Nipron
GAZE into the future

2018 November

Power Supply for System Rack

HPCFX-350P series

Nipron Co.,Ltd.

HPCFX-350P-X2S

1U size small form factor, large capacity ATX power supply with approximately 140% larger power capacity compared to our conventional models. Best choice for small built-in PCs and servers.

Flex ATX

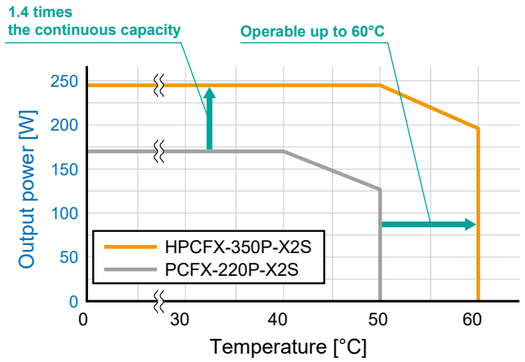
Continuous **245 W**

Peak **346 W**

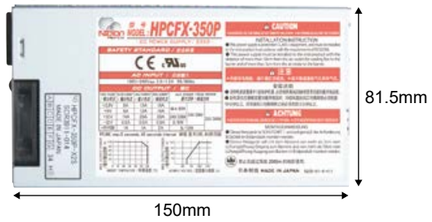
Small & large capacity

HPCFX-350P-X2S is a 1U size small form factor and large capacity ATX power supply suitable for small built-in PCs and servers. Compared to Nipron's conventional model PCFX-220P-X2S, it has approximately 140% larger capacity while the size remains the same. It also addresses high temperature operating environment and supplies power at the full rating up to the ambient temperature of 50°C. Also, it supports the operation up to the temperature of 60°C.

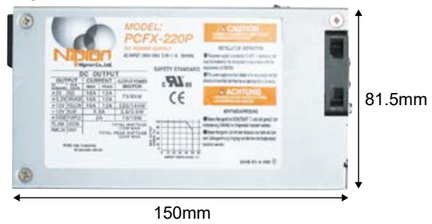
Output capacity vs. ambient temperature



HPCFX-350P-X2S
Height: 41mm



PCFX-220P-X2S
Height: 41mm



High efficiency

It achieves maximum efficiency of 88% typ. It reduces significantly power loss, minimizes power consumption during operation of equipment and contributes to mitigation of environmental load.

Efficiency graph * an example measurement

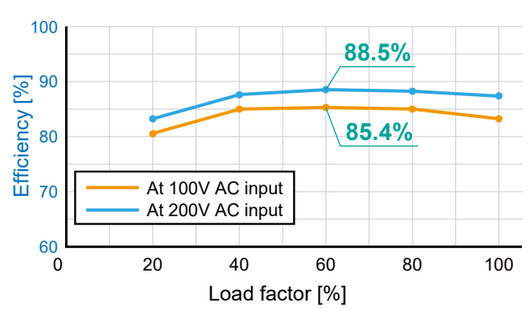


Photo of the inside

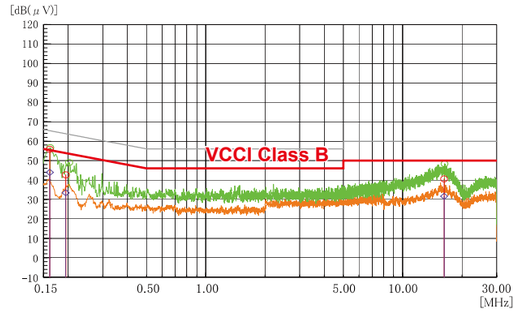
A design to ensure superior quality and high reliability

Low noise, low leakage current

The conducted emission for the power supply unit alone clears VCCI Class B. It reduced leakage current to 0.27mA at 100V AC and 0.68mA at 240V AC. No need for an external noise filter, helping to save associated work and costs.

Conducted emission

[At 100V AC , 60Hz, rated load] * an example measurement



Leakage current * an example measurement

Input voltage	Rated load	Minimum load
100V AC	0.27 mA	0.28 mA
200V AC	0.58 mA	0.60 mA
240V AC	0.68 mA	0.69 mA

I/O specifications

Input	85*-264V AC (Worldwide range)				
Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max continuous current/power	12A	12A	20A	0.5A	1A
	66.4W		240W	6W	5W
	240W				
	245W				
Peak current/power (within 5 s)	16A	16A	28A	0.5A	2A
	83W		336W	6W	10W
	336W				
	346W				
Min. current	0A	0A	0A	0A	0A

* Derating required

Low standby power

Standby power of 0.5W or lower, ErP Directive compliant

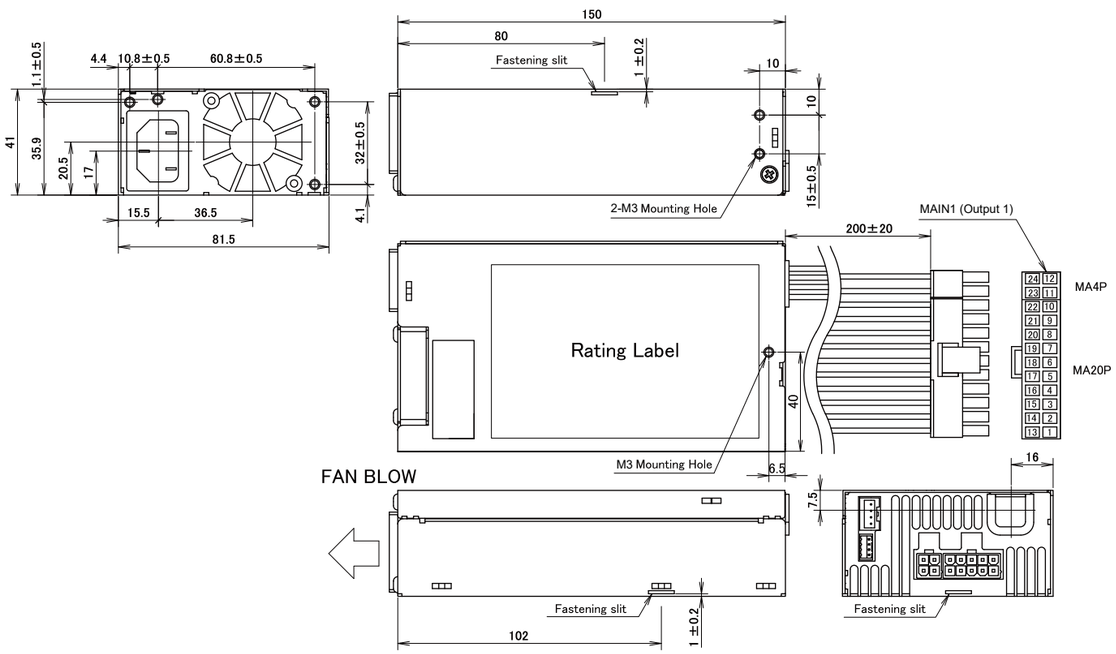
* an example measurement

Input voltage	100V AC	240V AC
Standby power	0.06 W	0.24 W

Other features

- Low noise design with a temperature controlled variable-speed fan
- Minimum load current 0A for all outputs specification
- The output cable configuration can be modified with the plug-in system (the main power excluded)
- The use of double-sided PCB with plated through hole
- A fan monitoring signal available in the standard model
- High efficiency with the adoption of a synchronous rectifier circuit

Outline drawing



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Momentary power failure and blackout backup model

HPCFX-350P-X2B

Even in an event of a blackout, the backup power can be supplied without a damage to the system by switching to the battery power without an interruption.

Flex ATX

Continuous **245 w**

Peak **346 w**

Use a Nonstop power supply to build a secure system that does not stop running with a blackout.

Compatible battery pack

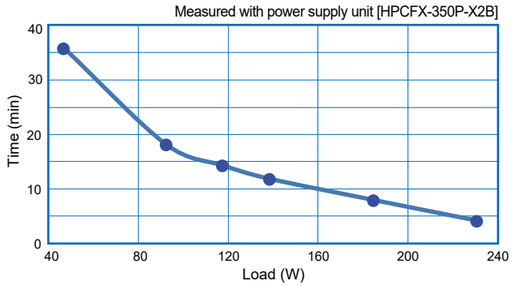
For 5-inch bay installation

BS28A-H350/2.5L Nickel-metal hydride battery pack

Features

- ●Adoption of a nickel metal-hydrate battery
- ● Prevents the drop in the capacity at low temperature with a built-in heater
- ● Status outputs (remaining capacity/battery life notification) available for the battery pack
- ● Low standby power specification

Battery backup discharge characteristics

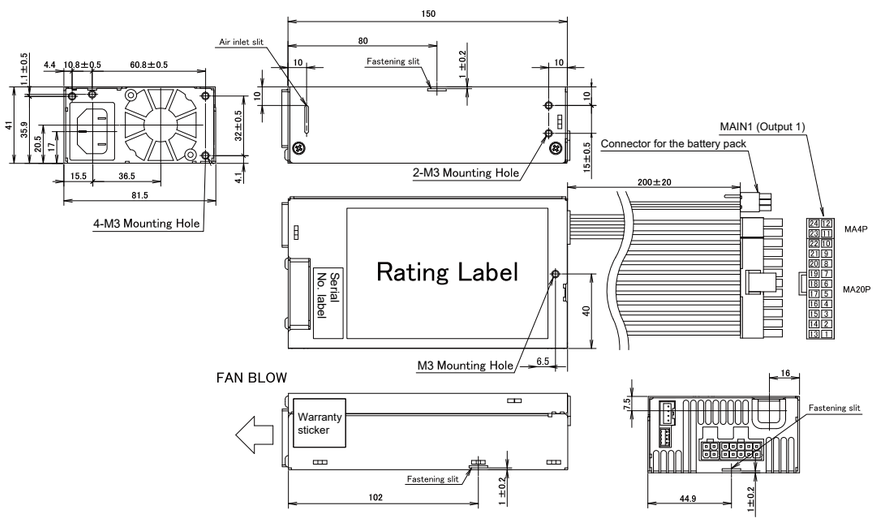


* The chart is for the purpose of reference only and the values shown are not guaranteed.

BS28A-H350/2.5L

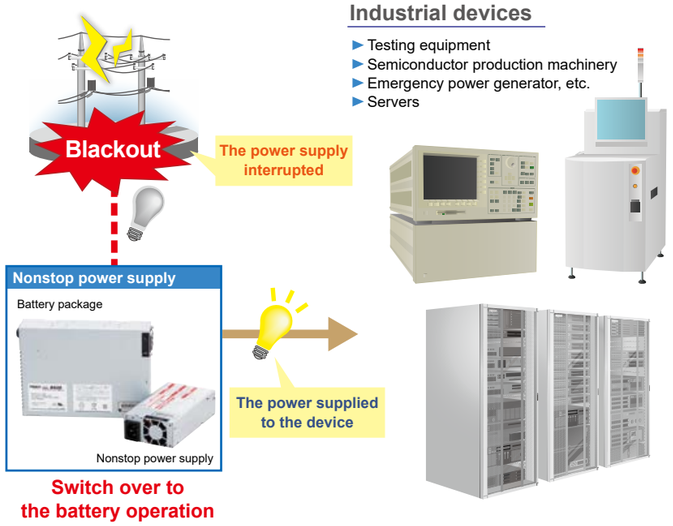
HPCFX-350P-X2B

Outline drawing



What is Nonstop power supply?

Nonstop PSU enables a secure backup system even with a blackout.

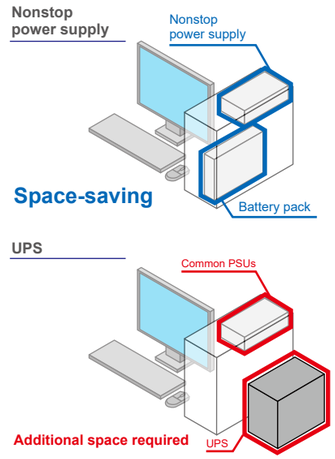


Industrial devices

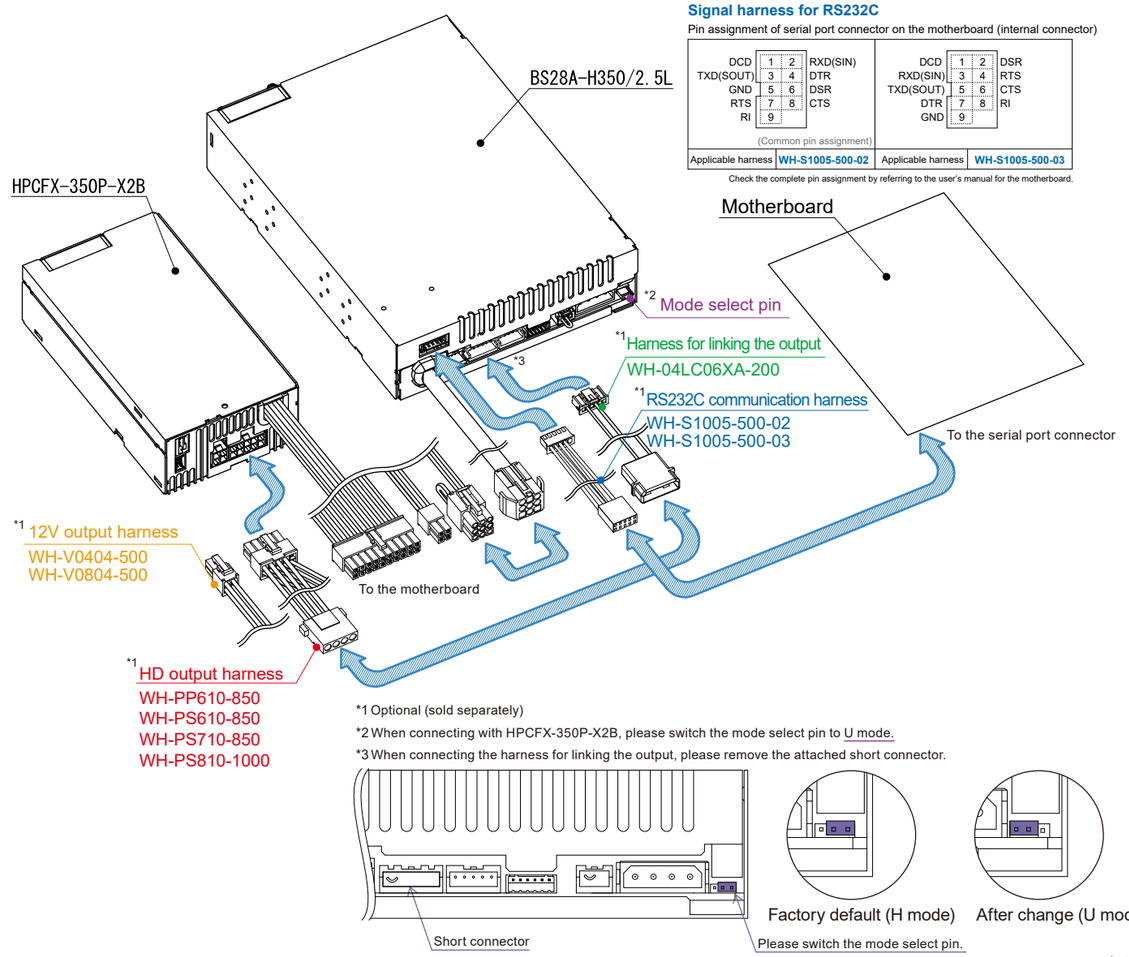
- ► Testing equipment
- ► Semiconductor production machinery
- ► Emergency power generator, etc.
- ► Servers

Space-saving

Because the battery package can be contained in the PC housing, more space can be saved compared to commonly found external UPS.



Conceptual connection diagram



*1 Optional (sold separately)

*2 When connecting with HPCFX-350P-X2B, please switch the mode select pin to U mode.

*3 When connecting the harness for linking the output, please remove the attached short connector.

System Rack Power Supply HPCFX-350P Series

Model	Description
HPCFX-350P-X2S	–
HPCFX-350P-X2B	Supports blackout backup

■Model Name Coding

HPCFX-350P-X2*

① ② ③ ④⑤⑥

① Series name
② Output power
③ Peak power available
④ ATX output
⑤ +3.3V output equipped
⑥ S: Standard
B: Supports backup

Features

- Double-sided PCB with plated through hole suitable for industrial use.
- High efficiency with synchronous rectification circuit
- Min. load current is 0A for all outputs.
- Safety standard certified (IEC/UL/CSA62368-1)
- By building in the thermal-sensing variable speed fan, noise reduction can be realised.
- Blackout backup available model lineup

Safety standards	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 | RoHS

●Input

AC input	85-264V AC (Worldwide range, with PFC)

●Output

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current/ max. power (coutinuous)	16A	12A	20A	0.5A	1A
	Total 66.4W		240W	6W	5W
	Total 240W				5W
	Total 245W				
Peak current/ peak power (within 5s)	16A	16A	28A	0.5A	2A
	Total 83W		336W	6W	10W
	Total 336W				10W
	Total 346W				
Min. current	0A	0A	0A	0A	0A

●Dimension

W×H×D (mm)	81.5×41×150

●Output connector (optional component except for main harness)

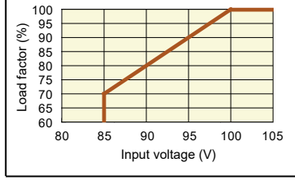
Main 20+4pin | Main 24pin | Main 20pin | AT | AUX | 12V 4pin | 12V 8pin | PCI-E 6pin | PCI-E 6+2pin | HDD | S-ATA | FDD

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

	Items		Specification					Measurements conditions, etc.
AC Input	Rated Voltage		100-240VAC (85*-264VAC)					Worldwide range *See <Fig.1> Low input voltage derating below.
	Input Frequency		50/60Hz					Frequency range 47-63Hz
	Efficiency		82% typ (100VAC), 87% typ (240VAC) *Characteristic data: Fig.5					At rated output
	Power Factor		96% min. (100VAC), 90% min. (240VAC) *Characteristic data: Fig.6					
	Inrush Current		50A peak (100VAC), 100A peak (240VAC) *Characteristic data: Fig.7					At rated output, cold start (25°C)
	Input Current		2.9A typ (100VAC), 1.2A typ (240VAC) *Characteristic data: Fig.5					
Output	Rated Voltage		+3.3V	+5V	+12V	-12V	+5VSB	
	Rated Current		8A	8A	14A	0.5A	1A	Reference value at measurement of input/output characteristics.
	Max. Current / Power		12A	12A	20A	0.5A	1A	Max. output power: 245W Refer to the derating condition
			66.4W max.		240W	6W	5W	
			240W max.				5W	
			245W max.					
	Peak Current / Power		16A	16A	28A	0.5A	2A	Peak output power: 346W Time: 5 sec or less Duty ratio of repetitive load: 10% or less (Refer to <Fig.2> Duty Ratio below.)
			83W max.		336W	6W	10W	
			336W max.				10W	
			346W max.					
	Min. Current		0A	0A	0A	0A	0A	
	Total Voltage Accuracy (%)		±5 max.	±5 max.	±5 max.	±10 max.	±5 max.	Accuracy against output voltage value including temperature and time lapse drifts as well as input/load regulation.
	Max. Ripple Voltage (mVp-p)		50 max.	50 max.	120 max.	120 max.	50 max.	Two wires are coming out from the output connector and connected into one at the edge. 47μF electrolytic capacitor and 0.1μF ceramic capacitor are placed on it and it is measured.*Characteristic data: Fig. 18
	Max. Spike Voltage (mVp-p)		100 max.	100 max.	200 max.	200 max.	100 max.	
Protection	Over Current Protection	OCP point (A)	17 min.	17 min.	29 min.	Short protection		Measurements done with no load except for the voltage measurement
		Method	All outputs of +3.3V, +5V, +12V and -12V are shut down.			Hold down current limiting	All outputs shut down	All outputs shut down with a +5VSB short-circuit (automatic recovery)
		Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			Automatic recovery		AC reclosing period of 270s or longer
	Over Voltage Protection	OVP point (V)	3.7-4.3	5.7-7.0	13.4-15.6	–	–	
		Method	All outputs of +3.3V, +5V, +12V and -12V are shut down.			–	–	
		Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			–	–	AC reclosing period of 270s or longer
Environment	Operating Temp./ Humidity		0-60°C*/10-90%					*Refer to <Fig.3> Temperature derating below. There shall be no condensation
	Storage Temp./Humidity		-20-70°C/10-95%					There shall be no condensation
	Vibration		Acceleration amplitude: 2G (10-55Hz), Sweep cycles: 10 times in the X-, Y-, and Z-axes					Follow JIS-C-60068-2-6 at no operation
	Mechanical Shock		Lift one bottom edge up to 50mm and let it fall. Number of bumps: 3 each of 4 edges					Follow JIS-C-60068-2-31 at no operation
Insulation	Dielectric Strength		AC input - FG/DC output: 1500VAC for 1 minute					Cut-off current 10mA
	Insulation Resistance		AC input - FG/DC output: 50MΩ min.					At 500VDC
	Leakage Current		1.0mA max. (100VAC) /2.0mA max. (200VAC) /2.4mA max. (240VAC) *Characteristic data: Fig.8					IEC62368 compliant
EMC	Line Noise Immunity		±2000V (pulse width of 100/1000nS, cycle period of 30 to 100Hz, Normal/Common mode with Positive/Negative polarity for 10 minutes)					There shall be no fluctuation of DC output or malfunction.
	Electrostatic Discharge		EN61000-4-2 compliant					
	Radiated, Radio-Frequency, Electromagnetic Field		EN61000-4-3 compliant					
	Fast Transient Burst		EN61000-4-4 compliant					
	Lightning Surge		EN61000-4-5 compliant					
	Radio Frequency Conducted Immunity		EN61000-4-6 compliant					
	Power-Frequency Magnetic Field Immunity		EN61000-4-8 compliant					
	Voltage dips/Regulation		EN61000-4-11 compliant					
	Conducted Emmision		VCCI-B, FCC-B, EN55022-B compliant, EN55032-B compliant* *Characteristic data: Fig.9, 10					Measured by single unit * Only for HPCFX-350P-X2B
	Harmonic Current Regulations		IEC61000-3-2 class D compliant					At rated input/output
Others	Safety Standards		UL62368, CSA62368 (c-UL) certified, EN62368, PSE (ordinance clause 2) compliant, CE Marking (LVD,EMC)					Class I equipment and build-in type power supply
	Cooling System		Forced air cooling: thermal-sensing variable speed fan embedded					Low speed rotation depending on power supply internal temperature
	Output Grounding		Connected chassis (FG)					
	Output Hold-up Time		AC cut-off → PWR_OK holds up 10ms min. *Characteristic data: Fig.15					At rated output *Refer to <Fig.4> Holding time derating below.
	Reliability Grade		FA (Industrial equipment grade to use double-sided PCB with plated through hole)					Following our standard
	MTBF		80,000 H min					Based on EIAJ RCR-9102
	Weight		0.7kg typ					
	Warranty		Three years after delivery: If any defects belong to us, the defective unit shall be repaired or replaced at our cost.					Except for errors caused by operation not specified in this specification.

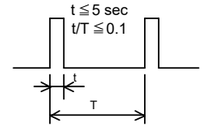
<Fig.1> Low input voltage derating

When the input voltage is 100V AC or less, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.



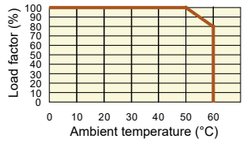
<Fig.2> Duty Ratio

Peak current/power shall be 5 sec or less continuously. For repetitive loads, duty ratio shall be 10% or less.



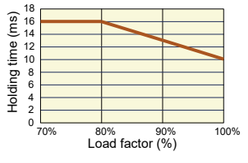
<Fig.3> Temperature Derating

When the ambient temperature (near the airflow inlet) exceeds 50°C, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.

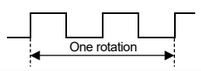


<Fig.4> Holding time derating

As the holding time changes according to the load factor, when holding time is required, it should be used according to the load factor shown below.
For the load factor below, the rated output power shall be 100%.



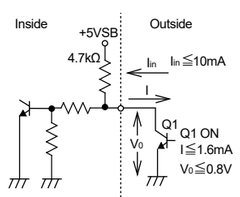
Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

	Items	Specification	Note
Input Signal	Output ON/OFF control signal (PS_ON#)	+3.3V, +5V, +12V and -12V outputs are delivered with 'L' input. +3.3V, +5V, +12V and -12V outputs shutdown with 'H' or 'OPEN' input.	
	+3.3V SENSE	The input terminal to detect the voltage of +3.3V output; by connecting to the load terminal, only the line drop of the + side of the output cable is compensated.	
	Fan control signal (FAN_C)	The control terminal of fan motor; the fan motor is forcibly rotated at full speed at 'L' input.	
Output Signal	Normal output signal (PWR_OK)	'H' signal is delivered when the +5V output is normal.	
	Fan monitoring signal (Fan_M)	Two cycle pulses per one rotation of the fan motor are delivered (open collector output). Duty ratio of the pulse shall be 0.5 typ. (Interval between the signals becomes longer at low speed and shorter at high speed.) The signal remains 'L' or 'OPEN' when the fan stops caused by any failure or malfunction.	

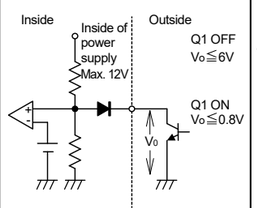
Signal Circuit

Input Signal Circuit

(PS_ON#)

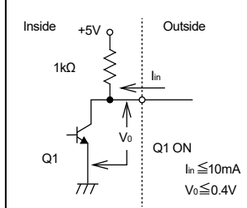


FAN_C signal input circuit

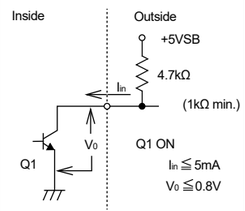


Output Signal Circuit

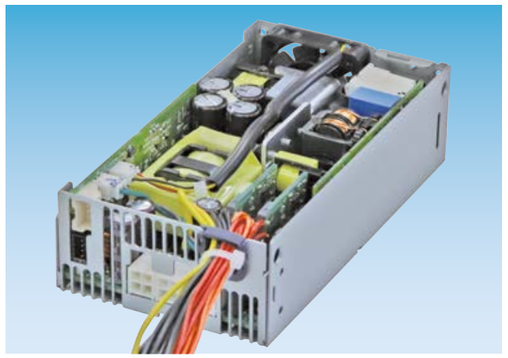
(PWR_OK)

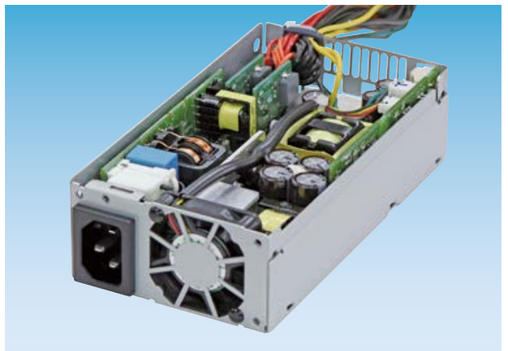


(FAN_M)

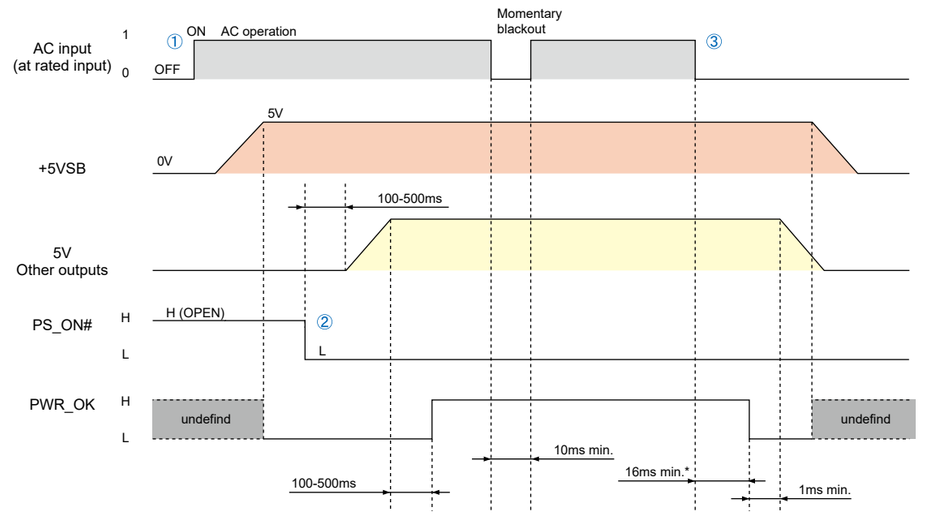


Internal structure (HPCFX-350P-X2S)

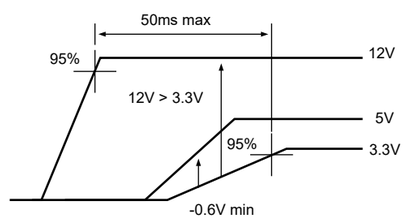




Sequence Timing Chart



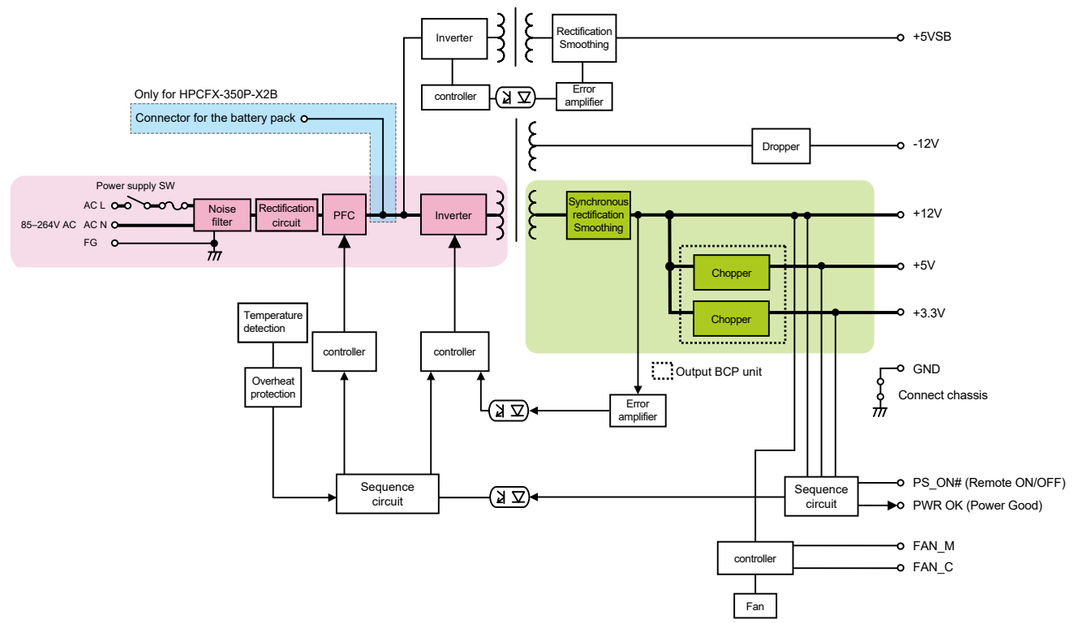
*Refer to <Fig.4> Holding time derating P.6



(1) Only +5VSB output starts up by supplying AC input while PS_ON# is "H" status.
(2) All output starts up by inputting PS_ON# "L". PWR_OK 'H' is delivered at 100-500 ms after +5V output starts up.
(3) At blackout, PWR_OK 'L' is delivered after 16ms or more. After that, all outputs (except +5VSB) shut down after 1ms or more.

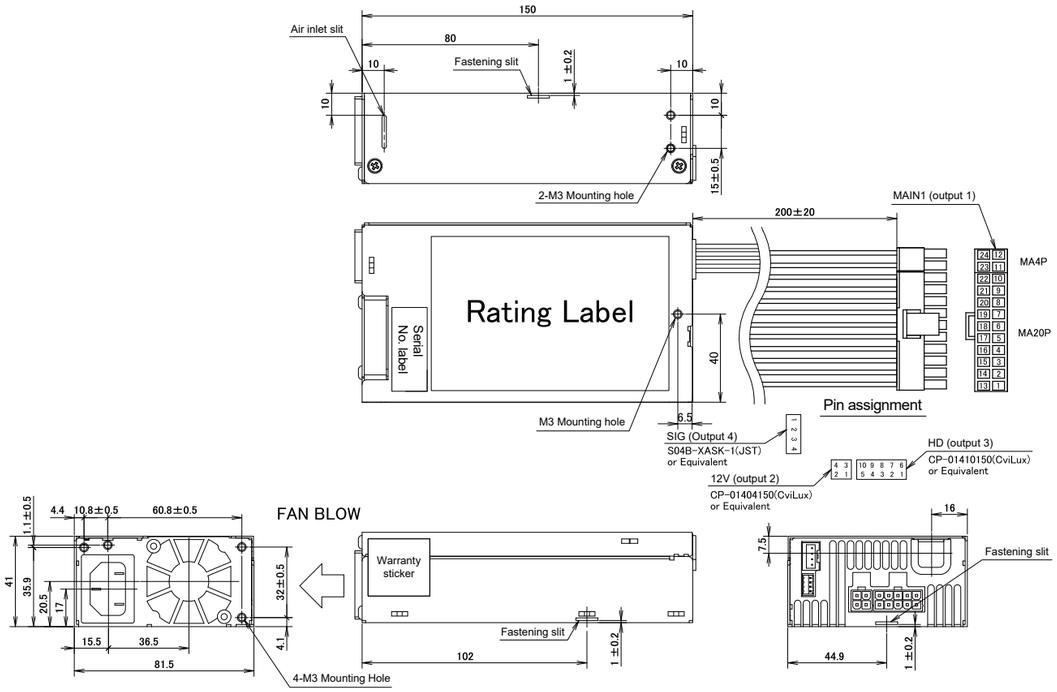
-Rise time difference among outputs shall be 50ms max.
-The output voltage level at rising of +12V shall be higher than that of +3.3V. Also, difference in output voltage level between +5V and +3.3V shall be -0.6V or more.
-The order and difference in level of output voltage for each output voltage at falling shall not be specified.
-Rise time of PWR_OK signal shall be 10ms or less.
(provided that capacitive load is not connected to PWR_OK signal output)

Block Diagram



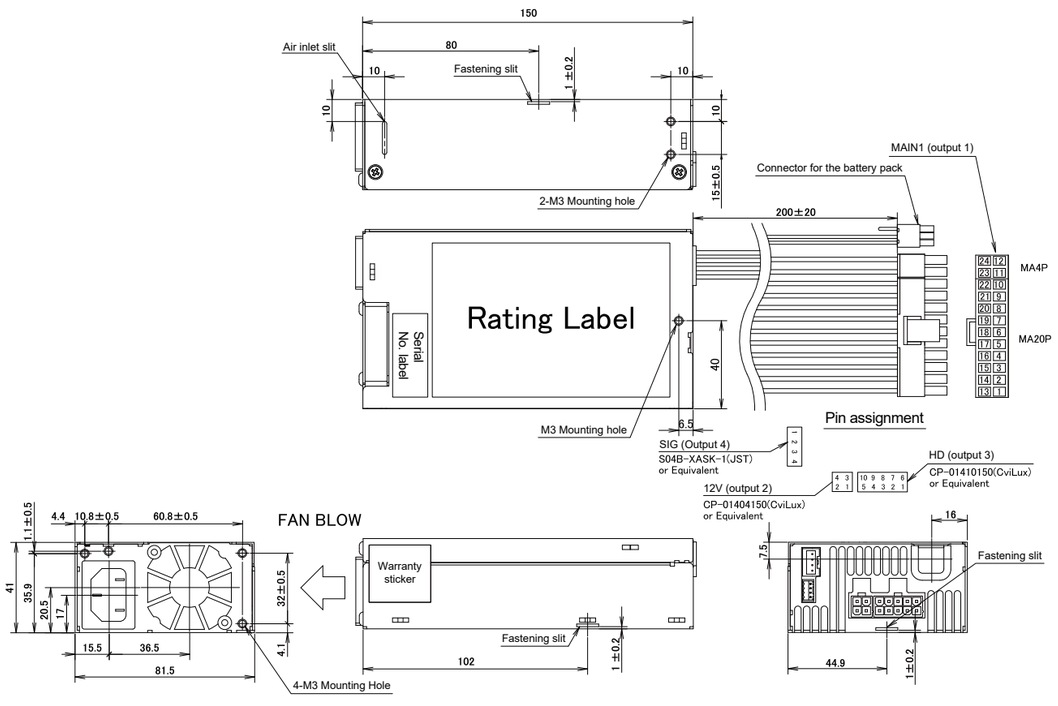
Outline Drawing

HPCFX-350P-X2S



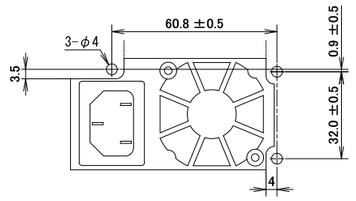
*1 Dimensional tolerance shall be ± 1mm unless otherwise specified.
*2 The screw depth of penetration into PSU is 5mm max.
*3 Insertion into the fastening slit shall be 4mm in depth and 9mm in width and 1mm in thick MAX.
(The recommended shape is ACC6200)

HPCFX-350P-X2B



HPCFX-350P-X2S / HPCFX-350P-X2B

How to process the mounting holes
(Recommended)



MA4P
(11,12,23,24PIN)

CONECTOR TYPE	PIN No.	WIRE COLOR	WIRE TYPE
Housing: CP-01104030-C(CviLux) or equivalent Terminal: CP-01100102(CviLux) or equivalent	11	YELLOW	UL1007 AWG #18
	24	BLACK	
	12	ORANGE	UL1007 AWG #20
	23	RED	

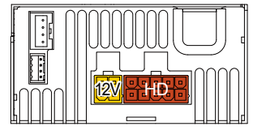
MA20P

CONECTOR TYPE	PIN No.	WIRE COLOR	WIRE TYPE
Housing: CP-01120030-C(CviLux) or equivalent Terminal: (13PIN) CP-01100105(CviLux) or equivalent (Other) CP-01100102(CviLux) or equivalent	1	ORANGE	UL1007 AWG #20
	2	ORANGE	
	3	BLACK	UL1007 AWG #18
	4	RED	UL1007 AWG #20
	5	BLACK	UL1007 AWG #18
	6	RED	UL1007 AWG #20
	7	BLACK	UL1007 AWG #18
	8	GRAY	UL1007 AWG #22
	9	VIOLET	UL1007 AWG #20
	10	YELLOW	UL1007 AWG #18
	13	ORANGE	UL1007 AWG #20
		BROWN	UL1007 AWG #22
	14	BLUE	
	15	BLACK	UL1007 AWG #18
	16	GREEN	UL1007 AWG #22
	17	BLACK	UL1007 AWG #18
	18	BLACK	
	19	BLACK	
	20	N.C	-
	21	RED	UL1007 AWG #20
	22	RED	

Options (Sold separately)

Detachable output harness

Model	Length and type of connector	Output port allocation
12V harness 12V		
WH-V0404-500	12V 500±15 12V 4Pin	
WH-V0804-500	12V 500±15 12V 8Pin	
HD harness HD		
WH-PP610-850	HD 550±15 150±15 150±15 Peripheral (HD)	
WH-PS610-850	HD 550±15 150±15 150±15 FD	
WH-PS710-850	HD 550±15 150±15 150±15 850±15 S-ATA	
WH-PS810-1000	HD 550±15 150±15 150±15 150±15	



Acceptable cables

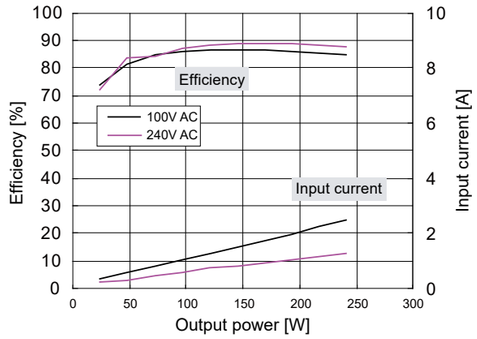
12V	HD
1 model	1 model

Cable

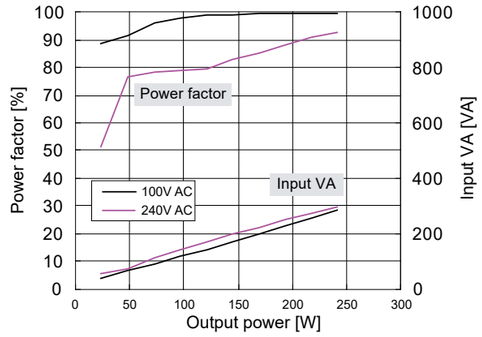
Photos	Model	Category	Description
	WH2753-02	AC power cord	125VAC 12V (tracking resistance type) [PSE]
	WH-04LC06XA-200	Harness for linking the output	Harness to stop discharge after OS shutdown during power failure.
	WH-S1005-500-02	Harness for RS232C communication	Harness for automatically shut down at blackout
	WH-S1005-500-03	Harness for RS232C communication	Harness for automatically shut down at blackout

Characteristics Data HPCFX-350P-X2S (Examples of actual measurement)

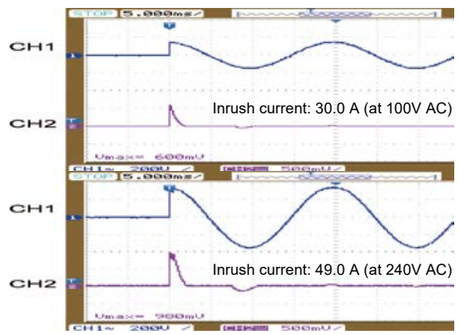
● Fig.5 Efficiency/Input Current vs. Output Power



● Fig.6 Power Factor/Input VA vs. Output Power



● Fig.7 Inrush Current



● Fig.8 Leakage Current

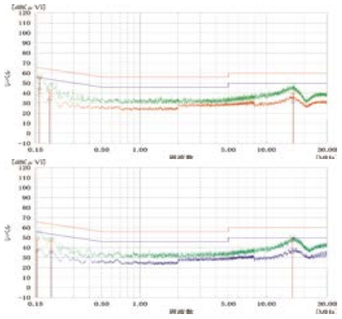
Input : 100, 200, 240V AC
Load : Rated load and Min. load

	Rated load	Min. load
100V AC	0.27mA	0.28mA
200V AC	0.58mA	0.60mA
240V AC	0.68mA	0.69mA

● Fig.9 Conducted Emission at 100V AC

Input : 100V AC
Load : Rated
Mode : Peak

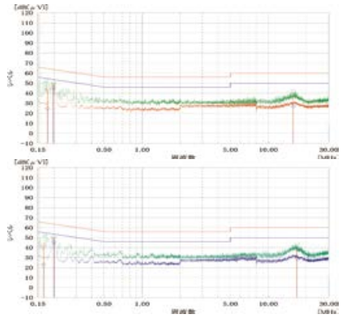
VCCI Class B



● Fig.10 Conducted Emission at 240V AC

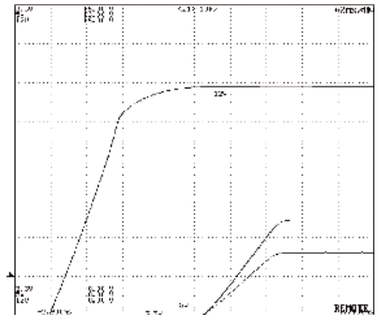
Input : 240V AC
Load : Rated
Mode : Peak

VCCI Class B



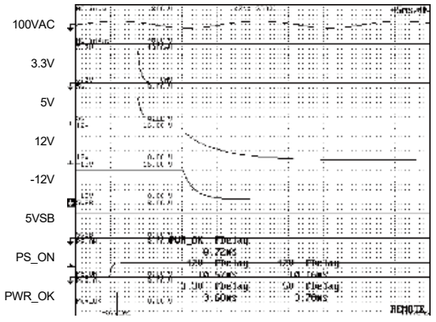
● Fig.11 Rising Characteristics at 100V AC

Input : 100V AC
Load : Rated
Time axis : 2 ms/DIV



● Fig.12 Falling Characteristics at 100V AC (at remote OFF)

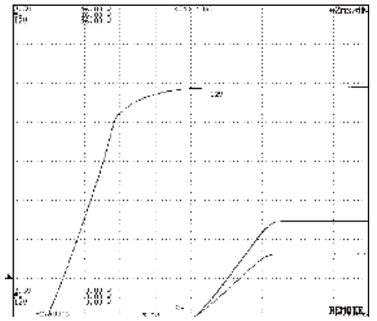
Input : 100V AC
Load : Rated
Time axis : 5 ms/DIV



Characteristics Data HPCFX-350P-X2S (Examples of actual measurement)

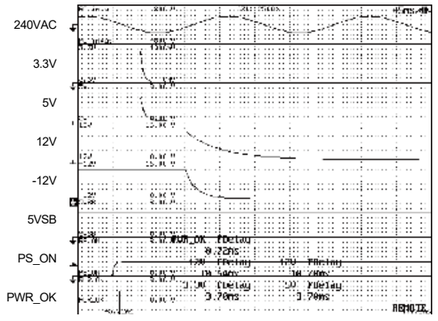
● Fig.13 Rising Characteristics at 240V AC

Input : 240V AC
Load : Rated
Time axis : 2 ms/DIV



● Fig.14 Falling Characteristics at 240V AC (at remote OFF)

Input : 240V AC
Load : Rated
Time axis : 5 ms/DIV



● Fig.15 Output Hold-up Time

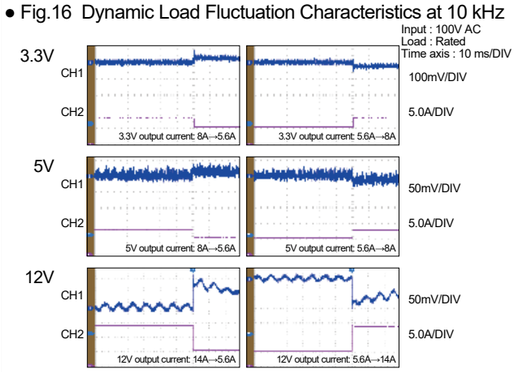
Load: Rated
(65°C: 80% load)

PWR_OK: the pont that PWR_OK signal "L" is delivered.
Output voltage: the point that output voltage exept 5VSB fails down to 95%.

Temp.	Input voltage	Hold-up time	
		PWR_OK	Output voltage
-5°C	100V AC	13.70ms	18.70ms
	240V AC	13.60ms	18.50ms
25°C	100V AC	15.00ms	19.90ms
	240V AC	15.20ms	20.00ms
45°C	100V AC	16.00ms	20.70ms
	240V AC	16.00ms	20.70ms
65°C (80% load)	100V AC	25.60ms	25.60ms
	240V AC	25.80ms	25.80ms

● Fig.16 Dynamic Load Fluctuation Characteristics at 10 kHz

Input : 100V AC
Load : Rated
Time axis : 10 ms/DIV



● Fig.17 Output Voltage Regulation (Load Fluctuation)

Output	Min. load	Rated load
12V output	0A	14A
5V output	0A	8A
3.3V output	0A	8A

AC input	85V	100V	240V	264V
3.3V output (min.)	3.305V	3.305V	3.304V	3.304V
3.3V output (rated)	3.263V	3.263V	3.263V	3.263V
5V output (min.)	5.010V	5.010V	5.009V	5.009V
5V output (rated)	4.937V	4.936V	4.936V	4.936V
12V output (min.)	11.905V	11.905V	11.903V	11.903V
12V output (rated)	11.815V	11.815V	11.815V	11.814V

● Fig.18 Ripple and Spike Voltage

Load: Rated

Temp.	AC Input voltage	+3.3V		+5V		+12V		-12V		+5VSB	
		Ripple (mV)	Noise (mV)	Ripple (mV)	Noise (mV)	Ripple (mV)	Noise (mV)	Ripple (mV)	Noise (mV)	Ripple (mV)	Noise (mV)
-5°C	100V	16.5	33.3	19.4	46.5	18.8	90.3	12.0	25.8	17.0	34.9
	240V	16.0	33.7	18.3	46.9	18.7	90.1	12.0	25.3	16.3	34.0
25°C	100V	18.0	37.9	19.7	47.0	18.3	85.9	14.4	28.1	15.9	34.1
	240V	18.2	34.6	19.1	45.5	18.1	84.4	14.3	27.7	15.4	32.7
55°C	100V	18.8	37.2	20.2	48.3	18.3	83.6	15.0	28.8	15.4	33.7
	240V	17.0	33.8	19.5	48.9	17.9	81.8	15.0	27.9	14.8	32.4
65°C	100V	17.1	34.2	25.7	55.4	17.7	74.2	13.3	26.0	14.3	33.7
	240V	16.4	34.0	25.9	55.1	17.9	77.4	14.0	26.0	15.7	34.3

● Fig.19 Ambient Temperature vs. Lifetime Expectancy

Input : 100V AC
Load : Rated

■Electrolytic capacitors

Power supply intake temperature	25°C
Lifetime expectancy (about)	79 years

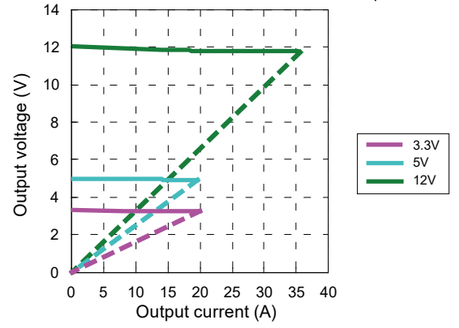
*The lifetime shall be 15 years at longest due to deterioration of sealing plates.

■Fan

Fan ambient temperature	25°C	35°C	45°C
Lifetime expectancy (about)	8.6 years	8.6 years	7.0 years

●Fig.20 Overcurrent Protection Characteristics (V - I Characteristics)

Input : 100V AC



Battery Pack BS28A-H350/2.5L

Model	Description
BS28A-H350 / 2.5L	—

■Model name coding

BS28 A - H 350 / 2.5 L
① ② ③ ④ ⑤ ⑥

① Series name
② Modification
③ Ni-MH
④ Output voltage
⑤ Capacity
⑥ Long life battery

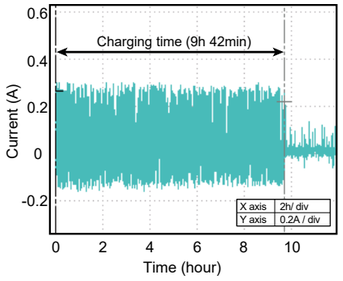
Features

- The battery pack can be fixed to a 5-inch bay.
- Ni-MH battery
- Built-in heater prevents capacity loss at low temperatures.
- It is possible to output the status of the battery pack (notification of remaining battery level and battery replacement time).
- Low standby power

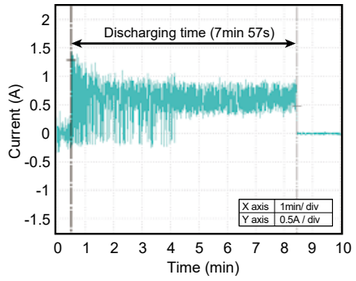
Battery Charge/Discharge Characteristics (Measured with HPCFX-350P-X2B)

(Be aware that it is a reference value at initial use of the battery pack; it is not a guaranteed value.) (Examples measurement)

[Charge Characteristics]
Temperature: 26°C
load condition: No load



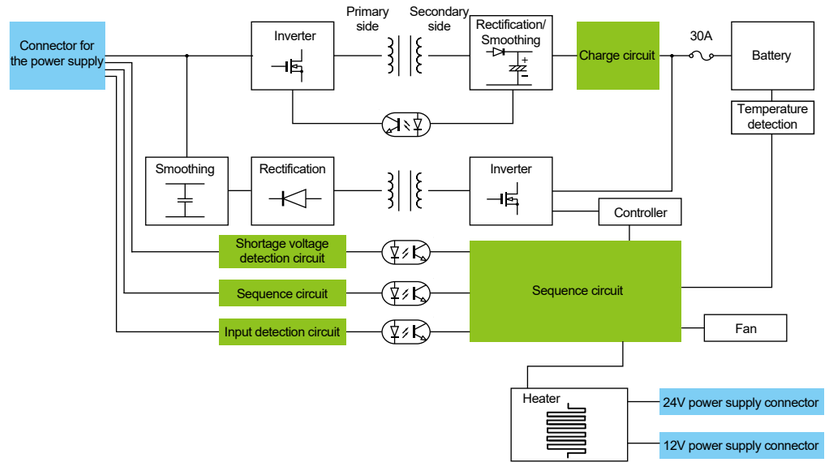
[Discharge Characteristics]
Temperature: 26°C
load condition: At 184W (at 80% rated load of HPCFX-350P-X2B)



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

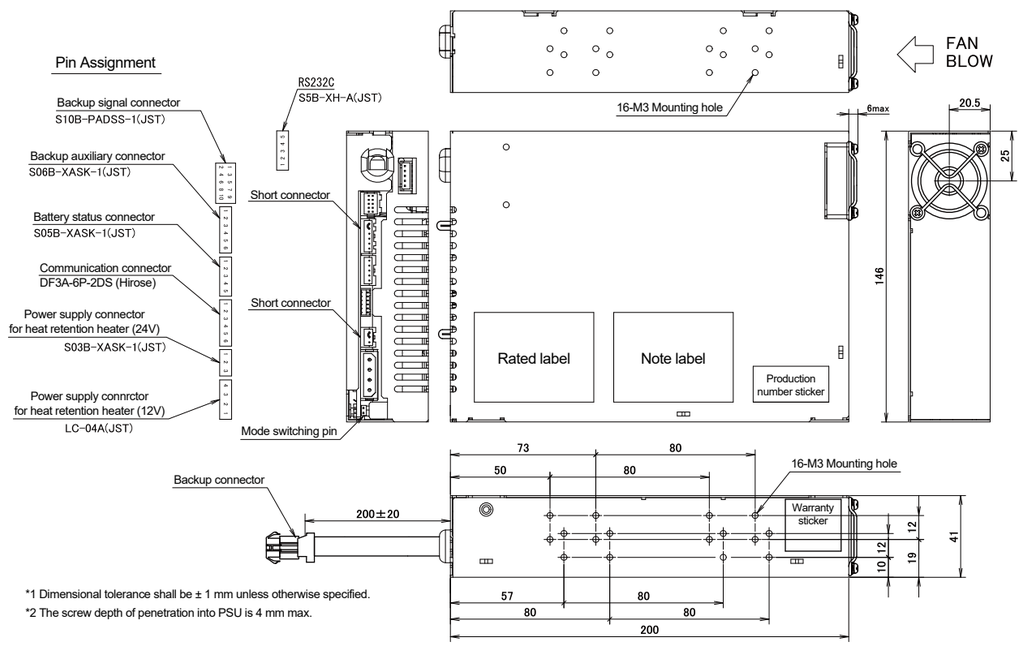
Items	Specification	Measurement condition, etc.
Battery	16.8V 2.5Ah	Sealed nickel hydoride battery
Nominal Battery Power Voltage	16.8V	
Rated Capacity	2.5Ah	10 hour rate
Max. Output Capacity	230W (Peak 380W)	Peak output within 10ms. (time ratio 10%) The effective value should not exceed 230W.
Over Discharge Protection	11.2V typ	Backup operation shut down
Charge Specification	0.25A typ	27V DC Max.
Heater	The elements operates at battery temperature 20°C (typ.) or less. (It warm up in order to improve the battery discharging characteristics at low temperature. The warm up time is about 1 hour from 0°C.) (Heater consumption power at operation: 10W typ)	It is valid when AC input is available, regardless of the PS_ON# signal of the power supply unit.
Built-in Fuse rating	30A	
Operating Temp./Humidity	0-50°C, 20-90%	There shall be no condensation. Internal heater will operate at 20°C typ. or less.
Storage Temp./Humidity	-20-65°C, 20-90%	
Vibration	To endure the vibration acceleration of 2G with vibration frequency of 10 to 55Hz for 10 sweep cycles in each X, Y, Z direction.	Follow JIS-C-60068-2-6 at no operation (With the normal packaging)
Mechanical Shock	Lift one bottom edge of the unit 50mm high with the opposite edge placed on the test bench, and let it fall. Repeat three times for each of four bottom edges.	Follow JIS-C-60068-2-31 at no operation (With the normal packaging)
Weight	1.8 kg typ	
Reliability Grade	FA	Following our standard
Expected Life*	About 9-10 years (5 times/year discharge), about 3-4 year (1 time/day discharge)	Environmental temp. 30°C, 100W 3min discharge at a time
Storage condition	Recharging once at least per year (or 6 months if available) is required for 6 months or longer storage. Storage within 1 year: -20 to +30°C or less / humidity 10-95% Storage within 90 days: -20 to +40°C or less / humidity 10-95% Storage within 30 days: -20 to +50°C or less / humidity 10-95%	When recharging is not conducted beyond the period on the left, the battery may not recover its capacity completely. Approximately 19 hours of charging time may be required in such a case.
Warranty	One year after delivery: If any defects belong to us, the defective unit shall be repaired or replaced at our cost. Except for failure by over discharge.	Except for errors caused by operation not specified in this specification.

Block Diagram



Outline Drawing

5-inch bay fixed type



*1 Dimensional tolerance shall be ± 1 mm unless otherwise specified.
*2 The screw depth of penetration into PSU is 4 mm max.

Connector pin allocation

Connector	Pin#	Signal name	Note
Backup signal connector (SIG_T)	1	AC_FAIL_T	
	2	SHUT_DOWN_T	
	3	BATT_LOW_T	
	4	-	
	5	FAN_M	
	6	-	
	7	GND	
	8	-	
	9	-	
	10	VCC5V	Total output of VCC 5V: 0.02A max

Connector	Pin#	Signal name	Note
Backup auxiliary connector	1	VCC5V	Total output of VCC 5V: 0.02A max
	2	R_ON	
	3	-	
	4	GND	
	5	Reserved	
	6	BATT+	Max. 0.02A

Connector	Pin#	Signal name	Note
Battery status connector	1	VCC5V	Total output of VCC 5V: 0.02A max
	2	BATT_E0	
	3	BATT_E1	
	4	BATT_E2	
	5	BATT_LIFE	

Connector	Pin#	Signal name	Note
Communication connector	1	VCC5V	Total output of VCC 5V: 0.02A max
	2	Reserved	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	GND	

Connector	Pin#	Signal name	Note
RS232C	1	VCC5V	Total output of VCC 5V: 0.02A max
	2	GND	
	3	BATT_LOW_R	
	4	SHUT_DOWN_R	
	5	AC_FAIL_R	

Connector	Pin#	Signal name	Note
Power supply connector for heat retention heater (12V)	1	Power input for 12V heater	12V ± 5%
	2	GND	
	3	GND	
	4	-	

Connector	Pin#	Signal name	Note
Power supply connector for heat retention heater (24V)	1	Power input for 24V heater	24V ± 5%
	2	GND	
	3	-	

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