Product Specification

Created: June 5th, 2013

This specification applies to Embedded type stabilized power supply HPCSA-570P-X2S-24V.

General specification (Provided at normal temperature and humidity unless otherwise specified)

	Items	Specifications	Measurement conditions, etc.
AC Input	Rated voltage	100-240 VAC	Worldwide range
	Voltage range	85-264 VAC	(Note 1)
	Current	5.0A typical at 100VAC / 2.1A typical at 240VAC	
	Rated frequency	50 / 60 Hz	Frequency range: 47 to 63Hz
	Inrush current	31A peak max. at 100VAC 75A peak max. at 240VAC	(Note2) With continuous rated output at cold start (25°C)
	Power factor	96% min. (100VAC) / 90% min. (240VAC)	
	Efficiency	80% typical at 100VAC / 85% typical at 240VAC	At rated output
Environment	Operating temp. /Humidity	0 to 60°C / 10 to 90% RH	No condensation (Note 3)
	Storage temp. /Humidity	-20 to 70°C / 10 to 95% RH	No condensation (Note 3)
	Vibration	To endure Vibration acceleration of 2G, Vibration of 10 to 55Hz for 10 sweep cycles in each X-, Y, and Z direction 10 times	JIS-C-60068-2-6 At no operation
	Mechanical strength	Lift one bottom edge 50mm high with the opposite edge placed on a test bench, and let if fall. Repeat 3 times on other three edges as well and no malfunction shall be observed	JIS-C-60068-2-31 At no operation

Note

Note 1. Follow the derating condition in another page regarding the lower limit of input voltage at Continuous max and Peak rating.

Note 2. Charging current equal to or less than 100μs into X-capacitor in input filter circuit shall not be defined as Inrush current.

Note 3. Follow the derating condition in another page when the ambient temperature exceeds 45°C.

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Drawn by	Reviewed by	Approved by	Series name:	Drawing No.
Yodo	川政	松原	HPCSA-570P-X2S-24V	3233−01−4−523

Items		Specifications	Measurement conditions, etc.
Insulation	Insulation resistance	50MΩ or more between input and FG/output	At 500VDC
	Dielectric strength	1.5kV for one minute between input and FG/output	Cut-off current 20mA
	Leakage current	0.5mA max. at 100VAC input, 1.0mA max. at 200VAC input, 1.2mA max. at 240VAC input	YEW.TYPE3226 (1kΩ range) or equivalent
EMS/EMI	Line noise immunity	±2,000V (pulse width of 100/1000ns, cycle period of 30 to 100Hz, Normal/Common mode with Positive/Negative polarity for 10 minutes)	To be measure with INS-410. There shall be no fluctuation in DC-component of output or no malfunction
	Surge immunity	IEC 61000-4-5 Installation Environment Class 3 compliant Common mode : ±2kV, Normal mode: ±1kV 5times for each	There shall be no malfunction or no failure At 100V/240V AC
	Electrostatic Discharge immunity	IEC 61000-4-2 test level 3 compliant Contact discharge:10 times at ±6kV	There shall be no malfunction or no failure At 100V/240V AC
	Conducted emission	VCCI / FCC / EN55022 Class A compliant	To be measured on the single power supply
	Harmonic current	IEC61000-3-2(Ed.2.1) Class D, EN61000-3-2(A14) Class D compliant	At rated input and load
Others	Safety standard	UL60950, CSA60950(c-UL), CCC approved, CE marking(IEC62368-1), PSE compliant ⚠	Class I equipment: Embedded type power supply
	Cooling system	Forced air cooling by internal fan	Fan speed changes according to operating temp. and load condition (Note 1)
	Dimensions	150(W)×86(H)×175(D)	Except protrusions; Refer to the outline drawing in another page
	Weight	2.2 kg	
	Reliability grade	FA	To follow our standard
	Lifetime expectancy	10 years or longer (Limited lifetime Component: Electrolytic capacitors and Fan motor)	Lifetime expectancy when operated at AC 100V, rated load, and 25 °C of the ambient temperature
	Warranty	Three years after delivery: If defects belong to us, the defective unit shall be repaired or replaced at our cost	Except the operation out of the specification

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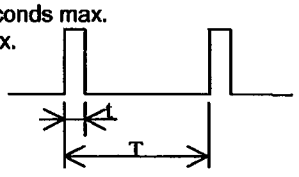
Drawn by	Yodo	Reviewed by		Approved by	TTC 20.10.09 有効	Series name: HPCSA-570P-X2S-24V	Drawing No. 3233−01−4−523 A

Output specification (All items shall be provided at normal temperature and humidity unless otherwise specified)

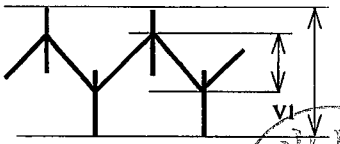
Items			CH1	CH2	CH3	CH4	CH5 (5VSB)	CH6	Measurement conditions, etc.
Output rating	Rated voltage		3.3V	5V	12V	-12V	5V	24V	
	Min. current		0A	0A	0A	0A	0A	0A	
	Rating	Rated current	7A	7A	17A	0.5A	2.0A	5A	Standard Value at measuring of input/output characteristics
		Rated power	23.1W	35W	204W	6W	10W	120W	
	Continuous max	Max. current	20A	24A	25A	0.5A	2.0A	8.3A	Continuous rating. Maximum total output power is 400W (see the derating conditions on P.6)
		Max. power	150W		300W	6W	10W	199.2W	
			300W						
			400W						
	Peak rating	Peak current	30A	30A	35A	0.5A	3.0A	12.5A	Momentary rating is within 5 seconds. Momentary total output power is 570W (See Figure.1 and the derating conditions on P.6)
		Peak power	200W		420W	6W	15W	300W	
			555W						
			570W						
Output characteristics	Total voltage regulation		±5%	±5%	±5%	±5%	±5%	±5%	See the derating conditions on P.6
	Max. ripple voltage (mV_{p-p})		50 Max.	50 Max.	120 Max.	120 Max.	50 Max.	160 Max.	Connect lead wires to output connecter, and then measure on the test board with an electrolytic capacitor (47μF) and a ceramic capacitor (0.1μF)
	Max. spike voltage (mV_{p-p})		100 Max.	100 Max.	170 Max.	170 Max.	100 Max.	200 Max.	
Protection	OCP	OCP point (A)	27 Min.	31 Min.	37 Min.	Short circuit protection		13 Min.	CH1: CH2 continuous max., others without loads CH2: CH1 continuous max., others without loads Others: all CH is measured with rated loads CH6: others without loads.
		Method	All outputs except CH5 shut down.			Hold-down current limiting	All outputs shut down	CH6 only Shuts off	
		Recovery	Reclosing of AC input or, restarting PS_ON.			Automatic recovery		Reclosing of AC input	
	OVP	OVP point (V)	3.76 to 4.3	5.74 to 7.0	13.4 to 15.6	–	–	28.8 to 33.6	
		Method	All outputs except CH5 shut down.			–	–	only Shuts off	
		Recovery	Reclosing of AC input or, restarting PS_ON.			–	–	Reclosing of AC input	
	Isolation of Output GND		Common					Indivisual	Output GND of CH1-5 and chassis are connected. GND of CH6 connected to the capacitor.

Figure 1. Duty ratio of Peak current/Power
Peak current/Power shall be 5 seconds max. and its duty ratio shall be 10% max.



t ≦5 sec.
t /T ≦0.1

Figure2. The definition of ripple and spike



Ripple: V1 (p-p)
Spike: V2 (p-p)

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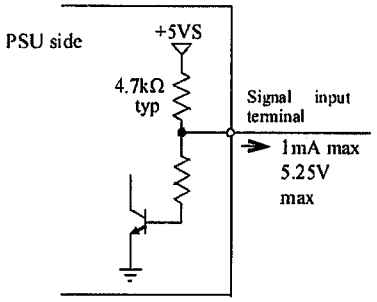
Input/Output signal specification

(Terms shall be provided at normal temperature and humidity unless otherwise specified)

Input signal	Output ON/OFF control signal (PS_ON#)	CH1 to CH4 and CH6 shut down at 'H' or 'OPEN' input
	24V Output ON/OFF control signal (24V_ON)	24V outputs when it is shunt between 24V_ON+ and 24V_ON- short 24V. (*Connectors are shorted at the shipment.) Invalid when PS_ON signal is'H'or'OPEN. (24V shutoff)
	+3.3V SENSE	Input terminal for voltage detection of CH1 (+3.3V); voltage drop of +side output cable is compensated when connected to load end
	Fan control signal (FAN_C)	Control terminal of a fan motor Fan motor operates at a maximum speed upon receipt of ' L '
Output signal	Normal output signal (PWR_OK)	'H' is delivered at normal output in CH1 to CH4 (Detection delay time: 100 to 500ms)
	Fan monitoring signal (FAN_M)	Two pulses per rotation of individual motors are delivered

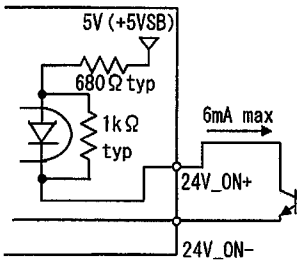
Input signal circuit

PS_ON



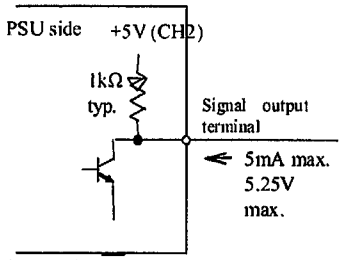
('L' ≦0.8V,2.0V≦ 'H')

24V_ON



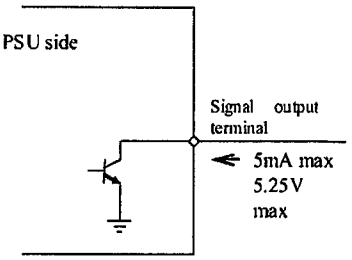
Output signal circuit

PWR_OK



('L'<0.4V)

FAN_M



('L'<0.4V)

Note:

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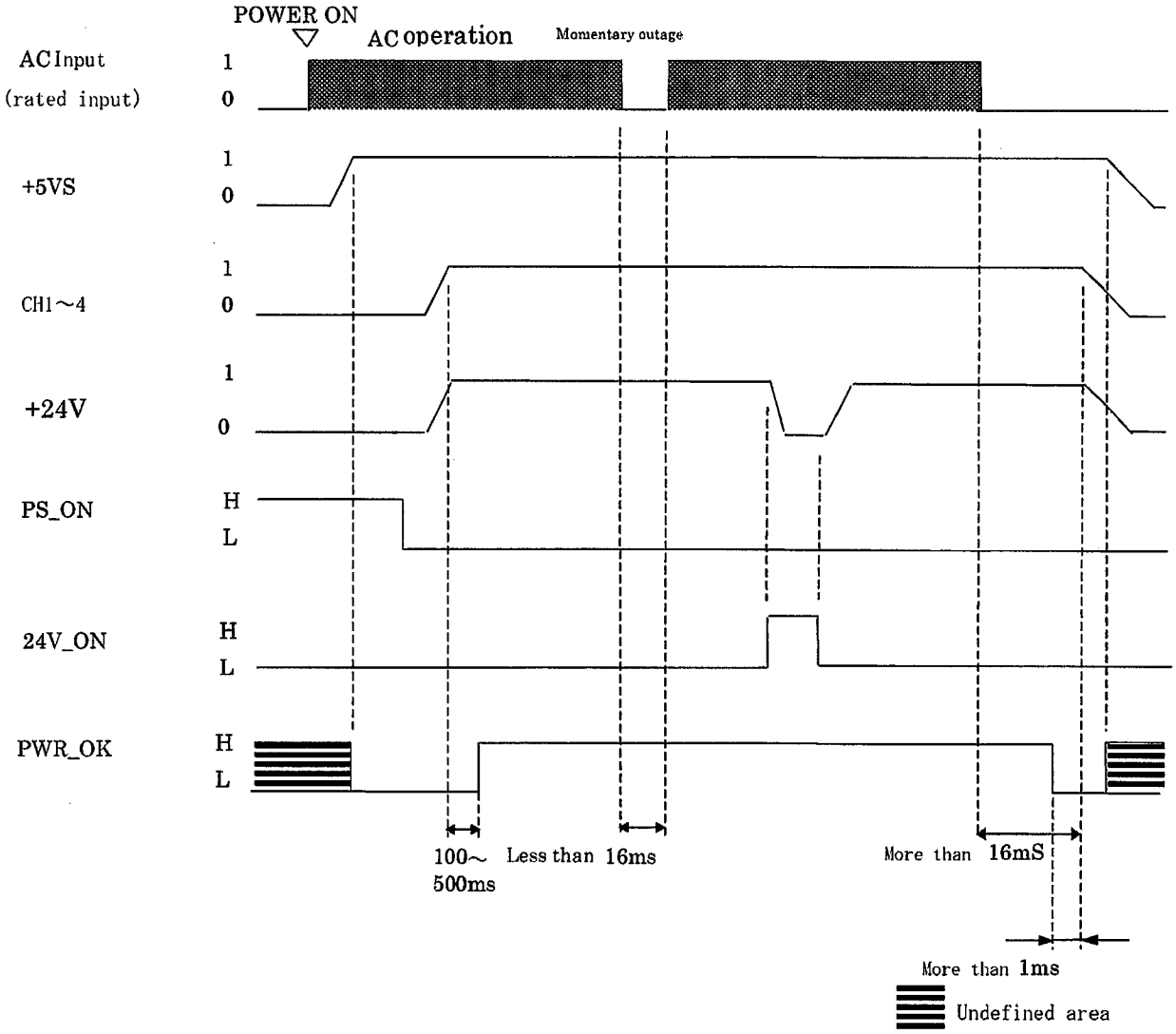
Sequence specification

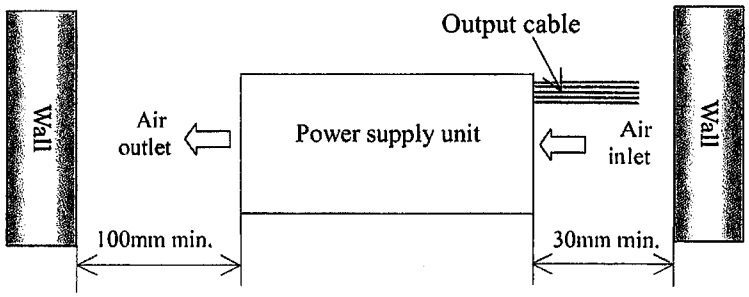
(All items shall be provided at normal temperature and humidity unless otherwise specified)



Installation condition

1. This power supply unit should be installed with the clearance as shown below from the wall to its air inlet and outlet.

2. Temperature around the air inlet area of the power supply unit should not exceed the maximum operating temperature.



Derating Conditions

Follow the item 1 and 2 below to derate output current and power in operation at high temperature and low input voltage. For Continuous and Peak rating, max. output current of each CH specified in output specification shall be regarded as 100% of load factor. Also, when total power between channels is provided, total of those powers shall be regarded as 100% of load factor.

1. When the ambient temperature adjacent to the air inlet exceeds 45°C, follow the load factor shown in Fig.1 for continuous and peak rating.

2. When input voltage is 90V or less at operation of continuous rating and peak rating (5 sec max.), follow the load factor shown in Fig.2. In addition, when the ambient temperature exceeds 45°C, the load factor shall be the load factor shown in Fig 2 multiplied by the load factor shown in Fig.1.

Cross regulation

The total voltage regulation of CH2 (5V) and CH3 (12V) is defined by the combinatorial range shown in Fig.3 Cross regulation.
It should be used within the combinatorial power between each CH.

Figure1. Derating curve for temperature

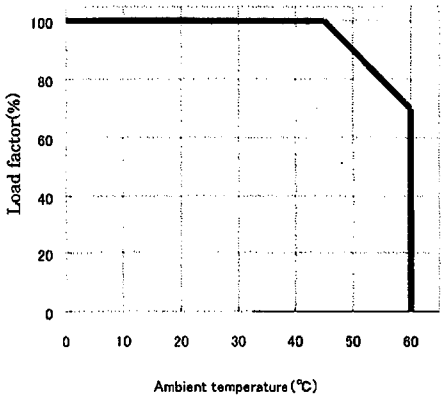


Figure2. Derating curve for low input voltage

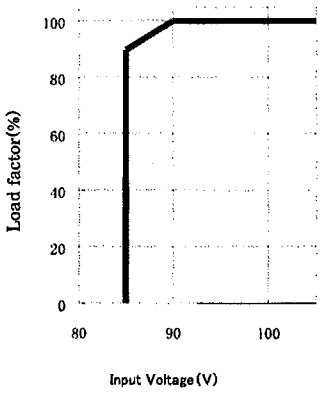
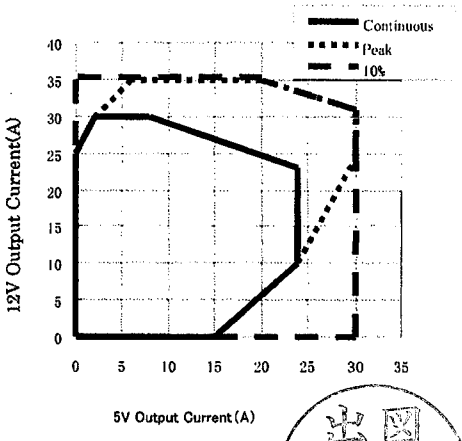


Figure3. Cross regulation



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Current ratings of output connector pins

The maximum allowable continuous current for each of output connector pins is shown in Table below.

The sum of the shared currents for the same output must be less than the maximum current specified for each output.

Connector	Pin	Output	Max. current	Note
MAIN1 (Output 1)	1	+3.3V	6.0A	
	2	+3.3V SE	-	+3.3V Sensing input
	3	+12V	6.0A	
	4	+5V	6.0A	
	5	+5V	6.0A	
	6	COM	6.0A	
	7	COM	6.0A	
	8	COM	6.0A	
	9	COM	6.0A	
	10	-12V	0.6A	
	11	+5VSB	4.0A	
	12	+3.3V	6.0A	
	13	+3.3V	6.0A	
	14	+12V	6.0A	
	15	+5V	6.0A	
	16	+5V	6.0A	
	17	COM	6.0A	
	18	COM	6.0A	
	19	COM	6.0A	
	20	COM	6.0A	
	21	PWR_OK	5mA	Signal output
	22	PS_ON	1mA	Signal input
MAIN2 (Output 2)	1	+5V	6.0A	
	2	+3.3V	6.0A	
12V1-2 (Output 3-4)	1	COM	6.0A	
	2	COM	6.0A	
	3	COM	6.0A	
	4	COM	6.0A	
	5	+12V	6.0A	
	6	+12V	6.0A	
	7	+12V	6.0A	
	8	+12V	6.0A	
HD (Output 5)	1	+3.3V	6.0A	
	2	+5V	6.0A	
	3	COM	6.0A	
	4	COM	6.0A	
	5	+12V	6.0A	
	6	+3.3V	6.0A	
	7	+5V	6.0A	
	8	COM	6.0A	
	9	COM	6.0A	
	10	+12V	6.0A	

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Current ratings of output connector pins

Connector	Pin	Output	Max. current	Note
SIG (Output 6)	1	NC	-	
	2	NC	-	
	3	NC	-	
	4	FAN_C	-	
	5	FAN_M	5mA	
	6	PS_ON	1mA	
	7	COM	2.0A	
	8	+3.3V SE	-	
	9	NC	-	
	10	+5VSB	2.0A	
24V-1 (Output 7)	1	+24V	7A	
	2	+24V	7A	
	3	COM (24V)	7A	
	4	COM (24V)	7A	
SIG (Output 8)	1	24V_ON+	6mA	
	2	24V_ON-	6mA	

Warnings and Cautions on operation

1. WARNING: ⚠ Grounding
   This power supply is designed as safety class I apparatus. For operator safety, be sure to ground the power supply by connecting the Earth terminal to earth ground.

2. WARNING: ⚠ Electrical shock hazards
   This power supply is designed for integrating. High potentials exist inside the power supply. When integrating the power supply into an instrument or system, use appropriate safe procedure to avoid electrical shock hazards.

3. CAUTION: ⚠ Output shortage
   Do not get output terminals shorted. When shorted, internal capacitors discharge at once to cause serious accident due to spark, etc. resulting in shortening lifetime of this unit.

4. CAUTION: ⚠ Inrush current limiting circuit
   Power thermistor is used to limit surge current to smoothing capacitors when AC input is turned on. When AC input is turned on shortly after AC input is turned off, excess surge current may flow as the power thermistor is still hot Make sure to turn on AC input 60 seconds or longer after AC input is turned off.

5. Acoustic noise at power-on
   Low frequency acoustic noise may be heard at turn-on of input or power-on by REMOTE ON/OFF signal. This noise is caused by low frequency transient vibration of choke coils for harmonic measures. This will not affect performance or lifetime at all.

6. Output cable handling
   Do not grab only output cables to move or carry this unit. Make sure to hold the main body while moving or carrying.

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