 sec. timer shutdown and hold down, best for induction motor load.



If the output current exceeds OCP2, the output voltage will start to go down and then shut off, provided such condition continues more than 300ms.
If the output current exceeds OCP1, the 5 sec. timer will set in and then reset if the load current decrease less than OCP1 within 5 second. If not, the output power will shut off.
In order to reset the power supply after being shut off, remove AC power for 10 second and turn on again. Any factor that causes over current conditions more than 5 sec. must be fixed.
In case of a repetitive pulse load within OCP2 point, the actual output current calculated by root-mean-square value shall be less than 100% of the rated current.
The GPSA series, however, has a safety design feature such as internal over heat protection that prevents its damage from a miss use due to over powered pulse loads.

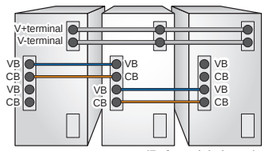
Feature2 Silence

GPSA series controls fan speed by temperature detection inside the power supply. Thus, the fan speed slows at light load inviting silence.

Feature3 3 units in parallel operation

In case of power shortage, output power can be increased with units in parallel connection. output voltage and current of each unit come to be balanced to deliver stable power by connecting output balancing signal (VB) and output current balancing signal (CB).

Output current at parallel operation must be “rated current times CHs connected times 90% of each output CH” or less.



(Referential picture)

Feature4 Complying with ErP directive

Contribute to reduction of CO_2 emission and saving electric bills by control standby power 1W max.

What’s ErP directive?

This is one of environmental standards on products that EU is expanding. Once it used to be called EuP directive, now the title has been changed to ErP directive. Intend to assigned class such as household electrical appliance and office electrical equipment. There are some requirements such as environmental design,and affix CE mark. Issued on Jan 7th, 2010.

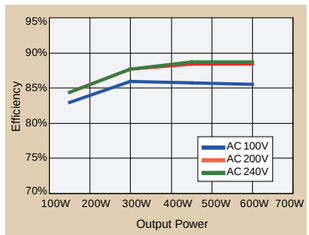
Power consumption at "Off Mode"
Over 1.00W (0.50W)* power consumption of equipments at off mode is prohibited.

Power consumption at "Standby Mode"
Over 1.00W (0.50W)* power consumption of equipments that only input reactivate function, or input reactivate function, only indicate reactivate functions available at standby mode is prohibited.
*Inside of ( ) is effective from Jan 17th, 2013.
*Built-in types are excepted for ErP directive.

Feature5 High efficiency

High efficiency 88.8% even with at 240VAC input and rated load. This is the power supply fitting with the times which can reduce CO_2 emission and save energy.

	Load factor 50% (Output 300W)	Load factor 100% (Output 600W)
AC100V	85.9%	85.5%
AC200V	87.7%	88.4%
AC240V	87.7%	88.8%

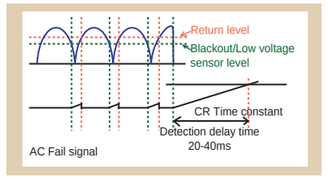


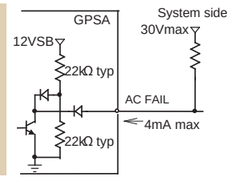
Feature6 Power failure sensor /Back-up operation during blackout

Blackout detection signal

GPSA-600 series is equipped with blackout detection signal. Cost to produce detection unit can be eliminated.

Signal	Detection level	Detection delay time	Output
Blackout detection signal	AC 80V or less	20 to 40ms	Open collector





Blackout detection signal equipped /Backup operation during blackout available

Battery backup operation during blackout is possible with the battery pack (BS14*-H24/2.5L) connected.

- Switches from AC operation to DC battery operation without instantaneous stop.
- Max. cont. output 170W, Peak output 240W (within 10s)
- Parallel battery backup operation is possible with current balance circuit equipped.
- Battery low signal equipped.
- Battery discharge will be stop by the timer stop with DIP switch or input of remote signal to GPSA.
- Automatic shut down can be done with NSP Pro2. (Harness is optional)

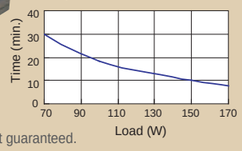
Battery pack (Ni-HM battery) [BS14*-H24/2.5L]

Automatic shut down possible by NSP Pro2 (Software)

LED lighting pattern changes when the BATT is charging or discharging.
Settable discharge stop time with DIP switch.
Setting available time
[BS14A-H24/2.5L]: 1min./5min./10min./15min./20min./25min./30min./35min.
[BS14P-H24/2.5L]: 5sec./10sec./30sec./1min./2min./3min./5min./10min.

Battery package

Model: BS14A-H24/2.5L
Battery: Ni-MH battery
Output: 24V 170W
(Peak 240W 10s max.)
Backup time: See the graph on the right



* Backup time is just a guideline at first use, not guaranteed.

Feature7 12V standby output 0.5A equipped

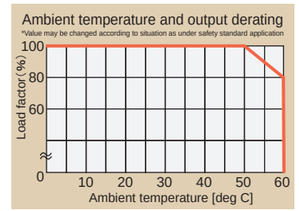
This standby 12VSB supplies 0.3A.
For example, we have track record such as 24V for motor drive and 12VSB as power supply used for interface of LAN and USB for finance terminal equipments.

12V standby output
+12VSB(Auxiliary power supply)
0.5A

*1 0.3A max at backup operation

Feature8 100% load factor with ambient temperature of 50 deg C

As this unit works at ambient temperature of 50 deg C with 100% load factor, high power feeding is available even at high temperature environment.



Model	Output voltage	Continuous	Peak (5s) AC100V	Peak (5s) AC200V
GPSA-600-24P	+24V	25A 600W	50A 1200W	60A 1440W
GPSA-600-48P	+48V	12.5A 600W	25A 1200W	30A 1440W
Common spec	Common spec	0.5A 6W (At backup operation 0.3A 3.6W)		

Other features

Variable resistor for output voltage

Operation stability of the system will be improved by line drop correction.

Remote ON/OFF function equipped

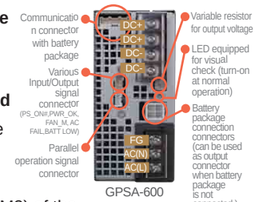
Output ON/OFF control is also available by Remote ON/OFF signal PS_ON.

Fan monitor signal equipped

Fan monitoring signals (FAN_M1,FAN_M2) of the two fans installed are available.Those signals allow you to monitor fan speed.

PWR_OK signal equipped

"H"signal is delivered when the output is normal.

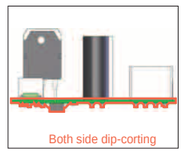


Application example

As with GPSA-360/750, Both side dip-coating available

- PCB coating (whole-dip coating)
- Protection of discrete components such as diodes against dusts by tubing

have been implemented.
Here's the solution! By whole-dip coating, as even double brushing cannot cover all area. It has brought continuous stable operation even under harsh neutral salt spray test!
(Brush-coating proved poor operation to stop in several minutes.)


Both side dip-corting


Referential picture


Under harsh neutral salt spray test (GPSA-750)

SEMI F47 standard compliant

Compliant to the regulation for supply voltage drop prescribed in SEMI standard.（Optional. Please contact us.）

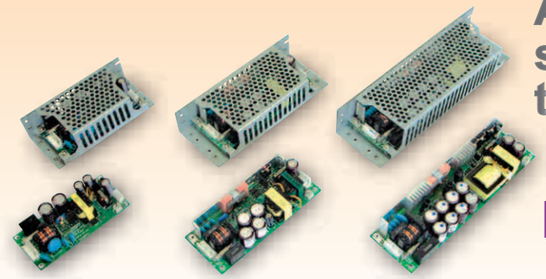
Specifications

Model	Series name	GPSA-360			NEW GPSA-600			GPSA-750		
(Series name) -		Continuous	Peak (5s) AC100V	Peak (5s) AC200V	Continuous	Peak (5s) AC100V	Peak (5s) AC200V	Continuous	Peak (5s) AC100V	Peak (5s) AC200V
12	+12V	30A 360W	40A 480W	40A 480W	--- ---	--- ---	--- ---	56A 672W	70A 840W	80A 960W
12P	+12V	--- ---	--- ---	--- ---	50A 600W	80A 960W	100A 1200W	--- ---	--- ---	--- ---
24	+24V	15A 360W	20.8A 499.2W	25A 600W	--- ---	--- ---	--- ---	30A 720W	37.5A 900W	50A 1200W
24P	+24V	Under design reviewing to increase the power up to 500W			25A 600W	50A 1200W	60A 1440W	Under re-designing to increase the power up to 1000W		
36P	+36V				16.6A 600W	33.3A 1200W	40A 1440W			
48P	+48V				12.5A 600W	25A 1200W	30A 1440W			
Common spec	+12VSB	0.3A 3.6W			0.5A 6W (At backup operation 0.3A 3.6W)			0.3A 3.6W		
Size (W×H×D mm)		41×128×230 (Exclusive fan guard (+5mm), exclusive terminal block (+15mm))			61×128×240 (Exclusive fan guard (+5mm), exclusive terminal block (+15mm))			82×128×235 (Exclusive fan guard (+5mm), exclusive terminal block (+20mm))		

* Complying to medical standard "mGPSA series" are available for 12V, 24V output. (mGPSA-150 is scheduled to be acquired.)
* With volume adjusting, 36V output can be used as 30V output power supply, 48V output power supply can be used as 42V power supply.
* Posted under development. Please contact us for more information.

AC-DC
Switching power supply

15W/30W/60W OZ series



AC-DC general purpose switching power supply to reduce electricity and CO_2

Resource saving
Long life
Safety-oriented

Continuous
15W/30W/60W
OZ series

OZ-015 Series　OZ-030 Series　OZ-060 Series

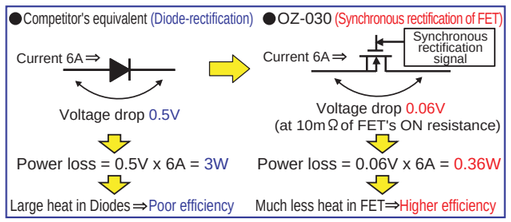
OZ series of general purpose AC/DC sw' power supply has brought higher efficiency compared with competitor's equivalent, resulting in a lot of advantages, such as compact/high power, electricity saving, long lifetime, etc. Besides, OZ series is safety-oriented product with double sided PCBs with through holes no matter how small the power is. Many of competitor's equivalents are single sided PCBs. Double sided PCBs with through holes eliminates solder cracks that is likely to occur in lead-free process so that you can use at ease our products in industrial environment where equipments vibrate.

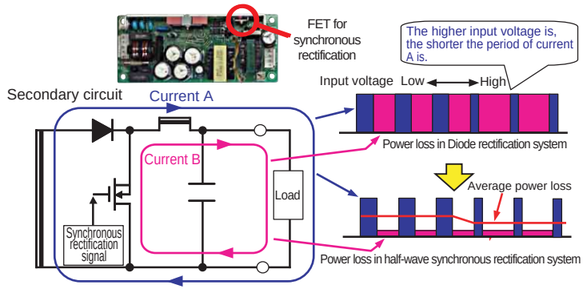
High efficiency

OZ series has realized high efficiency by synchronous rectifying circuit. (Some models are excepted)

●Synchronous rectification ⇒ High efficiency

Ex. OZ-030-5





* Synchronous rectification only when current B flows
⇒The higher input voltage is, the higher the efficiency is !

OZ-015/060 series can achieve one rank higher power compared with the competitor's equivalents in terms of form factor (bottom) size. Also, OZ-015 is smaller compared with the competitor's equivalents in term of output power.

Comparing with the same size (bottom) of the competitor's... ⇒ Higher power!

Comparing with the same power of the competitor's... ⇒ Smaller!

Comparison of Electrical bill and CO_2 emission

Electrical bill and CO_2 emission can be reduced with high efficiency OZ series installed. Designers at customers work hard every year to achieve CO_2 reduction target of ISO14000 (environment) for certificate renewal. End users are happy with Nipron power supplies because they can reduce considerable amount of CO_2 and electricity cost in a year even by 5% efficiency improvement.

OZ-030-5 vs. Competitor's equiv. efficiency comparison (Actual data)

	Output voltage	Power	Input voltage	Efficiency	Electric bill*
Nipron (OZ-030-5)	5V	30W	AC100V	81.6%	6,441yen
			AC200V	81.4%	6,457yen
Competitor's equiv. (1)	5V	30W	AC100V	77.9%	6,747yen
			AC200V	75.2%	6,989yen
Competitor's equiv. (2)	5V	30W	AC100V	74.1%	7,093yen
			AC200V	76.5%	6,870yen

*At 30W output, continuous 24 hours/day operation 20 yen/kWh conversion

Electric bill and CO_2 emission comparison (at 30W output, continuous 24 hour/day operation)

OZ-030-5 vs. Competitor's equivalent (1)

Annual electrical bill: approx. 306 yen at AC 100V/approx. 532 yen at AC 200V
CO_2 emission: approx. 5.8kg at AC 100V/approx/ 10.1kg at AC 200V !

Z-030-5 vs. Competitor's equivalent (2)

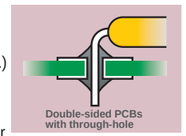
Annual electrical bill: approx. 652 yen at AC 100V/approx. 414 yen at AC 200V
CO_2 emission: approx. 12.3kg at AC 100V/approx/ 7.8kg at AC 200V !

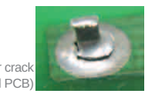
*1 20 yen/kWh conversion　*2 0.378kg CO_2/kWh conversion

Double-sided PCBs with through-hole (safety)

Small power OZ series is also safety-oriented product with double-sided PCBs with through-hole adopted. (Competitor's products adopt mainly single-sided PCBs.)

Solder cracks at high voltage part is likely to invite fire. With double-sided PCBs with through-hole is suitable for industrial use, solder crack problems do not happen even in lead-free process.





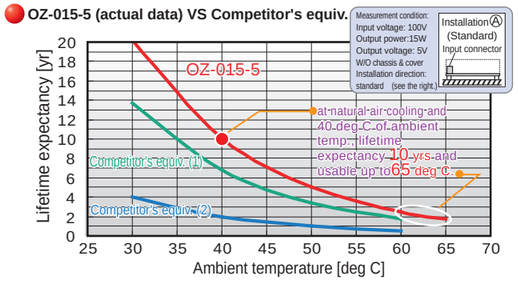
Case of Solder crack (in single-sided PCB)

Long lifetime

OZ series brings long lifetime due to efficiency-oriented design and longer-life electrolytic capacitors.
Also, OZ-015 & 030 series covers the operating temperature up to 65 deg C.
Following shows an example in comparison with competitor's equivalent.

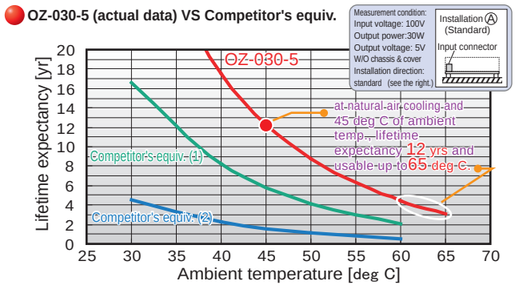
Lifetime expectancy comparison

OZ-015-5 (actual data) VS Competitor's equiv.



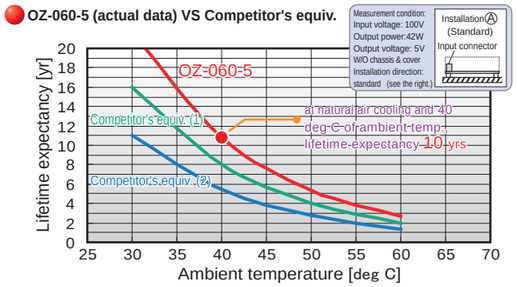
Note 1: Lifetime expectancy of competitor's (1) and (2) is calculated from their open data on the WEB.
Note 2: The lifetime expectancy is calculated with the constant 15 W load. (In actual use, load derating is required at high temp.)
Note 3: The lifetime expectancy is theoretical result, and it shall be 15 years max. when the material deterioration of the sealing part of electrolytic capacitors are taken into account.

OZ-030-5 (actual data) VS Competitor's equiv.



Note 1: Lifetime expectancy of competitor's (1) and (2) is calculated from their open data on the WEB.
Note 2: The lifetime expectancy is calculated with the constant 30W load. (In actual use, load derating is required at high temp.)
Note 3: The lifetime expectancy is theoretical result, and it shall be 15 years max. when the material deterioration of the sealing part of electrolytic capacitors are taken into account.

OZ-060-5 (actual data) VS Competitor's equiv.

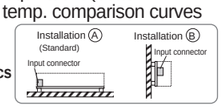


Note 1: Lifetime expectancy of competitor's (1) and (2) is calculated from their open data on the WEB.
Note 2: The lifetime expectancy is calculated with the constant 42W load. (In actual use, load derating is required at high temp.)
Note 3: Lifetime expectancy of competitor's (1) and (2) is calculated with constant 42W (70% load of OZ-060-5) because they cannot output 60W (constant output of OZ-060-5).
Note 4: The lifetime expectancy is theoretical result, and it shall be 15 years max. when the material deterioration of the sealing part of electrolytic capacitors are taken into account.

Nipron contributes to global environment improvement by industrial waste reduction driven by long life design policy (10 years and beyond).

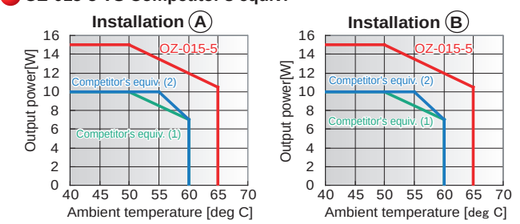
Excellent Output power v.s. Ambient temp. characteristics

OZ series performs excellent output characteristics even at high temperature compared with competitor's equivalent (bottom installation). The output power - ambient temp. comparison curves of single open frame are shown below.

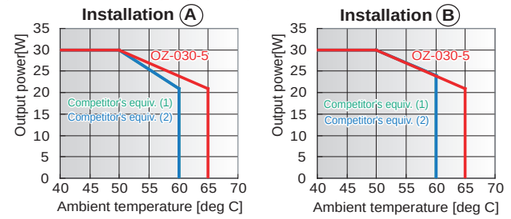


Output power - Ambient temp. characteristics

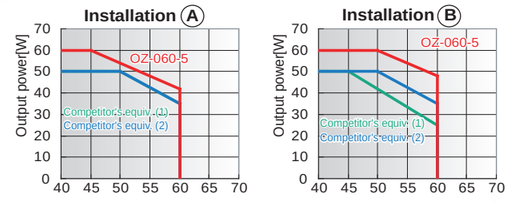
OZ-015-5 VS Competitor's equiv.



OZ-030-5 VS Competitor's equiv.



OZ-060-5 VS Competitor's equiv.



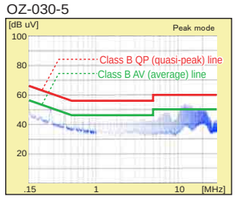
*1 OZ series has advantage in characteristics for other installation directions over competitor's.
*2 The above characteristics is given to 5V output type, but other outputs have the same advantage as well.

Low noise

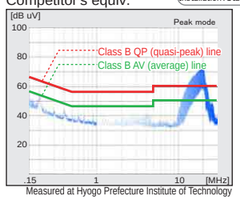
OZ series, even single unit itself, meets VCCI Class B (conducted emission/radiant noise). Applying external noise filter is not necessary.

Input voltage: 100V
Output power: 30W
Output voltage: 5V
W/O chassis&cover
Installation: Standard

OZ-030-5



Competitor's equiv.



Measured at Hyogo Prefecture Institute of Technology

Products line-up

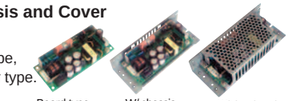
Model name	Series name -	3R3	5	12	15	24
Series name	Output voltage	+3.3V	+5V	+12V	+15V	+24V
OZ-015	Output current	3A	3A	1.3A	1A	0.7A
	Output power	9.9W	15W	15.6W	15W	16.8W
	Dimension (W x H x D)	50 x 28 x 105 (Board type)/57 x 35 x 125 (W/ chassis)/57 x 36 x 125 (W/ chassis and cover)				
	Input/Output terminal	Nylon connector				
OZ-030	Output current	6A	6A	2.5A	2A	1.3A
	Output power	19.8W	30W	30W	30W	31.2W
	Dimension (W x H x D)	55 x 28 x 133 (Board type)/65 x 35 x 163 (W/ chassis)/65 x 36 x 163 (W/ chassis and cover)				
	Input/Output terminal	Nylon connector				
OZ-060	Output current	12A	12A	5A	4A	2.5A
	Output power	39.6W	60W	60W	60W	60W
	Dimension (W x H x D)	55 x 32 x 195 (Board type)/65 x 41 x 225 (W/ chassis)/65 x 42 x 225 (W/ chassis and cover)				
	Input/Output terminal	Nylon connector or European terminal				
Common	Input voltage	AC85~264V (Worldwide input, PFC equipped)				

Two types of input / output terminals available

For OZ-060, European terminals as well as nylon connector for input/output terminal are available.

Choice from Chassis and Cover

Line up of 3 types, board type, with chassis type, and with chassis and cover type.

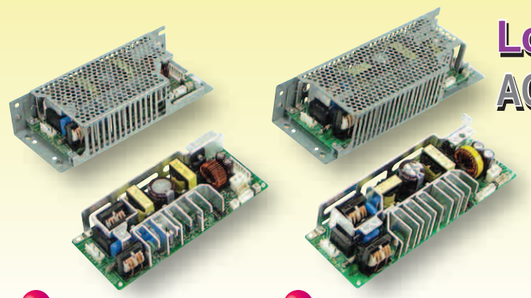


Variable resistor for output voltage equipped as standard

Operation stability of the system will be improved by line drop correction.
(Adjust range: ±10%)

AC-DC
Switching power supply

120W/170W OZP series



OZP-120 series

OZP-170 series

Long life, Low noise
AC-DC general-purpose power supply

Continuous 120W (Peak 216W max.)
Continuous 170W (Peak 300W max.)

OZP series

"Friendly to global environment" & "Quality product with lower price" as motto of Nipron's design policy brings energy saving (high efficiency) and resource saving (long life more than 10 years.) In OZP series, synchronous rectification and innovative circuits contribute to higher efficiency bringing in lower temp. rise and longer life with long-life electrolytic capacitors (105 deg C10000H.) Furthermore, VCCI Class B (Conducted emission/Radiation) easily passes without external noise filters. Excellent low noise power supply with the voices "No need of external noise filters!" from customers.

New **Low-cost type power supply with condensed function**

Model name: OZP-120-**-J0L OZP-170-**-J0L

New ! Low-cost type with condensed function by removing some functions. Please refer to bottom side of P6.

Long life (3 times longer than Competitor's)

In OZP series, synchronous rectification and innovative circuits contribute to higher efficiency bringing in lower temp. rise and longer life with long-life electrolytic capacitors (105 deg C 10000H.)
This is 3 times longer than competitor's ! (With condition written below, in house measurement)

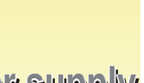
Nipron achieves higher efficiency with long-life design (10 years min) and contributes to improvement of the global environment by reduction of industrial wastes.

Life expectancy comparison

OZP-170 VS Competitor's equivalent (actual data)

Measurement condition
Input voltage: 100V
Output power: 150W
Output voltage: 12V
Installation direction: laterally-facing
W/O Chassis,Cover
(See the right pic.)

Direction Ⓒ



Note 1: The life expectancy is calculated based on our standard.
Note 2: The life expectancy is based on continuous load of 150W. (In practice, load derating is required at high temperature.)
Note 3: The life expectancy is a lifetime in calculation. It shall be 15 years at the longest when degradation of materials used for opening of electrolytic capacitors is taken into consideration.

High efficiency

OZP-170-12/15 VS Competitor's equivalent

	Output voltage	Output power	Input voltage	Efficiency(*1)	Electricity expense (year)(*2)
Nipron (OZP-170-12/15)	12V	150W	AC100V	82.9%	31,701yen
			AC200V	85.9%	30,594yen
Competitor's equivalent	12V	150W	AC100V	80.0%	32,850yen
			AC200V	83.3%	31,549yen

*1 Efficiency of competitor's equivalent is calculated from the data on their website.
*2 150W output, 24-hour continuous running, 20yen /kWh conversion

Comparison of Electric Bills & CO_2 emission (24-hour continuous running)

Reduction! in a year: Electric bill approx.1,149yen(at AC100V) / approx. 955yen(at AC200V)
CO_2 emission approx. 21.7kg(at AC100V) / approx.18kg(at AC200V) !

*1 20yen/kWh conversion *2 0.378kgCO_2/kWh conversion

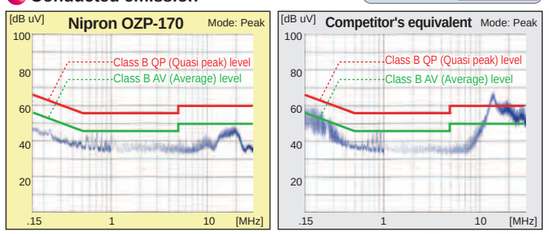
Low Noise

VCCI Class B (Conducted emission/Radiation) easily passes without external noise filters. A big customer who implemented OZP-170 says, "We usually get into trouble with noises in developing systems. It would take us 6 months at a worst case spending valuable times of engineers in vain." "However, thanks to OZP-170-24 and -12 power supply, an immediate effect and time saving was brought to us without external noise filters, resulting in cost saving as well."This encourages us, thank you.
Also, low leak current 0.1mA typ (at AC 100V).

Measurement condition
Input: 200V
Output power: 150W
Output voltage: 12V
W/O Chassis,Cover
Installation direction: Standard
(See the right pic.)

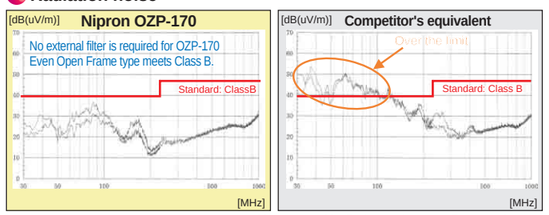
Direction Ⓐ (Standard)

Conducted emission



Measured at Hyogo Prefecture Institute of Technology

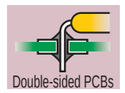
Radiation noise



Measured at Mie Prefecture Industrial Research Institute

Double-sided PCBs with through-hole (Safety)

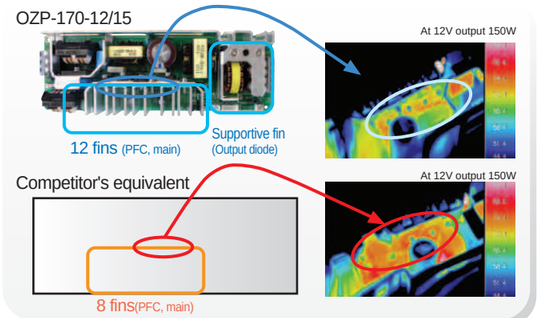
Solder crack at high voltage section is likely to burn. Double-sided PCBs with through-hole is the solution for solder crack in industrial use. Competitor's equivalents are, in many case, single-sided PCBs.



Solder crack
in single-sided PCB

High power output

With improvement of heat radiating structure and heat reduction by high efficiency, OZP series can output high power.

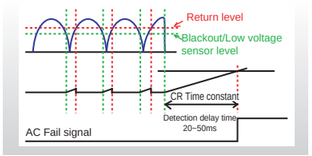


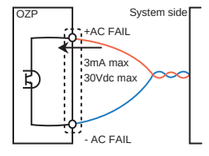
Power failure detection and backup operation

Power failure detection signal

All OZP series is equipped with power failure detection signal as standard, so that customer can save the cost for making detection board. (Except for J0L series)

Signal	Detection level	Detection delay time	Output
Blackout detection signal	AC 80V typ	20~50ms	Open collector





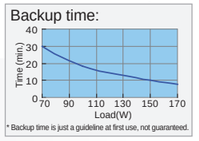
Backup Operation during blackout

Battery backup operation during blackout is possible for 24V output type (OZP-***-24-*B*) with the battery pack (BS14*-H24/2.5L) connected.

- Switches from AC operation to DC battery operation without instantaneous stop.
- Max. continuous output 170W, Peak output 240W (within 10s)
- Parallel battery backup operation is possible with current balance circuit equipped.
- Battery low signal equipped.
- Battery discharge will be stop by the timer stop with DIP switch or input of remote signal to OZP.
- Automatic shut down can be done with NSP Pro 2. (Harness is optional)

Battery pack(Ni-HM battery)
[BS14*-H24/2.5L]

Backup time:



* Backup time is just a guideline at first use, not guaranteed.

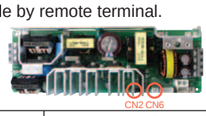
LED lighting pattern changes when the BATT is charging or discharging.

Settable discharge stop time with DIP switch.
■setting available time
[BS14A-H24/2.5L]: 1min./5min./10min./15min./20min./25min./30min./35min.
[BS14P-H24/2.5L]: 5sec./10sec./30sec./1min./2min./3min./5min./10min.

Other features

Output ON/OFF control function

ON/OFF control is available by remote terminal.
(Except for J0L series)



CN6 (RC signal terminal)	Apply voltage externally	Output ON
	Open	Output OFF
CN2 (Shorting plug)	Equipped	Remote signal ineffective (Output by AC apply)
	Removed	Remote signal effective (Output by remote signal CN6)

Variable resistor for output voltage

Operation stability of the system will be improved by line drop correction. 24V output can be boosted up to 29V, and also can be used as charging voltage source for lead battery. (Except for J0L series)

■ Variable range
12/30/48V Output: ±10%
15V Output: -5%,+10%
24V Output: -5%,+20%
36V Output: -10%,+15%

Corresponds to the capacitor package as for instantaneous power failure measure (Optional)

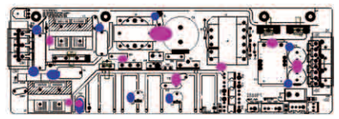
Capacitor package protects the system from instantaneous power failure. (Only for OZP-170 series)

Capacitor Package
(inside picture)
"BS13A-EC400/422F"

Application example

Anti-50G available !

It is a must to buy the power supply that uses double-sided through hole PC board for applications such as medical devises that equip moving arms or vibrators. In addition, large or heavy parts should be reinforced by silicone as anti-shock and vibration.
Nipron has anti-shock and vibration products available, and accepts special treatment.



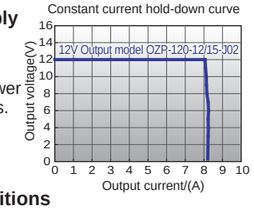
Power supply for MRI,CT

*The actual silicon locations may differ from the picture shown.

Constant current power supply

This is an example in which OZP-120-12/15 has been modified to constant current source used as a power supply for water clarification apparatus. (Constant current hold-down point is settable) Also, can be modified as a charger for Load-acid battery.

Constant current hold-down curve



Operation at -20 deg C conditions

This is an example of OZP series as an outside gate control P/S. Because of outside operations, customer initially asked -20 deg C special design, however, even standard OZP series has met -20 deg C operations. (Power derating required (Load 75%))

Products line-up

Model name	(Series name)-	12/15(Output voltage switching)		24	30/36(Output voltage switching)		48
Series name	Output voltage	+12V	+15V	+24V	+30V	+36V	+48V
OZP-120	Output current/ voltage Natural air cooling	10A	8A	5A	4A	3.4A	2.5A
		120W	120W	120W	120W	122.4W	120W
	Forced air cooling	12.5A	10A	6.3A	5A	4.2A	3.2A
		150W	150W	151.2W	150W	151.2W	153.6W
	Peak (10s)	15A	12A	9A	7.2A	6A	4.5A
		180W	180W	216W	216W	216W	216W
	Dimension(W x H x D)	73 x 35 x 180 (board type)/83 x 43 x 210 (w/ chassis)/83 x 45 x 210 (w/ chassis and cover)					
OZP-170	Output current/ voltage Natural air cooling	14A	11.2A	7A	—	—	—
		168W	168W	168W	—	—	—
	Forced air cooling	17.5A	14A	8.8A	—	—	—
		210W	210W	211.2W	—	—	—
	Peak (10s)	22.5A	18A	12.5A	—	—	—
		270W	270W	300W	—	—	—
	Dimension (W x H x D)	73 x 40 x 220 (board type)/83 x 49 x 252 (w/ chassis)/83 x 51 x 252 (w/ chassis and cover)					
Common	Input voltage	AC85V~264V (Worldwide input, PFC equipped)					
	Input/output terminal	Nylon connector, European terminal, or Block terminal					

Low-cost type power supply with condensed function

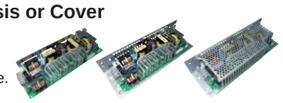
New ! Low-cost type with condensed function by removing functions on right note.
Model name: OZP-120-12-J0L, OZP-120-24-J0L, OZP-170-12-J0L, OZP-170-24-J0L

3 types for input/output terminals

European terminal or block terminal as well as nylon connectors for input/output terminals available.

Selectable Chassis or Cover

Choose from board type, with chassis type, or with chassis and cover type.



Switching Output voltage

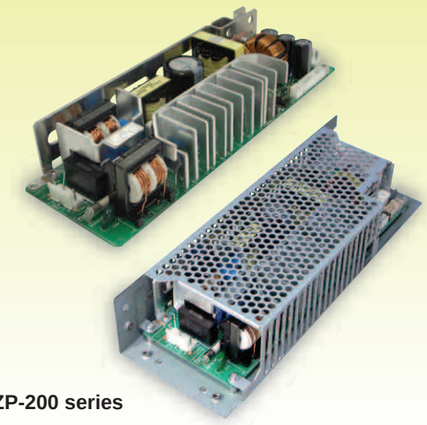
For 12V/15V, 30V/36V type can be switched output voltage by shorting plug.

■Shorting plug(CN9) apply: 12V,30V output remove: 15V,36V output (12V,30V set at the shipment)

- Selectable output voltage
- Remote ON/OFF control
- Power failure sensor
- Power failure back up
- Variable resistor for output voltage

AC-DC
Switching power supply

200W OZP-200 series



OZP-200 series

Focus on Green correspondence

High efficiency, High peak AC-DC switching power supply

Continuous 200W
Peak 300W/400W

OZP-200 series

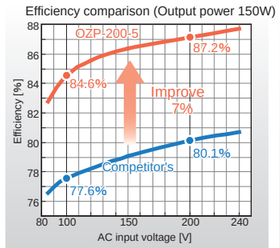
New models in OZP series! Powerfully supports the system with output continuous 200W, peak 300W/400W. Synchronous rectification circuit is equipped(*) and achieves. This type has achieved much higher efficiency than a general switching power supply resulting in reduction of electric bills, reduction of CO2, and long life. Also it brings low temperature rise for whole systems since it generates less heat. (* +3.3, +5V, and +12V output type.)

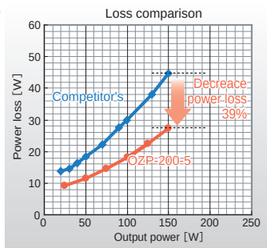
High efficiency 87%

High efficiency 87%* even with low voltage output. Improve 7% than general switching power supply. This is the power supply fitting with the times which can reduce CO_2 emission and save energy. (* At 200VAC input and rated load)

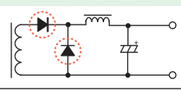
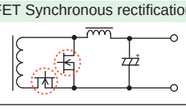
Efficiency comparison

Input Voltage		Nipron OZP-200-5	Competitor's 150W 5V	Difference
AC100V at 150W output	Efficiency	84.6%	77.6%	7.0%
	Input power	177.3W	193.3W	16.0W
AC200V at 150W output	Efficiency	87.2%	80.1%	7.1%
	Input power	172.0W	187.3W	15.3W

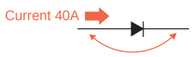




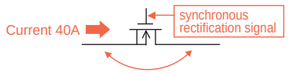
Improve efficiency with Synchronous rectification circuit

Diode Rectification	FET Synchronous rectification
	

If diode drop voltage is 0.5V and FET drop voltage is 0.06V (ON resistance 1.5m ohm) at current 40A;



Drop voltage 0.5V
Power loss=0.5V x 40A=20W
Heat generation: High ··· Low efficiency



Drop voltage 0.06V
(at FET ON resistance 1.5m ohm)
Power loss=0.06V x 40A=2.4W
Heat generation: Very low ... Efficiency UP

Comparison of Electric Bills & CO_2 emission

Conditions: 150W output, 24-hour continuous running for 365 days

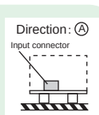
5V PSU 1 unit	Input voltage	Nipron OZP-200-5	Competitor's 150W 5V	Difference
Electric Bills (yen/year) *1	AC100V	31,064 yen	33,866 yen	2,802 yen
	AC200V	30,138 yen	32,809 yen	2,671 yen
CO_2 emission (kg/year) *2	AC100V	587.1kg	640.1kg	53.0kg
	AC200V	569.6kg	620.1kg	50.5kg

Reduction in a year: Electric bills approx. 2,802 yen at 100VAC/2,671 yen at 200VAC, CO_2 emission approx. 53kg at 100VAC/50.5kg at 200VAC. (*1) 20 yen/kWh (*2) 0.378kgCO_2/kWh

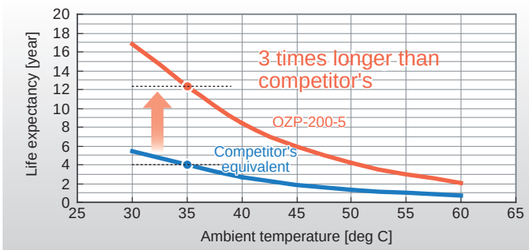
Long life, 3 times longer than Competitor's

Life expectancy min 10 years under conditions of natural air cooling and ambient temperature 30...This is 3 times longer than competitor's! Achieve longer life by thermal averaging design. (Long-life electrolytic capacitors, 10,000H at 105.., are used in weak point section.
(Measured in house with test conditions as above column)

Measurement conditions
Input voltage: 100V
Output power: 150W
W/O Chassis and cover
Installation direction: A
(See the right drawing)



Comparison of Life expactancy



Note 1: Life expectancy of competitor's equivalent is calculated from the data on their Web site.
Note 2: The life expectancy is based on continuous load of 150W. (In practice, load derating is required at high temperature.)
Note 3: The life expectancy is a lifetime in calculation. It shall be 15 years at the longest when degradation of materials used for opening of electrolytic capacitors is taken into account.

Parallel operation available

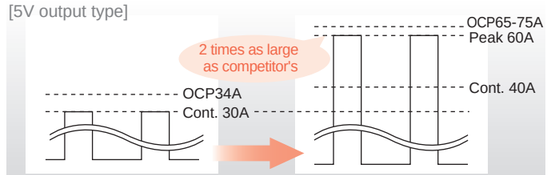
Current balance circuit is equipped and parallel operation is easily possible. (OZP-200-**-*S0) Output voltage volume are also got in balance, so it is OK to set the voltage of either one of the two units. The higher voltage setting will be taken, and the lower setting of the another unit will be boosted to the same value.

High peak power

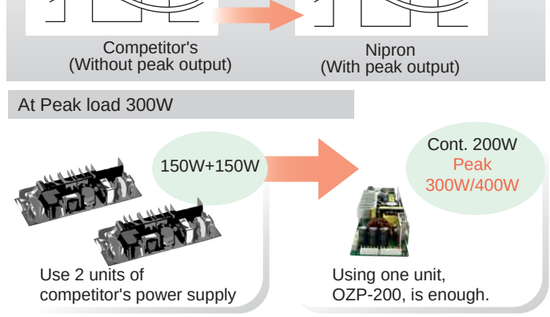
The circuit system regenerating switching surge voltage is adopted. By this circuit, Rebound (flyback) voltage occurred from large current output at secondary side is substantially reduced and surge energy is regenerated into input side.
This model achieves more than 1.3 times as large capacity as competitor's even with same chassis sizes. Also 1.5 to 2 times as large peak output then continuous output is possible. (Output voltage min 12V)

	Competitor	Nipron OZP-200
Cont.	150W	200W
Peak	———	300W(Output type: min 5V)/400W(Output type: min 12V)

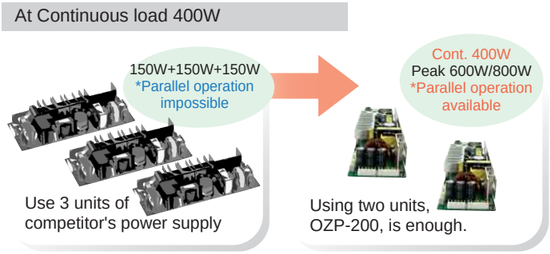
[5V output type]



At Peak load 300W



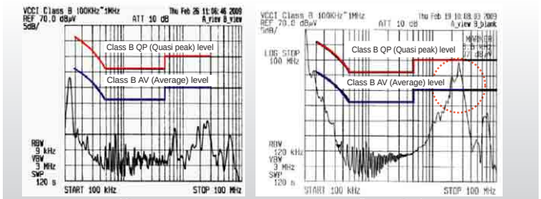
At Continuous load 400W



Cost down and Weight saving

Low noise & Low leakage current

Conducted emission VCCI Class B easily passes without external noise filter. It reflects the cost reduction for preparing the PC board at the user's side. Also leakage current is low 0.06mA at 100VAC and 0.12mA at 200VAC.



Other features

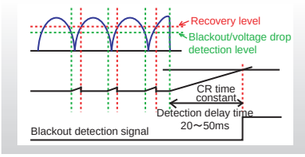
Output voltage remote sensing function

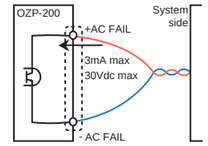
Detects output voltage by connecting the sensing wire to the load end, and compensate for the line drop as occurred by output cable. (+ side line drop)

Blackout detection signal equipped

Blackout detection signal is equipped. Cost to produce detection board can be eliminated.

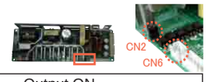
Signal	Detection level	Detection delay time	Output
Blackout detection signal	AC 80V typ	20~50ms	Open collector





Output ON/OFF control function

ON/OFF control is available by remote terminal.



CN6 (RC signal terminal)	Apply voltage externally	Output ON
	Open	Output OFF
CN2 (Shorting plug)	Equipped	Remote signal ineffective (Output by AC apply)
	Removed	Remote signal effective (Output by remote signal CN6)

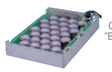
Double-sided PCBs with through-holes

With double-sided PCBs with through-holes suitable to industrial use adopted, solder cracks will be gone even in lead-free process. Also achieves higher efficiency to use epoxy-glass board that is less affected by aging variation.

Solder Crack

Corresponds to the capacitor package as for instantaneous power failure measure

Capacitor package protects the system from instantaneous power failure.



Capacitor Package "BS13A-EC400/422F"

Noise reduction board (Optional)

The noise occurred by plus loads as LED display can be reduced with this board.

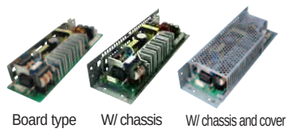
Output voltage settable resistor equipped as standard

Operation stability of the system will be improved by line drop correction. 24V output can be boosted up to 29V, and also can be used as charging voltage source for lead battery.

Product line up

Model name	OZP-200-	3R3	5	12	15	24	36	48
Output voltage		3.3V	+5V	+12V	+15V	+24V	+36V	+48V
Output current/voltage	Natural air cooling	40A	40A	16.7A	13.4A	8.4A	5.6A	4.2A
		132W	200W	200.4W	201W	201.6W	201.6W	201.6W
	Forced air cooling	46A	46A	20A	16A	10A	6.7A	5A
		151.8W	230W	240W	240W	240W	241.2W	240W
	Peak (10s)	60A	60A	33.4A	26.7A	16.7A	11.2A	8.4A
		198W	300W	400.8W	400.5W	400.8W	403.2W	403.2W
Input voltage		AC85~264V (Worldwide input, PFC equipped)						
Size(W x H x D)		73 x 40 x 222(board type)/83 x 49 x 252(w/ chassis)/84 × 51 × 252(w/ chassis and cover)						
Input/output terminal		Nylon connector or Harmonica terminal						

*With volume adjusting, 36V output power supply can be used as 30V power supply.



Board type W/ chassis W/ chassis and cover

Nylon connector Harmonica terminal

AC-DC
Switching power supply

360W/720W GPSA series

Fulfilling power supply with cost performance !
AC-DC General - purpose switching power supply

Continuous max 360W (Peak 600W max.)
Continuous max 720W (Peak 1200W max.)

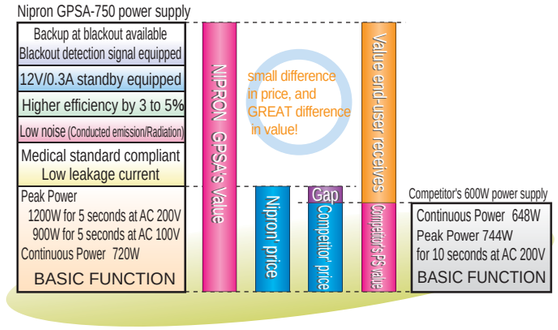
GPSA series

GPSA-360 series　GPSA-750 series

Excellent cost performance, multifunction power supply, GPSA series!

A little price difference gives you great added values, merits to end users by multifunctions which competitors do not have the equivalent types.

Function and Value



① High Peak Power

Peak power gives 1200W for 5 seconds, and more at AC 200V input.

■GPSA-360

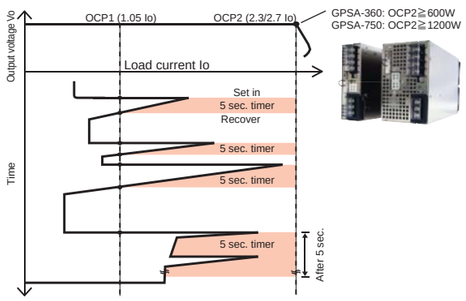
Rating	PeakMax
360W	500W (AC100V)
	600W (AC200V)

■GPSA-750

Rating	PeakMax
720W	900W (AC100V)
	1200W (AC200V)

GPSA series has two sets of over current protection (OCP1, OCP2) best for induction motor load.

GPSA has two sets of over current protection of 5 sec. timer shutdown and hold down, best for induction motor load.



If the output current exceeds OCP2, the output voltage will start to go down and then shut off, provided such condition continues more than 300ms.

If the output current exceeds OCP1, the 5 sec. timer will set in and then reset if the load current decrease less than OCP1 within 5 second. If not, the output power will shut off.

In order to reset the power supply after being shut off, remove AC power for 10 second and turn on again. Any factor that causes over current conditions more than 5 sec. must be fixed.

In case of a repetitive pulse load within OCP2 point, the actual output current calculated by root-mean-square value shall be less than 100% of the rated current.
The GPSA series, however, has a safety design feature such as internal over heat protection that prevents its damage from a miss use due to over powered pulse loads.

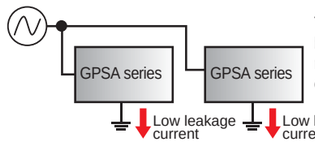
② Low Leakage Current Specification

GPSA series meets the leakage current of less than or equal to 0.5mA at nominal input voltage that Medical standard IEC60601-1 requires. In the case of multiple power supplies connected to one system, total leakage current of the system can be kept low when GPSA series is used. Also, using GPSA series as intermediate bus, low leakage current system can be built with D/C converters after the power supply.

Actual measurement example (actual measurement)

at rated load

Input voltage	GPSA-360-24	GPSA-750-24	Competitor's (600W)
AC100V	0.10mA	0.19mA	0.25mA
AC200V	0.19mA	0.37mA	0.46mA



Total leakage currernt can be kept low even when multiple power supplies are connected to the system.

About Medical Standards

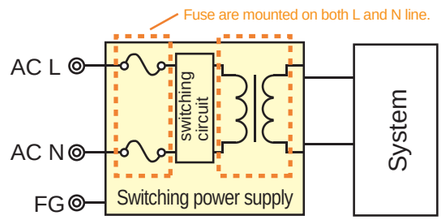
Medical Standards (IEC60601-1) will be hard to comply than Information equipment Standards (IEC60950-1).
Designing requirements are shown below.

- Fuse is without a tip
- Dielectric strength: 4kV (between primary and secondary)
- Insulating distance (approx. 1.5 times of IEC60950-1 Standard)

Complying with PSE Standards by fulfilling these requirements above.

Models which complying with Medical Standards have "m" before "GPSA" such like "mGPSA-360", "mGPSA-750"（750 is scheduled to be acquired）*[GPSAseries] are complied with medical standards.

<GPSA/mGPSAseries>



Isolation transformer for medical use are mounted.
Creepage distance and dielectric strength are also compliant with medical standard.

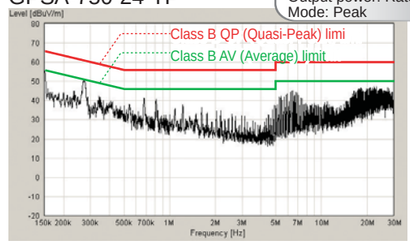
GPSA/mGPSA series have two fuses in both AC lines equipped and low leakage current meeting medical standard, PSE can be easily met.
Also, GPSA/mGPSA series have done to be double and reinforced insulation, therefore you will not need to prepare for extra fuses or breaker, or set up supplementary insulation outside of the power supply.

③ Conducted Emission Class B compliant

GPSA series meets conducted emission class B requirement even with low leakage current specification unlike other power supplies that also achieve low leakage current while victimizing conducted emission (or inviting large noise).

GPSA-750-24-TP

Input voltage: 100V AC
Output power: Rated (720W)
Mode: Peak

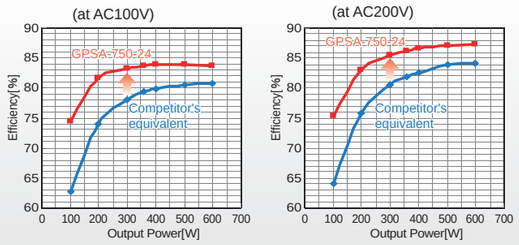


Actual measurement example (In-house data)

④ High efficiency&Long life

More than 3% higher efficiency compared with Competitor's

Efficiency Comparison



Efficiency comparison between GPSA-750-24 and Competitor's equivalent (actual data)

	Output Voltage	Output Power	Input Voltage	Efficiency	electricity expense*
Nipron (GPSA-750-24)	24V	600W	AC100V	83.6%	125,742yen
			AC200V	87.2%	120,551yen
Competitor's equivalent	24V	600W	AC100V	80.7%	130,260yen
			AC200V	84.2%	124,846yen

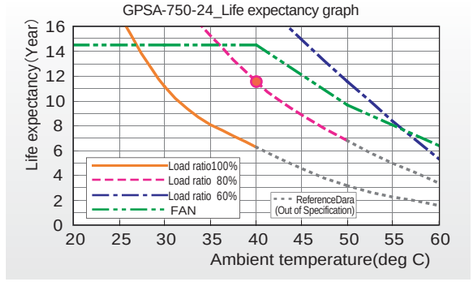
*600W Output, 24hours/day, continuous running　20 yen/kWh conversion
Comparison for electricity expense and CO_2 emission (600W output, 24 hours/day, continuous running)

Cuts electricity expense about 4,518yen (at AC100V)/about 4,295yen (at AC200V)
CO_2 emission about 85.4kg (at AC100V)/about 81.2kg (at AC200V) through a year!

(*1) 20 yen/kWh conversion (*2) 0.378 kgCO_2/kWh conversion

Life expectancy

With Load ratio 80% (576W), ambient temp. 40 deg C, life expectancy of GPSA is over 10 years!



⑤ 12V standby output equipped

This standby 12VSB supplies 0.3A, real ability is approx. 0.5A, as auxiliary power supply.
For example, we have track record such as 24Vfor motor drive and 12VSB as power supply used for interface of LAN and USB for finance terminal equipments.

Standby output
+12VSB (auxiliary power supply)
0.3A

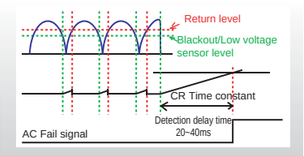
*1 Approx. 0.5A is actually available
*2 0.1A max at backup operation

⑥ Available for Power failure sensor/Back-up

Blackout detection signal

All GPSA series is equipped with blackout detection signal. Cost to produce detection unit can be eliminated.

Signal	Detection level	Detection delay time	Output
Blackout detection signal	AC 80V or less	20 to 40ms	Open collector

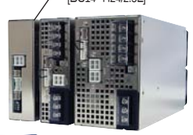


Blackout detection signal equipped/Backup at blackout available

Battery backup operation during blackout is possible for 24V output type (GPSA-***-24) with the battery pack (BS14*-H24/2.5L) connected.

- Switches from AC operation to DC battery operation without instantaneous stop.
- Max. cont. output 170W, Peak output 240W (within 10s)
- Parallel battery backup operation is possible with current balance circuit equipped.
- Battery low signal equipped.
- Battery discharge will be stop by the timer stop with DIP switch or input of remote signal to GPSA.
- Automatic shut down can be done with NSP Pro 2. (Harness is optional)

Battery pack(Ni-HM battery)
[BS14*-H24/2.5L]



Automatic shut down possible by NSP Pro 2 (Software)

LED lighting pattern changes when the BATT is charging or discharging.

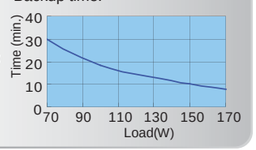
Settable discharge stop time with DIP switch.
■Setting available time
[BS14A-H24/2.5L]:1min./5min./10min./15min./20min./25min./30min./35min.
[BS14P-H24/2.5L]:5sec./10sec./30sec./1min./2min./3min./5min./10min.

■Battery package

Model: BS14A-H24/2.5L
Battery: Ni-MH battery
Output: 24V 170W (Peak 240W 10s max.)
Backup time: See the graph on the right

* Backup time is just a guideline at first use, not guaranteed.

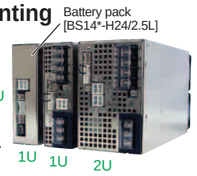
Backup time:



Other Features

Convenient size for rack mounting

Designed to mount in 19 inch rack.
1U (width), 3U (height) for GPSA-360/500P
2U (width), 3U (height) for GPSA-750/900P
In addition, 1U (width), 3U (height) for battery package.
They are all mountable into 1U, 2U, and 3U rack.



Silence

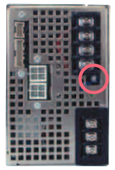
GPSA series controls fan speed by temperature detection inside the power supply. Thus,the fan speed slows at light load inviting silence.

Noise data (actual measurement example) Ambient temperature: 25 deg C, background noise: 31dB

Load	GPSA-360-24	GPSA-750-24	Competitor's (600W)
100W	39.0dB	37.0dB	53.5dB (fixed velocity FAN)
300W	45.5dB	39.5dB	
600W	—	45.5dB	

Variable resistor for output voltage

Operation stability of the system will be improved by line drop correction. 24V output can be boosted up to 29V, and also can be used as charging voltage source for lead battery. With volume adjusting, 36V output can be used as 30V output power supply, and 48V output power supply can be used as 42V output power supply.



Remote ON/OFF function equipped

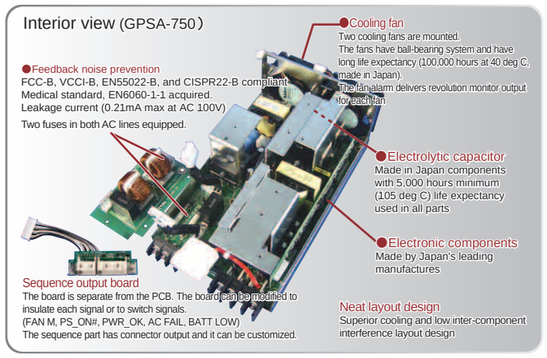
Output ON/OFF control is also available by Remote ON/OFF signal PS_ON.

Fan monitor signal equipped

Fan monitoring signals (FAN_M1,FAN_M2) of the two fans installed are available.Those signals allow you to monitor fan speed.

PWR_OK signal equipped

"H"signal is delivered when the output is normal.



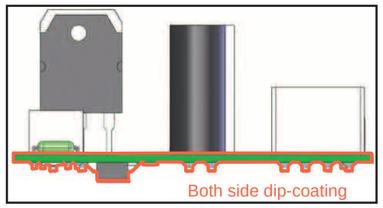
Application example

Whole-dip coating to resist neutral salt spray test

This example shows modified GPSA as a power supply for motor-roller conveyor.
Many of motor-roller conveyers are installed in factories and warehouses near the coast where salty humidity by sea breeze other than dust is generated. However, stable operation of power supply is required even in the environment like that.
- PCB coating (whole-dip coating)
- Protection of discrete components such as diodes against dusts by tubing

have been implemented.
Here's the solution! by whole-dip coating, as even double brushing cannot cover all area. It has brought continuous stable operation even under harsh neutral salt spray test!
(Brush-coating proved poor operation to stop in several minutes.)

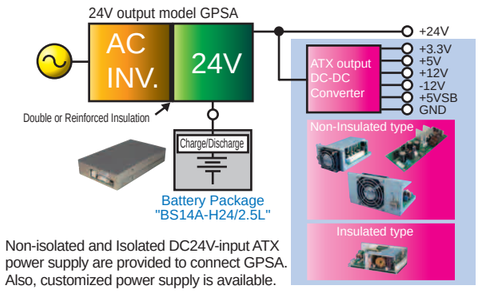
Under harsh neutral salt spray test



Referential picture

As medical-standard power system

- No isolation transformer required in front
- Backup operation at blackout is available
- Flexible medical power system is here for you simply changing the secondary unit of GPSA power supply



Non-isolated and Isolated DC24V-input ATX power supply are provided to connect GPSA. Also, customized power supply is available.

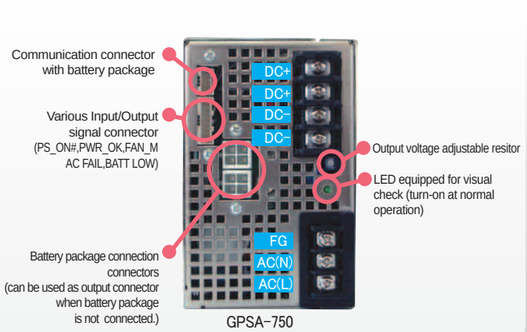
Ready for a sensor signal (HV signal) of voltage regeneratedof voltage regenerated

GPSA is ready for a sensor signal (HV signal) of voltage regenerated by servo motor driver.

Products line-up

Model name	(Series type)		12	24	Common SPEC
Series type	Output voltage		+12V	+24V	+12VSB
GPSA-360	Output current/ Output power	Continuous	30A	15A	0.3A
			360W	360W	3.6W
		Peak (5s) [AC100V]	40A	20.8A	0.3A
			480W	499.2W	3.6W
		Peak (5s) [AC200V]	40A	25A	0.3A
			480W	600W	3.6W
	Dimension (W x H x D)		41 x 128 x 230 (Exclusive fan guard (+5mm),exclusive terminal block (+15mm))		
GPSA-750	Output current/ Output power	Continuous	56A	30A	0.3A
			672W	720W	3.6W
		Peak (5s) [AC100V]	70A	37.5A	0.3A
			840W	900W	3.6W
		Peak (5s) [AC200V]	80A	50A	0.3A
			960W	1200W	3.6W
	Dimension (W x H x D)		82 x 128 x 235 (Exclusive fan guard (+5mm),exclusive terminal block (+20mm))		
Common	Input voltage		AC85V~264V (Worldwide input, with PFC)		
	Input/output terminal		Harmonica terminal		

* Complying to medical standard "mGPSA series" are available for 12V, 24V output. (mGPSA-750 is scheduled to be acquired.)



GPSA-750

Mechatronics Power Supply (No. 1)

- Selection Points for motor, solenoid and actuator
- Measure against vibration, shock and environmental problem

12V.15V.24V.30V.36V.48V

Wide variations for each motor type!

The drive unit such as motors or solenoids is popularly used for the automatic machine devices, the automatic measurement system, the cutting machine, the robot tool and carrier system.
The motor type and its control system is changed to the direct current motor, the AC servomotor and the stepping motor depend on the use or its combination of the case that driving force is top priority, the case that speed and response is demanded and the case of positioning precision are demanded.
As for the switching power supply, various functions become necessary. The needed functions are not only the variation of the output voltage but also the function that is needed by the various drive devices for example of the large peak current.
Otherwise, we have a look at a lot of contradiction and mismatch that it is chosen a power supply by severe cost priority, but it is chosen big power supplies more than required by peak electric current correspondence in the customers that make the design and fabrication of an automatic machine.
Taking advantage of this time that GPSA series is improved to the 3 times peak current for the motor load use , we NIPRON studied the most suitable choice method and produced this machatronics power supply as a special feature.

Mechatronics Power Supply, Selection for the various motor

Peak current ; 1.5 - 1.8 times available for 10 sec.

Peak current ; 2.3 - 2.7 times available for 5 sec.

24V limited edition available for the UPS functions

120W class | 170W class | 200W class | 360W class | 750W class | 600W class

Series type	Output voltage		+12V	+15V	+24V	+30V	+36V	+48V	+12VSB
OZP-120-*** 120W	Rated output current		10A	8A	5A	4A	3.4A	2.5A	
	Peak output current	AC100V	15A	12A	9A	7.2A	6A	4.5A	
		AC200V							
OZP-170-*** 170W	Rated output current		14A	11.2A	7A				
	Peak output current	AC100V	22.5A	9A	12.5A				
		AC200V							
OZP-200-*** 200W	Rated output current		16.7A	13.4A	8.4A		5.6A	4.2A	
	Peak output current	AC100V	33.4A	26.7A	16.7A		11.2A	8.4A	
		AC200V							
GPSA-360-*** 360W	Rated output current		30A		15A				0.3A
	Peak output current	AC100V	40A		20.8A				
		AC200V	40A		25A				
GPSA-600-*** 600W	Rated output current		50A		25A		16.6A	12.5A	0.5A
	Peak output current	AC100V	80A		50A		33.3A	25A	
		AC200V	100A		60A		40A	30A	
GPSA-750-*** 750W	Rated output current		56A		30A				0.3A
	Peak output current	AC100V	70A		37.5A				
		AC200V	80A		50A				

Selection points for the mechatronics power supply

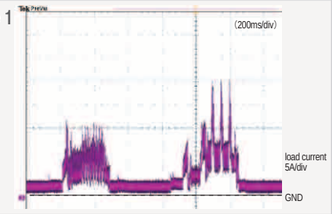
Point 1

Study of the voltage vs the peak current at the actual or worst condition

Actual condition example 1

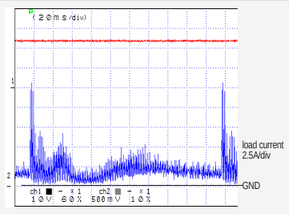
P/S：GPSA-360-24
Load：bill counter

Image

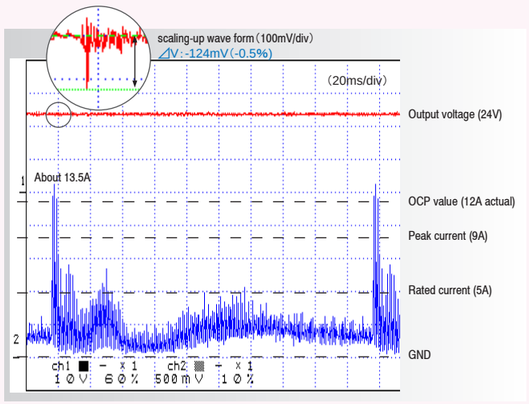


Actual condition example 2

P/S：OZP-120-24
Load : motor roller



We show our study about the waveform of the actual condition example 2.



This is the measured waveform of the load by the motor roller and OZP-120-24 above.
The actual peak currents exceed the peak value and the OCP value at the peak output timing of OZP-120-24 as can be seen the wave pattern.
It is apt to be judged that OZP-120-24 cannot be used in this case, but;

①Check the voltage dip
②Check the average current

The possibility of OZP-120-24 comes out by those checking.

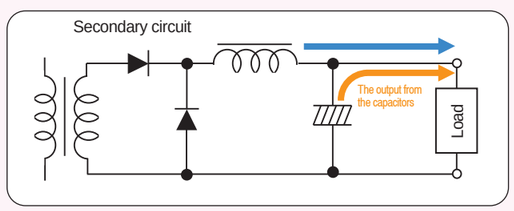
①Checking the voltage dip

When the peak currents at the motor start-up exceed the OCP value, that is cause of the big dip ΔV by the OCP characteristic of the power supply.

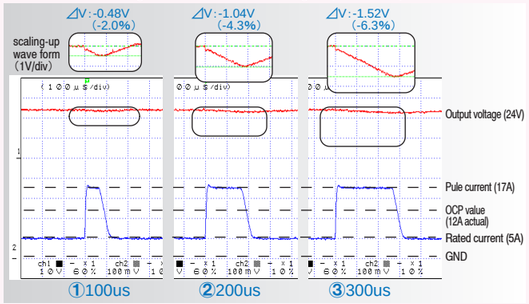
We can judge that it is in the OCP protect condition when the ΔV is more than 10%.
But when it is within 5 %, it is no problem because it is a transient voltage drop by the impedance of the power supply and its load line.

As the ΔV is 92mV and 0.4% in this case, it can be judged as no problem.

Even if the peak current more than OCP value happened, the output charged capacitors of the power-supply can supply the energy to the output and can make the stable voltage without the large voltage dip for a certain period of time.



Well, I show below the result using OZP-120-24.
We can find how long and how much the voltage dip is at the peak current.

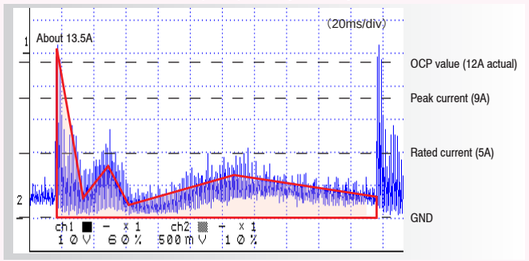


It is the waveform of the peak pulse current of 17A bringing from rated 5A during time of ①100us, ②200us, ③300us.
The each voltage dip is as followings; ①-0.48V(-2.0%), ②-1.04V(-4.3%), ③-1.52V(-6.3%) If there is it during 200us period of ②, We can obtain the stable output within load change -5%. *
As for this, even in the case of a different watage power supply of NIPRON, we can refer the result because the output capacity and the filter value can act to be in a proportion tendency.

*Please consider it as one aim because it changes by the load current levels.

②Checking the average current

After we could judge that there was no problem in the voltage dip caused by the peak current, we next need to calculate an approximate average current of the output and to confirm it whether continuous output is possibility thermally.



We calculate the average current of the waveform above assuming that it is the red line waveform.
If the average current that we demanded is lower than 70% of power supply output capacity, we can judge it no problem.
In this waveform, the average current of the red part is approximately 3A and is lower than 70% of the output capacity of OZP-120-24 and then we can judge it no problem even if the continuous use.

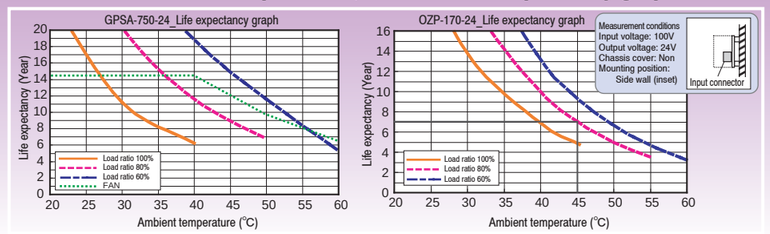
Hereon even if a peak load current is more than the OCP value, the power supply is not needed to change to a larger one of the capacity more than required and can has usable possibility just as it is.
So we recommend you to talk with us Nipron when you face to this kind of the problems.

Well, the mean current is measured by the function of the measuring instrument to confirm a average current ② and it can be judged even to confirm that the mean current is lower than the rated current of the power supply.

Point 2

How to calculate actual load current vs. required life, based on life expectancy graph

In case of OZP-170-24 (right side graph), assuming that peak current is less than 12.5A and 7 years life is required at 45℃ ambient, the load current Iorms necessary for 7 years life will be obtained at a cross point of 80% derating curve at 45℃, therefore, Iorms=7A×0.8=5.6A.



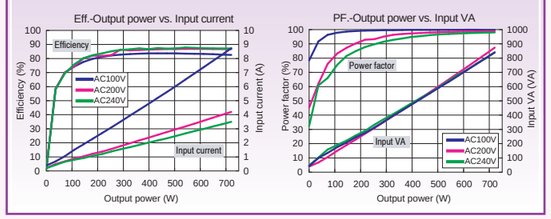
In a green age, total high efficiency power supply for motors to be sought

The total efficiency with the total load including the power transmission line is as below;

Power supply — Motor

PSU Efficiency 0.85 × Power factor 0.98 × Motor Efficiency 0.7 = 0.58 (58%)

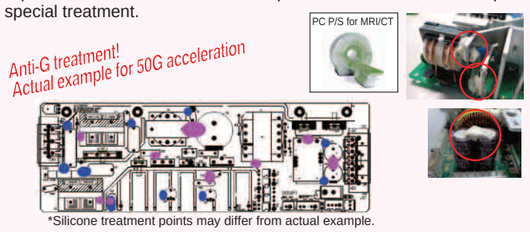
GPSA-750-24-TP (ex. Actual measurement)



Power supply for anti-shock and vibration

It is a must to buy the power supply that uses both-side through-hole-PC Board for applications such as Medical devises that equip moving arms or vibrators. In addition, large or heavy parts should be reinforced by silicone as anti-shock and vibration.
Nipron has anti-shock and vibration products available, and accepts special treatment.

Anti-G treatment!
Actual example for 50G acceleration



*Silicone treatment points may differ from actual example.

Both-side through-hole-PC Board used! (Competitors just single-side PC Board)

No more problem of solder cracks especially due to lead free soldering.

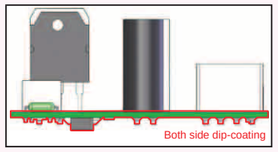
If solder cracks happen, protection circuits such as OCP and OVP may not work, or induce an abnormal output voltage causing the secondary failures in the system.

Operation at -20℃ conditions

This is an example of OZP series as an outside gate control P/S. Because of outside operations, customer initially asked -20℃ special design, however, even standard OZP series has met -20℃ operations. (Power derating required)

Environmental measures for motor equipment under harsh conditions

In case of motor roller conveyers in warehouses or plants that are often close to shores, hence, accidents due to accumulated dust and corrosion of saline particles, in case of weave machine application, problems due to conductive thread were observed.
Nipron is reinforcing environmental measures by dip-coating to both side of PC Board and putting insulation tubes to power semiconductor's leads.



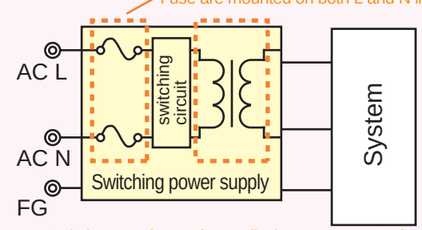
So convenient with stand-by P/S (power supply)

The recent trends show that requests for turning on/off power supplies through command signals in system or large machines are increasing. Therefore, a stand-by P/S that is always active must be equipped.
Nipron's GPSA series (Mechatronics P/S) has +12VSB@0.3A-0.5A stand-by P/S function.

PSE safety standard (Japan Product Safety, Electrical appliance & materials) to be complied

Because of two fuses in both AC lines equipped and low leakage current meeting medical standard, PSE can be easily met.
*We can comply with the departmental regulations 1

<GPSA series>

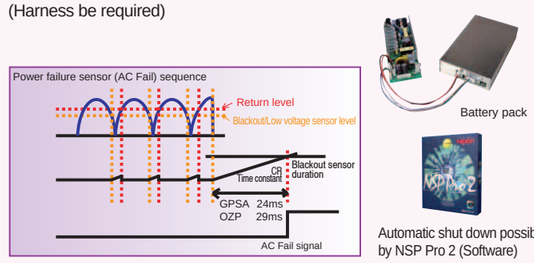


Isolation transformer for medical use are mounted.
Creepage distance and dielectric strength are also compliant with medical standard.

- Leakage current
  0. 3mA or less necessary at AC264V, 60Hz
  (patient-care system - class I)
- Dielectric strength: 4kV (between primary and secondary)
- Insulating distance (approx. 1.5 times of IEC60950-1 Standard)

Available for Power failure sensor / Back-up

GPSA and OZP entire series equip a power failure sensor so that customer can save the cost of making a sensor circuit.
Also +24V output type can achieve a back-up with batteries during blackout and then automatic shut down can be done with NSP Pro 2. (Harness be required)



Revolution in Mechatronics Power Supply to change the world of Heavy Machinery and Inspection Machines

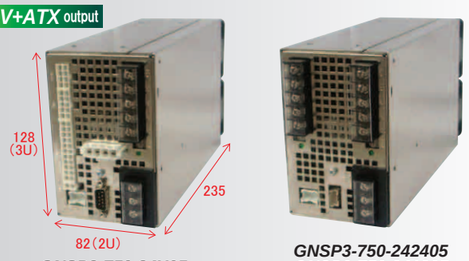
Special topics for All-in-one type system power supply

Nipron takes into account standardization of power supplies wherever possible.
Standardization may bring extra function to specific needs resulting in higher cost. However, it seems to be harder nowadays to produce customized products to meet individual customers.
Because building safety and stability in power supplies requires a lot of efforts and time for design development and evaluation test, and also safety standard acquisition requires much time and cost.
So far, there have been many power supply manufactures in Japan for customized power supplies. They meet specific requirements with Japanese sensitive and ingenious characteristics. Today they face repeatedly restructuring in manufacturing industry (hard) and many are forced to step down from their business despite they have good ability to maintain reliability.
We, Nipron, reflecting those circumstances, develop basic models of standardization-oriented products that can be easily modified.
This special topics show you high power multi output power supply (600 ~ 750W) in this stream.

Nonstop type (with UPS function)

GNSP series

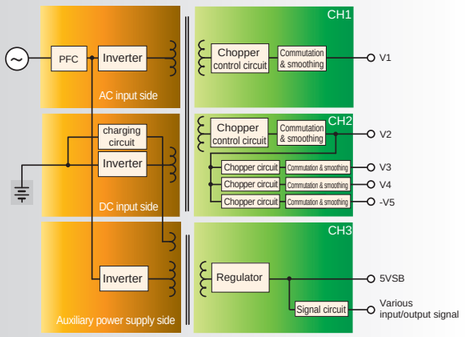
24V+ATX output



GNSP3-750-24X05
GNSP3-750-12X05

GNSP3-750-242405
GNSP3-750-241205
GNSP3-750-121205

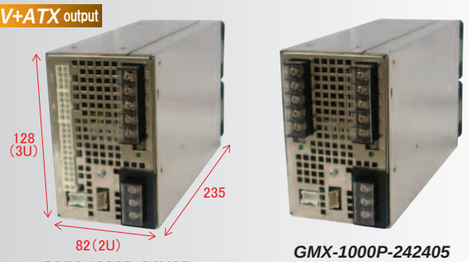
【Ex.】 GNSP3-750-24X05-TRP



General purpose type

GMX series

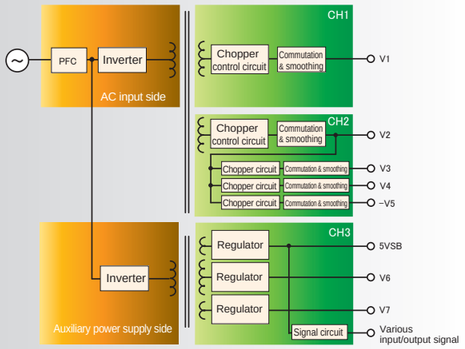
24V+ATX output



GMX-1000P-24X05
GMX-1000P-12X05

GMX-1000P-242405
GMX-1000P-241205
GMX-1000P-121205

【Ex.】 GMX-1000P-24X05-T2P



Various lineup and customization support

<Note> Continuous output power for CH1 + CH2 is 708 to 720W, and 1080W for peak power.									Nonstop type with UPS function	General purpose type
No	CH1 Power output	CH2 Multi output				CH3 Auxiliary output			GNSP model name	GMX model name
1	+24V 15A(22.5A)	+3.3V 10A(20A)	+5V 20A(30A)	+12V 17A(40A)	-12V 0.3A	+5VSB 1.5A	12/15V 8.4W	12/15V 6W	Negotiable	GMX-1000P-24X05-T2(5)P
2	+24V 15A(22.5A)	+3.3V 10A(20A)	+5V 20A(30A)	+12V 17A(40A)	-12V 0.3A	+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-24X05-TRP	GMX-1000P-24X05-T0P
3	+12V 30A(45A)	+3.3V 10A(20A)	+5V 20A(30A)	+12V 17A(40A)	-12V 0.3A	+5VSB 1.5A	12/15V 8.4W	12/15V 6W	Negotiable	GMX-1000P-12X05-T2(5)P
4	+12V 30A(45A)	+3.3V 10A(20A)	+5V 20A(30A)	+12V 17A(40A)	-12V 0.3A	+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-12X05-TRP	GMX-1000P-12X05-T0P
5	Any value between +24 and 48V 360W(540W)	Any value between +3.3 and +12V 130W(150W)		Any value between +12 and +36V 230W(360W)		+5VSB 1.5A	12/15V 8.4W	12/15V 6W	Negotiable	GMX-1000P-□-T2(5)P
6	Any value between +24 and 48V 360W(540W)	Any value between +3.3 and +12V 130W(150W)		Any value between +12 and +36V 230W(360W)		+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-□-TRP	GMX-1000P-□-T0P
7	Any value between +12 and 24V 360W(540W)	Any value between +3.3 and +12V 130W(150W)		Any value between +12 and +36V 230W(360W)		+5VSB 1.5A	12/15V 8.4W	12/15V 6W	Negotiable	GMX-1000P-□-T2(5)P
8	Any value between +12 and 24V 360W(540W)	Any value between +3.3 and +12V 130W(150W)		Any value between +12 and +36V 230W(360W)		+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-□-TRP	GMX-1000P-□-T0P
9	+24V 15A(22.5A)	+24V 15A(22.5A)	Parallel connection with CH1 is available At parallel connection: 30A (45A)			+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-242405-TRP	GMX-1000P-242405-T0P
10	+24V 15A(22.5A)	+12V 30A(45A)				+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-241205-TRP	GMX-1000P-241205-T0P
11	+12V 30A(45A)	+12V 30A(45A)	Parallel connection with CH1 is available At parallel connection: 60A (90A)			+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-121205-TRP	GMX-1000P-121205-T0P
12	Any value between +12 and 48V 360W(540W)	Any value between +15 and +36V 360W(540W)				+5VSB 1.5A	12/15V 8.4W	12/15V 6W	Negotiable	GMX-1000P-□-T2(5)P
13	Any value between +12 and 48V 360W(540W)	Any value between +15 and +36V 360W(540W)				+5VSB 1.5A	V6 ×	V7 ×	GNSP3-750-□-TRP	GMX-1000P-□-T0P

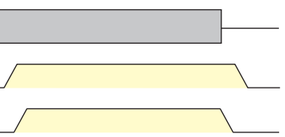
CH2 output
* Output combination is allowed such as single output, two outputs, three outputs and four outputs.
* ( ) shows peak power for 5 seconds at the max. Though continuous power rating is 360W, but approximately continuous 450W max can be obtained if CH1 output is reduced.

CH3 output
* +5VSB is synchronized with AC mains as standby output.
* Installed to all models as standard and continuous 15A load is available.
* Optional V6 and V7 are independent output and synchronized with +5BSB.

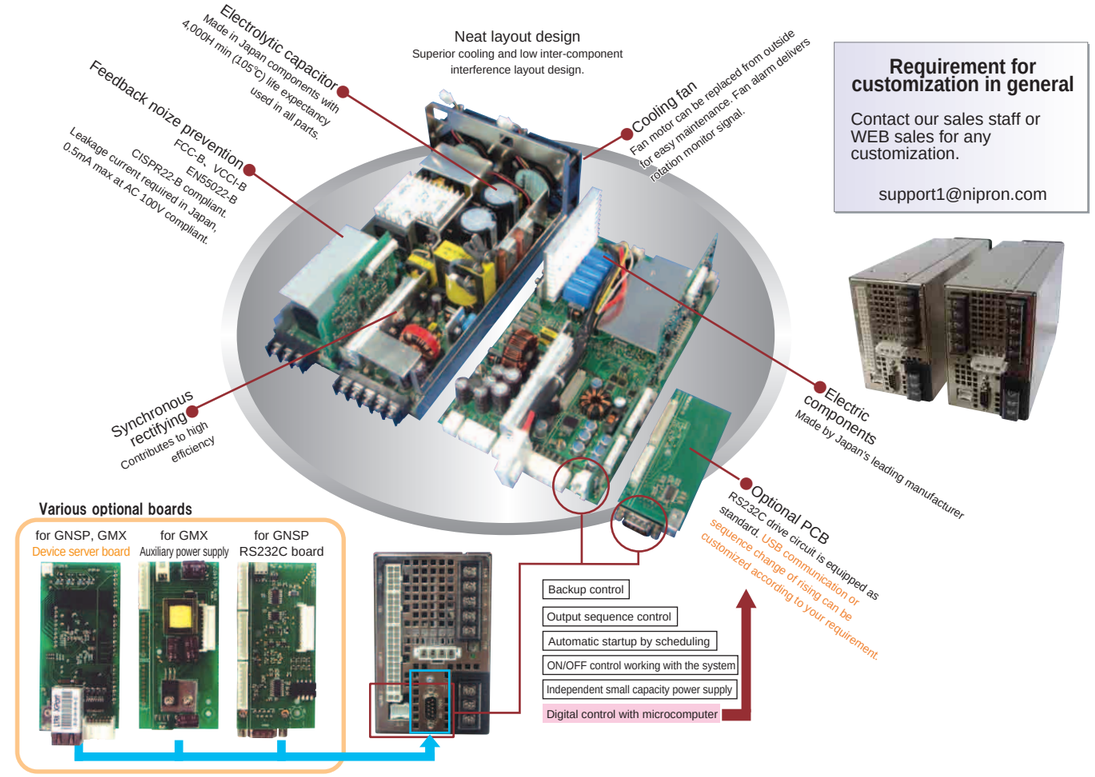
CH1 output
* CH1 is designed for Power use and its rating is 360W. ( ) shows peak power that gives up to 540W for 5 (five) seconds at the max.
* It also supplies 480W continuously if power in CH2 can be reduced

No. 1, 2, 3, 4, 9, 10, and 11 have been in the market. For No. 5, 6, 7, 8, 12, and 13, we are ready to hear your requirement to go ahead.

Rising and falling characteristics



* CH1 and CH2 are allowed to be on or off external remote ON-OFF signal. Also, those outputs for standard models start up and fall synchronizing with AC mains on.
* CH1 and CH2 can operate to rise and fall individually by external signal.
* Sequential timing of rise and fall of CH1 and CH2 can be programmed by micro computer in optional board if required.



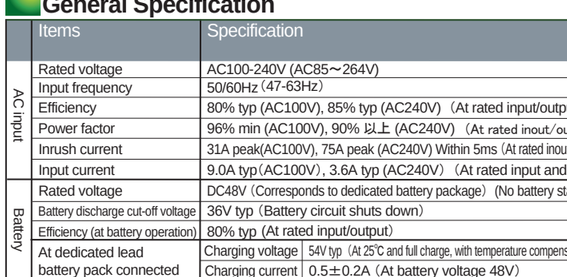
General Specification

	Items	Specification	
AC input	Rated voltage	AC100-240V (AC85～264V)	
	Input frequency	50/60Hz（47-63Hz）	
	Efficiency	80% typ (AC100V), 85% typ (AC240V)（At rated input/output）	
	Power factor	96% min (AC100V), 90% 以上 (AC240V)（At rated inout/output）	
	Inrush current	31A peak(AC100V), 75A peak (AC240V) Within 5ms（At rated inout/output and cold start 25℃）	
	Input current	9.0A typ（AC100V）, 3.6A typ (AC240V)（At rated input and max output）	
Battery	Rated voltage	DC48V（Corresponds to dedicated battery package）(No battery startup)	GNSP series only
	Battery discharge cut-off voltage	36V typ（Battery circuit shuts down）	
	Efficiency (at battery operation)	80% typ（At rated input/output）	
	At dedicated lead battery pack connected	Charging voltage: 54V typ（At 25℃ and full charge, with temperature compensating）	
		Charging current: 0.5±0.2A（At battery voltage 48V）	
Environment	Operating temperature/humidity	-10-70℃/10-90%（There shall be no condensation）	
	Storage temperature/humidity	-25-70℃/10-95%（There shall be no condensation）	
	Vibration	Acceleration of 2G with vibration frequency of 10-55Hz for 10 sweep cycles in the X/Y/Z direction（JIS-C-60068-2-6, at no operation）	
	Mechanical shock	Lift one bottom edge up to 50mm and let it fall. Repeat three times for each of four edges. No malfunction.（JIS-C-60068-2-31, at no operation）	
Insulation	Dielectric strength	AC input－DC input/DC output: AC3000V/min, AC input－FG: AC2000V/min DC output－FG: AC500V/min, +24V output－other outputs: AC500V/min	
	Insulation resistance	AC input－FG/DC input/DCoutput: 50MΩ min, DCinput－FG: 50MΩ min DC input－DCoutput: 50MΩ min, +24V output－other outputs: 50MΩ min (at DC500V)	
	Leakage current	0.5mA max (AC100V) /1mA max (AC200V) /1.2mA max (AC240V)	
EMC	Line noize immunity	±2000V(plus width 100ns and 1000ns, cycle period: 30-100Hz, normal and common mode with positive and negative polarities for 10 munutes each. (Measured by INS410. There shall be no fluctuation of DC output or mulfunction.)	
	Electrostatic discharge	EN61000-4-2	
	Radiated, radio-frequency EM field	EN61000-4-3	
	Fast transient burst	EN61000-4-4	
	Lightning surge	EN61000-4-5	
	Conducted disturbances induced by radio-frequency	EN61000-4-6	
	Power source frequency magneticfield	EN61000-4-8	
	Voltage dip/regulation	EN61000-4-11	
	Conducted emission	VCCI-B, FCC-B, EN55022-B, CISPR22-B (Measured with power supply single body)	
	Harmonic current regulation	IEC61000-3-2（At rated input/output）	
Others	MTBF	46,000 H min（by EIAJ RCR-9102）	
	Weight	3.0 kg typ	
	Dimensions	82（W）×128（H）×235（W）	

Flexible to maximize power

When power becomes short in single GNSP power supply, higher power can be available by parallel connection of each single power supply unit. In that case, make sure to connect current balancing terminals (CB) each other so that load current of each unit becomes balanced.

If single output, large capacity power supply is needed...

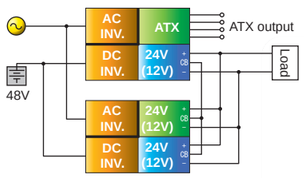


(Fig. 1)

24V 90A (12V 180A)

Up to three power supplies can be connected in parallel. Consult with us if larger power is needed.
<Note> We can also offer the power supply combined with a battery package and installed into a 19-inch rack (3U) as a backup system.

If large capacity of ATX power supply with 24V or 12V output is needed...

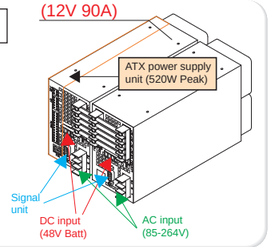


Extension unit
GNSP3-750-242405 or
GNSP3-750-121205

<Note> 15V output model is coming soon.

(Fig. 2)

24V 45A and ATX (12V 90A)

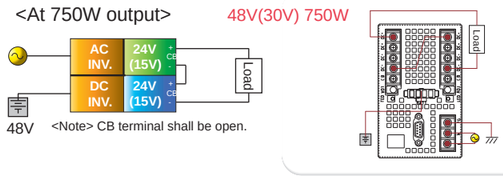


If large capacity of power supply with 30V or 48V output is needed...

15V or 24V output is to be connected in series.

<At 750W output>

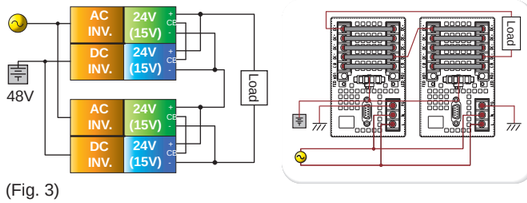
48V(30V) 750W



<Note> CB terminal shall be open.

<At 1500W output>

48V(30V) 1500W



(Fig. 3)

GNSP GMX

Nonstop type

General purpose type

Functions and Features

1. GNSP is Nonstop power supply

- Only with connecting to external 48V Lead battery, you can get Not-stop and uninterruptible power supply instead of UPS.
- No limitation of battery capacity (AH)
- New battery package, with the same dimension as power supply, equipping intelligence function in Ni-MH battery such as lifetime notice, scheduling, is under development.

2. Flexible to maximize power

- Load balancing terminals are equipped. (Fig.1)

3. ATX＋24V or 12V output

- High power multiple outputs are on demand. (Fig. 2)

4. Independent two systems with high power

- Equipped with completely insulated two-system DC high power output (CH1, CH2) the outputs can be ON-OFF controlled by external signal individually.
- Multiple GNSP power supplies can be backed up by external battery in common use.
- For standard type, CH1 and CH2 output operate synchronously with AC mains activation.

5. RS232C type optional board

- This function is standard for GNSP power supplies.

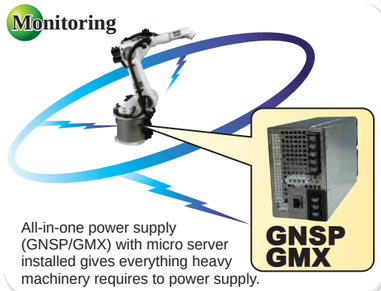
6. Customization of optional boards

- Sequence timing of rising and falling of CH1 and CH2 can be set to customer's requirement by exclusive micro computer that is installed. (Fig. 4)
- Load of power output such as 24V can be shut down sequentially by control of external FET switch for effective use of backup time. (Fig. 5)
- Also we have another board which provides stabilized two (V1 and V2) DC small outputs (14.4W max.) isolated each other.
- **With a board installing device server, monitoring, communication, and control can be performed. (See following page.)**

As network power supply

With a board installing device server,
Monitoring, Communication, and Control
can be performed.

Monitoring



All-in-one power supply (GNSP/GMX) with micro server installed gives everything heavy machinery requires to power supply.

Remote monitoring

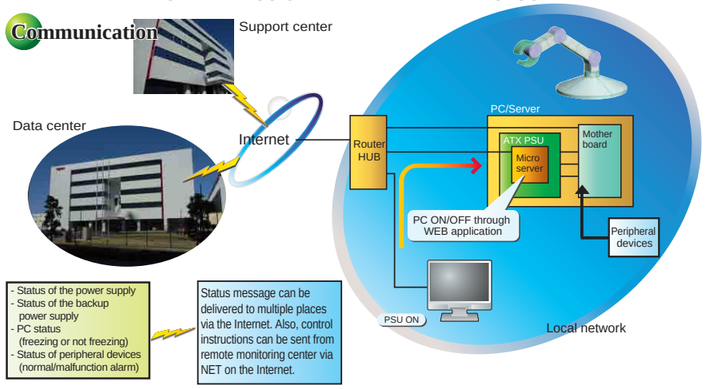
Monitoring on power supply condition	- Instantaneous power failure /power failure detecting signal - Power supply output malfunction detection - Internal temperature malfunction detection - Life expectancy of the power supply - Computer freezing detection
Monitoring on backup battery condition	- Temperature abnormality - Calculation of life span
Monitoring on PC	- PC freezing detection
Monitoring on peripheral devices	- Monitoring on alarm signal of individual devices via I/O terminal of power supply

Monitoring freeze-up condition of specific PC, the power supply can be rebooted automatically or remotely to unfreeze the PC

Remote communication is available as the power supply works via the Internet.

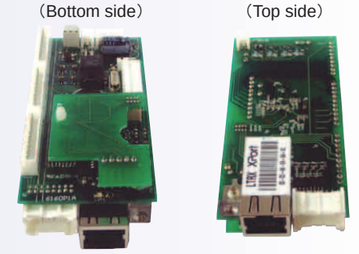
Function of the power supply with micro server equipped

Communication



7. Optional board built into device server

（Bottom side）　（Top side）

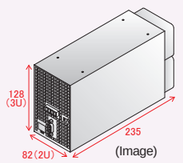


- **Control from the distance**
  CH1 and CH2 outputs can be ON/OFF controlled and shut down individually form the distance via the Internet. To achieve this, special software for shutdown function must be installed in the PC.
  <Note> Protection such as Password authentication to prevent external illegal access is equipped.

- **Monitoring information mail delivery**
  Monitoring information such as "Power supply status," "Presence of Freeze-up of PC," "Alarm information on peripheral devices," can be delivered by mail.

- **Freeze-up monitoring and reset of PC**
  Freeze-up status of PC connected to GNSP or GMX power supply can be monitored and the status notice can be delivered to reboot the PC manually after confirmation from the distance. In addition, Automatic reboot is available depending on setting.

- **Automatic shutdown by time at backup operation**
  The power supply can be shut down automatically by time when it reaches to the specific time during backup operation.



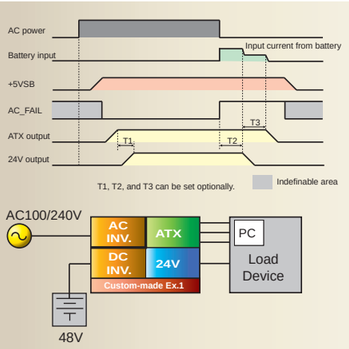
(Image)

Intelligence battery package for GNSP is coming soon!

48V battery package (Ni-MH battery compatible with Lead battery) for GNSP is under development. This battery package is to be operated and controlled by Mi-Pack Manager (application software) already in the market. With connecting to the board which installs device server and to this package, you can operate heavy machinery and inspection devices according to scheduling. In addition, maintenance information can be sent to remote places using battery lifetime diagnostic function via the Internet.

(Mi-Pack Ⅱ Manager)

Example of power supply timing by optional board customization



Customization 1

After AC power is turned on, the ATX output starts up in a defined way. 24V starts up after T1 without fail.

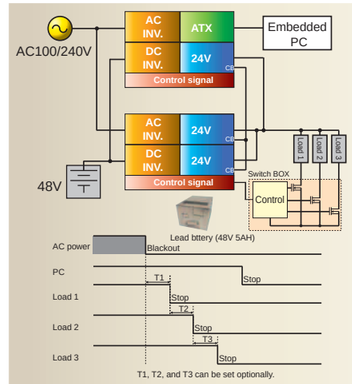
If the AC power is interrupted, all outputs will be covered by backup operation. After the fixed time (T2), however, 24V output will be shut to prevent exhaustion of the battery and the remaining power will be passed to ATX output (PC).

After the fixed time (T3) to shut down PC, ATX output gets shut.

(Detailed specification can be made after consultation with the customer.)

(Fig. 4)

Sequential shutdown of 24V loads by optional board customization



Customization 2

This example shows that PC is operated by ATX output, and 24V output for mechanism system backs up whole system while driving loads such as sequencer.

However, depending on loads for mechanism system, some devices may need no backup at all. On the contrary, some devices such as sequencer require backup in many cases for specific time and total management with PC may be necessary.

Load1 - 3 can be shutdown sequentially according to each system after the control by signals (ex. AC failure signal AC_FAIL) delivered from GNSP for the specific time (T1, T2, and T3) in the external switch BOX.

(Fig. 5)

Application example: Power supply for ATM (Automatic Transaction Machine)

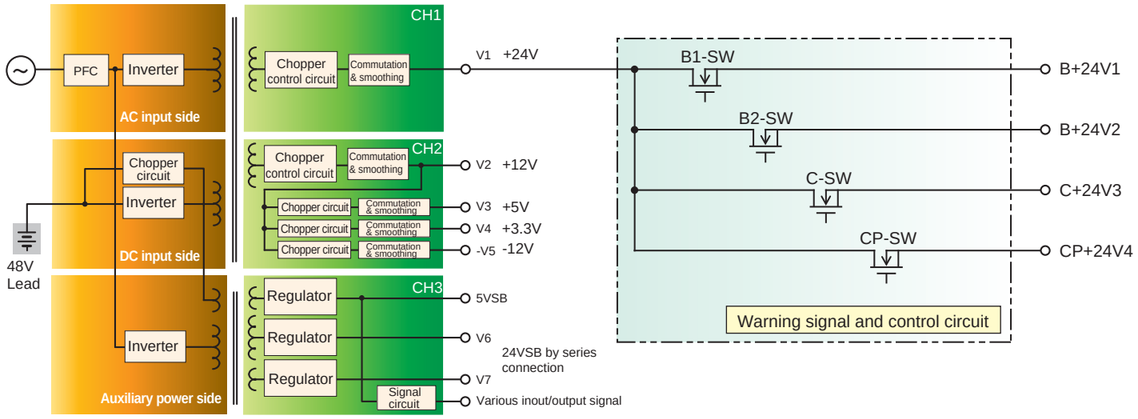
- Input specification: AC100V/200V, Prevention measures needed against harmonic current.
- Customer request specification

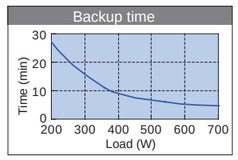
Output voltage	+5VSB	+24VSB	+3.3V	+5V	+12V	-12V	B+24V1	B+24V2	C+24V3	CP+24V4	Output capacity
Continuous (thermal average)	0.5A	18W	4A	10A	10A	0.03A	11A	1.5A	2A	2.5A	650W
Max output	0.5A	18W	4.5A	16A	14A	0.03A	25A	2A	2A	15A	1000W
Control signal	Always-output		Output by PS_ON				B signal ON		C signal	CP signal	

Nipron
GNSP3-750-24X05-□

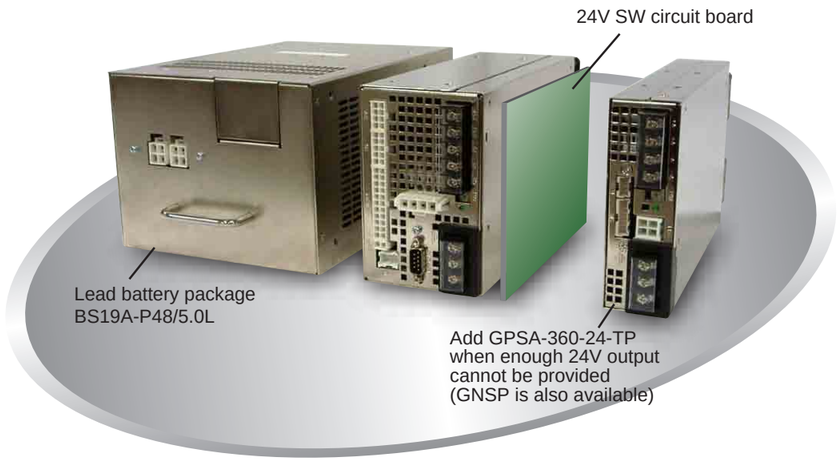
Output voltage		CH3 auxiliary output			CH2 multi output				CH3 power output				Output capacity
		+5VSB	+12V	+12V	+3.3V	+5V	+12V	-12V	+24V power output				
Cont. output	Rated	1.5A	8.4W	6W	10A	20A	17A	0.3A	15A (Peak 30A)				720W
	Thermal average of real road	↓ 0.5A	Series connection 24V 18W		↓ 4A	↓ 10A	↓ 10A	↓ 0.03A	↓ 11A	↓ 1.5A	↓ 2A	↓ 2.5A	650W
Peak		1.5A	24V 18W		10A	20A	17A	0.3A	25A	2A	2A	15A	1080W
Control signal		Always-output			Output by PS_ON				B1-SW	B2-SW	C-SW	CP-SW	
During backup operation		Warning board backup 20W: 2 hours typ			Shutdown of ATX board (PC) 200W: 3 minits typ				All outputs 650W, backup 2 minutes				

GNSP3-750-24X05-□





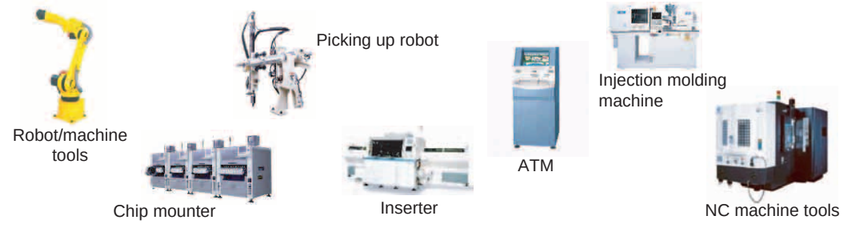
(Image)



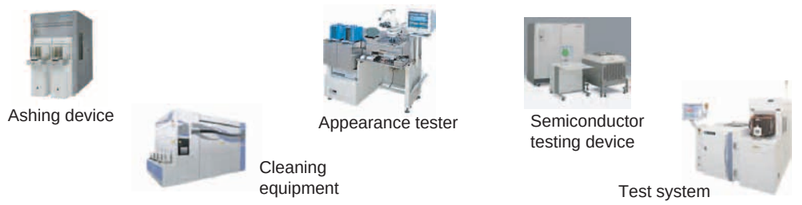
Application example: Power supply for Robot/Heavy machinery/Semiconductor Equipment/Inspection machine

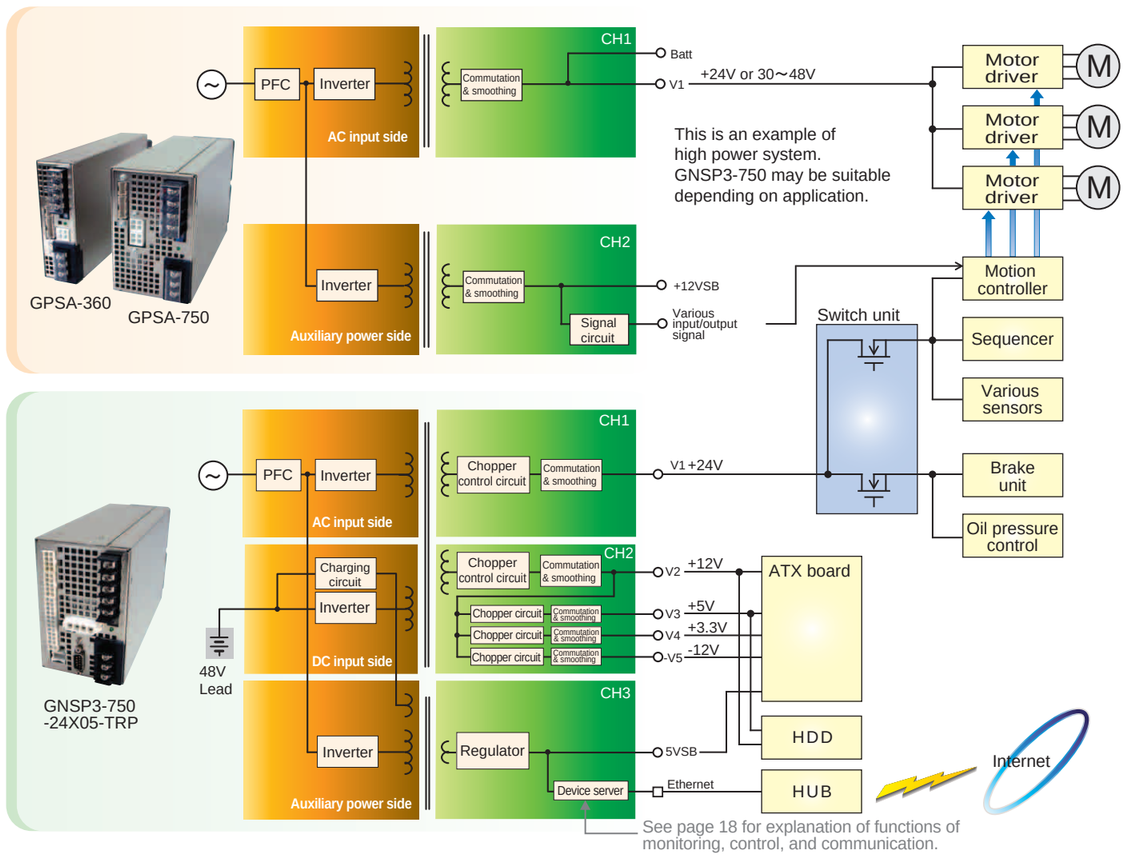
Example of system power supply considering mutual interlock including blackout backup of power supplies used for each device

Robot/Heavy machinery



Semiconductor manufacturing/Inspection equipment

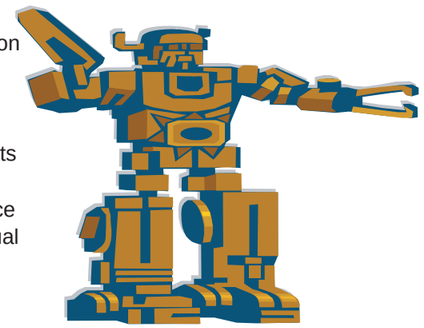




See page 18 for explanation of functions of monitoring, control, and communication.

Application example: Power supply for machines that use multiple PCs

Occasionally one system uses three to five PCs such as robot. For example, one PC is used for robot eye (CCD camera) and image processing, and second PC is for censing or I/O, and, others may be used for communication system or as upper server to manage information on whole robot system.
For the system like this, whole PCs must be totally controlled to manage mutual interlock including start-up and shutdown procedure.
For that case, our GNSP model, GNSP3-750-242405-TRP (two 24V outputs type) performs total management of power supplies in PC and main uninterruptible power supply function when used as below. Also, with device server which is one of optional boards equipped in this power supply, mutual communication with remote places such as monitoring, control, and communication can be proceeded via the network bringing considerable advantage for remote maintenance.



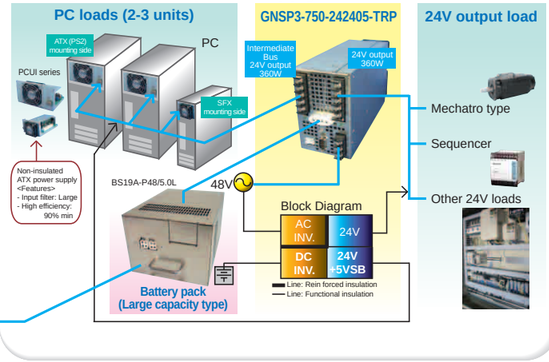
Example of three PCs and mechanism system (24V) are integrated

GNSP3-750-242405-TRP

CH1 output
24V 15A continuous (Peak 22.5A 5 sec)
CH2 output (insulated perfectly from CH1)
24V 15A
+5VSB

Under the circumstance of Non-stop power supply (uninterruptible power), total power management (total monitoring and control) on multiple PCs and mechanism system driven by 24V can be performed.

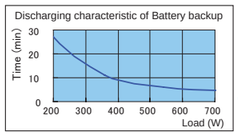
Power to three PCs and uninterruptible total control using 24V control power supply and 24V medium BUS



<<PCUI type ATX power supply as load of CH2>>

Input DC24V (21.6～26.4V)
Output
+3.3V 10Amax
+5V 10Amax
+12A 10Amax
-12V 0.3A
+5VSB 1A (Peak 2A)

This unit is non-isolated ATX power supply, but works without any problem in parallel connection of several PCs as input filter capacity is large.

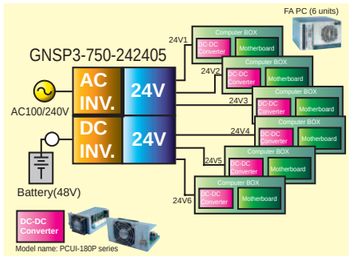


Example of two 24V power supplies control power supplies of six PCs and conduct backup operation at blackout

GNSP3-750-242405-TRP

CH1 output
24V 15A continuous (Peak 22.5A 5 sec)
CH2 output (insulated perfectly from CH1)
24V 15A
+5VSB

(Note) Parallel operation of CH1 and CH2
Perfect balancing of Loads by connecting current balancing terminals



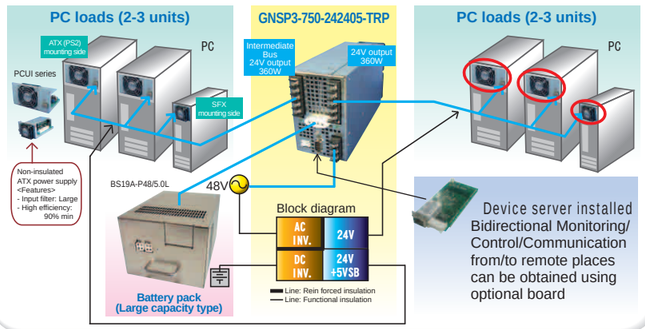
Power to six PCs from one GNSP as DC-UPS (750W/1080W peak, uninterruptible) and uninterruptible total control

Insulated DC-DC converter type ATX power supply, PCFD-180P-X2S

Input DC20V-36V Output
+3.3V 10Amax
+5V 10Amax
+12V 0.3A
+5SB 1A

If isolation model is required,

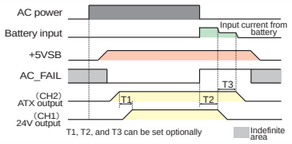
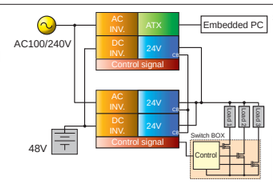
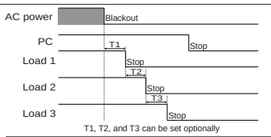
*Chassis and FAN also available (Model: PCFD-180P-X2S-SF)



Check sheet for power supply specification selection

When modification in GNSP/GMX series is required, fill out this sheet and send a copy to the address below by fax or e-mail with the copy attached

To	Sales strategy group Nipron Co., Ltd. 1-3-30, Nishinagasu-cho, Amagasaki-city, Hyogo 660-0805, Japan Tel: 81-6-6487-0611	Company name			
		Person in charge	Name	Department	
FAX	+81-6-6487-2212	Contact info	TEL	FAX	
E-mail	support1@nipron.com	E-mail			

	Confirmation of your specification			Answer
1	Input specification of the power supply is AC100/200V (85-264V, Worldwide input specification with PFC circuit).			☐OK ☐NG
2. Battery	(1) Do you need battery backup operation during power failure?			☐Yes ☐No
	(2) Battery pack type	Lead	<Standard product> BS19A-P48/5.0L（48V 5AH）	☐Use this product
			Prepare other battery pack at your (customer's) side. (There is no limit about 48V capacity)	☐Yes
		Ni-HM (compatible type of Lead battery)	<Under development> Ni-HM battery with "Mi-Pack Ⅱ Manager" (application software) - Life span calculation, scheduling function, and communication are available.	☐Would like Nipron to develop this product in hurry ☐Consider the adoption of this product after being ready
3. Output	(1) Auxiliary power supply (standby) output +5V (1.5A) is equipped as standby output of standard function. Do you need other voltage of standby output? <Note> Except standard 5V standby output, 2 more standby outputs are available. (Use V6 and V7) *1 V6 and V7 are insulated and outputs in synchronization with 5VSB *2 Output capacities of V6 and V7 are: V6+V7=14.4W max	V6 output (8.4W)		☐12V（0.7A） ☐15V（0.56A） ☐Others（___V ___A）
		V7 output (6W)		☐12V（0.5A） ☐15V（0.4A） ☐Others（___V ___A）
		V6+V7 (in series)		☐24V（0.5A） ☐30V（0.4A） ☐Others（___V ___A）
				☐Don't need auxiliary power
	(2) CH1 power output - Voltage, continuous current, peak current, and peak output time <Note> Continuous rated output power of CH1 shall be 360W max (peak 540W), but able to take continuous 450W typ max if CH2 outputs lower power. Total continuous output power of CH1 and CH2 shall be 708W - 720W.			☐12V ☐15V ☐24V ☐30V ☐48V ☐Others (___V) Current (Continuous___A Peak___A___S)
	(3) CH2 multi output <Note> Able to choose output type from single output, 2 outputs, 3 outputs, and 4 outputs. Continuous rated output power shall be 360W max, but able to take continuous 450W typ max if CH1 outputs lower power.	1st output		☐+3.3V (Continuous ___A Peak ___A) ☐Don't need
		2nd output		☐+5V (Continuous ___A Peak ___A) ☐Don't need
		3rd output		☐+12V (Continuous ___A Peak ___A) ☐Don't need
		4th output		☐-12V (0.3A) ☐Don't need
		Other outputs from 1st to 3rd output		☐+24V (Continuous ___A Peak ___A) ☐Don't need ☐Other (___V Continuous ___A Peak ___A)
	(4) Extension unit (In case CH1 cannot provide enough power)	Do you need extension unit?		☐Yes (Add ___W) ☐No
		If yes, do you need battery backup operation during power failure?		☐Yes ☐No ※If yes, use GNSP power supply. If no, use GPSA/OZP/Other power supply.
4. Optional function	(1) Do you need RS232C signal connector in order to shutdown PC at battery backup operation during power failure?			☐Yes ☐No
	(2) Would you like to take another method that is different from (1) at backup operation during power failure, for shutdown of each outputs and falling sequence? (Ex. Timer stop)	Customize of the optional board		☐Need ☐Don't need
		Use the device server function		☐Yes ☐No
	(3) Would you like to monitoring PC freezing and reset it? <Note> Optional board with built-in device server (GB-DS) is required.	Automatic recovery by internal setting of the power supply		☐Need ☐Don't need
		Remote recovery from a distance		☐Need ☐Don't need
	(4) Do you need functions as remote control, monitoring, abnormal notice, and so on? <Note> Optional board with built-in device server (GB-DS) is required for controlling from a distance.			Functions (☐Need ☐Don't need) ☐Remote on/off ☐Power failure detection ☐Abnormal power supply notice ☐Monitoring internal temperature of the system ☐FAN rotating speed monitoring ☐Expectancy of life span ☐Abnormal notice by e-mail (Number of e-mail addresses: ____)
	(5) Do you need rising/falling sequence of CH1/CH2 outputs? <Note> Customization of optional board is required. (Timer setting) - If you don't need them, use standard RS232C board. CH1/CH2 of standard product rises and falls in synchronization with AC input.			☐Yes ☐No T1 ____ ～ ____ ms T2 ____ ～ ____ ms T3 ____ ～ ____ ms
	(6) In order to use battery capacity efficiently, do you need sequentially disconnected sequence of CH1 output load? <Note> Customization of optional board and external switch are required.			☐Yes ☐No T1 ____ ～ ____ (unit: ____) T2 ____ ～ ____ (unit: ____) T3 ____ ～ ____ (unit: ____)
		Would you like to ask Nipron to make external FET switch and PCB of the controller?		☐Yes ☐No
	(7) Do you need these functions provided by management software "Mi-Pack Ⅱ Manager"? - Calculation/notice of the Ni-HM battery life span - Scheduling operation	Calculation/ Notice of the battery life span		☐Need (☐calculation of battery life span ☐Notice) ☐Don't need
		Scheduling operation		☐Need ☐Don't need
	(8) Information such as alarm signal from the component, which is not Nipron power supply and embedded in the same system, needs to be transformed to a distance via device server unit?	Notice function		☐Need ☐Don't need
		Unit names and signals you need (Able to accept max 4 I/O signals)		1. 2. 3. 4.
5. System/others	(1) Would you like to ask Nipron to integrate some components into a case at Nipron side, such as extension power supply unit, battery pack, and switch controller? <Note> Dimensions of the power supply cannot be changed.			☐Yes ☐No
	(2) Do you need customization of output cable?			☐Yes ☐No
	(3) If you have any further request, please let us know.			

Here comes the thunderstorm season!

- Nonstop power supply will protect your system -

Nipron Nonstop power supply Featured

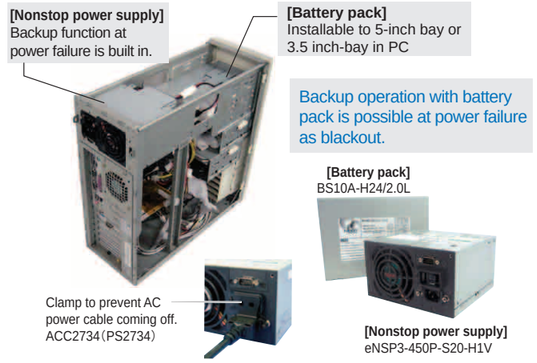
Now we are in the rainy season again. Speaking of the rainy season, "THUNDERSTORM." The most feared thing for systems is the loss of confidence and trust from customers. The "blackout" generated by "thunderstorm" may crash the system in the worst case following its abnormal system shutdown, which burdens vast amounts of money loss to customers.
Though we are supplied with stable power due to high technology of the power company nowadays, we still face "blackout" or "momentary power failure" at switching of transmission grid, and "momentary blackout" that momentarily drops line voltage under natural hazard such as thunderstorm.
"Blackout (AC power supply stop)" may occur due to cabling trouble, breaker trip, or wrong operation. That is why measures against power failures must be secured for critical systems just in case. Responding to the case, we feature, this time, Nipron's "Nonstop power supply" in a bid to guard customer's critical system from power failures.

Nonstop power supply is...

Nipron's original equipped with uninterruptible power system installing power failure backup circuit inside. With a battery package connected, the power supply can keep on providing stable power to loads without any abnormity and fluctuation at input voltage problems such as blackout, momentary power failure, and voltage drop.

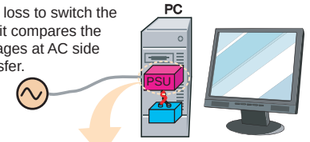
Space saving

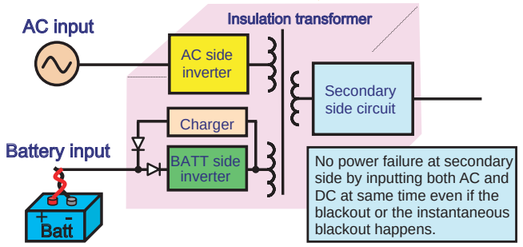
For Nonstop power supply, battery package for backup is able to be installed to 5-inch bay or 3.5-inch bay in PC (in the chassis) so that Nonstop power supply brings space saving unlike UPS which needs to be mounted outside.



Stable power supply without instantaneous blackout

Nonstop power supply has no time loss to switch the operation to battery at blackout as it compares the voltage level between inverter voltages at AC side and battery side for automatic transfer.
Thus it realizes uninterruptible power supply with high reliability.
Principle of typical Nonstop power supply is shown below.

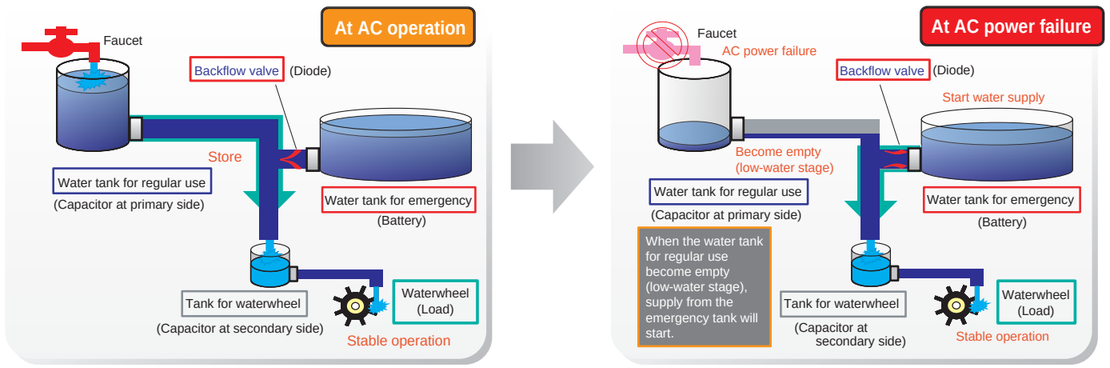




The power supply has two gates (input) and two engines (converter), one for AC side and the other for battery side, and completely isolated each other. Two inputs from AC side and battery side are connected at a time to one high frequency transformer. This is called 2 (two) gates and 2 (two) engines method (parallel converters) - Our patent circuit.
Power to load is provided from AC side normally. Once input voltage drop or power stop (blackout) occurs at AC side, the power is provided from battery side to compensate this situation. Accordingly, uninterruptible power environment is provided to secondary outputs so that no damage to computer system is given to secure continuous operation.

Comparing with flow of water:

Compared with flow of water, Nonstop power supply consists of regular-use tank for AC input and emergency use tank for battery input. The water level of the secondary is always kept constant as the water is always supplied from the tank with higher pressure. The principle can be explained in this way.



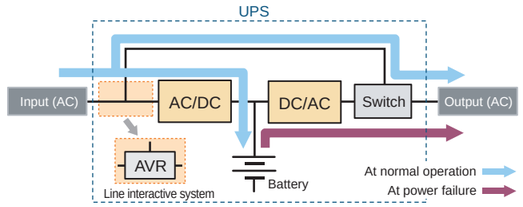
Differences from the UPS

UPS (uninterruptible power supply system) is well known as one of the measure for power failure. Here are some differences between UPS and Nipron's nonstop power supply.

Categories of UPS

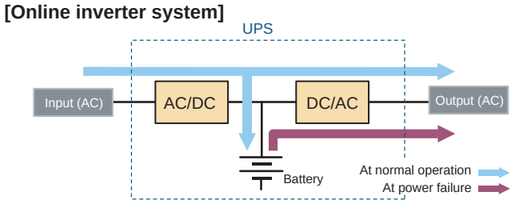
UPS is categorized mainly in two systems, one is standby power system (line interactive power system) and the other is online power system.

[Standby power system (Line interactive system)]



Standby power system normally outputs commercial alternating current as it is, and switches to battery power when blackout is detected or input voltage drops. For this reason, switching time loss is inevitable at system switching. On the other hand, for online power system, AVR (automatic voltage regulator) is added to standby power system to cover wider input voltage range than standby power system. There might cause some problems with equipments connected as output waveform of both systems at battery operation are usually pseudo-sine waves (square wave.)
Also, wave distortion of waveform of supply mains (input) leads UPS to judge blackout wrongly in many cases so that the system is switched to battery operation causing system shutdown. (In particular, switching mode equipments such as inverters used in railways generates wave distortion.)

[Online inverter system]



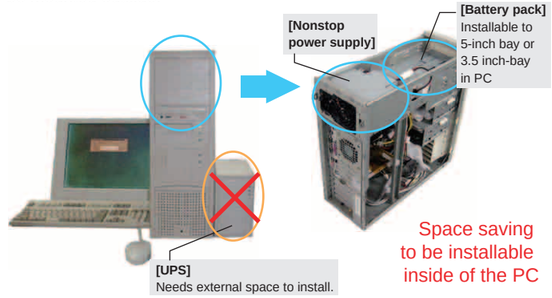
Online inverter system provides alternating current via inverter whether supply mains is normal or blackout. For this reason, switching time to battery operation is zero securing continuous output power.
Output waveform is usually sine wave and the circuit is costly complicated. However, in the case that the system is used under severe supply mains change, or stable output voltage is required for equipments connected, online power system should be selected for UPS.

Differences between Nonstop power supply and UPS

What is the difference between Nonstop power supply and UPS? Here are the answers compared with online inverter system UPS. (Because nonstop power supply is also high reliability power supply that can be operate stably without instantaneous power failure.)

Difference (1) Space saving:

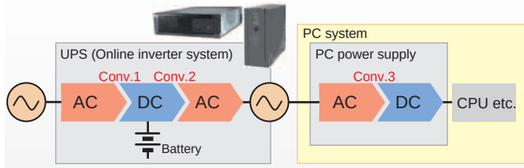
For Nonstop power supply, battery package for backup is able to be installed to 5-inch bay or 3.5-inch bay in PC (in the chassis) so that Nonstop power supply brings space saving unlike UPS which needs to be mounted outside.



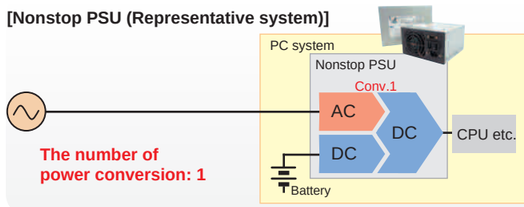
Difference (2) High efficiency and Energy saving:

Nowadays, "DC power dispatching system" that dispatches electric power to equipments in DC mode has become a topic as energy saving.
DC power dispatching system feeds power to equipments which operate with DC input voltage (almost equipments including PCs, of course) so that efficiency can be increased by decreasing the number of conversion from AC to DC to realize energy saving. As with DC power dispatching system, our Nonstop power supply can decrease the number of power conversion to PCs.
So to speak, "DC backup power supply."

[UPS (Online inverter system)]



[Nonstop PSU (Representative system)]

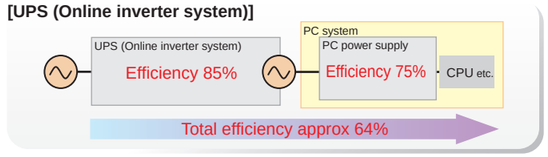


At normal operation, UPS conducts power conversion two times inside UPS. Additionally power conversion is conducted once in PC. Therefore the number of conversion becomes three times in total. Also, two conversions are processed at blackout in total. On the other hand, Nonstop power supply conducts only one conversion regardless of input voltage condition, normal or blackout remaining without lowering efficiency, resulting in energy saving in comparison with UPS. Moreover, as UPS and PC power supply is connected in series, when AC cable connecting UPS and PC power supply comes off accidentally, power to PC system is lost leading to most dangerous shutdown.
While, for Nonstop power supply, as the circuit is connected in parallel and also a battery is installed inside PC, this kind dangerous situation never happens and it gives advantage of Nonstop power supply over UPS in reliability as well.

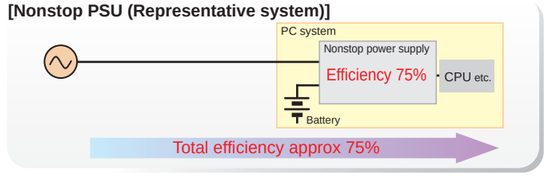
Difference of efficiency and space saving

Let's compare the actual differences between the number of power conversions. Suppose 85% efficiency for UPS, 75% for PC power supply, and also 75% for Nonstop power supply. Total efficiency for the system connected with UPS would be 64% (0.85 times 0.75) which is 11% lower than Nonstop power supply.

[UPS (Online inverter system)]



[Nonstop PSU (Representative system)]



In case of 24-hour continuous operation with PC load capacity 300W

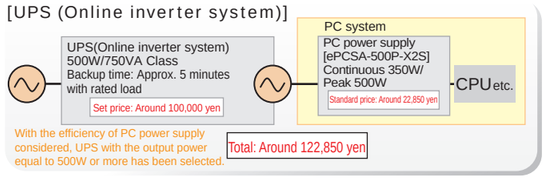
	Efficiency	Load capacity	Input capacity	Electric bills (/year)	CO_2 emission
UPS connected	64%	300W	469W	82,125 yen	1,552kg
Nonstop PSU	75%	300W	400W	70,080 yen	1,325kg

(*1) 20 yen/kWh conversion (*2) 0.378 kgCO_2/kWh conversion

Compared the efficiency with above data, nonstop power supply can reduce; Electric bills approx 12,045 yen/year, and CO_2 emission approx 227 kg/year.

Difference (3) Cost;

Cost differences between UPS connection and Nonstop power supply connection is shown below. (However, standard price for the power supply mentioned below do not include output harnesses.)



In comparison with the condition above, 70,000 yen or more cost reduction can be achieved for Nonstop power supply than UPS introduction.
(In addition, this comparison is on a basis of catalog price, not actual sales price. Also, as the price of UPS depends on manufacturers, take this comparison just as a guideline.)

Automatic shutdown available

With automatic shutdown software "NSP Pro 2" installed, critical data and the system can be protected from power failures such as unexpected blackout, voltage fluctuation, in conjunction with Nonstop power supply.
Supply mains status signals sent to serial port (COM port) via RS-232C from Nonstop power supply are monitored, and non-stop system operation for a short period of time is provided with blackout confirmation timer. And for blackout for a long period of time, Windows is automatically shut down by automatic shutdown function to shut down the system in safety.
(*)Some models allow USB communication. (OS standard UPS service for Windows2000/XP may be utilized, but time setting in detail is not available.)

Automatic shutdown software

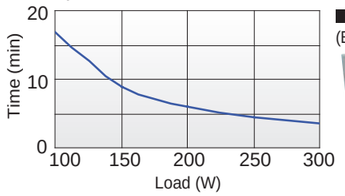
Model: NSP Pro 2

OS specification:
Windows 2000/XP/Vista/7

- Advanced time setting (blackout recovery monitoring time, etc.) that Windows standard UPS service does not cover is available.
- Visible and easy setting by GUI

Connect Nonstop power supply and PC with RS232C cable [WH2601-02] (PS2601-02)
(Some models allow USB communication.)

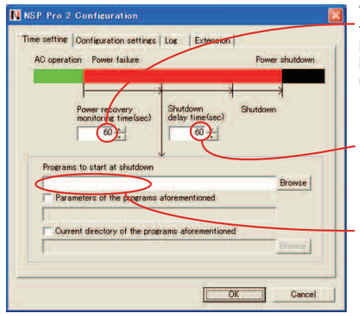
Backup time*



■Battery pack
(BS10A-H24/2.0L)

* Backup time when battery package BS10A-H24/2.0L is in use.
(Backup time varies on models of battery package.)
* Backup time is just a reference at first use, not guaranteed.
* Time till output shutdown from occurrence of blackout

Monitor screen (Time setting)

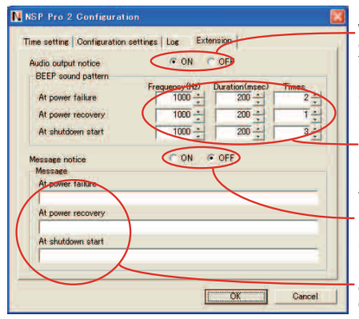


The time to judge that recovery is impossible after a blackout can be set up in second.

Shutdown delay time, after it is judged that recover is impossible, can be set up in second.

Specific program in "exe" and "bat" can be set up to operate at the moment is judged that recovery is impossible.

Monitor screen (Condition setting)



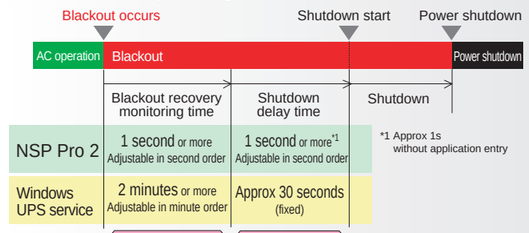
It allows to set up whether to deliver a noise at blackout, recovery, and the start of shutdown.

It allows to set up the frequency, time, and the number of beep noise at blackout, recovery, and the start of shutdown.

It allows to set up whether to display a message at blackout, recovery, and the start of shutdown.

It allows to change the content of the message delivered at blackout, recovery, and the start of shutdown.

[Shutdown sequence]



Other features

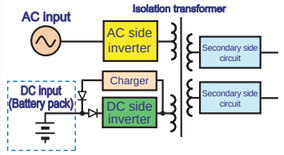
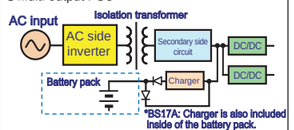
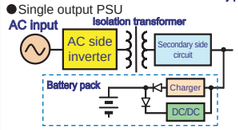
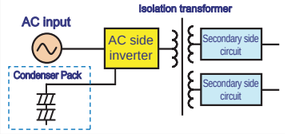
- ■Log output (13 kinds of logs are selectable)
- ■Reboot at blackout recovery
  System re-boot or not can be specified in the case that supply mains has been recovered during shutdown delay time.
- ■Ignoring time at initial blackout
  If blackout detection within a specific time is not desired after the start of Nonstop power supply monitoring service, the time can be specified in second order.
- ■Voice notice is available when abnormality occurs.
- ■Conjunction with user application is available with communication interface installed.

Summary

Nonstop power supply achieves high efficiency by minimizing the number of power conversion to one allowing reduction of electricity cost and CO_2 emission. In addition, you could gain a lot of merits such as higher reliability, space saving, and system introduction cost saving with Nonstop power supply implementation.
For models, many are lined up as shown in the following pages including batteries such as Lead-acid battery, Ni-MH battery to choose from.
Pick up our Nonstop power supply for your critical system protection from power failures.

Categories of Nonstop power supply system

Nonstop power supply is categorized as following table according to its backup time or use.

Nonstop power supply system	Features	Adopted model
2G-2E system 	Our original circuit (Patented) has 2 (two) inputs (gates) for AC and DC for each and 2 (two) converters (engines) realizing parallel converter system to receive both AC and DC for one high frequency transformer. We call this system 2G-2E (2 gates-2 engines) circuit. Its feature brings you compact, lightweight and high efficiency due to one transformer which handles AC input, DC input, and DC output. Also, several models have its GND of DC input (battery) isolated so that operation without affection by noise can be achieved even though multiple equipments are connected to one battery. In addition, Nonstop power supply with 2G-2E system have two categories. One is for only backup purpose at blackout (startup with DC input is unavailable.), and the other for both AC + DC input (startup with single DC input is available.) Both categories are lined up.	**[DC startup unavailable]** eNSP3-450P-S20 series mNSP3-450P-S20 series eNSP-300P series aNSP3-250P series eNSP3-200-S10-H1 NSP3-150-F2S GNSP3-750 series **[DC startup available]** NSP2-250-D2S NSP2-250-F2S cNSP-250-D4S vNSP-300P-X4S
Secondary side backup system ●Multi-output PSU  ●Single output PSU 	In this system, battery is connected to secondary line. For ATX output (multi outputs), as outputs are delivered via DC-DC conversion after AC-DC conversion, the efficiency is lower than 2G-2E system. However, this system keeps almost the same efficiency as 2G-2E level as a result by improving the efficiency of DC-DC converter applying synchronous rectifying circuit. Also, the efficiency at DC input (battery) operation is the same as the efficiency of DC-DC converter (90% or more) resulting in longer backup time than 2G-2E system. For single output power supply, output is delivered via DC-DC converter (booster circuit) with charger circuit installed in battery package side. Additionally, isolation between DC input and DC output is unavailable. Besides, this model is designed only for backup at blackout (Startup with DC input is unacceptable.)	**[DC startup unavailable]** NSP6F-220P-S10 PCFL-180P-X2S2 PCFD-180P-X2S OZP-120 24V series OZP-170 24V series GPSA-360 24V series GPSA-750 24V series
Primary side backup system 	In this system, capacitor package shall be connected (or extended) to primary rectifying capacitor. Backup time is shorter (approx. 1 sec with 180W load) than battery and this system is the best way at momentary blackout. Moreover, due to quick charging, this system can handle the environment where momentary blackout frequents	eNSP4-500P series

Product lineup of Nonstop power supply

2G-2E system (DC startup unavailable,Common GND between Battery-DC output)

eNSP3-450P-S20 series

0A as min load current for all outputs, high-powered Nonstop power supply

ATX Continuous 350W Peak 450W

Output connector (Optional)

Safety standard	UL	CSA	EN	CE	CCC*

*CCC compliant product: eNSP3-450P-C20 series

AC input	85-264V (Worldwide input)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	20A	22A	22A	0.5A	2A
	160W max				
	334W max				
	350W max				
Peak current/power (Within 5s)	30A	33A	30A	0.5A	2.5A
	200W max				
	432W max				
	450.5W max				
Min current	0A	0A	0A	0A	0A
W×H×D(mm)	150×86×140 PS/2 size				

-H1V	With RS232C signal unit
-H6V	With USB signal unit

Applicable battery pack

BS11A-P24/2.3L(K)	5 inch bay fixed type, Lead-acid battery
RBS02A-P24/2.3L(K)	5 inch bay removable type,Lead-acid battery
BS12A-P24/5.0L	5 inch bay double unit fixed type,Lead-acid high capacity battery
BS10A-H24/2.0L	5 inch bay fixed type,Ni-MH battery
BS22A-H24/2.0L	

mNSP3-450P-S20 series

Medical standard compliant high-powered Nonstop power supply

ATX Continuous 301W Peak 450W

Output connector (Optional)

Safety standard	UL	CSA	EN	CE	CCC

AC input	85-264V (Worldwide input)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	20A	22A	22A	0.5A	2A
	160W max				
	285W max				
	301W max				
Peak current/power (Within 5s)	30A	33A	30A	0.5A	2.5A
	200W max				
	432W max				
	450.5W max				
Min current	0A	0A	0A	0A	0A
W×H×D(mm)	150×86×140 PS/2 size				

-H7V	With RS232C signal unit
-H6V	With USB signal unit

Applicable battery pack

BS11A-P24/2.3L(K)	5 inch bay fixed type, Lead-acid battery
RBS02A-P24/2.3L(K)	5 inch bay removable type,Lead-acid battery
BS12A-P24/5.0L	5 inch bay double unit fixed type,Lead-acid high capacity battery
BS10A-H24/2.0L	5 inch bay fixed type,Ni-MH battery
BS22A-H24/2.0L	

eNSP-300P series

Nonstop power supply with Removable backup function

ATX Continuous 203W Peak 303W

Output connector -S20 -1*S / -L20 -1*S

Safety standard	UL	CSA	EN	CE	CCC

AC input	85-264V (Worldwide input)					
Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max current/power (Continuous)	14A	21A	10A	0.3A	0.8A	1.5A
	125W max					
	185W max					
	203.6W max					
Peak current/power (Within 5s)	28A	30A	15A	0.3A	0.8A	2.5A
	180W max					
	280W max					
	303.6W max					
Min current	0A	1A	0A	0A	0A	0A
W×H×D(mm)	150×86×155 PS/2 mounting size					

-*20-11S	With RS232C signal unit
-*20-16S	With USB signal unit

Applicable battery pack

BS05A-P24/2.2L(K)	5 inch bay fixed type, Lead-acid battery
RBS01A-P24/2.2L(K)	5 inch bay removable type,Lead-acid battery
BS06A-H24/2.5L	5 inch bay fixed type,Ni-MH battery
BS06B-H24/2.5L	

aNSP3-250P series

Low cost type Nonstop power supply with input selection SW

ATX Continuous 203W Peak 251W

Output connector -S20 / -S21

Safety standard	UL	CSA	EN	CE	CCC

AC input	90-132V, 180-264V (Switching system)					
Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max current/power (Continuous)	14A	21A	10A	0.3A	0.8A	1.5A
	125W max					
	185W max					
	203.6W max					
Peak current/power (Within 5s)	20A	25A	13A	0.3A	0.8A	2A
	155W/35A max					
	230W max					
	251.1W max					
Min current	0A	2A	0A	0A	0A	0A
W×H×D(mm)	150×86×140 PS/2 size					

Applicable battery pack(-S20)

BS05A-P24/2.2L(K)	5 inch bay fixed type, Lead-acid battery
RBS01A-P24/2.2L(K)	5 inch bay removable type,Lead-acid battery
BS06A-H24/2.5L	5 inch bay fixed type,Ni-MH battery
BS06B-H24/2.5L	

Applicable battery pack(-S21)

BS11A-P24/2.3L	5 inch bay fixed type, Lead-acid battery
RBS02A-P24/2.3L	5 inch bay removable type,Lead-acid battery
BS12A-P24/5.0L	5 inch bay double unit fixed type,Lead-acid battery

eNSP3-200-S10-H1

Nonstop power supply with 3.5 inch battery pack

ATX Continuous 202W

Output connector

Safety standard	UL	CSA	EN	CE	CCC

AC input	85-264V (Worldwide input)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	14A	21A	10A	0.8A	2.5A
	125W max				
	185W max				
	202.1W max*				
Min current	0A	1A	0A	0A	0A
W×H×D(mm)	150×86×140 PS/2 size				

*Shall be 100W max during backup operation

Applicable battery pack

BP03A-H16/2.5L	3.5 inch bay size,Ni-MH battery
BS03A-H16/2.5L	3.5 inch bay fixed type,Ni-MH battery

NSP3-150-F2S

With +24V Output Nonstop power supply

Multi Continuous 152W

Output connector

*Out of safety standard

Safety standard	UL	CSA	EN	CE	CCC

AC input	85-264V (Worldwide input)				
Output voltage	+5V	+12V	+24V	-12V	+5VSB
Max current/power (Continuous)	20A	5A	2A	0.5A	1A
	152W max				
Min current	1.5A	0A	0A	0A	0A
W×H×D(mm)	150×86×140 PS/2 size				

Applicable battery pack

BS05A-P24/2.2L(K)	5 inch bay fixed type, Lead-acid battery
RBS01A-P24/2.2L(K)	5 inch bay removable type,Lead-acid battery
BS06A-H24/2.5L*	5 inch bay fixed type,Ni-MH battery
BS06B-H24/2.5L*	

2G-2E system (DC startup unavailable,Isolated Battery between GND)

Product lineup of Nonstop power supply

2G-2E system (DC startup available, Battery-GND isolated)

GNSP3-750 series

All in one type system power supply with isolated 2ch outputs

With installing device server optional board, remote monitoring, communication, and control via the internet are available.

Single Continuous 360W Peak 540W / ATX Continuous 348W Peak 527W

	24V+24V			12V+12V			24V+12V		
AC input	85-264V (Worldwide input)								
Model name	GNSP3-750-242405-TRP			GNSP3-750-121205-TRP			GNSP3-750-241205-TRP		
Output voltage	+24V	+24V	+5VSB	+12V	+12V	+5VSB	+24V	+12V	+5VSB
Max current/power (Continuous)	15A	15A	1.5A	30A	30A	1.5A	15A	30A	1.5A
	727.5W max			727.5W max			727.5W max		
Peak current/power (Within 5s)	22.5A	22.5A	1.5A	45A	45A	1.5A	22.5A	45A	1.5A
	1087.5W max			1087.5W max			1087.5W max		
Min current	0A	0A	0A	0A	0A	0A	0A	0A	0A
W × H × D (mm)	82 × 128 × 235 (2U wide/3U high)								

Safety standard: UL / CSA / EN / CE / KCC

Applicable battery pack

BS19A-P48/5.0L : 4U/3U size fixed type, Lead-acid battery

24V+ATX

Connectors for ATX output (Optional)

Main (20pin) / Main (24pin) / 12V (4pin) / 12V (8pin) / PCI-E (6pin) / x5 / S-ATA x4 / x1

AC input	85-264V (Worldwide input)					
Model name	GNSP3-750-24X05-TRP					
Output voltage	+24V	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	15A	14A	21A	28A	0.3A	1.5A
	348.1W max					
	708.1W max					
Peak current/power (Within 5s)	22.5A	20A	30A	40A	0.3A	1.5A
	527.5W max					
	1067.5W max					
Min current	0A	0A	0A	0A	0A	0A
W × H × D (mm)	82 × 128 × 235 (2U wide/3U high)					

12V+ATX

connectors for ATX output (Optional)

Main (20pin) / Main (24pin) / 12V (4pin) / 12V (8pin) / PCI-E (6pin) / x5 / S-ATA x4 / x1

AC input	85-264V (Worldwide input)					
Model name	GNSP3-750-12X05-TRP					
Output voltage	+12V	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	30A	14A	21A	28A	0.3A	1.5A
	348.1W max					
	708.1W max					
Peak current/power (Within 5s)	45A	20A	30A	40A	0.3A	1.5A
	527.5W max					
	1067.5W max					
Min current	0A	0A	0A	0A	0A	0A
W × H × D (mm)	82 × 128 × 235 (2U wide/3U high)					

2G-2E system (DC Startup available, Battery-GND isolated)

NSP2-250-D2S

DC startup available Nonstop power supply

Output connectors: Main (20pin) / x5 / x1

ATX Continuous 230W

Safety standard	UL	CSA	EN	CE	KCC
AC input	85-264V (Worldwide input)						
DC input	24V (20-32V)						
Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max current/power (Continuous)	10A	23A	12A	0.5A	0.5A	1A
	133W max					
	217W max					
	230.5W max					
Min current	0A	1.5A	0A	0A	0A	0A
W × H × D (mm)	150 × 86 × 140 PS/2 size					

Applicable battery pack

BS05A-P24/2.2L(K)	5 inch bay fixed type, Lead-acid battery
RBS01A-P24/2.2L(K)	5 inch bay removable type, Lead-acid battery
BS06A-H24/2.5L*	5 inch bay fixed type, Ni-MH battery
BS06B-H24/2.5L*	

*Shall be out of safety standard.

NSP2-250-F2S

AT output type Nonstop power supply with 24V output

Output connectors: AT / x2 / x1

AT Continuous 240W Peak 255W

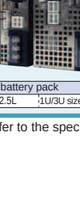
Safety standard	UL	CSA	EN	CE	KCC
AC input	90-264V (Worldwide input)						
DC input	24V (20-32V)						
Output voltage	+5V	+12V	+24V	-5V	-12V	+5VSB
Max current/power (Continuous)	10A	4A	6A	0.2A	0.2A	1A
	232W max					
	240.4W max					
Peak current/power (Within 10s)	10A	6A	8A	0.5A	0.5A	1A
	240W max					
	255W max					
Min current	0.5A	0A	0A	0A	0A	0A
W × H × D (mm)	150 × 86 × 140 PS/2 size					

Applicable battery pack

BS05A-P24/2.2L(K)	5 inch bay fixed type, Lead-acid battery
RBS01A-P24/2.2L(K)	5 inch bay removable type, Lead-acid battery
BS06A-H24/2.5L	5 inch bay fixed type, Ni-MH battery
BS06B-H24/2.5L	

cNSP-250-D4S

Nonstop power supply for Compact PCI



cPCI Continuous 250W

Applicable battery pack

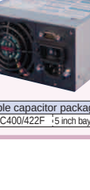
BS19A-P48/5.0L*1	4U/3U size fixed type, Lead-acid battery
PS2866*2	Ni-MH battery with 6U/10HP size VME rack type

*1 Connection part shall be modified for battery connection.
*2 Please ask us about detail information of PS2866.

Safety standard	UL	CSA	EN	CE	KCC
AC input	90-264V (Worldwide input)					
DC input	48V (40-59V)					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	10A	30A	4A	2A	1A
	173W max				
	250W max				
Min current	0A	2A	0A	0A	0A
W × H × D (mm)	40.3 × 268 × 171				

vNSP-300P-X4S

Nonstop power supply for VMEbus



VME Continuous 250W Peak 300W

Applicable battery pack

BS19A-P48/5.0L*1	4U/3U size fixed type, Lead-acid battery
PS2866*2	Ni-MH battery with 6U/10HP size VME rack type

*1 Connection part shall be modified for battery connection.
*2 Please ask us about detail information of PS2866.

Safety standard	UL	CSA	EN	CE	KCC
AC input	85*-264V (Worldwide input) *Safety standard: from AC 90V				
DC input	48V (40-65V*) *Safety standard: up to DC 59V				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	15A	35A	5A	4A	0.5A
	39A max				
	250.7W max				
Peak current/power (Within 10s)	17A	40A	7A	5A	0.5A
	40A max				
	300W max				
Min current	0A	2A	0A	0A	0A
W × H × D (mm)	50.4 × 261.9 × 175.6				

Secondary side backup system (DC startup unavailable, Common GND between battery and DC output)

NSP6F-220P-S10

SFX size, small type Nonstop power supply

Output connectors: Main 20-pin / 12V (4pin) / x3 / S-ATA x4 / x1

SFX Continuous 160W Peak 220W

Safety standard	UL	CSA	EN	CE	KCC
AC input	85-264V (Worldwide input)					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	10A	10A	10A	0.3A	1.5A
	160W max				
Peak current/power (Within 5s)	10A	10A	14A	0.3A	1.8A
	220W max				
Min current	0A	0A	0A	0A	0A
W × H × D (mm)	100 × 63.5 × 145				

Applicable battery pack

BP03A-H16/2.5L	3.5 inch bay size, Ni-MH battery
BS03A-H16/2.5L	3.5 inch bay fixed type, Ni-MH battery

PCFL-180P-X2S2

Fanless Nonstop power supply

Output connectors (Optional): Main (20pin) / Main (24pin) / x5 / S-ATA x4 / x1

Continuous 90W Peak 180W

A case with SFX mounting surface is also available. Please ask us for detail.

Safety standard	UL	CSA	EN	CE	KCC
AC input	85-264V (Worldwide input)					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous) (Basic structure)	at natural air cooling	10A	10A	7.5A	0.3A	1.5A
		60W max				
		Within output power cross regulation*1 (90W max)				
Max current/power (Continuous) (With special AI heat sink)	at natural air cooling	10A	10A	10A	0.3A	1.5A
		70W max				
		Within output power cross regulation*1 (102W max)				
Max current/power (Continuous) (With external fan)	at forced air cooling*2	10A	10A	10A	0.3A	2A
		Within output power cross regulation*1 (105W max)				
Peak current/power (Within 5s)		10A	10A	15A	0.3A	2A
		Within output power cross regulation*1 (180W max)				
Min current		0A	0A	0A	0A	0A
W × H × D (mm)	93 × 55 × 160					

*1 Please refer to the specification for detail.
*2 At forced air cooling, airflow of the component side shall be 0.5m³/min or more.

Applicable battery pack

BS17A-H24/2.0L	3.5 inch bay fixed type, Ni-MH battery

PCFD-180P-X2S

Fanless Nonstop power supply with DC input

Output connectors (Optional): Main (20pin) / Main (24pin) / x5 / S-ATA x4 / x1

Continuous 90W Peak 180W

A case with SFX mounting surface is also available. Please ask us for detail.

Safety standard	UL	CSA	EN	CE	KCC
DC input	20-36V					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous) (Basic structure)	at natural air cooling	10A	10A	7.5A	0.3A	1A
		60W max				
		Within output power cross regulation*1 (90W max)				
Max current/power (Continuous) (With special AI heat sink)	at natural air cooling	10A	10A	8.5A	0.3A	1A
		70W max				
		Within output power cross regulation*1 (102W max)				
Max current/power (Continuous) (With external fan)	at forced air cooling*2	10A	10A	10A	0.3A	1.5A
		Within output power cross regulation*1 (105W max)				
Peak current/power (Within 5s)		10A	10A	15A	0.3A	1.8A
		Within output power cross regulation*1 (180W max)				
Min current		0A	0A	0A	0A	0A
W × H × D (mm)	93 × 55 × 160					

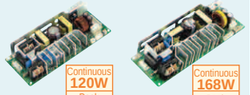
*1 Please refer to the specification for detail.
*2 At forced air cooling, airflow of the component side shall be 0.5m³/min or more.

Applicable battery pack

BS17A-H24/2.0L	3.5 inch bay fixed type, Ni-MH battery.

OZP-120 24V series OZP-170 24V series

Nonstop function mounted to the general purpose power supply



Continuous 120W Peak 216W / Continuous 168W Peak 300W

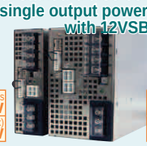
Safety standard	UL	CSA	EN	CE	KCC
AC input	85-264V (Worldwide input)					
Model name	OZP-120-24-*B*		OZP-170-24-*B*		
Output voltage	+24V		+24V		
Max current/power (Continuous) (Natural air cooling)	5A		7A		
	120W		168W		
Max current/power (Continuous) (Forced air cooling)	6.3A		8.8A		
	151.2W		211.2W		
Peak current/power (Within 5s)	9A		12.5A		
	216W		300W		
Min current	0A		0A		
W × H × D (mm)	73 × 35 × 180 (Board type) 83.8 × 45 × 210 (W/ chassis and cover)		73 × 40 × 222 (Board type) 83.8 × 51 × 252 (W/ chassis and cover)		

Applicable battery pack

BS14A-H24/2.5L	1U/3U size fixed type, Ni-MH battery

GPSA-360 series GPSA-750 series

Medical standard also compliant, single output power supply with 12VSB output



Continuous 360W Peak(max) 600W / Continuous 720W Peak(max) 1200W

Models with medical standard acquired are "mGPSA-360 and mGPSA-750" (mGPSA-750: during preparation).
(GPSA series are medical standard compliled product.)

Safety standard*	UL	CSA	EN	CE	KCC

*Acquired model: GPSA-360-24-TP (Other models are scheduled to be acquired.)

AC input	85-264V (Worldwide input)			
Model name	GPSA-360-24-TP		GPS A-750-24-TP	
Output voltage	+24V	+12VSB	+24V	+12VSB
Output current/power (Continuous)	15A	0.3A	30A	0.3A
	360W	3.6W	720W	3.6W
Output current/power (Peak (5s) AC 100V)	20.8A	0.3A	40A	0.3A
	499.2W	3.6W	900W	3.6W
Output current/power (Peak (5s) AC 200V)	25A	0.3A	80A	0.3A
	600W	3.6W	1200W	3.6W
Min current	0A	0A	0A	0A
W × H × D (mm)	41 × 128 × 230 (1U wide/3U high)		82 × 128 × 235 (2U wide/3U high)	

Applicable battery pack

BS14A-H24/2.5L	1U/3U size fixed type, Ni-MH battery

*Please refer to the specification data sheet for more detail.

Primary side backup system (intended to backup at instantaneous power failure by electrolytic capacitor)

eNSP4-500P series

The best choice for instantaneous power failure measure. Capacitor backup power supply

ATX Continuous 350W Peak 500W

Output connectors (Optional): Main (20pin) / Main (24pin) / 12V (4pin) / 12V (8pin) / PCI-E (6pin) / x5 / S-ATA x4 / x1

Safety standard	UL	CSA	EN	CE	KCC
AC input	85-264V (Worldwide input)					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	20A	22A	22A	0.5A	2A
	160W max				
	334W max				
	350W max				
Peak current/power (Within 5s)	30A	33A	30A	0.5A	2.5A
	200W max				
	482W max				
	500.5W max				
Min current	0A	0A	0A	0A	0A
W × H × D (mm)	150 × 86 × 140 PS/2 size				

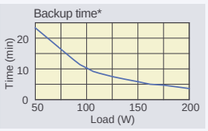
Applicable capacitor packages

BS13A-EC400/422F	5 inch bay fixed type, capcitor packages

Battery packages

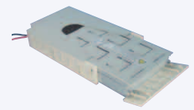
BS05A-P24/2.2L(K) BS11A-P24/2.3L(K)

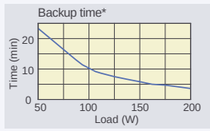
Lead | 5" bay



RBS01A-P24/2.2L(K) RBS02A-P24/2.3L(K)

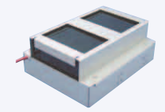
Lead | 5" bay/Removable

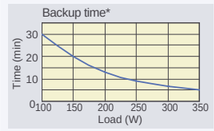




BS12A-P24/5.0L

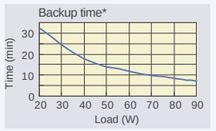
Lead | 5"2 bay





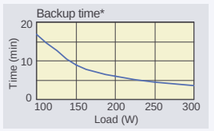
BS17A-H24/2.0L

Ni-MH | 3.5" bay



BS10A-H24/2.0L BS22A-H24/2.0L (See below)

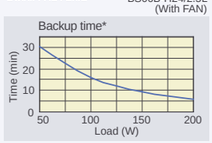
Ni-MH | 5" bay



BS06A-H24/2.5L BP03A-H16/2.5L

Ni-MH | 5" bay

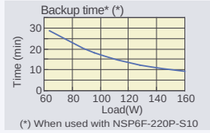
BS06A-H24/2.5L / BS06B-H24/2.5L (With FAN)



BS03A-H16/2.5L BP03A-H16/2.5L

Ni-MH | 3.5" bay

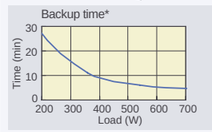
BS03A-H16/2.5L / BP03A-H16/2.5L



(*) When used with NSP6F-220P-S10

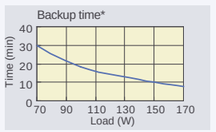
BS19A-P48/5.0L

Lead | 3U/4U



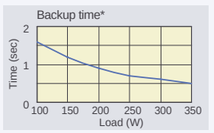
BS14A-H24/2.5L

Ni-MH | 1U/3U



BS13A-EC400/422F

Capacitor | 5" bay



*The backup time is only for reference at initial use, NOT guaranteed.
*Line charts shows time length from blackout to power supply shutdown.

Display battery Life span & Condition! Schedule operation available!

Intelligence Battery Pack "Mi-Pack II Manager"

Server's automatic operation is possible!

Calculation

Life span based on changes of features

a. Changes of inner resistance
b. Changes of unbalance voltage when discharging

Life span based on use frequency and total time

c. Depth of cycle discharge
d. Total discharge capacity and depth of discharge
e. Ambient temperature
f. Total time after the start of using

Judgment

When difference between default value and present value exceeds the fixed value

Among the values gained by c through f, the one with the smallest value is mainly used to display the remaining time.
When the lifetime expires, an alarm is delivered and can be monitored as event information.

Notice

E-mail is delivered to max 5 addresses.

Using dedicated control software (Mi-Pack II Manager) enable to manage schedules in the PC (automatic start-up/shutdown). Not just specific date, you can also setup the schedule per week. That means, for example, daily start-up/shutdown operation at the work place as personal office if setting schedule by fixed day/time. Automatic operation is also available for production line, monitoring system, and others.

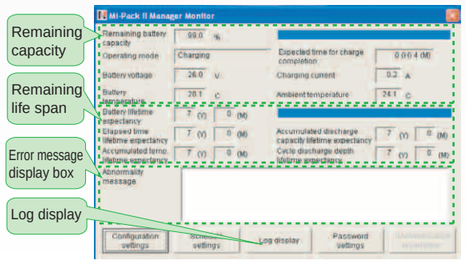
Announce via e-mail through the Internet

E-mail information

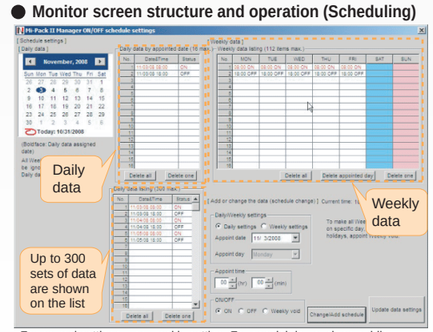
- Start/stop monitoring
- Blackout/recovery occurred
- Battery voltage decreased
- Operate blackout shutdown
- Application registration
- Application start up failure
- Operate schedule shutdown
- Life span based on time after the start of using
- Life span based on total discharge capacity
- Life span based on ambient temperature
- Life span based on depth of cycle discharge
- Battery voltage difference prediction
- Inner resistance life span prediction
- Power supply fan abnormality/recovery
- Discharging current abnormality/recovery
- Battery pack fan abnormality/recovery
- Battery voltage rise abnormality/recovery
- Battery voltage decline abnormality/recovery
- Battery temperature rise abnormality/recovery
- Charging current abnormality

Gives notice for battery's life span, so periodical replacement of the battery pack will not be needed. It may possibly be used for more than 7 years without battery replacement.

Monitor screen structure and operation (monitor)



Monitor screen structure and operation (Scheduling)



For normal settings, use weekly setting. For special day such as public holiday and new year, use daily setting and modify or cancel the set-up time.

OS specification

- Windows Server 2008 R2 (x64)
- Windows Server 2008 R2 Server Core (x64)
- Windows Server 2008 (x86/x64)
- Windows Server 2008 Server Core (x86/x64)
- Windows Server 2003 R2 (x86/x64)
- Windows 7 (x86/x64)
- Windows Vista (x86)
- Windows XP (x86)
- Windows 2000 SP4 (x86) (IE5.01 or later)

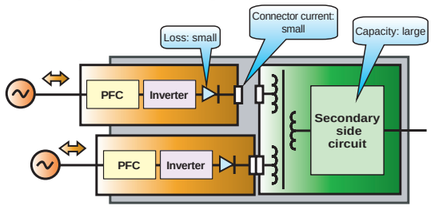
Application version of Nonstop power supply!

Redundant power supply brought by brand-new idea born from Nonstop circuit

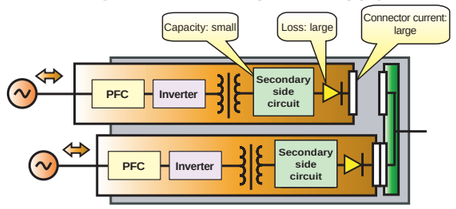
Primary redundant system

Primary redundant power supply is redundant power supply that only primary side is redundant and secondary side is common realized by Nipron's unique circuit technology. Improving reliability of primary side that is likely to be damaged by surge stress caused by lightning surge and high-voltage switching circuit including PFC circuit, and thermal reliability, this brand-new redundant power supply is designed to have more reasonable margin than normal redundant power supply (full redundant power supply) even in a limited space.

Primary redundant system



Existing full redundant power supply



	Primary redundant system (Nipron system)	Existing full redundant power supply (Power supply without enough space)
Efficiency	- Power loss of mutual interference diode is several wattage or less as it is mounted in primary side. - As secondary side is in common, component size is one rank or two larger to contribute to higher efficiency due to lower resistance (77% typical at AC 240V). *Our new product achieves high efficiency 85% typ at AC 240V.	- As Oring diode for parallel operation is mounted in each main output, power loss is 10W to some 10W to raise temperature and reduce efficiency of the power supply. - With components squashed up in a small space, power loss caused by chokes or electric capacitors is large.
Simplicity of circuit and number of components	- Number of components is fewer as secondary side is in common, and it has margin in component size to keep clearance between them. Also it has large derating of part rating.	- Same secondary circuit is doubled to meet full redundancy to increase components and likely to cause mutual touching of components.
When one unit of redundant unit fails;	- By making secondary side in common and having enough margin in components, even one primary unit can afford continuous full power with no problem including primary unit components.	- With load sharing between 2 units, when one unit fails, the other unit has to burden all output power limiting long time operation (one hour or longer) as thermal design has no margin.

Products line-up

pNSP2U-550P-AAS

AC input	85-264V (Worldwide input)						
Output valtage	+3.3V	+5V	+12V1	+12V2	+12V3	-12V	+5VSB
Max current/power (Continuous)	20A	20A	18A	12A	10A	0.5A	2A
	25A max		35A max				
	427.6W max						
Peak current/power (Within 5s)	20A	20A	18A	12A	16A	0.5A	2A
	25A max		44A max				
	550W max						
Min current	0A	0A	0A	0A	0A	0A	0A
W × H ×D (mm)	108 × 83.8 × 400						

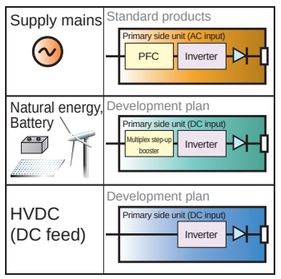
pNSP2U-330P-AAS

AC input	85-264V (Worldwide input)				
Output valtage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	10A	10A	18A	0.5A	2A
	260W max				
Peak current/power (Within 5s)	15A	15A	25A	0.5A	2A
	312W max				
	328W max				
Min current	0A	0A	0A	0A	0A
W × H × D (mm)	108 × 83.8 × 300				

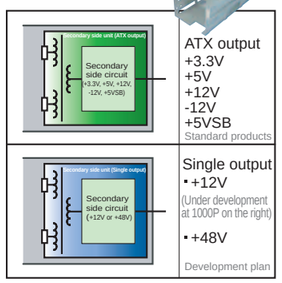
Wide application of Primary redundant power supply

By changing primary unit in primary redundant power supply, disparate inputs such as natural energy (photovoltaic cells, wind generation, etc.) and HVDC become acceptable. For example, by inputting two disparate inputs, commercial input + natural energy (photovoltaic cells), reduction of CO_2 emission is expected utilizing best mix. Burden ratio between two type of inputs (disparate inputs) is adjustable by external signal so that CO_2 emission minimization program becomes available. In addition, secondary unit for single output (12V, 48V) and ATX specification can be ready.

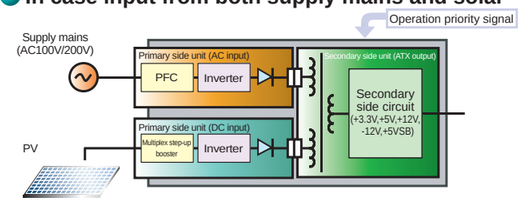
Primary side unit



Secondary side unit



In case input from both supply mains and solar



At normal operation, energy source alternates between commercial power and photovoltaic cells. By using operation first signal, either of those sources can be given priority in operation for effective use. For example, photovoltaic cells comes first during daylight(*), and in the night commercial power comes first utilizing midnight power effectively.

(*) In the case that power is not available from photovoltaic cells, feeding is switched automatically to commercial source.

New product

Higher efficiency

Newcomers with full model change

pNSP2U-1000P series

Highly increased power, more compact

Continuous 430W ➤ 800W
Peak 550W ➤ 1000W

Length400mm ➤ 350mm

1000W type is about to join pNSP2U series with Nipron's unique circuit technology "Primary Redundant system" embedded. With synchronous rectifying circuit adopted and improved, high efficiency, compact and higher power have been brought to meet customers' request.

Products line-up

In addition to 330W peak and 550W peak power, high power 1000W peak type, that is 12V single output and ATX output type, joins this time featuring high efficiency and compact.

Category	Model name	Output type	Length (mm)	Output power (W) continuous/peak	Rectifying	Operation efficiency (%) 100V/240V
Existing	pNSP2U-330P	ATX	300	280/330	Diode	73/76
	pNSP2U-550P	ATX	400	430/550	Diode	74/77
New product	pNSP2U-1000P	ATX	350	800/1000	Synchronous rectifying	82/85
	pNSP2U-1000P	12V single output	350	800/1000	Synchronous rectifying	83/86

Input/Output specification

ATX output type

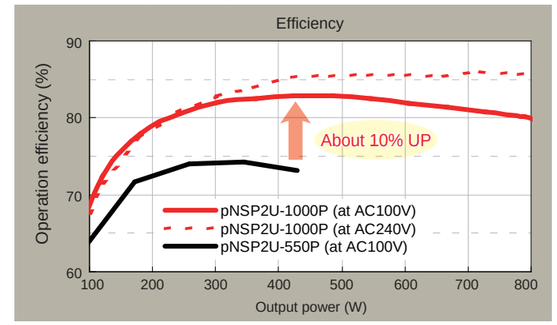
AC input	85-264V (Worldwide input)				
Output valtage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/power (Continuous)	20A	20A	63.3A	0.5A	2A
	66W	100W	759.6W	6W	10W
	775.6W max				
Peak current/power (Within 5s)	21A	21A	66A	0.5A	2A
	69.3W	105W	792W	6W	10W
	982.3W max				
Min current	0A	0A	0A	0A	0A
W × H × D (mm)	108 × 83.8 × 350				

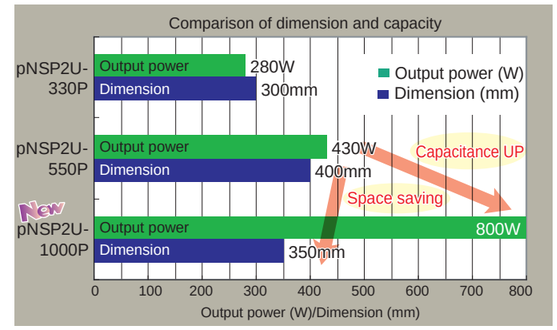
12V Single output type

AC input	85-264V (Worldwide input)	
Output valtage	+12V	+5VSB
Max current/power (Continuous)	66A	2A
	792W	10W
	802W max	
Peak current/power (Within 5s)	83A	2A
	996W	10W
	1006W max	
Min current	0A	0A
W × H × D (mm)	108 × 83.8 × 350	

High efficiency

With input unit circuit improved, and with high performance parts and synchronous rectifying circuit adopted, high efficiency is at your hand. Surprisingly, approx. 10% higher efficiency than existing models in addition to higher output power and compact design at a time.





Other features

Erroneous operation prevention system and AC cable coming-off prevention wire

Operation error prevention function is installed at AC switch section so that you do not have to worry about turning off the power by mistake. Also, power cable will not come off by mistake as AC cable connection section has coming off prevention wire installed.

In case of unit failure

Even if one of the primary unit become failure, continuous operation with the other unit is available.Also, this redundant unit is hot-swappable in replacing the defective unit with non-defective one.

Revolution changing the medical world

Special topics about medical power supply

For PC system of colorful diagnostic imaging, speedy dynamic picture image, and ATX power supply which provides DC power to speedy& high capacity video card using more and more evolving GPU, 800W-1000W class products are required. Also, other medical equipment has DC power source.

This time, Nipron has developed various kinds of medical standards complied power supply, and we feature requirements and specifications that are specially needed as medical electric systems.

What is Medical Standards Management Board?

- Standard which intend to medical electrical system
  Requirements about electric systems used in clinical practice are contained. Also contained is technical requirement which exceed general information processing system about basic requirement of safety such as electrification, insulation.
- International Standard
  Based on IEC60601-1, there are various specifications.

Classification		IEC specification NO. (Establishment date)	IEC specification NO. (Establishment date)
Safety	Basic Standard	IEC60601-1 (1988) IEC60601-1 IEC60601-1	・Medical electrical equipment: general requirement of safety ↔JIS T 0601-1(1999)
		IEC60601-1-1 (1992) IEC60601-1-1	・Safety requirement of medical electrical system ↔JIS T 0601-1-1(1999)
		IEC60601-1-2 (1993)	・Electromagnetic compatibility (EMC) ―requirement and test
		IEC60601-1-3 (1994)	・General requirement about radiation protection
		IEC60601-1-4 (1996)	・Medical electrical system for programming―safety
		IEC60601-1-5 (200X)	・Image quality and dose of Diagnostic X-ray apparatus
	Particular Standard	IEC60601-2-28 (1993)	・X-ray source assembly―safety
		IEC60601-2-32 (1994)	・Related equipment(devices) safety
		IEC60601-2-45/ Ed. 1(1998) →IEC60601-2-45/Ed. 2(2001) →IEC60601-2-45/Ed. 3(200X)	・Breast X-ray apparatus and breast filming stereotactic equipment ↔JIS Z 4751-2-45(2001)
Quality Management	Basic Standard	IEC61223-1 (1993)	・Evaluation and routine determination of quality maintenance for Medical picture category: general rule ↔JIS Z 4751-2-1(2001)
	Particular Standard	IEC61223-2-10 (1999)	・Invariance test for breast X-ray apparatus
		IEC61223-3-2 (1996) →IEC61223-3-2/Ed. 2(200X)	・Acceptance for breast X-ray apparatus

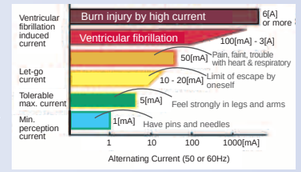
What's different from present power supply specification?

Medical Standards (IEC60601-1) will be hard to comply than Information equipment Standards (IEC60950-1). Designing requirements are shown below.

- Fuse is without a tip
- Leakage current
  0. 3mA or less necessary at AC264V, 60Hz
  (patient-care system - class I)
- Dielectric strength: 4kV (between primary and secondary)
- Insulating distance (approx. 1.5 times of IEC60950-1 Standard)

Macro shock

Graph is the reaction of human body when alternating current (50 or 60[Hz]) flow in through surface of skin.
These show the current value when the current flowed 1 sec. in adult male's body.
2/3 of its value is said for female, and 1/2 for children.
It starts feeling pins-and-needles sensations at approx.1 [mA]=(1/1000[A]) and it is called minimum perception current. When the current is large, it flows not only through the surface but also inner part of the body, which causes various symptoms.
If a certain level of the current flowed through the heart, muscle of the heart starts excitation contraction and stops pumping out the blood. This kind of heart condition is called "ventricular fibrillation".
It is also said that ventricular fibrillation will happen when the amount of the current flowed through the surface of the skin goes up to 100[mA] or more.



Micro shock

It is said that human body can cause "ventricular fibrillation" with aprox.100[uA](=0.1[mA]) when the current directly flowed into the body especially near heart.
This current value is called "micro shock ventricular fibrillation induced current".
Therefore, medical system that its electrode is used near heart is regulated to reduce especially "the leakage current" by JIS standards.

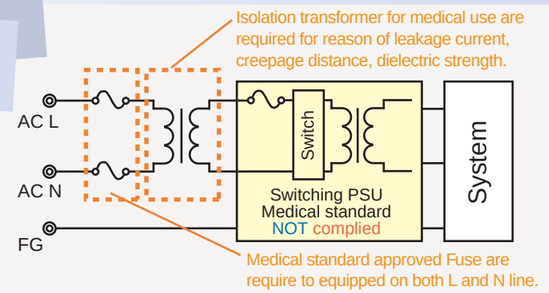
Reference website: "Toranomon-byouin"

Advantages of medical standards complied power supply

● Applying standards for power supply installed system

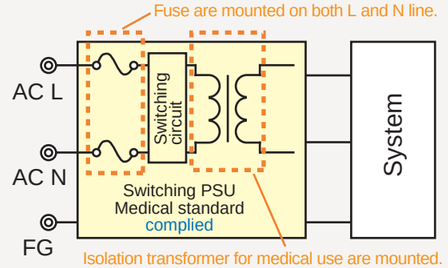
・Power supply NOT complied

When power supply does not comply with the standards, customers are required to prepare for input fuses and insulating transformer etc.
Because fuses and transformer will be installed separately, system will be large and expensive.



・mNSP3/mPCSA, mGPSA series (complied)

These series are all done to be double and reinforced insulation. That is why we are able to satisfy this requirement.
You will not need to prepare for extra fuses or transformer. Also, it is compact and inexpensive rather than using power supplies those are not complying whith the standards.



ATTN:
Please be careful with specifications/cautions for competitors' medical power supply as shown below.

- Certified as basic insulation, extra insulation circuit is required outside the power supply.
- Insulating material must be used in system chassis when it is used near the patient or other than that.
- When applying for medical systems standards, safety standards certified fuses or breaker needs to be connected to input terminal.
- Conducted emissions are FCC-A, VCC-A, ripple will be 1.5 times of standard.

Four fields of the standard

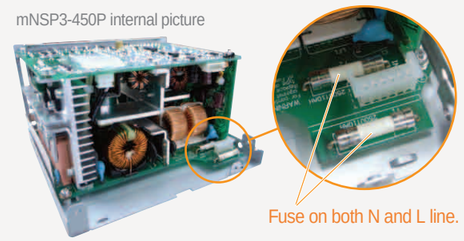
Medical system are one of the international fields, and are classified into 4 different fields considering the effects on human body.

For production and distribution of relatively low risk (class II) system and external diagnostic medicines, private third party certification authority began to certify on behalf of the country.
Below is the comparison of classification on acceptance & necessity by the country and certification division of revised law.

International division	Medical equipment division based on risk	Past	After constriction 2005
Class I	Effects on human body in case of failure is considered very low. (Ex. extrasomatic diagnostic instrument, X-ray film)	Need no certification	Self-certification
Class II	Effects on human body in case of failure is considered lower. (Ex. MRI, electronic blood pressure, digestive catheter, ultrasonograph)	Government certification	Certification by third party
Class III	Effects on human body in case of failure is considered higher. (Ex. dialyzer, artificial ventilator)	Government certification	Government certification
Class IV	Effects on human body in case of failure is considered loss of life. (Ex. pace maker, artificial heart valve)		

mNSP/mPCSA series and mGPSA series matches class I, II.
Please consult about matching systems for class III, IV.

mNSP3-450P internal picture



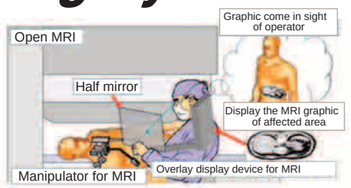
Transition of Medical Standards

- At present, IEC60601-1 3rd is issued.
  From this standard, risk management is required.
  Because it was not enough to manage the quality of medical systems only by ISO9001, ISO14971 is issued and we will have to satisfy the requirements based on it.
  (Certification authority such as UL etc. are not ready to deal with it. It will be applied some time later.)
- Medical Standards are hard to complied, contains various kinds, and is keep changing many times. It is risky for us NIPRON, but we will investigate and handle it with full efforts.

Realizing minimally invasive surgery by image information

Precision surgery
by image-guidance

(image)



Reference website: Graduate school of information science and technology, the University of Tokyo

Highly-reliable/highly-functional medical computers Had been waited eagerly for
Medical Standard "UL, CSA, IEC60601-1" Complied PSU

mNSP3/mPCSA Series

Input/output specification [ ]:mPCSA-500P-X2S

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ power (continuous)	20A	22A	22A	0.5.A	2A
	Total 285 W				
	Total 301 W				
Peak current/ power (within 5s)	30A	33A	30A	0.5A	2.5A
	Total 432 W [482 W]				
	Total 450.5 W [500.5 W]				
Min. current	0A	0A	0A	0A	0A
Input voltage	AC85~264V				

Backup operation available
Nonstop power supply mNSP3-450P-S20-H1V

Intelligence battery pack "Mi-Pack II" connectable. Dectects battery life span. Schedule function.

Continuous max. 300W | Peak 450W

Without Backup operation
mPCSA-500P-X2S

Continuous max. 300W | Peak 500W

▪Low leakage current specification

Satisfy 0.3mA or less leakage current (AC264V input) to comply Medical standard IEC60601-1 and class I (3P input plug with earthing).

Load condition: Rated

Leakage current measured value (example)

Rated input V	mNSP3-450P-S20-H1V	mPCSA-500P-X2S
AC100V	0.09 mA	0.09 mA
AC264V	0.25 mA	0.25 mA

▪Conducted emission class B compliant

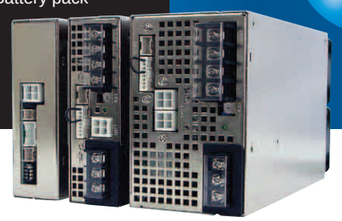
Generally, conducted emission is tend to be sacrificed to specify low leakage current (generate more noise), but we satisfy conducted emission class B for low leakage current spec. (installed in computer chassis, measured at load factor 70%)

Front PC power supply for medical system

High cost, heavy weight commercial insulating transformer will be UNNECESSARY.

mGPSA-360/750 Series

Battery pack



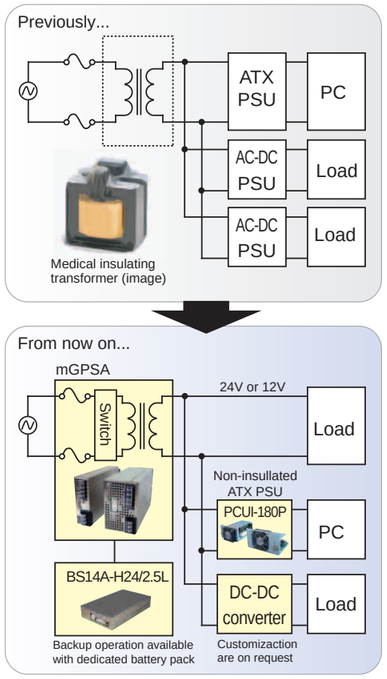
mGPSA-360 Series | mGPSA-750 Series

Medical standard(UL,CSA,IEC60601-1)
mGPSA-360 series: Compliant
mGPSA-750 series: Preparation

●Low leakage current
0.3mA or less (at AC 264V input)

●Input huses
mounted on both L (live) and N (neutral) line

●Double and reinforced insulation
When applying for medical standard for your equipment, you will not need to connect fuse and breaker, or set up supplementary insulation outside the power supply.



Line-up and Input/output specification

Series	Output voltage		+12V	+24V
mPSA-360 series	Rated output current		30A	15A
	Peak output current	AC100V	40A	20.8A
		AC200V	40A	25A
mPSA-750 series	Rated output current		56A	30A
	Peak output current	AC100V	70A	37.5A
		AC200V	80A	50A
Input voltage	AC85~264V			

mNSP3-450P-S20 series

Continuous: 301W
Peak: 450.5W

-H7V	With RS232C signal unit
-H6V	With USB signal unit

Medical standard IEC60601-1 certified, nonstop ATX power supply

- Battery back up function at blackout (with dedicated battery pack)
- Double and reinforced insulation type, so that Medical standard approved commercial insulating transformer is unnecessary.
- Fuses are mounted on both L/N line
- Leakage current: 0.1mA typ (At AC 100V input)
- Equipped with thermal-sensing speed control fan, Silent.

Output connectors (Optional): Main (24pin) | Main (24Pin) | AT | 12V (4Pin) | 12V (8Pin) | PCI-E (6pin) | AUX | ×5 | S-ATA ×4 | ×1

Safety standard	UL	CSA	EN	CE	CCC
Dimensions	W × H × D (mm) = 150 × 86 × 140 PS/2 size				

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/ Max power (Continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 285W				
	Total 301W				
Peak current/ Peak power (Within 5s)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 432W				
	Total 450.5W				
Min current	0A	0A	0A	0A	0A

mPCSA-500P-X2S

Continuous: 301W
Peak: 500.5W

Medical standard IEC60601-1 certified, ATX power supply

- Double and reinforced insulation type, so that Medical standard approved commercial insulating transformer is unnecessary.
- Fuses are mounted on both L/N line
- Leakage current: 0.1mA typ (At AC 100V input)
- Equipped with thermal-sensing speed control fan, Silent.

Output connectors (Optional): Main (24pin) | Main (24Pin) | AT | 12V (4Pin) | 12V (8Pin) | PCI-E (6pin) | AUX | ×5 | S-ATA ×4 | ×1

Safety standard	UL	CSA	EN	CE	CCC
Dimensions	W × H × D (mm) = 150 × 86 × 140 PS/2 size				

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/ Max power (Continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 285W				
	Total 301W				
Peak current/ Peak power (Within 5s)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 482W				
	Total 500.5W				
Min current	0A	0A	0A	0A	0A

mPCSL-210-X2S

Continuous: 210.8W

Medical standard IEC60601-1 certified, slim body ATX power supply

- Slim body with 48mm thick and 90mm width
- Leakage current: 0.17mA typ (At AC 100V input)
- Equipped with thermal-sensing speed control fan, Silent.
- Life expectancy 7 years at ambient temperature 40 deg C and max output (electrolytic capacitor: about 13 years, FAN: about 7 years)
- Conducted emission class B

Output connectors: Main (24pin) | Main (24Pin) | AT | 12V (4Pin) | 12V (8Pin) | PCI-E (6pin) | AUX | ×2 | S-ATA ×2 | ×1

Safety standard	UL	CSA	EN	CE	CCC
Dimensions	W × H × D (mm) = 90 × 48 × 273				

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/ Max power (Continuous)	10A	10A	12A	0.3A	1.5A
	Total 83W				
	Total 199.7W				
	Total 210.8W				
Min current	0A	0A	0.8A	0A	0A

mGPSA-360/750 series

mGPSA-360 series: Continuous: 360W, Peak: 600W
mGPSA-750 series: Continuous: 720W, Peak: 1200W

Medical standard IEC60601-1 certified, single output power supply with high capacity and high peak power

- Mountable for system rack, convenient size 1U/2U/3U
- +12VSB output equipped
- Blackout detection signal equipped. For 24V output type, battery backup operation during blackout is possible with the battery pack connected.
- Conducted emission class B
- Equipped with thermal-sensing speed control fan, Silent.

*mGPSA-750series: during preparation

Safety standard	UL	CSA	EN	CE	CCC

Dimensions		
	mGPSA-360	W × H × D (mm) = 41 × 128 × 230
	mGPSA-750	W × H × D (mm) = 82 × 128 × 235

Model	Output voltage		+12V	+24V	+12VSB
	mGPSA-360-		12-TP	24-TP	Common
mGPSA-360	Max current/power(Continuous)		30A 360W	15A 360W	0.3A 3.6W
	Peak current/power (Within 5s)	AC100V	40A 480W	20.8A 499.2W	---
		AC200V	40A 480W	25A 600W	---
Model	mGPSA-750-		12-TP	24-TP	Common
mGPSA-750	Max current/power(Continuous)		56A 672W	30A 720W	0.3A 3.6W
	Peak current/power (Within 5s)	AC100V	70A 840W	37.5A 600W	---
		AC200V	80A 960W	50A 1200W	---

Applicable examples

Ultrasonograph
ePCSA-650P-E2S
eNSP-300P-S20-11S

Operation microscope
mGPSA-360-24-TP
BS14A-H24/2.5L

Medical DVR
PCTF-220P-X2S

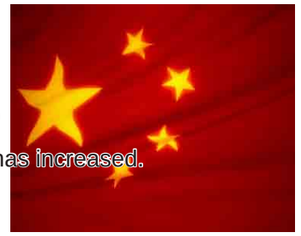
PC for medical analyzer
PCTF-220P-X2S

PC for MRI/CT
ePCSA-500P-X2S

Immunoanalytical system
mGPSA-750-12-TP

China Compulsory Certification

CCC Certified Products



Since China is growing rapidly, imports and exports between Japan and China has increased.
Therefore there are many chances for our products to be certified by CCC.
This time we would like to introduce products certified by CCC.

What's CCC?

CCC stands for China Compulsory Certification, which new certification is publicized from AQSIQ (State General Administration of the People's Republic of China for Quality Supervision and Inspection and Quarantine) and CNCA (Certification and Accreditation Administration of the People's Republic of China) due to China's reexamination of forced certification by WTO affiliate country.
It is a certification standard about safety and EMC for products sold in China. Any shipping, import, and sales of products without CCC certification are prohibited. Letters on right side of CCC shows class of certification. "S" means "safety certification", "EMC" means "EMC (electromagnetic compatibility)", "S&E" means "Safety and EMC", "F" means "Fire-related". Those models (series) on this page has been certified "S&E".

CCC S&E Mark

ePCSA-500P-X2C (ePCSA-500P-X2C series certified)

Continuous Max: 350W
Peak: 500W

All outputs equipped with voltage regulation circuit individually

- Allows stable State-of-art CPU operation
- 74ms output hold-up time with 200W at instantaneous blackout to cover poor power condition
- Thermal-sensing fan adjusts speed, Silent

Dimension	W x H x D (mm) = 150 x 86 x 140 PS/2 size

Output connectors (optional): Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x5, x1, S-ATA x4, PCI-E x1

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (Continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 334W				
	Total 350W				
Peak current/ Peak power (Within 5 sec)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 482W				
	Total 500.5W				
Min. load	0A	0A	0A	0A	0A

eNSP3-450P-C20-H1V/H6V (eNSP3-450P-C2* series certified)

Continuous Max: 350W
Peak: 450W

-H1V	With RS232C signal unit
-H6V	With USB signal unit

0A Minimum Current for All Outputs, High Power Nonstop Power Supply

- With backup function, it protects your PC from Blackout.
- Thermal-sensing fan adjusts speed, Silent
- Designed to last 10 years minimum with continuous rated operation at 45 deg C

Dimension	W x H x D (mm) = 150 x 86 x 140 PS/2 size

Output connectors (optional): Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x5, x1, S-ATA x4, PCI-E x1

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (Continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 334W				
	Total 350W				
Peak current/ Peak power (Within 5 sec)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 432W				
	Total 450.5W				
Min. load	0A	0A	0A	0A	0A

PC2U-530P-X2S (PC2U-530P series certified)

Continuous Max: 401W
Peak: 530W

Dimension	W x H x D (mm) = 108 x 82 x 200 2U size

Output connectors (optional): Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x5, x1, S-ATA x4, PCI-E x1

2U height in compliant to rack servers ATX Power Supply

- Connector method adopted to all outputs corresponding to a variety of output connector type
- All output in stable operation even with no load current
- Thermal-sensing fan adjusts speed, Silent

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (Continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 385W				
	Total 401W				
Peak current/ Peak power (Within 5 sec)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 512W				
	Total 530.5W				
Min. load	0A	0A	0A	0A	0A

PC1U-300P-E2S (PC1U-300P series certified)

Continuous Max: 250W
Peak: 300W

Dimension	W x H x D (mm) = 106 x 41 x 260 1U size

Output connectors (optional): Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x5, x1, S-ATA x4, PCI-E x1

+12V dual output, High power 1U size PC Power Supply

- +12V dual output allows stable CPU operation.
- All output in stable operation even with no load current
- Connector system for output harness enables flexible selection in specification

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB
Max. current/ Max. power (Continuous)	16A	14A	16A	10A	0.5A	2A
	Total 90W		Total 216W			
	Total 250W					
Peak current/ Peak power (+12V1: 0.5s, Others: Within 5 sec)	16A	16A	22A	10A	0.8A	2.5A
	Total 100W		Total 264W			
	Total 300W					
Min. load	0A	0A	0A	0A	0A	0A

PCSF-350P-X2S1 (PCSF-350P series certified)

Continuous Max: 250W
Peak: 350W

Dimension	W x H x D (mm) = 125 x 63.5 x 125 SFX Appendix C

Output connectors (optional): Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x5, x1, S-ATA x4, PCI-E x1

+12Vdual output,Ultra high efficiency SFX power supply

- SFX power supply corresponding to Appendix C mounting surface
- +12V dual output allows stable CPU operation.
- All output in stable operation even with no load current

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB
Max. current/ Max. power (Continuous)	14A	16A	10A	16A	0.5A	2A
	Total 90W		Total 220W			
	Total 250W					
Peak current/ Peak power (+12V2: 0.5s ,Others: Within 5 sec)	20A	21A	16A	22A	0.8A	3A
	Total 120W		Total 270W			
	Total 350W					
Min. load	0A	0A	0A	0A	0A	0A

PCSA-370P-X2S/X2S1/X2S3 (PCSA-370P series certified)

Continuous Max: 280W
Peak: 370W

Output connector: -X2S, -X2S1, -X2S3 — Main (24pin), Main (20pin), AT, 12V, AUX, Processor, x4, x1, S-ATA x2, PCI-E x1

370W-class Highly Economical ATX Power Supply

- With same high reliability, 370W peak output economical ATX power supply
- Low price ATX power supply with condensed function
- Thermal-sensing fan adjusts speed, Silent

Dimension	W x H x D (mm) = 150 x 86 x 140 PS/2 size

Certified by	UL	CSA	EN	CE	CCC

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (Continuous)	17A	21A	18A	0.5A	1.5A
	Total 35A max*				
	Total 267W				
	Total 280.5W				
Peak current/ Peak power (Within 5 sec)	20A	25A	18A	0.5A	2.5A
	Total 35A max				
	Total 352W				
	Total 370.5W				
Min. load	0A	2A	0A	0A	0A

*Restricted by 30A by safety standard

NEW PRODUCT

SFX12V
Nonstop Power Supply

Small and powerful / Nonstop power supply / Palm size

Battery pack
"BS03A-H16/2.5L"

Model: NSP6F-220P-S10

Continuous 160W
Peak 220W

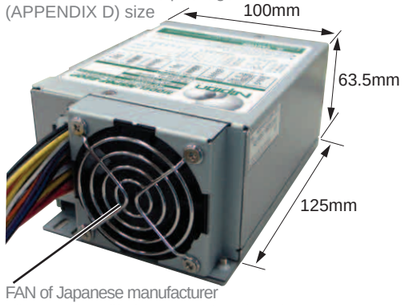
Input voltage	Efficiency	Power factor
AC100V	75.1%	99.5%
AC240V	79.1%	96.3%
DC16.8V (Battery operation)	90.2%	-

(Measured value)

SFX 12V standard, palm size small PC power supply

Comply with Standard SFX Profile Package (APPENDIX D) size * FAN is projected at back side

Standard SFX Profile package
(APPENDIX D) size



FAN of Japanese manufacturer
Silent and long life (8.6 years at 40 deg C)

Installable for other mounting sizes by using optional attachment panel

For PS3 Form Factor (APPENDIX E) and ATX (PS/2) size
Model: ACC2837

For TOP FAN mount (Reduced Depth Top Mount Fan) Package (APPENDIX C)
Model: ACC5134

Backup operation

Backup operation at blackout is possible by connecting dedicated battery pack.
High efficiency 90% and keeps power loss minimum.

Battery pack

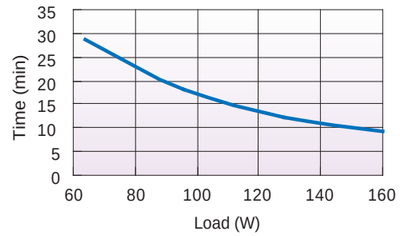
Model: BP03A-H16/2.5L

Small size Ni-MH battery pack
Capacity: 16.8V/2.5AH
Size (mm): 92.5W x 159.5D x 23.7H

Model: BS03A-H16/2.5L
Installable for 3.5 inch bay

Small size Ni-MH battery pack
Capacity: 16.8V/2.5AH
Size (mm): 101.5W x 175D x 25H

Back up time



* This is not guaranteed value but reference value at default condition.
* This graph shows the time length from the time of blackout to the time of PSU output shutdown.

Automatic shutdown available

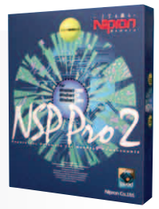
Automatic shutdown at blackout is also possible by using automatic shutdown control software "NSP Pro 2".
(In case of Windows 2000/XP, OS standard UPS service also can be used.)

Automatic shutdown software

Model: NSP Pro 2

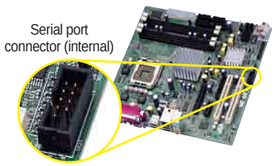
OS specification:
Windows 2000/XP/Vista/7

- Detail time setting that Windows standard UPS service does not cover is settable (power recovery supervisory time)
- Visible and easy setting by GUI



Signal connection image

When using automatic shutdown function, please connect RS232C connector (9 pin) to serial port connector of motherboard (internal).



* TTL signal type is also available. Model: NSP6F-220P-T10

Input/output specification

Input

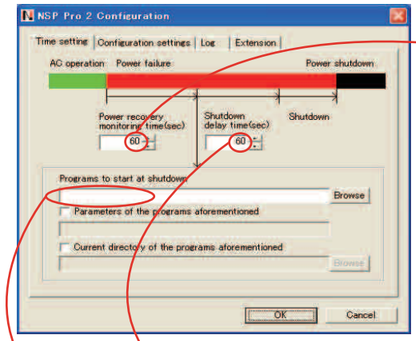
AC input	85 - 264V (Worldwide input)
DC input	16.8V (Dedicated battery pack)

Output

Note: Main 3 outputs are easily customizable to other voltage (15V or less)

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (Continuous)	10A	10A	10A	0.3A	1.5A
	Total 160W or less				
Peak current Peak power (Within 5S)	10A	10A	14A	0.3A	1.8A
	Total 220W or less				
Min. current	0A	0A	0A	0A	0A

Monitor screen (Condition setting)



The time to judge that recovery is impossible after a blackout can be set up in second.

Shutdown delay time, after it is judged that recover is impossible, can be set up in second.

Specific program in "exe" and "bat" can be set up to operate at the moment is judged that recovery is impossible.

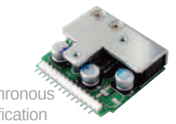
Other features

- **Min. load current 0A for all outputs**
  No need to care about min. load current. Various types of loads within the range of output specification.

- **Synchronous rectification chopper PCB**
  Chopper unit is adopted for indivisual output to easily customize output. Also high efficiency by PFC circuit.

Measured value (at rated load)

Input voltage	Efficiency
AC100V	75.1%
AC240V	79.1%
DC16.8V (Battery operation)	90.2%



Synchronous rectification chopper PCB

- **Expected life more than 10 years**
  Expected life is more than 10 years at rated load and intake air temperature 35 deg C. (FAN is 8.6 years at 40 deg C.)

- **Main connector 20+4 pin**
  Available for both 20 pin and 24 pin motherboard

Output connector

New

Flex ATX spec, small power supply release!

Model: PCFX-220P-X2S

- Small size 81.5W x 41H x 150D, installable for 1U rack server
- Modified model with silent FAN is also available
- Active filter (PFC circuit) equipped
- World wide input

Security camera and stand alone DVR is popular applications.

AC input	90 - 264V (Worldwide input)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max. power (continuous)	10A	10A	10A	0.3A	2A
	Total 75W or less				
	Total 170W or less				
Peak current/ Peak power (within 5S)	12A	12A	12A	0.3A	2A
	Total 85W or less				
	Total 220W or less				
Min. current	0A	0A	0.5A	0A	0A

Continuous 170W
Peak 220W

NEW PRODUCT

New comer living up to your expectation!

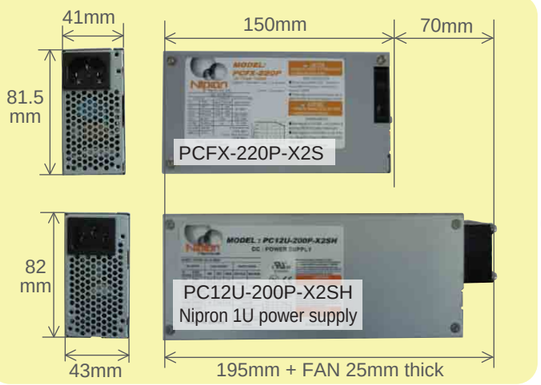
Compact PC power supply in Flex ATX standard dimension

Input voltage	Efficiency	Power factor
AC100V	74.82%	99.30%
AC240V	79.29%	94.70%

*Measured value (Conditions: Rated load and normal temperature)

Compact 1U dimension power supply newer than ever

Here for you by implementing small new components with optimized layout!

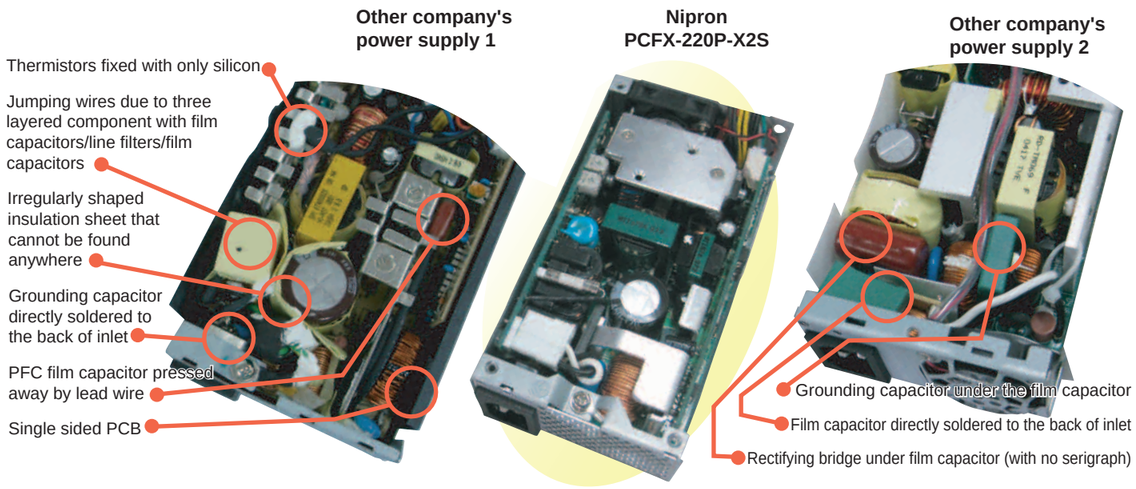


Small size 81.5(W) x 41(H) x 150(D)

- Designed as 1U power supply of DVR to be built in 1U dimension unit as its height is 41 mm!
- Meeting Flex ATX dimension [81.5 (W) x 40.5 (H) x 150 (D)] in ATX standard
- Depth 150mm: as shorter as 70mm compared with our existing 1U power supply PC12U-200P-X2SH by implementing small new components with optimized layout

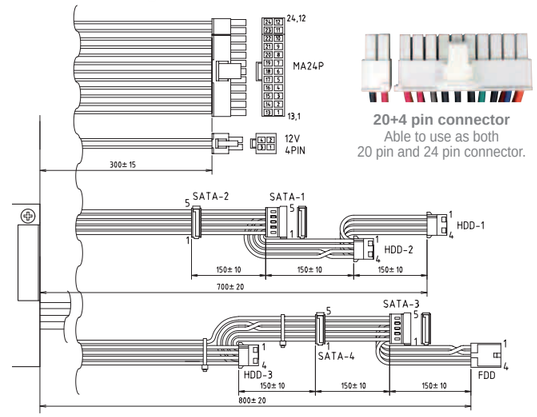
High reliability still stays there even in small dimension!

Much higher reliability is obvious when compared with offshore products. Choose Nipron's power supply! and feel relaxed during its lifetime rather than you feel anxious about offshore products whose component layout may give you any trouble in use.



Output harness specification to meet latest demand

Harness diagram



20+4 pin connector
Able to use as both 20 pin and 24 pin connector.

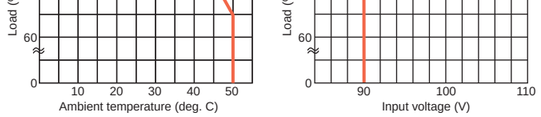
Output harness is adopted following high demand after check to meet customer's specification.

Main connector	20+4 pin connector
S-ATA connector	4
Peripheral connector	3
12V connector (4 pin)	1
FDD connector	1

Input/output specification

AC input	90-264V (Worldwide input)

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/voltage (continuous)	10A	10A	10A	0.3A	2A
	Total 75W max				
	Total 170W max				
Peak current/voltage (within 5S)	12A	12A	12A	0.3A	2A
	Total 85W max				
	Total 220W max				
Min current	0A	0A	0.5A	0A	0A



Other features

With slit for fixing

Can be fixed to chassis as slit for fixing with penetration depth of 7mm on the side

Life expectancy 8.5 years

8.5 years of lifetime expectancy at input/output rating and ambient temperature of 40℃ (approx 10.3 yrs for electrolytic capacitors, approx 8.5 yrs for fans)

PFC circuit equipped

High power factor with PFC circuit (Power Factor Correction) equipped (At normal temperature and rated load, 99% typ at 100V and 95% typ at 240V)

Thermal sensing speed control FAN equipped

Thermal fan speed control equipped.
The fan speed is low when the temperature inside the power supply is low resulting in silence. The speed goes high when the temperature inside the power supply is high so that high temperature air inside PC is exhausted more resulting in low temperature rise of hot components such as CPU.

FAN speed control PCB
Detecting fin temperature by thermistor

Worldwide input

Input voltage selection switch is unnecessary unlike switch system as worldwide input system is adopted so that 90 to 264V input voltage is acceptable without switch operation.

Safety standard acquired

Acquired safety standard: UL(IEC)60950-1・c-UL・CE

New

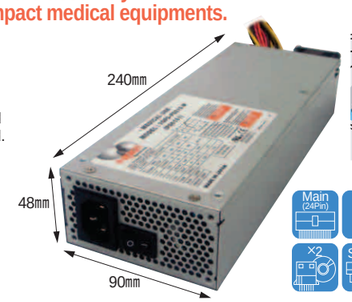
New comer! Slim body ATX power supply with medical standard

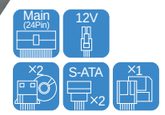
Medical Standard

Existing ATX power supply (PS/2 size) occupies wider area causing hard assembly.
However this model gives you ultimate solution for PCs built in compact medical equipments.

Model name: mPCSL-210-X2S

- Medical standard IEC/UL (c-UL) 60601-1 compliant (60950-1 also compliant)
- Slim body 48mm thick and 90mm wide
- Low leakage current 0.2mA (at AC 100V input), complied with medical standard
- Silent. Thermal sensing FAN detects internal temperature and controls operation speed.
- Life expectancy 7 years at ambient temperature 40 deg C and max output (Electrolytic capacitor 13 years, FAN 7 years)
- Conducted emission voltage class B (VCCI/FCC/EN55022)





AC input	85 - 264V (Worldwide input)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max current/voltage (continuous)	10A	10A	12A	0.3A	1.5A
	Total 83W max				
	Total 199.7W max				
	Total 210.8W max				
Min current	0A	0A	0.8A	0A	0A

Slim body ATX Power Supply

Continuous 210W

For Green Innovation Era

Ultra High Efficient Complying with 80Plus

Peak Power 1000W ATX Power Supply!!

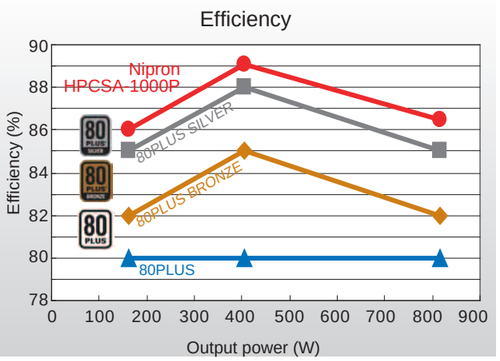
Continuous: 822W Peak: 1000W

Model: HPCSA-1000P-E2S

Contribute to reduction of world's power loss.

Complying with 80Plus, high efficiency ATX power supply with huge capacity 1000W

High power is now required as processing speed of recent CPU and GPU has much improved. On the contrary, however, CO_2 reduction is required and while many users increasingly demand highly efficient power supply. Under those circumstances, we, Nipron, have developed HPCSA-1000P-E2S as the first shot that provides 1000 peak output to meet 80Plus. This power supply has reduced conduction loss and switching loss by adopting new material, silicon carbide, resulting in drastic conversion efficiency improvement.



What's 80Plus ?

80 Plus is an American certification program, for power saving of electric equipments. Requires more than 80% of efficiency at AC115V input and 20%, 50%, 100% rated capacity with more than 90% power factor (with PFC for harmonic). There are 4 grades 80PLUS, 80PLUS BRONZE, 80PLUS SILVER, 80PLUS GOLD by efficiency.

Load Factor	80PLUS	80PLUS BRONZE	80PLUS SILVER	80PLUS GOLD
at 20%	80%	82%	85%	87%
at 50%	80%	85%	88%	90%
at 100%	80%	82%	85%	87%

Comparison of electric bills and CO_2 emission

Comparison of electric bills and CO_2 emission between HPCSA-100P-E2S and general switching power supply with efficiency 70% is shown below.

Conditions: AC 115V input,800W output, 24-hour continuous running for 365 days

	Efficiency	Input power	Electric bill[*1]	CO_2 emission per year[*2]
HPCSA-1000P-E2S	86.5%	924.9W	162,035 yen	3,062.5kg
Power supply with efficiency 70%	70.0%	1142.9W	200,229 yen	3,784.3kg
Difference	16.5%	-218.0W	-38,194 yen	-721.8kg

(*1) 20 yen/kWh (*2) 0.378kgCO_2/kWh

Less than 1W standby power complying with ErP directive

Contribute to reduction of CO_2 emission and saving electric bills by control standby power 1W max.

What's ErP directive ?

ErP directive is one of environmental legislation and regulations for products developed by EU, used to be called EuP directive. Intend to assigned class such as household electrical appliance and office electrical equipment. There are some requirements such as environmental design, and affix CE mark. Issued on Jan 7th, 2010

Power consumption at "Off Mode"

Over 1.00W (0.50W)* power consumption of equipments at off mode is prohibited.

Power consumption at "Standby Mode"

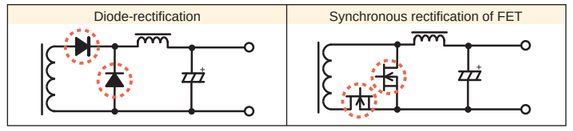
Over 1.00W (0.50W)* power consumption of equipments that only input reactivate function, or input reactivate function, only indicate reactivate functions available at standby mode is prohibited.

*Inside of ( ) is effective from Jan 17th, 2013

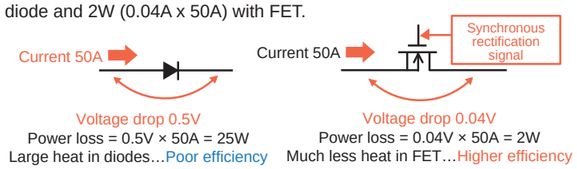
*Built-in types are excepted for ErP directive.

Synchronous rectification circuit equipped

HPCSA-1000P-E2S has synchronous rectification circuit and achieves high efficiency.



If loaded current is 50A, diode drop voltage will be 0.5V and FET drop voltage will be 0.04V. FET is much smaller than diode and can save power loss. Total amount of power loss will be 25W (0.5V x 50A) with diode and 2W (0.04A x 50A) with FET.



Other features

- Double-sided PCBs with through-hole
- Enough creeping distance complying with medical standard, fuse without tip
- All outputs have the minimum load 0A.
- Equipped with thermal-sensing speed control fan, Silent.
- 85 mm height mountable into 2U size chassis

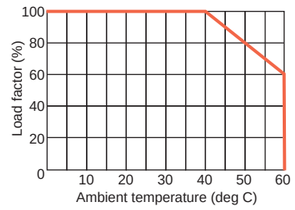
*Location of mounting holes is complying with PS/2 standard.

Specifications

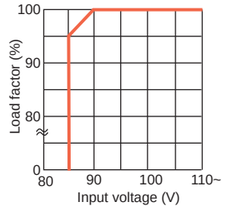
I/O specifications

Input voltage	AC85*-264V (Worldwide range) *Derating is required (to 90V)							
Output voltage	+3.3V	+5V	+12V1	+12V2	+12V3	+12V4	-12V	+5VSB
Max current/ Max power (Continuous)	25A	25A	18A	18A	18A	18A	0.4A	3A
	Total 207.5W		Total 792W					
	Total 822W							
Peak current/ Peak power (Within 5s)	30A	30A	25A	25A	25A	25A	0.6A	4A
	Total 249 W		Total 1000W					
	Total 1000W							
Minimum current	0A	0A	0A	0A	0A	0A	0A	0A
Deminsion	150(W) × 85(H) × 190(D) mm EPS size							

Ambient temperature and output derating



Input voltage and output derating

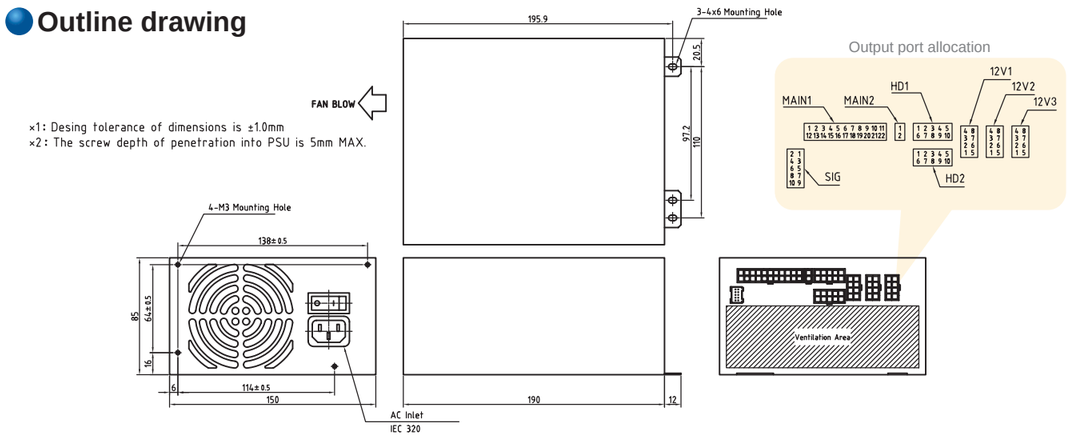


Output connectors

Port	Model name	Connector type/length	Connector specificarions	Acceptable cable(s)
Main	WH-M2022-500	500±15 20Pin	20pin main connector	1
	WH-M2422-500	500±15 24Pin	24pin main connector	
HD 1,2	WH-PP610-850	550±15 150±15 150±15	Peripheral connector×5 FDD connector×1	2
	WH-PS610-850	550±15 150±15 150±15	SATA connector×2 Peripheral connector×3 FDD connector×1	
	WH-PS710-850	550±15 150±15 150±15 850±15	SATA connector×4 Peripheral connector×2 FDD connector×1	

Port	Model name	Connector type/length	Connector specifications	Acceptable cable(s)
12V 1,2,3	WH-V0808-500	500±15 12V 8Pin	+12V8Pin connector	3
	WH-V0408-500	500±15 12V 4Pin	+12V4Pin connector	
	WH-VG208-500	500±15 12V 4Pin + PCI-E 6Pin	+12V4Pin connector PCI-E6Pin connector	
	WH-VV208-500-02	500±15 12V 8Pin 12V 8Pin	+12V8Pin connector×2	
	WH-VG208-500-02	500±15 12V 8Pin PCI-E 6Pin	+12V8Pin connector PCI-E6Pin connector	
	WH-G0808-500	500±15 PCI-E 8Pin(6Pin+2Pin)	PCI-E8Pin connector	
	WH-GG208-500	500±15 PCI-E 6Pin PCI-E 8Pin(6Pin+2Pin)	PCI-E6Pin connector PCI-E8Pin connector	

Outline drawing



GREEN!!

Nipron's Energy Converter contributing to solutions of environment problems

tajubu

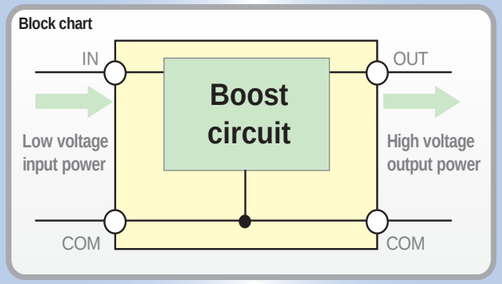
"Tajubu" is DC-DC booster adopting multiple boosting system. The brand name, "Tajubu", was named after Nipron's original "Multiple boosting system."
This system converts (boosts), with high efficiency, energies unstable and hard to use such as green energies including solar light, wind power, and fuel battery, or batteries and capacitors to energies stable and easy to use. Also, the output can be directly connected to HVDC line and most suitable for DC power feeding system, which has now become the topics.
In addition, bidirectional Tajubu, which not only steps down the voltage but also boosts as well, is lined up.
By operating bi-directionally, "Tajubu" is highly expected to respond to the environmental requirement our modern society is taking into account since the energy can be charged and discharged as well.
That is why we feature this time "Energy Converter; Tajubu" which converts with high efficiency to the energy easy to use.

Booster type Tajubu
TB series

- **Utilization for automated guided vehicle(AGV)** — Inverter cost reduction/options increase
- **Efficient utilization of natural energy** — Tajubu for the solor cell — Improvement of global environment

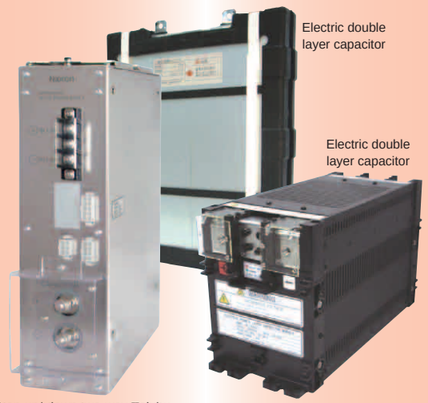
Booster type Tajubu
TB4S-2000-280

Block chart



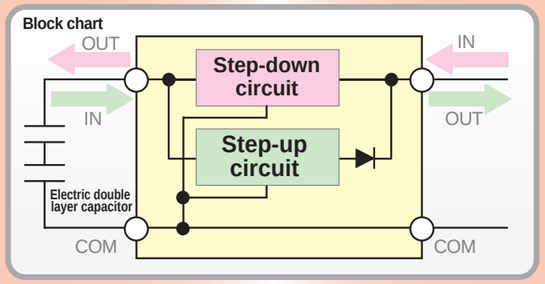
Step-up/-down Two-way Tajubu
TBR series

- **Absorption and reutilization of regenerative energy** — Energy saving (Reduction of electlic bill and CO_2)
- **Peak power cut** — Reduction of access to electricity
- **Blackout backup** — Reliability improvement



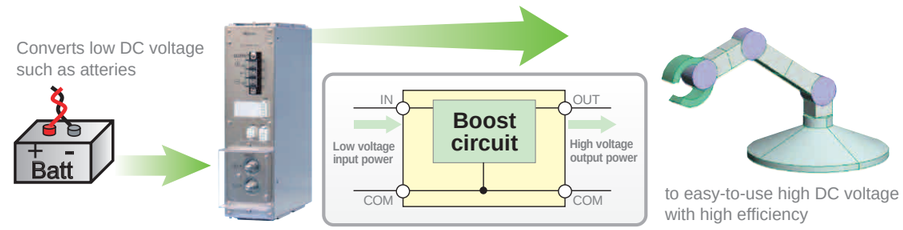
Step-up/-down two-way Tajubu
TBRS-5000/3000-155/320

Block chart



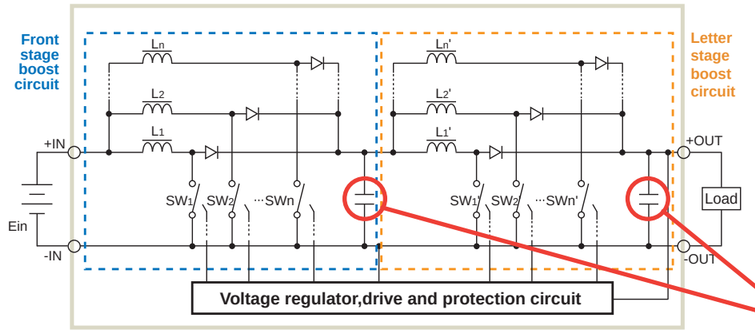
"Tajubu" is...

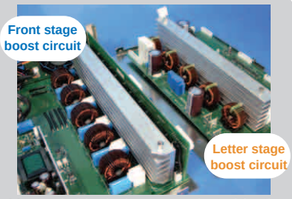
"Tajubu" (booster type) is DC-DC converter with multiple boosting system, and converts low DC input voltage to high DC voltage easy to use with high efficiency (92 to 97*%). * depending on the difference between input and output voltage.



Nipron' s unique products, the multiple boost circuit

Normally used step-up power supply has choke coils to store in itself exciting energy generated during ON time and to transfer flyback energy generated during OFF time to electrolytic capacitors after rectification process. This energy is supplied to load via high voltage circuit. However, when the output exceeds 100W, it generates heat due to ripple current in the capacitors to limit the output power. The efficiency at this time is 75 to 80% in general. In Nipron' Tajubu as shown below, it has multiple bootstrap circuits in parallel to control on time of each circuit. It boosts input voltage 10 times or more as high to provide maximum continuous power, 2 to 10kW, with ultra high efficiency (94 to 97%) without electrolytic capacitors. In addition, several multi-boost circuits are connected in series as shown in the block diagram to gain high voltage and large current with stable output regulation in a comprehensive shift-control way. Also, for several applications, it has ability to achieve constant voltage and current in various methods.





Most suitable devices are selected for the first and the second channel respectively.
- Total efficiency up
- Achievement of high voltage and high power

- High efficiency in compact size

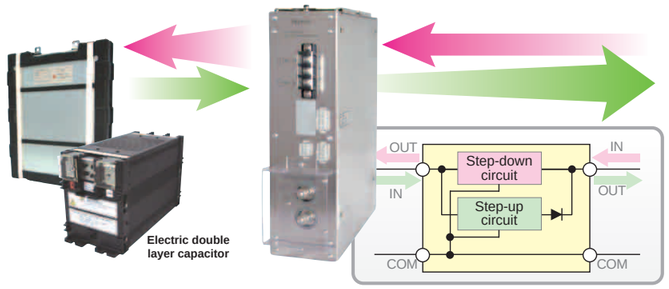
feature

- Adopting Nipron' s original multiple boosting circuit, Compact/High efficiency (92 to 97*%) has been brought. *depending on the difference between input and output voltage.
- With 2-stage boosting circuit adopted, total efficiency has been improved as most suitable devices are used for the first and the second channel respectively.
- Parallel operation is available (we have the track record of up to 10 units in parallel operation.)
- More than double peak current of rated output (with in 10 seconds)
- Higher reliability due to PCB coating
- Lined up as standard products in stock

Parallel running available

Step-up/-down two-way Tajubu

Step-up/-down two-way Tajubu, with both of multiple booster circuit and multiple step-down circuit adopted, has realized two-way operation to charge capacitors (step down) and discharge to equipments from capacitors (step up.) With this two-way Tajubu implemented, system configuration such as absorption/re-use of regenerative energy, cutting of peak power, and back up at blackout can be easily built.

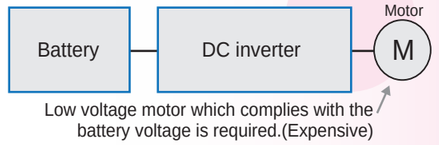


Automatic charging and discharging by detecting voltage (also, control by signal input is available,) brings simple connection only between capacitors and loads.

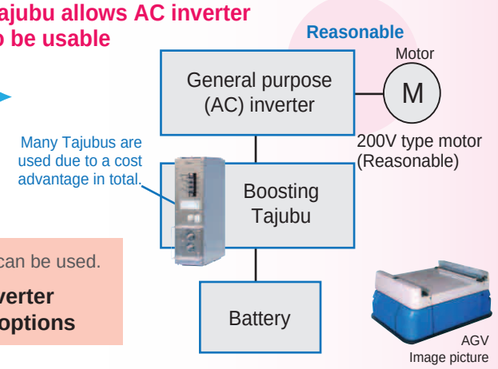
Booster Tajubu for automated guided vehicle

With booster type Tajubu (TB series) installed to automated transportation robot (AGV) powered by a battery, general purpose inverters (AC) which are inexpensive and variously lined up can be utilized.

Use DC inverter



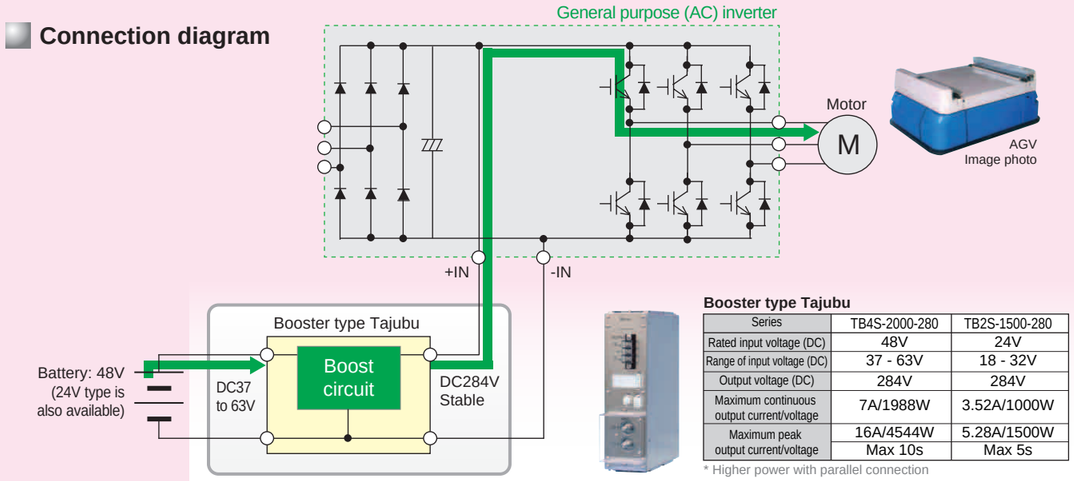
Tajubu allows AC inverter to be usable



With booster type Tajubu equipped, general purpose inverters can be used.

Compared with DC inverter...
- **Lower cost inverter**
- **More inverter options**

Connection diagram



Booster type Tajubu

Series	TB4S-2000-280	TB2S-1500-280
Rated input voltage (DC)	48V	24V
Range of input voltage (DC)	37 - 63V	18 - 32V
Output voltage (DC)	284V	284V
Maximum continuous output current/voltage	7A/1988W	3.52A/1000W
Maximum peak output current/voltage	16A/4544W	5.28A/1500W
	Max 10s	Max 5s

* Higher power with parallel connection

Usage example

Case1. device:AGV
Tajubu in use:TB4S-2000-280(standard product)

Successful cost reduction by implementing general purpose inverters with Tajubu!

Case2. device:AGV
Tajubu in use:TB4S-2000-280(standard product)

Other two boosters used to be connected, but only one Tajubu has brought cost reduction because it provides peak current double as much as the rated current!!!

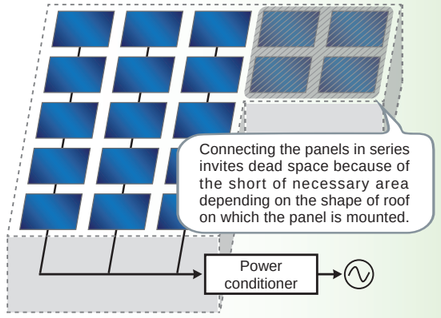
We have a track record showing a lot (1,000 units or more) have been delivered to semiconductor factories since 10 years ago.

Beyond Tajubu application for only AGV, every application for equipments with battery-driven motors would be expected! Booster type Tajubu is actively playing an important role in equipments in surprising sectors unexpectedly.

Booster Tajubu for solar cell (equipped with MPPT circuit)

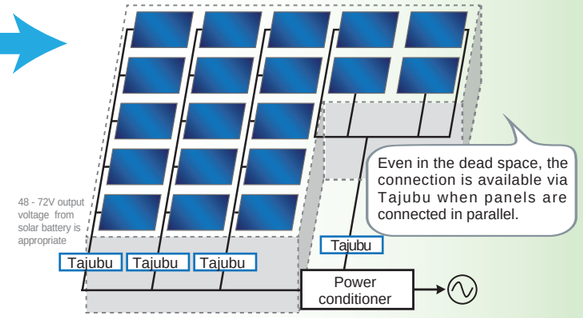
Booster type Tajubu with MPPT circuit equipped derives solar cell energy at a maximum.
For solar cell panel, low voltage parallel connection has higher reliability than high voltage series connection regarding wire breaking and malfunction.
Also, in the case of connection in series, dead space occurs due to short of necessary area depending on the shape of roof, but effective utilization eliminating the dead space can be brought by parallel connection.

High voltage via series connection



<<solar cell in series connection>>

As the connection is in parallel, higher reliability against wire breaking and malfunction is secured.

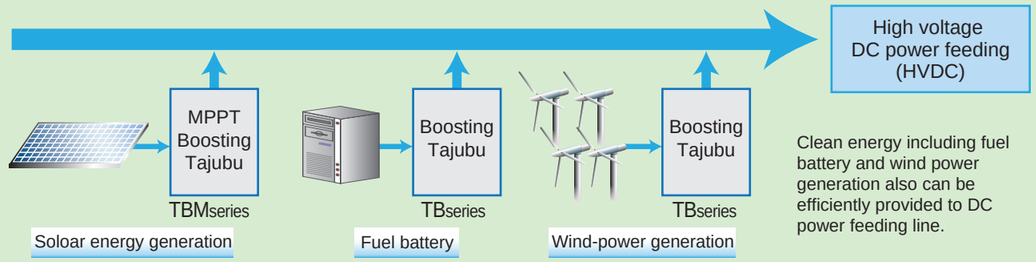


<<Solar cell in parallel connection, covering faragments>>

MPPT operation?

MPPT stands for Maximum Power Point Tracking meaning tracking the maximum power point.MPPT control refers to the control to track the maximum power point (optimal operating point) of the solar cell. Solar cell has the characteristics that the current derived is determined by the load voltage connected. In order to efficiently draw the energy from solar cell, load voltage connected to the solar cell needs to be controlled so as to make the power maximum. This control is referred to as MPPT control.

By utilizing booster type Tajubu equipped with MPPT circuit for DC power feeding system as well, the energy from the solar cell is supplied on a preferential basis and efficiently to DC power feeding line.



Clean energy including fuel battery and wind power generation also can be efficiently provided to DC power feeding line.

Usage example

Device:DC power feeding system

Tajubu in use: Equipped with MPPT circuit, Booster type Tajubu (modified from standard type)
High efficiency! by feeding solar cell energy to DC power feeding system via Tajubu

DC power feeding?

DC power feeding is power feeding system to supply electric power in DC form to electronics devices.
This power feeding system realizes higher efficiency to save energy by decreasing conversion frequency of energy delivered to computers such as servers. The energy is converted three times in total such as AC to DC (to charge UPS), DC to AC (for server input), AC to DC (converted in servers to actuate electronic devices), resulting in much loss when UPS (uninterruptible power supply) is used. If DC can be supplied to the server, however, the conversion is only once, that is, just one conversion to AC to DC. DC power feeding system has come from this ides to save energy with higher efficiency while reducing the number of conversion.

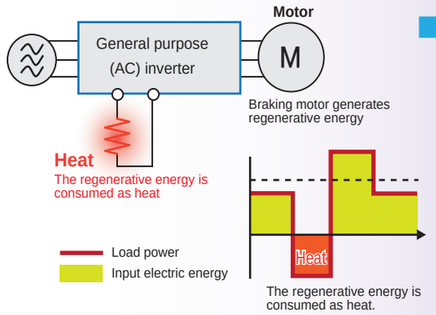
TBR series

Step-up/-down two-way Tajubu for avsorbing and reutilizing regenerative energy

With two-way TAJUBU, boosting-/step down-type, combined with electric double layer capacitor, regenerative energy of there-phase motor can be utilized effectively while allowing electric power rate to be reduced. Also, CO_2 reduction is expected.

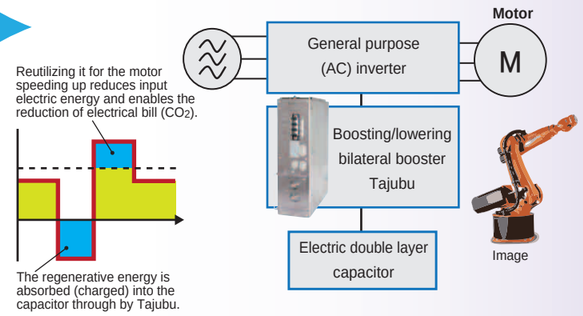
Existing mechanism

The regenerative energy is consumed as heat

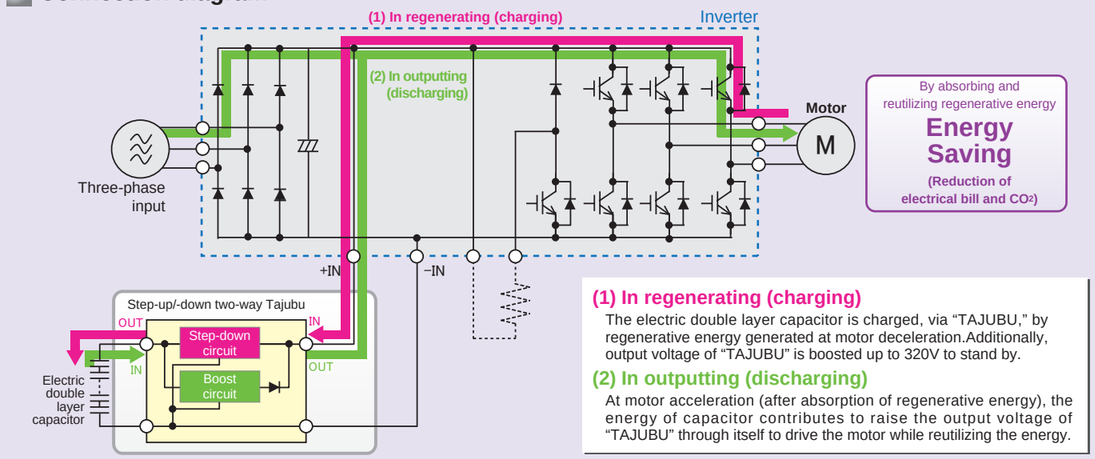


Alternative mechanism (Tajubu)

Absorbing and reutilizing regenerative energy



Connection diagram



By absorbing and reutilizing regenerative energy

Energy Saving

(Reduction of electrical bill and CO_2)

(1) In regenerating (charging)

The electric double layer capacitor is charged, via “TAJUBU,” by regenerative energy generated at motor deceleration.Additionally, output voltage of “TAJUBU” is boosted up to 320V to stand by.

(2) In outputting (discharging)

At motor acceleration (after absorption of regenerative energy), the energy of capacitor contributes to raise the output voltage of “TAJUBU” through itself to drive the motor while reutilizing the energy.

Step-up/-down two-way Tajubu TBRS-5000/3000-155/320

The step-down part (charging on capacitor)		
Input voltage	DC240-420V	
Output voltage	Max DC155V	Voltage for charging on capacitor
Output capacity	Max 5kW	Capacity for charging on capacitor
The boost part (discharging to the invertor)		
Input voltage	DC240-420V	Voltage of capacitor
Output voltage	Max DC320V	Output voltage for invertor
Output capacity	Max 3kW	Output capacity for invertor

* Higher power with parallel connection

Changes for setting voltage and output power capacity are available at us. Please contact us.

Case

Robot : Handling robot
Tajubu in use :
TBRS-5000/3000-155/320 (standard type)

Handling robot
Payload : 200kg
Input electric energy(1 hour) :
DBR (discharge resistance) only【about5.4kWh】
Tajubu+capasitor【about4.3kWh】


Image

When TAJUBU is operated for 20 hours per day, 20 days per month, approx...

a year, electrical bill about 52,000 yen /year

at the rate of 10 yen/kWh

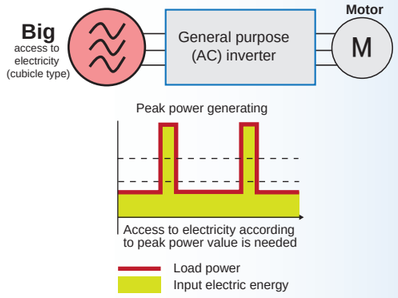
2,900Kg/year of CO_2 emission can be reduced!

at the rate of 0.555kgCO_2/kWh

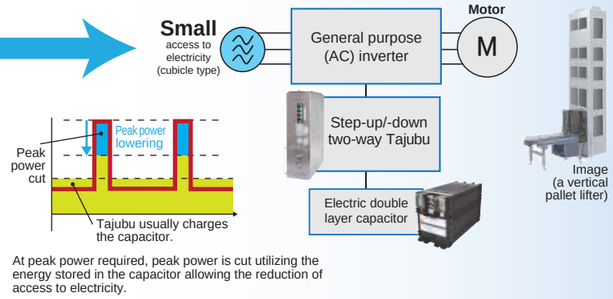
Step-up/-down two-way Tajubu for peak cut

With two-way TAJUBU, boosting-/step down-type, combined with electric double layer capacitor for an equipment requiring peak power, peak power is cut utilizing the energy stored in the capacitor allowing the reduction of access to electricity.

Access to electricity according to peak power value is needed

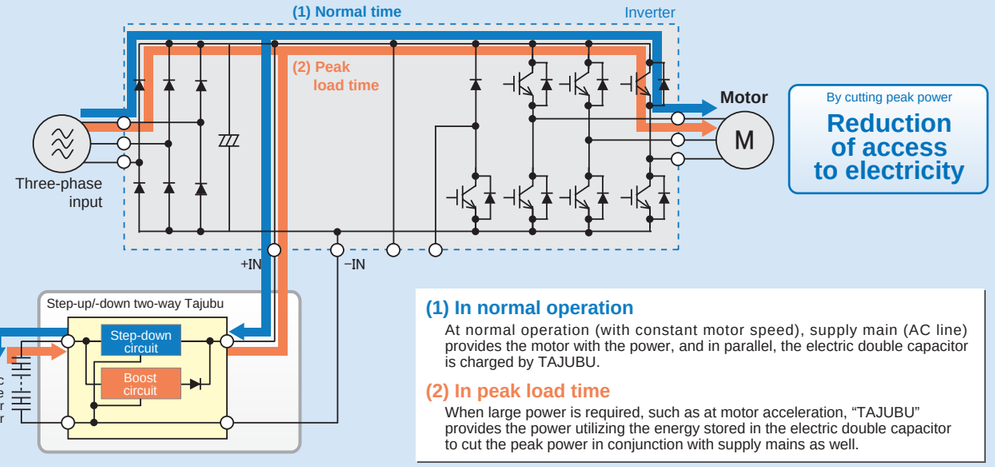


Cutting peak power reduces accessto electricity



At peak power required, peak power is cut utilizing the energy stored in the capacitor allowing the reduction of access to electricity.

Connection diagram



By cutting peak power

Reduction of access to electricity

(1) In normal operation

At normal operation (with constant motor speed), supply main (AC line) provides the motor with the power, and in parallel, the electric double capacitor is charged by TAJUBU.

(2) In peak load time

When large power is required, such as at motor acceleration, “TAJUBU” provides the power utilizing the energy stored in the electric double capacitor to cut the peak power in conjunction with supply mains as well.

Reduction of basic electric power contract fee at end users and, an advantage is brought in to eliminate cubicle when electric power has come down to 50kW!!

For customers who have a contracted load system with low voltage for contacted power, with installing equipment having power cutting function, the contracted power can be lowered to reduce the basic electric power contract fee.

For example,
In the case of installment of three units shown below to compare,
(1) 3 units of 15kW of input peak power with no peak power cutting function
(2) 3 units of 10kW of input peak power with peak power cutting function

When contracted electric power compared between them, 38kW for (1), 26kW* for (2) contributing to 12kW reduction.

Basic charge reduction of
12,000 yen per month
and
144,000 yen per year

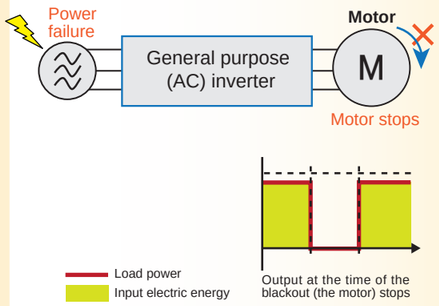
Providing that basic charge is approx.1,000 yen per month for 1kW, **charge reduction would be 144,000 yen based on 12,000 yen per month, 144,000 yen per year respectively.** *Calculated based on the information on Kansai Electric Power Co., Inc. website on the Internet.

Moreover, even in the case that cubicle is required due to the contracted power of 50kW or more, an advantage is brought in to eliminate the cubicle if the power has come down to 50kW or less by cutting peak power.

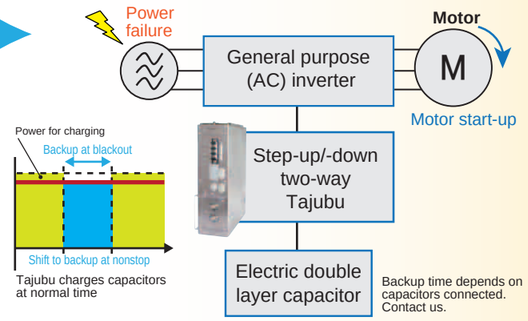
Step-up/-down two-way Tajubu for blackout backup

With booster type/two-way system TAJUBU and electric double layer capacitor combined, stable energy can be supplied to loads by compensating insufficient energy even with unstable input such as solar cells.

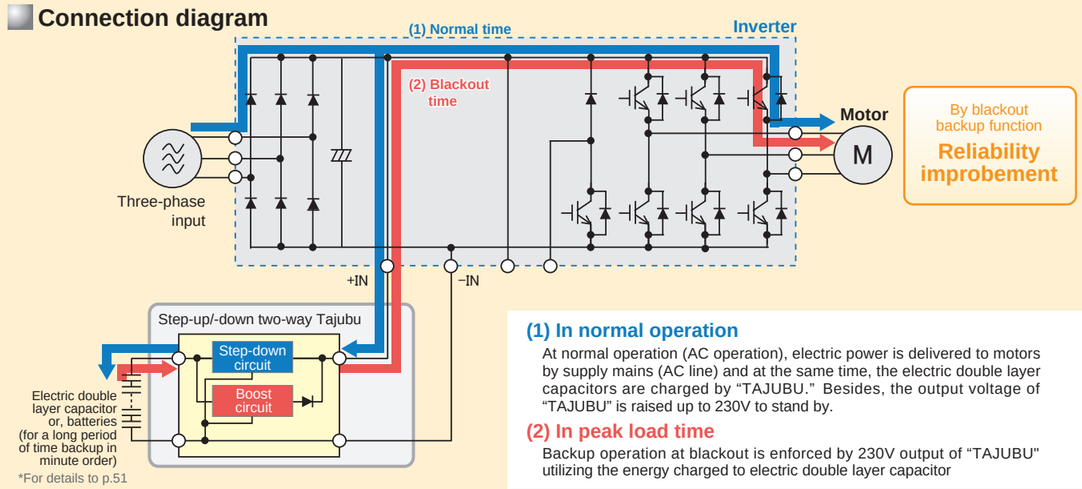
At the time of blackout, the motor stops



Motors can be kept in operation by backup even at blackout



Connection diagram



By blackout backup function
Reliability improbement

*For details to p.51

(1) In normal operation

At normal operation (AC operation), electric power is delivered to motors by supply mains (AC line) and at the same time, the electric double layer capacitors are charged by “TAJUBU.” Besides, the output voltage of “TAJUBU” is raised up to 230V to stand by.

(2) In peak load time

Backup operation at blackout is enforced by 230V output of “TAJUBU” utilizing the energy charged to electric double layer capacitor

Step-up/-down two-way Tajubu

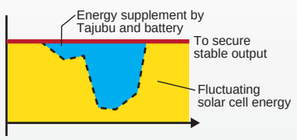
The step-down part (charging on capacitor)		
Input voltage	DC245~340V	
Output voltage	Max DC155V	Voltage for charging on capacitor
Output capacity	Max 5kW	Capacity for charging on capacitor
The boost part (discharging to the inverter)		
Input voltage	DC48~160V	Voltage of capacitor
Output voltage	Max DC320V	Output voltage for invertor
Output capacity	Max 3kW	Output capacity for invertor

*Higher power with parallel connection

Changes for setting voltage and output power capacity are available at us. Please contact us.

Case

Two-way system TAJUBU is now in operation at Earth Port (Minato-kita NT building, TOKYO GAS Co., Ltd.) Earth Port is an energy saving building of Tokyo Gas which has realized energy and CO2 saving by introducing gas-engine cogeneration system, and utilizing natural day lighting, natural ventilation, and photovoltaic generation.



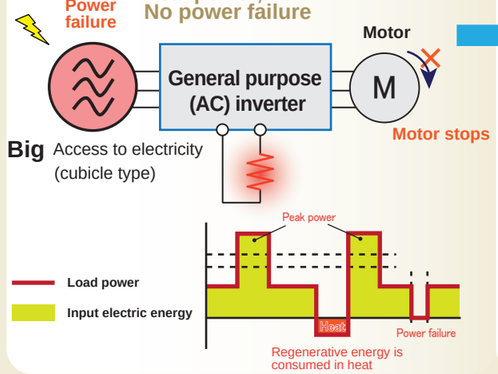
Tajubu in use:
Modified version of TBRS-5000/3000-155/320
(10 units in parallel connection)
Use: Supplement of solar cell energy
Concept: Stable electric power is delivererd by Tajubu and battery supplementing unstable power generation by photovoltaic generation.


Earth Port

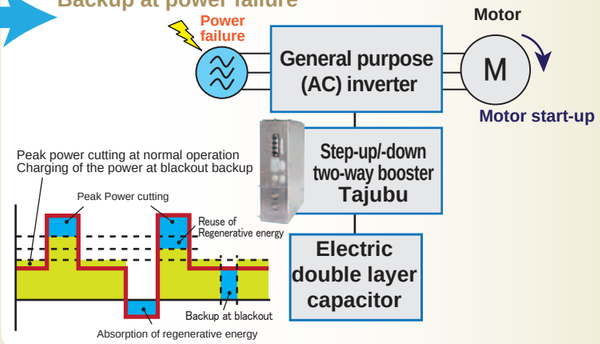
For various uses Step-up/-down two-way Tajubu

Multiple applications can be performed by just one TAJUBU, such as absorption and reuse of regenerative energy, peak-current cutting, backup at blackout in addition to individual application.

Regenerative heat consumption, Peakpower, No power failure



Absorption and reuse of regenerative energy, Peak power cutting, Backup at power failure



As with other connections, simply connecting capacitors and loads with TAJUBU
Voltage setting and capacitors are adjustable at us. Please contact us.

Tajubu products lineup

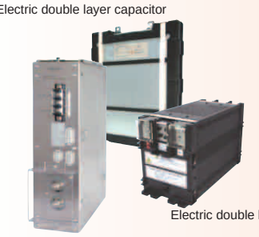
Booster type Tajubu

Series	TB4S-2000-280	TB4D-4000-280	TB2S-1500-280	TB2S-1500-140
Rated input voltage (DC)	48V	48V	24V	24V
Range of input voltage (DC)	37 – 63V	37 – 63V	18 – 32V	18 – 32V
Output voltage (DC)	284V	284V	284V	140V
Maximum continuous output current/voltage	7A	14A	3.52A	7.4A
	1988W	3976W	1000W	1000W
Maximum peak output currrent/voltage	16A	30A	5.28A	11A
	4544W	8520W	1500W	1540W
	Max 10s	Max 10s	Max 5s	Max 5s
Size (W×D×H) mm	290×200×80	330×200×175	290×200×80	290×200×80

*TB4D-4000-280 is a parallel connection type of two TB4D-4000-280s.
*Contact us as input voltage, etc. can be modified.

Step-up/-down two-way Tajubu

Electric double layer capacitor

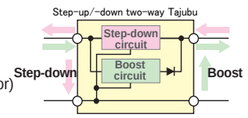


Electric double layer capacitor

Step-up/-down two-way Tajubu
TBRS-5000/3000-155/320

Series	TBRS-5000/3000-155/320		
Step-down part (charging on capacitor)		Boost part (discharging to the inverter)	
Input voltage	240 - 420V	Input voltage	48 - 160V
Output voltage	70V(input 340V max)/155V(input 340V minimum)	Output voltage	230V(input 80V max)/320V(input 80V minum)
Output (charging) current1	20A minimum (output in 0 - 70V)	Output (charging) current	6.5A
Output (charging) current2	60A minimum(output in 83V max)	Maximum output voltage	1500W(output in 230V)/2080W(output in 320V)
Peak output voltage (max 10s)	5kW minimum (output in 83V minimum)	Peak output current	10A
		Peak output voltage	3200W(output in 320V)

Operation image



Step-down part output
Boost part input
(Electric double layer capacitor)

Step-down part output
Boost part input
(Rectified voltage by inverter)

Output: DC0V->70V 20A minimum Capacitor initial charging	Step-down	Input: DC240V - 340V Voltage after smoothing when AC200V is connected to inverter
Input: DC48V - 80V	Boost	Output: DC230 6.5A max (1500W) Voltage for the purpose of backup at AC power failure
Output: DC155V max 60A max/5kW Regenerative energy is absorbed in capacitor	Step-down	Input: DC340V - 420V At regenerative energy (voltage) occurred
Input: DC80V - 155V	Boost	Output: DC320V peak10A (3200W) Efficient use of regenerative energy

Contact us!

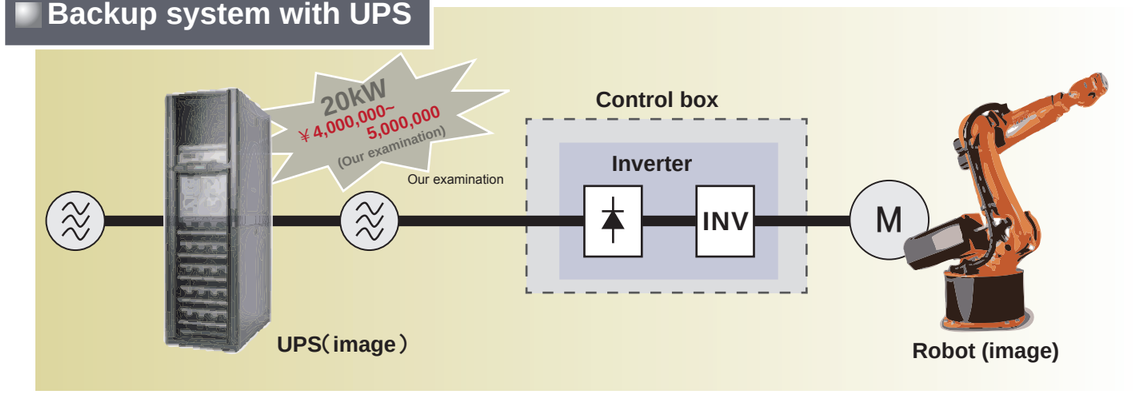
This product is a basic specification product for regenerative energy absorption and reuse.For other applications such as input voltage change and peak power cutting, please contact us as specification can be modified. Also, electric double layer capacitors can be discussed. Contact us first

*For detailed specification of the product, refer to product specification

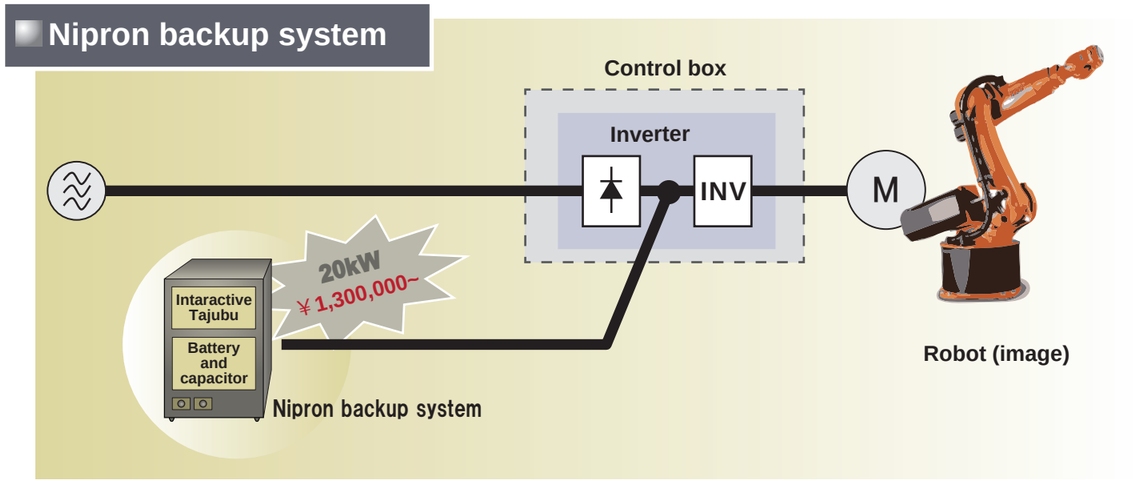
Recommendation of a long time backup for large machineries

Entrust us, Nipron, for Robots (large machineries) backup at power failure!
Let us propose to you Nipron’ s backup system with booster-/step down-type two-way TAJUBU, electric double layer capacitors and battery built in. With this backup system, in addition to possible cost reduction, absorption and reuse of regenerative energy of robots are achievable as well as backup at power failure when compared with existing UPS (uninterruptible power supply) system.

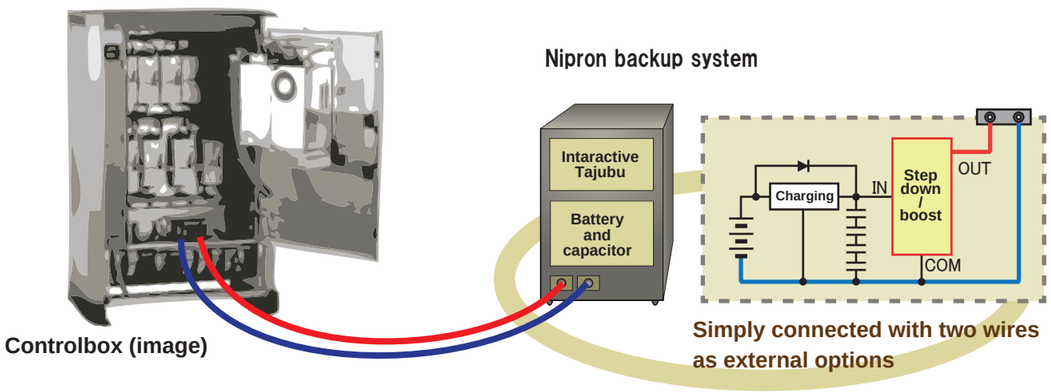
Backup system with UPS



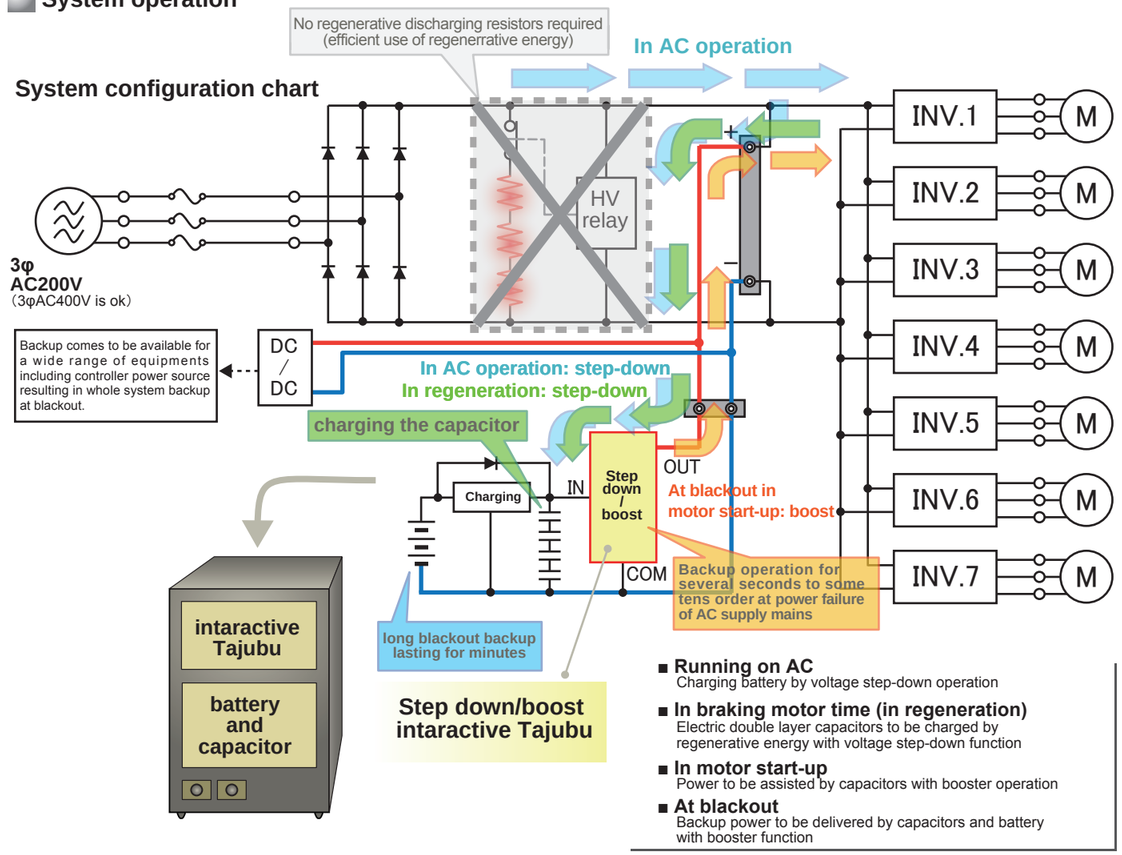
Nipron backup system



Connection image

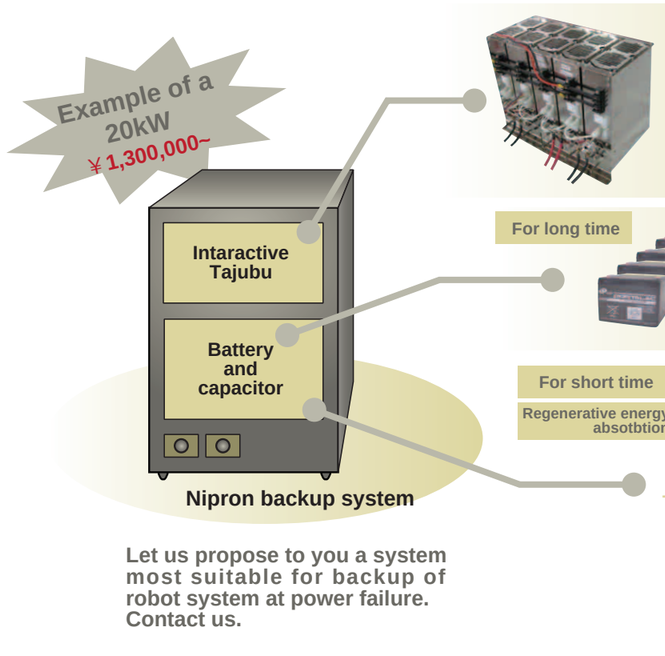


System operation



- **Running on AC**
  Charging battery by voltage step-down operation
- **In braking motor time (in regeneration)**
  Electric double layer capacitors to be charged by regenerative energy with voltage step-down function
- **In motor start-up**
  Power to be assisted by capacitors with booster operation
- **At blackout**
  Backup power to be delivered by capacitors and battery with booster function

Example of 20kW backup system configuration (Configration is at your discretion.)



Let us propose to you a system most suitable for backup of robot system at power failure. Contact us.

【Intaractive Tajubu product examples】
- At blackout (boost operation): DC96V⇒230V
- Power:20kW, efficiency:about 95%
- In regeneration (step-down operation)
  DC340~420V->182V power:20kW
- Size (mm):420×200×290

For long time

【Lead battery example】
- Rated voltage: 96V (12V×8series connection)
- Capacity: 100Ah
- Backup time: about 6minutes (20kW/h)
- Size(mm): 338×170×215(×8)

For short time
Regenerative energy absotbtion

【Capacitor example_A】
- Rated voltage: 202V
- Capacity: 1.8F
- Backup time: 0.5~1 second (20kW/h)
- Size(mm): 143×305×190 (×8)

【Capacitor example_B】
- Rated voltage: 160V
- Capacity: 3.7F
- Backup time: 0.5~1 second (10kW/h)
- Size(mm): 266×39×316

Tackling Smart Grid

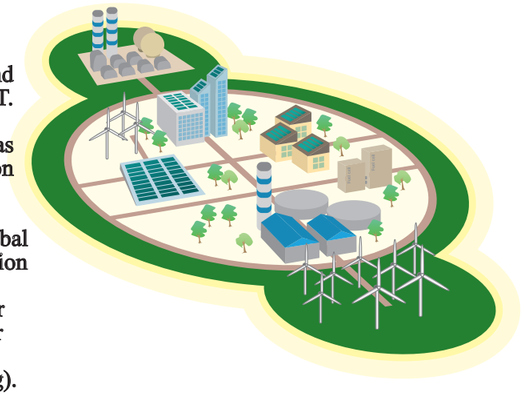
Global Environment Improvement with Green Energy Leveraged

Featuring Smart Grid

"Smart Grid," present-day topics for next generation power grid
Smart grid is power distribution system with high-efficiency/-quality/-reliability that enables automatic power adjustment from both sides of demand and supply by controlling existing electric power, such as thermal power, hydraulic power, and renewable energy such as photovoltaic power generation through IT.

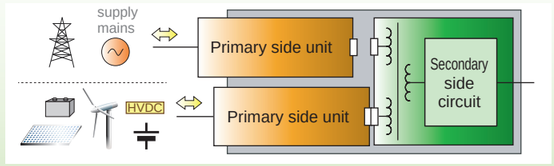
Through this tackle on global environment issues, it is counted on as 21st century social infrastructure to bring in CO_2 emission reduction and power demand leveling.

Under the situation like that, we are on the way to contribute to global environment improvement through Smart Grid system, as the solution to environment issue, developing "SUN Tajubu," energy converter equipped with MPPT control, which allows maximum of the power from solar cells delivered to HVDC in addition to power supply for server which can connect non-commercial power such as green energy like solar cells and HVDC (High Voltage DC power feeding).



Nipron's environment-friendly products

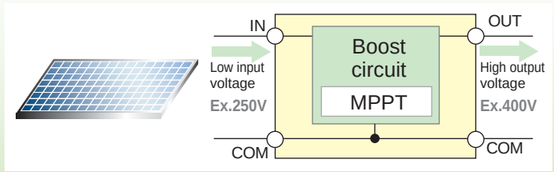
Environment-friendly power supply for server which allows disparate inputs



pNSP2U-1000P

Primary Redundant

Energy converter equipped with MPPT control to utilize maximum of the solar cell energy



TBM series

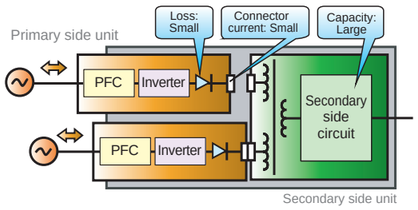
SUN Tajubu

Primary Redundant

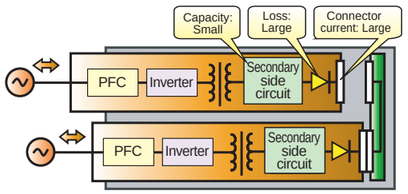
Primary redundant power supply is redundant power supply that only primary side is redundant and secondary side is common realized by Nipron's unique circuit technology. Improving reliability of primary side that is likely to be damaged by surge stress caused by lightning surge and high-voltage switching circuit including PFC circuit, and thermal reliability, this brand-new redundant power supply is designed to have more reasonable margin than normal redundant power supply (full redundant power supply) even in a limited space.

Further, this product flexibly responds to coming "Smart Grid" era by changing the primary unit of primary redundant power supply to enable disparate inputs such as new energy of solar cells and HVDC to be connected.

Primary redundant system

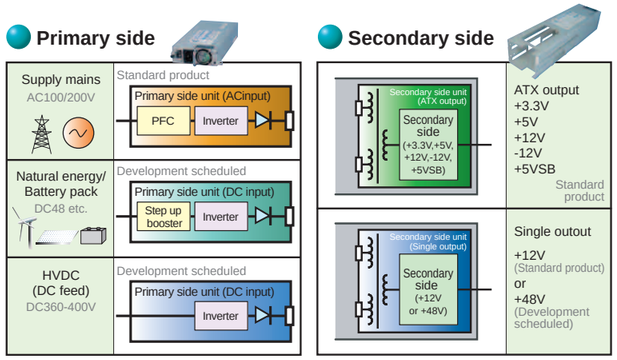


Existing full redundant power supply

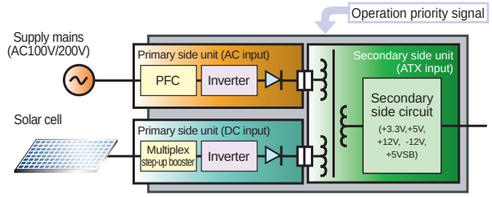


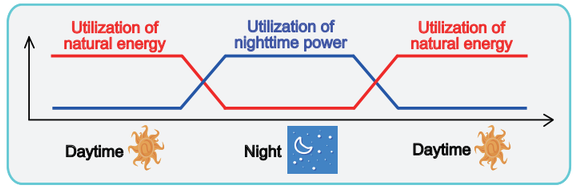
Change the primary unit and disparate input connection will be on hand!

By changing primary unit in primary redundant power supply, disparate inputs such as natural energy (photovoltaic cells, wind generation, etc.) and HVDC become acceptable. For example, by inputting two disparate inputs, commercial input + natural energy (photovoltaic cells), reduction of CO_2 emission is expected utilizing best mix. Burden ratio between two type of inputs (disparate inputs) is adjustable by external signal so that CO_2 emission minimization program becomes available. In addition, secondary unit for single output (12V, 48V) and ATX specification can be ready.



In case input from both supply mains and solar





At normal operation, energy source alternates between commercial power and photovoltaic cells. By using operation first signal, either of those sources can be given priority in operation for effective use. For example, photovoltaic cells comes first during daylight(*), and in the night commercial power comes first utilizing midnight power effectively.

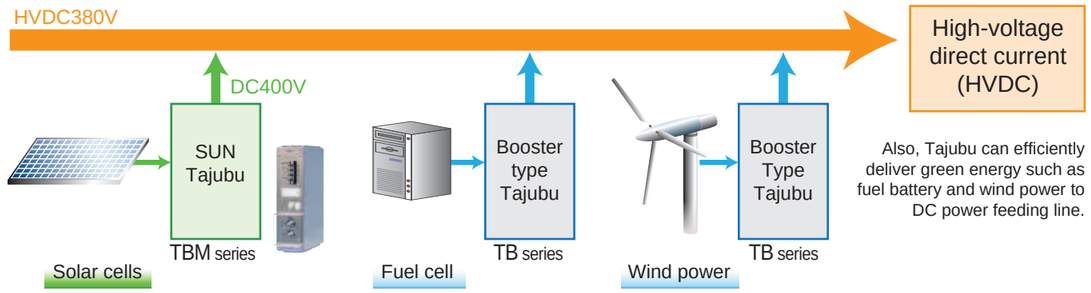
(*) In the case that power is not available from photovoltaic cells, feeding is switched automatically to commercial source.

Product lineup

Model	pNSP2U-330P-AAS					pNSP2U-550P-AAS							pNSP2U-1000P-AAS					pNSP2U-1000P-AAS(12)	
Voltage	+3.3V	+5V	+12V	-12V	+5VSB	+3.3V	+5V	+12V1	+12V2	+12V3	-12V	+5VSB	+3.3V	+5V	+12V	-12V	+5VSB	+12V	+5VSB
Max current/ power (Continuous)	10A	10A	18A	0.5A	2A	20A	20A	18A	12A	10A	0.5A	2A	20A	20A	63.3A	0.5A	2A	66A	2A
	260W max			6W	10W	25A max		35A max			6W	10W	66W	100W	759.6W	6W	10W	792W	10W
	276W max					427.6W max							775.6W max					802W max	
Peak current/ power (Within 5s)	15A	15A	25A	0.5A	2A	20A	20A	18A	12A	16A	0.5A	2A	21A	21A	66A	0.5A	2A	83A	2A
	312W max			6W	10W	25A max		44A max			6W	10W	69.3W	105W	792W	6W	10W	996W	10W
	328W max					550W max							982.3W max					1006W max	
Min current	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A	0A
WxHxD (mm)	108 x 83.8 x 300					108 x 83.8 x 400							108 x 83.8 x 350						

SUN Tajubu

“SUN Tajubu” is here for you, installing MPPT circuit which derives maximum power form solar cells to “Tajubu,” DC-DC converter, which has realized high efficiency and compact equipped with Nipron’s original multiple boosting circuit.
“SUN Tajubu” is an energy converter to deliver maximum power from solar cells to HVDC (high voltage DC power feeding) line.



Also, Tajubu can efficiently deliver green energy such as fuel battery and wind power to DC power feeding line.

Once solar cells start generation of electricity, “SUN Tajubu” starts boosting operation to supply DC 400V in priority to HVDC line.
When load power of HVDC exceeds generated power of solar cells, “SUN Tajubu” decreases output voltage controlled by MPPT while adjusting the power for HVDC to start power feeding so that maximum power from solar cells is delivered.
“SUN Tajubu” has realized stable operation in delivering the maximum power from solar cells to load power of HVDC so that power shortfall is always controlled to be supplied from HVDC.

<Specification example>

Input	DC200V-DC395V
Output	DC400V 10A 4000W
Efficiency	97% typ

* As the specification change is available to meet your system, please contact us.

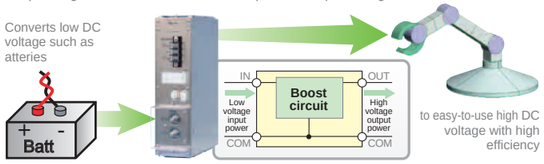
What is MPPT control?

MPPT stands for Maximum Power Point Tracking meaning tracking the maximum power point.
MPPT control refers to the control to track the maximum power point (optimal operating point) of the solar cell.
Solar cell has the characteristics that the current derived is determined by the load voltage connected.
In order to efficiently draw the energy from solar cell, load voltage connected to the solar cell needs to be controlled so as to make the power maximum. This control is referred to as MPPT control.

What is Tajubu?

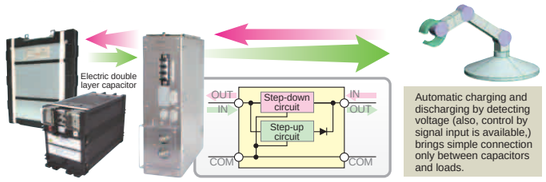
Booster type Tajubu

“Tajubu” (booster type) is DC-DC converter with multiple boosting system, and converts low DC input voltage to high DC voltage easy to use with high efficiency (92 to 97*%).
* depending on the difference between input and output voltage.



Step-up/-down two-way Tajubu

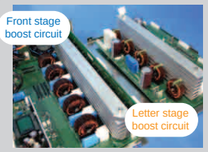
Step-up/-down two-way Tajubu, with both of multiple booster circuit and multiple step-down circuit adopted, has realized two-way operation to charge capacitors (step down) and discharge to equipments from capacitors (step up.) With this two-way Tajubu implemented, system configuration such as absorption/re-use of regenerative energy, cutting of peak power, and back up at blackout can be easily built.



Automatic charging and discharging by detecting voltage (also, control by signal input is available,) brings simple connection only between capacitors and loads.

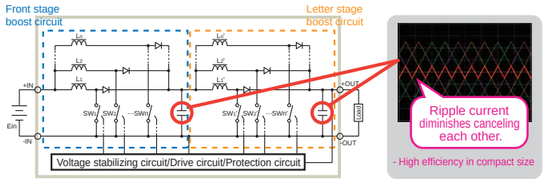
Features

- Adopting Nipron’s original multiple boosting circuit, ompact/High efficiency (92 to 97*%) has been brought. *depending on the difference between input and output voltage.
- With 2-stage boosting circuit adopted, total efficiency has been improved as most suitable devices are used for the first and the second channel respectively.
- Parallel operation is available (we have the track record of up to 10 units in parallel operation.)
- More than double peak current of rated output (with in 10 seconds)
- Higher reliability due to PCB coating
- Lined up as standard products in stock feature



Most suitable devices are selected for the first and the second channel respectively.
- Total efficiency up
- Achievement of high voltage and high power

In Nipron' Tajubu as shown below, it has multiple bootstrap circuits in parallel to control on time of each circuit. It boosts input voltage 10 times or more as high to provide maximum continuous power, 2 to 10kW, with ultra high efficiency (94 to 97%) without electrolytic capacitors. In addition, several multi-boost circuits are connected in series as shown in the block diagram to gain high voltage and large current with stable output regulation in a comprehensive shift-control way. Also, for several applications, it has ability to achieve constant voltage and current in various methods.



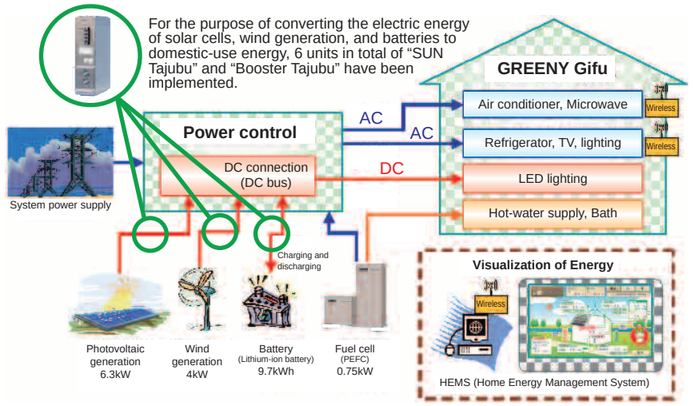
Adoption Examples

"Tajubu” has been adopted by JX Nippon Oil & Energy Corporation in “Environment-friendly multi-energy system” for domestic use.

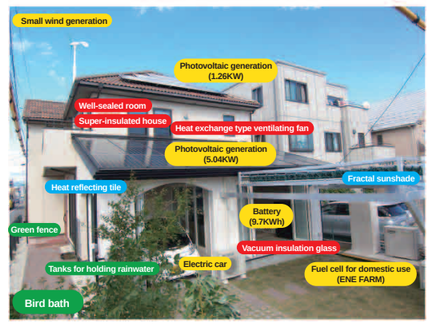
"Tajubu” has been adopted by JX Nippon Oil & Energy Corporation in “Environment-friendly multi-energy system” for domestic use.
For the purpose of converting the electric energy of solar cells, wind generation, and batteries to domestic-use energy, 6 units in total of “SUN Tajubu” and “Booster Tajubu” have been implemented.

“Environment-friendly multi-energy system” has now become next generation multi-energy system which connects solar cells, wind generation and lithium battery in DC mode to feed the energy in DC mode for domestic use.
This enables to control power generation/charge/discharge of each equipment in response to load factor and purveys necessary power and hot water required at home including fuel battery (ENE FARM).
Additionally, by installing HEMS (Home Energy Management System) that shows status of use for the power and hot water on the monitor, energy is visualized as well. Further, another significant feature is that it supplies electricity and hot water even at blackout of system power supply.
“Environment-friendly multi-energy system” for domestic use is implemented at “GREENY Gifu” which has been opened in Gifu city on November 5, 2010 as a stronghold of Gifu prefecture next generation energy infrastructure concept.

Diagram of "Environment-Friendly Multi-Energy System” for domestic use



“GREENY Gifu” appearance

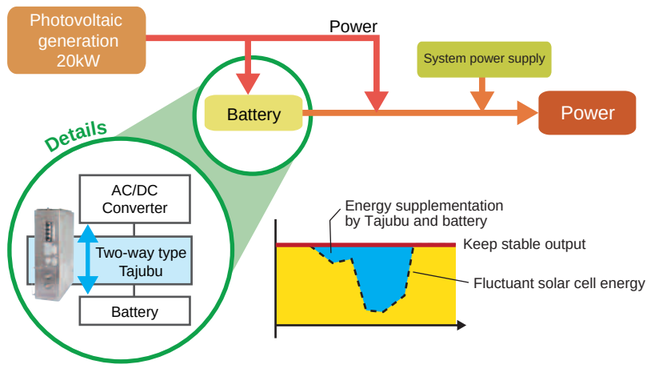


“Bi-directional Tajubu” is adopted in “Earth Port” Kouhoku Building, TOKYO GAS Co., Ltd.

“Bi-directional Tajubu” is adopted in “Earth Port” Kouhoku Building, TOKYO GAS Co., Ltd.
Fluctuating photovoltaic energy is complemented by the combination of Tajubu and Battery to feed the stable power.
Just one unit can handle charging/discharging battery with “Bi-directional Tajubu.”

The “Earth Port” is an energy-saving and CO_2 reduction building that implemented an advanced energy utilization system such as natural daylighting, natural ventilation, and photovoltaic power generation. This building has been awarded many awards including Environment/Energy-saving Architectural Award Construction Minister Award in 1997, and has been ranked S class in according to Comprehensive Assessment System for Built Environment Efficiency (CASBEE)*1.

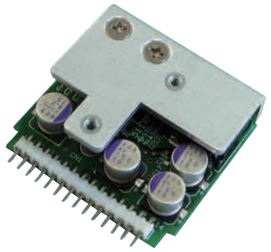
* Comprehensive Assessment System for Built Environment Efficiency (CASBEE)
This method is to evaluate environment efficiency of architectural structures and rank them in five ranks among “S rank (splendid),” “A rank (very good),” “B+ rank (good),” “B- rank (rather poor),” and “C rank (poor).”



“Earth port” appearance

Multi-output switching power supply composed of DC-DC step-down chopper units!

Featuring DC-DC step-down chopper units



For customers who need multi-output switching power supplies, let us introduce our DC-DC step-down chopper units. Multi-output switching power supplies are demanded for measurement-related equipments in particular.
In response to the demand, various multi-output switching power supplies with high efficiency and stability become available by using DC-DC step-down chopper units, PS5114 series, which are built as standard in our ATX power supply.
So this time, let us introduce the features, characteristics, models equipped with chopper units, and examples of use of DC-DC step-down chopper unit, PS5114 series.

Principle of DC-DC chopper circuit

DC-DC chopper circuit is simply composed of switching devices, a choke coil, and a capacitor. With the switching devices turned on and off (chopping), dc voltage is stepped down or boosted.
In ON/OFF control (chopping) of switching device, the longer on-time of switching device, the higher output voltage is, and vice versa. Thus, the necessary output voltage can be gained by controlling the ON/OFF time, duty cycle which is ON time ratio in one cycle.
Our PS5114 series is step-down chopper units.

DC-DC chopper circuit/Principle

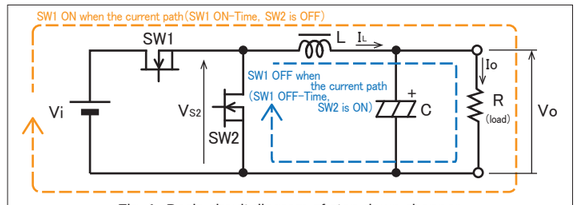


Fig. 1 Basic circuit diagram of step-down chopper

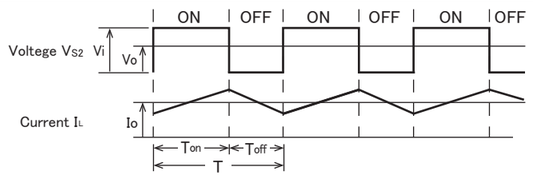


Fig. 2 Operation waveform

The basic circuit diagram of step-down chopper by FET device is shown in the Fig.1 on the left.
Here, V1: supply voltage, SW1/SW2: switching devices,
VS2: voltage between Drain and Source of SW2,
Ton: On-time of SW1, Toff: Off-time of SW1
Provided that each device operates ideally, when each device repeatedly turns on and off in T cycle as shown in Fig.2, output voltage Vo becomes the average of VS2, and described by a formula below.

$$Vo = Vi \times \frac{Ton}{T}$$

When dc voltage is turned on and off (chopped) by switching device SW1, the output voltage turns on and off, and the current flows like sawtooth wave.
To smooth the voltage and the current, choke coil L, switching device SW2*, and capacitor C are used.

※ SW2 may be a diode, but as it causes a voltage loss due to its forward voltage, FET is preferred same as SW1.
Our PS5114 series use FETs operated in synchronous rectifying mode to reduce losses for higher efficiency.

DC-DC step-down chopper units PS5114 series Features

Chopper unit can synchronize at between each other.

With each unit synchronized in operation, disordered oscillation affected by ripples, etc. is avoided and noise is reduced as well.
In this series, we have a master unit which sends synchronous signal and a slave unit which operates synchronously with the signal from the master unit.

Large capacitance polymer capacitors are used as input/output capacitor.

Large capacitance polymer capacitors are used as input/output capacitor. Because its input/output impedance is low, it operates steadily with dynamic load and allows high ripple current so that long-term life is realized even under high temperature operating condition.

Be easy to change the startup timing

With constant of internal components changed, the startup timing of multi-outputs can be easily changed.
For controller boards, troubles often happen as its initial reset is determined based on startup waveform and its timing variously. In that case, startup timing of each output should be organized at power supply side to meet the characteristics of each board.

High efficiency with using synchronous rectifier circuit

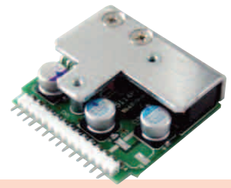
With synchronous smoothing circuit adopted, high efficiency has been brought because loss due to forward voltage of diode is removed and switching loss is minimized by adoption of low ON resistance switching device.

Outline of PS5114 series

Line-up chart

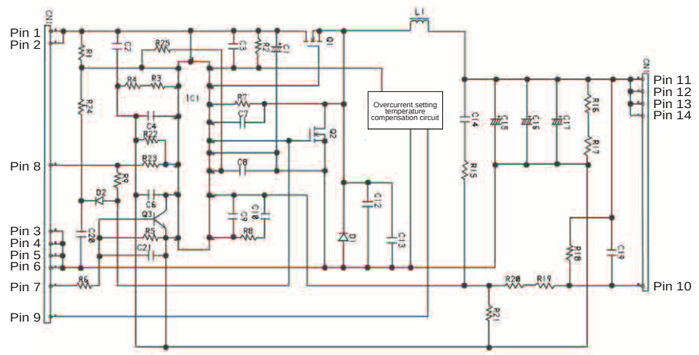
Model	Output voltage	Load current	Input voltage	Synchronization signal※	Standard Price
PS5114-3R3-M	+3.3V±5%	10A	DC10V～27V	Master type (Sends synchronization signal)	1,800 yen
PS5114-5-M	+5V±5%	10A	DC10V～27V		
PS5114-12-M	+12V±5%	10A（14Apeak）	DC15V～27V		
PS5114-15-M	+15V±5%	7A	DC18V～27V		
PS5114-3R3-S	+3.3V±5%	10A	DC10V～27V	Slave type (operates in synchronization by signal)	1,800 yen
PS5114-5-S	+5V±5%	10A	DC10V～27V		
PS5114-12-S	+12V±5%	10A（14Apeak）	DC15V～27V		
PS5114-15-S	+15V±5%	7A	DC18V～27V		

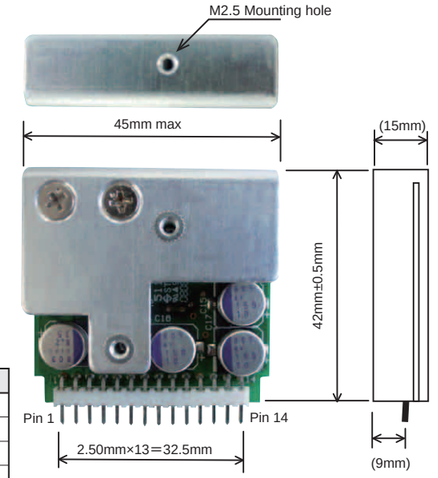
※Keep input current at under 6A. ※+15V output type is under development.



※ About synchronization signal
Main unit contains “master type” which outputs synchronization signal and
“slave type“ which is received the synchronized signal from “master type” and operates synchronous.
For multi-output configuration with multiple units, choose one master type and slave type for others, and connect oscillation frequency synchronization terminal (Pin8) of each unit.
This enables each unit to synchronize in normal operation.
If only one unit is used, select master type.

Circuit diagram, External dimensions・Terminal allocation/Terminal function



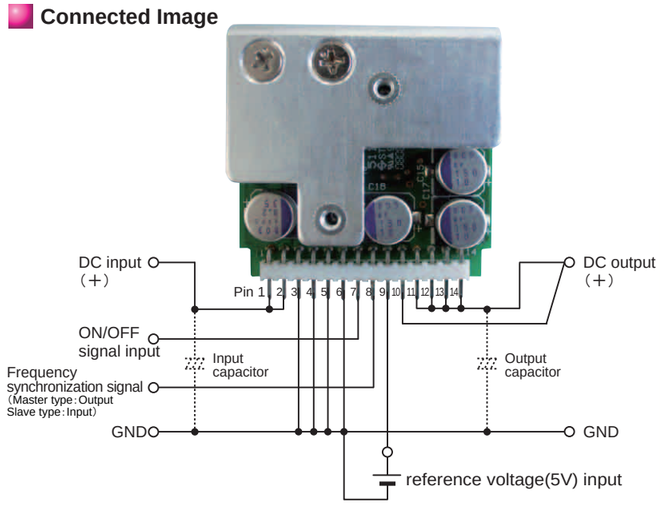


Board hole diameter 1mm

Pin No.	Function
1,2	DC input（＋side）
3,4,5,6	GND
7	Input output ON/OFF controlling signal (L: output ON, H: output OFF)
8	Oscillation frequency synchronization signal (master type: output synchronization signal, slave type: input synchronization signal) Master type provides synchronization signal (133kHz±12%) to slave type.
9	5V±5% input standard voltage (temperature adjustment of over current setting point)
10	Sensing for output voltage feedback
11,12,13,14	DC output（＋side）

※Acceptable current per Pin is 3A max.

Connected Image



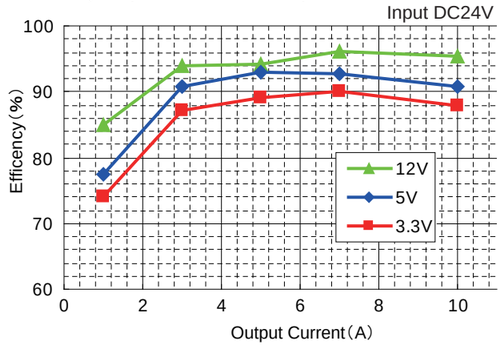
■About reference voltage(5V) input
+5V applied to Pin9 is used as reference voltage for temperature compensation of overcurrent protection value, etc.
When 5V is delivered by 3-terminal regulator, use the specification of 5V 100mA or so.

■About Input capacitor
Input capacitor is required for stable operation in the case of long input wiring.
Capacitance may vary due to wiring condition. Normally electrolytic capacitor with around 1000uF is used.

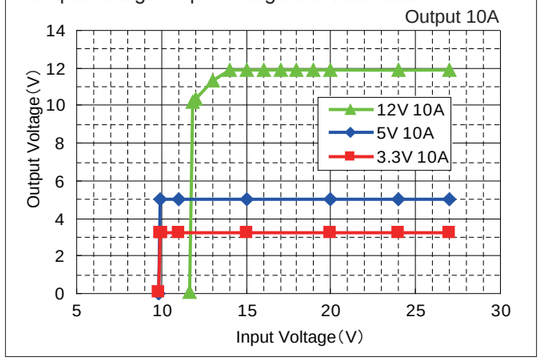
■About Output capacitor
Output capacitor has no condenser capacity at load side.
Please connect 470μF level of capacitor or larger electrolytic capacitor between output and GND if output ripple/spike are large.

Property data (Example of experiment)

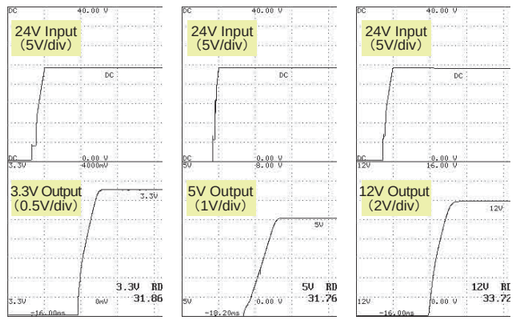
● Efficency / Input Current Vs. Output Power



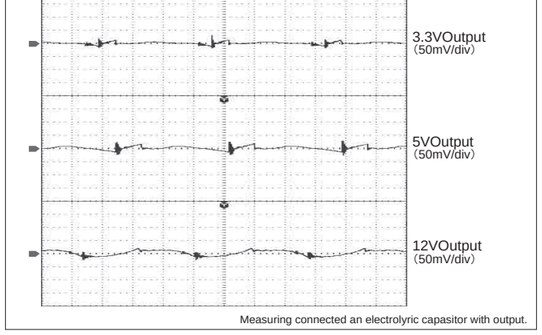
● Output voltage / Input voltage characteristics



● Rising Characteristics

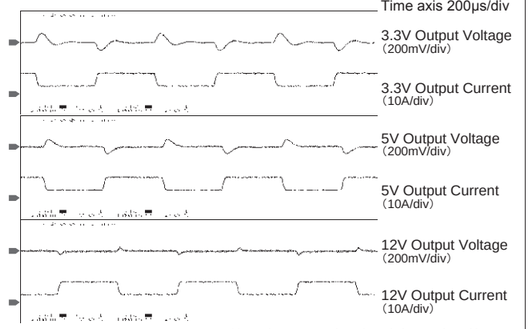


● Ripple and Spike Voltage



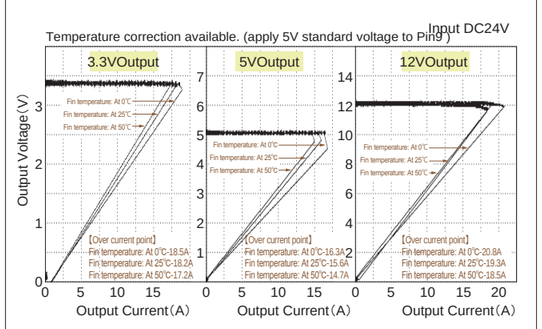
Measuring connected an electrolyric capasitor with output.

● Dynamic Load Function Characteristics At 1kHz



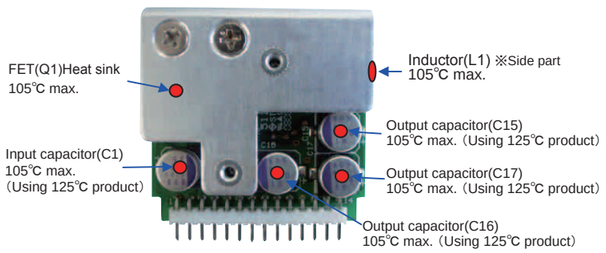
Measuring connected an electrolyric capasitor with output.

● Over Current Protection (V-I)



Temperature rise limit/Temperature measurement point

Please make a equipping radiation fin and enforcement air cooling and reducing of output power as well for ambient temperature due to keep the increase in temperature threshold limit value at indicated temperature of element below.



■Lifetime of polymer capacitor

Generally, the lifetime of electrolytic capacitors follows Arrhenius equation, double chemical reaction for every 10℃* meaning double lifetime with 10℃ less. For polymer capacitors, as 20℃-10 times lifetime rule* meaning 10 times lifetime with 20 ℃ less is applied, lifetime difference becomes larger when temperature is reduced. For example, when a capacitor with the same 105℃ 5000 hrs rating is used, polymer capacitor achieves 50,000 hours at 85℃, and 20,000 hours for electrolytic capacitor on the contrary. The lower the temperature, the longer the lifetime of polymer capacitor is.
For PS5114 series, polymer capacitors with 105℃ (125℃product) 5000 hrs rating are used.

(*) Applied to the environment under 105℃

※Formula of lifetime of polymer capacitor: $Lx = 5000 \times 10^{\frac{105-Tx}{20}}$

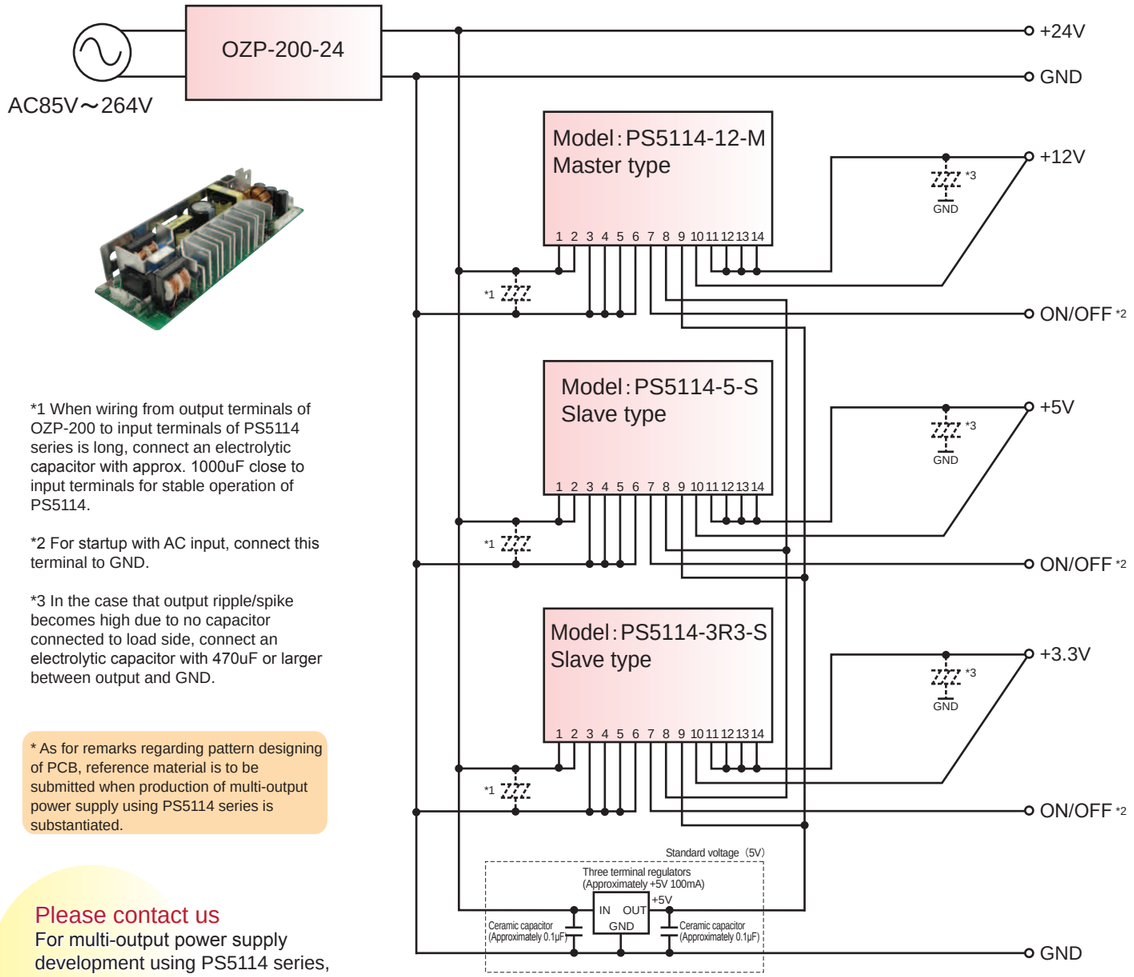
Tx : Measured temperature

Calculation example : Tx=85℃ ⇒ lifetime = 50,000 hours

Configuring AC-DC switching power supply with multi-output

With 24V output power supply and PS5114 series combined, AC-DC switching power supply with multi-output can be configured. As shown below, multi-output of 12V, 5V, and 3.3V is configured with OZP-200-24 as 24V power supply.

Connection example



*1 When wiring from output terminals of OZP-200 to input terminals of PS5114 series is long, connect an electrolytic capacitor with approx. 1000uF close to input terminals for stable operation of PS5114.

*2 For startup with AC input, connect this terminal to GND.

*3 In the case that output ripple/spike becomes high due to no capacitor connected to load side, connect an electrolytic capacitor with 470uF or larger between output and GND.

* As for remarks regarding pattern designing of PCB, reference material is to be submitted when production of multi-output power supply using PS5114 series is substantiated.

Please contact us

For multi-output power supply development using PS5114 series, please contact us any time as we can handle it depending on the contents.

Spec Sheet

Input

AC input	85 to 264V (worldwide range)

Output

Output voltage	+3.3V	+5V	+12V	+24V
Max. current/ Max. power (continuous)	10A	10A	10A	8.4A
	OZP-200-24Output under 201.6W			
Peak current/ Peak power (within 5s)	10A	10A	14A	16.7A
	OZP-200-24Output under 400.8W			
Min. current	0A	0A	0A	0A

PS5114 Pin Assignment

Pin No.	Function
1,2	DC input (+side)
3,4,5,6	GND
7	Input output ON/OFF controlling signal (L:output ON, H:output Off)
8	Oscillation frequency synchronization signal (master type: output synchronization signal, slave type: input synchronization signal) Master type provides synchronization signal (133kHz±12%) to slave type.
9	5V±5% input standard voltage (temperature adjustment of over current setting point)
10	Sensing for output voltage feedback
11,12,13,14	DC output (+side)

※Acceptable current per Pin is 3A max.

Our product lineups using DC-DC step-down chopper unit PS5114 series

SFX size, Compact Nonstop Power Supply

Model **NSP6F-220P-S10**

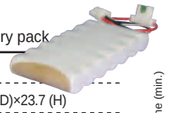
Continuous	160W
Peak	220W

- Palm size PC power supply, complying SFX 12V standard
- Achieved 90% high efficiency at back up operation.
- 20+4 pin is adopted as main connector.
- Backup operation during blackout is possible

Safty standard	UL	CSA	EN	CE	CCC
AC input	85～264V (worldwide range)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max.power (Continuous)	10A	10A	10A	0.3A	1.5A
	Total160W Max.				
Peak current/ Peak power (within 5s)	10A	10A	14A	0.3A	1.8A
	Total220W Max.				
Min. current	0A	0A	0A	0A	0A
W×H×D (mm)	100×63.5×145				

Output connectors: Main (20+4pin) / 12V (4pin) / ×3 / S-ATA ×4 / ×1

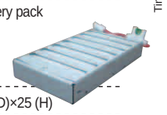
Compatible battery pack



BP03A-H16/2.5L

Size:92.5 (W)×159.5 (D)×23.7 (H)

Small size Ni-MH battery pack

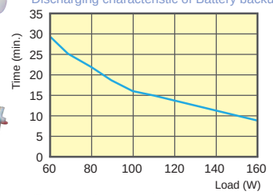


BS03A-H16/2.5L

Size:101.5 (W)×175 (D)×25 (H)

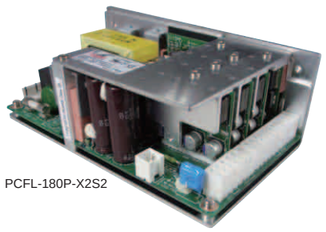
Installable for 3.5inch bay, small size Ni-MH battery pack

Discharging characteristic of Battery backup



*The backup time is only for reference at initial use, NOT guaranteed.
*Line charts shows time length from blackout to power supply shutdown.

Natural air cooling design, Fanless ATX Power Supply



PCFL-180P-X2S2

Contact us for chassis in response to SFX mounting face as we can handle it depending on the contents.

Model **PCFL-180P series**

Continuous	90W
Peak	180W

Safty standard	UL	CSA	EN	CE	CCC
AC input	85～264V (worldwide range)				
Output voltage	+3.3V	+5V	+12V	+24V	-12V	+5VSB
PCFL-180P-X2S2	○	○	○	-	○	○
PCFL-180P-F1S	-	○	○	○	○	○
PCFL-180P-F2S	○	○	○	○	○	○
Max. current\ Max. power (Continuous) — Time at natural air cooling (Basic conmfiguration)	10A	10A	7.5A	3.75A	0.3A	1.5A
	60W Max.					
	Within the limits of output power restrictions (Max.90W)					
Time at natural air cooling (Exclusive heat sink attachment)	10A	10A	8.5A	4.25A	0.3A	1.5A
	70W Max.					
	Within the limits of output power restrictions (Max.102W)					
At the time of forced air cooling using a external fan*1	10A	10A	10A	5A	0.3A	1.5A
	Within the limits of output power restrictions (Max.150W)					
Peak current / Peak power (within 5s)	10A	10A	15A	7.5A	0.3A	2A
	Within the limits of output power restrictions (Max.180W)					
Min. current	0A	0A	0A	0A	0A	0A
W×H×D (mm)	93×55×160					

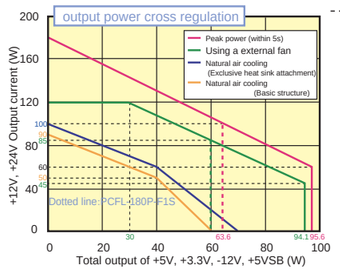
*1 In forced air cooling, air flow if 0.5m3/min. more ti parts syrfaceus reqyured.

Output connectors (Optional): Main (20pin) / Main (24pin) / ×5 / ×1 / S-ATA ×4

Series Lineup

PCFL-180P-X2S2	ATX Output, Batttery Backup available
PCFL-180P-F1S	With+5V, +12V, -12V, +5VSB, +24V (No +3.3V)
PCFL-180P-F2S	With ATX Output , +24V

- Natural air cooling design, Fanless ATX Power Supply
- PCFL-180P-X2S2 the backup function
- Compact dimension brought by a new circuit with no electrolytic capacitors for input smoothing

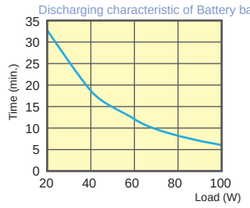


Compatible battery pack

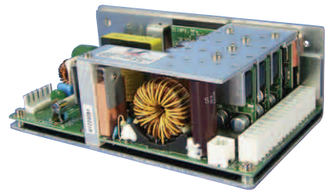
BS17A-H24/2.0L

Installable for 3.5inch bay, Ni-MH battery pack

Discharging characteristic of Battery backup



DC24V Input Fanless ATX Power Supply



Contact us for chassis in response to SFX mounting face as we can handle it depending on the contents.

Model **PCFD-180P-X2S**

Continuous	90W
Peak	180W

- DC24V Input Fanless ATX Power Supply
- Backup function at blackout
- With medical standard compliant 24V output power supply connected, medical standard compliant ATX output power supply is at hand.

PS5105/PS5105-02

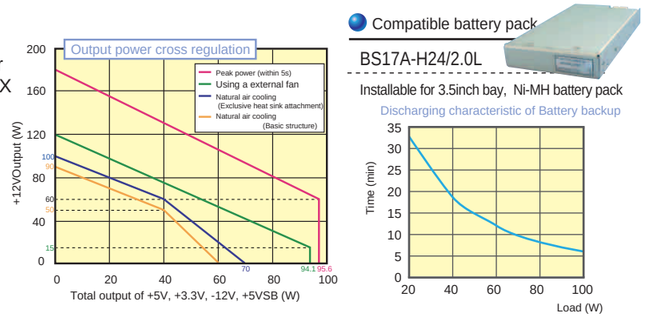
Transforming peripheral connector to 12V power connector.

Length of harness :80mm (PS5105)
320mm (PS5105-02)

Safty standard	UL	CSA	EN	CE	CCC
DC input	20～36V				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current\ Max. power (Continuous) — Time at natural air cooling (Basic configuration)	10A	10A	7.5A	0.3A	1A
	60W Max.				
	Within the limits of output power restrictions (Max.90W)				
Time at natural air cooling (Exclusive heat sink attachment)	10A	10A	8.5A	0.3A	1A
	70W Max.				
	Within the limits of output power restrictions (Max.102W)				
At the time of forced air cooling using a external fan*1	10A	10A	10A	0.3A	1.5A
	Within the limits of output power restrictions (Max.150W)				
Peak current / Peak power (within 5s)	10A	10A	15A	0.3A	1.8A
	Within the limits of output power restrictions (Max.180W)				
Min. current	0A	0A	0A	0A	0A
W×H×D (mm)	93×55×160				

*1 In forced air cooling, air flow if 0.5m3/min. more ti parts syrfaceus reqyured.

Output connectors (Optional): Main (20pin) / Main (24pin) / ×5 / ×1 / S-ATA ×4



Compatible battery pack

BS17A-H24/2.0L

Installable for 3.5inch bay, Ni-MH battery pack

Discharging characteristic of Battery backup

DC24V Input, non-isolated ATX/SFX power supply

* This product is suggested model (subject to change in specification)

PCUI-180P-X2SF1

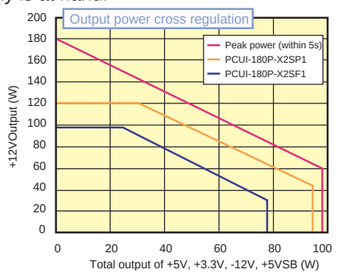
SFX Continuous 150W / Peak 180W

PCUI-180P-X2SP1

ATX Continuous 120W / Peak 180W

Model **PCUI-180P series**

- DC24V Input, non-isolated ATX/SFX power supply
- Two mounting surface types available for PS/2 (ATX) and SFX power supply.
- With medical standard compliant 24V output power supply connected, medical standard compliant ATX output power supply is at hand.



Safty standard	UL	CSA	EN	CE	CCC

PCUI-180P-X2SP1

DC input	21.6～26.4V				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max.power (Continuous)	10A	10A	10A	0.3A	1A
	Within the limits of output power restrictions (Max.150W)				
Peak current / Peak power (within 5s)	10A	10A	15A	0.3A	1.8A
	Within the limits of output power restrictions (Max.180W)				
Min. current	0A	0A	0A	0A	0A
W×H×D (mm)	150×86×110				

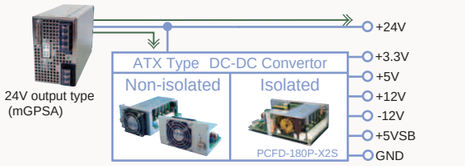
PCUI-180P-X2SF1

DC Input	21.6～26.4V				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ Max.power (Continuous)	10A	10A	8A	0.3A	1A
	Total 70W				
	Within the limits of output power restrictions (Max.120W)				
Peak current / Peak power (within 5s)	10A	10A	15A	0.3A	1.8A
	Within the limits of output power restrictions (Max.180W)				
Min. current	0A	0A	0A	0A	0A
W×H×D (mm)	100×63.5×151				

Output connectors (Optional): Main (20pin) / Main (24pin) / ×5 / ×1 / S-ATA ×4

- As power supply system compliant with medical standard

With mGPSA-360/750 24V output model and ATX output model with DC 24V input combined, ATX output power supply with low leakage current compliant with medical standard is at hand.



Once just mGPSA has complied to medical standard, your system can be standardized regardless of medical standard even though secondary output voltages are variously customized.