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# POS Power Supply

## POS Nonstop Power Supply with +24V Output and PCB with Double-sided Through Holes



PS7103-03

**RoHS Directive**

<b>POS</b>	
<b>NSP</b> (nonstop power supply)	
<b>Continuous Max</b>	<b>Peak Power</b>
<b>180W</b>	<b>250W</b>

Model	Description	Stock	Standard Price (Before Tax)
PS7103-03		1 to 30 units: Standard stock 50 units or more: 100 days before delivery	¥25, 100

■ Model name coding ① Series name  
**PS7103-03** ② Modification code  
 ①      ②

### Features

- Nonstop power supply for POS device
- With 24V output
- Dedicated to AC100V input
- LED turns on when the protection circuit operates
- PCB with double-sided through holes is adopted (mass-production item). The price can be discounted to a large extent depending on the number of units.

**This unit is widely used as a power supply for ticket vending machines and POS.**

Refer to "Product Page Guideline" on page B-B1 for icons.

Acquired safety standard	UL	CSA	EN	CE	CCC
Reliability Grade	HFA	FA	HOA	OA	

### ● Function

DC start	RS 232C	USB	TTL	PFC	Silence	5VSB FAN	TSFC FAN	Connection	Fit for Panel	RoHS Directive
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### ● Input

AC input	90V to 110V
DC input	24V (dedicated battery package※)

※ Battery package is optional (sold separately).

### ● Output

Output voltage	+3.3V	+5V	+12V	+24V	+5VSB
Max current/ max power (continuous)	10A	20A	6.4A	4.2A	3.3A
	Total 22A		Total 150W		
Peak current/ peak power (10s max※1)	10A	20A	8.1A	4.2A	3.3A
	Total 250W		Total 180W		
Minimum current	0.5A	2A	0.1A	0A	0A

※1 For 24V output, 16A; 1ms max is also possible.  
 ※2 Max. load at backup operation shall be 100W.

### ● Dimensions

W × H × D (mm)	300 × 80 × 99.2
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### ● Output connector

This unit is a connector output type.  
 Contact us if output harnesses are needed.

# General Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

A. UPDATE

	Page	Items	Specification	Measurement conditions, etc.		
AC Input	D-6(1)	Rated voltage	AC90-110V, the initial voltage can be AC85-115V <a href="#">Characteristic data(B-C148 Fig.5)</a>			
	D-6(2)	Input frequency	50/60Hz	49-61Hz		
	D-6(3)	Efficiency	50% min <a href="#">Characteristic data (B-C148 Fig.1)</a>	At rated input/output		
	D-6(4)	Power factor	70% min <a href="#">Characteristic data (B-C148 Fig.1)</a>			
	D-6(5)	Inrush current	42A peak (AC100V) <a href="#">Characteristic data (B-C148 Fig.2)</a>	With rated input/output at cold start (25°C)		
	D-6(6)	Input VA	8.0A max <a href="#">Characteristic data (B-C148 Fig.1)</a>	AC90V, at rated output, except AC OUT		
DC Input	D-6(1)	Rated voltage	DC24V (corresponds to dedicated battery package)			
	D-6(7)	Battery discharge cut-off voltage	20V±1V (shutdown of battery circuit)			
	D-6(3)	Efficiency (at battery operation)	65% min	At backup operation, DC 22V		
Output	—	Rated voltage	+3.3V      +5V      +12V      +24V      +5VSB			
	—	Rated current	3A      20A      2A      0.5A      3.3A			
	D-6(8)	Max current/power	10A      20A      6.4A      4.2A      3.3A	Max output power is 180W. It shall be 100W min at backup operation.		
			Total 22A			
			Total 150W			
	D-6(9)	Peak current/power	10A      20A      8.1A      4.2A      3.3A	Peak output power is 250W(10s max) For 24V output, 16A; 1ms max is possible.		
			Total 180W			
	D-6(10)	Minimum current	0.5A      2A      0.1A      0A      0A			
	D-6(11)⑧	Total voltage accuracy (%)	±5 max      ±5 max      ±5 max      ±5 max      ±5 max	Sum of temperature, input, and load regulations		
	D-7(12)	Max ripple voltage (mVp-p)	50 max      100 max      100 max      480 max      100 max	It shall be measured with 20MHz oscilloscope ※1		
D-7(12)	Max spike voltage (mVp-p)	100 max      200 max      200 max      960 max      200 max	<a href="#">Characteristic data (B-C149 Fig.15)</a>			
Protection	D-7(13)	Over Current	OCP point (A)      3.3 min      21 min      2.5 min      3 min      3.5 min	Without battery for 24V		
		Protection	Method	All outputs except for +5VSB shut down All outputs shut down at battery operation.	Foldback current limiting All outputs shut down	
	D-7(14)	Recovery (over current)	At AC operation      Reclosing AC input	Automatic recovery	Reclosing AC input	
		Over Voltage Protection	OVP point (V)      3.7 to 4.3      5.5 to 6.7      13.2 to 15.6      26.4 to 31.2	—	—	
	—	Recovery (over voltage)	At AC operation      Reclosing of AC input	—	—	
		ALM lamp	At battery operation      Reclosing of AC input	—	—	
Charge	—	ALM lamp	LED (red) turns on while protection circuit is operating; it is displayed "POW ALM."			
	—	Charging in the reverse position	No smoke or flame shall occur when the battery is connected in the reverse position.			
	—	Charge voltage	27.0V to 27.6V (initial voltage at charge: 15±2V)	At minimum load		
Environment	—	Charge current	0.5±0.2A	At initial charge		
	D-7(16)	Operating temperature/humidity	0-50°C/10-90%	There shall be no condensation.		
	D-7(17)	Storage temperature/humidity	-15-60°C/95% max	There shall be no condensation.		
	D-7(18)	Vibration	0.20G (at operation), 0.50G (at no operation), in the X, Y, Z directions, 5-100Hz			
	D-7(19)	Mechanical shock	5.0G (at operation), 50.0G (at no operation), in the X, Y, Z directions			
Insulation	D-7(20)	Dielectric strength	AC 1000V for one minute between the primary and secondary components	Perception current: 10mA (humidity: 60% max)		
	D-7(21)	Insulation resistance	AC 1000V for one minute between the primary component and FG	Perception current: 15mA (humidity: 60% min)		
			25MΩ min between the primary and secondary components	DC500V		
			25MΩ min between the primary component and FG			
	D-7(22)	Leakage current	25MΩ between the secondary component and FG			
D-7(23)	Line noise immunity	1mA max				
EMS	D-7(24)	Line noise immunity	Impulse noise: ±1000V (pulse width: 50, 100, 200, 400, and 800ns, phase angle: 90° and 270° for five minutes each)	There shall be no malfunction.		
	D-7(24)	Electrostatic discharge	EN61000-4-2 compliant			
	D-7(25)	Radiated, radio-frequency EM field	EN61000-4-3 compliant			
	D-7(26)	Fast transient burst	EN61000-4-4 compliant			
	D-7(27)	Lightning surge	EN61000-4-5 compliant			
	D-7(28)	Conducted disturbances induced by radio-frequency	EN61000-4-6 compliant			
	D-7(29)	Power source frequency magnetic field	EN61000-4-8 compliant			
	D-8(30)	Voltage dip/regulation	EN61000-4-11 compliant			
Other	D-8(31)	Conducted emission	VCCI-A compliant	With the unit installed in a device		
	D-8(32)	Harmonic current regulation	IEC61000-3-2 VCCI Class D compliant	With 100W min output		
	D-8(34)	Cooling system	Forced-air cooling			
	D-8(35)	Output GND terminal	Capacitor grounding			
	D-8(38)	Output hold-up time	<a href="#">Characteristic data (B-C149 Fig.9)</a>			
F-3	Reliability Grade	HOA	It is to follow our standard			
D-8(41)	MTBF	100,000 H min	Based on EIAJ RCR-9102			
—	Weight	3.3 kg typical				
F-3	Warranty	One year after delivery. If any faults belong to us, the defective unit shall be repaired or replaced at our cost.	Except for errors caused by operation not listed.			

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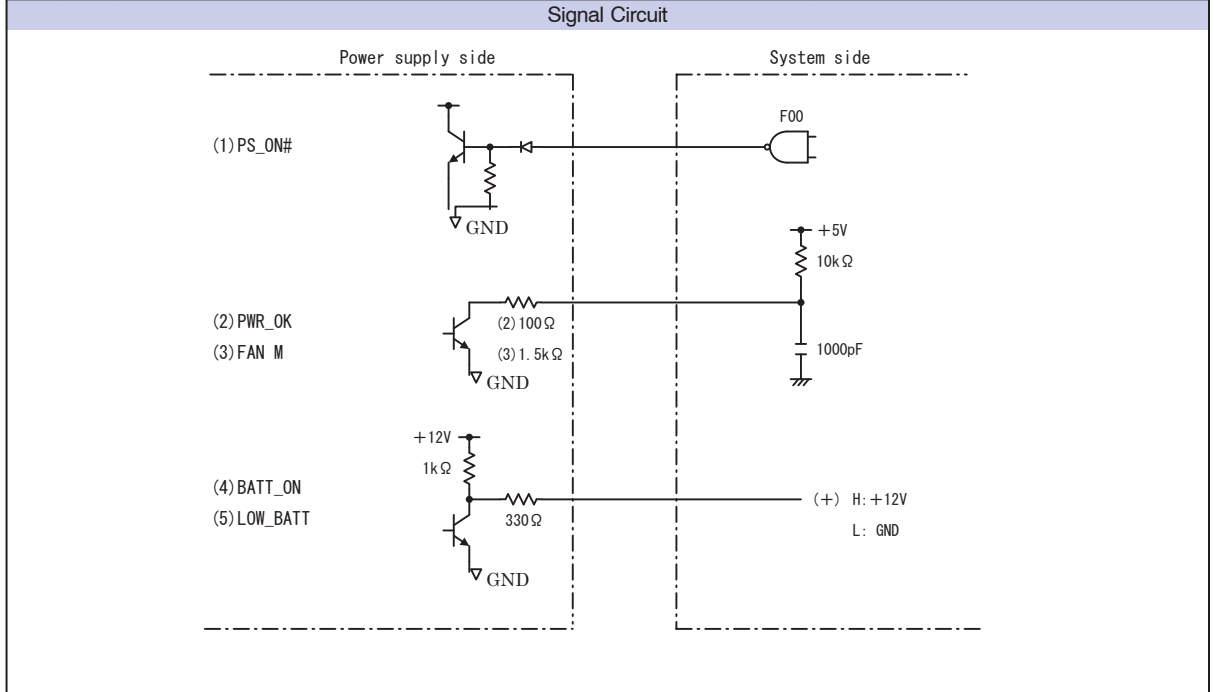
※1 When measuring ripple and noise, measurement point shall be away from output connectors and load lines which do not affect the measurement point.

Connect capacitors to the measurement point as listed below to measure.

- 3.3V : Connect two tantal capacitors or 47uF electrolytic capacitors in parallel + a 10000pF ceramic capacitor
- 5V, 12V, 24V, 5VSB : Connect a tantal capacitor or a 47uF electrolytic capacitor + a 10000pF ceramic capacitor

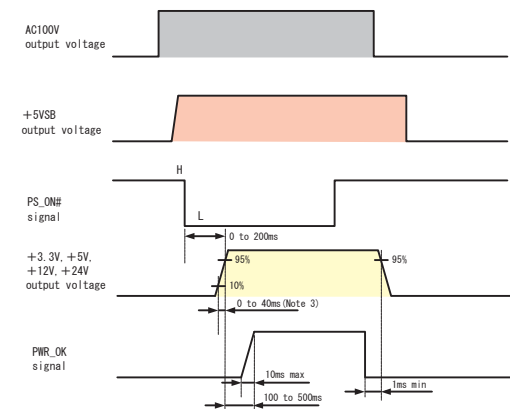
## Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

Items	Specification	Note
<b>Input Signal</b> Output ON/OFF control signal (PS_ON#)	Remote ON: TTL level 'L' Remote OFF: TTL level 'H'	J5 connector 14-pin
<b>Output Signal</b> Normal output signal (PWR_OK)	When all DC outputs reaches 95%, TTL level 'H' is delivered.	J5 connector 8-pin
Battery switching signal (BATT_ON)	At normal operation: 'L' level GND At battery output: 'H' level +12V	J4 connector 1-pin
Low battery signal (LOW_BATT)	At normal operation: 'L' level GND At battery output: 'H' level +12V	J4 connector 3-pin
Fan monitor signal (FAN_M)	The signal notifies the FAN speed; two pulses of tachometer signals are delivered per one rotation of the fan motor (open collector output).	J4 connector 5-pin



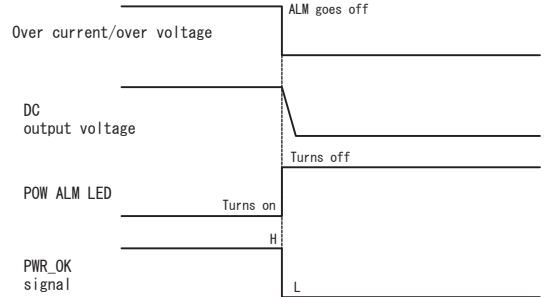
## Power Supply Timing

Remote ON/OFF (when the battery is not connected, AC 100V, 70% load)

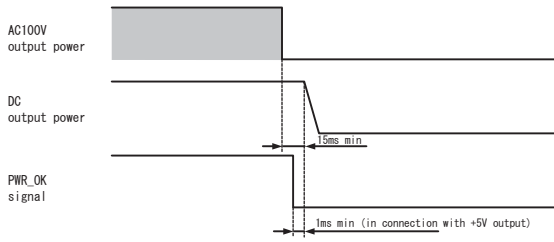


Note 1 The power shall be able to turn on and off with AC SW without problem with remote ON signal input  
 Note 2 Secondary inrush shall not overlap with the inrush while AC100V output is rising.  
 Note 3 The rising time for +24V shall be 0 to 200ms.

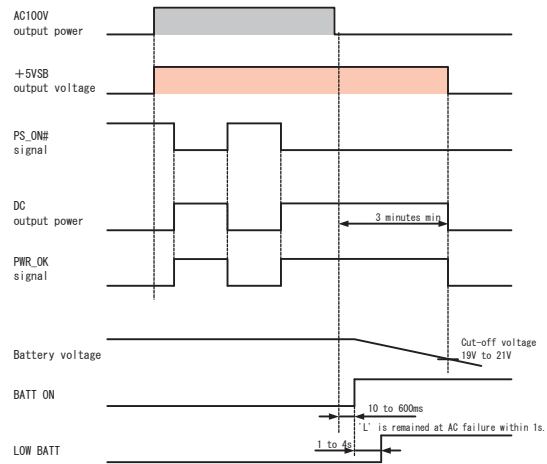
## ALARM



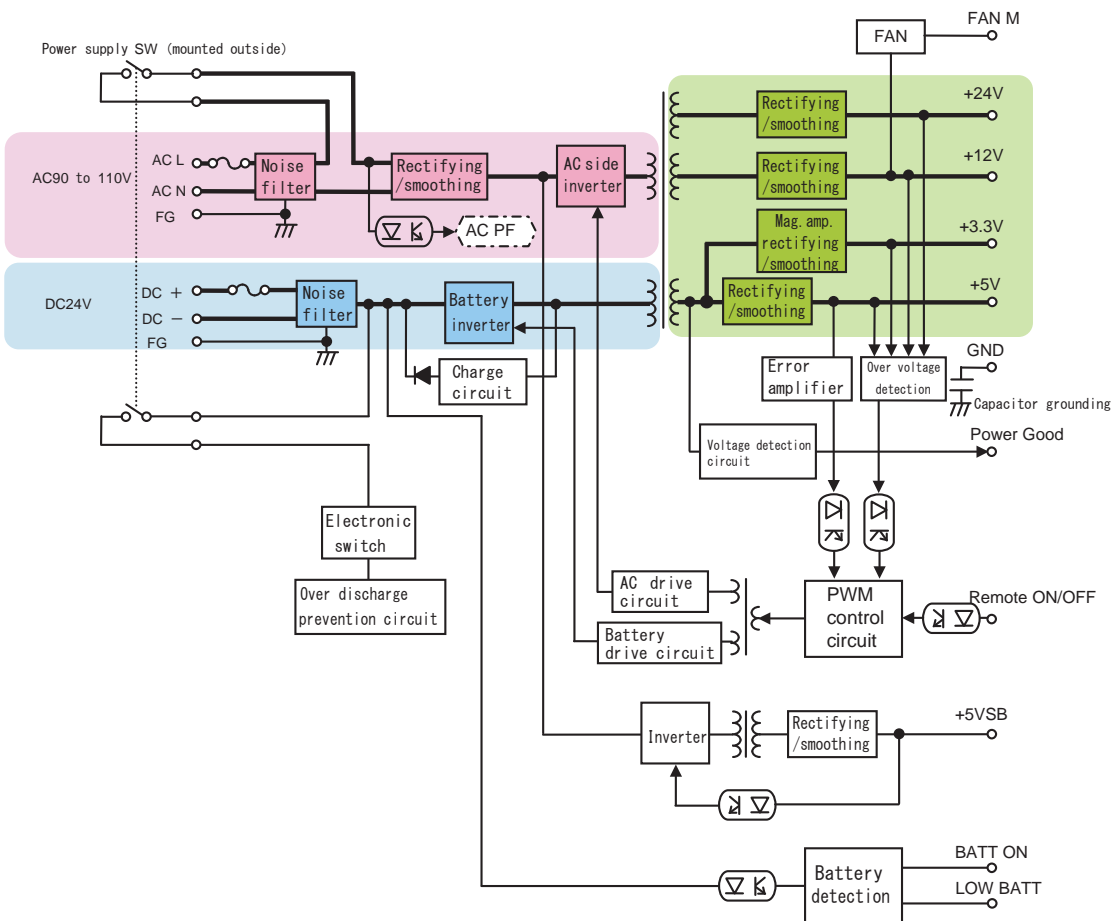
AC input failure (AC100V, 70% load)



AC input failure (when the battery is connected)



Block Diagram



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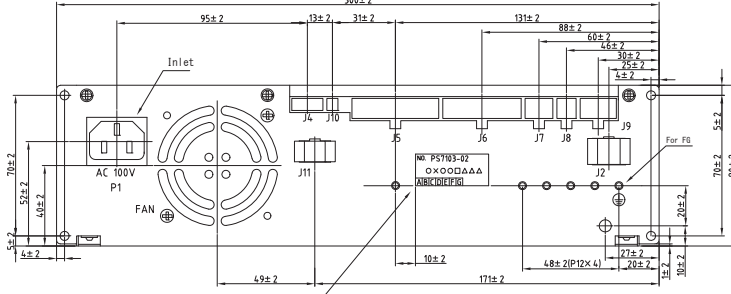
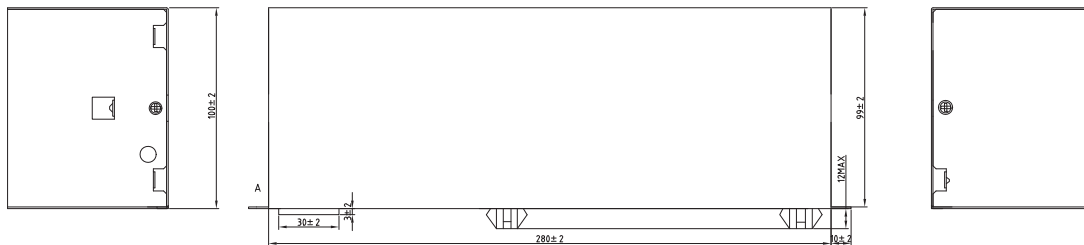
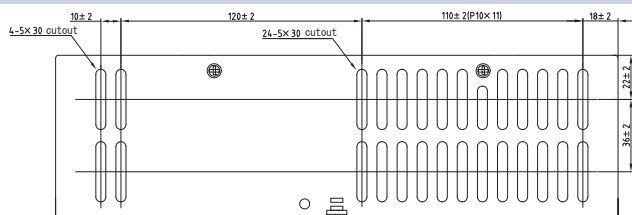
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(Dimensional tolerance: ±1)

※ Dimensional tolerance shall be ±1 unless otherwise specified.

■ Installation direction  
The unit can be installed in any directions.

Content  
Model  
Production number  
REV. (painted)

P1(for AC100V input)

Connector sign		P1	
Connector name NC-176-1.0(Nicoon) or equivalent			
Pin #	Function	Pin #	Function
1	AC100V (H)	2	AC100V (N)
3	FG		

J2(for battery connection)

Connector sign		J2	
Connector name XLR-04V (JST)			
Pin #	Function	Pin #	Function
1	BATT + side	2	BATT - side
	※	4	※

3-pin is shorted on the trunking cable side.

J4(UPS signal)

Connector sign		J4	
Connector name IL-G-6P-S3L2-SA-1 (gilding)			
Pin #	Function	Pin #	Function
1	BATT ON (+): CTS	2	BATT ON (-)
3	LOW BATT (+): DCD	4	LOW BATT (-)
5	FANM	6	NC

J5(output for main board)

Connector sign		J5	
Connector name 5569-20A(tin-plated) (Molex)			
Pin #	Function	Pin #	Function
1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PWR_OK
9	+5VSB	10	+12V
11	+3.3V	12	NC
13	GND	14	PS_ON#
15	GND	16	GND
17	GND	18	NC
19	+5V	20	+5V

J6(output for I/O)

Connector sign		J6	
Connector name 5569-18A(tin-plated) (Molex)			
Pin #	Function	Pin #	Function
1	GND	2	GND
3	GND	4	GND
5	+5V	6	GND
7	+24V	8	+5V
9	+5V	10	GND
11	+5V	12	GND
13	+5V	14	GND
15	+24V	16	GND
17	+5V	18	+5V

J7(for PR/HDD and others)

Connector sign		J7	
Connector name 5569-06A(tin-plated) (Molex)			
Pin #	Function	Pin #	Function
1	GND	2	GND
3	GND	4	+24V
5	+5V	6	+5VSB

J8(output for checker)

Connector sign		J8	
Connector name 5569-04A (tin-plated) (Molex)			
Pin #	Function	Pin #	Function
1	GND	2	+5V
3	+12V	4	GND

J9

Connector sign		J9	
Connector name 5569-08A (tin-plated) (Molex)			
Pin #	Function	Pin #	Function
1	+24V	2	+24V
3	+24V	4	NC
5	GND	6	GND
7	GND	8	NC

J10(DC OUT) status signal


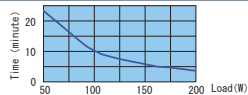

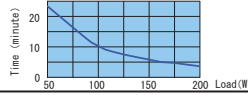

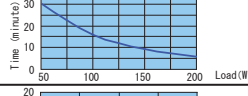

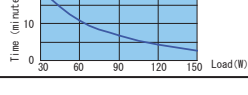
Connector sign		J10	
Connector name IL-G-2P-S3L2-SA-1 (gilding) (JAE)			
Pin #	Function	Pin #	Function
1	PWR_OK	2	PS_ON#

※Branches off from 8-pin and 14-pin of J5  
J11(primary side of the switch, secondary side)


Connector sign		J11	
Connector name ELR-04NV (JST)			
Pin #	Function	Pin #	Function
1	DC side	2	DC side
3	AC side	4	AC side

However, a pin shall be connected to NC as well.

## Optional Components (Sold separately)

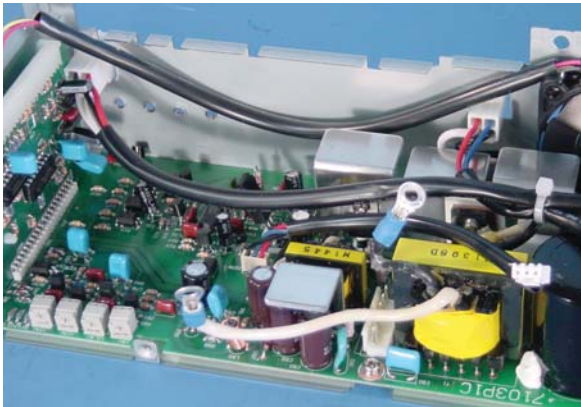
Battery package					
Page	Picture	Model	Battery type	Shape (size)	Backup time
B-G2		BS05A-P24/2. 2L	Lead	5-inch bay fixed type (W × D × H=146 × 190 × 37mm)	
B-G4		RBS01A-P24/2. 2L	Lead	5-inch bay fixed, removable type (W × D × H=146 × 245 × 42mm)	
B-G10		BS06A-H24/2. 5L (For standby use) BS06B-H24/2. 5L (With fan, for cycle use)	Ni-MH	5-inch bay fixed (W × D × H=146 × 181 × 38mm)	
B-G24		BS08A-H24/2. 0L	Ni-MH	5-inch bay fixed (W × D × H=130 × 140 × 38mm)	

※ The backup time is a reference value at initial use; it is not a guaranteed value.  
 ※ Conversion harness, PS2754 is needed to connect a battery package

Cable				
Page	Picture	Model	Type	Description
B-G46		WH2753	AC power code	AC125V 12A 【PSE】

Other optional components		
Page	Model	Description
B-G52	ACC2637	Automatic startup unit

## Internal Structure



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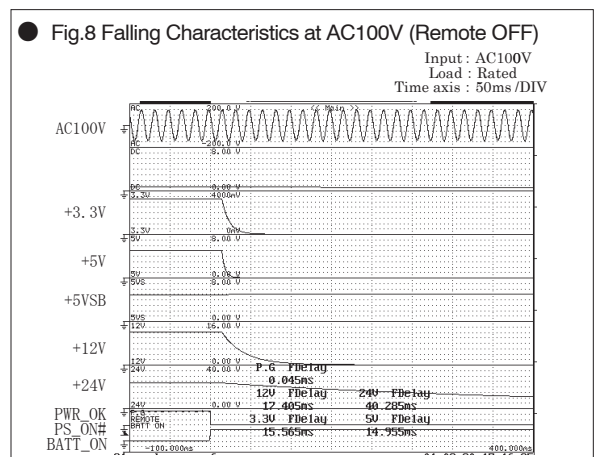
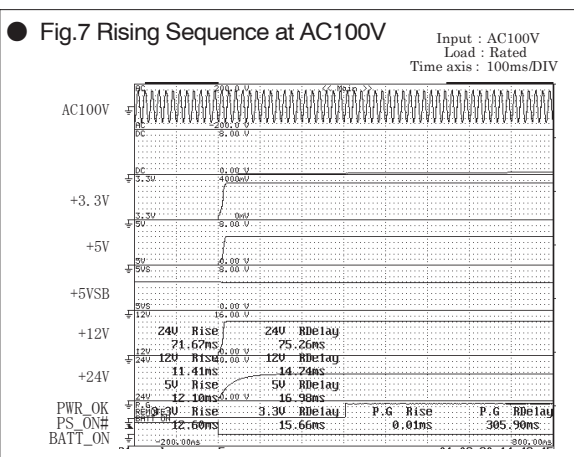
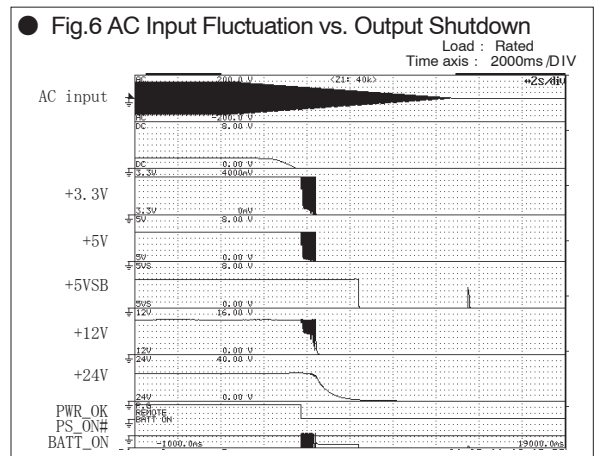
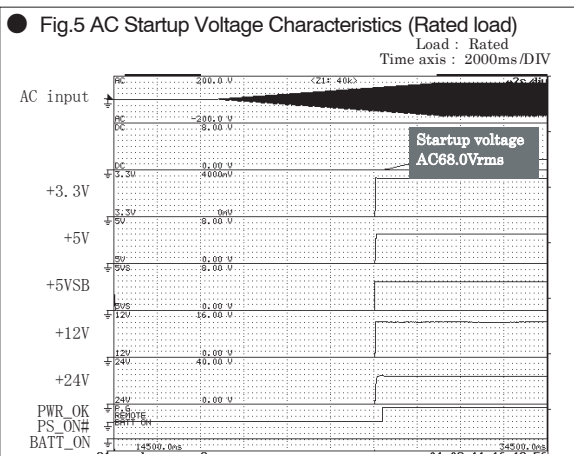
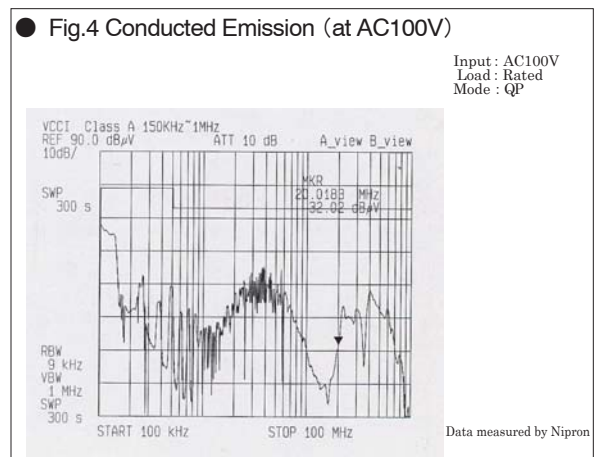
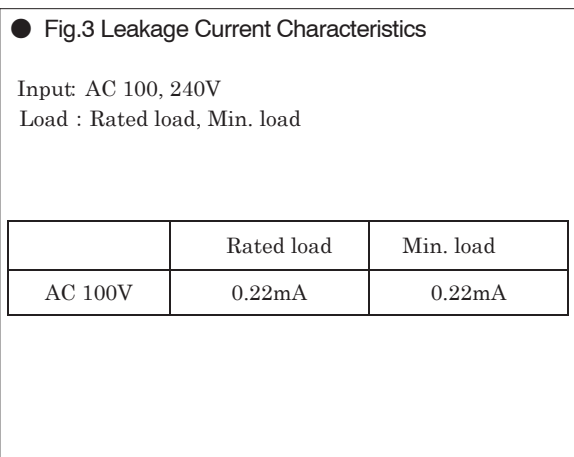
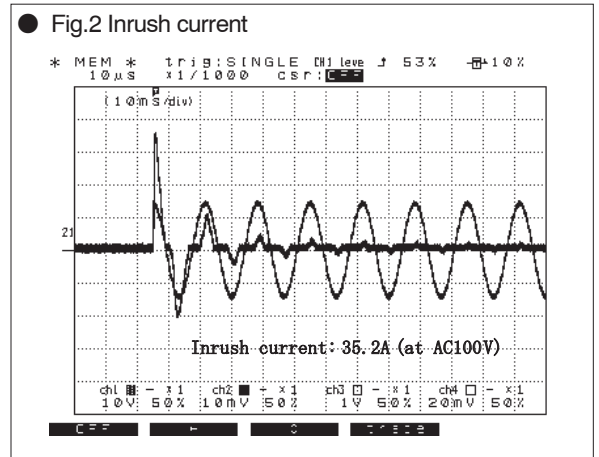
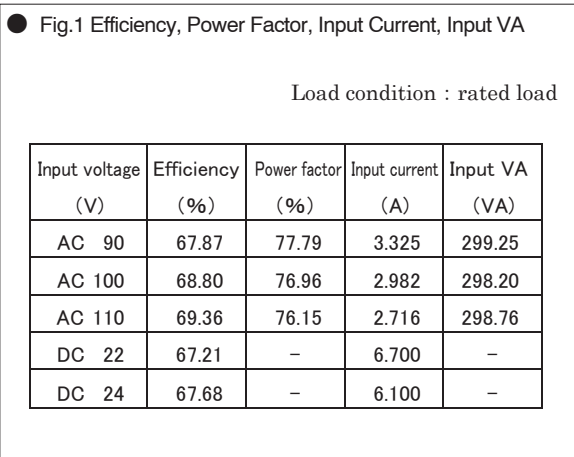
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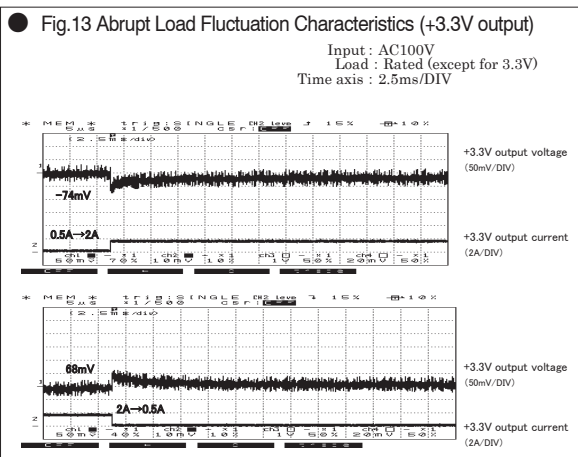
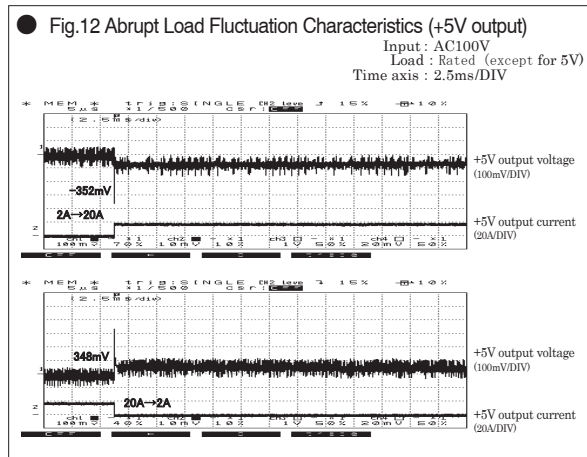
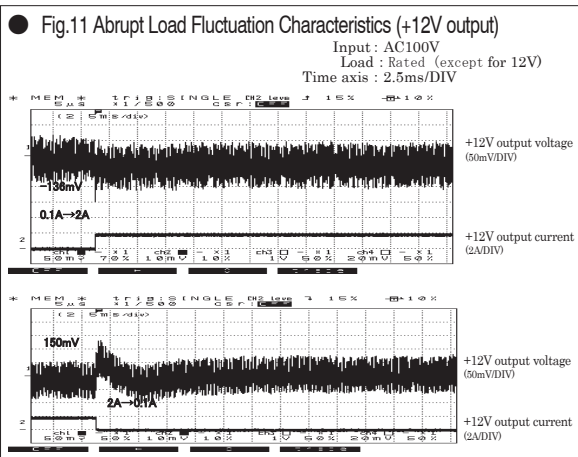
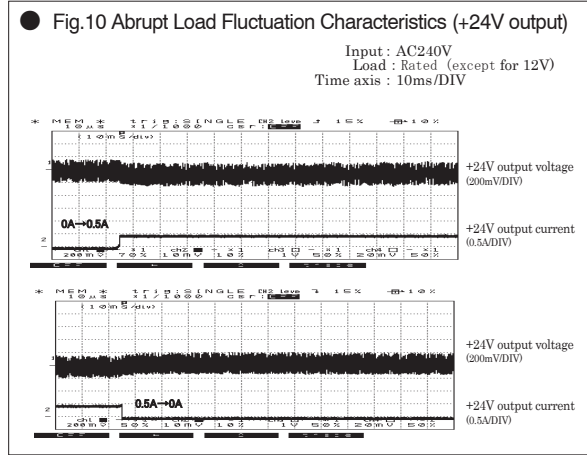
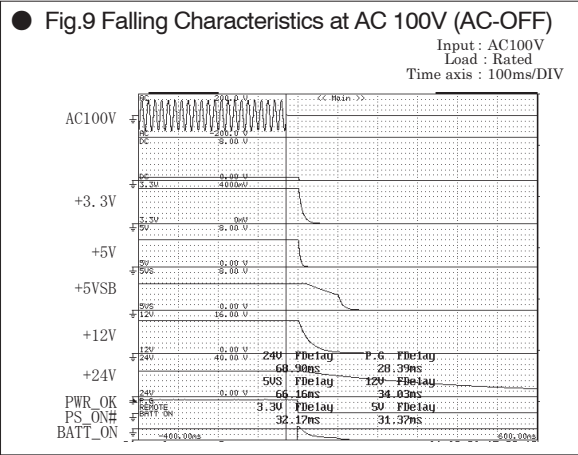
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**C** Characteristic Data (Examples of actual measurement)





● Fig.14 Rated Output Voltage Characteristics

	Output	Min. load	Rated load
24V output	0A	0.5A	
12V output	0.1A	2A	
5V output	2A	20A	
3.3V output	0.5A	2A	

AC input	AC 90V	AC 100V	AC 110V
24V output (min)	23.745V	23.850V	24.030V
24V output (rated)	23.694V	23.420V	23.247V
12V output (min)	11.999V	12.000V	12.004V
12V output (rated)	12.045V	12.044V	12.042V
5V output (min)	5.071 V	5.072 V	5.072 V
5V output (rated)	5.006 V	5.007 V	5.007 V
3.3V output (min)	3.327V	3.326V	3.325V
3.3V output (rated)	3.282V	3.279V	3.284V

● Fig.15 Ripple and Spike Characteristics  
 Input : AC100V  
 Load : Rated

Input voltage (V)	12V output		5V output		3.3V output	
	Ripple (mV)	Spike (mV)	Ripple (mV)	Spike (mV)	Ripple (mV)	Spike (mV)
AC90	22	110	20	76	10	28
AC100	22	110	20	80	10	28
AC110	24	110	20	80	10	36
DC24	14	32	8	24	8	14

Computer Power Supply - BRAIN

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- B. SELECTION GUIDE
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  - B-B. NONSTOP POWER SUPPLY
  - B-C. AC+DC DUAL-INPUT PSU
  - B-D. GENERAL PURPOSE PC PSU
  - B-E. GENERAL PURPOSE REDUNDANT PSU
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