

Product Specification

Model PC1U-300P-E2S	Created: May 31, 2006
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Scope

This specification applies to Embedded type DC stabilized power supply PC1U-300P-E2S.
Items in the specification shall be provided at normal temperature and humidity unless otherwise specified.

General Specification

	Items	Specification/Standard	Measurement conditions, etc.
Input Specification	Rated voltage	AC100 to 240V	Worldwide range
	Voltage range	85 (Note 1) to 264V	
	Input current	3.4A typical at 100V input/1.4A typical at 240V input.	
	Rated frequency	50 and 60 Hz	Frequency range: 47Hz to 63Hz
	Inrush current (Note 2)	31A peak or less at 100V input. 75A peak or less at 240V input.	At rated output. Reclosing interval is 10 seconds minimum with Cold start (25°C).
	Power factor Efficiency	96% typical at 100V input/90% typical at 240V input 73% typical at 100V input/77% typical at 240V input	At rated output.
Environment	Operating temperature/humidity	0 to 60°C (Note 3) /10 to 90%RH	There shall be no condensation.
	Storage temperature/humidity	-20 to 70°C/10 to 95%RH	There shall be no condensation.
	Vibration	To endure acceleration of 2G with a vibration frequency of 10 to 55Hz for 10 sweep cycles in the X, Y, and Z-direction for each	JIS-C-60068-2-6 At no operation.
	Mechanical shock (Surface dropping)	Lift one bottom edge of the unit up to 50 mm high with the opposite edge placed on the test bench, and let it fall. Repeat 3 times for each base and no malfunction shall be observed.	JIS-C-60068-2-31 At no operation.
Insulation	Insulation resistance	50MΩ or more between input and FG/output.	With DC500V
	Dielectric withstand	AC1.5kV for one minute between input and FG/output	Cut-off current is 20mA
	Leakage current	0.5mA or less at 100V input/1mA or less at 200V input/ 1.2mA or less at 240V input.	YEW. TYPE3226 (1kΩ) or equivalent
E M S · E M I	Line noise immunity test	Apply ±2000V with pulse width of 100ns and 1000ns, cycle period of 30 to 100Hz, and normal/common mode with positive/negative polarity for 10 minutes each.	To be measured with INS-410. There shall be no fluctuation of DC-component in output voltage or malfunction.
	Surge immunity test	IEC 61000-4-5 Installation Environment Class 3 compliant. Apply five times each of ±2kV common mode and ±1kV normal mode.	There shall be no malfunction or breakdown (at AC100V/240V input).
	Electrostatic discharge immunity test	IEC 61000-4-2 Test Level 3 compliant. ±6kV contact discharge for 10 times.	There shall be no malfunction or breakdown (at AC100V/240V input).
	Conducted emission	VCCI/FCC/CISPR22-B/EN55022 Class B compliant.	To be measured with the power supply single body.
	Harmonic current	IEC 61000-3-2 Class D compliant.	At rated input and output.
Others	Safety standard	UL60950, CSA 60950 (c-UL), and EN60950 acquired. The electrical Appliance and Material Safety Law compliant. CE marking (Low Voltage Directive) CCC(S&E) acquired	Class I equipment Embedded type power supply Only a product after REV.B is acquired.
	Cooling system	Forced air cooling	(Note 4)
	Dimensions	106(W)×41(H)×260(D)	Excluding projections. See the outline drawing on another page.
	Weight	1.25kg typical	
	Reliability grade	FA	To follow our standard.
	Lifetime expectancy	10 years minimum (components with short lifetime expectancy: electrolytic capacitor and fan motor).	Under the condition that the unit continuously operates at 100V AC input, Rated load, and 25°C.
	M.T.B.F.	70,000 hours minimum	Based on EIAJ RCR-9102.
	Warranty	Three years after delivery. However, if any faults belong to us, the defective unit shall be repaired or replaced at our cost.	Except for errors caused by operation not specified in the specification.

Note 1. Minimum input voltage at continuous rated load. For minimum input voltage at momentary peak rated load, see the derating conditions on another page.

Note 2. Inrush current of 100 μs or less into X-capacitor of input noise filter is not specified.

Note 3. When the ambient temperature exceeds 40°C, follow the derating conditions on another page.

Note 4. Fan motor rotates at low speed at standby mode (at PS_ON signal 'H' or 'OPEN') in order to prevent reliability deterioration caused by the temperature rise of the components inside the power supply. Fan motor may stop rotating at the low temperature inside the supply.

出図

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REV.	Date	Description	By	REV.	Date	Description	By

Drawn by Mori	Checked by Ishikawa	Approved by Arino	Drawing No. 6124-01-4-521	Sheet No. 1/8
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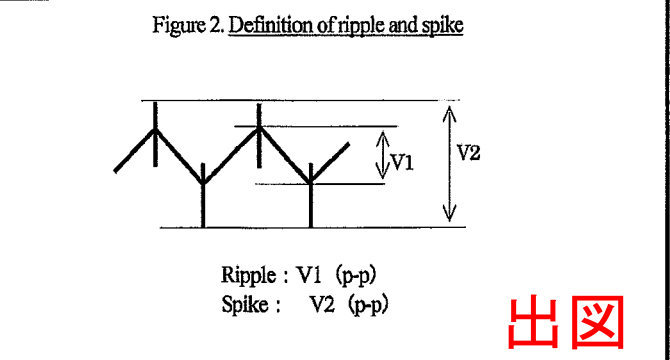
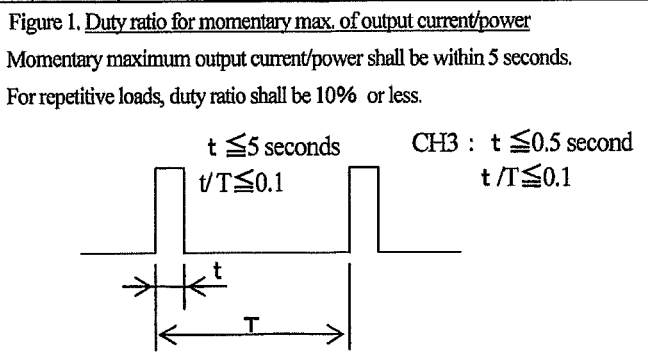
Due to the technical improvement, the specifications and functions are subject to change without notice.

Product Specification

Model PC1U-300P-E2S	Created: May 31, 2006
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Output Specification (Voltage shall be measured at output connector terminal. Voltage drop of the load side connector due to contact resistance is not included)

Items	CH1	CH2	CH3 (12V1)	CH4 (12V2)	CH5	CH6 (5VSB)	Measurement conditions, etc.			
Rated voltage [V]	+3.3	+5	+12	+12	-12	+5				
Minimum current [A]	0	0	0	0	0	0				
Output Rating	Rated current [A]	8	8	8	6	0.5	2	Standard value at measuring of input/output characteristics. Rated total output power is 250W (see the derating conditions on page 5).		
	Rated power [W]	26.4	40	96	72	6	10			
Continuous max. rating	Max. current [A]	16	14	16	10	0.5	2	Continuous rating. Maximum total output power is 250W (see the derating conditions on page 5). Total shall be 250W or less.		
	Max. output power [W]	52.8	70	192	120	6	10			
		90	216							
Momentary max. rating	Momentary current [A]	16	16	22	-	0.8	2.5	Momentary rating is within 5 seconds. Momentary total output power is 300W. For repetitive momentary loads, duty ration shall be 10% or less (see Figure 1 below and derating conditions on page 5). 0.5 second or less for CH3 only. Total shall be 300W or less.		
	Momentary output power [W]	52.8	80	264	-	9.6	12.5			
		100	264							
Output Characteristics	Total voltage accuracy [%]	±5	±5	±5	±5	±5	±5	Accuracy against output voltage value including temperature and time-lapse drifts as well as input/load regulation 1 above.		
	Ripple voltage [mVp-p]	50 max.	50 max.	80 max.	80 max.	80 max.	50 max.	Connect an electrolytic capacitor (10 μF) and a ceramic capacitor (0.1μF) on the test board and measure with an oscilloscope of 100MHz bandwidth. The test board shall be separated from load wires and within 150mm from the output terminals.		
	Ripple + spike voltage [mVp-p]	100 max.	100 max.	200 max.	200 max.	200 max.	100 max.			
Protection circuit/others	OCP/Short circuit	Method	Hold-down current limiting: CH1 to 5 to shut down				Hold-down current limiting: All outputs shut down		When CH6 is shorted, all outputs shut down (automatic recovery) .	
		OCP point [A]	17 or more	17 or more	17 or more	12 or more	Short circuit protection	Short circuit protection	In measuring CH3 and CH4, other CHs are no loads. In measuring the rest of the CHs, they shall be rated of load	
		Recovery	Reclosing of input (reclosing interval: 10s or more).				Automatic recovery (*1)		*1. For CH5: or reclosing of input	
	Over Voltage protection	OVP point [V]	3.76 to 4.3	5.74 to 7.0	13.4 to 15.6	-	-	-		
		System	CH1 to CH5 outputs shut down				-	-	Zener	
		Recovery method	Reclosing of input (*2)				-	-	clamp	*2. Reclose input after at least 10 seconds.
	Low voltage lock-out	CH1 to 5 to shut down when AC input is 80V or less.								
Insulation between GND terminal of each output	Connection is common for all outputs.							Connected to power supply's chassis.		



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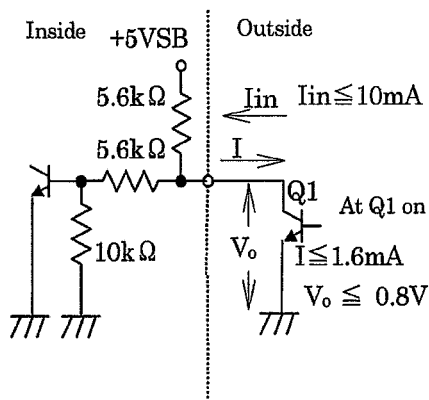
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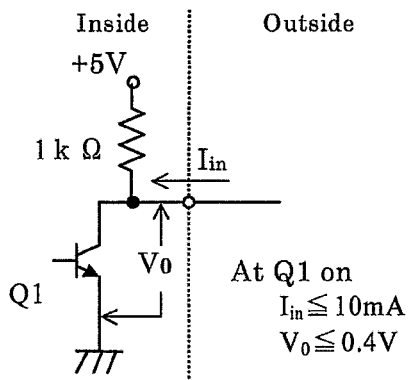
Signal Input/Output Specification

	Items	Specification
Input	PS_ON	CH1 to 5 are output upon receipt of 'L'. CH1 to 5 shut down upon receipt of 'H' or 'OPEN'.
	+3.3V SENSING	Input terminal for Voltage detection of CH1 (+3.3V) output to compensate the voltage drop of + side cable by connecting to the + side load end. (Refer to "current rating table for load connection pins" on page 6 and 7).
Output	PWR_OK	'H' signal is delivered when CH2 (+5V) output is ON.
	FAN_M1	Two pulse waves are delivered per one rotation of a fan motor. Duty ratio for the pulse shall be 0.5 (typical). The signal remains 'L' or 'OPEN' when the fan stops operating due to malfunction.
	FAN_M2	

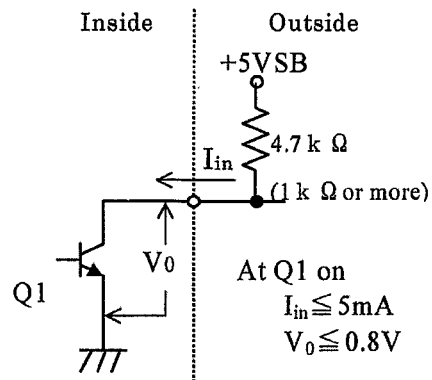
PS_ON signal input circuit



PWR_OK signal output circuit



FAN M signal output circuit



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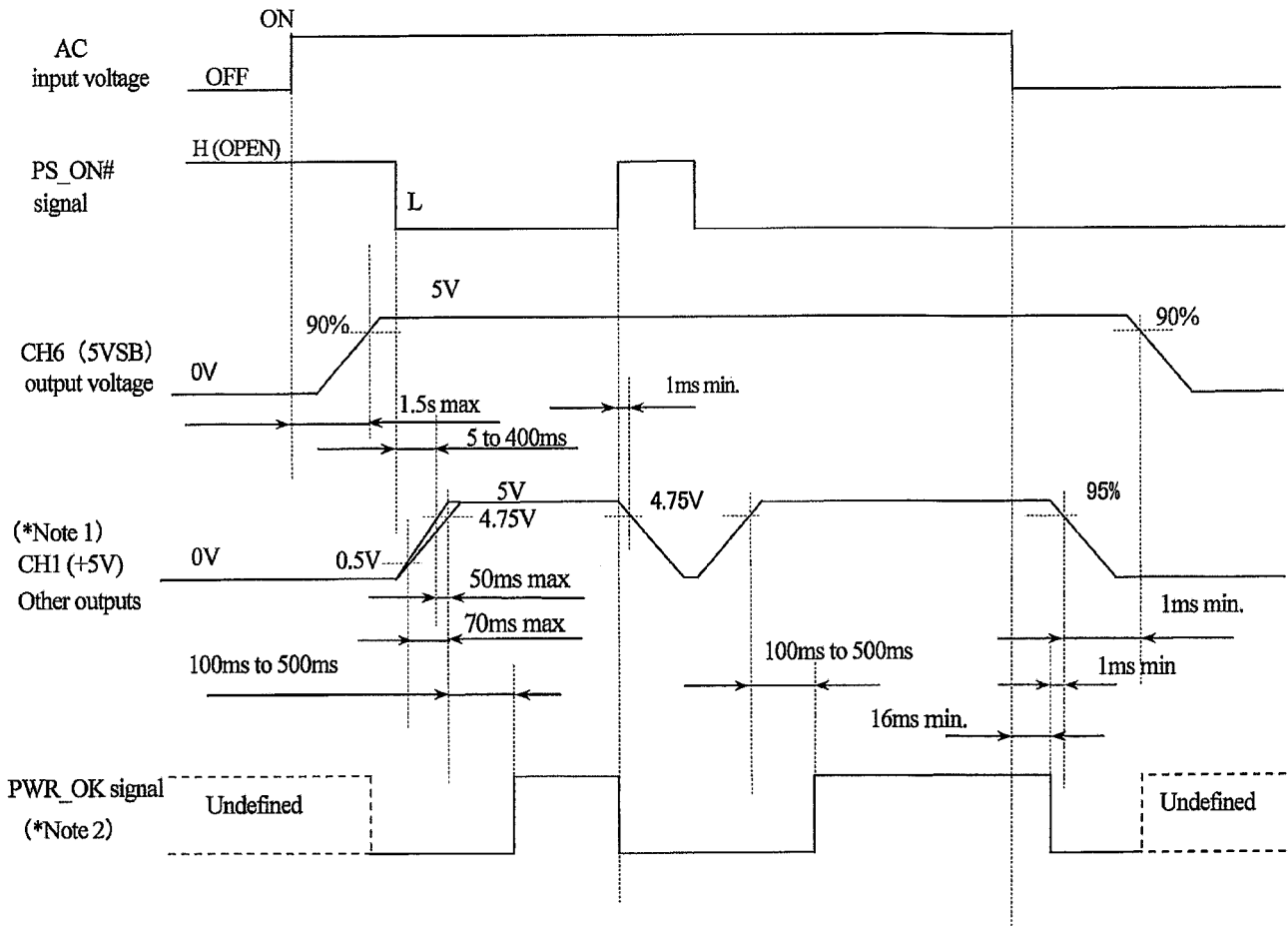
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Power Supply Timing (At rated input and output.)



*Note 1: Outputs other than CH 2 (+5V) shall follow this except for the voltage value, and difference in rise time from CH 2 (+5V) shall be 50ms or less. In addition, output voltage level of CH2 (+5V) and CH3 (+12V) shall be at or above that of CH1 (+3.3V). Also, difference in output voltage level between CH2 (+5V) and CH1 (+3.3V) shall be 2.25V or less. However, order and difference in level of output voltage for each output voltage at falling shall not be specified.

*Note 2: Rise time and fall time of PWR_OK signal shall be 100 μ s or less (provided that capacitive load is not connected to PWR_OK signal output).

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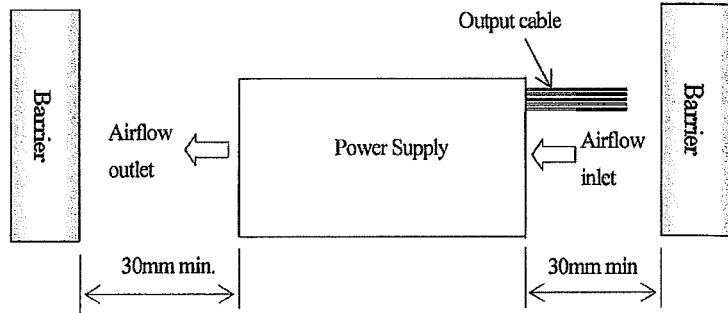
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Installation

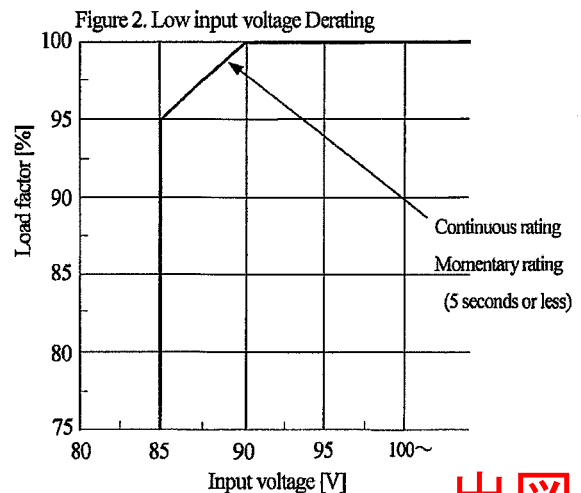
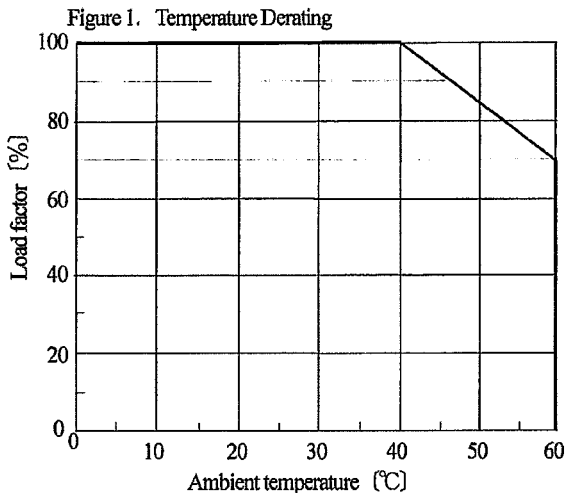
- When installing the power supply, make sure that the distance between airflow-inlet/outlet of this unit and the adjacent barriers keeps the dimensions below at minimum.
- Make sure to install the power supply in a position where temperature near the airflow inlet does not exceed the maximum operating temperature specified.



Derating Conditions

When using under high temperature or at low input voltage, follow the item 1 and 2 below to derate output current/power. For continuous rating, however, max. output current for each CH specified in the "output specification" including +5VSB shall be 100% of load factor. Also, total of max. output current of CH1 and 2, and CH3 and 4, and total of max. output power of CH1 to 6 shall be 100% of load factor. In the same way, momentary output current value for each channel shall be 100% of load factor. Also, total of momentary output current of CH1 and 2, and CH3 and 4, and total momentary output power of CH 1 to 6 shall be 100%. of load factor.

- When the ambient temperature around the airflow inlet exceeds 40°C, both continuous and momentary ratings shall follow the derating curve in Figure 1.
- When using with continuous and instantaneous rating (within 5 seconds or less) at or below 90V, follow the solid-line of derating curve below. Also, if the ambient temperature exceeds 40°C, follow the load factor that is gained by multiplying the load factor in Fig. 1 and the one in Figure 2.



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Product Specification

Model **PC1U-300P-E2S**

Created: May 31, 2006

Current Rating Table for Load Connection Pins

The maximum current that can be drawn continuously from load connection pins is shown in the table below. However, the total current for each output shall not exceed the maximum output current specified in the output specification.

Connector name	Pin#	Output (signal) name	Max. current per pin	Note
CUSTOM 1 (Output 1)	1	+3.3V	6.0A	
	2	+3.3V	6.0A	
	3	+5V	6.0A	
	4	+5V	6.0A	
	5	+5VSB	2.5A	
	6	+12V2	6.0A	
	7	COM	6.0A	
	8	COM	6.0A	
	9	COM	6.0A	
	10	COM	6.0A	
	11	+3.3V	6.0A	
	12	+3.3V	6.0A	
	13	+5V	6.0A	
	14	+5V	6.0A	
	15	+5V	6.0A	
	16	+12V2	6.0A	
	17	COM	6.0A	
	18	COM	6.0A	
	19	COM	6.0A	
	20	COM	6.0A	
CUSTOM 1 (Output 2)	1	-12V	0.8A	
	2	PS_ON	10mA	Signal input
	3	PWR_OK	10mA	Signal output
	4	+3.3V SENSING	10mA	+3.3V Sensing input

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Current Rating Table for Load Connection Pins

The maximum current that can be drawn continuously from load connection pins is shown in the table below. However, the total current for each output shall not exceed the maximum output current specified in the output specification.

Connector name	Pin #	Output signal name	Max. current per pin	Note
12V (Output 3)	1	COM	6.0A	
	2	COM	6.0A	
	3	COM	6.0A	
	4	COM	6.0A	
	5	+12V1	6.0A	
	6	+12V1	6.0A	
	7	+12V1	6.0A	
	8	+12V1	6.0A	
HD (Output 4)	1	+3.3V	6.0A	
	2	+5V	6.0A	
	3	COM	6.0A	
	4	COM	6.0A	
	5	+12V2	6.0A	
	6	+3.3V	6.0A	
	7	+5V	6.0A	
	8	COM	6.0A	
	9	COM	6.0A	
	10	+12V2	6.0A	
FAN (Output 5) *1	1	FAN_M1	5mA	Signal output
	2	FAN_M2	5mA	Signal output
	3	COM	10mA	

*1. When using 3-pin COM of FAN (output 5), make sure that output current other than FAN_M1 and FAN_M2 does not flow through this pin.

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Precaution before use

1. Grounding  *Warning*
 This power supply is designed and produced as Class I equipment. Make sure to properly ground the grounding terminal (Chassis) for safe operation.
2. Electric shock  *Warning*
 This power supply is designed and produced as built-in equipment, and contains a high-voltage part. Make sure to securely install the power supply into equipment to prevent electric shock.
3. Output short circuit  *Caution*
 Prevent shorting output. If output is shorted, capacitors inside the power supply rapidly discharge and it may lead to fire and/or sparks, resulting in a serious accident. It also shortens the lifetime of the power supply.
4. Inrush current limiting circuit  *Caution*
 Inrush prevention circuit is used to limit surge current into the smoothing capacitor when AC input is turned on. If input is reclosed before the specified reclosing interval after input failure, inrush prevention circuit may not work, and excessive surge current may damage the power supply. Make sure to take enough reclosing interval as specified.
5. Noise at power-on and power-off
 A low frequency noise may be heard at AC input or power-on/off by PS_ON signal; this noise is caused by low frequency vibration of chokes to regulate harmonic current in transition period. A similar noise may be observed while being energized (at operation and standby). These noises, however, do not cause any damage to the characteristics and lifetime of the power supply.
6. Handling of the output cable
 Do not grab the output cables solely when you move or carry the power supply. Hold the body of the supply when you move or carry.

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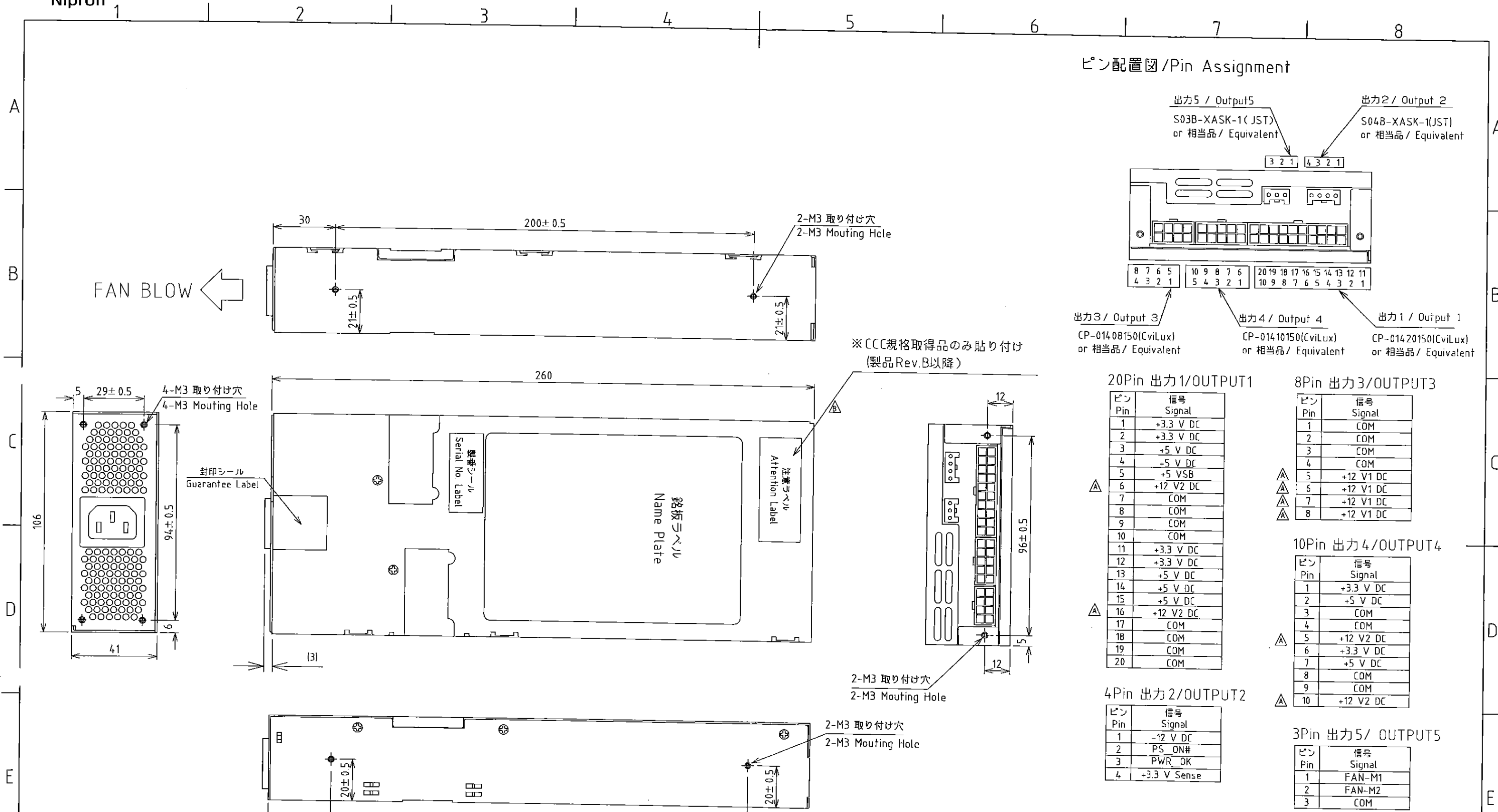
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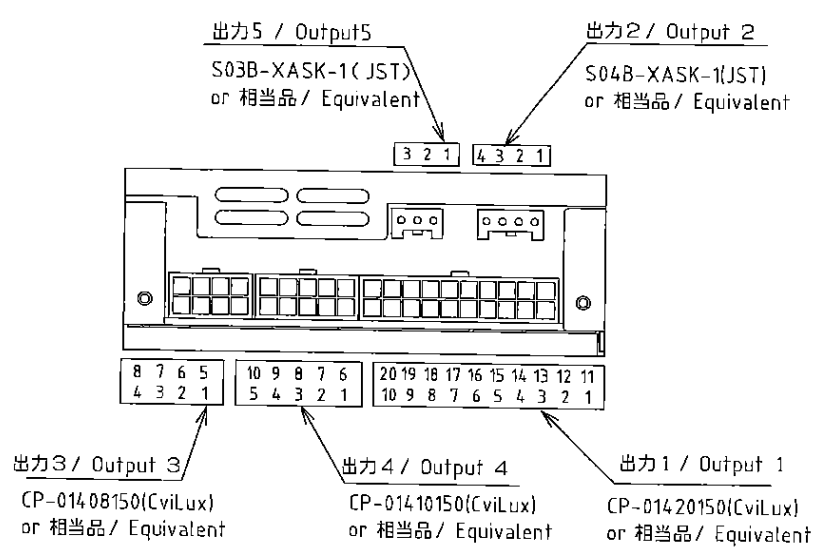
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ピン配置図/Pin Assignment



20Pin 出力1/OUTPUT1

ピン Pin	信号 Signal
1	+3.3 V DC
2	+3.3 V DC
3	+5 V DC
4	+5 V DC
5	+5 VSB
6	+12 V2 DC
7	COM
8	COM
9	COM
10	COM
11	+3.3 V DC
12	+3.3 V DC
13	+5 V DC
14	+5 V DC
15	+5 V DC
16	+12 V2 DC
17	COM
18	COM
19	COM
20	COM

8Pin 出力3/OUTPUT3

ピン Pin	信号 Signal
1	COM
2	COM
3	COM
4	COM
5	+12 V1 DC
6	+12 V1 DC
7	+12 V1 DC
8	+12 V1 DC

10Pin 出力4/OUTPUT4

ピン Pin	信号 Signal
1	+3.3 V DC
2	+5 V DC
3	COM
4	COM
5	+12 V2 DC
6	+3.3 V DC
7	+5 V DC
8	COM
9	COM
10	+12 V2 DC

4Pin 出力2/OUTPUT2

ピン Pin	信号 Signal
1	-12 V DC
2	PS_ON#
3	PWR_OK
4	+3.3 V Sense

3Pin 出力5/ OUTPUT5

ピン Pin	信号 Signal
1	FAN-M1
2	FAN-M2
3	COM

推奨ハーネス/Recommendation Harness **出図**

出力コネクタ OUTPUT CONNECTOR	型式 MODEL	型式 MODEL
出力1・2 / OUTPUT1・2	WH6113-13(20Pin)	WH6113-12(24Pin)
出力3 / OUTPUT3	WH-V0408-500(4Pin)	WH-V0808-500(8Pin)
出力4 / OUTPUT4	WH-PP610-850	WH-PS610-850

△×1 注意ラベル追加 2008.10.27 I-201006 梅木
△×8 信号の表記変更 2006.07.31 I-180728 西

※ 特に指示がない寸法公差は±1mmとする。
インレット、コネクタ等の凸部は含まず。
取り付けピンの電源内部長さは6mmMAX

DRAWN BY	CHECKED BY	CHECKED BY	APPROVED BY	SCALE	MATERIALS	TITLE	PC1U-300P
西	有野	—	西	×	-	外観図	
ISSUED	2006.06.06			UNITS	FINISH	DRAWING NO.	6124-01-3-050
				m/m	-		
				3RD ANGLE PROJECTION			