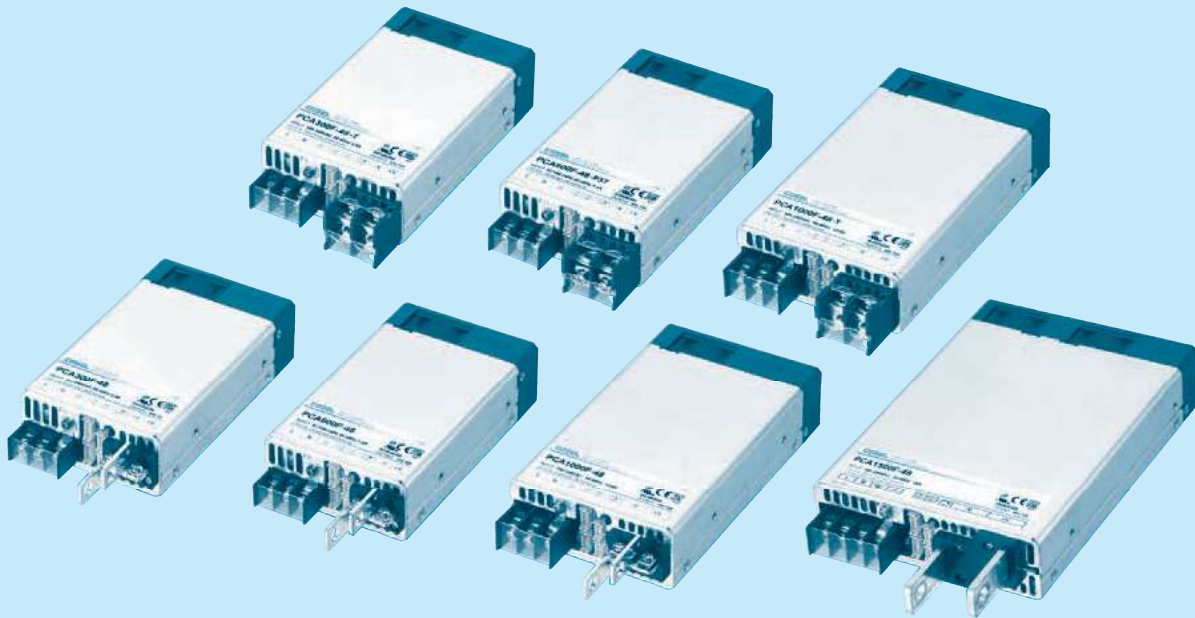


# PCA-series



PCA300F

PCA600F

PCA1000F

PCA1500F

## Feature

Low profile (41mm, 1.61 inch = meet 1U height)  
 Universal input 85 - 264VAC  
 (Refer to "Input voltage Derating")  
 DC input 88 - 370VDC possible : Excluding PCA1000F and PCA1500F  
 (Refer to "Input voltage Derating")  
 For medical electric equipment (ANSI/AAMI ES60601-1, EN60601-1 3rd)  
 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)  
 UL508 (Optional)

## Safety agency approval

- UL62368-1, C-UL (CSA62368-1), EN62368-1, ANSI/AAMI ES60601-1, EN60601-1 3rd  
 UL508 (Optional)

## Up to 5-year warranty (Refer to Instruction Manual)

## CE marking

Low Voltage Directive  
 RoHS Directive

## UKCA marking

Electrical Equipment Safety Regulations  
 RoHS Regulations

## EMI

- PCA300F, PCA600F  
 Complies with FCC-B, CISPR32-B, EN55011-B, EN55032-B, VCCI-B
- PCA1000F, PCA1500F  
 Complies with FCC-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A

## EMS Compliance : EN61204-3, EN61000-6-2 IEC60601-1-2 (2014), EN60601-1-2 (2015)

EN61000-4-2  
 EN61000-4-3  
 EN61000-4-4  
 EN61000-4-5  
 EN61000-4-6  
 EN61000-4-8  
 EN61000-4-11

# PCA300F

PC A 300 F -5 -□  
① ② ③ ④ ⑤ ⑥



**RoHS  
2MOPP**



Terminal Block Style

Example recommended EMI/EMC filter  
**NAC-06-472**



High 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 \*7
- C : with Coating
- G : Low leakage current
- T : Terminal Block Style
- I : with PMBus interface
- F2 : Reverse air exhaust type
- P3 : Master-slave Operation
- W1 : Alarm function
- T5 : UL508

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                 | PCA300F-5 | PCA300F-12 | PCA300F-15 | PCA300F-24 | PCA300F-32 | PCA300F-48 |
|-----------------------|-----------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 300       | 324        | 330        | 336        | 320        | 336        |
| DC OUTPUT             | 5V 60A    | 12V 27A    | 15V 22A    | 24V 14A    | 32V 10A    | 48V 7A     |

## SPECIFICATIONS

|                                            | MODEL                                 |                                                                                                        | PCA300F-5                                                 | PCA300F-12                                                                                                                                                                                                   | PCA300F-15     | PCA300F-24     | PCA300F-32     | PCA300F-48     |                |
|--------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|
| INPUT                                      | VOLTAGE                               | [VAC]                                                                                                  | 85 - 264 1 φ                                              |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            |                                       | [VDC] *1                                                                                               | 88 - 370                                                  |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            | CURRENT[A]                            | ACIN 100V                                                                                              | 3.8typ                                                    |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            |                                       | ACIN 230V                                                                                              | 1.6typ                                                    |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            | FREQUENCY[Hz]                         |                                                                                                        | 50/60 (45 - 66)                                           |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            | EFFICIENCY[%]                         | ACIN 100V                                                                                              | (Io=50%)                                                  | 86typ                                                                                                                                                                                                        | 87typ          | 87typ          | 88typ          | 88typ          | 88typ          |
|                                            |                                       |                                                                                                        | (Io=100%)                                                 | 87typ                                                                                                                                                                                                        | 88typ          | 88typ          | 89typ          | 89typ          | 89typ          |
|                                            |                                       | ACIN 230V                                                                                              | (Io=50%)                                                  | 87typ                                                                                                                                                                                                        | 88typ          | 88typ          | 89typ          | 89typ          | 89typ          |
|                                            |                                       |                                                                                                        | (Io=100%)                                                 | 89typ                                                                                                                                                                                                        | 90typ          | 90typ          | 91typ          | 91typ          | 91typ          |
|                                            | POWER FACTOR                          | ACIN 100V                                                                                              | 0.98typ (Io=100%)                                         |                                                                                                                                                                                                              |                |                |                |                |                |
| ACIN 230V                                  |                                       | 0.95typ (Io=100%)                                                                                      |                                                           |                                                                                                                                                                                                              |                |                |                |                |                |
| INRUSH CURRENT[A]                          | ACIN 100V *2                          | 20/40 typ (Io=100%) (Primary inrush current / Secondary inrush current) (More than 3 sec. to re-start) |                                                           |                                                                                                                                                                                                              |                |                |                |                |                |
|                                            | ACIN 230V *2                          | 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) |                                                                                                                                                                                                              |                |                |                |                |                |
| OUTPUT                                     | VOLTAGE[V]                            |                                                                                                        | 5                                                         | 12                                                                                                                                                                                                           | 15             | 24             | 32             | 48             |                |
|                                            | CURRENT[A]                            |                                                                                                        | 60                                                        | 27                                                                                                                                                                                                           | 22             | 14             | 10             | 7              |                |
|                                            | LINE REGULATION[mV]                   |                                                                                                        | 20max                                                     | 48max                                                                                                                                                                                                        | 60max          | 96max          | 128max         | 192max         |                |
|                                            | LOAD REGULATION[mV]                   |                                                                                                        | 40max                                                     | 100max                                                                                                                                                                                                       | 120max         | 150max         | 150max         | 480max         |                |
|                                            | RIPPLE[mVp-p]                         | 0 to +50℃ *3*4                                                                                         | 160max                                                    | 240max                                                                                                                                                                                                       | 240max         | 240max         | 320max         | 480max         |                |
|                                            |                                       | -20 to 0℃ *3                                                                                           | 280max                                                    | 320max                                                                                                                                                                                                       | 320max         | 320max         | 420max         | 640max         |                |
|                                            | RIPPLE NOISE[mVp-p]                   | 0 to +50℃ *3*4                                                                                         | 240max                                                    | 300max                                                                                                                                                                                                       | 300max         | 300max         | 400max         | 600max         |                |
|                                            |                                       | -20 to 0℃ *3                                                                                           | 320max                                                    | 360max                                                                                                                                                                                                       | 360max         | 360max         | 480max         | 720max         |                |
|                                            | TEMPERATURE REGULATION[mV]            | 0 to +50℃ *4                                                                                           | 50max                                                     | 120max                                                                                                                                                                                                       | 150max         | 240max         | 320max         | 480max         |                |
|                                            |                                       | -20 to +50℃ *4                                                                                         | 75max                                                     | 180max                                                                                                                                                                                                       | 180max         | 290max         | 400max         | 600max         |                |
|                                            | DRIFT[mV] *5                          |                                                                                                        | 20max                                                     | 48max                                                                                                                                                                                                        | 60max          | 96max          | 128max         | 192max         |                |
|                                            | 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 | 28.80 to 57.60 |
| 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 | 48.00 to 48.48 |                |
| PROTECTION<br>CIRCUIT AND<br>OTHERS        | 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 | 60.00 to 67.20 |
|                                            | REMOTE SENSING                        |                                                                                                        |                                                           | Provided                                                                                                                                                                                                     |                |                |                |                |                |
|                                            | REMOTE ON/OFF (RC)                    |                                                                                                        |                                                           | Provided                                                                                                                                                                                                     |                |                |                |                |                |
|                                            | DC_OK LAMP                            |                                                                                                        |                                                           | LED (Blue)                                                                                                                                                                                                   |                |                |                |                |                |
|                                            | ALARM LAMP                            |                                                                                                        |                                                           | LED (Orange)                                                                                                                                                                                                 |                |                |                |                |                |
|                                            | COMMUNICATION FUNCTION                |                                                                                                        |                                                           | Provided (Extended UART)                                                                                                                                                                                     |                |                |                |                |                |
| ISOLATION                                  | 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)                                                                                                                                |                |                |                |                |                |
| OUTPUT-AUX-RC-PG-INFO-DS-ADDR0-ADDR1-ADDR2 |                                       |                                                                                                        |                                                           | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)                                                                                                                                |                |                |                |                |                |
| ENVIRONMENT                                | OPERATING TEMP.,HUMIDITY.AND ALTITUDE |                                                                                                        |                                                           | -20 to +70℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                |                |                |                |                |
|                                            | STORAGE TEMP.,HUMIDITY.AND ALTITUDE   |                                                                                                        |                                                           | -20 to +75℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                |                |                |                |                |
|                                            | VIBRATION                             |                                                                                                        |                                                           | 10 - 55Hz 19.6m/s² (2G) 3minutes period, 60minutes each along X, Y and Z axis                                                                                                                                |                |                |                |                |                |
|                                            | IMPACT                                |                                                                                                        |                                                           | 196.1m/s² (20G) 11ms, once each X, Y and Z axis                                                                                                                                                              |                |                |                |                |                |
| SAFETY<br>AND NOISE<br>REGULATIONS         | 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), UL508 (Optional), Complies with IEC60601-1-2 4th Ed. |                |                |                |                |                |
|                                            | CONDUCTED NOISE                       |                                                                                                        |                                                           | Complies with FCC Part15 classB, VCCI-B, CISPR32-B, EN55011-B, EN55032-B                                                                                                                                     |                |                |                |                |                |
|                                            | HARMONIC ATTENUATOR *6                |                                                                                                        |                                                           | Complies with IEC61000-3-2 (class A)                                                                                                                                                                         |                |                |                |                |                |

## SPECIFICATIONS

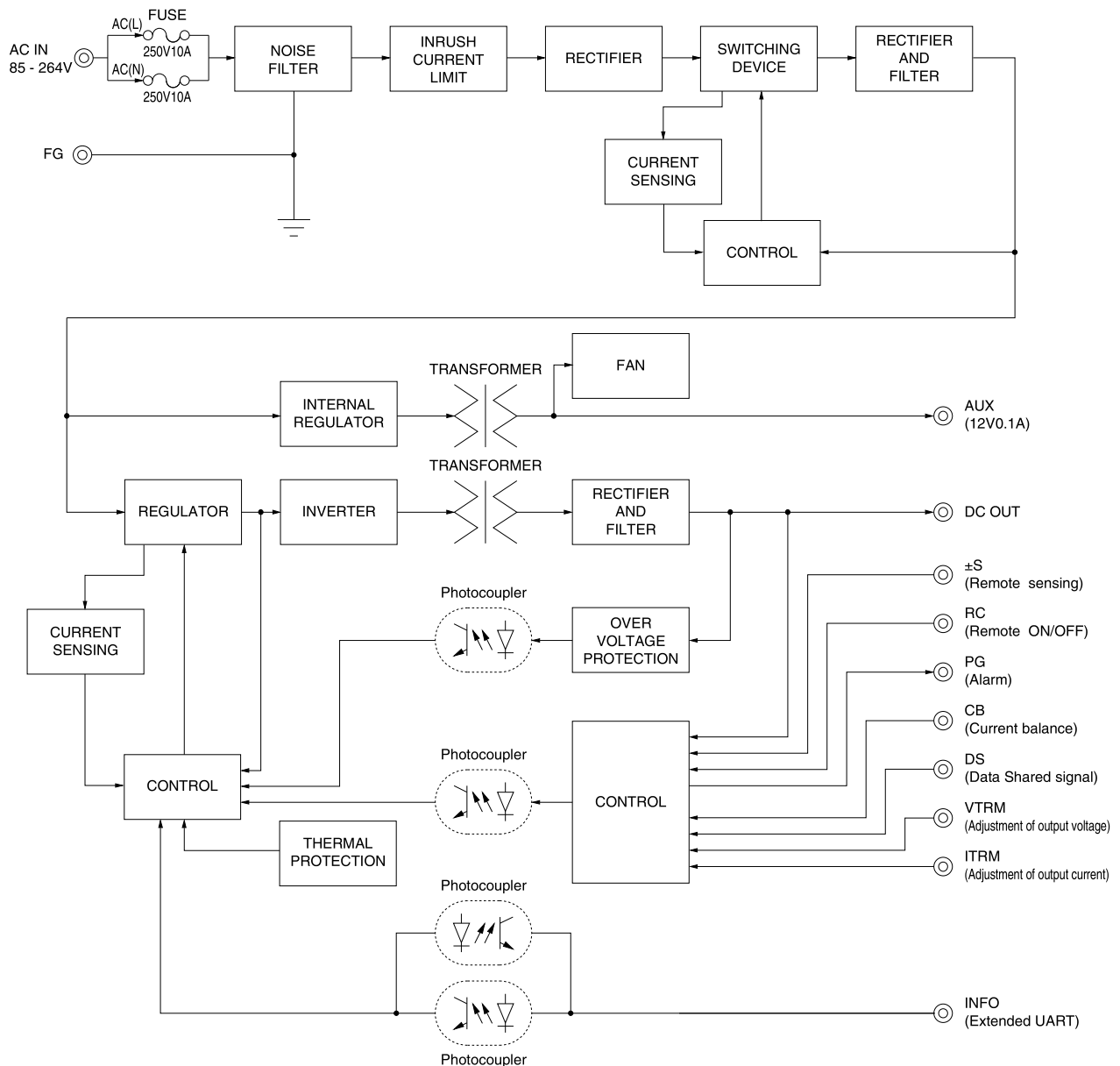
|        |                  |                                                                                                       |
|--------|------------------|-------------------------------------------------------------------------------------------------------|
| OTHERS | CASE SIZE/WEIGHT | 89 X 41 X 152mm [3.50 X 1.61 X 5.98 inches] (without terminal block and screw) (W X H X D) / 840g max |
|        | COOLING METHOD   | Forced cooling (internal fan)                                                                         |

- \*1 DC input safety agency approvals deleted.
- \*2 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter(0.2ms or less) is excluded.
- \*3 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN:RM103). Please refer to the instruction manual 1.2.
- \*4 5V output product, the maximum temperature of 40°C.
- \*5 Drift is the change in DC output for an eight hours period after a half-hour warm-up at 25°C.
- \*6 Please contact us about another class.
- \*7 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

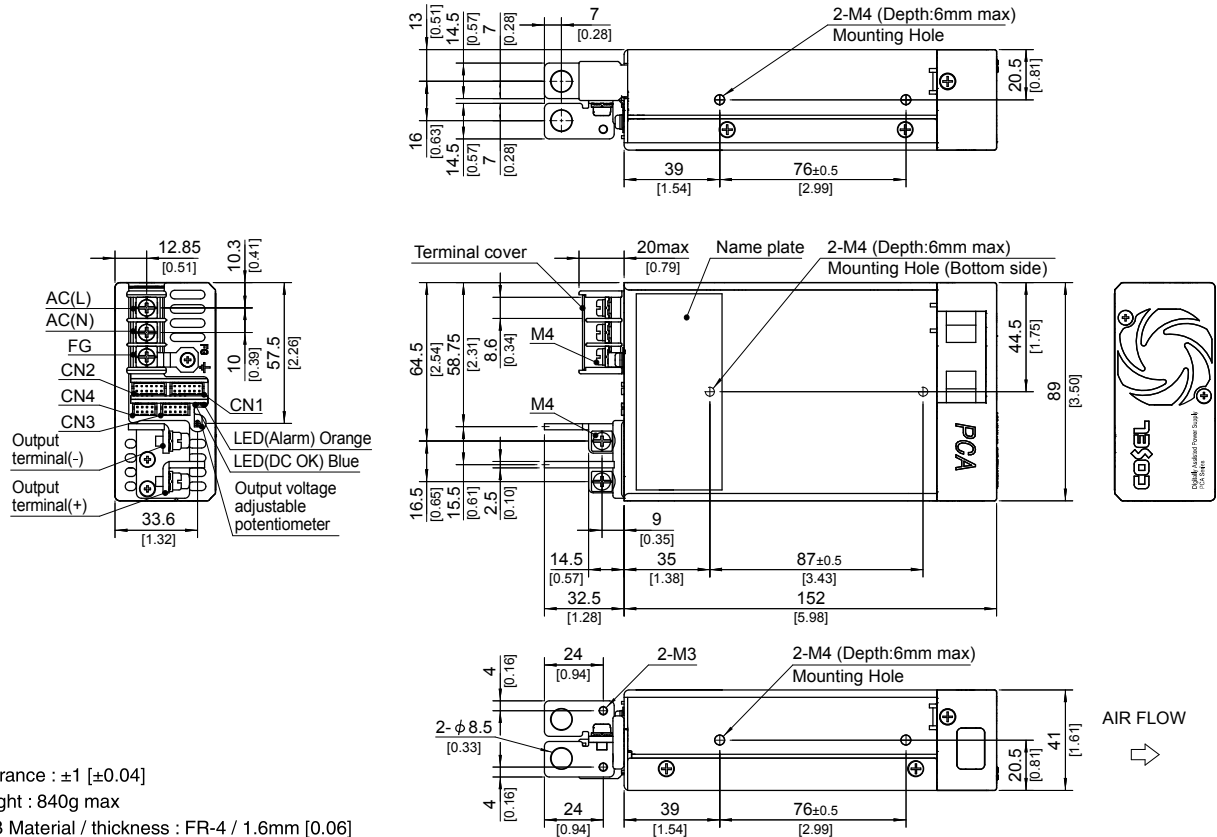
- Low profile (41mm, 1.61 inch = meet 1U height)
- Universal input 85 - 264VAC
- DC input 88 - 370VDC possible
- For medical electric equipment (ANSI/AAMI ES60601-1, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
- Medical Isolation Grade 2MOPP
- With AUX output 12V 0.1A (Voltage adjustable range 5 - 12V)
- Constant 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)
- UL508 approval

## Block diagram



## External view

<PCA300F-□ (Bus Bar Style) >

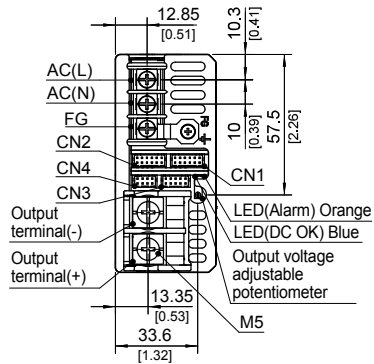


- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [ ] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
  - M3 0.6N·m max
  - M4 1.6N·m max
- ※ Please connect safety ground to FG terminal on the unit.

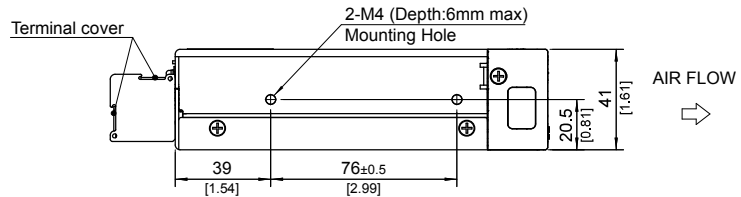
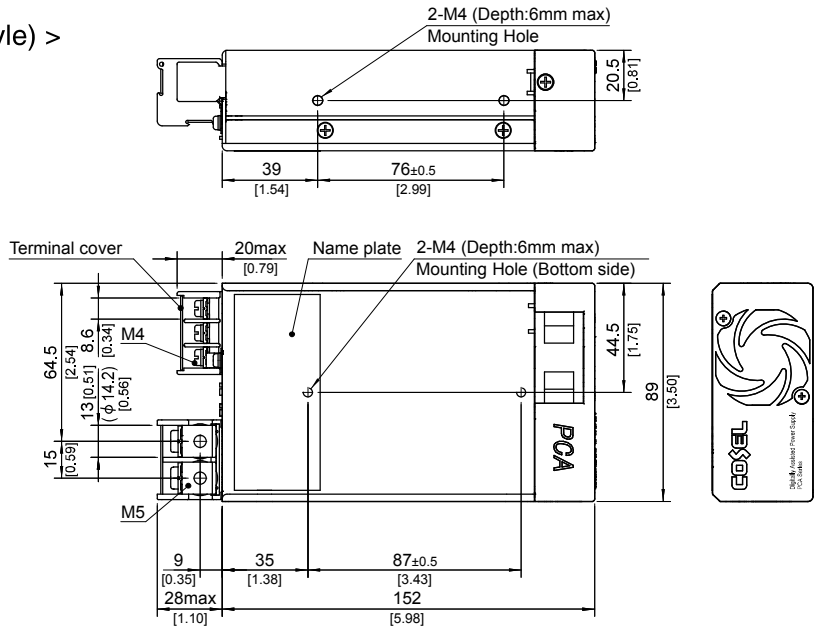


## External view

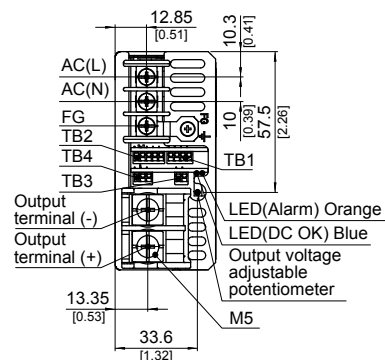
## &lt;PCA300F-□-T (Terminal Block Style) &gt;



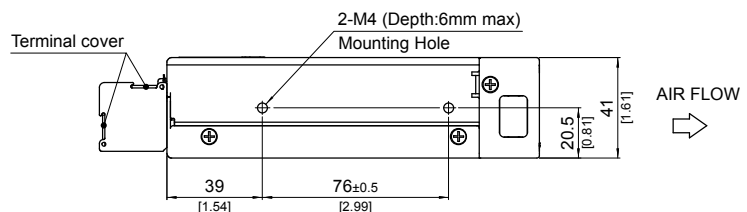
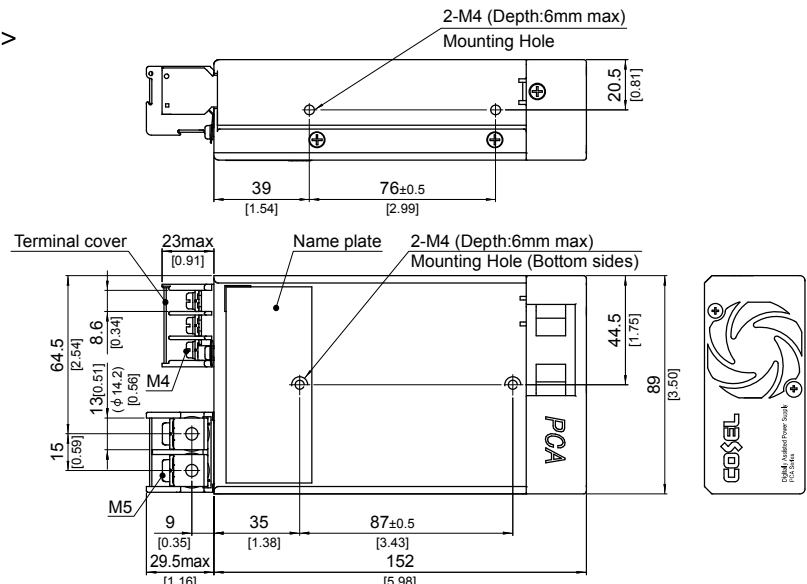
- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [ ] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
  - M4 1.6N·m max
  - M5 2.5N·m max
- ※ Please connect safety ground to FG terminal on the unit.



## &lt;PCA300F-□-T5 (Acquired UL508) &gt;



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g 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.



# PCA600F

PC A 600 F -5 -□

① ② ③ ④ ⑤ ⑥



RoHS  
2MOPP



Terminal Block Style

Example recommended EMI/EMC filter  
NAC-16-472



High 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 \*7
- C : with Coating
- G : Low leakage current
- T : Terminal Block Style
- (Only 12V, 15V, 24V, 32V and 48V)
- I : with PMBus interface
- F2 : Reverse air exhaust type
- P3 : Master-slave Operation
- W1 : Alarm function
- T5 : UL508
- (Only 12V, 15V, 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                 | PCA600F-5 | PCA600F-12 | PCA600F-15 | PCA600F-24 | PCA600F-32 | PCA600F-48 |
|-----------------------|-----------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 600       | 636        | 645        | 648        | 640        | 624        |
| DC OUTPUT             | 5V 120A   | 12V 53A    | 15V 43A    | 24V 27A    | 32V 20A    | 48V 13A    |

## SPECIFICATIONS

|                                     | MODEL                                      |                | PCA600F-5                                                                                                                                                                                                    | PCA600F-12     | PCA600F-15     | PCA600F-24     | PCA600F-32     | PCA600F-48     |        |
|-------------------------------------|--------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|--------|
| INPUT                               | VOLTAGE                                    | [VAC]          | 85 - 264 1 φ (Output derating is required at less than 90V. Refer to “Derating” )                                                                                                                            |                |                |                |                |                |        |
|                                     |                                            | [VDC] *1       | 88 - 370 (Output derating is required at less than 110V. Refer to “Derating” )                                                                                                                               |                |                |                |                |                |        |
|                                     | CURRENT[A]                                 | ACIN 100V      | 7.3typ                                                                                                                                                                                                       |                |                |                |                |                |        |
|                                     |                                            | ACIN 230V      | 3.2typ                                                                                                                                                                                                       |                |                |                |                |                |        |
|                                     | FREQUENCY[Hz]                              |                | 50/60 (45 - 66)                                                                                                                                                                                              |                |                |                |                |                |        |
|                                     | EFFICIENCY[%]                              | ACIN 100V      | (Io=50%)                                                                                                                                                                                                     | 90typ          | 91typ          | 91typ          | 91typ          | 91typ          | 91typ  |
|                                     |                                            |                | (Io=100%)                                                                                                                                                                                                    | 89typ          | 90typ          | 90typ          | 91typ          | 91typ          | 91typ  |
|                                     |                                            | ACIN 230V      | (Io=50%)                                                                                                                                                                                                     | 92typ          | 92typ          | 92typ          | 93typ          | 93typ          | 93typ  |
|                                     |                                            |                | (Io=100%)                                                                                                                                                                                                    | 91typ          | 92typ          | 92typ          | 93typ          | 93typ          | 93typ  |
| POWER FACTOR                        |                                            | ACIN 100V      | 0.98typ (Io=100%)                                                                                                                                                                                            |                |                |                |                |                |        |
|                                     |                                            | ACIN 230V      | 0.95typ (Io=100%)                                                                                                                                                                                            |                |                |                |                |                |        |
| INRUSH CURRENT[A]                   |                                            | ACIN 100V*2    | 20/40 typ (Io=100%) (Primary inrush current / Secondary inrush current) (More than 3 sec. to re-start)                                                                                                       |                |                |                |                |                |        |
|                                     |                                            | ACIN 230V*2    | 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)                                                                                                                                                    |                |                |                |                |                |        |
| OUTPUT                              | VOLTAGE[V]                                 |                | 5                                                                                                                                                                                                            |                |                |                |                |                |        |
|                                     | CURRENT[A]                                 |                | 120                                                                                                                                                                                                          | 53             | 43             | 27             | 20             | 13             |        |
|                                     | LINE REGULATION[mV]                        |                | 20max                                                                                                                                                                                                        | 48max          | 60max          | 96max          | 128max         | 192max         |        |
|                                     | LOAD REGULATION[mV]                        |                | 40max                                                                                                                                                                                                        | 100max         | 120max         | 150max         | 150max         | 480max         |        |
|                                     | RIPPLE[mVp-p]                              | 0 to +50℃ *3*4 | 160max                                                                                                                                                                                                       | 240max         | 240max         | 240max         | 320max         | 480max         |        |
|                                     |                                            | -20 to 0℃ *3   | 280max                                                                                                                                                                                                       | 320max         | 320max         | 320max         | 420max         | 640max         |        |
|                                     | RIPPLE NOISE[mVp-p]                        | 0 to +50℃ *3*4 | 240max                                                                                                                                                                                                       | 300max         | 300max         | 300max         | 400max         | 600max         |        |
|                                     |                                            | -20 to 0℃ *3   | 320max                                                                                                                                                                                                       | 360max         | 360max         | 360max         | 480max         | 720max         |        |
|                                     | TEMPERATURE REGULATION[mV]                 | 0 to +50℃ *4   | 50max                                                                                                                                                                                                        | 120max         | 150max         | 240max         | 320max         | 480max         |        |
|                                     |                                            | -20 to +50℃ *4 | 75max                                                                                                                                                                                                        | 180max         | 180max         | 290max         | 400max         | 600max         |        |
|                                     | DRIFT[mV]                                  |                | *5                                                                                                                                                                                                           | 20max          | 48max          | 60max          | 96max          | 128max         | 192max |
|                                     | 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 | 28.80 to 57.60 |        |
| 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 | 48.00 to 48.48 |                |        |
| PROTECTION<br>CIRCUIT AND<br>OTHERS | 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 | 60.00 to 67.20 |        |
|                                     | REMOTE SENSING                             |                | Provided                                                                                                                                                                                                     |                |                |                |                |                |        |
|                                     | REMOTE ON/OFF (RC)                         |                | Provided                                                                                                                                                                                                     |                |                |                |                |                |        |
|                                     | DC_OK LAMP                                 |                | LED (Blue)                                                                                                                                                                                                   |                |                |                |                |                |        |
|                                     | ALARM LAMP                                 |                | LED (Orange)                                                                                                                                                                                                 |                |                |                |                |                |        |
|                                     | COMMUNICATION FUNCTION                     |                | Provided (Extended UART)                                                                                                                                                                                     |                |                |                |                |                |        |
| ISOLATION                           | 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)                                                                                                                                |                |                |                |                |                |        |
|                                     | OUTPUT・AUX・RC・PG・INFO・DS・ADDR0・ADDR1・ADDR2 |                | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)                                                                                                                                |                |                |                |                |                |        |
| ENVIRONMENT                         | OPERATING TEMP.,HUMIDITY,AND ALTITUDE      |                | -20 to +70℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                |                |                |                |                |        |
|                                     | STORAGE TEMP.,HUMIDITY,AND ALTITUDE        |                | -20 to +75℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                |                |                |                |                |        |
|                                     | VIBRATION                                  |                | 10 - 55Hz 19.6m/s² (2G) 3minutes period, 60minutes each along X, Y and Z axis                                                                                                                                |                |                |                |                |                |        |
|                                     | IMPACT                                     |                | 196.1m/s² (20G) 11ms, once each X, Y and Z axis                                                                                                                                                              |                |                |                |                |                |        |
| SAFETY<br>AND NOISE<br>REGULATIONS  | 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), UL508 (Optional), Complies with IEC60601-1-2 4th Ed. |                |                |                |                |                |        |
|                                     | CONDUCTED NOISE                            |                | Complies with FCC Part15 classB, VCCI-B, CISPR32-B, EN55011-B, EN55032-B                                                                                                                                     |                |                |                |                |                |        |
|                                     | HARMONIC ATTENUATOR *6                     |                | Complies with IEC61000-3-2 (class A)                                                                                                                                                                         |                |                |                |                |                |        |

## SPECIFICATIONS

|        |                  |                                                                                                       |
|--------|------------------|-------------------------------------------------------------------------------------------------------|
| OTHERS | CASE SIZE/WEIGHT | 89 X 41 X 152mm [3.50 X 1.61 X 5.98 inches] (without terminal block and screw) (W X H X D) / 840g max |
|        | COOLING METHOD   | Forced cooling (internal fan)                                                                         |

\*1 DC input safety agency approvals deleted.

\*2 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter(0.2ms or less) is excluded.

\*3 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN:RM103). Please refer to the instruction manual 1.2.

\*4 5V output product, the maximum temperature of 40°C.

\*5 Drift is the change in DC output for an eight hours period after a half-hour warm-up at 25°C.

\*6 Please contact us about another class.

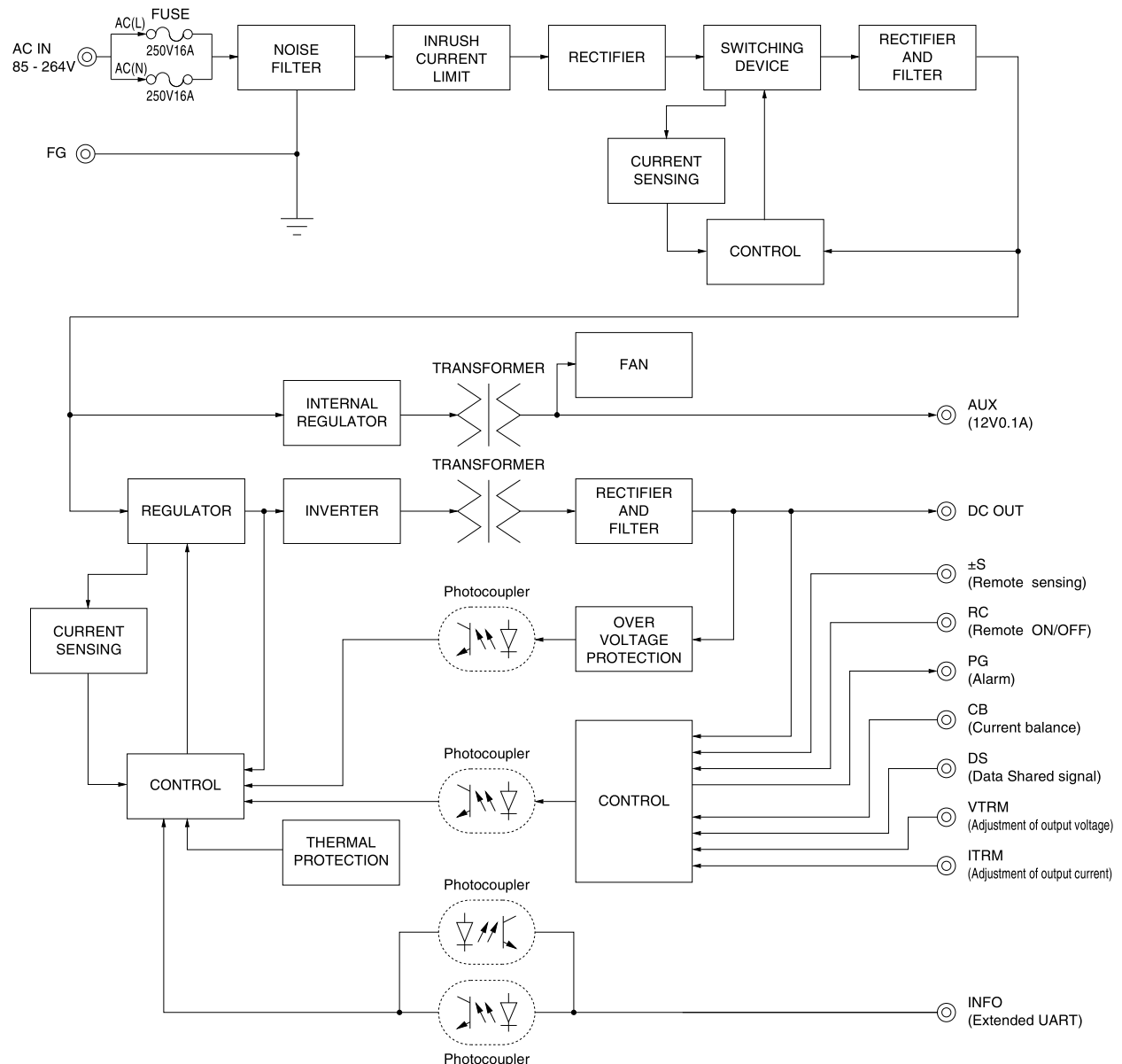
\*7 The listed options may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

\* A sound may occur from power supply at pulse loading.

## Features

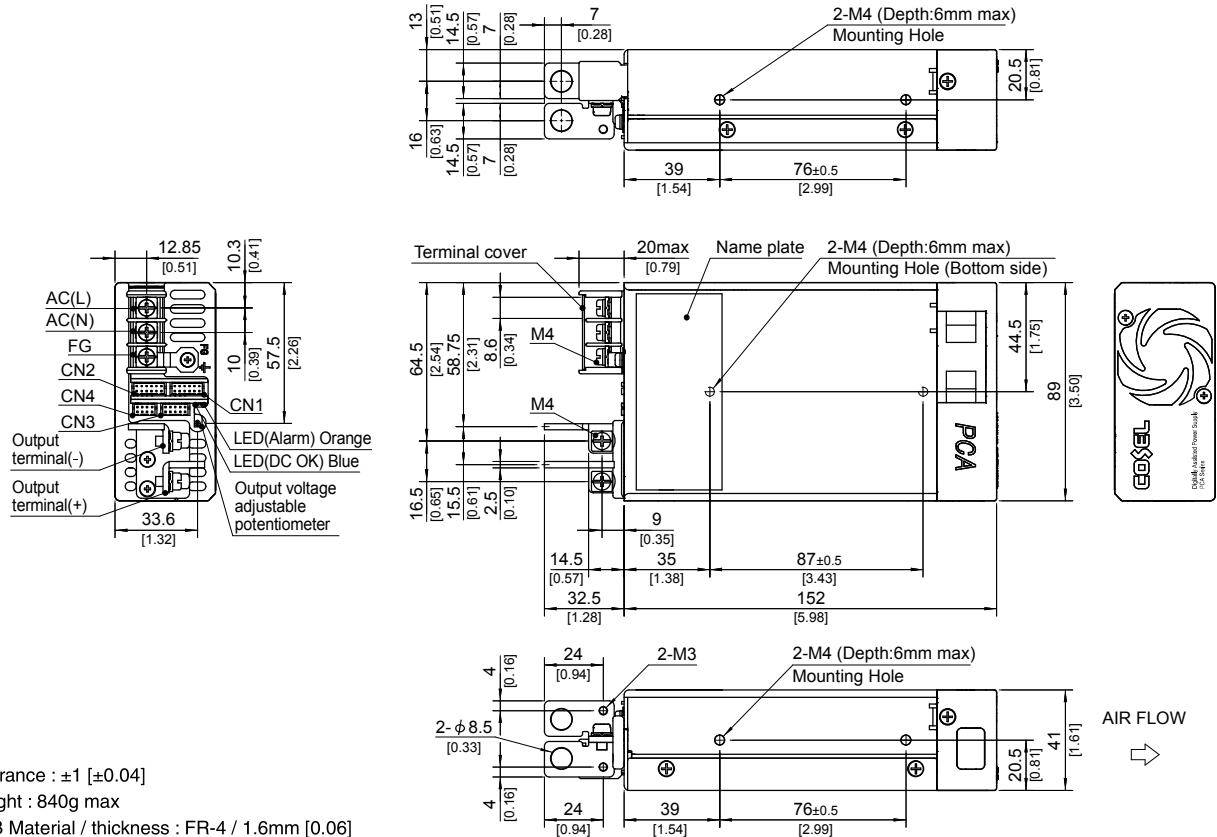
- Low profile (41mm, 1.61 inch = meet 1U height)
- Universal input 85 - 264VAC (Refer to “Derating”, when using at 85 - 90VAC)
- DC input 88 - 370VDC possible (Refer to when using at 88 - 110VDC)
- For medical electric equipment (ANSI/AAMI ES60601-1, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
- Medical Isolation 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)
- UL508 approval

## Block diagram



## External view

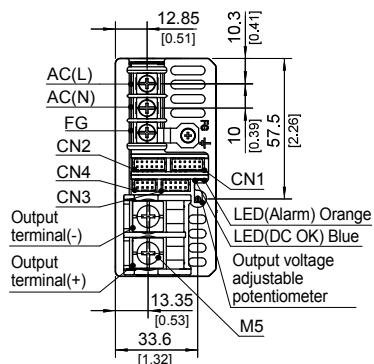
<PCA600F-□ (Bus Bar Style) >



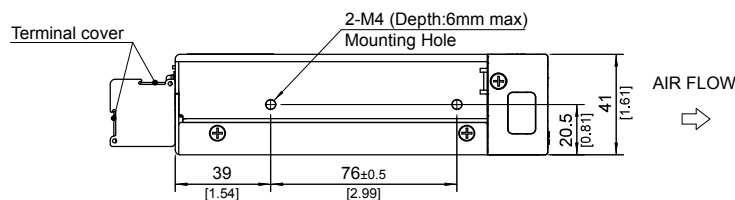
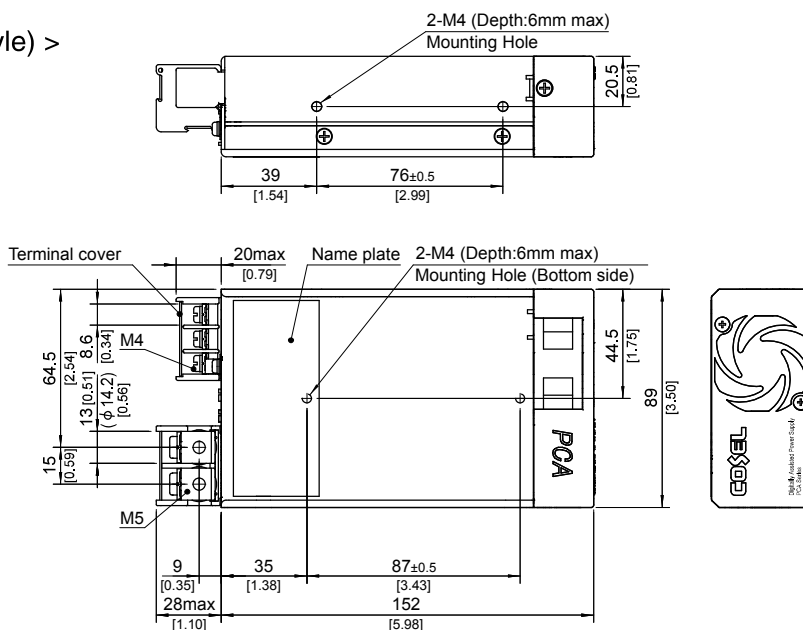
- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [ ] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
  - M3 0.6N·m max
  - M4 1.6N·m max
- ※ Please connect safety ground to FG terminal on the unit.

## External view

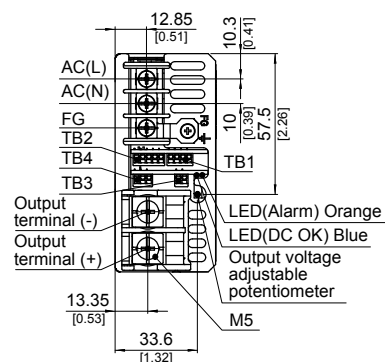
## &lt;PCA600F-□-T (Terminal Block Style) &gt;



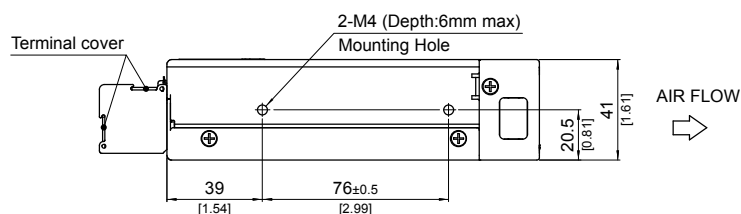
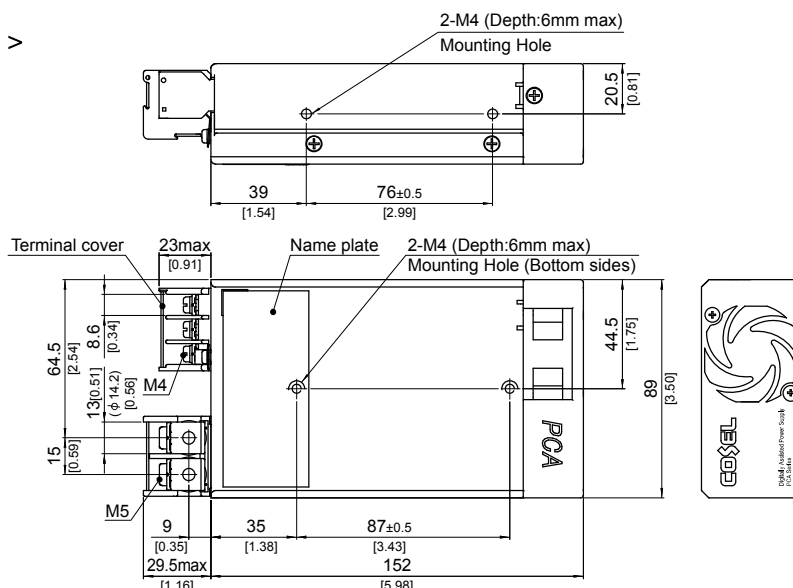
- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [ ] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
  - M4 1.6N·m max
  - M5 2.5N·m max
- ※ Please connect safety ground to FG terminal on the unit.



## &lt;PCA600F-□-T5 (Acquired UL508) &gt;



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 840g 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.



# PCA1000F

PC A 1000 F -5 -□

① ② ③ ④ ⑤ ⑥



RoHS  
2MOPP



Terminal Block Style

Example recommended EMI/EMC filter  
NAC-20-472



High 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)
- T5: UL508
- (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          | 91typ          | 91typ |
|                                            |                                       |                                                                               | (Io=100%)                                                                                                                                                                                                    | 89typ                                                                            | 90typ          | 90typ          | 91typ          | 91typ          | 91typ |
|                                            |                                       | ACIN 230V                                                                     | (Io=50%)                                                                                                                                                                                                     | 92typ                                                                            | 92typ          | 92typ          | 93typ          | 93typ          | 93typ |
|                                            |                                       |                                                                               | (Io=100%)                                                                                                                                                                                                    | 91typ                                                                            | 92typ          | 92typ          | 93typ          | 93typ          | 93typ |
|                                            | 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)                     |                                                                                                                                                                                                              |                                                                                  |                |                |                |                |       |
| OUTPUT                                     | VOLTAGE[V]                            |                                                                               | 5                                                                                                                                                                                                            | 12                                                                               | 15             | 24             | 32             | 48             |       |
|                                            | CURRENT[A]                            |                                                                               | 200                                                                                                                                                                                                          | 88                                                                               | 70             | 44             | 33             | 22             |       |
|                                            | LINE REGULATION[mV]                   |                                                                               | 20max                                                                                                                                                                                                        | 48max                                                                            | 60max          | 96max          | 128max         | 192max         |       |
|                                            | LOAD REGULATION[mV]                   |                                                                               | 40max                                                                                                                                                                                                        | 100max                                                                           | 120max         | 150max         | 150max         | 480max         |       |
|                                            | RIPPLE[mVp-p]                         | 0 to +50℃ *2*3                                                                | 160max                                                                                                                                                                                                       | 240max                                                                           | 240max         | 240max         | 320max         | 480max         |       |
|                                            |                                       | -20 to 0℃ *2                                                                  | 280max                                                                                                                                                                                                       | 320max                                                                           | 320max         | 320max         | 420max         | 640max         |       |
|                                            | RIPPLE NOISE[mVp-p]                   | 0 to +50℃ *2*3                                                                | 240max                                                                                                                                                                                                       | 300max                                                                           | 300max         | 300max         | 400max         | 600max         |       |
|                                            |                                       | -20 to 0℃ *2                                                                  | 320max                                                                                                                                                                                                       | 360max                                                                           | 360max         | 360max         | 480max         | 720max         |       |
|                                            | TEMPERATURE REGULATION[mV]            | 0 to +50℃ *3                                                                  | 50max                                                                                                                                                                                                        | 120max                                                                           | 150max         | 240max         | 320max         | 480max         |       |
|                                            |                                       | -20 to +50℃ *3                                                                | 75max                                                                                                                                                                                                        | 180max                                                                           | 180max         | 290max         | 400max         | 600max         |       |
|                                            | DRIFT[mV]                             | *4                                                                            | 20max                                                                                                                                                                                                        | 48max                                                                            | 60max          | 96max          | 128max         | 192max         |       |
|                                            | 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 | 28.80 to 57.60 |                |       |
| 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 | 48.00 to 48.48 |                |       |
| PROTECTION<br>CIRCUIT AND<br>OTHERS        | 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 | 60.00 to 67.20 |       |
|                                            | REMOTE SENSING                        |                                                                               | Provided                                                                                                                                                                                                     |                                                                                  |                |                |                |                |       |
|                                            | REMOTE ON/OFF (RC)                    |                                                                               | Provided                                                                                                                                                                                                     |                                                                                  |                |                |                |                |       |
|                                            | DC_OK LAMP                            |                                                                               | LED (Blue)                                                                                                                                                                                                   |                                                                                  |                |                |                |                |       |
|                                            | ALARM LAMP                            |                                                                               | LED (Orange)                                                                                                                                                                                                 |                                                                                  |                |                |                |                |       |
| COMMUNICATION FUNCTION                     |                                       | Provided (Extended UART)                                                      |                                                                                                                                                                                                              |                                                                                  |                |                |                |                |       |
| ISOLATION                                  | 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)                                                                                                                                |                                                                                  |                |                |                |                |       |
| OUTPUT-AUX-RC-PG-INFO-DS-ADDR0-ADDR1-ADDR2 |                                       | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature) |                                                                                                                                                                                                              |                                                                                  |                |                |                |                |       |
| ENVIRONMENT                                | OPERATING TEMP.,HUMIDITY.AND ALTITUDE |                                                                               | -20 to +70℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                                                                                  |                |                |                |                |       |
|                                            | STORAGE TEMP.,HUMIDITY.AND ALTITUDE   |                                                                               | -20 to +75℃, 20 - 90%RH (Non condensing)                                                                                                                                                                     |                                                                                  |                |                |                |                |       |
|                                            | VIBRATION                             |                                                                               | 10 - 55Hz 19.6m/s² (2G) 3minutes period, 60minutes each along X, Y and Z axis                                                                                                                                |                                                                                  |                |                |                |                |       |
|                                            | IMPACT                                |                                                                               | 196.1m/s² (20G) 11ms, once each X, Y and Z axis                                                                                                                                                              |                                                                                  |                |                |                |                |       |
| SAFETY<br>AND NOISE<br>REGULATIONS         | 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), UL508 (Optional), 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 X 41 X 178mm [4.02 X 1.61 X 7.01 inches] (without terminal block and screw) (W X H X D) / 1.2kg max |
|        | COOLING METHOD   | Forced cooling (internal fan)                                                                           |

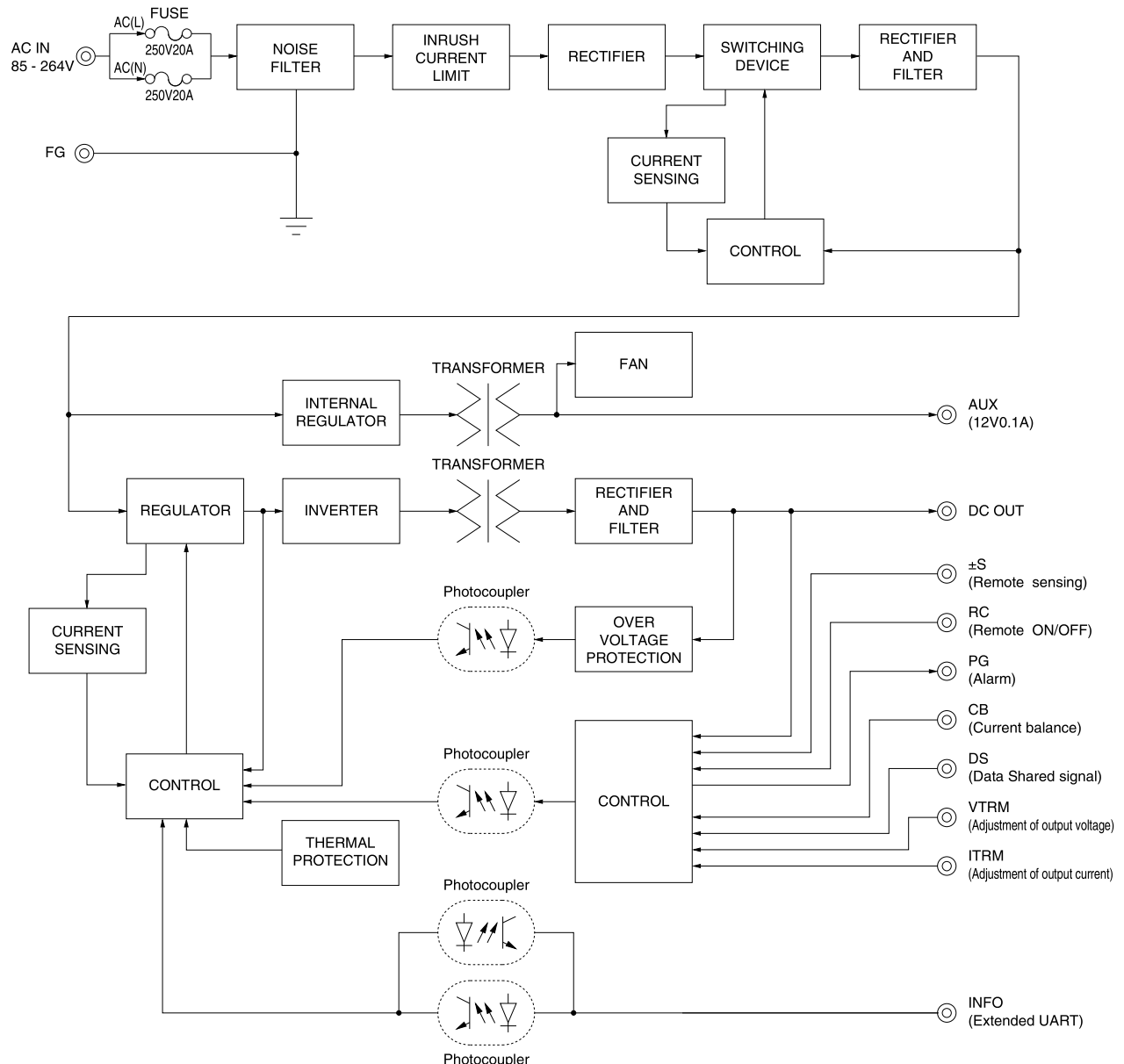
- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter(0.2ms or less) is excluded.
- \*2 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN:RM103). Please refer to the instruction manual 1.2.
- \*3 5V, 12V, 15V output product, the maximum 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

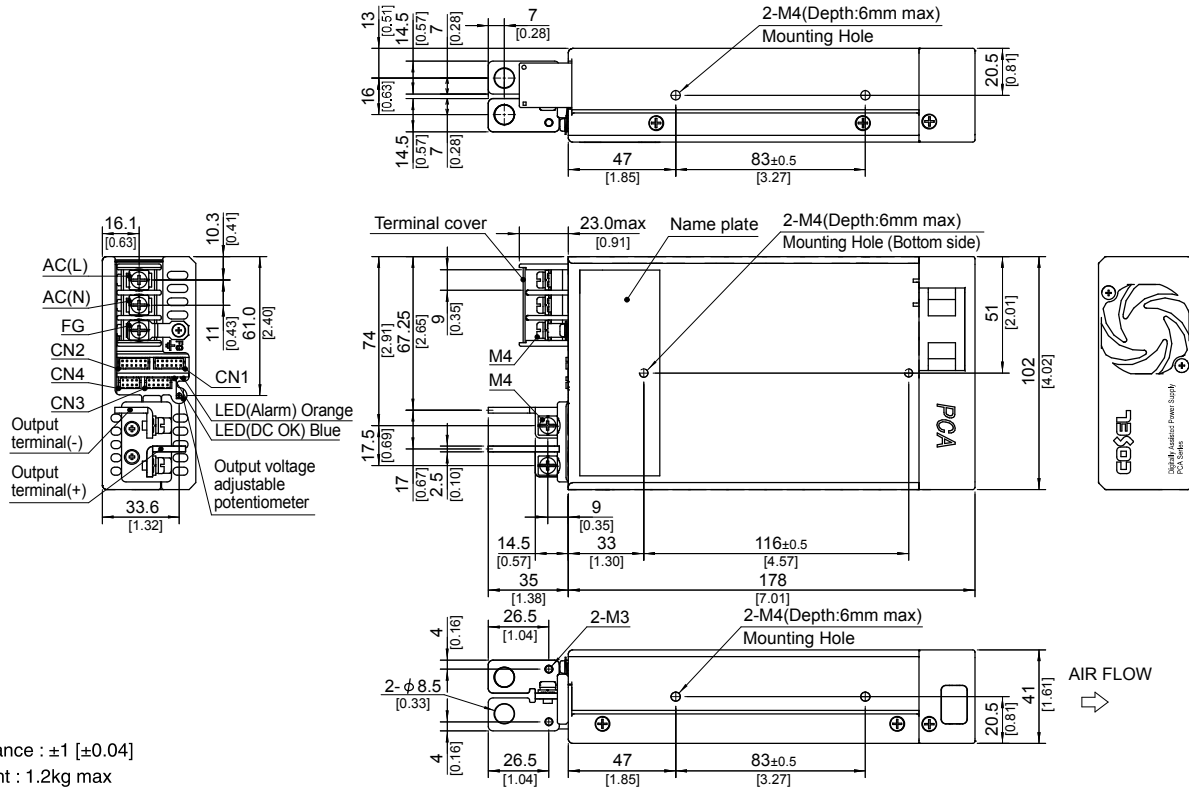
- Low profile (41mm, 1.61 inch = meet 1U height)
- Universal input 85 - 264VAC (Refer to “Derating”, when using at 85 - 90VAC)
- For medical electric equipment (ANSI/AAMI ES60601-1, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
- Medical Isolation Grade 2MOPP
- With AUX output 12V 0.1A (Voltage adjustable range 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)
- UL508 approval

## Block diagram



## External view

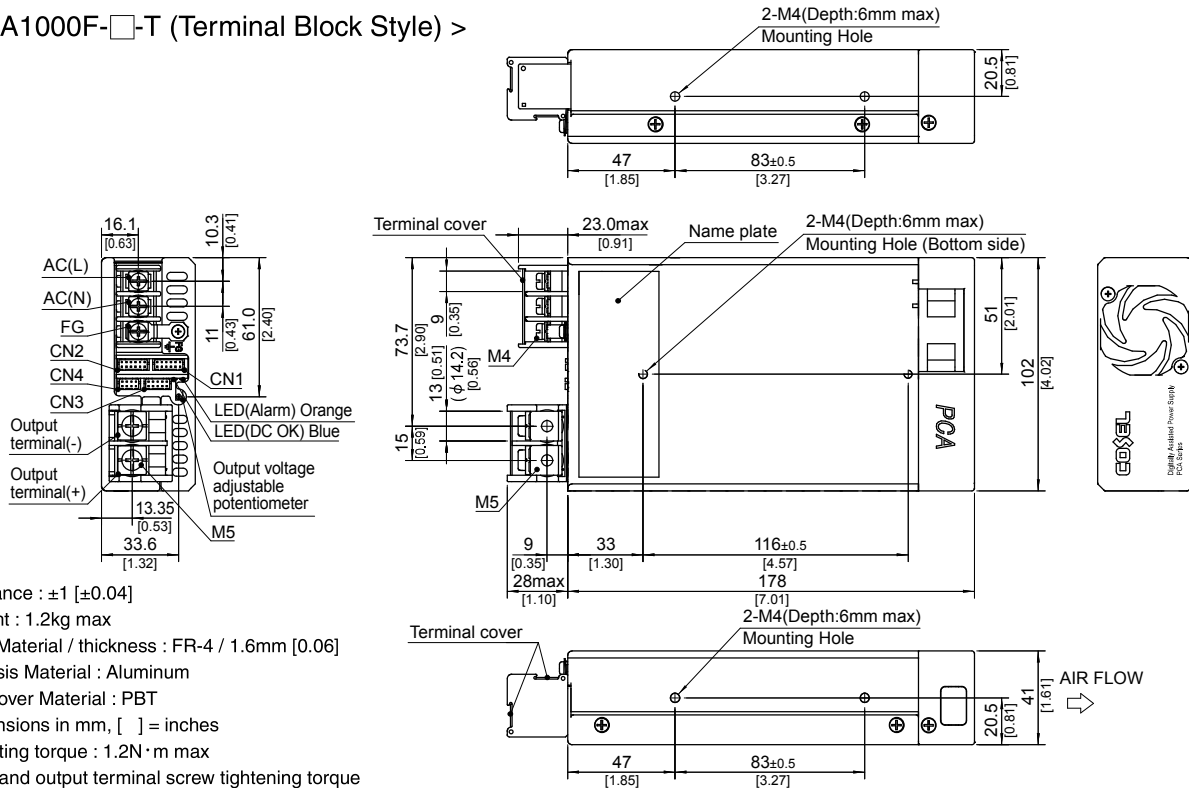
<PCA1000F-□ (Bus Bar Style) >



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ 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.

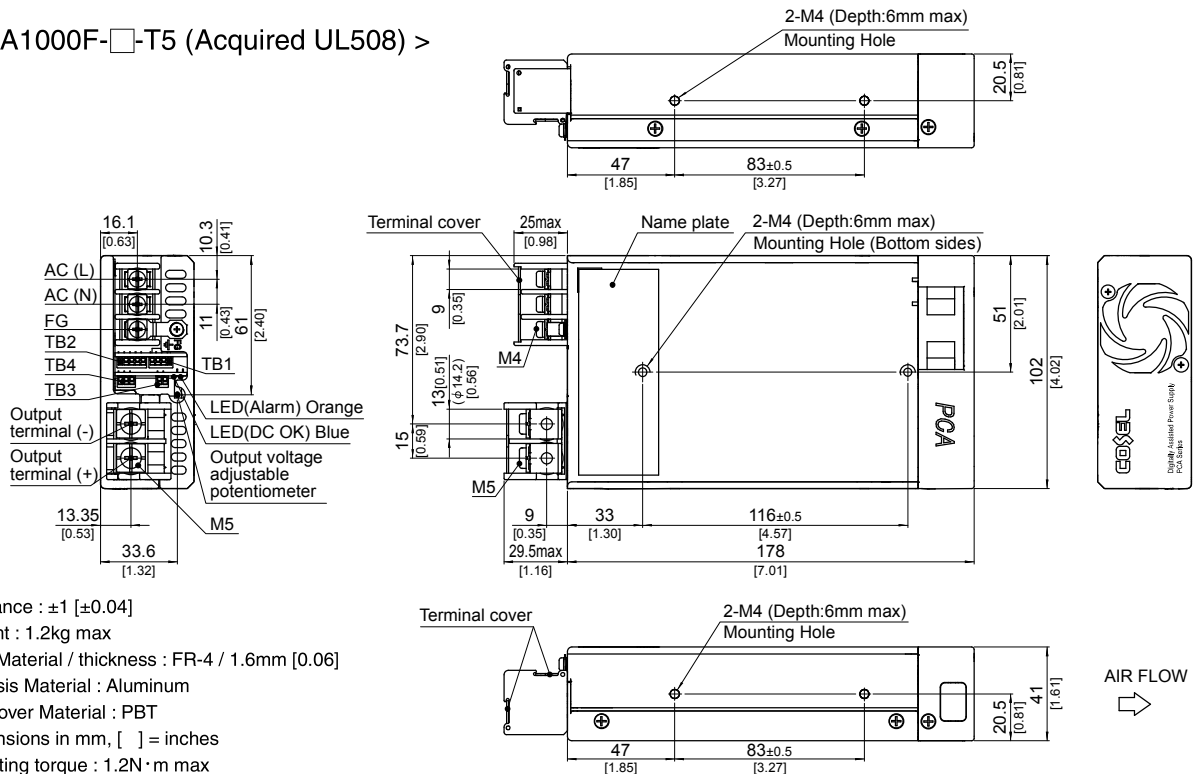
## External view

## &lt;PCA1000F-□-T (Terminal Block Style) &gt;



- ※ Tolerance :  $\pm 1$  [±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.

## &lt;PCA1000F-□-T5 (Acquired UL508) &gt;



- ※ Tolerance :  $\pm 1$  [±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.

# PCA1500F

PC A 1500 F -5 -□

① ② ③ ④ ⑤ ⑥



RoHS  
2MOPP



Example recommended EMI/EMC filter  
NAC-30-472



High 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
- I : with PMBus interface
- F2 : Reverse air exhaust type
- P3 : Master-slave Operation
- W1 : Alarm function

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                 | PCA1500F-5                  | PCA1500F-12   | PCA1500F-15   | PCA1500F-24 | PCA1500F-32 | PCA1500F-48 |
|-----------------------|-----------------------------|---------------|---------------|-------------|-------------|-------------|
| MAX OUTPUT WATTAGE[W] | ACIN 100V/230V 1500/1500    | 1500/1500     | 1500/1500     | 1560/1680   | 1504/1664   | 1536/1680   |
| DC OUTPUT             | ACIN 100V/230V 5V 300A/300A | 12V 125A/125A | 15V 100A/100A | 24V 65A/70A | 32V 47A/52A | 48V 32A/35A |

## SPECIFICATIONS

|                               | MODEL                                                      | PCA1500F-5      | PCA1500F-12                                                                                                                                                                                | PCA1500F-15    | PCA1500F-24    | PCA1500F-32    | PCA1500F-48    |
|-------------------------------|------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| INPUT                         | VOLTAGE                                                    | [VAC]           | 85 - 264 1 φ (Output derating is required at less than 95V. Refer to "Derating")                                                                                                           |                |                |                |                |
|                               | CURRENT[A]                                                 | ACIN 100V       | 18typ                                                                                                                                                                                      |                |                |                |                |
|                               |                                                            | ACIN 230V       | 7.8typ                                                                                                                                                                                     |                |                |                |                |
|                               | FREQUENCY[Hz]                                              |                 | 50/60 (45 - 66)                                                                                                                                                                            |                |                |                |                |
|                               | EFFICIENCY[%]                                              | ACIN 100V       | (Io=50%)                                                                                                                                                                                   | 90typ          | 91typ          | 91typ          | 91typ          |
|                               |                                                            |                 | (Io=100%)                                                                                                                                                                                  | 88typ          | 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 10 sec. to re-start)                                                                                    |                |                |                |                |
|                               |                                                            | ACIN 230V *1    | 40/40 typ (Io=100%) (Primary inrush current / Secondary inrush current) (More than 10 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]                                                 | ACIN 100V/230V  | 300/300                                                                                                                                                                                    | 125/125        | 100/100        | 65/70          | 47/52          |
|                               | 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)                                                                                                              |                |                |                |                |
|                               | OUTPUT - AUX · RC · PG · INFO · DS · ADDR0 · ADDR1 · ADDR2 |                 | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)                                                                                                              |                |                |                |                |
| SAFETY AND NOISE REGULATIONS  | 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 <sup>2</sup> (2G) 3minutes period, 60minutes each along X, Y and Z axis                                                                                                  |                |                |                |                |
|                               | IMPACT                                                     |                 | 196.1m/s <sup>2</sup> (20G) 11ms, once each X, Y and Z axis                                                                                                                                |                |                |                |                |
| SAFETY AND NOISE REGULATIONS  | 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, CISPR11-A, CISPR32-A, EN55011-A, EN55032-A                                                                                                        |                |                |                |                |
|                               | HARMONIC ATTENUATOR *5                                     |                 | Complies with IEC61000-3-2 (class A)                                                                                                                                                       |                |                |                |                |

## SPECIFICATIONS

|        |                  |                                                                                                         |
|--------|------------------|---------------------------------------------------------------------------------------------------------|
| OTHERS | CASE SIZE/WEIGHT | 140 X 41 X 203mm [5.52 X 1.61 X 7.99 inches] (without terminal block and screw) (W X H X D) / 2.0kg max |
|        | COOLING METHOD   | Forced cooling (internal fan)                                                                           |

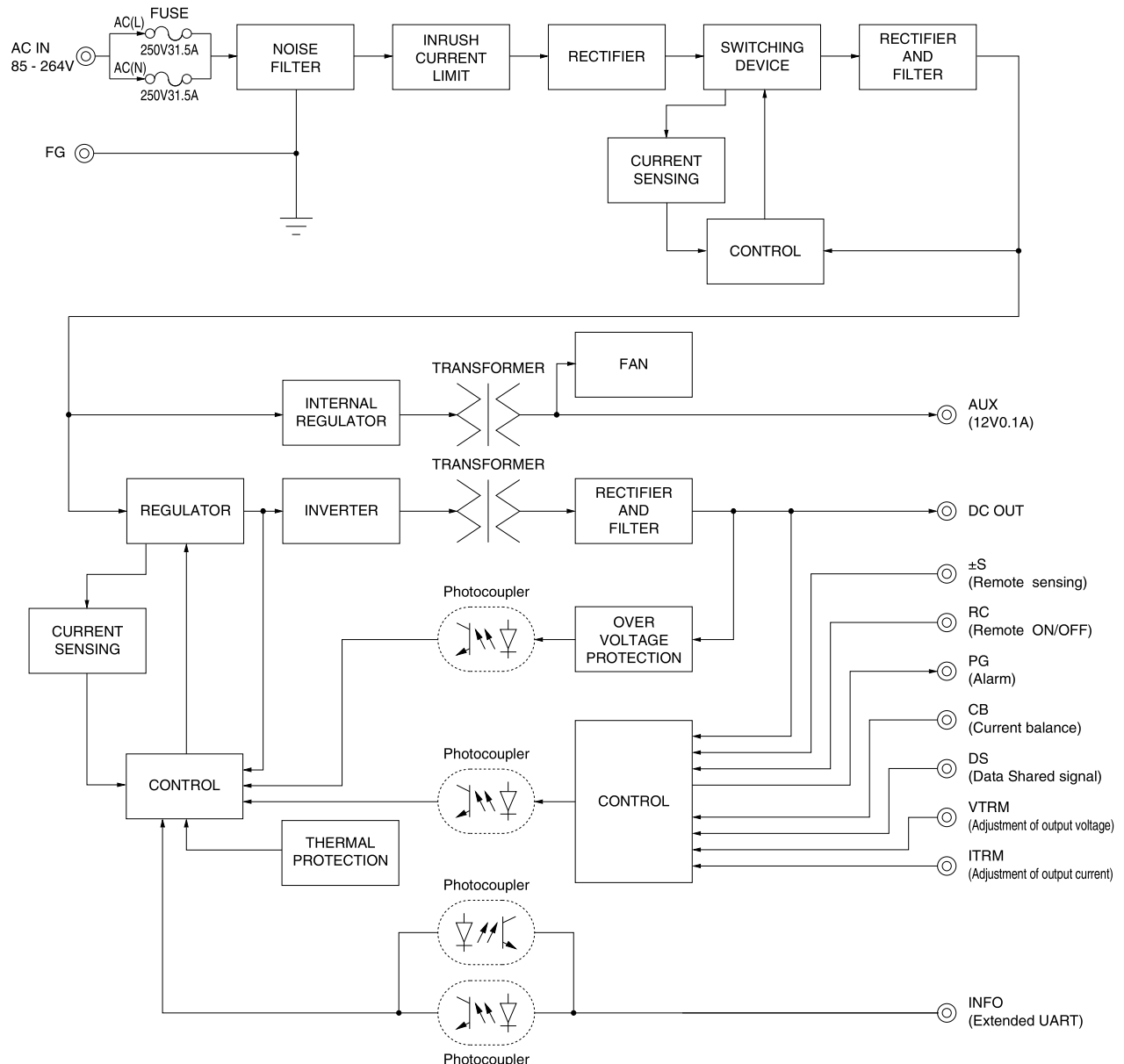
- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter(0.2ms or less) is excluded.
- \*2 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN:RM103). Please refer to the instruction manual 1.2.
- \*3 5V, 12V, 15V output product, the maximum 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.

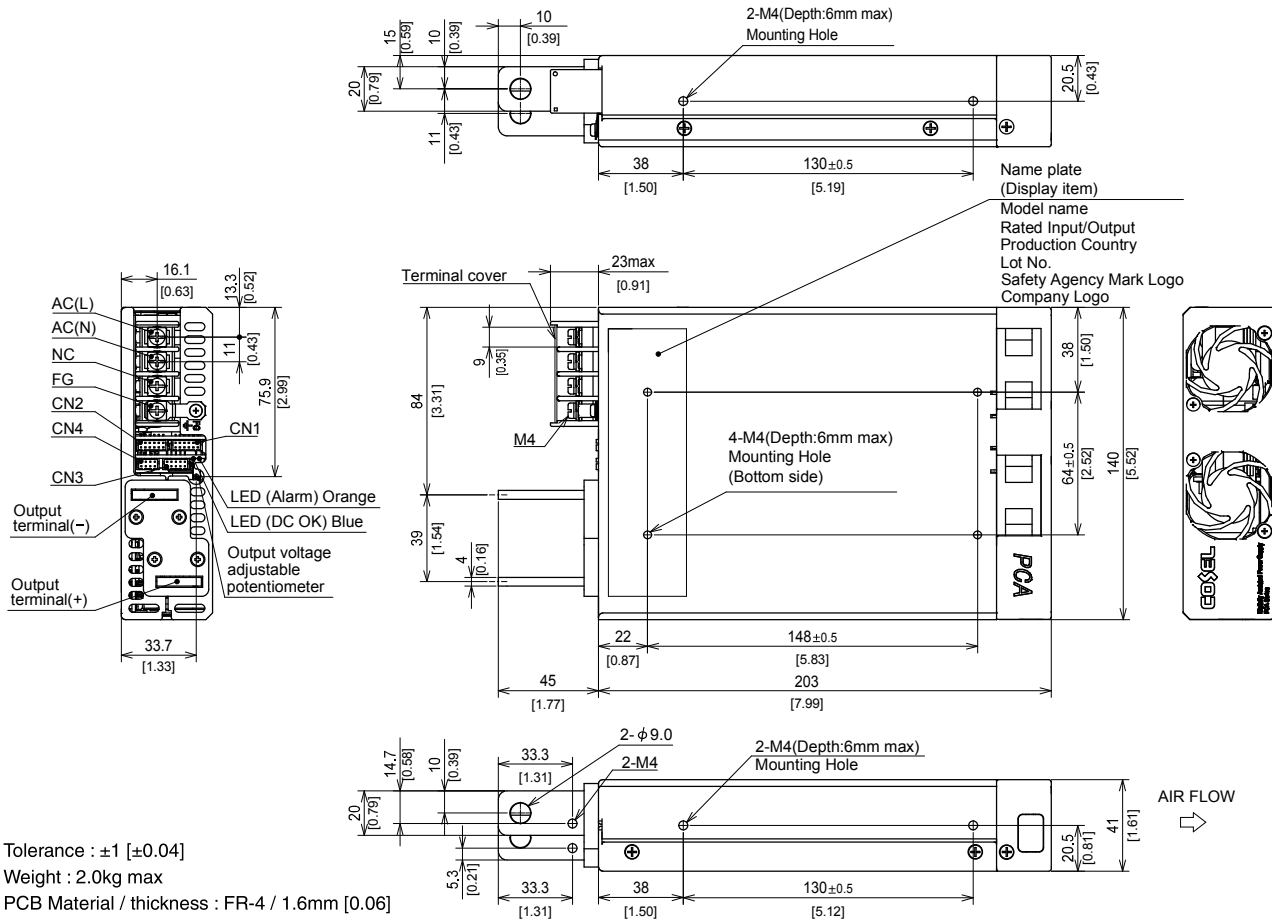
## Features

- Low profile (41mm, 1.61 inch = meet 1U height)
- Universal input 85 - 264VAC (Refer to “Derating”, when using at 85 - 95VAC)
- 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 (Refer to the item 2.6 on Instruction Manual.)
- With various alarms
- Parallel Operation / N+1 Parallel Redundancy Operation available
- Monitoring function and various setting values can be changed by communication (Refer to the item 2.11 on Instruction Manual.)
- Complies with SEMI F47 (Refer to the item 2.1 on Instruction Manual.)

## Block diagram



External view

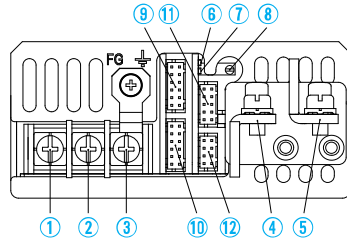


- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 2.0kg max
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis Material : Aluminum
- ※ Fan cover Material : PBT
- ※ Dimensions in mm, [ ] = inches
- ※ Mounting torque : 1.2N·m max
- ※ Input and output terminal screw tightening torque
  - M3 0.6N·m max
  - M4 1.6N·m max
- ※ Please connect safety ground to FG terminal on the unit.

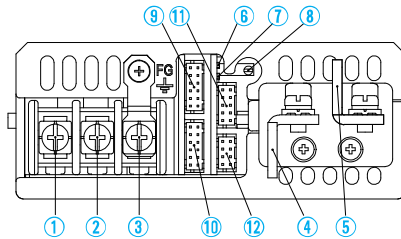


## Terminal Blocks

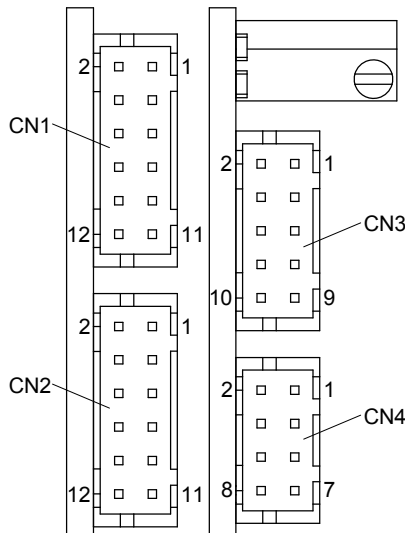
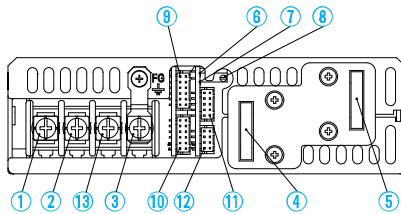
## ●PCA300F, PCA600F



## ●PCA1000F



## ●PCA1500F



Connector pin numbers

- ①AC (L) } Input Terminals 85 - 264VAC 1  $\phi$  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 } Connectors  
 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<br>CN2 | S12B-PHDSS<br>PHDR-12VS | Reel : SPHD-002T-P0.5<br>Loose : BPHD-001T-P0.5 *3<br>BPHD-002T-P0.5 *3 | J.S.T |
| CN3        | S10B-PHDSS<br>PHDR-10VS |                                                                         |       |
| CN4        | S8B-PHDSS<br>PHDR-8VS   |                                                                         |       |

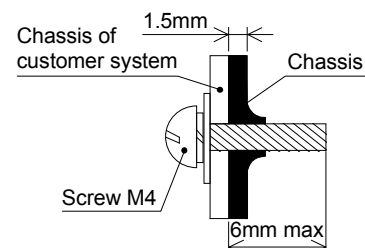
\*1 For -P3 option.

\*2 For -I option.

\*3 The manufacturer prepares only the ratchet hand.

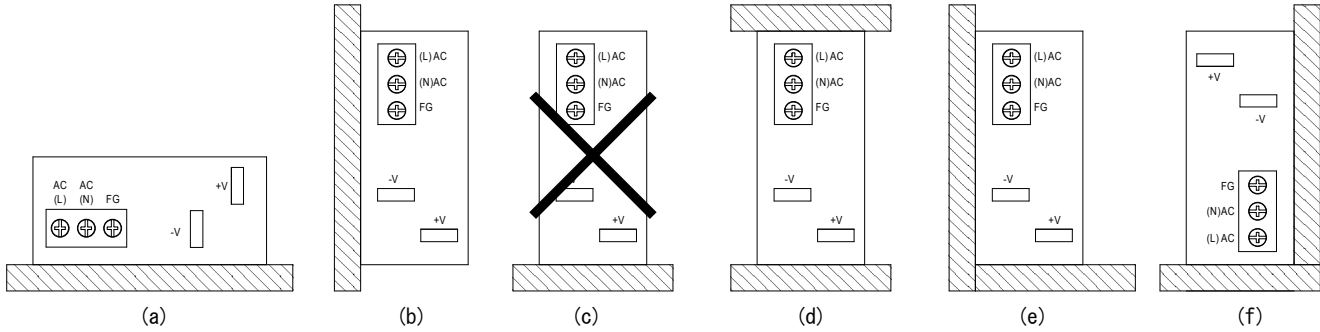
## Assembling and Installation Method

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



### Assembling and Installation Method

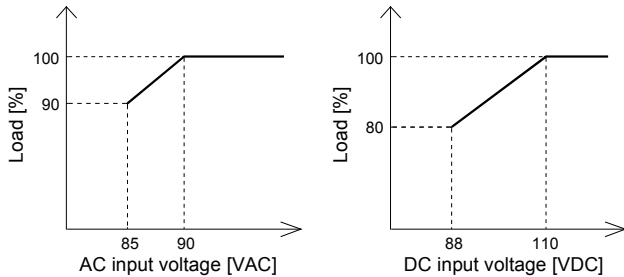
- Please do not block built-in fans and ventilation holes. When the power supply is mounted by screws, please consider its weight and set it in place. (Please see below.)
- Please avoid installing the power supply by only one narrow side like the Fig.(c).  
In that case, another narrow side or the wide side should be also used to install as shown in Fig.(d), (e), and (f).
- 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.



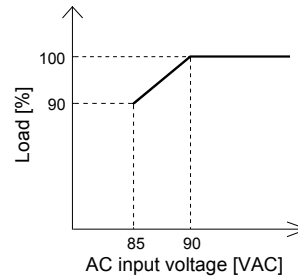
### Derating

#### Input voltage Derating curve

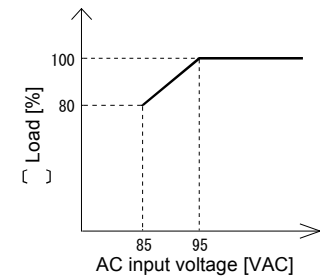
##### ●PCA600F



##### ●PCA1000F

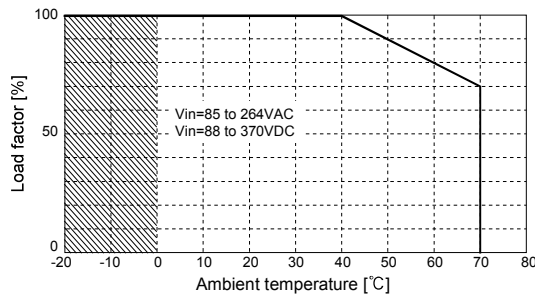


##### ●PCA1500F



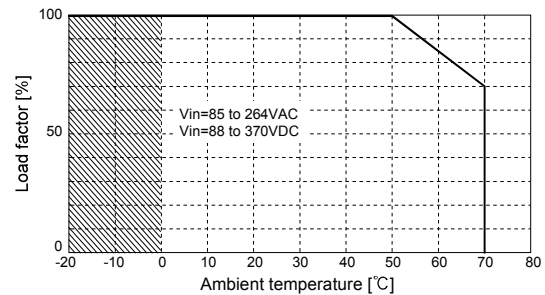
##### ●PCA300F-5

#### Ambient Temperature Derating Curve



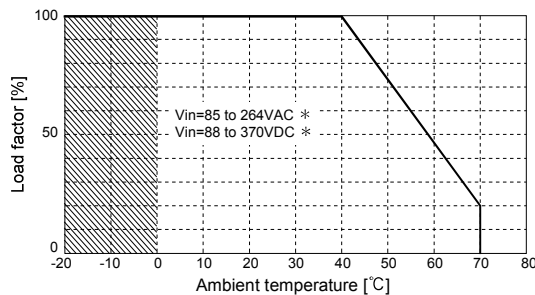
##### ●PCA300F-12, -15, -24, -32, -48

#### Ambient Temperature Derating Curve



##### ●PCA600F-5

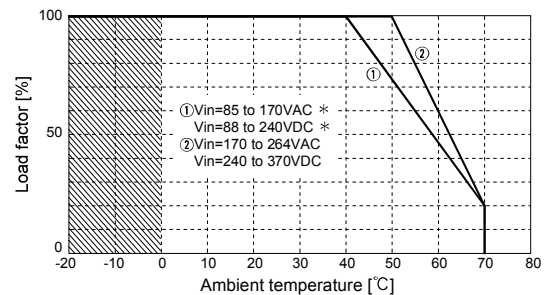
#### Ambient Temperature Derating Curve



\*With derating due to input voltage

##### ●PCA600F-12, -15, -24, -32, -48

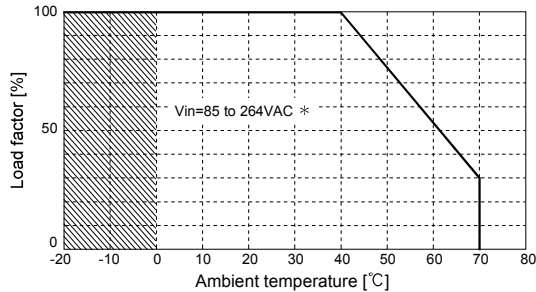
#### Ambient Temperature Derating Curve



\*With derating due to input voltage

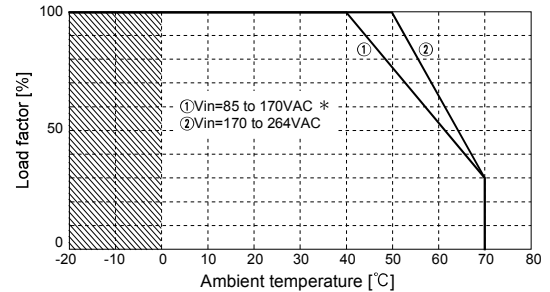
## Derating

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



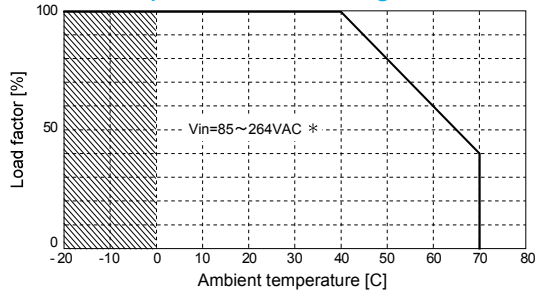
\*With derating due to input voltage

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



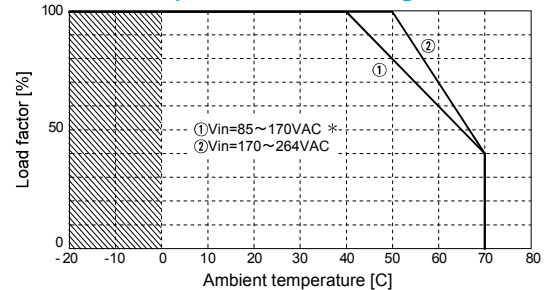
\*With derating due to input voltage

● 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.

***Authorised, valued-added distributor***

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