



RoHS



2MOPP



Terminal Block Style

Example recommended EMI/EMC filter
NAC-20-472High voltage pulse noise type : NAP series
Low leakage current type : NAM series
Low profile type : EAC series* A higher current rating EMI/EMC filter
may be recommended in view of the
other devices that could be connected
in parallel with the power supply.

- ① Series name
② Single output
③ Output wattage
④ Universal input
⑤ Output voltage
⑥ Optional *6
C : with Coating
G : Low leakage current
T : Terminal Block Style
 (Only 24V, 32V and 48V)
I : with PMBus interface
F2 : Reverse air exhaust type
P3 : Master-slave Operation
W1 : Alarm function
E1 : EMI classB
 (Only 24V, 32V and 48V)

For option details, refer to
instruction manual 6.1.

* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	PCA1000F-5	PCA1000F-12	PCA1000F-15	PCA1000F-24	PCA1000F-32	PCA1000F-48
MAX OUTPUT WATTAGE[W]	1000	1056	1050	1056	1056	1056
DC OUTPUT	5V 200A	12V 88A	15V 70A	24V 44A	32V 33A	48V 22A

SPECIFICATIONS

	MODEL	PCA1000F-5	PCA1000F-12	PCA1000F-15	PCA1000F-24	PCA1000F-32	PCA1000F-48
INPUT	VOLTAGE	[VAC]	85 - 264 1 φ (Output derating is required at less than 90V. Refer to "Derating")				
	CURRENT[A]	ACIN 100V	12.0typ				
		ACIN 230V	5.3typ				
	FREQUENCY[Hz]		50/60 (45 - 66)				
	EFFICIENCY[%]	ACIN 100V	(Io=50%)	90typ	91typ	91typ	91typ
			(Io=100%)	89typ	90typ	90typ	91typ
		ACIN 230V	(Io=50%)	92typ	92typ	92typ	93typ
			(Io=100%)	91typ	92typ	92typ	93typ
OUTPUT	POWER FACTOR	ACIN 100V	0.98typ (Io=100%)				
		ACIN 230V	0.95typ (Io=100%)				
	INRUSH CURRENT[A]	ACIN 100V*1	20/40 typ (Io=100%) (Primary inrush current / Secondary inrush current) (More than 3 sec. to re-start)				
		ACIN 230V*1	40/40 typ (Io=100%) (Primary inrush current / Secondary inrush current) (More than 3 sec. to re-start)				
	LEAKAGE CURRENT[ma]		0.5max (ACIN 240V 60Hz, Io=100%, According to IEC60601-1)				
	VOLTAGE[V]		5	12	15	24	32
	CURRENT[A]		200	88	70	44	33
	LINE REGULATION[mV]		20max	48max	60max	96max	128max
	LOAD REGULATION[mV]		40max	100max	120max	150max	150max
	RIPPLE[mVp-p]	0 to +50°C *2*3	160max	240max	240max	240max	320max
PROTECTION CIRCUIT AND OTHERS		-20 to 0°C *2	280max	320max	320max	320max	420max
	RIPPLE NOISE[mVp-p]	0 to +50°C *2*3	240max	300max	300max	300max	400max
		-20 to 0°C *2	320max	360max	360max	360max	480max
	TEMPERATURE REGULATION[mV]	0 to +50°C *3	50max	120max	150max	240max	320max
		-20 to +50°C *3	75max	180max	180max	290max	400max
	DRIFT[mV]	*4	20max	48max	60max	96max	128max
	START-UP TIME[ms]		700typ (ACIN 100/230V Io=100%)				
	HOLD-UP TIME[ms]		20typ (ACIN 230V Io=80%) / 16typ (ACIN 230V Io=100%)				
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		3.00 to 6.00	7.20 to 14.40	9.00 to 18.00	14.40 to 28.80	19.20 to 38.40
	OUTPUT VOLTAGE SETTING[V]		5.00 to 5.05	12.00 to 12.12	15.00 to 15.15	24.00 to 24.24	32.00 to 32.32
ISOLATION	OVERCURRENT PROTECTION		Works over 105% of rating (Recovers automatically, Hiccup overcurrent)				
	OVERVOLTAGE PROTECTION[V]		6.25 to 7.00	15.00 to 16.80	18.75 to 21.00	30.00 to 33.60	40.00 to 44.80
	REMOTE SENSING		Provided				
	REMOTE ON/OFF (RC)		Provided				
	DC_OK LAMP		LED (Blue)				
	ALARM LAMP		LED (Orange)				
ENVIRONMENT	COMMUNICATION FUNCTION		Provided (Extended UART)				
	INPUT-OUTPUT		AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP				
	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP				
	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)				
SAFETY AND NOISE REGULATIONS	OUTPUT-AUX · RC · PG · INFO · DS · ADDR0 · ADDR1 · ADDR2		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)				
	OPERATING TEMP., HUMIDITY AND ALTITUDE		-20 to +70°C, 20 - 90%RH (Non condensing)				
	STORAGE TEMP., HUMIDITY AND ALTITUDE		-20 to +75°C, 20 - 90%RH (Non condensing)				
	VIBRATION		10 - 55Hz 19.6m/s ² (2G) 3minutes period, 60minutes each along X, Y and Z axis				
	IMPACT		196.1m/s ² (20G) 11ms, once each X, Y and Z axis				
	AGENCY APPROVALS		UL62368-1, EN62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1), ANSI/AAMI ES60601-1, EN60601-1 3rd, C-UL (equivalent to CAN/CSA-C22.2 No.60601-1), Complies with IEC60601-1-2 4th Ed.				
	CONDUCTED NOISE		Complies with FCC Part15 classA, VCCI-A, CISPR32-A, EN55011-A, EN55032-A				
	HARMONIC ATTENUATOR *5		Complies with IEC61000-3-2 (class A)				

SPECIFICATIONS

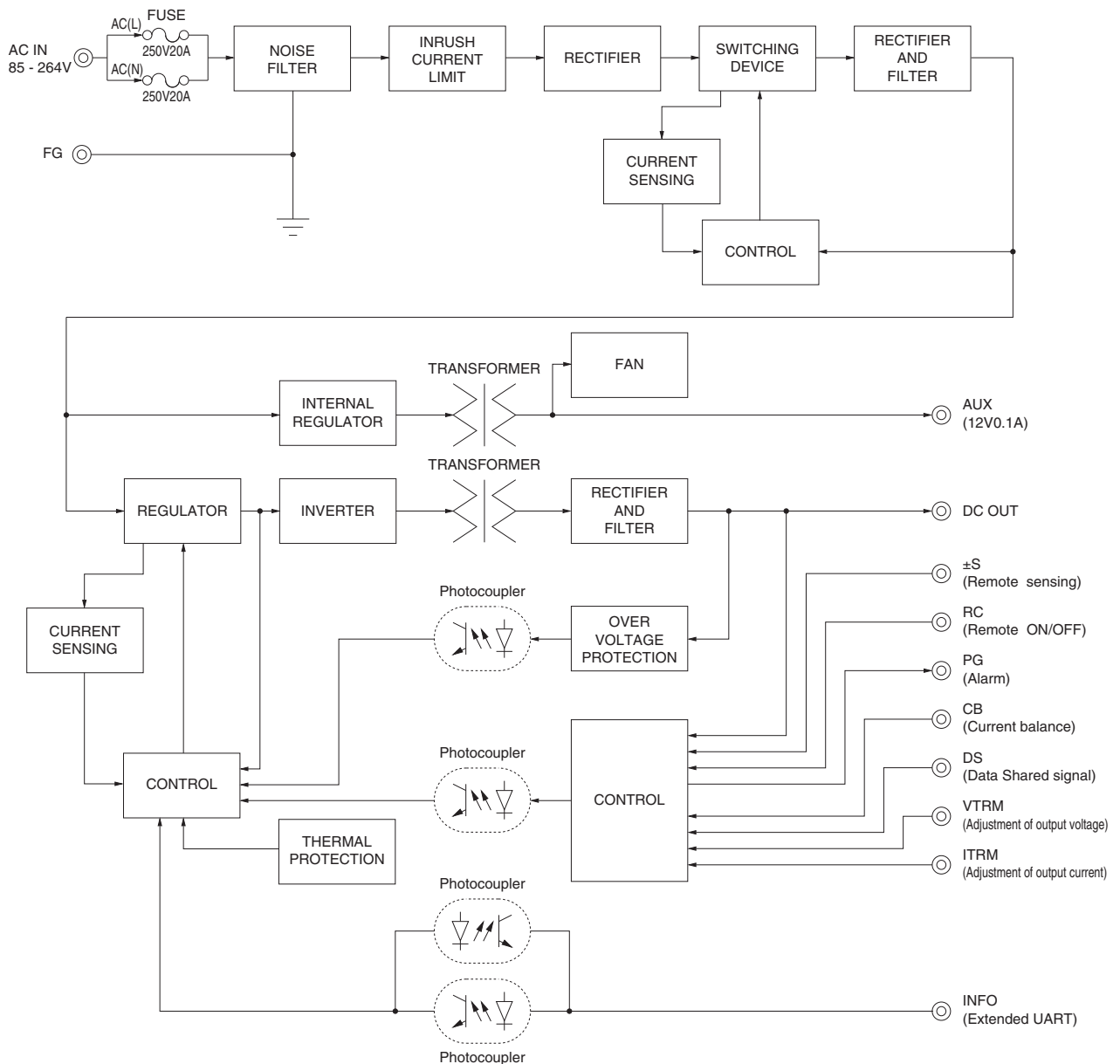
OTHERS	CASE SIZE/WEIGHT	102×41×178mm [4.02×1.61×7.01 inches] (without terminal block and screw) (W×H×D) / 1.2kg max
	COOLING METHOD	Forced cooling (internal fan)

- *1 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter(0.2ms or less) is excluded.
- *2 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN:RM103). Please refer to the instruction manual 1.2.
- *3 5V, 12V, 15V output product, the maximum temperature of 40°C.
- *4 Drift is the change in DC output for an eight hours period after a half-hour warm-up at 25°C.
- *5 Please contact us about another class.
- *6 The listed options may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.
- * A sound may occur from power supply at pulse loading.

Features

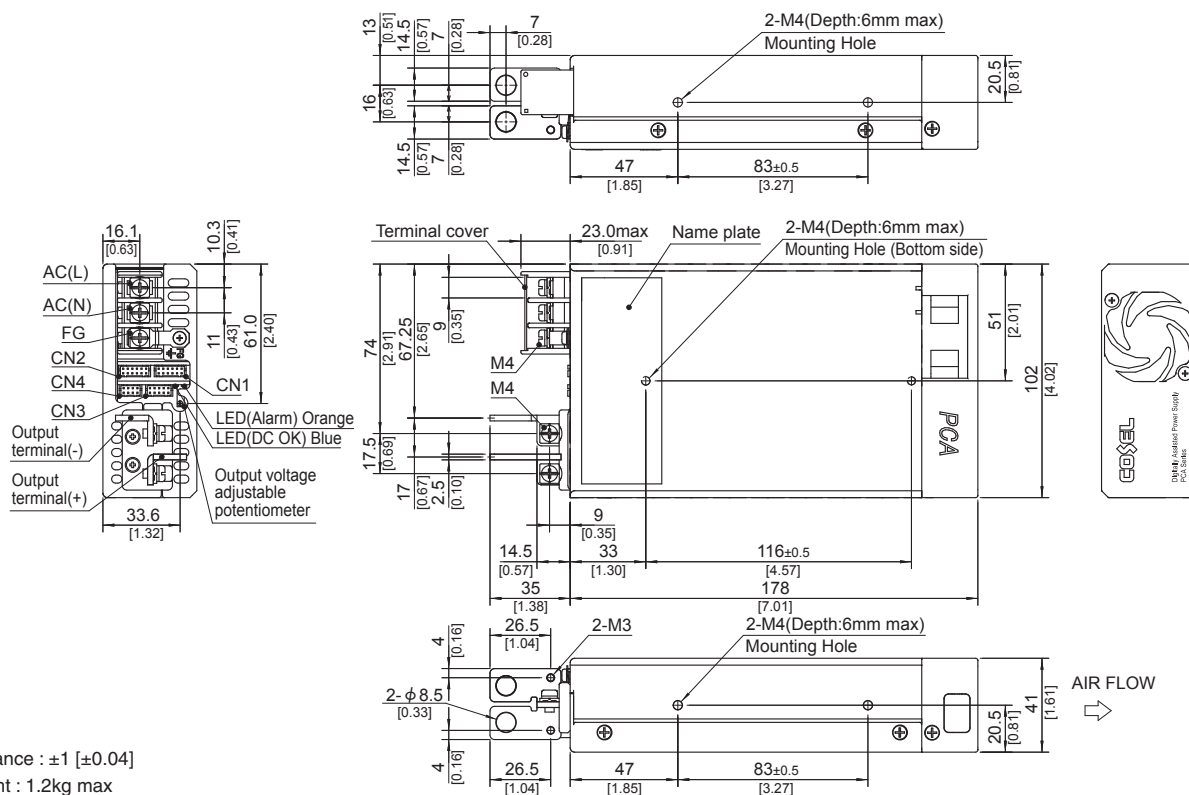
- Low profile (41mm, 1.61 inch = meet 1U height)
- Universal input 85 - 264VAC (Refer to “Derating”, when using at 85 - 90VAC)
- For medical electric equipment (ANSI/AAMI ES60601-1, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
- Medical Isolation Grade 2MOPP
- With AUX output 12V 0.1A (Voltage adjustable range 5 - 12V)
- Constant current function
- Output voltage can be adjusted to near 0V (the item 2.6 on Instruction Manual)
- With various alarms
- Parallel Operation / N+1 Parallel Redundancy Operation possible
- Monitoring function and various setting values can be changed by communication (the item 2.11 on Instruction Manual)
- Complies with SEMI F47 (the item 2.1 on Instruction Manual)

Block diagram



External view

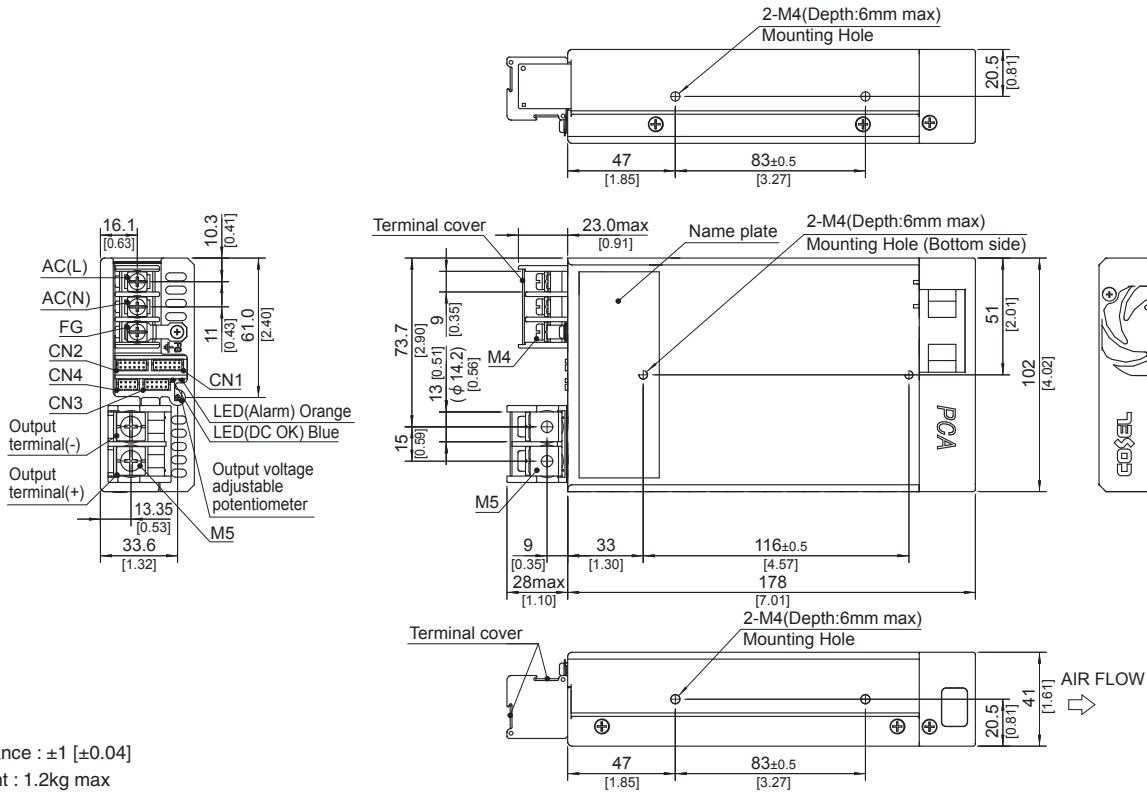
<PCA1000F-□ (Bus Bar Style) >



- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 1.2kg max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
 - M3 0.6N·m max
 - M4 1.6N·m max
- ※ Please connect safety ground to FG terminal on the unit.

External view

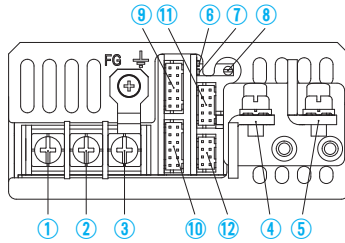
<PCA1000F-□-T (Terminal Block Style) >



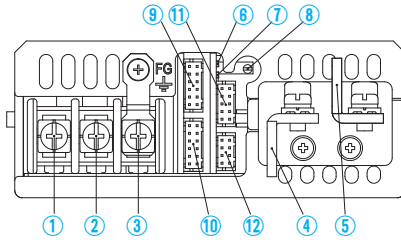
- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 1.2kg max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [] = inches
- ※ Mounting torque : 1.2N · m max
- ※ Input and output terminal screw tightening torque
 - M4 1.6N · m max
 - M5 2.5N · m max
- ※ Please connect safety ground to FG terminal on the unit.

Terminal Blocks

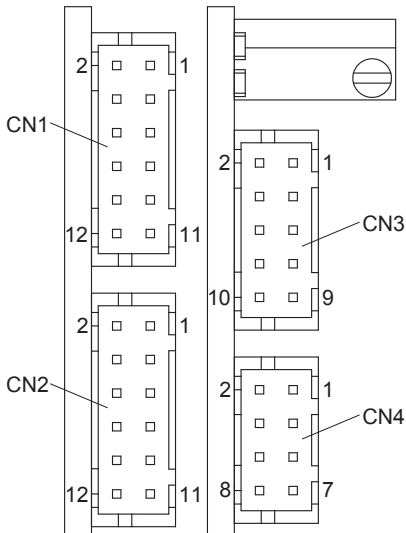
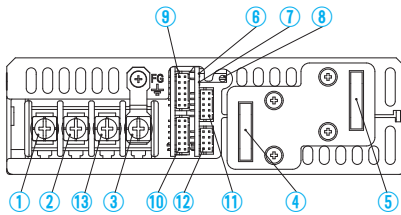
●PCA300F, PCA600F



●PCA1000F



●PCA1500F



Connector pin numbers

- ①AC (L) } Input Terminals 85 - 264VAC 1 ϕ 45 - 66Hz
- ②AC (N) } (M4) 88 - 370VDC (Excluding PCA1000F PCA1500F)
- ③Frame ground (M4)
- ④-Output
- ⑤+Output
- ⑥LED for fault condition detection (ALARM) Color : Orange
- ⑦LED for output voltage confirmation (DC_OK) Color : Blue
- ⑧Output voltage adjustable potentiometer
- ⑨CN1
- ⑩CN2
- ⑪CN3
- ⑫CN4
- ⑬N.C.

Pin Configuration and Functions of CN1, CN2

Pin No.	Function		Ground level
1	+S	+Remote sensing	COM
2	N.C.	No connection	-
3	N.C.	No connection	-
4	-S	-Remote sensing	COM
5	VTRM	Adjustment of output voltage	COM
6	COM	Common ground (for signal)	COM
7	INFO	Extended UART signal	SGND
8	CB	Current Balance	COM
9	DS	Data Shared signal	SGND
10	SGND	Signal ground	SGND
11	RC2	Remote ON/OFF	RCG
12	RCG	Remote ON/OFF ground	RCG

* Each terminal of CN1 and CN2 are connected inside the power supply.

Pin Configuration and Functions of CN3

Pin No.	Function		Ground level
1	AUX	Auxiliary output	AUXG
2	AUXG	Auxiliary output ground	AUXG
3	RC1	Remote ON/OFF	AUXG
4	AUXG	Auxiliary output ground	AUXG
5	PG	Alarm	PGG
6	PGG	Alarm ground	PGG
7	ITRM	Adjustment of output current	COM
8	COM	Common ground (for signal)	COM
9	VTRM_EN	Enable Vtrm	COM
10	SLV_EN	Enable Slave mode *1	COM

Pin Configuration and Functions of CN4

Pin No.	Function		Ground level
1	SDA	Serial data *2	SGND
2	SGND	Signal ground	SGND
3	SCL	Serial clock *2	SGND
4	SMBA	SMBAlert *2	SGND
5	ADDR0	Address bit 0	SGND
6	ADDR1	Address bit 1	SGND
7	ADDR2	Address bit 2	SGND
8	SGND	Signal ground	SGND

Matching connectors and terminals

Connector	Housing	Terminal	Mfr.
CN1 CN2	S12B-PHDS	PHDR-12VS	Reel : SPHD-002T-P0.5 Loose : BPHD-001T-P0.5 *3 BPHD-002T-P0.5 *3 J.S.T
CN3	S10B-PHDS	PHDR-10VS	
CN4	S8B-PHDS	PHDR-8VS	

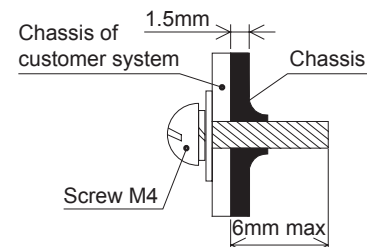
*1 For -P3 option.

*2 For -I option.

*3 The manufacturer prepares only the ratchet hand.

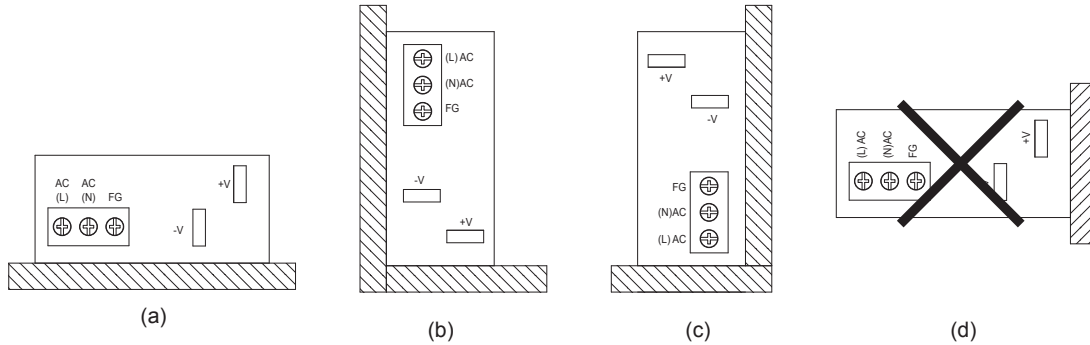
Assembling and Installation Method

- Please observe the mounting screw length in right figure to obtain enough isolation between screws and internal components.



Assembling and Installation Method

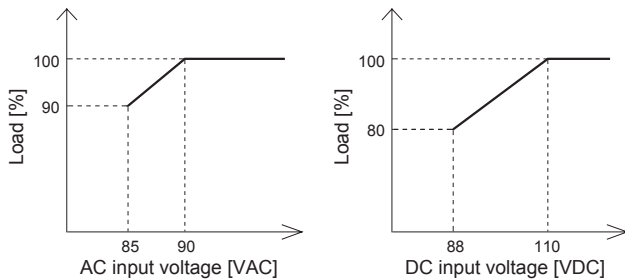
- Please do not block built-in fans and ventilation holes. When the power supply is mounted by screws, please consider its weight and set it in place. (Please see below.)
- Please avoid the D installation method in the following figure because it will cause stress on the mounting holes.
- If power supplies are used in a dusty environment, it might cause a failure. Please consider taking such countermeasures as installing an air filter near the suction area of the system to prevent a failure.



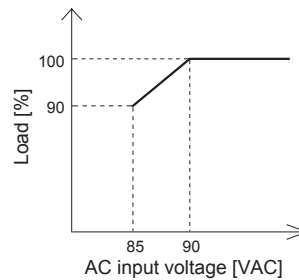
Derating

Input voltage Derating curve

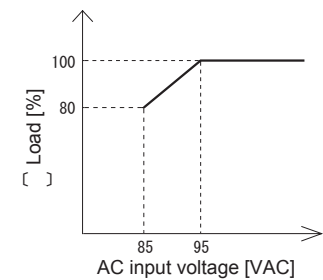
● PCA600F



● PCA1000F

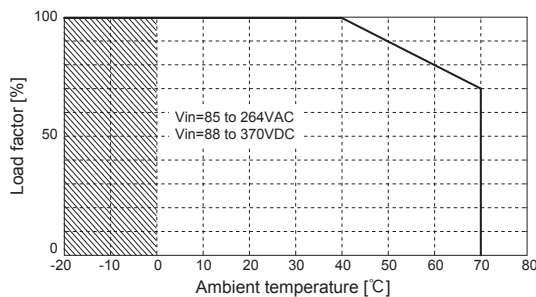


● PCA1500F



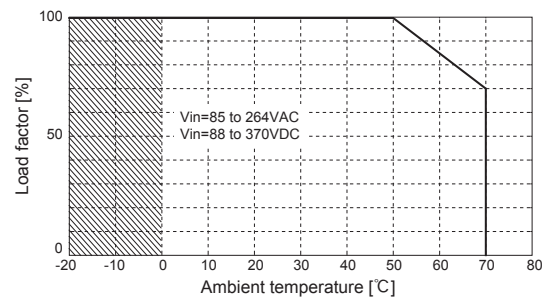
● PCA300F-5

Ambient Temperature Derating Curve



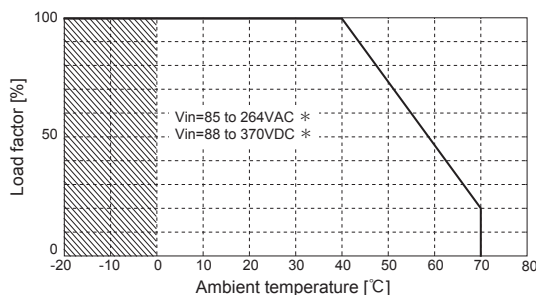
● PCA300F-12, -15, -24, -32, -48

Ambient Temperature Derating Curve



● PCA600F-5

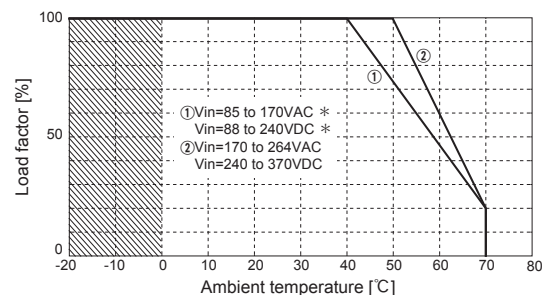
Ambient Temperature Derating Curve



*With derating due to input voltage

● PCA600F-12, -15, -24, -32, -48

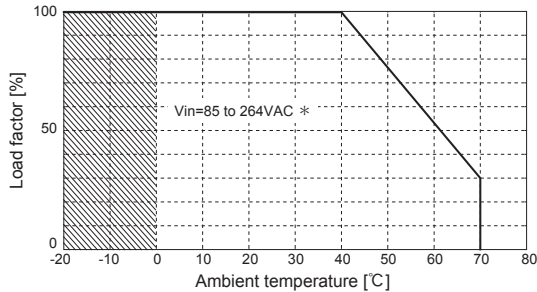
Ambient Temperature Derating Curve



*With derating due to input voltage

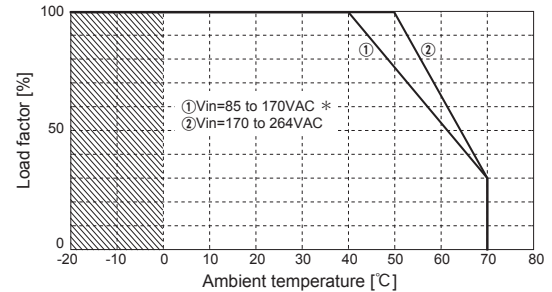
Derating

● PCA1000F-5, -12, -15 Ambient Temperature Derating Curve



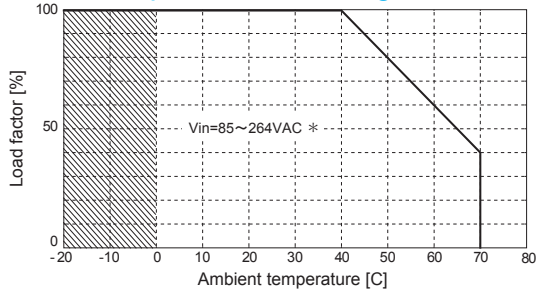
*With derating due to input voltage

● PCA1000F-24, -32, -48 Ambient Temperature Derating Curve



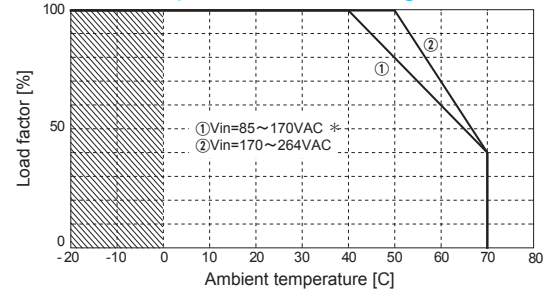
*With derating due to input voltage

● PCA1500F-5, -12, -15 Ambient Temperature Derating Curve



*With derating due to input voltage

● PCA1500F-24, -32, -48 Ambient Temperature Derating Curve



*With derating due to input voltage

■ Specifications for ripple and ripple noise are different in the hatched area.

■ The ambient temperature is defined as the temperature of the air at air-intake side of the power supply.

Instruction Manual

◆ It is necessary to read the "Instruction Manual" and "Before using our product" before you use our product.

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection circuit	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
PCA300F	Active filter	15 - 400	3.8	250V 10A	Relay	FR-4	-	Yes	Yes	Yes
	Buck converter	88								
	Full - bridge converter	44								
PCA600F	Active filter	15 - 400	7.3	250V 16A	Relay	FR-4	-	Yes	Yes	Yes
	Buck converter	88								
	Full - bridge converter	44								
PCA1000F	Active filter	15 - 400	12.0	250V 20A	Relay	FR-4	-	Yes	Yes	Yes
	Buck converter	88								
	Full - bridge converter	44								
PCA1500F	Active filter	15 - 400	18.0	250V 31.5A	Relay	FR-4	-	Yes	Yes	Yes
	Buck converter	88								
	Full - bridge converter	44								

* The value of input current is at ACIN 100VAC and rated load.