

FPS SERIES

AC/DC Front End



FPS



Features

- Compact, 1U high, and, high power density
Size: 127(W)×41(H)×290(D) mm
Power Density: 11W/inch³,
Maximum Output Power: 1kW
- Universal Input: AC85-265V
- Up to 3000W (3 units) in 19"rack
- Hot swap / N+1 redundant parallel operation available
- I²C option available (/S, /PS model)
- Front IEC inlet model (AC input) available, (/P, /PS model)

Power Supply Identification

FPS 1000 - 48 /PS

Series	O/P Power	O/P Voltage	Option
	1000(W)	12(V)	Blank: Standard Model
	3000(W)	24(V)	/P : IEC Inlet Type (on front panel)
		48(V)	/S : I ² C Option built-in
			/PS : IEC inlet +I ² C Option

Note: FPS3000 is 3x FPS + FPS-S1U in one rack.
FPS3000 can include 3x FPS with same ratings.

Applications



FPS-S1U /PS

Series	Option
	Blank: Standard Model (For FPS1000-*, FPS1000-*/S)
	/P : IEC Inlet Type (on front panel, for FPS1000-*/P, FPS1000-*/PS)

Note: FPS-S1U does not have FPS1000. This is 1U rack only. Up to 3x FPS1000 (with same voltage rating) can be installed into FPS-S1U.

Product Line up

Output Voltage	1000W	
	Output Current	Model
12V	72A	FPS1000-12
24V	40A	FPS1000-24
48V	21A	FPS1000-48

Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.



FPS3000 - □
Shelf type: 3 units of FPS1000 mounting in a 19-inch shelf (FPS-S1U) with maximum 3kW
Size: 440(W)×43.6(H)×351(D) mm

FPS1000 Specifications

ITEMS/UNITS		MODEL	FPS1000-12	FPS1000-24	FPS1000-48
Input	Voltage Range (*1)	V	AC85 - 265 continuous (Universal input)		
	Frequency (*1)	Hz	47 - 63, single phase		
	Power Factor (115/230VAC)(typ)		More than 0.98 at maximum output power		
	Efficiency (typ) (*2)	%	81 / 83	84 / 86	85 / 88
	Current (100/200VAC) (max)	A	12.0 / 6.0		
	Inrush Current (*3)	A	Less than 40		
Output	Leakage Current (230VAC)	mA	Less than 1.1		
	Nominal Voltage	VDC	12	24	48
	Maximum Current (*Fig.1)	A	72	40	21
	Maximum Power	W	864	960	1008
	Voltage Set Point		12V +/-1%	24V +/-1%	48V +/-1%
	Maximum Line Regulation(*5)		0.40%		
	Maximum Load Regulation(*6)		0.80%		
	Temperature Coefficient		200PPM/°C		
	Warm Up Drift		0.1% of rated Vout for 8hrs after 30min warm-up. Constant line, load and temperature.		
	Maximum Ripple & Noise (*4)	mVp-p	150	200	300
	Hold-up Time (100VAC)(typ)	ms	20 at rated output voltage and less than 80% of rated load.		
	Voltage Adjustable Range	VDC	10.5 - 13.2	21.5 - 29	43 - 58
	Over Current Protection(*Fig.1)		105 - 125% of maximum output current.		
	Function	Over Voltage Protection (*8)	VDC	14.3 - 15.7	31 - 34
Over Temperature Protection			Inverter shut down method, automatic reset.		
Remote Sensing (*7)			Possible. Refer to instruction manual.		
Remote ON/OFF Control			By electrical signal or dry contact. ON: 0 - 0.6V or short. OFF: 2 - 15V or open.		
Parallel Operation (*9)			Possible. Refer to instruction manual.		
Series Operation (*10)			Possible. Refer to instruction manual.		
Over Temperature Alarm Signal			Open collector signal. Normal: ON, Max.sink current: 10mA.		
DC OK signal			Open collector signal. On when Vout>80+/-5% rated output. Max.sink current: 10mA		
AC Fail Signal			Open collector signal. On when Vin > 85VAC, Max.sink current: 10mA.		
AUX-BIAS Power Supply			11.2 - 12.5VDC. 0.25A maximum output current.		
Output Voltage Trimming			Possible, via Vout trim pin in the I/O connector. Refer to instruction manual.		
Front Panel Indicators			AC OK, DC OK, DC FAIL		
I ² C Interface			Optional. Refer to instruction manual.		
Environment		Operating Temperature	°C	0 to 50: 100% load. Derate 2%/°C, 50 to 60	
	Storage Temperature	°C	-30 to 85		
	Operating Humidity	%RH	10 - 90, no condensation.		
	Storage Humidity	%RH	10 - 95, no condensation.		
	Vibration		Built to meet ETS 300 019		
	Shock		Built to meet ETS 300 019		
	Cooling		By internal fans. Variable speed control.		
Isolation	Withstand Voltage		Input-Output: 3000Vrms, 1min. Input-Ground: 2000Vrms, 1min. Output-Ground: 500Vrms, 1min.		
	Isolation Resistance		More than 100Mohm at 25°C and 70% RH. Output-Ground: 500VDC		
Standards	Safety Standards		Approved by UL60950-1, EN60950-1, CSA C22.2 No.60950-1		
	EMI (*11)		EN55022B, FCC part 15J-B, VCCI-B		
Mechanical	Weight (typ)	g	2000		
	Size (W x H x D)	mm	127 x 41 x 290 (Refer to outline drawing.)		

(*1) For cases where conformance to various safety standards (UL, EN etc.) is required, to be described as 100-240Vac (50/60Hz).

(*2) At 100/200VAC, rated load and 25°C ambient temperature.

(*3) Not applicable for the noise filter inrush current less than 0.2ms.

(*4) Measured with JEITA RC-9131 1:1 probe, 20MHz B.W.

(*5) From 85-132Vac or 170-265VAC, constant load.

(*6) From no-load to rated load, constant input voltage.

Measured at the sensing point in remote sense.

(*7) Remote sensing can compensate up to 1V drop on each load wire.

(*8) Inverter shut down method. Reset by AC voltage recycle or by ON/OFF control.

(*9) Derate maximum output power by 10% for input voltage less than 100V_{RMS}.

(*10) Series operation is not applicable for units with I²C bus option (/S, /PS model).

(*11) For FPS 1000-12/P(S), when used not with FPS-S1U or FPS-T1U racks, an EMI suppressor clamp should be attached to the AC cable, as close as possible to the AC inlet, to meet class B.

Model	FPS1000	FPS1000	FPS1000
V1	-12	-24	-48
V1	12V	24V	48V
V2	13.2V	29V	58V
I1	66A	33A	17.25A
I2	72A	40A	21A

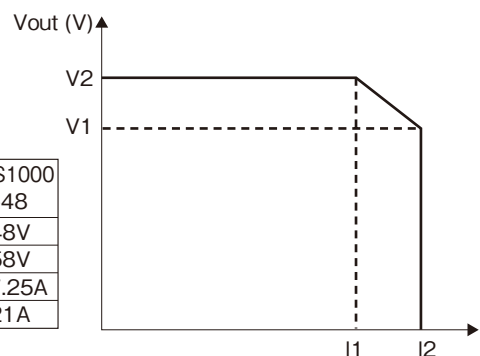
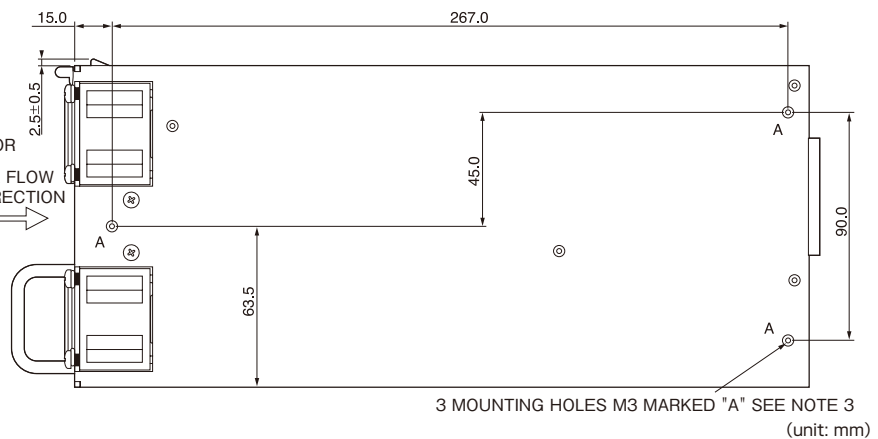
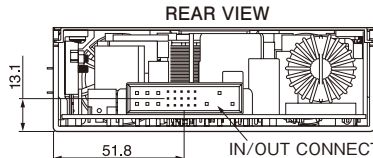
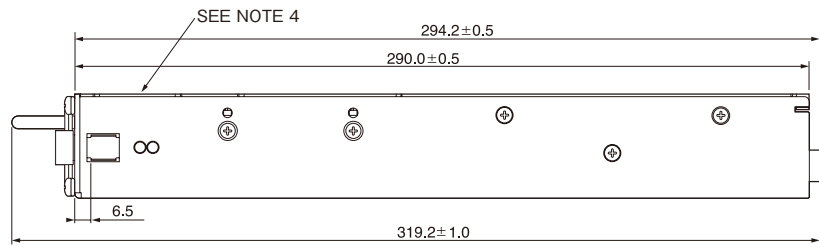
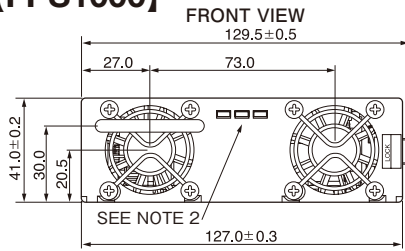


Fig.1 Rated output current vs rated output voltage

Outline Drawing

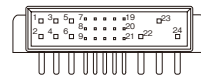
[FPS1000]



NOTES

- CONNECTOR TYPE: PCIB24W9M400A1, POSITRONIC. FEMALE CONNECTOR TYPE: PCIB24W9F400A1,-S1031(not attached with unit)
- LED INDICATORS. REFER TO INSTRUCTION MANUAL.
- MOUNTING SCREWS MUST NOT PENETRATE MORE THAN 3mm INTO THE UNIT.
- MODEL NAME, INPUT AND OUTPUT RATING AND SAFETY APPROVALS SYMBOLS ARE DESCRIBED ON TOP SURFACE LABEL.
- ALLOW MINIMUM 50mm OF UNRESTRICTED AIR SPACE AT THE REAR OF UNIT. DO NOT OBSTRUCT AIR FLOW TO THE UNIT FRONT PANEL.
- IN OUT CONNECTOR BACK VIEW AND PINS ASSIGNMENT:

AIR FLOW DIRECTION

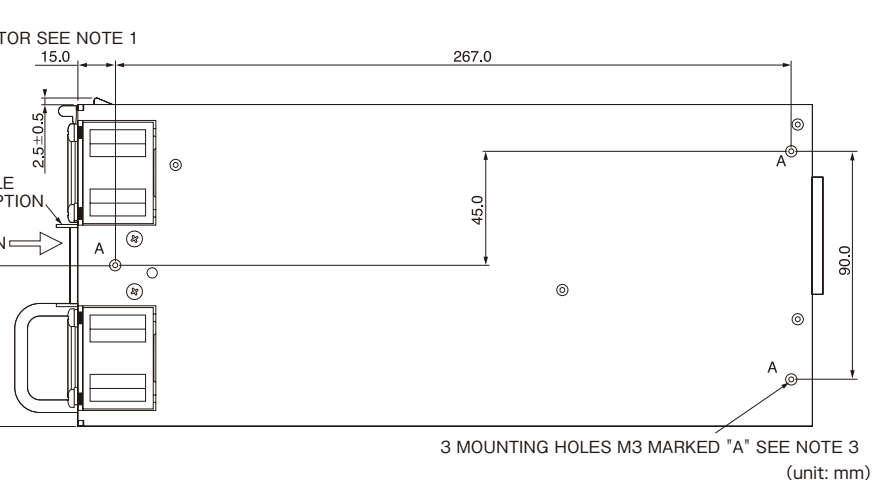
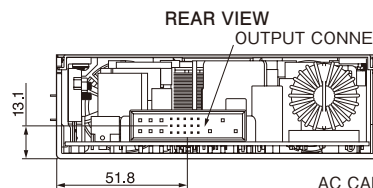
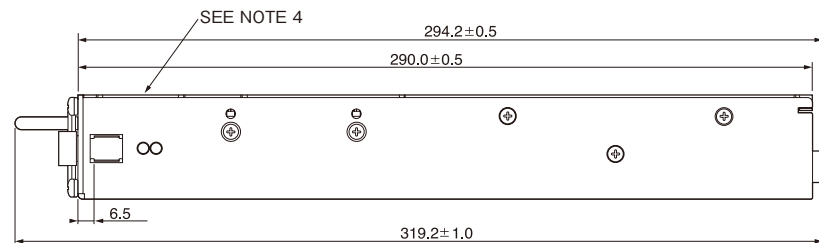
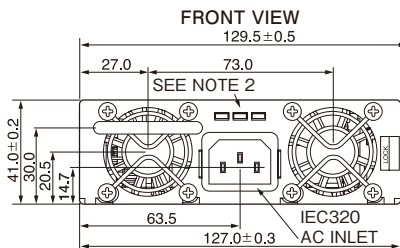


PIN NUMBER	FUNCTION
1	+v
2	+v
3	-v
4	+v
5	-v
6	-v
7	ON/OFF
8	+S

PIN NUMBER	FUNCTION
9	DC_OK
10	SIGNAL_RTN
11	AC_FAIL
12	TEMP_ALARM
13	-S
14	V_TRIM
15	CS
16	+12V_AUX

PIN NUMBER	FUNCTION
17	SDA (FC)
18	SCL (FC)
19	A0 (FC)
20	A1 (FC)
21	A2 (FC)
22	ACG
23	ACL
24	ACN

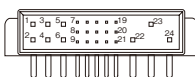
[FPS1000/P]



NOTES

- CONNECTOR TYPE: PCIB24W9M400A1, POSITRONIC. FEMALE CONNECTOR TYPE: PCIB24W9F400A1,-S1031(not attached with unit)
- LED INDICATORS. REFER TO INSTRUCTION MANUAL.
- MOUNTING SCREWS MUST NOT PENETRATE MORE THAN 3mm INTO THE UNIT.
- MODEL NAME, INPUT AND OUTPUT RATING AND SAFETY APPROVALS SYMBOLS ARE DESCRIBED ON TOP SURFACE LABEL.
- ALLOW MINIMUM 50mm OF UNRESTRICTED AIR SPACE AT THE REAR OF UNIT. DO NOT OBSTRUCT AIR FLOW TO THE UNIT FRONT PANEL.
- IN OUT CONNECTOR BACK VIEW AND PINS ASSIGNMENT:

AIR FLOW DIRECTION



PIN NUMBER	FUNCTION
1	+v
2	+v
3	-v
4	+v
5	-v
6	-v
7	ON/OFF
8	+S

PIN NUMBER	FUNCTION
9	DC_OK
10	SIGNAL_RTN
11	AC_FAIL
12	TEMP_ALARM
13	-S
14	V_TRIM
15	CS
16	+12V_AUX

PIN NUMBER	FUNCTION
17	SDA (FC)
18	SCL (FC)
19	A0 (FC)
20	A1 (FC)
21	A2 (FC)
22	NC
23	NC
24	NC

FPS-S1U Specifications

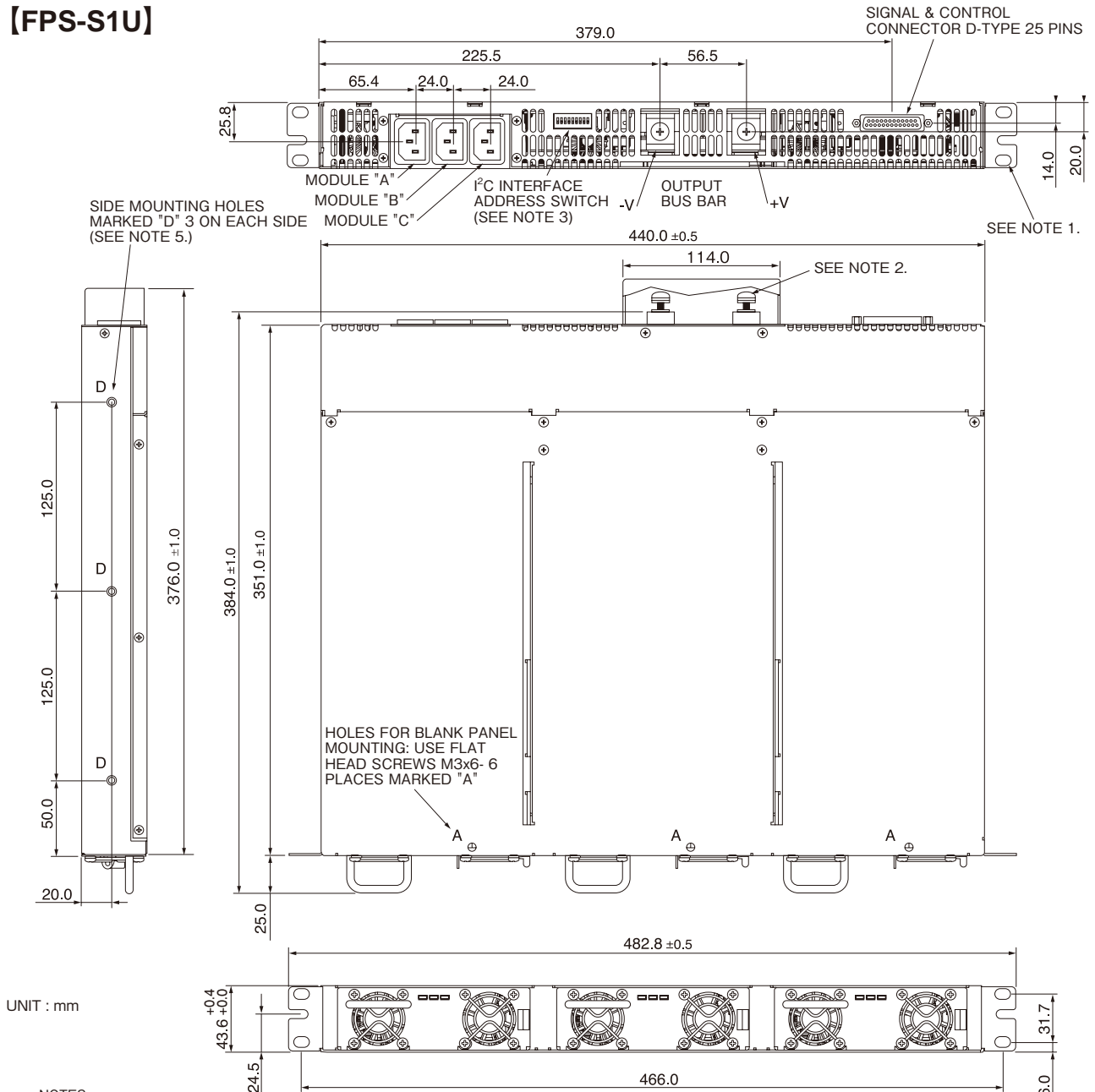
FPS

ITEMS/UNITS		MODEL	FPS-S1U
Input	Voltage Range	(*2) V	AC85 - 265 continuous (Universal input)
	Frequency	(*2) Hz	47 - 63, Single phase
	Current (100/200VAC)(max)	A	12.0 / 6.0 for each FPS1000 unit installed
Output	Maximum Power	(*1) W	3000
Function	Remote Sensing	(*3)	Possible.
	Remote ON/OFF Control		Separate control for each FPS1000 unit, by electrical signal or dry contact. On: 0 - 0.6V or short. OFF: 2 - 15V or open.
	Parallel Operation	(*6)	Possible.
	Series Operation	(*4)	Possible. Up to 2 racks of the same voltage and current rating.
	Over Temperature Alarm Signal		Separate control for each FPS1000 unit, open collector signal. Normal: ON, max.sink current: 10mA
	DC OK Signal		Separate control for each FPS1000 unit, open collector signal. On when $V_{out} > 80\% \pm 5\%$ max.sink current: 10mA
	AC Fail Signal		Separate control for each FPS1000 unit, open collector signal. On when $V_{in} > 85VAC$, max.sink current: 10mA.
	AUX-BIAS Power Supply		11.2 - 12.5VDC. Maximum output current: 0.25A x Number of installed FPS1000 units.
	Output Voltage Trimming		Possible. Refer to instruction manual.
	AC Input Connector		FPS-S1U: IEC inlet for each power supply module. FPS-S1U/P: None
	Output Terminals		Bus-bars. Refer to outline drawing.
	Number of Power Supply Modules (*5)		Maximum 3 FPS1000 modules of the same output voltage rating.
	Environment	Operating Temperature	°C
Storage Temperature		°C	-30 to 85
Operating Humidity		%RH	10 - 90, no condensation.
Storage Humidity		%RH	10 - 95, no condensation.
Vibration			Built to meet ETS 300 019
Shock			Built to meet ETS 300 019
Isolation	Withstand Voltage		Input-Output: 3000Vrms, 1min. Input-Ground: 2000Vrms, 1min. Output-Ground: 500Vrms, 1min.
	Isolation Resistance		More than 100MΩ at 25°C and 70% RH. Output-Ground: 500VDC
Standards	Safety Standards		UL60950-1, EN60950-1, CSA C22.2 No.60950-1
Mechanical	Weight (typ)	g	3700
	Size (W x H x D)	mm	440 x 44 x 351 (Refer to outline drawing.)

(*1) For input voltage lower than 100VAC, maximum output power is 2700W.
 (*2) For cases where conformance to various safety standards (UL, EN etc.) is required, to be described as 100-240VAC (50/60Hz).
 (*3) Remote sensing can compensate up to 1V drop on each load wire.
 (*4) Not applicable for units with I²C bus option.
 (*5) The output of all the FPS1000 modules are connected in parallel in the rack.
 (*6) Up to 3 racks with max.8 FPS1000 units of the same voltage and current rating.

Outline Drawing

[FPS-S1U]



UNIT : mm

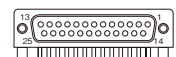
NOTES

- (*1) MOUNTING HOLES FOR 19" RACK, USE M6x12 TO FIX THE UNIT TO A RACK.
- (*2) M6x16 SCREWS FOR LOAD WIRES FIXING, USE M6 LUG FOR THE LOAD WIRES, RECOMMENDED TIGHTENING TORQUE 42 - 56 Kgf.cm
- (*3) REFER TO INSTRUCTION MANUAL FOR SETTING DETAILS.
- (*4) MODEL NAME , VOLTAGE AND CURRENT RATING AND SAFETY

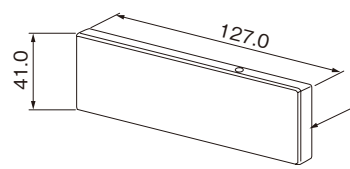
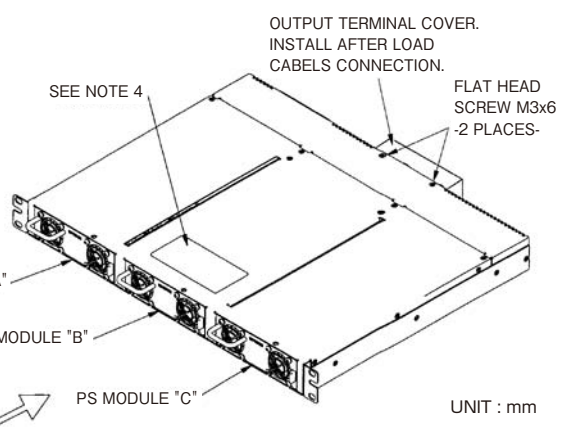
- (*5) MOUNTING HOLES M5 FOR MOUNTING BRACKETS . USE M5x8 SCREWS TO FIX THE BRACKETS TO THE CHASSIS. SCREWS MUST NOT PENETRATE THE CHASSIS MORE THAN 6 mm.
- (*6) THE FPS-S1U RACK IS SHOWN WITH 3 FPS1000 UNITS INSTALLED.

SIGNALS & CONTROL CONNECTOR PINS ASSIGNMENT

CONNECTOR DESCRIPTION:
D-TYPE RIGHT ANGLE, 25 POSITIONS,
FRONT METAL SHELL,
AMP P/N: 747846-4



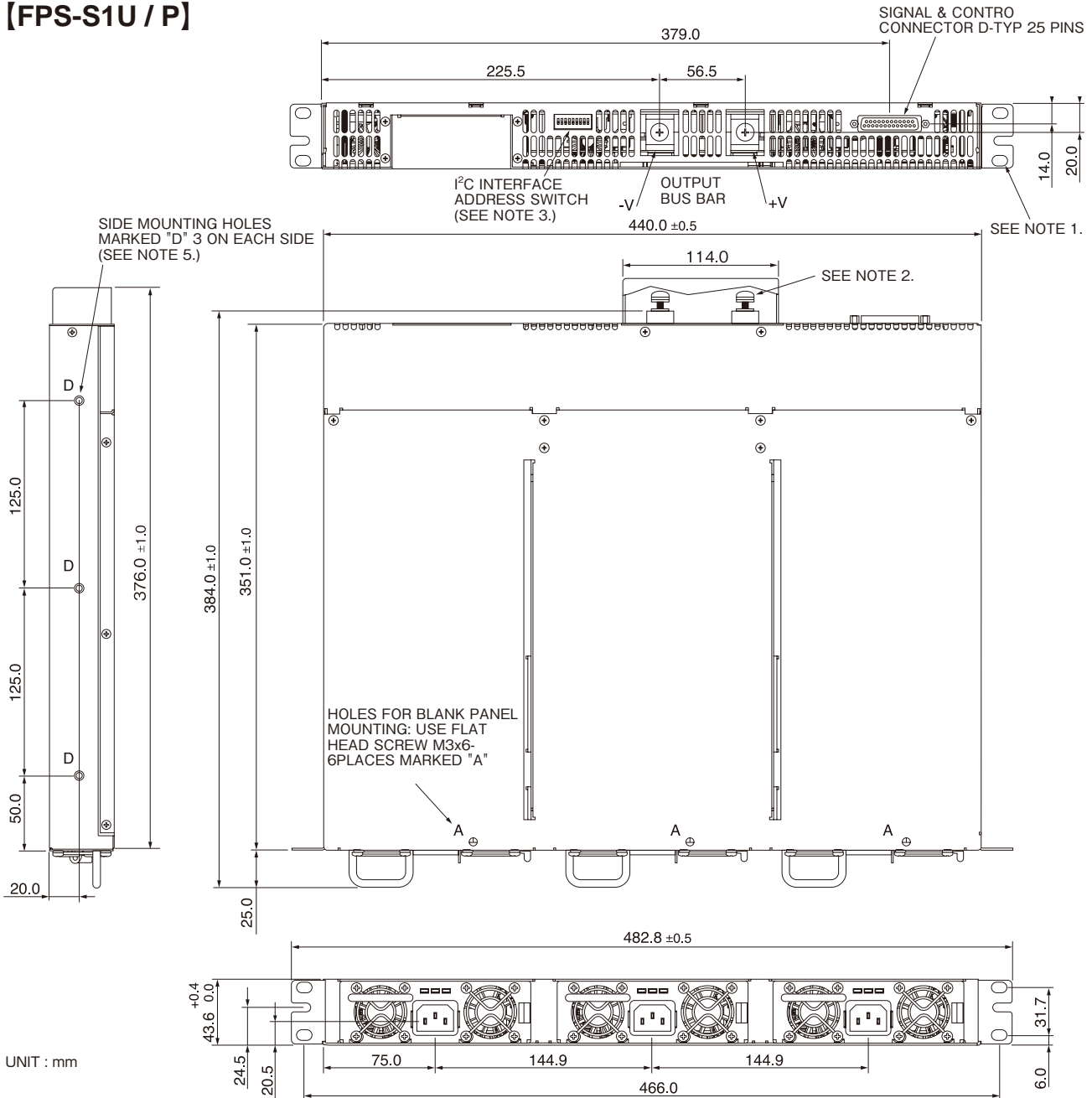
PIN NUMBER	FUNCTION	PIN NUMBER	FUNCTION	PIN NUMBER	FUNCTION
1	V_TRIM_B	9	CS	17	NC
2	TEMP_ALARM_B	10	V_TRIM_C	18	NC
3	DC_OK_B	11	SIGNAL_RTN	19	NC
4	TEMP_ALARM_A	12	DC_OK_C	20	SCL(I ² C)
5	ON/OFF_A	13	+S	21	SDA(I ² C)
6	DC_OK_A	14	AC_FAIL_B	22	-S
7	V_TRIM_A	15	ON/OFF_B	23	TEMP_ALARM_C
8	+12V_AUX	16	AC_FAIL_A	24	AC_FAIL_C
				25	ON/OFF_C



• All specifications are subject to change without notice.

[FPS-S1U / P]

FPS

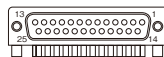


NOTES

- (*1) MOUNTING HOLES FOR 19" RACK, USE M6x12 TO FIX THE UNIT TO A RACK.
- (*2) M6x16 SCREWS FOR LOAD WIRES FIXING. USE M6 LUG FOR THE LOAD WIRES. RECOMMENDED TIGHTENING TORQUE 42 - 56 Kgf.cm
- (*3) REFER TO INSTRUCTION MANUAL FOR SETTING DETAILS.
- (*4) MODEL NAME , VOLTAGE AND CURRENT RATING AND SAFETY APPROVALS SYMBOLS WILL BE SHOWN HERE ACCORDING TO THE SPECIFICATIONS.
- (*5) MOUNTING HOLES M5 FOR MOUNTING BRACKETS . USE M5x8 SCREWS TO FIX THE BRACKETS TO THE CHASSIS. SCREWS MUST NOT PENETRATE THE CHASSIS MORE THAN 6 mm.
- (*6) THE FPS-S1U/P RACK IS SHOWN WITH 3 FPS1000/P UNITS INSTALLED.

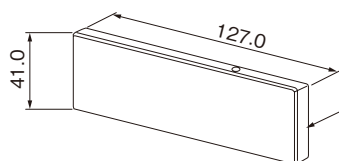
SIGNALS & CONTROL CONNECTOR PINS ASSIGNMENT

CONNECTOR DESCRIPTION:
D-TYPE RIGHT ANGLE, 25 POSITIONS,
FRONT METAL SHELL.
AMP P/N: 747846-4



PIN NUMBER	FUNCTION	PIN NUMBER	FUNCTION	PIN NUMBER	FUNCTION
1	V_TRIM_B	9	CS	17	NC
2	TEMP_ALARM_B	10	V_TRIM_C	18	NC
3	DC_OK_B	11	SIGNAL RTN	19	NC
4	TEMP_ALARM_A	12	DC_OK_C	20	SCL(FC)
5	ON/OFF_A	13	+SENSE	21	SDA(FC)
6	DC_OK_A	14	AC_FAIL_B	22	-SENSE
7	V_TRIM_A	15	ON/OFF_B	23	TEMP_ALARM_C
8	+12V_AUX	16	AC_FAIL_A	24	AC_FAIL_C
				25	ON/OFF_C

OUTPUT TERMINAL COVER.
INSTALL AFTER LOAD
CABLES CONNECTION.



BLANK PANEL
INFORMATION:
(OPTIONAL)
ORDER NAME: FPS-BP

