

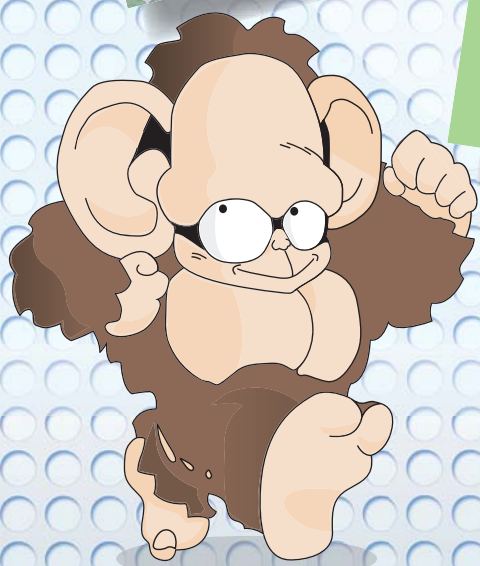
Nipron

Nipron Wave

Special Edition 2

- Highlighted products with features -
2010 Summer

Nipron Wave
Vol.18 2010 Winter



Nipron's Power Supply that guards safety and ease of mind

We, Nipron, proudly declare that Nipron's power supply is grounds of customers' products and the bedrock to support them. Our primary mission is to guard customer's safety and ease of mind bringing power supplies designed with sensible design policy.

Nipron Co., Ltd.

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.

Medical Standards

"UL, CSA, IEC60601-1" compliant "m Series"

Battery Pack



Battery Backup available

mNSP3-450P-S20-H1V

ATX	
NSP (Nonstop PSU)	
Continuous Max.	Peak Power
300W	450W



mPCSA-500P-X2S

ATX	
Continuous Max.	Peak Power
300W	500W

Battery Pack

※ mGPSA-750 series during preparation



mGPSA-360 Series

mGPSA-750 Series

Single output	
Continuous Max.	Peak Power
360W	600W

Single output	
Continuous Max.	Peak Power
720W	1200W

Battery Backup available for 24V output

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)	• Medical electrical equipment: general requirement of safety ⇨JIS T 0601-1(1999)
		IEC60601-1	
		IEC60601-1	• Safety requirement of medical electrical system ⇨JIS T 0601-1-1(1999)
		IEC60601-1-1 (1992)	
		IEC60601-1-1	• Electromagnetic compatibility (EMC) — requirement and test
		IEC60601-1-2 (1993)	
		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)

■ Advantages of medical standards complied power supply

● Applying standards for power supply installed system

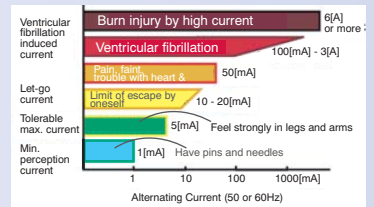
▪ Power supply **NOT** complied

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.

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.

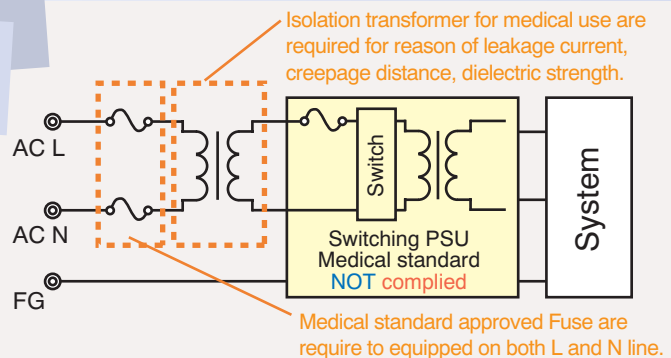
If a certain level of the current flowed through the heart, muscle of the heart starts excitation contraction and stops pumping out the blood. This kind of heart condition is called "ventricular fibrillation". It is also said that ventricular fibrillation will happen when the amount of the current flowed 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 approx.100[μA] (=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"



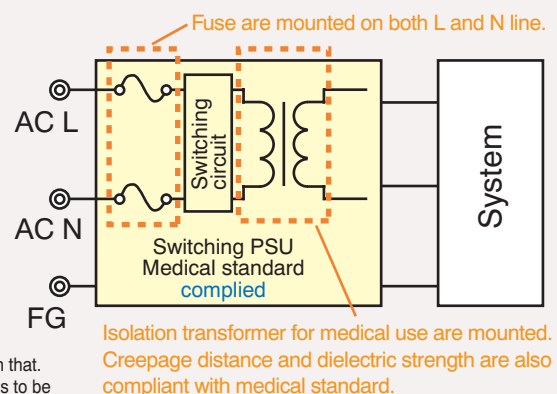
▪ mNSP3/mPCSA, mGPSA series (complied)

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 with the standards.

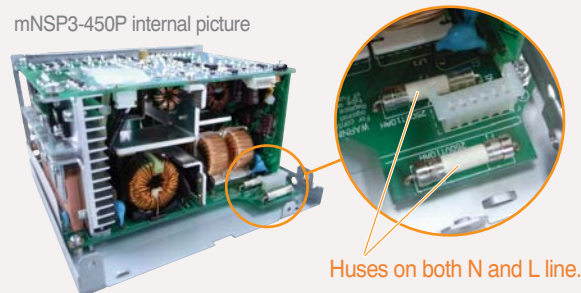
ATTN:

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.



mNSP3-450P internal picture



■ 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 construction 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)	Government certification	Government certification

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

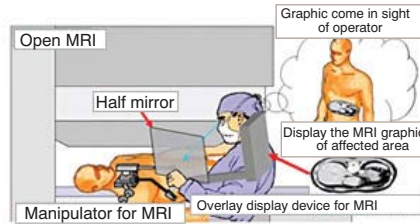
■ Transition of Medical Standards

- 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



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



(image)

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	0.5A	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				

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%)

Backup operation available

Nonstop power supply
mNSP3-450P-S20-H1V



Continuous max. 300W
Peak 450W

Without Backup operation

mPCSA-500P-X2S



Continuous max. 300W
Peak 500W

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

Because it is double and reinforced insulation type, Medical standards matched commercial insulating transformer is unnecessary (low cost, downsizing)

New Product Development News

We are under development for 1000W class nonstop type ATX power supply towards release in April 2010. Design to comply with medical standard IEC 60601-1, energy saving 80 Plus compliant.

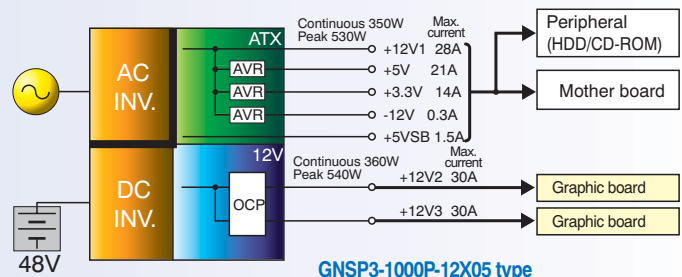
<ATTN> For customers who needs 1000W output ATX PSU (Medical Standard incompliant)

As great capacity ATX power supply

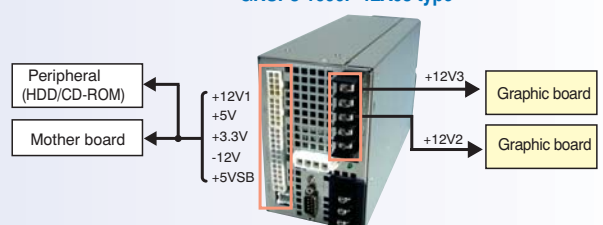
There is a growing need for 1000W output class ATX power supply for the graphic board (VGA) which capacity is becoming greater and greater. As a power supply to satisfy these needs, GNSP2-1000P-12X05 perfectly suits the field that handles with image processing apparatus including systems for medical purpose.

Output specification

	+3.3V	+5V	+12V1	-12V	+5VSB	+12V2	+12V3
Max. output current	14A	21A	28A	0.3A	1.5A	30A	30A
Max. output capacity	348.1W			360W			
	708.1W						
Peak output current	20A	30A	40A	0.3A	1.5A	45A	45A
Peak output capacity	527.5W			540W			
	1067.5W						



GNSP2-1000P-12X05 type



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-750 series: during preparation

● Low leakage current

0.3mA or less (at AC 264V input)

● Input fuses

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.

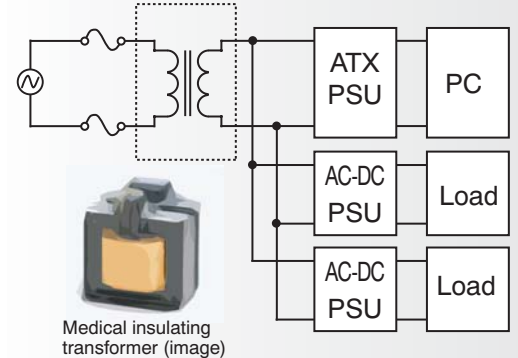
Line-up and Input/output specification

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

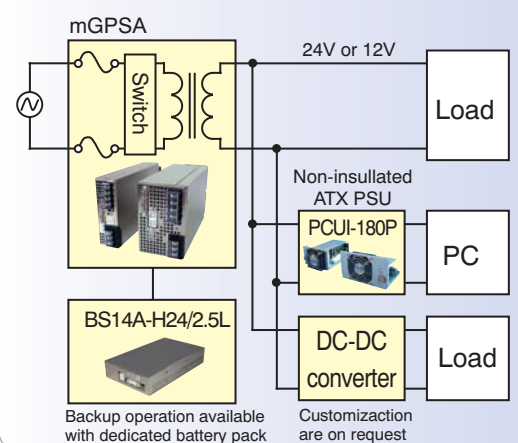
Features

- Conducted emission class B compliant
Low leakage current spec, and satisfies conducted emission class B.
- Convenient size for loading system rack
Height 3U, width 1U/2U sized rack embedded size.
- 12V standby power supply output
0.3A output is possible as auxiliary power (standby output).
- Blackout detection signal available
24V output type is available backup operation when connected to dedicated battery pack.

Previously...



From now on...



Applicable examples

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



Security camera for tensive unit
mPCSA-500P-X2S



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



PC for MRI/CT
ePCSA-500P-X2S



PC for medical analyzer
PCTF-220P-X2S



Immunoanalytical system
mGPSA-750-12-TP



Ultrasonograph for overseas
mGPSA-360-12-TP



Medical DVR
PCTF-220P-X2S



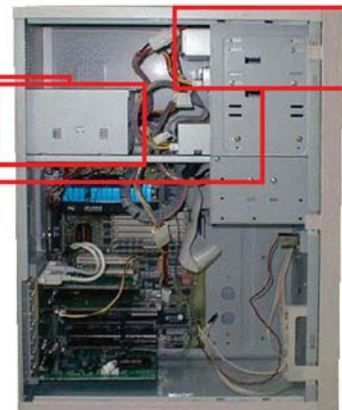
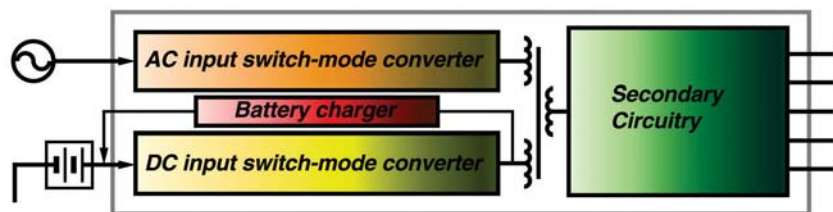
(images)

Built-in type Nonstop Power Supply surpasses standalone UPS

Smart UPS solution configured with a PS2 size nonstop power supply and a battery pack

Advanced ATX power supply with removable nonstop function unit

Lead-acid or Ni-MH battery pack installable in 5-inch bay



Nonstop power supply with removal backup function

Model: **eNSP-300P series**



Model **RBS01A-P24/2.2L**
Removable lead-acid battery pack



ATX NSP (Nonstop PSU)	
Continuous Max.	200W
Peak Power	300W

Output connectors	
eNSP-300P-S20-11S	Main (20Pin) 12V (4Pin) AUX X5 X1
eNSP-300P-L20-11S	Main (20+4Pin) 12V (4Pin) 12V (5Pin) X3 S-ATA X4

AC Input	85 to 264V (worldwide range)				
DC Input	24V (5" bay type Lead-acid battery, Ni-MH battery)				
Output voltage	+3.3V	+5V	+12V	-5V	-12V
	14A	21A	10A	0.3A	0.8A
	Total 125W		Total 203.6W		
Max. current/ power (continuous)	Total 185W		Total 203.6W		
	28A	30A	15A	0.3A	0.8A
	Total 180W		Total 280W		
Peak current/ power (within 5s)	Total 280W		Total 303.6W		
	0A	1A	0A	0A	0A
	Total 303.6W				
Min. current	0A	1A	0A	0A	0A

High-powered Nonstop power supply

Model: **eNSP3-450P-S20-H1V**



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

ATX NSP (Nonstop PSU)	
Continuous Max.	350W
Peak Power	450W

Output connectors (Optional)	
Main (24Pin)	Main (20Pin) 12V (4Pin) 12V (5Pin) X5 S-ATA X4 PCI-E X1

AC Input	85 to 264V (worldwide range)				
DC Input	24V (5" bay type Lead-acid battery, Ni-MH battery)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
	20A	22A	22A	0.5A	2A
	Total 160W		Total 334W		
Max. current/ power (continuous)	Total 334W		Total 350W		
	30A	33A	30A	0.5A	2.5A
	Total 200W		Total 432W		
Peak current/ power (within 5s)	Total 432W		Total 450.5W		
	0A	0A	0A	0A	0A
	Total 450.5W				
Min. current	0A	0A	0A	0A	0A
W x H x D (mm)	150 x 86 x 140				

Small but Powerful!!

Compact size Nonstop power supply

Model: **NSP6F-220P-S10**



SFX NSP (Nonstop PSU)	
Continuous Max.	160W
Peak Power	220W

Output connectors	
Main (20+4Pin)	12V (4Pin) X3 S-ATA X4

AC Input	85 to 264V (worldwide range)				
DC Input	16.8V (3.5" bay type Ni-MH battery)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
	10A	10A	10A	0.3A	1.5A
	Total 160W		Total 160W		
Max. current/ power (continuous)	Total 160W		Total 160W		
	10A	10A	14A	0.3A	1.8A
	Total 220W		Total 220W		
Peak current/ power (within 5s)	Total 220W		Total 220W		
	0A	0A	0A	0A	0A
	Total 220W				
Min. current	0A	0A	0A	0A	0A
W x H x D (mm)	100 x 63.5 x 145				

ATX power supplies deliver high power outputs with high efficiency and reliability

excellent series employ ABS resin panel, cooling fan replaceable from front, I/O interface port and power switch safeguard

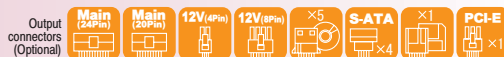


Admirable Hold-up time at momentary blackout, PC power supply with high power

Model: **ePCSA-500P-X2S**



ATX	
Continuous Max.	350W
Peak Power	500W



AC Input	85 to 264V (worldwide range)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ power (continuous)	20A	22A	22A	0.5A	2A
	Total 160W		Total 334W		
	Total 334W				
	Total 350W				
Peak current/ power (within 5s)	30A	33A	30A	0.5A	2.5A
	Total 200W		Total 482W		
	Total 482W				
Min. current	Total 500.5W			0A	0A
	0A	0A	0A		
W × H × D (mm)	150 × 86 × 140				

High efficiency, High power PC power supply

Model: **ePCSA-650P-E2S**



ATX/EPS	
Continuous Max.	550W
Peak Power	650W



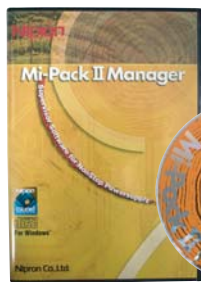
AC Input	85 to 264V (worldwide range)						
Output voltage	+3.3V	+5V	+12V1	+12V2	+12V3	-12V	+5VSB
Max. current/ power (continuous)	24A Total 140W	24A Total 420W	18A Total 550W	12A	12A	0.5A	2.5A
Peak current/ power (within 5s)	24A Total 150W	24A Total 480W	22A Total 650W	16A	16A	0.5A	3A
Min. current	0A	0A	0A	0A	0A	0A	0A
W × H × D (mm)	150 × 86 × 180						

Intelligence Battery Pack

"Mi-Pack II"

OS specification

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



Application software
Mi-Pack II Manager

Battery pack
BS22A-H24/2.0L



Display battery Life span & Condition!

Calculation

Life span based on changes of features

- changes of inner resistance
- changes of unbalance voltage when discharging

Life span based on use frequency and total time

- depth of cycle discharge
- total discharge capacity and depth of discharge
- ambient temperature
- total time after the start of using

Judgment

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

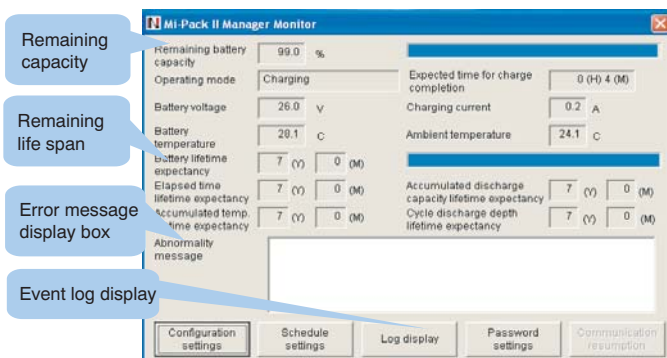
Among the values gained by c through f, the one with the smallest value is mainly used to display the remaining time.
When the lifetime expires, an alarm is delivered and can be monitored as event information.

Notice

e-mail is delivered to max. 5 addresses

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)



● PC monitor display function

1. Battery voltage (unit: 0.1V)
2. Discharging current (unit: 0.1V)
3. Battery temperature (unit: 0.1 deg C)
4. Ambient temperature (unit: 0.1 deg C)
5. Life span based on depth of cycle discharge (unit: year/month)
6. Life span based on ambient temperature (unit: year/month)
7. Life span based on total discharge capacity (unit: year/month)
8. Life span based on time after the start of using (unit: year/month)
9. Log data display

- An error information is delivered via email.
- RS-232C is equipped for external communication.

Event recorder embedded for analysis

Keeps operating from the time of manufacturing, since EEPROM is embedded as an event recorder inside the battery pack. It memorizes the event log until the end of use, so it is possible to analyze when needed.

MORE INFORMATION

<http://www.nipron.co.jp/>

Search

Mi-Pack II from Top page

Notice

Requests to acquire CCC Standard for export commodity to China has been increasing. Nipron's products shown on the right has certified CCC STANDARD.

CCC STANDARD



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.

CCC standard certified products



Nonstop ATX PSU
eNSP3-450P-C20-H*V



ATX PSU
PCSA-370P-X2S



1U size ATX PSU
PC1U-300P-E2S



ATX PSU
ePCSA-500P-X2C



SFX size PSU
PCSF-350P-X2S1



2U size ATX PSU
PC2U-530P-X2S

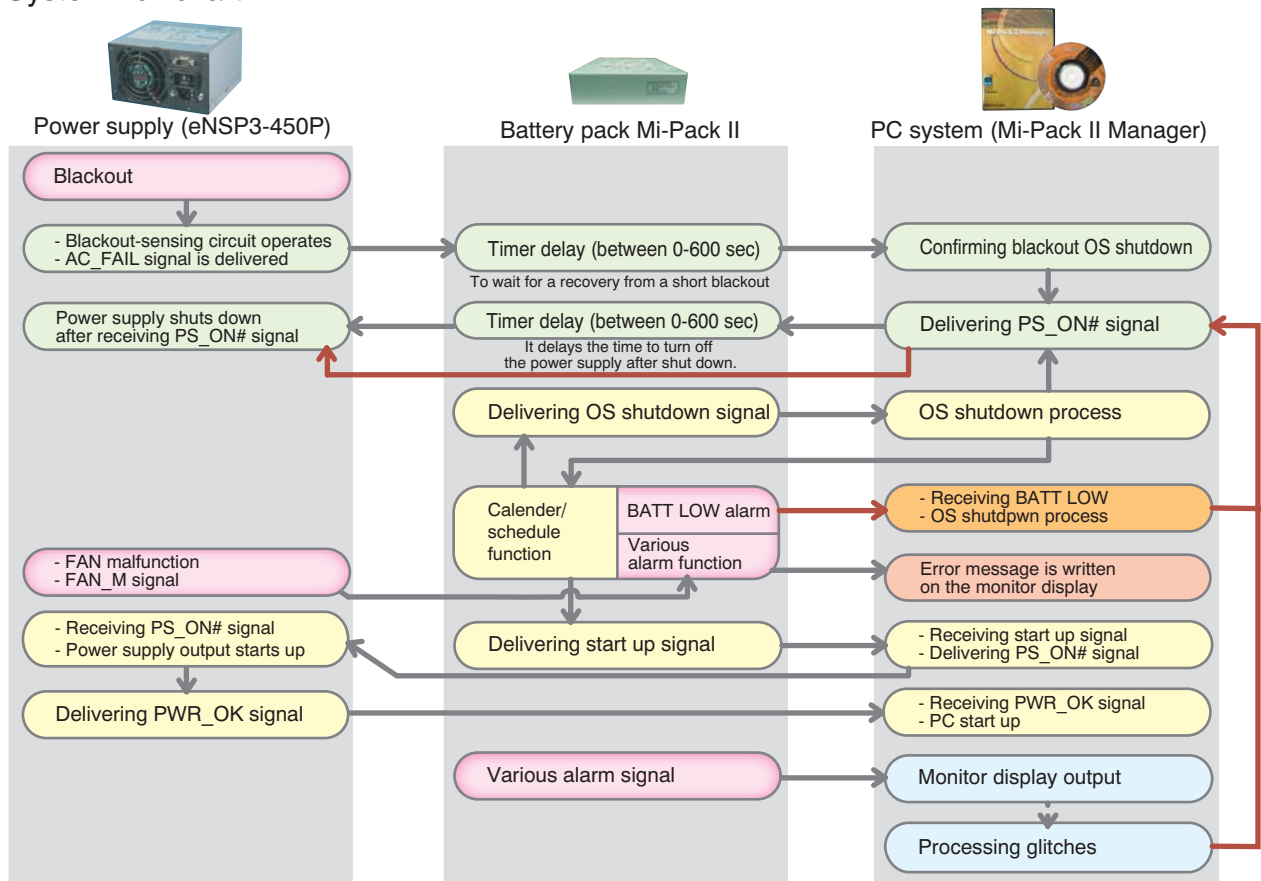
Server's automatic operation is possible.

Nonstop power supply
eNSP3-450P-S20-H*V



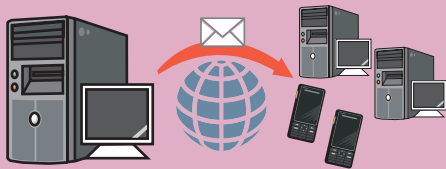
Using dedicated control software (Mi-Pack II Manager) enable to manage schedules in the PC (automatic start-up/shutdown). Not just specific date, you can also setup the schedule per week. That means, for example, daily start-up/shutdown operation at the work place as personal office if setting schedule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

● System flowchart



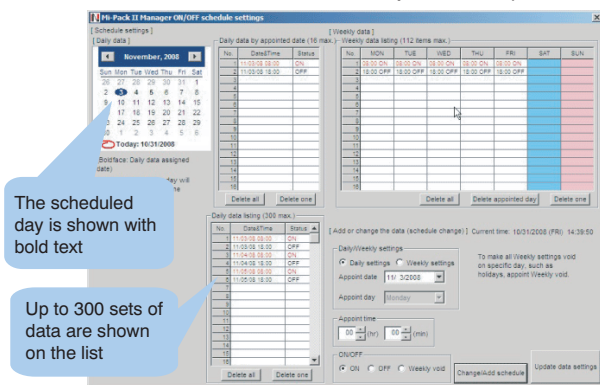
Email information

- 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



Announce the blackout via email through the internet

● 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.

Mechatronics Power Supply (No. 1)

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

12V.24V.30V.36V.42V.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 mechatronics 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

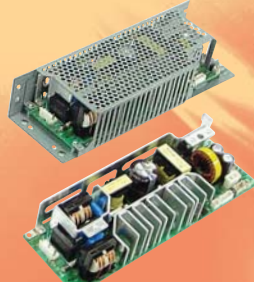
360W class

750W class

Battery pack



OZP-120 series



OZP-170 series



GPSA-360 series



GPSA-750 series



BS14A-H24/2.5L

Available for the backup
against the blackout

software

NSP Pro2



Series type	Output voltage	+12V	+24V	+30V	+36V	+42V	+48V	+12VSB
OZP-120-*** 120W	Rated output current	10A	5A	4A	3.4A		2.5A	
	Peak output current	AC100V						
		AC200V	15A	9A	7.2A	6A	4.5A	
OZP-170-*** 170W	Rated output current	14A	7A	5.6A	4.7A		3.5A	
	Peak output current	AC100V						
		AC200V	22.5A	12.5A	10A	8.4A	6.3A	
GPSA-360-*** 360W	Rated output current	30A	15A	12A	10A	8.5A	7.5A	0.3A
	Peak output current	AC100V	40A	20.8A	16.6A	13.8A	11.9A	
		AC200V	40A	25A	20A	16.6A	14.2A	
GPSA-750-*** 750W	Rated output current	56A	30A	24A	20A	17.1A	15A	0.3A
	Peak output current	AC100V	70A	37.5A	30A	25A	21.4A	
		AC200V	80A	50A	40A	33.3A	28.5A	

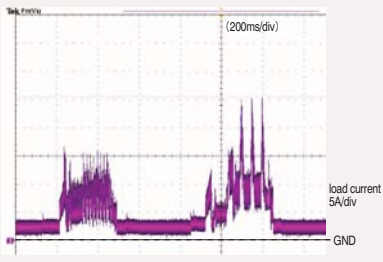
Selection points for the mechatronics power supply

Point 1

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

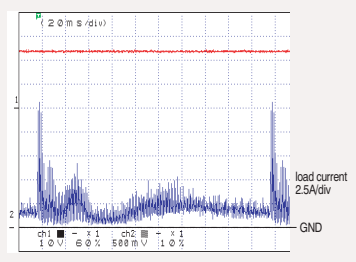
Actual condition example 1

P/S : GPSA-360-24
Load : bill counter

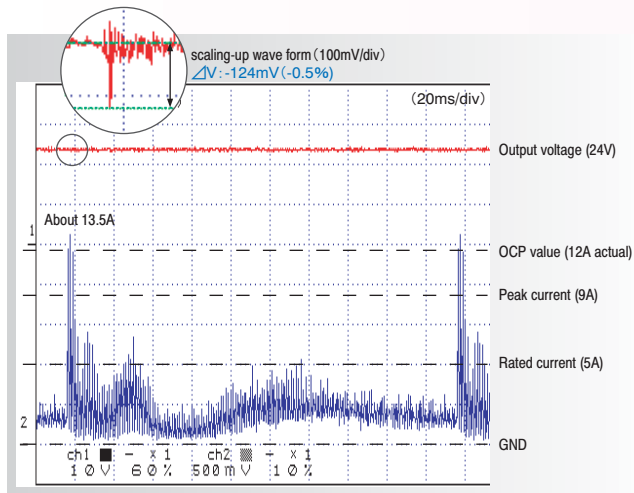


Actual condition example 2

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%.

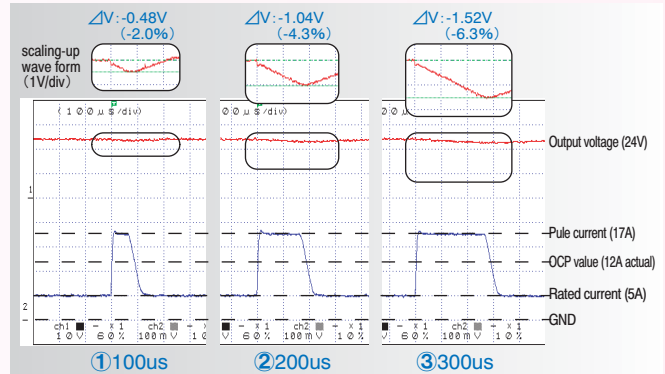
But when it is within 5 %, it is no problem because it is a transient voltage drop by the impedance of the power supply and its load line.

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.

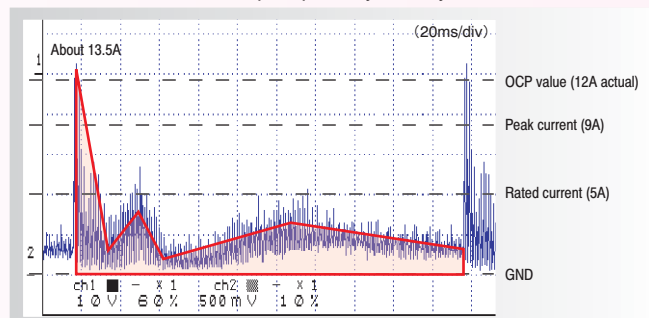
The each voltage dip is as follows; ①-0.48V (-2.0%) , ②-1.04V (-4.3%) , ③-1.52V (-6.3%) . If there is it during 200us period of ②, We can obtain the stable output within load change -5% .*

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.

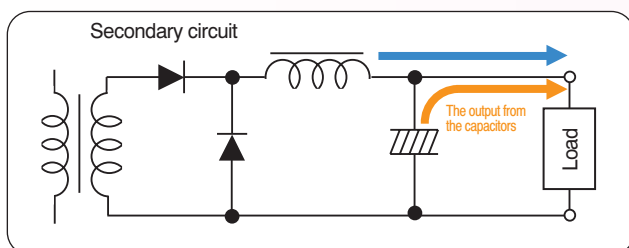
If the average current that we demanded is lower than 70% of power supply output capacity, we can judge it no problem.

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.

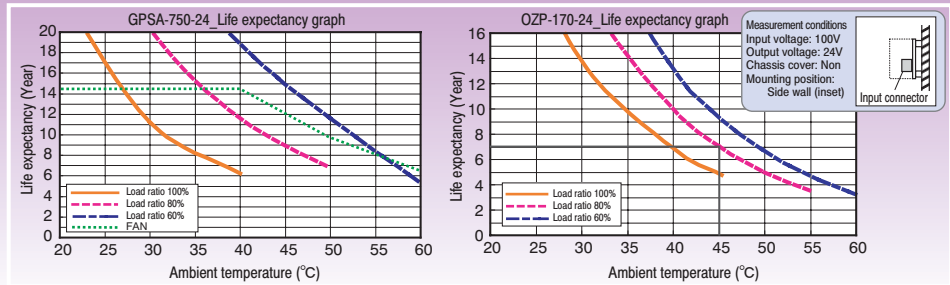
Well, the mean current is measured by the function of the measuring instrument to confirm a average current ② and it can be judged even to confirm that the mean current is lower than the rated current of the power supply.



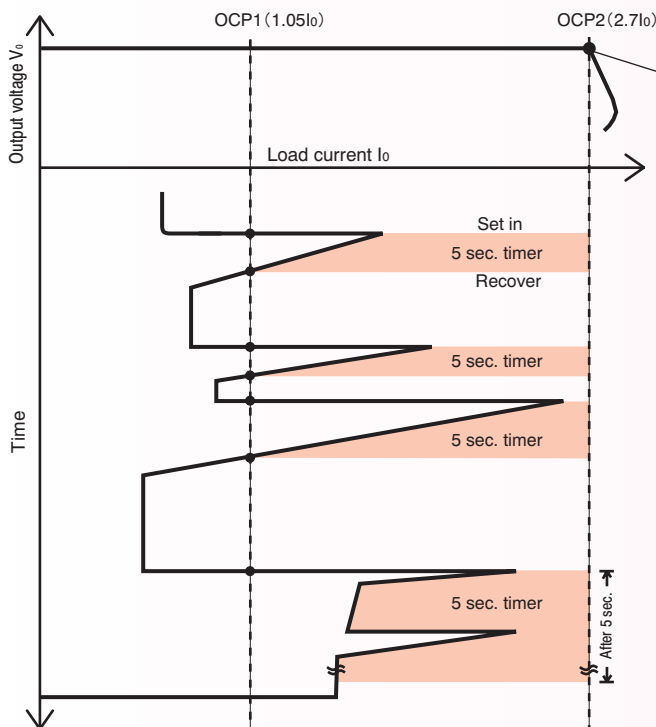
Point 2

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°C ambient, the load current forms necessary for 7 years life will be obtained at a cross point of 80% derating curve at 45°C, therefore, $I_{rms} = 7A \times 0.8 = 5.6A$.



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



GPSA-360 : OCP2 \geq 830W
GPSA-750 : OCP2 \geq 2000W



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.

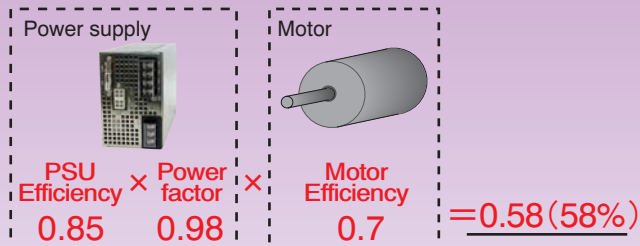
In case of a repetitive pulse load within OCP2 point, the actual output current calculated by root-mean-square value shall be less than 100% of the rated current.

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.

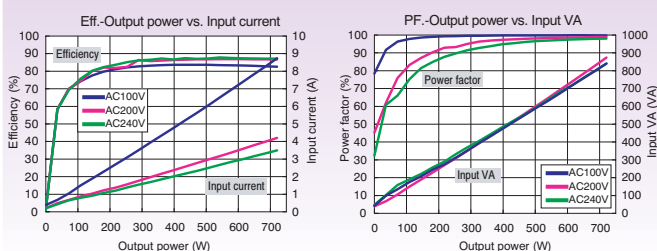
As OZP-120 or OZP-170 series does not equip the 5 second timer that GPSA series has, the actual output current calculated by root-mean-square value shall be within the rated current. It has, however, internal thermal protection.

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;



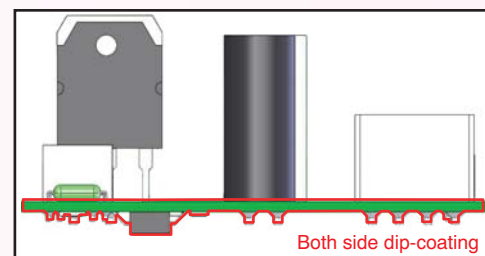
GPSA-750-24-TP (ex. Actual measurement)



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.

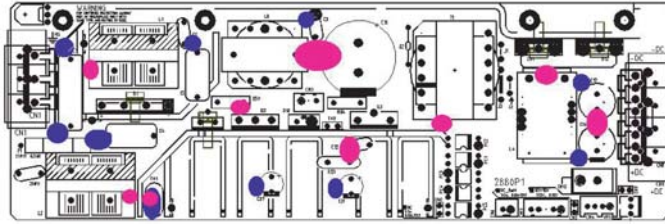
Nipron is reinforcing environmental measures by dip-coating to both side of PC Board and putting insulation tubes to power semiconductor's leads.



● Power supply for anti-shock and vibration

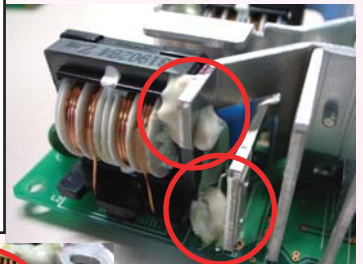
It is a must to buy the power supply that uses both-side through-hole-PC Board for applications such as Medical devices that equip moving arms or vibrators. In addition, large or heavy parts should be reinforced by silicone as anti-shock and vibration. Nipron has anti-shock and vibration products available,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

*Anti-G treatment!
Actual example for 50G acceleration*



*Silicone treatment points may differ from actual example.

PC P/S for MRI/CT



● 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.



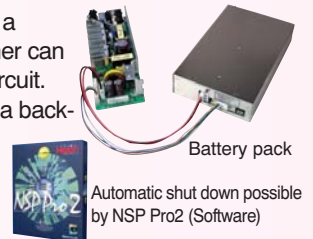
If solder cracks happen, protection circuits such as OCP and OVP may not work, or induce an abnormal output voltage causing the secondary failures in the system.

● Operation at -20°C conditions

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

● 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 Pro2. (Harness be required)



■ Functions often asked by customers

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

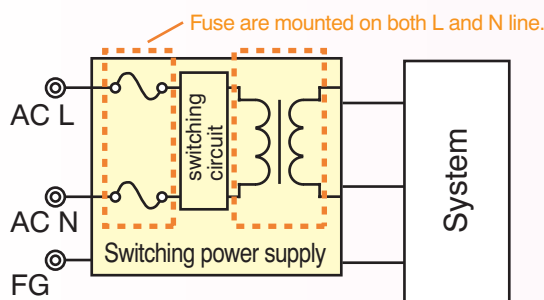
The recent trends show that requests for turning on/off power supplies through command signals in system or large machines are increasing. Therefore, a stand-by P/S that is always active must be equipped. Nipron's GPSA series (Mechatronics P/S) has +12VSB@0.3A-0.5A stand-by P/S function.

● 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.

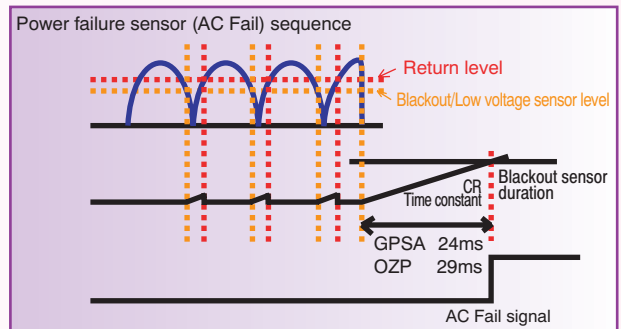
*We can comply with the departmental regulations 1

<GPSA series>



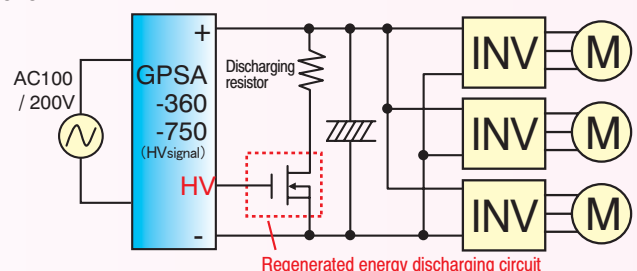
Isolation transformer for medical use are mounted. Creepage distance and dielectric strength are also compliant with medical standard.

- 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)



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

GPSA P/S is ready for a sensor signal (HV signal) of voltage regenerated by servo motor driver. Also output abnormal high voltage can be sensed by this HV signal. OVP has been set much higher than that of HV sensor level.



Wait a minute! Don't jump to outward price gap... Take into account TCO (Total Cost of Ownership)!!

AC to DC general-purpose power supply series



Great Help~1 Low Noise

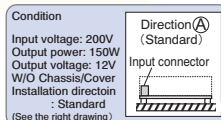
VCCI Class B (Conducted emission/Radiation) easily passes without external noise filters

Here's "Great Help~" response from Customer.

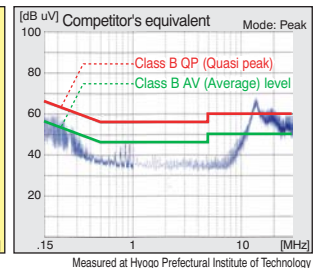
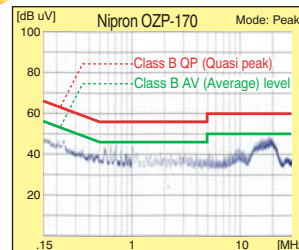


A big customer who implemented OZP-170 says, "We usually get into trouble with noises in developing systems. It would take us 6 months in a worst case spending valuable times of engineers in vain." "However, thanks to OZP-170-24 and -12 power supply, an immediate effect and time saving was brought to us without external noise filters, resulting in cost saving as well."

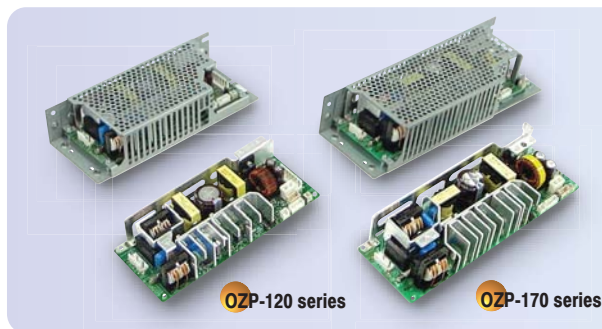
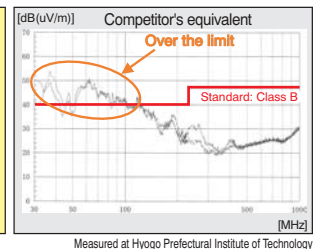
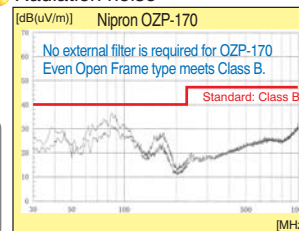
This encourages us, thank you.



Conducted emission



Radiation noise



Product lineup

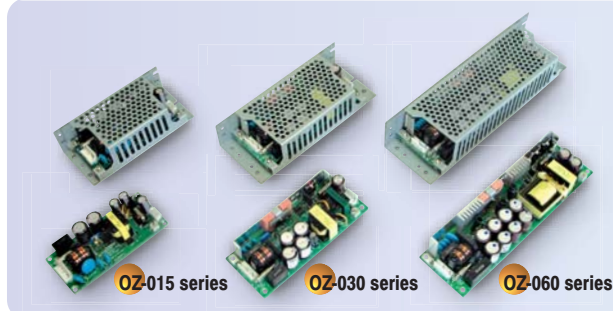
Series name	Output voltage		+12V	+15V	+24V		
OZP-120 series	Load current	Convection	10A	8A	5A	Coming soon	
		Forced cooling	12.5A	10A	6.3A		
		Peak	15A	12A	9A		
OZP-170 series	Load current	Convection	14A	11.2A	7A	34A	34A
		Forced cooling	17.5A	14A	8.8A	42A	42A
		Peak	22.5A	18A	12.5A	50A	50A
Input voltage	AC85 to 264V						

Input voltage AC85 to 264V

※ Selectable for +12V or +15V output ※ For +24V output model, backup at blackout is available.
※ +3.3V and +5V output models are subject to change as they are under development.

Great Help~2 Drastic CO₂ Reduction ! Electricity Cost Saving

Designers at customers work hard every year to achieve CO₂ reduction target of ISO14000 (Environment) for certificate renewal. End users are happy with Nipron power supplies because they can reduce considerable amount of CO₂ and electricity cost in a year even by 5% efficiency improvement.



Product lineup

Series name	Output voltage	+3.3V	+5V	+12V	+15V	+24V
OZ-015 series	Load current	3A	3A	1.3A	1A	0.7A
OZ-030 series	Load current	6A	6A	2.5A	2A	1.3A
OZ-060 series	Load current	12A	12A	5A	4A	2.5A
Input voltage		AC85 to 264V				

High efficiency

Efficiency comparison between OZ-030 and Competitor's equivalent (actual data)

	Output voltage	Power	Input voltage	Input VA	Efficiency
Nipron (OZ-030-5)	5.1V	30.6W	AC100V	37.5W	81.6%
			AC200V	37.6W	81.4%
Competitor's equiv.①	5.1V	30.6W	AC100V	39.3W	77.9%
			AC200V	40.7W	75.2%
Competitor's equiv.②	5.1V	30.6W	AC100V	41.3W	74.1%
			AC200V	40.0W	76.5%

Comparison of Electric Bills & CO₂ emission (24-hour continuous running)

OZ-030-5 vs Competitor's equivalent ①

Reduction! in a year: Electric bill approx. **306 yen** at AC 100V/approx. **532 yen** at AC 200V
CO₂ emission approx. **5.8kg** at AC100V/approx. **10.1kg** at AC200V

OZ-030-5 vs Competitor's equivalent ②

Reduction! in a year: Electric bill approx. **652 yen** at AC 100V/approx. **414 yen** at AC 200V
CO₂ emission approx. **12.3kg** at AC100V/approx. **7.8kg** at AC200V

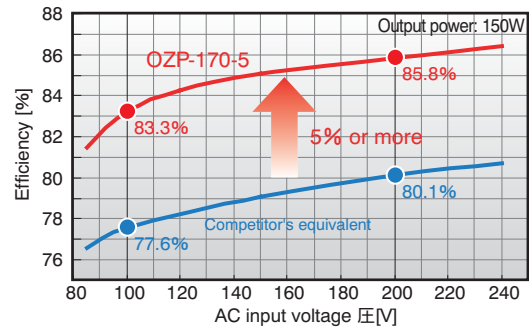
*1 20 yen/kWh conversion *2 0.378kgCO₂/kWh conversion

New As power supply for LED Lighting

+5V & +3.3V output type are coming soon in OZP series.

New models in OZP series! +5V & +3.3V output type are lined up. This type has achieved higher efficiency with synchronous rectification equipped resulting in **reduction of electric bills**, **reduction of CO₂** and **long life**. Also it brings lower temp. rise in whole system as it generates less heat.

Efficiency comparison between OZ-170-5 and Competitor's equivalent (actual data)



Comparison of Electric Bills & CO₂ emission (24-hour continuous running)

Reduction! in a year: Electric bill approx. **2,317 yen** at AC 100V/approx. **2,179 yen** at AC 200V
CO₂ emission approx. **43.8kg** at AC100V/approx. **41.2kg** at AC200V

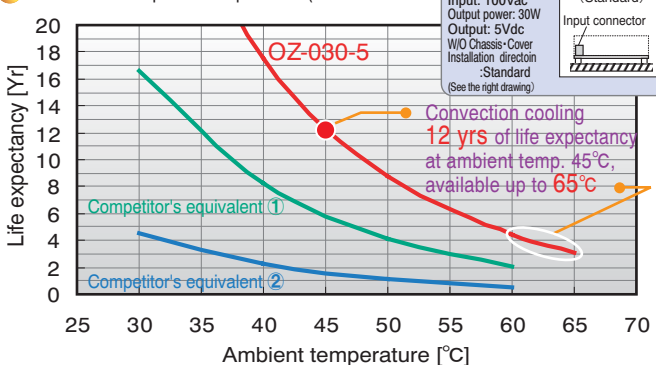
*1 20 yen/kWh conversion *2 0.378kgCO₂/kWh conversion

Great Help~3 Long life (3 times as long as Competitor's)

"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 OZ/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°C10000H.)

Long life

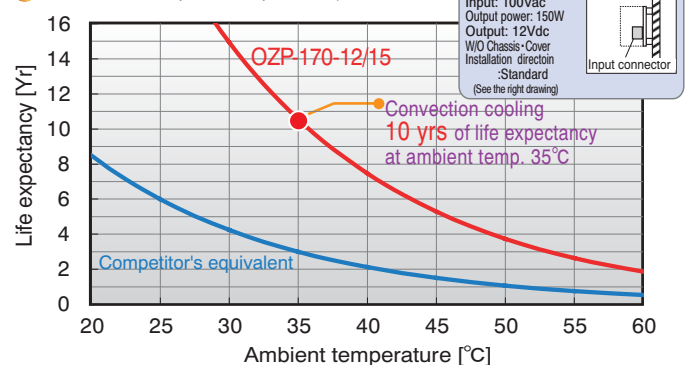
OZ-030 vs Competitor's equivalent (actual data)



Note 1: Life expectancy of Competitor's equivalent ① and ② is calculated based on the data on their Web site.
Note 2: The life expectancy is based on continuous load of 30W. (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 longest when degradation of materials used for opening of electrolytic capacitors is taken into account.

Now used in BOX PC as embedded power supply

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



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 longest when degradation of materials used for opening of electrolytic capacitors is taken into consideration.

Great Help~4 High reliability and various options

Competitor's equivalents to OZ & OZP series are, in many cases, single-sided PCBs to make them cheaper. We, Nipron, use consistently double-sided PCBs with through holes for even small power as we regard power supplies as "Dangerous."

Double-sided PCBs with through holes (Safety-oriented products)

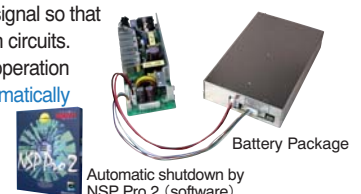
Solder crack at high voltage section is likely to burn. Double-sided PCBs with through holes is the solution for solder crack in industrial use. (Competitor's equivalents are, in many cases, single-sided PCBs.



Solder crack in single-sided

Blackout detection signal equipped/Backup at blackout

All OZP series equips blackout detection signal so that customers can save cost to build detection circuits. Also, 24V output type carries out backup operation with battery package connected, and **automatically shut downs by NSP Pro 2**. (Harness is optional.)



Automatic shutdown by NSP Pro 2 (software)

Fulfilling power supply with cost performance! **GPSA series**

Price gap is only 10 to 20% for the advantage of power and ample function.



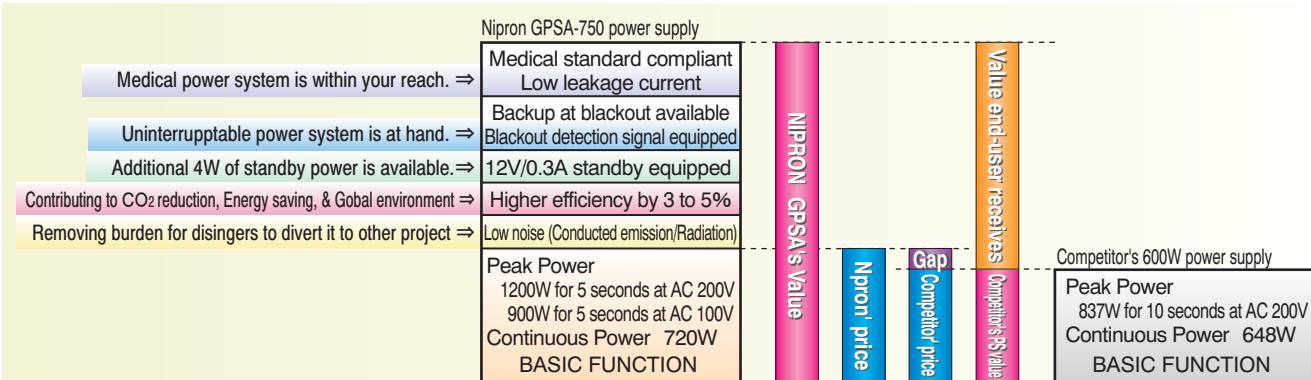
GPSA-360 series

GPSA-750 series

Product lineup

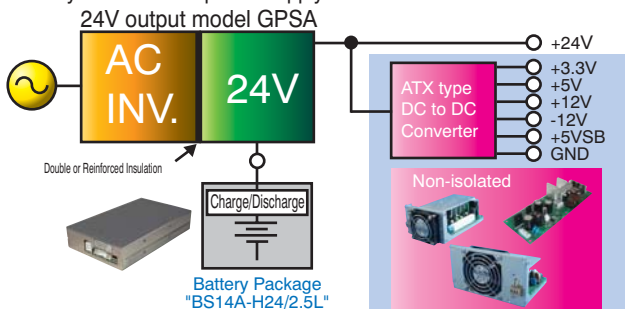
Series name	Output voltage	+12V	+24V
GPSA-360 series	Rated load current	30A	15A
	Peak Load current	AC100V 40A	20.8A
		AC200V 40A	25A
GPSA-750 series	Rated load current	56A	30A
	Peak Load current	AC100V 70A	37.5A
		AC200V 80A	50A
Input voltage		AC85 to 264V	

※ +24V output model is backup available at blackout.



As medical-standard power system

- No isolation transformer required in front
- Backup 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, customised power supply is available.

Blackout detection signal equipped/Backup at blackout

Blackout detection signal is equipped to all GPSA series to save customer's cost for building detection block.

In addition, 24V output model carries out backup at blackout by connecting to battery package and **shuts down automatically by NSP Pro 2.**

(Harness is optional.)



12V Standby equipped

+12VSB provides 0.3A to serve as auxiliary power supply with actual load of approx. 0.5A.

For example, in practice, +12VSB is used as interface power supply with LAN or USB while 24V output drives motors in financial terminals. Also, it can be used as standby power supply to turn on or off remotely.

Standby power supply
+12VSB (Auxiliary power)
0.3A
※1 Approx. 0.5A is actually available.
※2 0.1A max at backup operation.

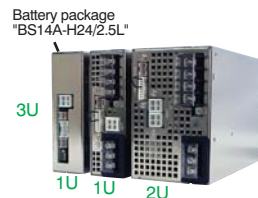
High Peak Power

Peak power gives more than 120% of rated power for 5 seconds, and more at AC 200V input.

Convenient size for rack mounting

Designed to mount in 19 inch rack
1U (width), 3U (height) for GPSA-360
2U (width), 3U (height) for GPSA-750

In addition, 1U (width), 3U (height) for battery package
They are all mountable into 1U, 2U, and 3U rack.

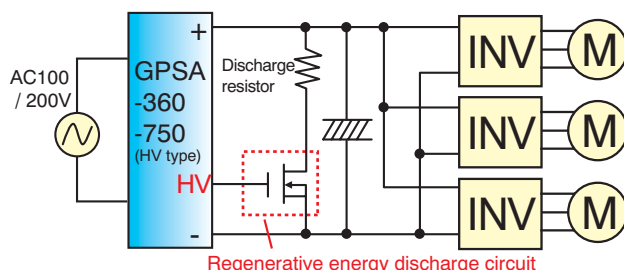


Dimension (W × H × D)
GPSA-360: 41 × 128 × 230 mm
GPSA-750: 82 × 128 × 235 mm
BS14A-H24/2.5L: 41 × 128 × 211 mm

New +24 to +48V output models are lined up for motor drive in GPSA series.

New models are here in GPSA series! +24V, +30/36V, and +42/48V output models equipped with regenerative voltage detection signal (HV) lined up.

Regenerative energy discharge circuit is easily built by HV signal for the system in which multiple DC inverters (Servo) are used.



Product lineup

Series name	Output voltage	+24V	+30V	+36V	+42V	+48V
GPSA-360 series (HV type)	Rated load current	15A	12A	10A	8.5A	7.5A
	Peak Load current	AC100V 20.8A	16.6A	13.8A	11.9A	10.4A
		AC200V 25A	20A	16.6A	14.2A	12.5A
GPSA-750 series (HV type)	Rated load current	30A	24A	20A	17A	15A
	Peak Load current	AC100V 37.5A	30A	25A	21.4A	18.7A
		AC200V 50A	40A	33.3A	28.5A	25A
Input voltage		AC85 to 264V				

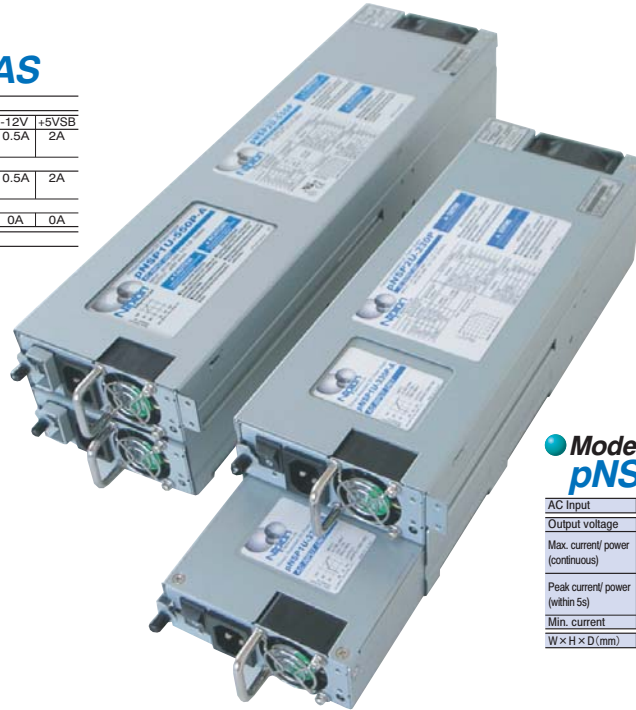
※ +30V and +36V are output voltage adjustable. ※ +42V and +48V are output voltage adjustable.
※ +24V output model is backup available at blackout.

New Redundant Architecture Convertible to Nonstop Power Supply

Primary Redundant Power Supply
SSI-ERP2U conformity, Hot swappable 2U height

Model pNSP2U-550P-AAS

AC Input	85 to 264V (worldwide range)									
Output voltage	+3.3V	+5V	+12V1	+12V2	+12V3	-12V	+5VSB			
Max. current/ power (continuous)	20A	20A	18A	12A	10A	0.5A	2A	Total 25A	Total 427.6W	
Peak current/ power (within 5s)	20A	20A	18A	12A	16A	0.5A	2A	Total 25A	Total 44A	
Min. current	0A	0A	0A	0A	0A	0A	0A	Total 550W		
W x H x D (mm)	108 x 83.8 x 400									



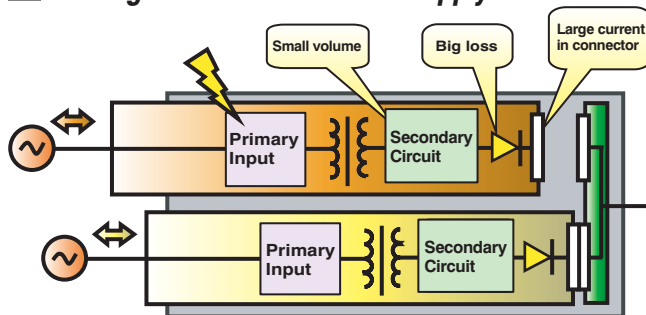
2U server case with Primary Redundant PSU (pNSP2U-550P/330P) installed is available. Also, Server with pNSP2U-550P/330P PSU installed is available.



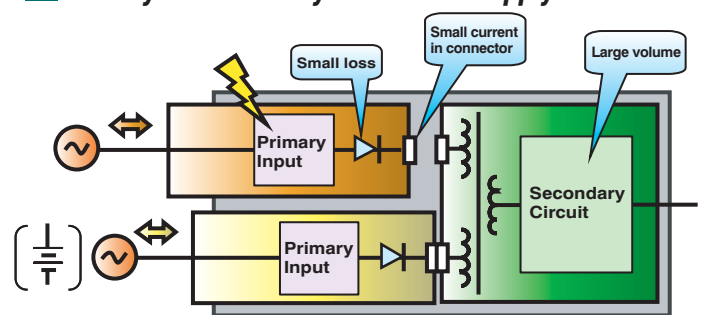
Model pNSP2U-330P-AAS

AC input	85 to 264V (worldwide range)					
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB	
Max. current/ power (continuous)	10A	10A	18A	0.5A	2A	
	Total 260W					
	Total 276W					
Peak current/ power (within 5s)	15A	15A	25A	0.5A	2A	
	Total 312W					
	Total 328W					
Min. current	0A	0A	0A	0A	0A	
W × H × D (mm)	108 × 83.8 × 300					

Existing Full redundant Power Supply



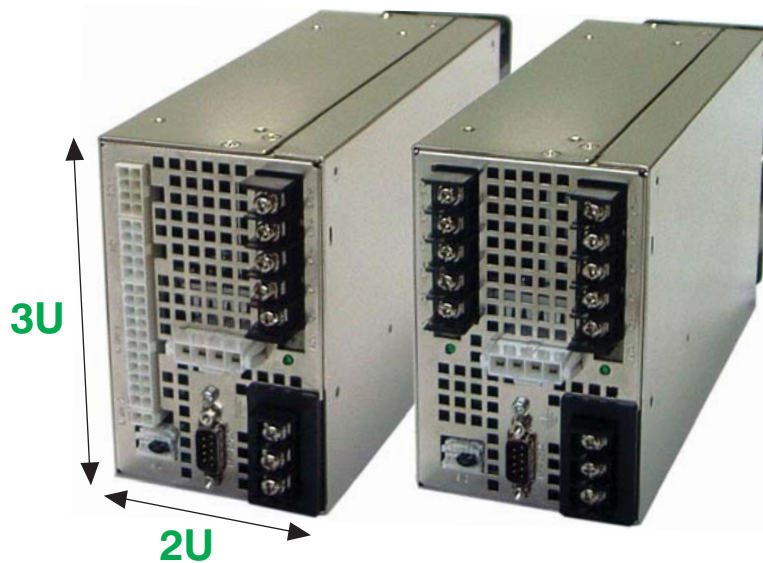
Primary Redundant system Power Supply



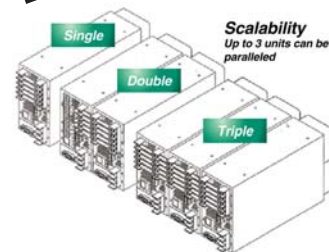
	Existing (full redundant by competitors)	Primary redundant system (Nipron system)
Efficiency	<ul style="list-style-type: none"> As Oring diode or FET for parallel operation is mounted in each main output, power loss is 10W to some 10W to raise temperature of the power supply. With components squashed up in a small space expecting cooling by fan, total power loss caused by chokes, etc is 60 to 67%. 	<ul style="list-style-type: none"> 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).
Simplicity of circuit and number of components	<ul style="list-style-type: none"> Same secondary circuit is doubled to meet full redundancy to increase components and likely to cause mutual touching of components. 	<ul style="list-style-type: none"> Number of components is fewer as secondary side is in common, and it has margin in component size to keep clearance between them. To raise efficiency, with enough margin in Schottky diode rating for low resistance instead of synchronous rectifying, possibility of defects is decreased due to simple design.
When one unit of redundant unit fails;	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

All functions you need are in one unit!

GNSP series



ATX output
Backup function
High power for single output PSU
High power 2-Output PSU
Parallel running function




DC-UPS, as a source of large machinery

1. Nonstop power supply (uninterruptible PSU)
2. Total power control (Integrated monitoring • management)
3. One GNSP is enough for controlling a large machinery

Power supply for important systems • machinery

4. Flexible for higher power.
5. No need for a custom order! Flexible multi-output.
6. As a high power ATX power supply



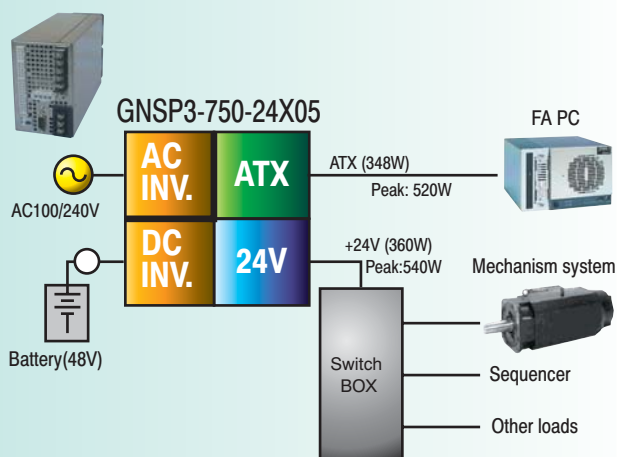
 battery pack (BS19A-P48/5.0L)

Model Listing

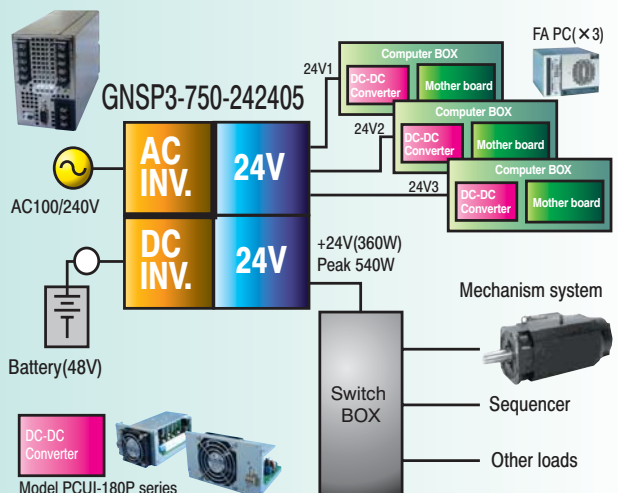
MODEL	OUTPUT	OUTPUT POWER
GNSP3-750-242405-TRP	24V 2 outputs	728W (1080W)
GNSP3-750-121205-TRP	12V 2 outputs	728W (1080W)
GNSP3-750-241205-TRP	24V & 12V power supply	728W (1080W)
GNSP3-750-24X05-TRP	24V & ATX power supply	708W (1067W)
GNSP3-1000P-12X05-TRP	12V & ATX power supply	708W (1067W)

System Structures

Ex. Combination of ATX PSU and 24V DC industrial-use PSU



Ex. Combination of machinery (24V) and 3 PC.



Multiplex Boosters efficiently step up DC drive voltage for powering robot and FA equipment

Tajubu series High Power Boosters

92%-94% efficiency



Product lineup

Model	Input voltage	Output voltage	Dimensions (W×D×H)
TB4S-2000-280	DC37~63V	284V	290×200×80
TB4D-4000-280*	DC37~63V	284V	330×200×175
TB2S-1500-280	DC18~32V	284V	290×200×80
TB2S-1500-140	DC18~32V	140V	290×200×80

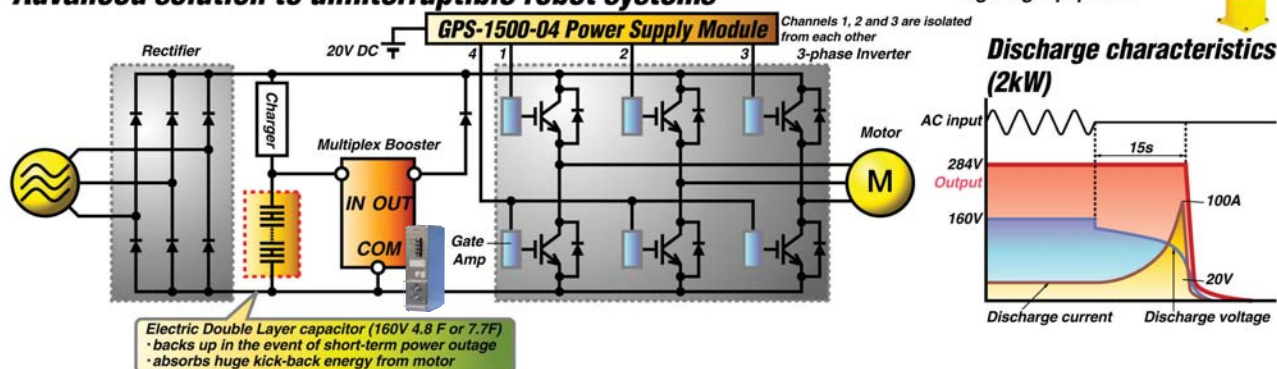
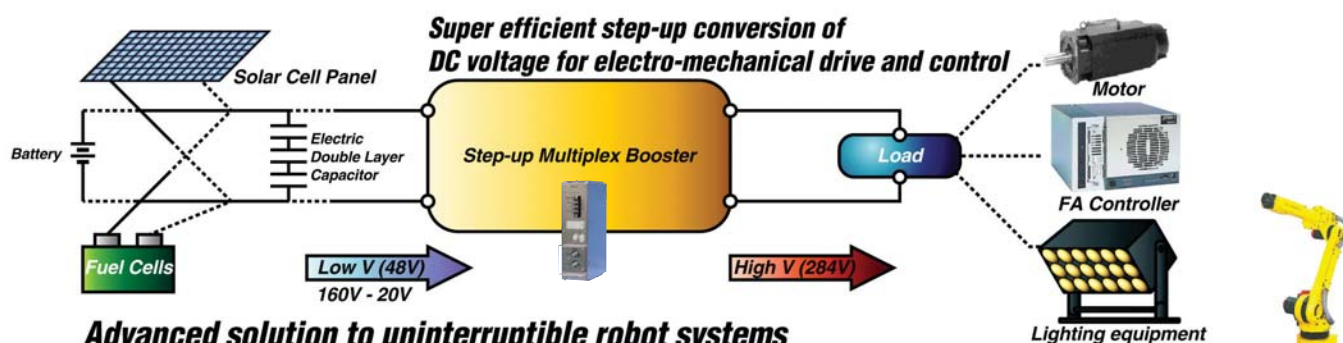
* TB4D-4000-280 is composed of two units of TB4S-2000-280 in parallel connection.

Output specifications

Model	TB4S-2000-280	TB4D-4000-280	TB2S-1500-280	TB2S-1500-140
Output voltage	+284V	+284V	+284V	+140V
Rated current/	7A	14A	3.52A	7.4A
Rated power (Continuous)	1988W	3976W	1000W	1000W
Peak current/Peak power	16A 4544W 10 sec. max.	30A 8520W 10 sec. max.	5.28A 1500W 5 sec. max.	11A 1540W 5 sec. max.

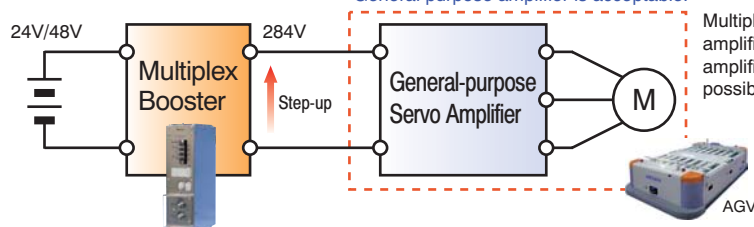
Up to 3 units can be paralleled to scale up system power

Pump up drive voltage



Power supply for general-purpose servo amplifier used in Automated Guided Vehicle (AGV)

General purpose amplifier is acceptable.



Multiplex Booster allows a general purpose servo amplifier to be used instead of a custom 48 V servo amplifier (for driving a servo motor), thus making it possible to build the AGV at low cost.



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

Special topics for All-in-one type system

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.

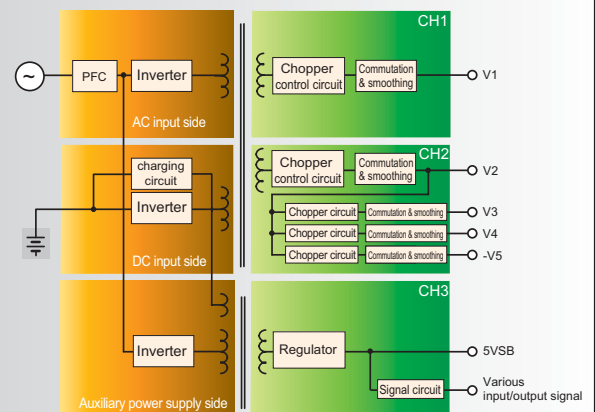
We, Nipron, reflecting those circumstances, develop basic models of standardization-oriented products that can be easily modified.

This special topics show you high power multi output power supply (600 ~ 750W) in this stream.

Nonstop type (with UPS function)



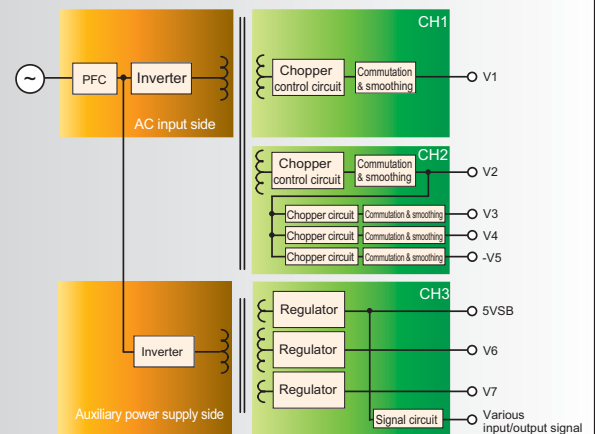
[Ex.] GNSP3-750-24X05-TRP



General purpose type



[Ex.] GMX-1000P-24X05-T2P



We recommend the Nipron. Nipron Web Sales

<http://www.nipron.co.jp/>

Various lineup and customization support

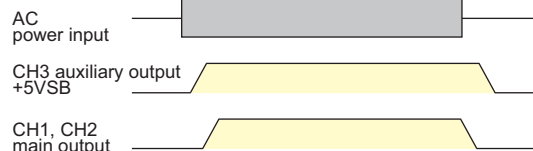
<Note> Continuous output power for CH1 + CH2 is 708 to 720W, and 1080W for peak power.									Nonstop type with UPS function	General purpose type
No	CH1 Power output	CH2 Multi output				CH3 Auxiliary output			GNSP model name	GMX model name
1	+24V 15A(22.5A)	+3.3V 10A(20A)	+5V 20A(30A)	+12V 17A(40A)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

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

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 +5VSB.

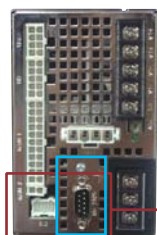
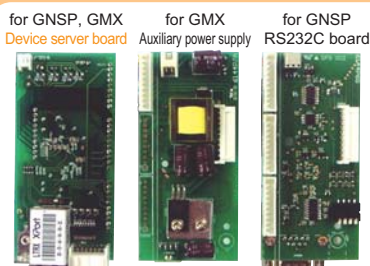
Rising and falling characteristics



* 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.

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.

Various optional boards



- Backup control
- Output sequence control
- Automatic startup by scheduling
- ON/OFF control working with the system
- Independent small capacity power supply
- Digital control with microcomputer

Optional PCB
RS232C drive circuit is equipped as standard. USB communication or sequence change of rising can be customized according to your requirement.

Requirement for customization in general

Contact our sales staff or WEB sales for any customization.

support1@nipron.com



Electric components
Made by Japan's leading manufacturer

100% satisfaction is here for you! Nipron Web Sales

<http://www.nipron.co.jp/>

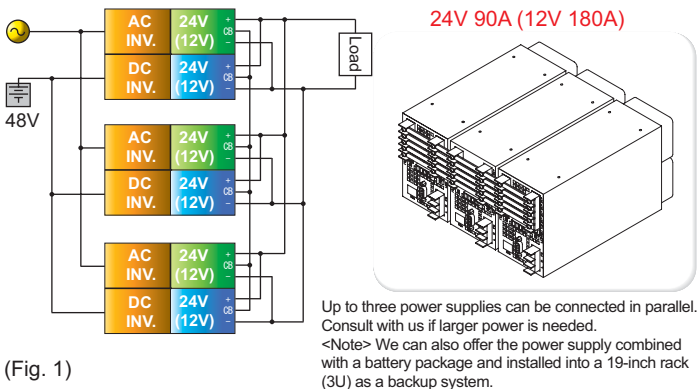
General Specification

Items	Specification
AC input	Rated voltage
	AC100-240V (AC85~264V)
	Input frequency
	50/60Hz (47-63Hz)
	Efficiency
Battery	80% typ (AC100V), 85% typ (AC240V) (At rated input/output)
	Power factor
	96% min (AC100V), 90% 以上 (AC240V) (At rated in/out/output)
	Inrush current
	31A peak(AC100V), 75A peak (AC240V) Within 5ms (At rated in/out/output and cold start 25°C)
Environment	Input current
	9.0A typ (AC100V), 3.6A typ (AC240V) (At rated input and max output)
	Rated voltage
	DC48V (Corresponds to dedicated battery package) (No battery startup)
	Battery discharge cut-off voltage
Insulation	36V typ (Battery circuit shuts down)
	Efficiency (at battery operation)
	80% typ (At rated input/output)
	At dedicated lead
	battery pack connected
EMC	Charging voltage
	54V typ (At 25°C and full charge, with temperature compensating)
	Charging current
	0.5±0.2A (At battery voltage 48V)
	Operating temperature/humidity
Others	-10-70°C/10-90% (There shall be no condensation)
	Storage temperature/humidity
	-25-70°C/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)
Insulation	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)
	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
EMC	Insulation resistance
	AC input—FG/DC input/DC output: 50MΩ min, DC input—FG: 50MΩ min
	DC input—DC output: 50MΩ min, +24V output—other outputs: 50MΩ min (at DC500V)
	Leakage current
	0.5mA max (AC100V) / 1mA max (AC200V) / 1.2mA max (AC240V)
Others	Line noise immunity
	±2000V (plus width 100ns and 1000ns, cycle period: 30-100Hz, normal and common mode with positive and negative polarities for 10 minutes each. (Measured by INS410. There shall be no fluctuation of DC output or malfunction.)
	Electrostatic discharge
	EN61000-4-2
	Radiated, radio-frequency EM field
Insulation	EN61000-4-3
	Fast transient burst
	EN61000-4-4
	Lightning surge
	EN61000-4-5
EMC	Conducted disturbances induced by radio-frequency
	EN61000-4-6
	Power source frequency magnetic field
	EN61000-4-8
	Voltage dip/regulation
Others	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)
Insulation	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

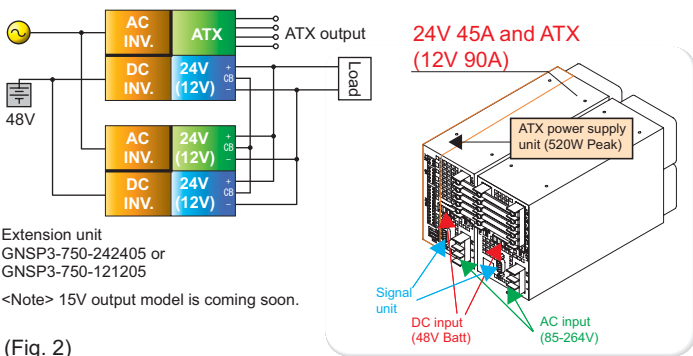
When power becomes short in single GNSP power supply, higher power can be available by parallel connection of each single power supply unit. In that case, make sure to connect current balancing terminals (CB) each other so that load current of each unit becomes balanced.

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



(Fig. 1)

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



(Fig. 2)

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

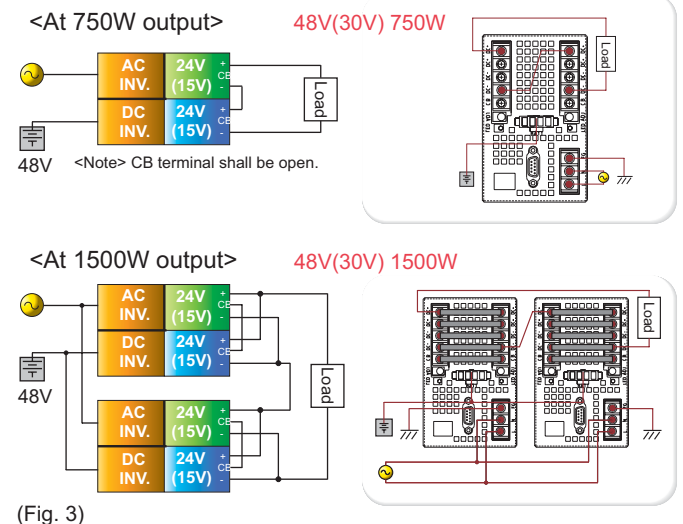
- This function is standard for GNSP power supplies.

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.)

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

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

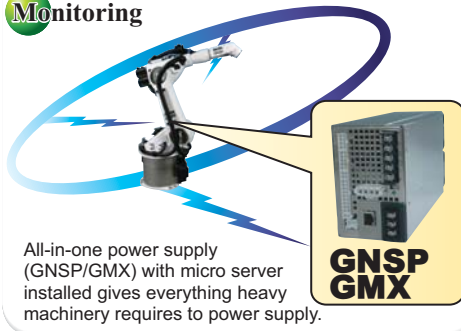


(Fig. 3)

As network power supply

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

Monitoring



Remote monitoring

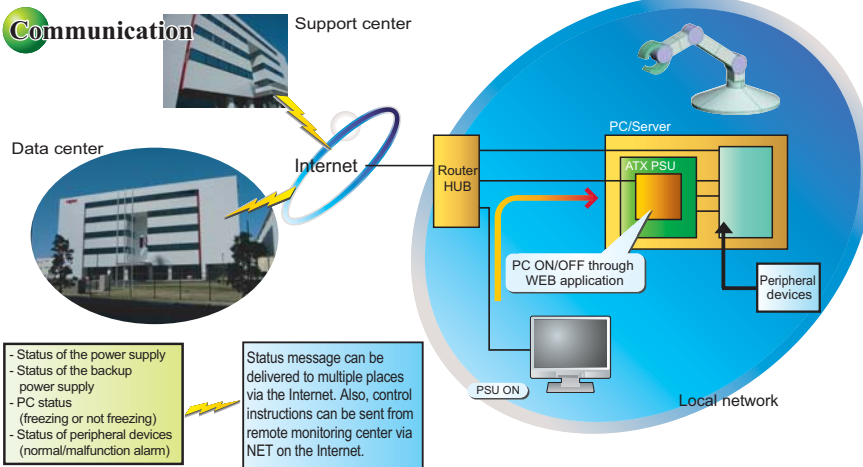
Monitoring on power supply condition	→	- Instantaneous power failure / power failure detecting signal - Power supply output malfunction detection - Internal temperature malfunction detection - Life expectancy of the power supply - Computer freezing detection
Monitoring on backup battery condition	→	- 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



- Status of the power supply
- Status of the backup power supply
- PC status (freezing or not freezing)
- Status of peripheral devices (normal/malfunction alarm)

Status message can be delivered to multiple places via the Internet. Also, control instructions can be sent from remote monitoring center via NET on the Internet.

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 from 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

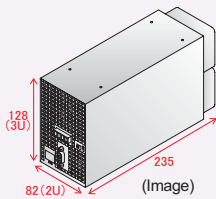
Freeze-up status of PC connected to GNSP or GMX power supply can be monitored and the status notice can be delivered to reboot the PC manually after confirmation from the distance. In addition, Automatic reboot is available depending on setting.

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.

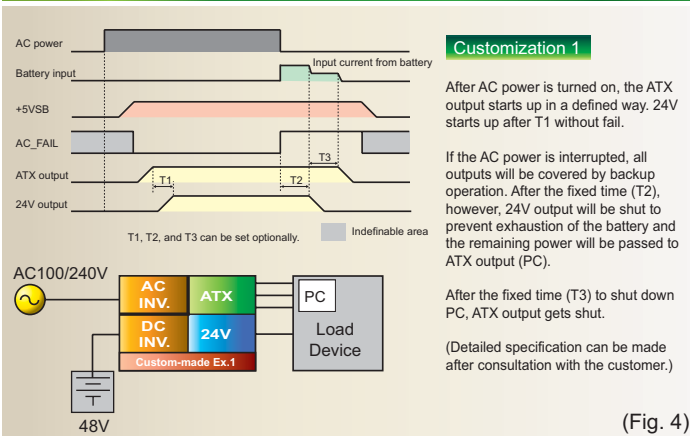
Intelligence battery package for GNSP is coming soon!

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.



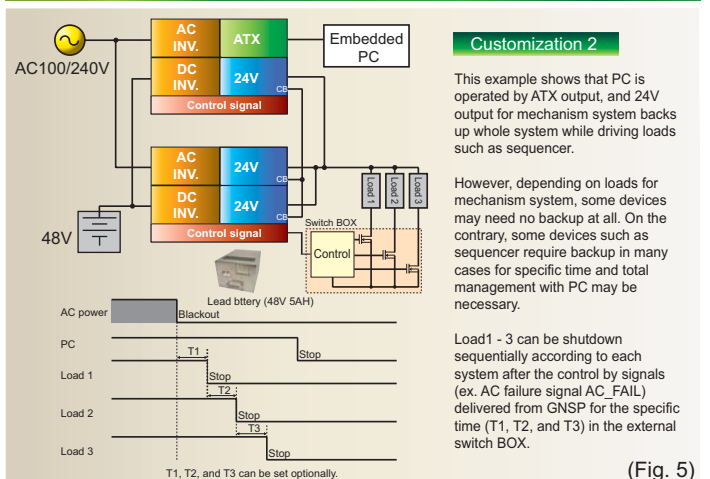
(Mi-Pack II Manager)

Example of power supply timing by optional board customization



(Fig. 4)

Sequential shutdown of 24V loads by optional board customization



(Fig. 5)

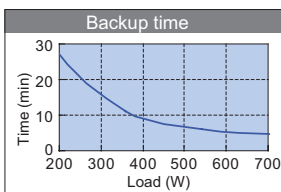
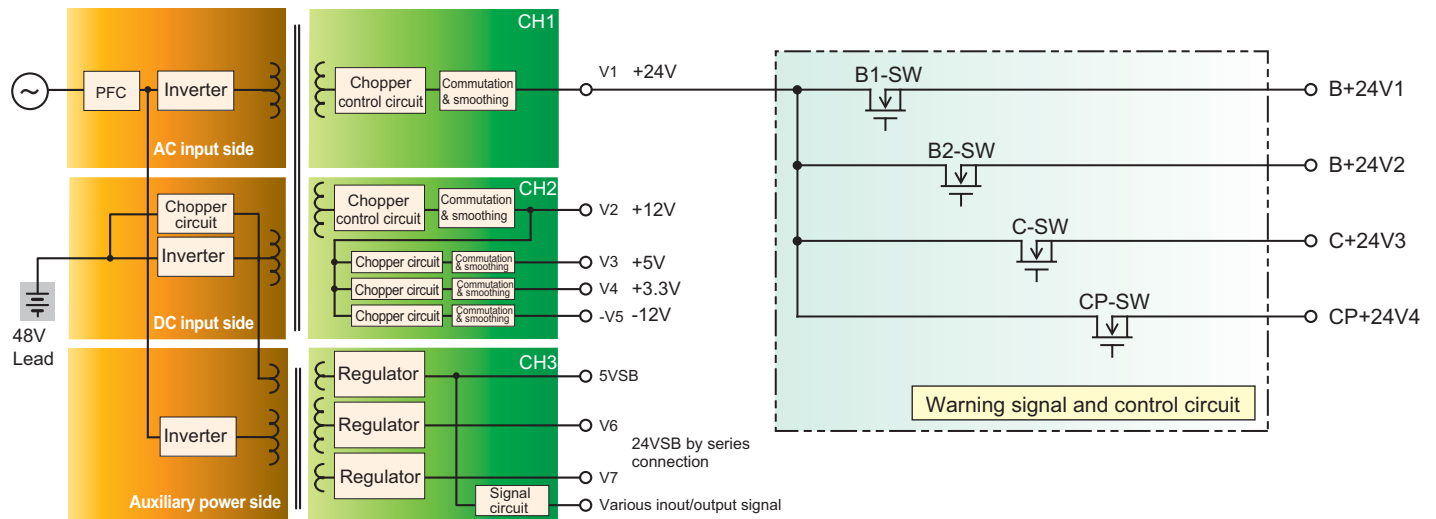
Application example: Power supply for ATM (Automatic Transaction Machine)

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

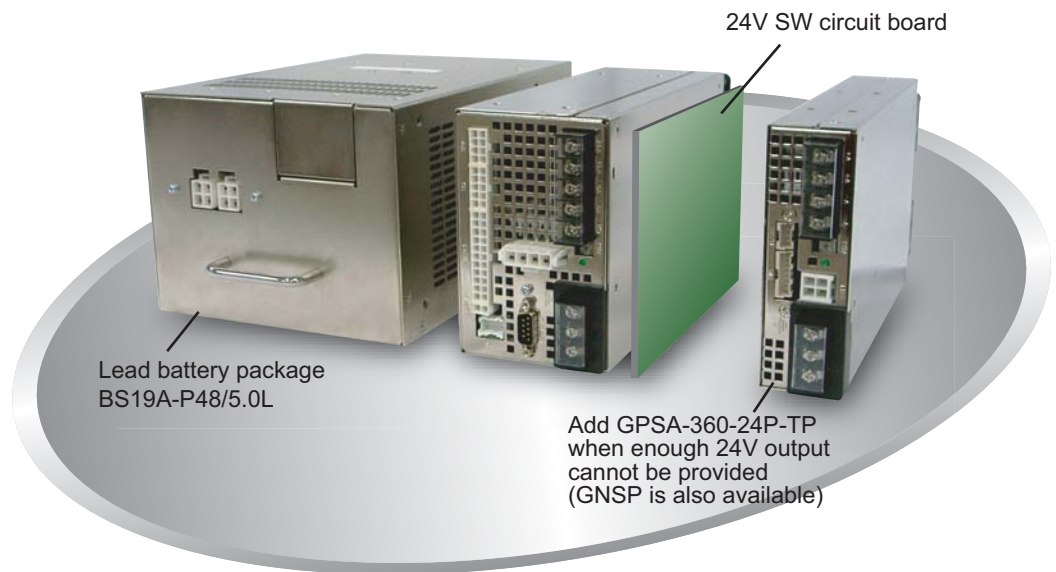
Output voltage	+5VSB	+24VSB	+3.3V	+5V	+12V	-12V	B+24V1	B+24V2	C+24V3	CP+24V4	Output capacity
Continuous (thermal average)	0.5A	18W	4A	10A	10A	0.03A	11A	1.5A	2A	2.5A	650W
Max output	0.5A	18W	4.5A	16A	14A	0.03A	25A	2A	2A	15A	1000W
Control signal	Always-output		Output by PS_ON				B signal ON		C signal	CP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



Give us any inquiry on power supply. Nipron Web Sales

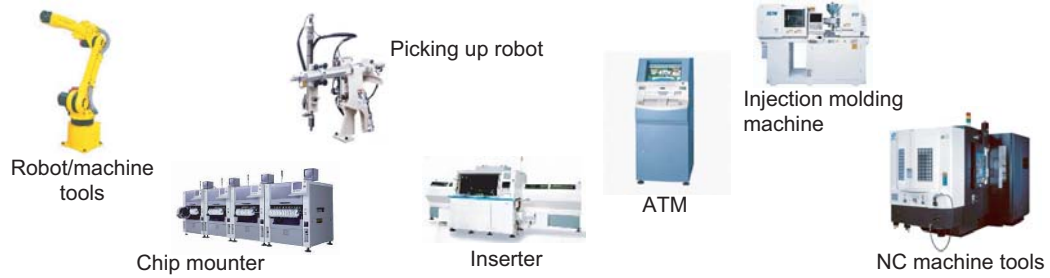
<http://www.nipron.co.jp/>

Application example: Power supply for Robot/Heavy machinery/Semiconductor

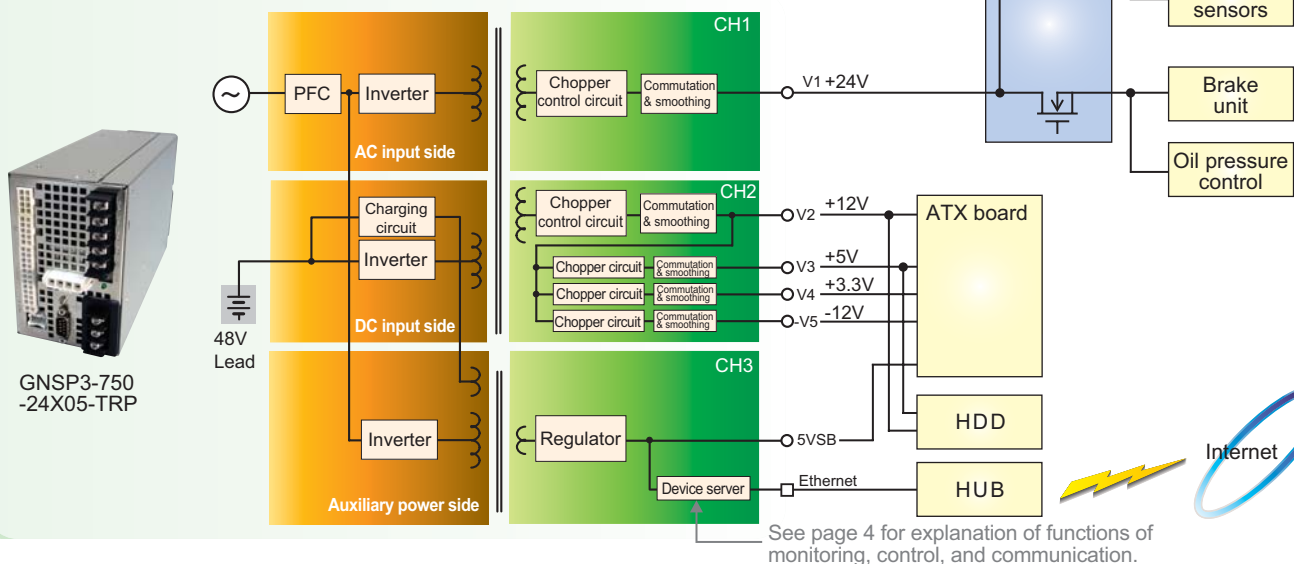
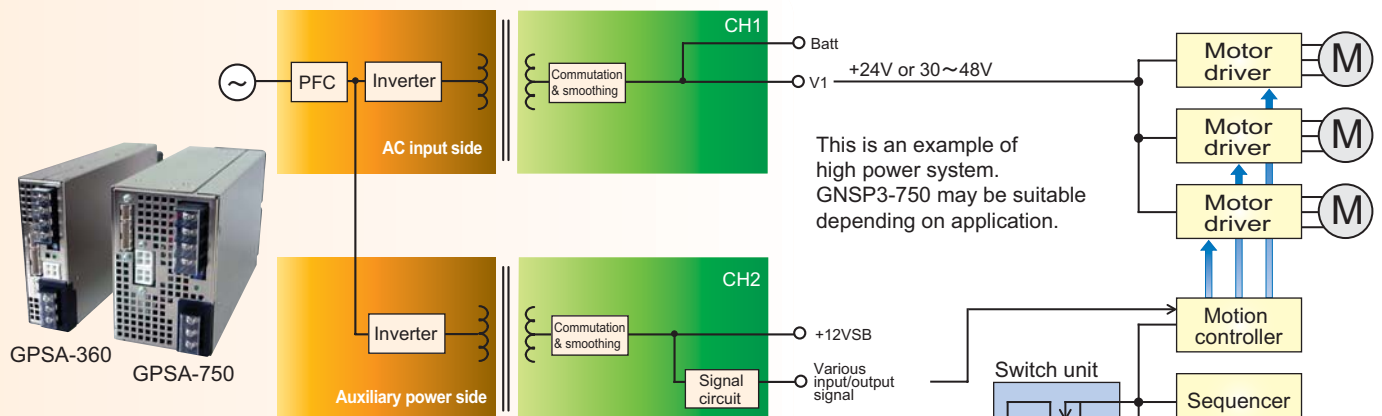
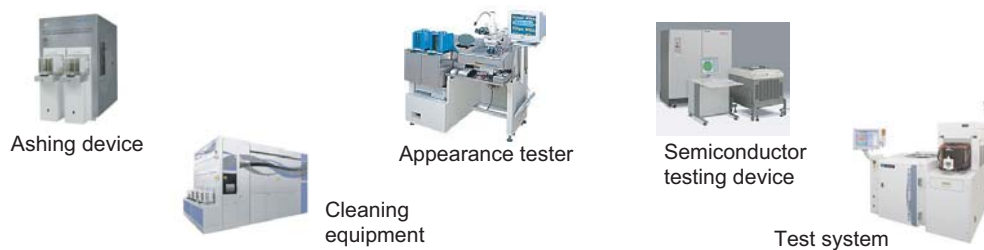
Example of system power supply considering mutual interlock including blackout backup of power supplies used for each device

Equipment/Inspection machine

● Robot/Heavy machinery



● Semiconductor manufacturing/Inspection equipment



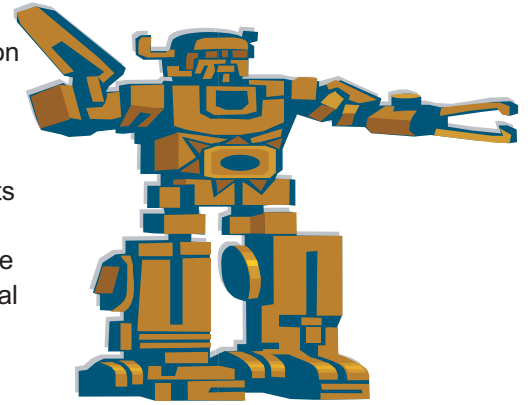
Most suitable power supply for your system will be advised. Nipron Web Sales

<http://www.nipron.co.jp/>

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 sensing 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.

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

Input DC24V (21.6~26.4V)

Output

+3.3V 10Amax

+5V 10Amax

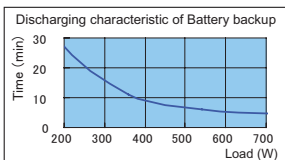
+12V 10Amax

-12V 0.3A

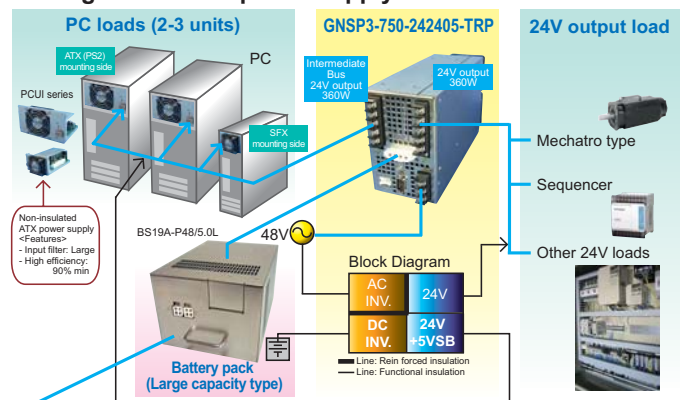
+5VSB 1A (Peak 2A)



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.



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



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

GNSP3-750-242405-TRP

CH1 output

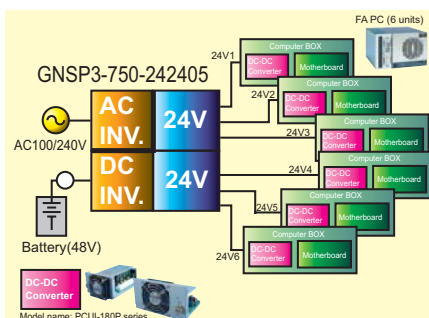
24V 15A continuous (Peak 22.5A 5 sec)

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

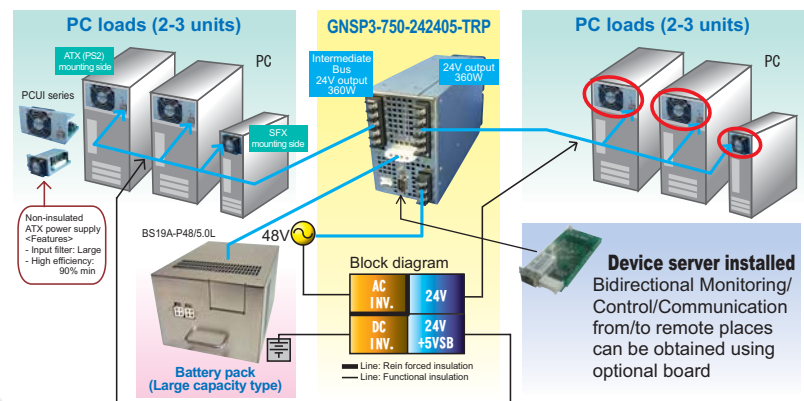


Power to six PCs from one GNSP as DC-UPS (750W/1080W peak, uninterruptible) and uninterruptible total control

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

Input DC20V-36V
Output
+3.3V 10Amax
+5V 10Amax
+12V 0.3A
+5VSB 1A
If isolation model is required, ↓

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



Device server installed
Bidirectional Monitoring/
Control/Communication
from/to remote places
can be obtained using
optional board

Easy operation even at the first time! Nipron Web sales

<http://www.nipron.co.jp/>

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).		<input type="checkbox"/> OK <input type="checkbox"/> NG	
2. Battery	(1) Do you need battery backup operation during power failure?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
	(2) Battery pack type	<div>Lead</div> <div>Ni-HM (compatible type of Lead battery)</div>	<div><Standard product> BS19A-P48/5.0L (48V 5AH) Prepare other battery pack at your (customer's) side. (There is no limit about 48V capacity)</div> <div><Under development> Ni-HM battery with "Mi-Pack II Manager" (application software) - Life span calculation, scheduling function, and communication are available.</div>	
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		<div>V6 output (8.4W)</div> <div>V7 output (6W)</div> <div>V6+V7 (in series)</div>	<div><input type="checkbox"/>12V(0.7A) <input type="checkbox"/>15V(0.56A) <input type="checkbox"/>Others (___V ___A)</div> <div><input type="checkbox"/>12V(0.5A) <input type="checkbox"/>15V(0.4A) <input type="checkbox"/>Others (___V ___A)</div> <div><input type="checkbox"/>24V(0.5A) <input type="checkbox"/>30V(0.4A) <input type="checkbox"/>Others (___V ___A)</div>
	(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.			<div><input type="checkbox"/>12V <input type="checkbox"/>15V <input type="checkbox"/>24V</div> <div><input type="checkbox"/>30V <input type="checkbox"/>48V <input type="checkbox"/>Others (___V)</div> <div>Current (Continuous ___A Peak ___A S)</div>
	(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.		<div>1st output</div> <div>2nd output</div> <div>3rd output</div> <div>4th output</div> <div>Other outputs from 1st to 3rd output</div>	<div><input type="checkbox"/>+3.3V (Continuous ___A Peak ___A) <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>+5V (Continuous ___A Peak ___A) <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>+12V (Continuous ___A Peak ___A) <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>-12V (0.3A) <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>+24V (Continuous ___A Peak ___A) <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>Other (___V Continuous ___A Peak ___A)</div>
	(4) Extension unit (In case CH1 cannot provide enough power)		<div>Do you need extension unit?</div> <div>If yes, do you need battery backup operation during power failure?</div>	<div><input type="checkbox"/>Yes (Add ___W) <input type="checkbox"/>No</div> <div><input type="checkbox"/>Yes <input type="checkbox"/>No</div> <div>※If yes, use GNSP power supply. If no, use GPSP/OZP/Other power supply.</div>
	(1) Do you need RS232C signal connector in order to shutdown PC at battery backup operation during power failure?			<input type="checkbox"/> Yes <input type="checkbox"/> 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)		<div>Customize of the optional board</div> <div>Use the device server function</div>	<div><input type="checkbox"/>Need <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>Yes <input type="checkbox"/>No</div>
	(3) Would you like to monitoring PC freezing and reset it? <Note> Optional board with built-in device server (GB-DS) is required.		<div>Automatic recovery by internal setting of the power supply</div> <div>Remote recovery from a distance</div>	<div><input type="checkbox"/>Need <input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>Need <input type="checkbox"/>Don't need</div>
	(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.			<div>Functions (<input type="checkbox"/>Need <input type="checkbox"/>Don't need)</div> <div><input type="checkbox"/>Remote on/off <input type="checkbox"/>Power failure detection <input type="checkbox"/>Abnormal power supply notice <input type="checkbox"/>Monitoring internal temperature of the system <input type="checkbox"/>FAN rotating speed monitoring <input type="checkbox"/>Expectancy of life span <input type="checkbox"/>Abnormal notice by e-mail (Number of e-mail addresses: ___)</div>
	(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.			<div><input type="checkbox"/>Yes <input type="checkbox"/>No</div> <div>T1 ___ ~ ___ ms</div> <div>T2 ___ ~ ___ ms</div> <div>T3 ___ ~ ___ ms</div>
	4. Optional function	(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.		
(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		<div>Calculation/Notice of the battery life span</div> <div>Scheduling operation</div>	<div><input type="checkbox"/>Need (<input type="checkbox"/>calculation of battery life span <input type="checkbox"/>Notice)</div> <div><input type="checkbox"/>Don't need</div> <div><input type="checkbox"/>Need <input type="checkbox"/>Don't need</div>	
(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?		<div>Notice function</div> <div>Unit names and signals you need (Able to accept max 4 I/O signals)</div>	<div><input type="checkbox"/>Need <input type="checkbox"/>Don't need</div> <div>1. _____</div> <div>2. _____</div> <div>3. _____</div> <div>4. _____</div>	
(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.			<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. System/others	(2) Do you need customization of output cable?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
	(3) If you have any further request, please let us know.			

Focus on Green correspondence

High efficiency, High peak AC-DC switching power supply

Continuous 200W
Peak 300W/400W

OZP-200 series

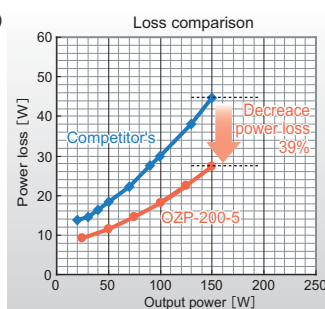
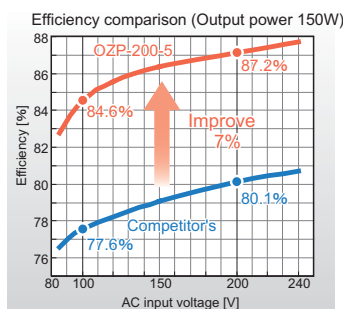
New models in OZP series! Powerfully supports the system with output continuous 200W, peak 300W/400W. Synchronous rectification circuit is equipped(*) and achieves. This type has achieved much higher efficiency than a general switching power supply resulting in reduction of electric bills, reduction 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%

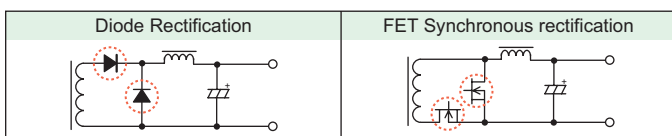
High efficiency 87%* even with low voltage output. Improve 7% than general switching power supply. This is the power supply fitting with the times which can reduce CO2 emission and save energy. (* At 200VAC input and rated load)

Efficiency comparison

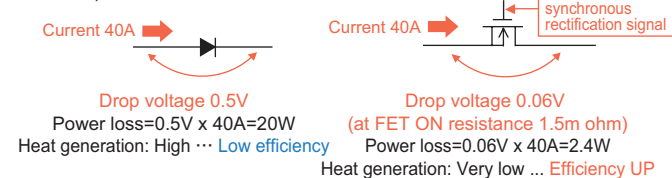
Input Voltage		Nipron OZP-200-5	Competitor's 150W 5V	Difference
AC100V	Efficiency	84.6%	77.6%	7.0%
at 150W output	Input power	177.3W	193.3W	16.0W
AC200V	Efficiency	87.2%	80.1%	7.1%
at 150W output	Input power	172.0W	187.3W	15.3W



Improve efficiency with Synchronous rectification circuit



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



Comparison of Electric Bills & CO2 emission

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

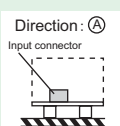
5V PSU 1 unit	Input voltage	Nipron OZP-200-5	Competitor's 150W 5V	Difference
Electric Bills	AC100V	31,064 yen	33,866 yen	2,802 yen
(yen/year) *1	AC200V	30,138 yen	32,809 yen	2,671 yen
CO2 emission	AC100V	587.1kg	640.1kg	53.0kg
(kg/year) *2	AC200V	569.6kg	620.1kg	50.5kg

Reduction in a year: **Electric bills** approx. 2,802 yen at 100VAC/2,671 yen at 200VAC, **CO2 emission** approx. 53kg at 100VAC/50.5kg at 200VAC. (*1) 20 yen/kWh (*2) 0.378kgCO2/kWh

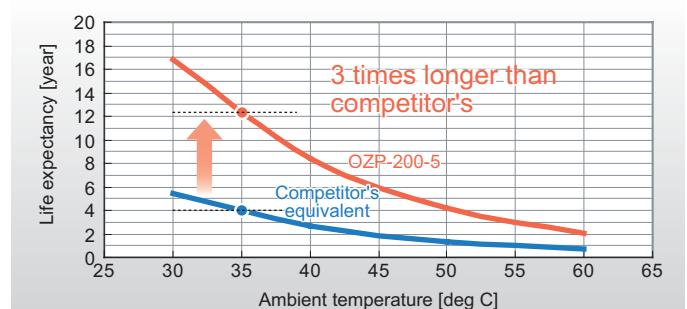
Long life, 3 times longer than Competitor's

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 expectancy



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.

We recommend the Nipron. Nipron Web Sales

<http://www.nipron.co.jp/>

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.



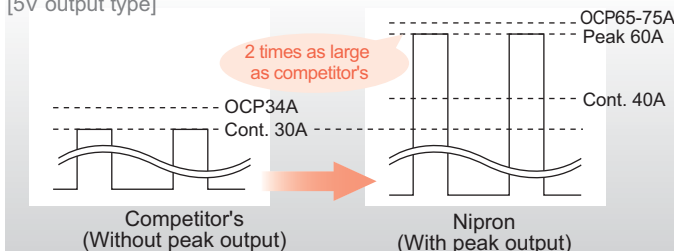
High peak power

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.

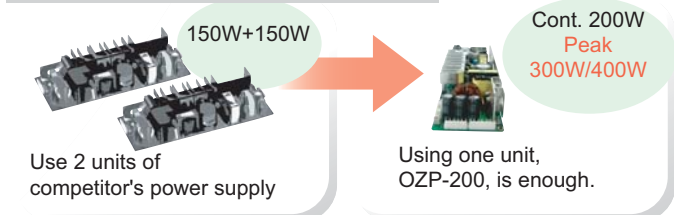
This model achieves more than 1.3 times as large capacity as competitor's even with same chassis sizes. Also 1.5 to 2 times as large peak output then continuous output is possible. (Output voltage min 12V)

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

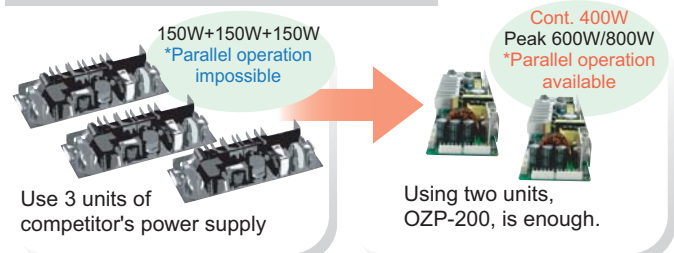
[5V output type]



At Peak load 300W



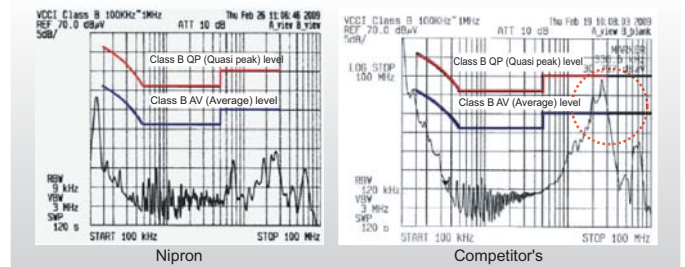
At Continuous load 400W



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

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

The diagram shows the internal circuit of the OZP-200 connected to a system side. It includes a +AC FAIL signal, a 3mA max current limit, and a 30Vdc max output voltage. The detection delay time is 20~50ms.

Output ON/OFF control function

ON/OFF control is available by remote terminal.

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



Corresponds to the capacitor package as for instantaneous power failure measure

Capacitor package protects the system from instantaneous power failure.



Noise reduction board (Optional)

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

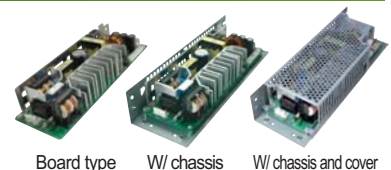
Output voltage settable resistor equipped as standard

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	24	36	48
Output voltage		3.3V	+5V	+12V	+24V	+36V	+48V
Output current/voltage	Natural air cooling	40A	40A	16.7A	8.4A	5.6A	4.2A
		132W	200W	200.4W	201.6W	201.6W	201.6W
	Forced air cooling	46A	46A	20A	10A	6.7A	5A
		151.8W	230W	240W	240W	241.2W	240W
	Peak (10s)	60A	60A	33.4A	16.7A	11.2A	8.4A
		198W	300W	400.8W	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 x 51 x 252(w/ chassis and cover)						
Input/output terminal	Nylon connector or Harmonica terminal						

*With volume adjusting, 12V output can be used as 15V output power supply, 36V output power supply can be used as 30V power supply.



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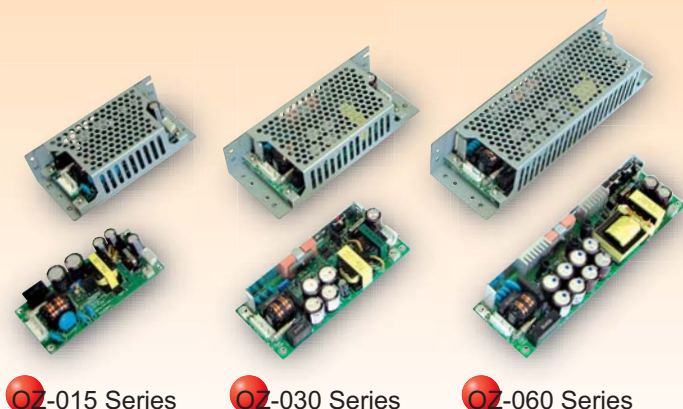
<http://www.nipron.co.jp/>

AC-DC general purpose
switching power supply
to reduce electricity and CO₂

Resource saving
Long life
Safety-oriented

Continuous
15W/30W/60W

OZ series



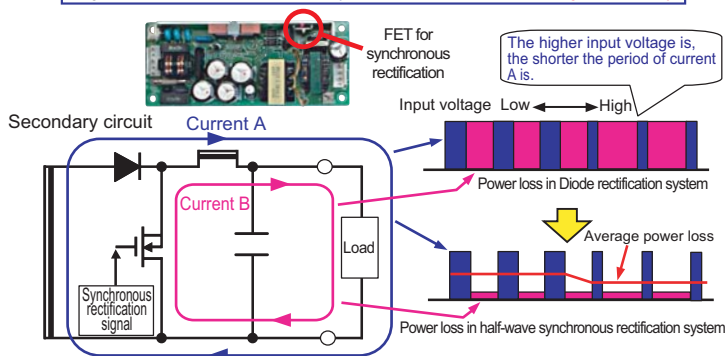
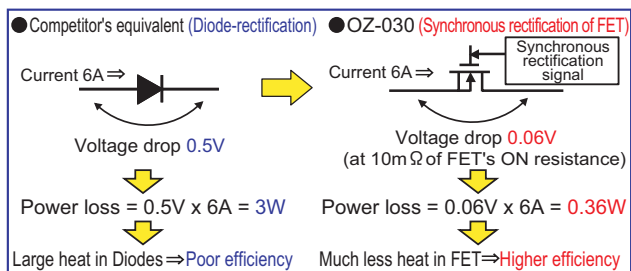
OZ series of general purpose AC/DC sw' power supply has brought **higher efficiency** compared with competitor's equivalent, resulting in a lot of advantages, such as **compact/high power, electricity saving, long lifetime, etc.** Besides, OZ series is **safety-oriented** product with double sided PCBs 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 CO₂ emission

Electrical bill and CO₂ emission can be reduced with high efficiency OZ series installed. Designers at customers work hard every year to achieve CO₂ reduction target of ISO14000 (environment) for certificate renewal. End users are happy with Nipron power supplies because they can reduce considerable amount of CO₂ 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%	6,441 yen
			AC200V	81.4%	6,457 yen
Competitor's equiv. (1)	5V	30W	AC100V	77.9%	6,747 yen
			AC200V	75.2%	6,989 yen
Competitor's equiv. (2)	5V	30W	AC100V	74.1%	7,093 yen
			AC200V	76.5%	6,870 yen

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

Electric bill and CO₂ 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
CO₂ emission: approx. **5.8kg** at AC 100V/approx/ **10.1kg** at AC 200V !

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

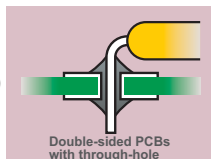
Annual electrical bill: approx. **652 yen** at AC 100V/approx. **414 yen** at AC 200V
CO₂ emission: approx. **12.3kg** at AC 100V/approx/ **7.8kg** at AC 200V !

*1 20 yen/kWh conversion *2 0.378kg CO₂/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)

Looking for single output PSU? Ask us! Nipron Web Sales

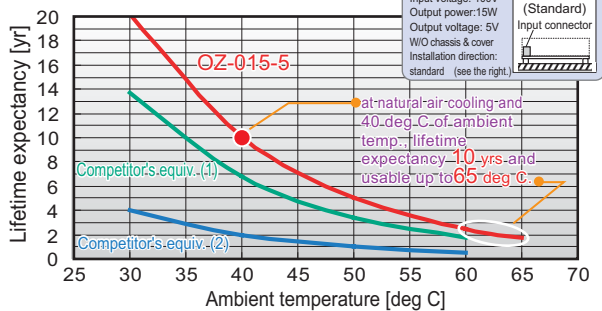
<http://www.nipron.co.jp/>

Long lifetime

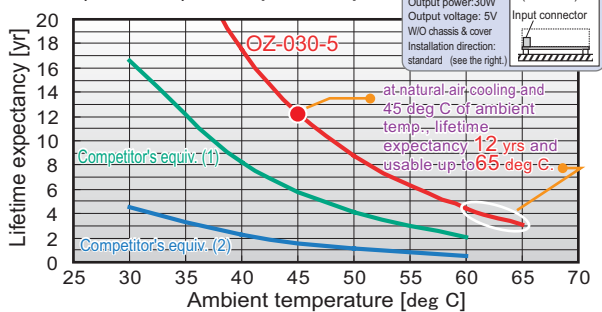
OZ series brings long lifetime due to efficiency-oriented design and longer-life electrolytic capacitors. Also, OZ-015 & 030 series covers the operating temperature up to 65 deg C. Following shows an example in comparison with competitor's equivalent.

Lifetime expectancy comparison

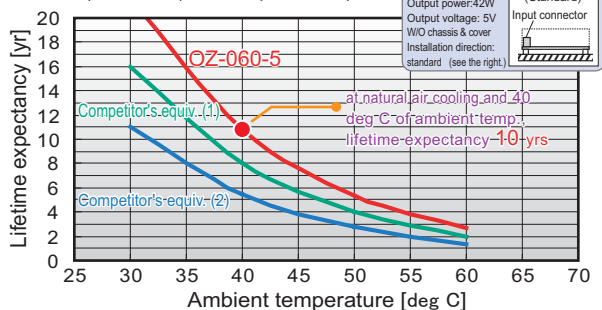
● OZ-015-5 (actual data) VS Competitor's equiv.



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



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



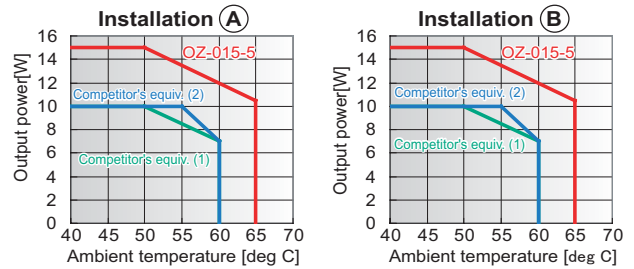
Nipron contributes to global environment improvement by industrial waste reduction driven by long life design policy (10 years and beyond).

Excellent Output power v.s. Ambient temp.

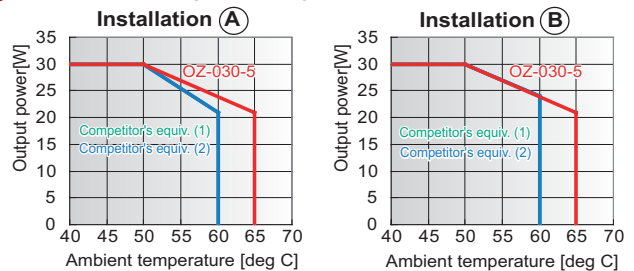
OZ series performs excellent output characteristics even at high temperature compared with competitor's equivalent (bottom installation). The output power - ambient temp. comparison curves of single open frame are shown below.

● Output power - Ambient temp. characteristics

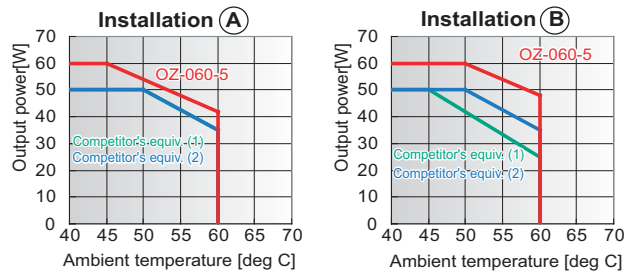
● OZ-015-5 VS Competitor's equiv.



● OZ-030-5 VS Competitor's equiv.



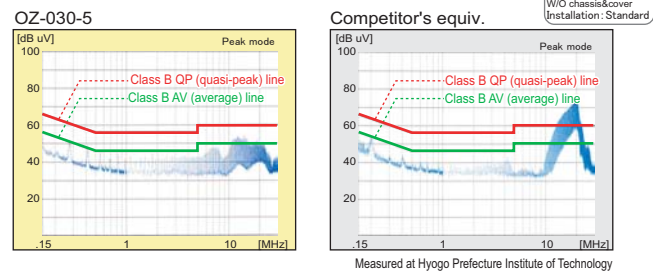
● OZ-060-5 VS Competitor's equiv.



*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.



Products line-up

Model 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)				

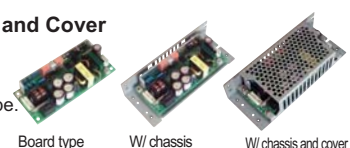
Two types of input / output terminals available

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.

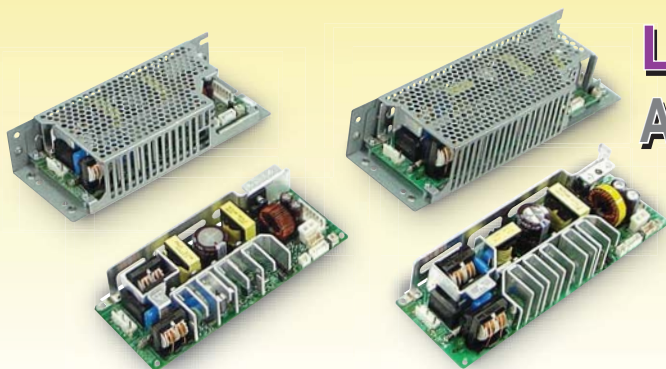


Variable resistor for output voltage equipped as standard

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

Having trouble about shipping date? Nipron Web Sales

<http://www.nipron.co.jp/>



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.

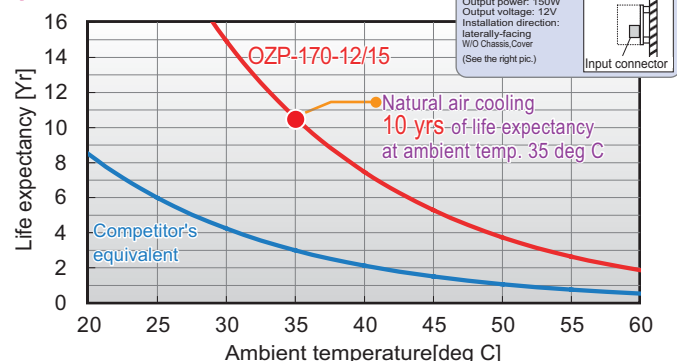
Long life (3 times longer than Competitor's)

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)



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 & CO₂ emission (24-hour continuous running)

Reduction! in a year: Electric bill approx. 1,149yen (at AC100V) / approx. 955yen (at AC200V)
CO₂ emission approx. 21.7kg (at AC100V) / approx. 18kg (at AC200V)!

*1 20yen/kWh conversion

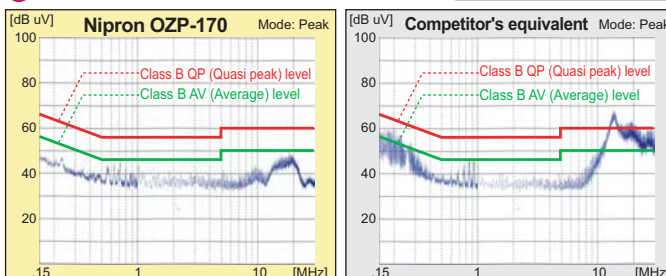
*2 0.378kgCO₂/kWh conversion

Low Noise

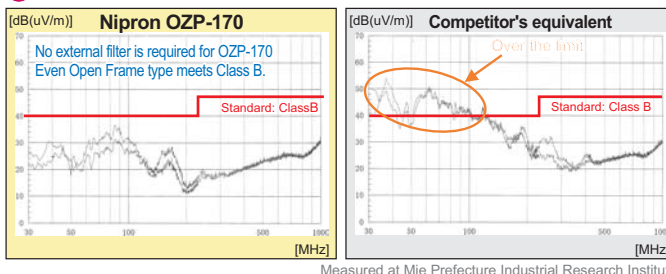
VCCI Class B (Conducted emission/Radiation) easily passes without external noise filters. A big customer who implemented OZP-170 says, "We usually get into trouble with noises in developing systems. It would take us 6 months at a worst case spending valuable times of engineers in vain." "However, thanks to OZP-170-24 and -1,Q 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 (A) (Standard)
Input connector

Conducted emission

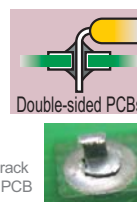


Radiation



Double-sided PCBs with through-hole (Safety)

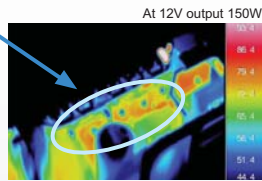
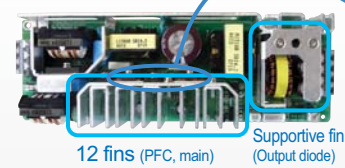
Solder crack at high voltage section is likely to burn. Double-sided PCBs with through-hole is the solution for solder crack in industrial use. Competitor's equivalents are, in many case, single-sided PCBs.



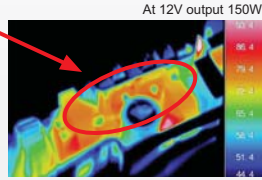
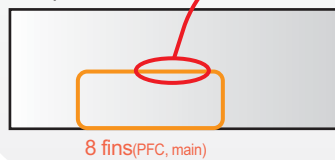
High power output

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

OZP-170-12/15



Competitor's

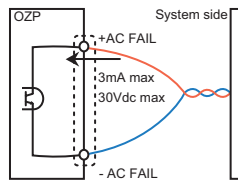
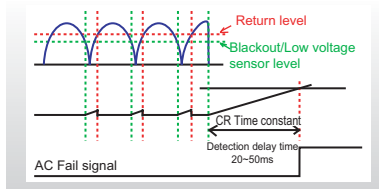


Power failure detection and backup operation

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.

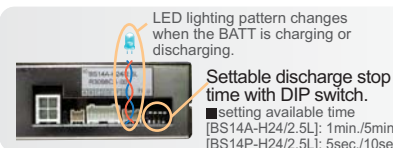
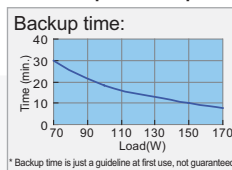
Signal	Detection level	Detection delay time	Output
Blackout detection signal	AC 80V typ	20~50ms	Open collector



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 Pro2. (Harness is optional)



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

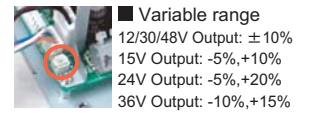
ON/OFF control is available by remote terminal.



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

Variable resistor for output

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



Variable range
 12/30/48V Output: $\pm 10\%$
 15V Output: $-5\%, +10\%$
 24V Output: $-5\%, +20\%$
 36V Output: $-10\%, +15\%$

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

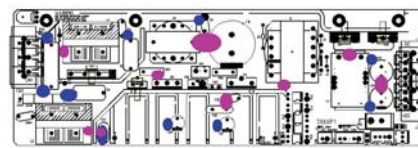
Capacitor package protects the system from instantaneous power failure. (Only for OZP-170 series)



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 devices 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.

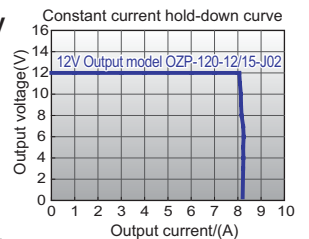


*The actual silicon locations may differ from the picture shown.



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.



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					

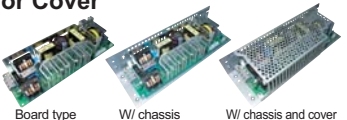
3 types for input/output terminals

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



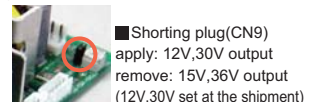
Selectable Chassis or Cover

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.



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<http://www.nipron.co.jp/>



GPSA-360 series

GPSA-750 series

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

Continuous max 360W (Peak 840W max.)
Continuous max 720W (Peak 1920W max.)

GPSA 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.

① High Peak Power

Peak power gives more than 120% of rated power for 5 seconds, and more at AC 200V input.

■ GPSA-360

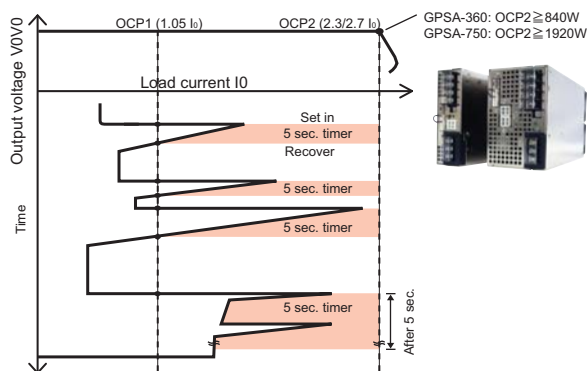
Rating	PeakMax
360W	720W (AC100V) 840W (AC200V)

■ GPSA-750

Rating	PeakMax
720W	960W (AC100V) 1920W (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.

Function and Value

Nipron GPSA-750 power supply

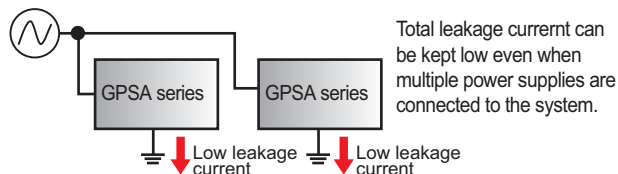
Backup at blackout available Blackout detection signal equipped 12V/0.3A standby equipped Higher efficiency by 3 to 5% Low noise (Conducted emission/Radiation) Medical standard compliant Low leakage current Peak Power 1200W for 5 seconds at AC 200V 900W for 5 seconds at AC 100V Continuous Power 720W BASIC FUNCTION	NIPRON GPSA's Value	small difference in price, and GREAT difference in value!	Value end-user receives	Competitor's 600W power supply Continuous Power 648W Peak Power 744W for 10 seconds at AC 200V BASIC FUNCTION
	Nipron's price	Gap	Competitor's \$9 value	

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)

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



About Medical Standards

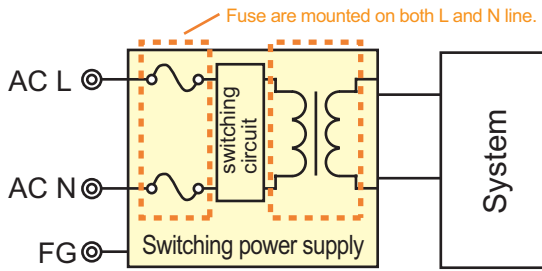
Medical Standards (IEC60601-1) will be hard to comply than Information equipment Standards (IEC60950-1). Designing requirements are shown below.

- 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.

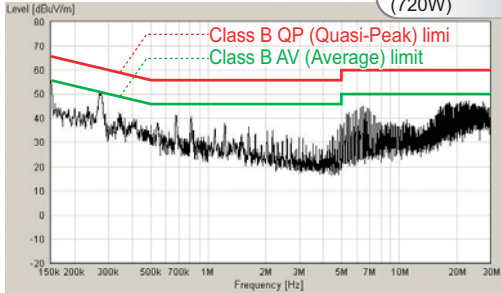
GPSA/mGPSA series have two fuses in both AC lines equipped and low leakage current meeting medical standard, PSE can be easily met. Also, GPSA/mGPSA series have done to be double and reinforced insulation, therefore you will not need to prepare for extra fuses or breaker, or set up supplementary insulation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

③ Conducted Emission Class B

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-750-24P-TP

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

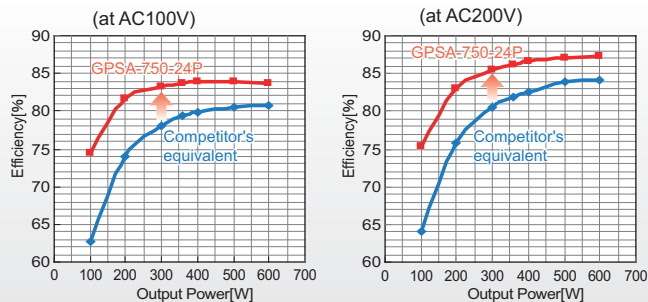


Actual measurement example (In-house data)

④ High efficiency&Long life

More than 3% higher efficiency compared with Competitor's

Efficiency Comparison



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

	Output Voltage	Output Power	Input Voltage	Efficiency	electricity expense*
Nipron (GPSA-750-24P)	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

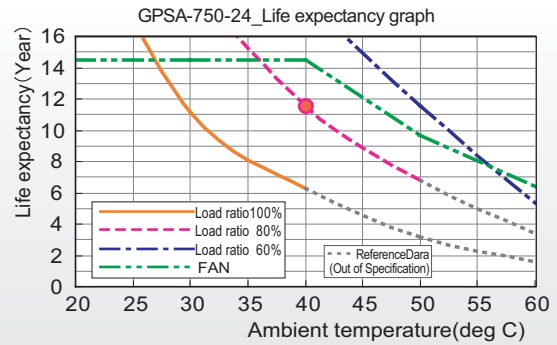
Comparison for electricity expense and CO2 emission (600W output, 24 hours/day, continuous running)

Cuts electricity expense about **4,518yen** (at AC100V)/about **4,295yen** (at AC200V)
CO2 emission about **85.4kg** (at AC100V)/about **81.2kg** (at AC200V) through a year!

(*1) 20 yen/kWh conversion (*2) 0.378 kgCO₂/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 24V for 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

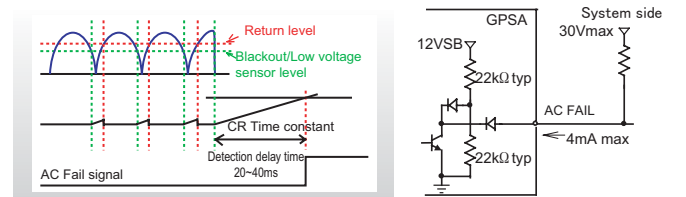
*2 0.1A max at backup operation

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

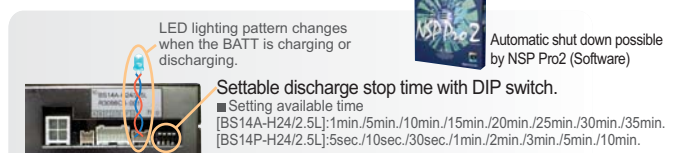
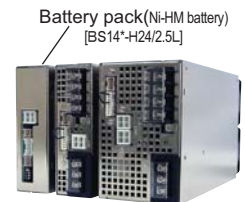


Blackout detection signal equipped/Backup at blackout available

Battery backup operation during blackout is possible for 24V output type (GPSA-***-24P) 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)

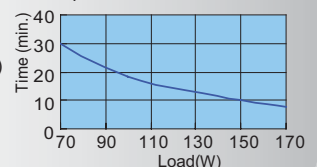


Battery package

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:



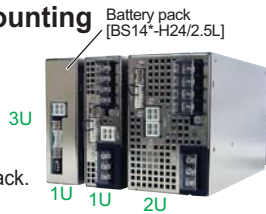
Receipts are issuable! Nipron Web Sales

<http://www.nipron.co.jp/>

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-360-24P	GPSA-750-24P	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

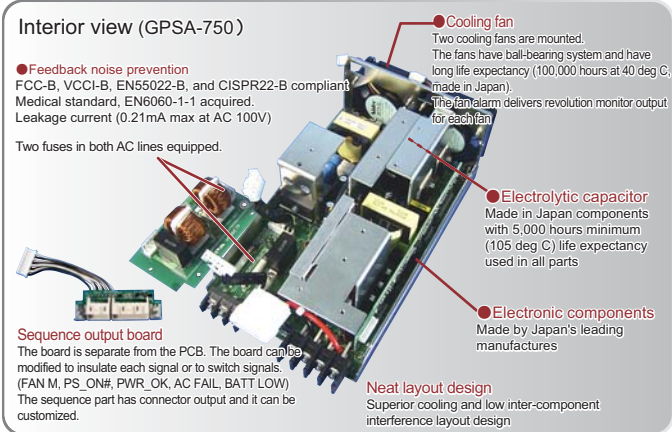
Output ON/OFF control is also available by Remote ON/OFF signal PS_ON.

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)

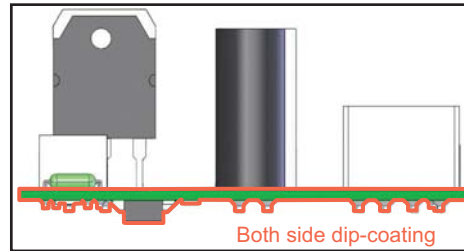
- Protection of discrete components such as diodes against dusts by tubing have been implemented.

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.)



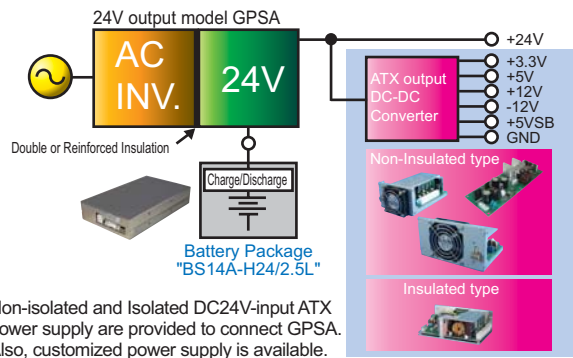
Under harsh neutral salt spray test



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



Ready for a sensor signal (HV signal) of

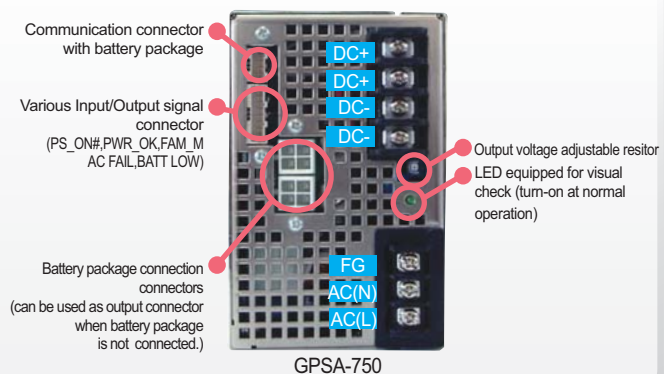
GPSA is ready for a sensor signal (HV signal) of voltage regenerated by servo motor driver.

Products line-up

Model name	(Series type)	12	24P	36P	48P	Common SPEC
Series type	Output voltage	+12V	+24V	+36V	+48V	+12VSB
GPSA-360	Output current/	Continuous	30A	15A	10A	7.5A
		Peak (5s)	40A	30A	20A	15A
	Output power	[AC100V]	480W	720W	720W	720W
		Peak (5s)	40A	35A	23.3A	17.5A
	[AC200V]	480W	840W	840W	840W	840W
		Peak (5s)	40A	35A	23.3A	17.5A
GPSA-750	Output current/	Continuous	56A	30A	20A	15A
		Peak (5s)	70A	40A	26.7A	20A
	Output power	[AC100V]	840W	960W	960W	960W
		Peak (5s)	80A	80A	53.3A	40A
	[AC200V]	960W	1920W	1920W	1920W	1920W
		Peak (5s)	80A	80A	53.3A	40A
Common	Input voltage	AC85V~264V (Worldwide input, with PFC)				
		Harmonica terminal				

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

* With Output voltage adjustable resistor, 36V output power supply can be used as 30V, 48V output power supply can be used as 42V.



Competitive price because of manufacturer. Nipron Web Sales

<http://www.nipron.co.jp/>

For Green Innovation Era Ultra High Efficient Complying with 80Plus 1000W Peak Power ATX PSU !!

Will be released August 2010!

Continuous: 800W
Peak: 1000W

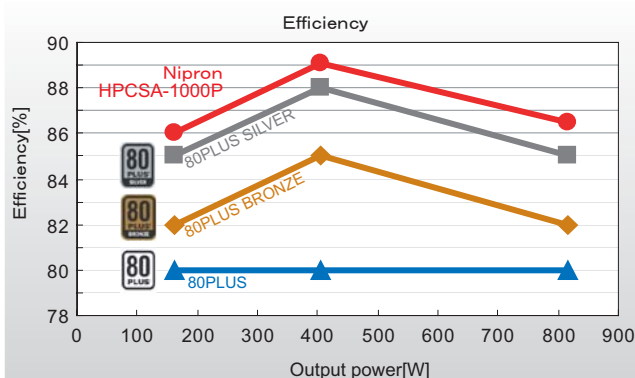
Model: **HPCSA-1000P-E2S**



Features

- Complying with 80Plus, huge capacity 1000W High efficiency ATX Power Supply. Contributes to a reduction of energy loss
- Equipped with 4CH for +12V output, allows total 1000W peak output
- At standby mode (when remote is OFF), if the temp. inside of ther power supply rises, fan rotates in order to reduce heat in +5VSB circuit.
- Equipped with thermal-sensing speed control fan, Silent
- Less than 1W standby power complying with ErP directive
- Conducted Emission Class B
- Life expectancy over 10 years at 35 deg C. Long life
- Output harness has a connector system. All outputs have the minimum load current 0A.

Efficiency



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 on Jan 17th, 2013.

*Built-in types are except for ErP commission.

What's 80Plus?

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

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

Specification

Input voltage	AC85~264V (Worldwide range)* Needs derating (~90V)							
Output voltage	+3.3V	+5V	+12V1	+12V2	+12V3	+12V4	-12V	+5VSB
Max current/power (continuous)	20A	20A	18A	18A	18A	18A	0.4A	3A
	Total 166W		Total 792W				Total 20W	
	Total 800W							
Peak current/power (within 5s)	30A	30A	22A	22A	22A	22A	0.6A	4A
	Total 249 W		Total 1000W				Total 27W	
	Total 1000W							
Minimum current	0A	0A	0A	0A	0A	0A	0A	0A
Deminsion	150(W) x 86(H) x 190(D)mm EPS size							

*Products specification is subject to change due to under development.

Port	Model	Connector type/length	Number of cables
Main	WH-M2022-500	500±15 → 20Pin	1
	WH-M2422-500	500±15 → 24Pin	
Output harness	WH-V0808-500	500±15 → 12V 8Pin	3
	WH-V0408-500	500±15 → 12V 4Pin	
	WH-VG208-500	500±15 → 12V 4Pin PCI-E 6Pin	
HD	WH-PP610-850	550±15 → 50±15 → 150±15	2
	WH-PS610-850	550±15 → 50±15 → 150±15	
	WH-PS710-850	550±15 → 50±15 → 150±15 850±15 → SATA	

Buy more saves more! Point discount system available! Nipron WEB sales <http://www.nipron.co.jp/>

New comer living up to your expectation!

Compact PC power supply in Flex ATX standard dimension

Model name: **PCFX-220P-X2S**

Continuous 170W
Peak 220W

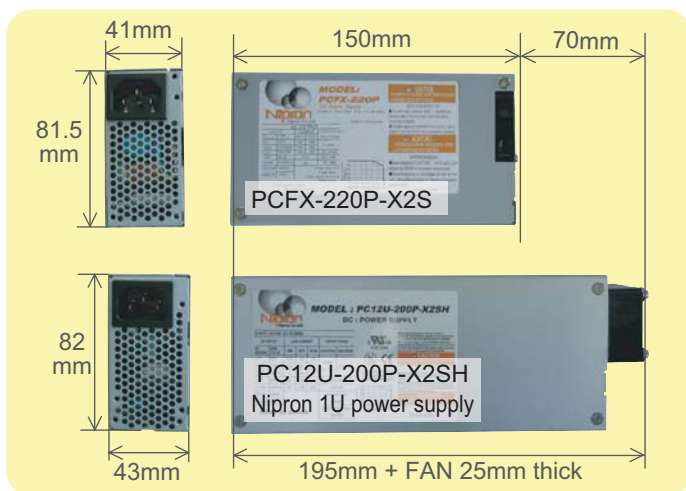
Input voltage	Efficiency	Power factor
AC100V	74.82%	99.30%
AC240V	79.29%	94.70%

*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



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.

Other company's power supply 1

Thermistors fixed with only silicon

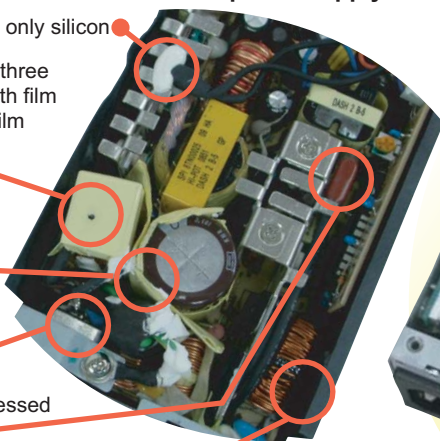
Jumping wires due to three layered component with film capacitors/line filters/film capacitors

Irregularly shaped insulation sheet that cannot be found anywhere

Grounding capacitor directly soldered to the back of inlet

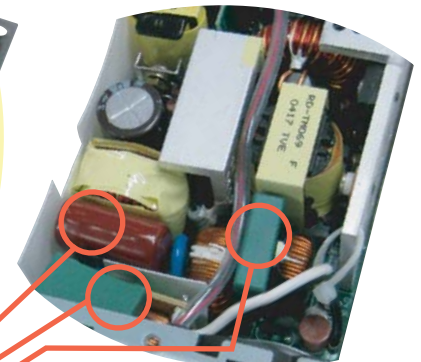
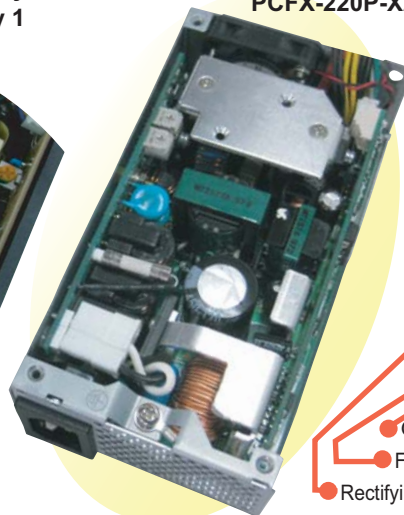
PFC film capacitor pressed away by lead wire

Single sided PCB



Nipron PCFX-220P-X2S

Other company's power supply 2



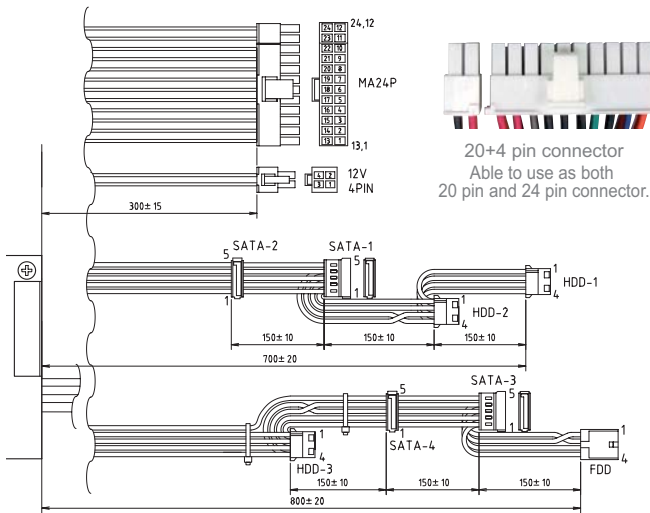
- Grounding capacitor under the film capacitor
- Film capacitor directly soldered to the back of inlet
- Rectifying bridge under film capacitor (with no serigraph)

Easy! Just follow three steps for product delivery. Nipron Web Sales

<http://www.nipron.co.jp/>

Output harness specification to meet latest demand

Harness diagram



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

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

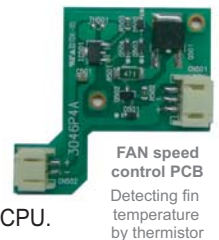
8.5 years of lifetime expectancy at input/output rating and ambient temperature of 40 deg C (approx 10.3 yrs for electrolytic capacitors, approx 8.5 yrs for fans)

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.



Worldwide input

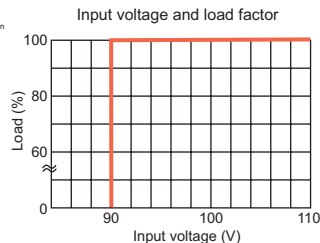
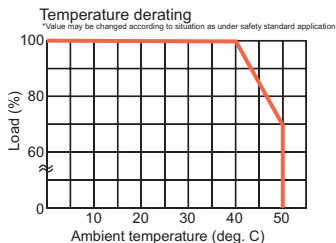
Input voltage selection switch is unnecessary unlike switch system as worldwide input system is adopted so that 90 to 264V input voltage is acceptable without switch operation.

Safety standard acquisition scheduled

Safety standard: UL(IEC)60950-1·c-UL·CE marking acquisition in schedule

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



Now

New comer! Slim body ATX power supply with 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



Medical Standard

Slim body ATX Power Supply

Continuous 210W

Competitive price because of manufacture. Nipron Web Sales

<http://www.nipron.co.jp/>

**NEW
PRODUCT**

SFX12V Nonstop Power Supply

**Small and powerful!
Palm size
Nonstop power supply**



Battery pack
"BS03A-H16/2.5L"

Model: NSP6F-220P-S10



Optimum structure
considered airflow.
High-grade parts used in.

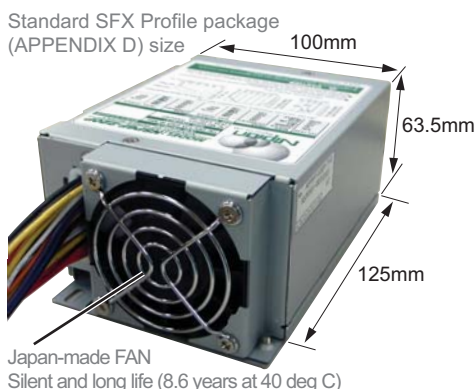
**Continuous 160W
Peak 220W**

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

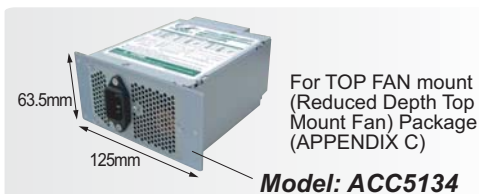
(Measured value)

SFX 12V standard, palm size small PC power supply

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



Installable for other mounting sizes by using optional attachment panel



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



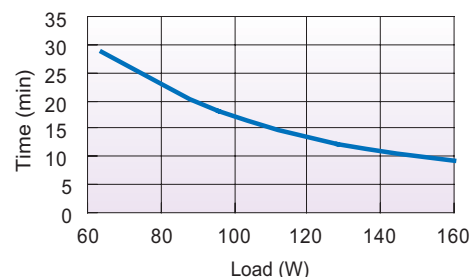
Model: BS03A-H16/2.5L

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



Backou 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.

Check all series above Nipron WEB direct marketing

<http://www.nipron.co.jp/>

Automatic shutdown

Automatic shutdown at blackout is also possible by using automatic shutdown control software "NSP Pro2".
(In case of Windows 2000/XP, OS standard UPS service also can be used.)

Automatic shutdown software

Model: NSP Pro 2

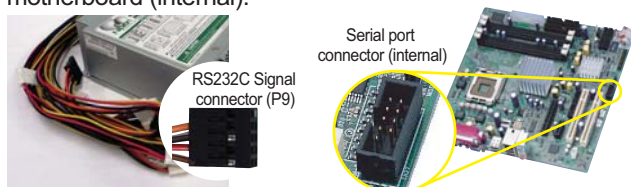
OS specification:
Windows 2000/XP/Vista

- 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

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

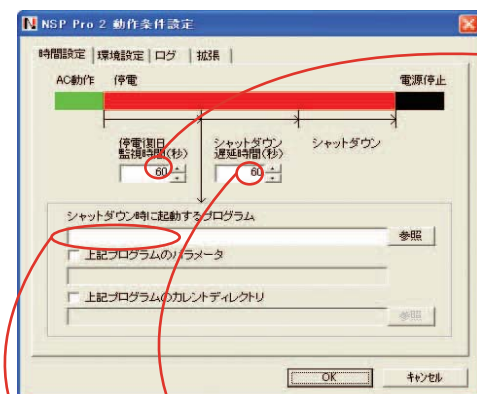
AC input	85 - 264V (Worldwide input)
DC input	16.8V (Dedicated battery pack)

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	10A	10A	14A	0.3A	1.8A
Peak power (Within 5S)	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 individual 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%



- 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 8.5W 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



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

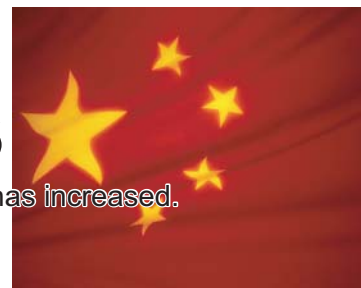


Security camera and stand alone DVR is popular applications.

Continuous **170W** Peak **220W**

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

Dimension	W x H x D (mm) = 150 x 86 x 140	PS/2 size
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Output connectors (optional)	Main (20Pin)	Main (24Pin)	AT	12V	AUX	Processor	X6	X1	S-ATA	PCH-E
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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

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

Dimension	W x H x D (mm) = 150 x 86 x 140	PS/2 size
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Output connectors (optional)	Main (20Pin)	Main (24Pin)	AT	12V	AUX	Processor	X6	X1	S-ATA	PCH-E
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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

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











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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)										

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)										

+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
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)												

+12V dual 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

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

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