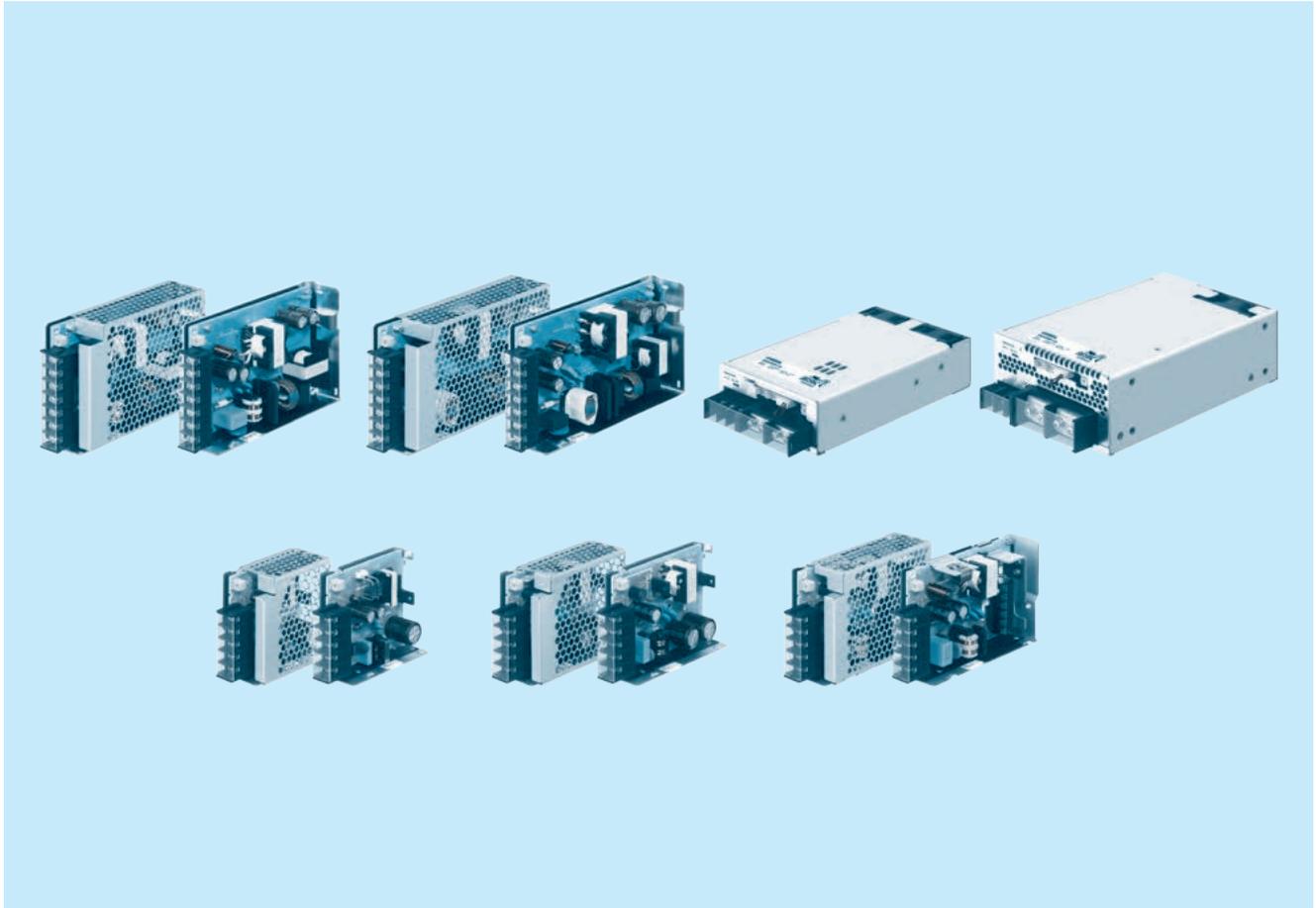




# PDA-series



## Feature

- High efficiency
- Low noise
- Complies with SEMI F47
- Harmonic attenuator (Complies with IEC61000-3-2)
- Universal input (85-264VAC)
- Built-in inrush current, overcurrent and overvoltage protection circuits
- UL508 (Optional)
  - PDA300F/600F
  - Parallel Operation / N+1 Parallel Redundancy Operation possible
  - With various alarms
  - With AUX output 12V
  - Output voltage can be varied to near 0V

## Safety agency approvals

- UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1), EN62368-1
- Complies with DEN-AN
- UL508 (Optional)

## 5-year warranty (refer to Instruction Manual)

## CE marking

- Low Voltage Directive
- RoHS Directive

## UKCA marking

- Electrical Equipment Safety Regulations
- RoHS Regulations

## EMI

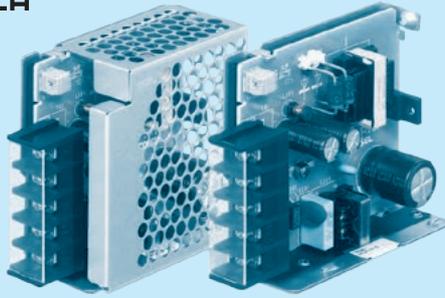
- Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B, VCCI-B

## EMS Compliance : EN61204-3, EN61000-6-2

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

# PDA15F

PD A 15 F - □ - □  
 ① ② ③ ④ ⑤ ⑥



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



High voltage pulse noise type : NAP series  
 Low leakage current type : NAM 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 \*1
- N : with cover
- C : with Coating
- G : LOW leakage current
- J1 : VH(J.S.T.) connector type
- N1 : with DIN rail and Cover
- T5 : UL508[5V,12V,24V]

For option details, refer to Instruction Manual 8.1.

\* 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	PDA15F-3R3	PDA15F-5	PDA15F-12	PDA15F-15	PDA15F-24
MAX OUTPUT WATTAGE[W]	*2 9.9	15	15.6	15	16.8
DC OUTPUT	*2 3.3V 3A	5V 3A	12V 1.3A	15V 1A	24V 0.7A

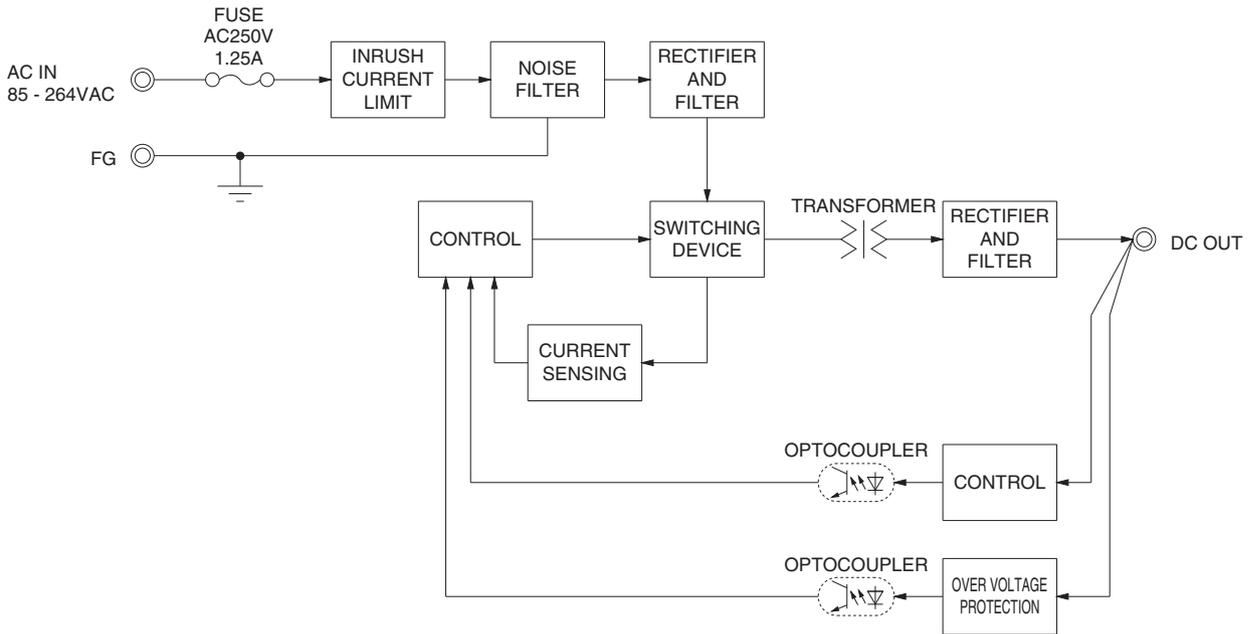
## SPECIFICATIONS

	MODEL	PDA15F-3R3	PDA15F-5	PDA15F-12	PDA15F-15	PDA15F-24	
INPUT	VOLTAGE[VAC]	*2 85 - 264 1 φ (Refer to "Derating" and Instruction Manual 1.1)					
	CURRENT[A]	ACIN 100V	0.24typ	0.35typ			
		ACIN 230V	0.13typ	0.19typ			
	FREQUENCY[Hz]	50 / 60 (45 - 440)					
	EFFICIENCY[%]	ACIN 100V	72.0typ	75.0typ	78.5typ	80.5typ	81.0typ
		ACIN 230V	73.0typ	78.5typ	81.5typ	82.5typ	83.5typ
INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) at cold start					
	ACIN 230V	35typ (Io=100%) at cold start					
LEAKAGE CURRENT[ma]	0.15 / 0.30max (ACIN 100V / 240V, 60Hz, Io=100%, According to IEC62368-1, and DEN-AN)						
OUTPUT	VOLTAGE[V]	3.3	5	12	15	24	
	CURRENT[A]	*2 3.0	3.0	1.3	1.0	0.7	
	LINE REGULATION[mV]	*3 20max	20max	48max	60max	96max	
	LOAD REGULATION[mV]	*3 40max	40max	100max	120max	150max	
	RIPPLE[mVp-p]	0 to +55°C	80max	80max	120max	120max	120max
		-20 to 0°C	140max	140max	160max	160max	160max
		Io=0 to 15%	300max	300max	300max	360max	300max
	RIPPLE NOISE[mVp-p]	0 to +55°C	120max	120max	150max	150max	150max
		-20 to 0°C	160max	160max	180max	180max	180max
		Io=0 to 15%	360max	360max	360max	360max	360max
	TEMPERATURE REGULATION[mV]	0 to +55°C	50max	50max	120max	150max	240max
		-20 to +55°C	60max	60max	150max	180max	290max
	DRIFT[mV]	*5 20max	20max	48max	60max	96max	
	START-UP TIME[ms]	80typ (ACIN 100V, Io=100%)					
HOLD-UP TIME[ms]	20typ (ACIN 100V, Io=100%) / 150typ (ACIN 230V, Io=100%)						
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.85 to 3.60	4.50 to 5.50	10.00 to 13.20	13.20 to 18.00	19.20 to 27.00		
OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically					
	OVERVOLTAGE PROTECTION	4.00 to 5.25	5.75 to 7.00	15.00 to 18.00	20.00 to 25.00	30.00 to 37.00	
	REMOTE SENSING	Not provided					
ISOLATION	INPUT-OUTPUT	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)					
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)					
	OUTPUT-FG	500VAC 1minute, Cutoff current = 25mA, 500VDC 100MΩ min (At Room Temperature)					
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	*2 -20 to +70°C, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max					
	STORAGE TEMP., HUMID. AND ALTITUDE	-20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max					
	VIBRATION IMPACT	10 - 55Hz, 19.6m/s <sup>2</sup> (2G), 3minutes period, 60minutes each along X, Y and Z axis 196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis					
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN					
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B					
	HARMONIC ATTENUATOR	*6 Complies with IEC61000-3-2 (Class A) (No built-in power factor correction)					
OTHERS	CASE SIZE/WEIGHT	31 X 78 X 85mm [1.22 X 3.07 X 3.35 inches] (without terminal block) (W X H X D) / 180g max (with cover : 210g max)					
	COOLING METHOD	*2 Convection/Forced air (Requires external fan) (Refer to "Derating")					

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.  
 \*4 This is the value that measured on measuring board with capacitor of 22 μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104).  
 Ripple and ripple noise spec is change at Io=0 to 15% by burst operation.

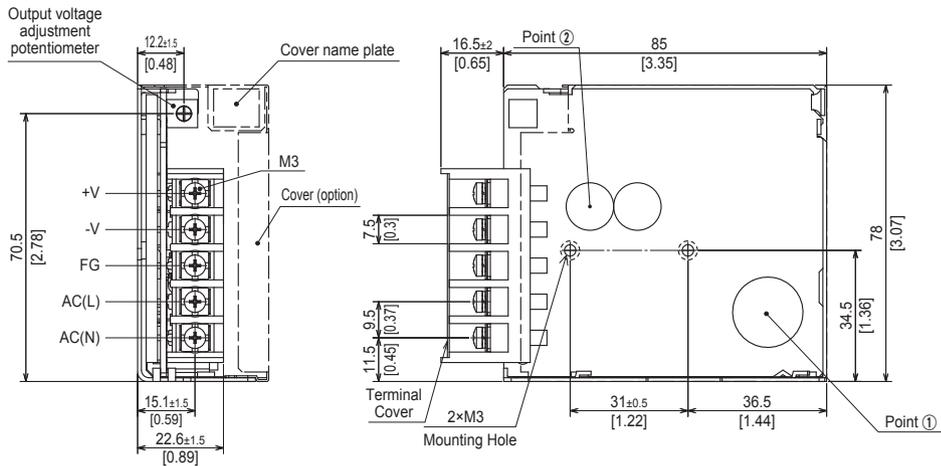
\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Parallel operation is not possible.  
 \* Sound noise may be generated by power supply in case of pulse load.

## Block diagram

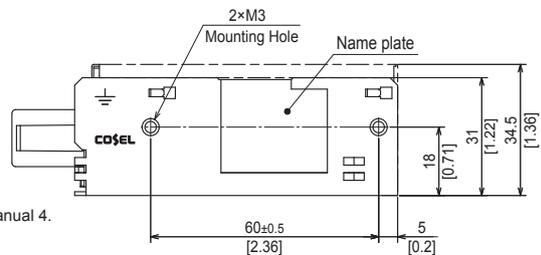


## External view

\*External size of option J1, N1 and V is different from standard model and refer to 8 option of instruction manual for details.

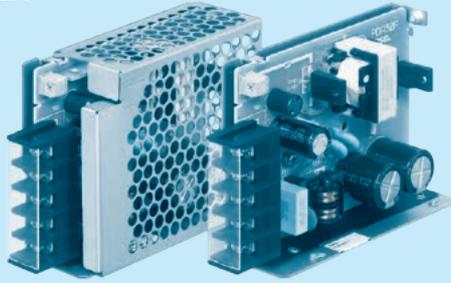


- \* Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- \* Weight : 180g max (with cover : 210g max)
- \* PCB Material / thickness : CEM3 / 1.6mm [0.06]
- \* Chassis material : Galvanized steel plate
- \* Dimensions in mm, [ ] = inches
- \* Mounting torque : 0.6N · m max
- \* Screw tightening torque : M3 0.8N · m max
- \* Please connect safety ground to the unit in 2-M3 holes
- \* Point ①, Point ② are thermometry points. Please refer to Instruction Manual 4.



# PDA30F

① PD ② A ③ 30 ④ F ⑤ -□ ⑥ -□



Example recommended EMI/EMC filter  
NAC-06-472



High voltage pulse noise type : NAP series  
Low leakage current type : NAM 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 \*1
- N : with cover
- C : with Coating
- G : LOW leakage current
- J1 : VH(J.S.T.) connector type
- N1 : with DIN rail and Cover
- T5 : UL508[5V,12V,24V]

For option details, refer to Instruction Manual 8.1.

\* 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	PDA30F-3R3	PDA30F-5	PDA30F-12	PDA30F-15	PDA30F-24
MAX OUTPUT WATTAGE[W]	*2 19.8	30	30	30	31.2
DC OUTPUT	*2 3.3V 6A	5V 6A	12V 2.5A	15V 2A	24V 1.3A

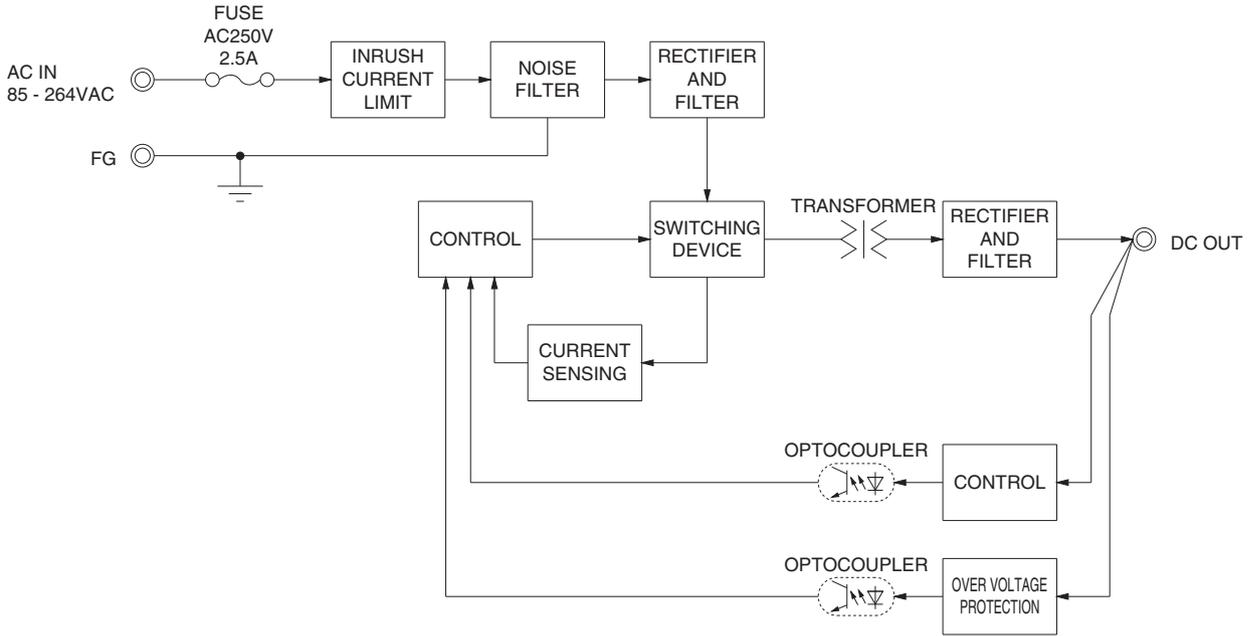
## SPECIFICATIONS

	MODEL	PDA30F-3R3	PDA30F-5	PDA30F-12	PDA30F-15	PDA30F-24	
INPUT	VOLTAGE[VAC]	*2 85 - 264 1 φ (Refer to "Derating" and Instruction Manual 1.1)					
	CURRENT[A]	ACIN 100V	0.42typ	0.62typ			
		ACIN 230V	0.22typ	0.32typ			
	FREQUENCY[Hz]	50 / 60 (45 - 440)					
	EFFICIENCY[%]	ACIN 100V	82.5typ	83.0typ	82.0typ	81.0typ	83.5typ
		ACIN 230V	84.5typ	87.0typ	85.5typ	84.5typ	86.5typ
INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) at cold start					
	ACIN 230V	35typ (Io=100%) at cold start					
LEAKAGE CURRENT[mA]	0.25 / 0.55 max (ACIN 100V / 240V, 60Hz, Io=100%, According to IEC62368-1, and DEN-AN)						
OUTPUT	VOLTAGE[V]	3.3	5	12	15	24	
	CURRENT[A]	*2 6.0	6.0	2.5	2.0	1.3	
	LINE REGULATION[mV]	*3 20max	20max	48max	60max	96max	
	LOAD REGULATION[mV]	*3 40max	40max	100max	120max	150max	
	RIPPLE [mVp-p]	0 to +55°C	80max	80max	120max	120max	120max
		-20 to 0°C	140max	140max	160max	160max	160max
		Io=0 to 15%	300max	300max	300max	300max	300max
	RIPPLE NOISE [mVp-p]	0 to +55°C	120max	120max	150max	150max	150max
		-20 to 0°C	160max	160max	180max	180max	180max
		Io=0 to 15%	360max	360max	360max	360max	360max
	TEMPERATURE REGULATION [mV]	0 to +55°C	50max	50max	120max	150max	240max
		-20 to +55°C	60max	60max	150max	180max	290max
	DRIFT [mV]	*5 20max	20max	48max	60max	96max	
START-UP TIME [ms]	80typ (ACIN 100V, Io=100%)						
HOLD-UP TIME [ms]	20typ (ACIN 100V, Io=100%) / 150typ (ACIN 230V, Io=100%)						
OUTPUT VOLTAGE ADJUSTMENT RANGE [V]	2.85 to 3.60	4.50 to 5.50	10.00 to 13.20	13.20 to 18.00	20.40 to 27.00		
OUTPUT VOLTAGE SETTING [V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically					
	OVERVOLTAGE PROTECTION	4.00 to 5.25	5.75 to 7.00	15.00 to 18.00	20.00 to 25.00	30.00 to 37.00	
	REMOTE SENSING	Not provided					
ISOLATION	INPUT-OUTPUT	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)					
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)					
	OUTPUT-FG	500VAC 1minute, Cutoff current = 25mA, 500VDC 100MΩ min (At Room Temperature)					
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	*2 -20 to +70°C, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max					
	STORAGE TEMP., HUMID. AND ALTITUDE	-20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max					
	VIBRATION IMPACT	10 - 55Hz, 19.6m/s <sup>2</sup> (2G), 3minutes period, 60minutes each along X, Y and Z axis 196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis					
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN					
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B					
	HARMONIC ATTENUATOR	*6 Complies with IEC61000-3-2 (Class A) (No built-in power factor correction)					
OTHERS	CASE SIZE/WEIGHT	31 X 78 X 103mm [1.22 X 3.07 X 4.06 inches] (without terminal block) (W X H X D) / 250g max (with cover : 280g max)					
	COOLING METHOD	*2 Convection/Forced air (Requires external fan) (Refer to "Derating")					

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.  
 \*4 This is the value that measured on measuring board with capacitor of 22 μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104).  
 Ripple and ripple noise spec is change at Io=0 to 15% by burst operation.

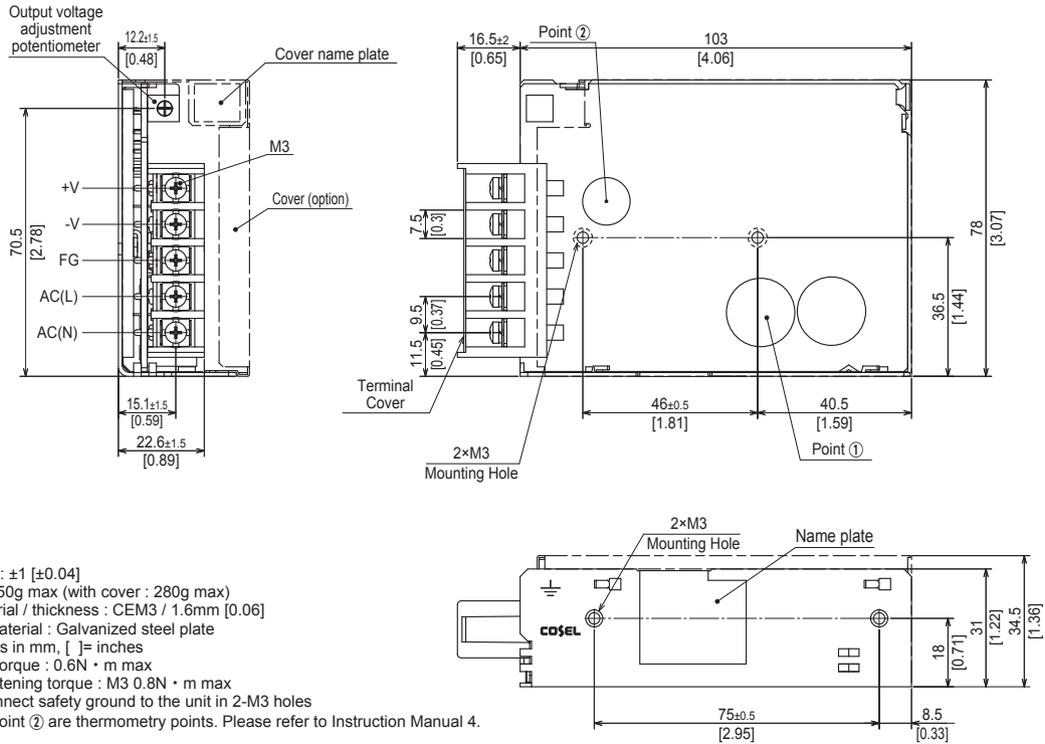
\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Parallel operation is not possible.  
 \* Sound noise may be generated by power supply in case of pulse load.

Block diagram



External view

\*External size of option J1, N1 and V is different from standard model and refer to 8 option of instruction manual for details.



- \* Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- \* Weight : 250g max (with cover : 280g max)
- \* PCB Material / thickness : CEM3 / 1.6mm [0.06]
- \* Chassis material : Galvanized steel plate
- \* Dimensions in mm, [ ]= inches
- \* Mounting torque : 0.6N · m max
- \* Screw tightening torque : M3 0.8N · m max
- \* Please connect safety ground to the unit in 2-M3 holes
- \* Point ①, Point ② are thermometry points. Please refer to Instruction Manual 4.

# PDA50F

PD A 50 F - □ - □  
 ① ② ③ ④ ⑤ ⑥



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



High voltage pulse noise type : NAP series  
 Low leakage current type : NAM 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 \*1  
 N : with cover  
 C : with Coating  
 G : LOW leakage current  
 J1 : VH(J.S.T.) connector type  
 N1 : with DIN rail and Cover  
 T5 : UL508[24V]

For option details, refer to Instruction Manual 8.1.

\* 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	PDA50F-3R3	PDA50F-5	PDA50F-12	PDA50F-15	PDA50F-24	PDA50F-36	PDA50F-48
MAX OUTPUT WATTAGE[W]	*2 33	50	51.6	52.5	52.8	50.4	52.8
DC OUTPUT	*2 3.3V 10A	5V 10A	12V 4.3A	15V 3.5A	24V 2.2A	36V 1.4A	48V 1.1A

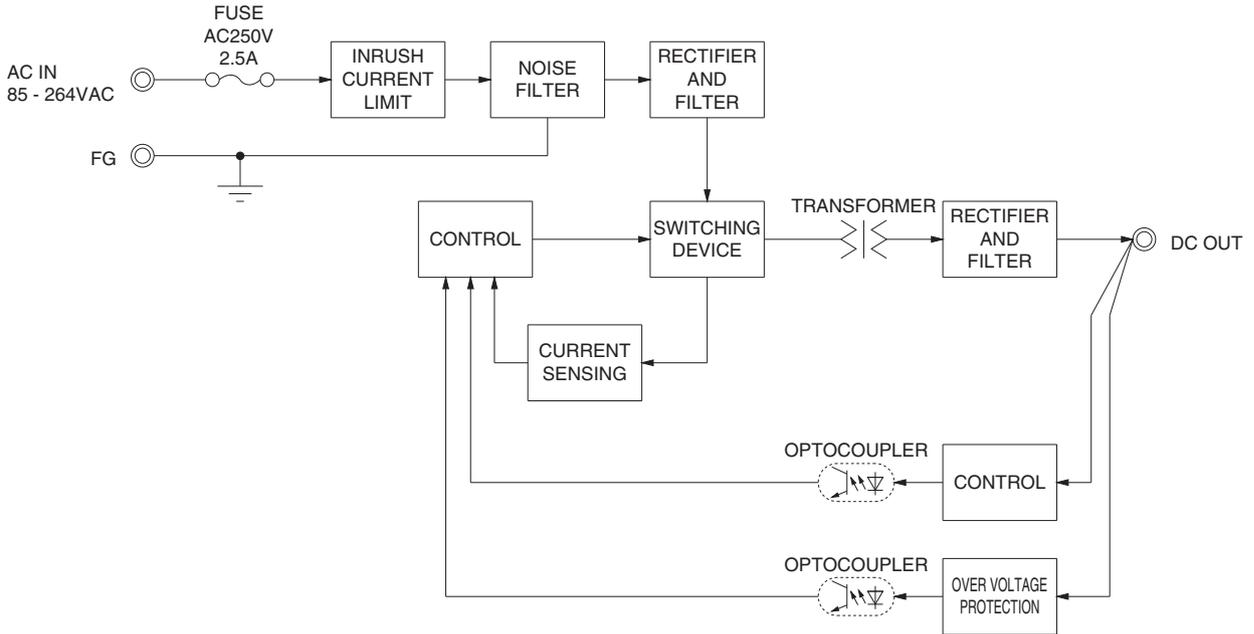
## SPECIFICATIONS

MODEL	PDA50F-3R3	PDA50F-5	PDA50F-12	PDA50F-15	PDA50F-24	PDA50F-36	PDA50F-48	
<b>INPUT</b>	85 - 264 1 φ (Refer to Instruction Manual 1.1)							
VOLTAGE[VAC]	*2							
CURRENT[A]	ACIN 100V 0.72typ	1.05typ						
	ACIN 230V 0.38typ	0.52typ						
FREQUENCY[Hz]	50 / 60 (45 - 440)							
EFFICIENCY[%]	ACIN 100V 80.0typ	81.5typ	82.5typ	83.0typ	85.0typ	85.0typ	86.0typ	
	ACIN 230V 82.5typ	85.0typ	85.0typ	85.0typ	87.5typ	87.5typ	88.5typ	
INRUSH CURRENT[A]	ACIN 100V 15typ (I <sub>o</sub> =100%) at cold start							
	ACIN 230V 35typ (I <sub>o</sub> =100%) at cold start							
LEAKAGE CURRENT[mA]	0.3 / 0.65 max (ACIN 100V / 240V, 60Hz, I <sub>o</sub> =100%, According to IEC62368-1, and DEN-AN)							
<b>OUTPUT</b>	VOLTAGE[V]	3.3	5	12	15	24	36	48
	CURRENT[A]	*2 10	10	4.3	3.5	2.2	1.4	1.1
	LINE REGULATION[mV]	*3 20max	20max	48max	60max	96max	144max	192max
	LOAD REGULATION[mV]	*3 40max	40max	100max	120max	150max	240max	240max
	RIPPLE[mVp-p]	0 to +50°C 80max	80max	120max	120max	120max	150max	200max
		-20 to 0°C 140max	140max	160max	160max	160max	200max	250max
		I <sub>o</sub> =0 to 15% 300max	300max	300max	300max	300max	300max	300max
	RIPPLE NOISE[mVp-p]	0 to +50°C 120max	120max	150max	150max	150max	250max	300max
		-20 to 0°C 160max	160max	180max	180max	180max	300max	480max
		I <sub>o</sub> =0 to 15% 360max	360max	360max	360max	360max	360max	360max
	TEMPERATURE REGULATION[mV]	0 to +50°C 50max	50max	120max	150max	240max	360max	480max
		-20 to +50°C 60max	60max	150max	180max	290max	450max	600max
	DRIFT[mV]	*5 20max	20max	48max	60max	96max	144max	192max
	START-UP TIME[ms]	80typ (ACIN 100V, I <sub>o</sub> =100%)						
	HOLD-UP TIME[ms]	20typ (ACIN 100V, I <sub>o</sub> =100%) / 140typ (ACIN 230V, I <sub>o</sub> =100%)						
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.85 to 3.63	4.00 to 5.50	10.00 to 13.20	13.20 to 18.00	19.20 to 27.00	28.80 to 39.60	39.00 to 53.00
	OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	36.00 to 37.44	48.00 to 49.92
<b>PROTECTION CIRCUIT AND OTHERS</b>	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically						
	OVERVOLTAGE PROTECTION	4.00 to 5.25	5.75 to 7.00	15.00 to 18.00	20.00 to 25.00	30.00 to 37.00	43.00 to 50.00	58.00 to 67.00
	REMOTE SENSING	Not provided						
<b>ISOLATION</b>	INPUT-OUTPUT	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)						
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)						
	OUTPUT-FG	500VAC 1minute, Cutoff current = 25mA, 500VDC 100MΩ min (At Room Temperature)						
<b>ENVIRONMENT</b>	OPERATING TEMP., HUMID. AND ALTITUDE	*2 -20 to +70°C, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max						
	STORAGE TEMP., HUMID. AND ALTITUDE	-20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max						
	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						
<b>SAFETY AND NOISE REGULATIONS</b>	AGENCY APPROVALS	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN						
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B						
	HARMONIC ATTENUATOR	*6 Complies with IEC61000-3-2 (Class A) (No built-in power factor correction)						
<b>OTHERS</b>	CASE SIZE/WEIGHT	31 X 82 X 120mm [1.22 X 3.23 X 4.72 inches] (without terminal block) (W X H X D) / 330g max (with cover : 370g max)						
	COOLING METHOD	*2 Convection/Forced air (Requires external fan) (Refer to "Derating")						

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.  
 \*4 This is the value that measured on measuring board with capacitor of 22 μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104).  
 Ripple and ripple noise spec is change at I<sub>o</sub>=0 to 15% by burst operation.

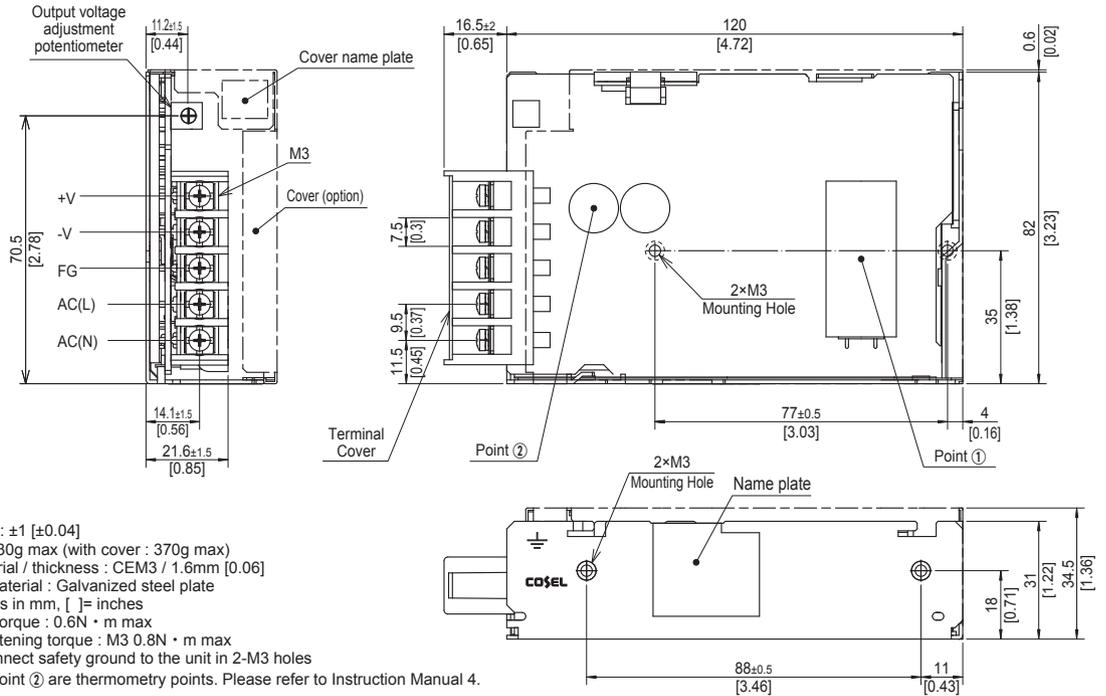
\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Parallel operation is not possible.  
 \* Sound noise may be generated by power supply in case of pulse load.

Block diagram



External view

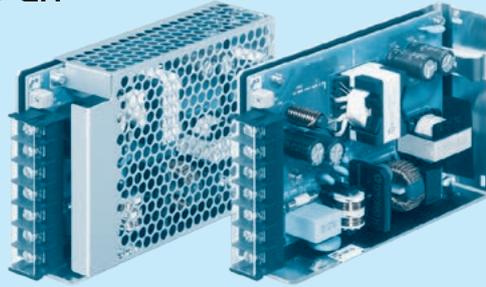
\*External size of option J1, N1 and V is different from standard model and refer to 8 option of instruction manual for details.



- \* Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- \* Weight : 330g max (with cover : 370g max)
- \* PCB Material / thickness : CEM3 / 1.6mm [0.06]
- \* Chassis material : Galvanized steel plate
- \* Dimensions in mm, [ ]= inches
- \* Mounting torque : 0.6N · m max
- \* Screw tightening torque : M3 0.8N · m max
- \* Please connect safety ground to the unit in 2-M3 holes
- \* Point ①, Point ② are thermometry points. Please refer to Instruction Manual 4.

# PDA100F

① PD ② A ③ 100 ④ F ⑤ -□ ⑥ -□



Example recommended EMI/EMC filter  
NAC-06-472



High voltage pulse noise type : NAP series  
Low leakage current type : NAM 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 \*1
- N : with cover
- C : with Coating
- G : LOW leakage current
- J1 : VH(J.S.T.) Connector type (only -12, -15, -24, -36, -48)
- N1 : with DIN rail and Cover
- T5:UL508[24V]

For option details, refer to Instruction Manual 8.1.

\* 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	PDA100F-3R3	PDA100F-5	PDA100F-12	PDA100F-15	PDA100F-24	PDA100F-36	PDA100F-48
MAX OUTPUT WATTAGE[W]	*2 66	100	102	105	108	100.8	100.8
DC OUTPUT	*2 3.3V 20A	5V 20A	12V 8.5A	15V 7A	24V 4.5A	36V 2.8A	48V 2.1A

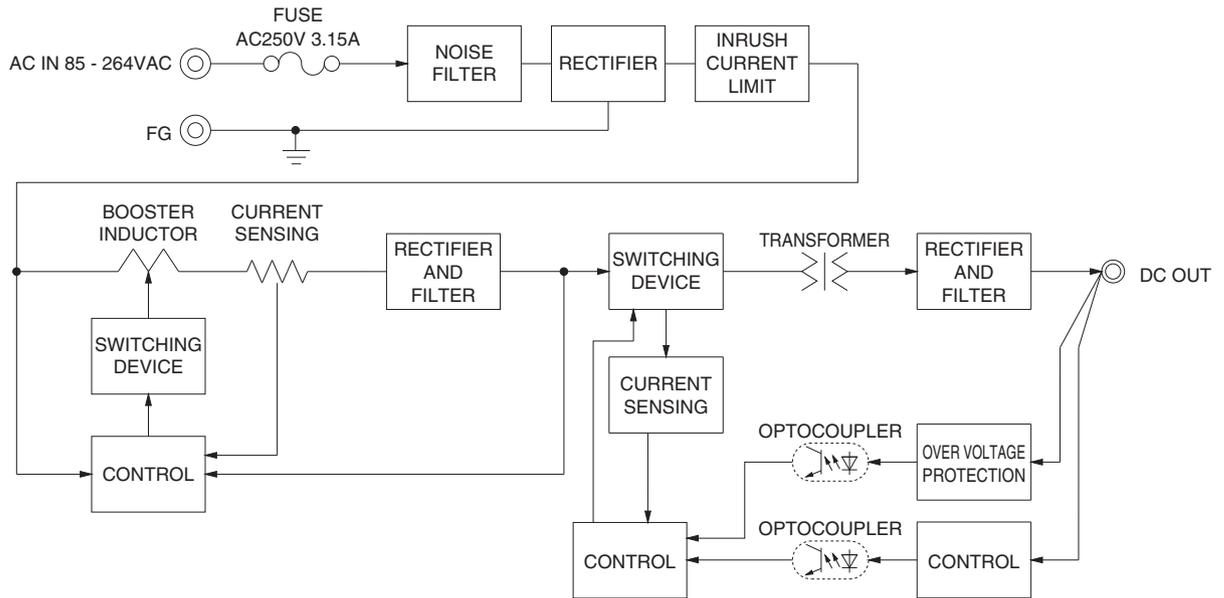
## SPECIFICATIONS

MODEL	PDA100F-3R3	PDA100F-5	PDA100F-12	PDA100F-15	PDA100F-24	PDA100F-36	PDA100F-48	
<b>INPUT</b>	85 - 264 1 φ (Refer to Instruction Manual 1.1)							
VOLTAGE[VAC]	*2							
	ACIN 100V	0.9typ	1.3typ					
CURRENT[A]	ACIN 230V	0.4typ	0.6typ					
	FREQUENCY[Hz]	50 / 60 (45 - 66)						
EFFICIENCY[%]	ACIN 100V	85.0typ	87.0typ	88.5typ	88.5typ	87.5typ	88.0typ	
	ACIN 230V	86.5typ	89.5typ	91.0typ	91.0typ	89.5typ	90.5typ	
POWER FACTOR (Io=100%)	ACIN 100V	0.97typ	0.97typ					
	ACIN 230V	0.81typ	0.87typ					
INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) at cold start						
	ACIN 230V	35typ (Io=100%) at cold start						
LEAKAGE CURRENT[mA]	0.4 / 0.75 max (ACIN 100V / 240V, 60Hz, Io=100%, According to IEC62368-1, and DEN-AN)							
<b>OUTPUT</b>	VOLTAGE[V]	3.3	5	12	15	24	36	48
CURRENT[A]	*2	20	20	8.5	7	4.5	2.8	2.1
LINE REGULATION[mV]	*3	20max	20max	48max	60max	96max	144max	192max
LOAD REGULATION[mV]	*3	40max	40max	100max	120max	150max	240max	240max
RIPPLE[mVp-p]	0 to +50°C	80max	80max	120max	120max	120max	150max	150max
	-20 to 0°C	140max	140max	160max	160max	160max	200max	200max
	Io=0 to 15%	300max	300max	360max	500max	500max	500max	500max
RIPPLE NOISE[mVp-p]	0 to +50°C	120max	120max	150max	150max	150max	250max	250max
	-20 to 0°C	160max	160max	180max	180max	180max	300max	300max
	Io=0 to 15%	360max	360max	400max	600max	600max	600max	600max
TEMPERATURE REGULATION[mV]	0 to +50°C	50max	50max	120max	150max	240max	360max	480max
	-20 to +50°C	60max	60max	150max	180max	290max	450max	600max
DRIFT[mV]	*5	20max	20max	48max	60max	96max	144max	192max
START-UP TIME[ms]	100typ (ACIN 100V, Io=100%)							
HOLD-UP TIME[ms]	20typ (ACIN 100V, Io=100%)							
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.85 to 3.63	4.00 to 5.50	10.00 to 13.20	13.20 to 18.00	19.20 to 27.00	28.80 to 39.60	39.00 to 53.00	
OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	36.00 to 37.44	48.00 to 49.92	
<b>PROTECTION CIRCUIT AND OTHERS</b>	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically						
OVERVOLTAGE PROTECTION	4.00 to 5.25	5.75 to 7.00	15.00 to 18.00	20.00 to 25.00	30.00 to 37.00	43.00 to 50.00	58.00 to 67.00	
REMOTE SENSING	Not provided							
<b>ISOLATION</b>	INPUT-OUTPUT	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)						
INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)							
OUTPUT-FG	500VAC 1minute, Cutoff current = 25mA, 500VDC 100MΩ min (At Room Temperature)							
<b>ENVIRONMENT</b>	OPERATING TEMPERATURE,HUMID	*2 -20 to +70°C, 20 - 90%RH (Non condensing)						
STORAGE TEMPERATURE,HUMID	-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							
<b>SAFETY AND NOISE REGULATIONS</b>	AGENCY APPROVALS	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN						
CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B							
HARMONIC ATTENUATOR	*6 Complies with IEC61000-3-2 (Class A)							
<b>OTHERS</b>	CASE SIZE/WEIGHT	32 X 93 X 147mm [1.26x3.66x5.79 inches] (without terminal block) (W X H X D) / 440g max (with cover : 500g max)						
COOLING METHOD	*2	Convection/Forced air (Refer to "Derating")						

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.  
 \*4 This is the value that measured on measuring board with capacitor of 22 μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter

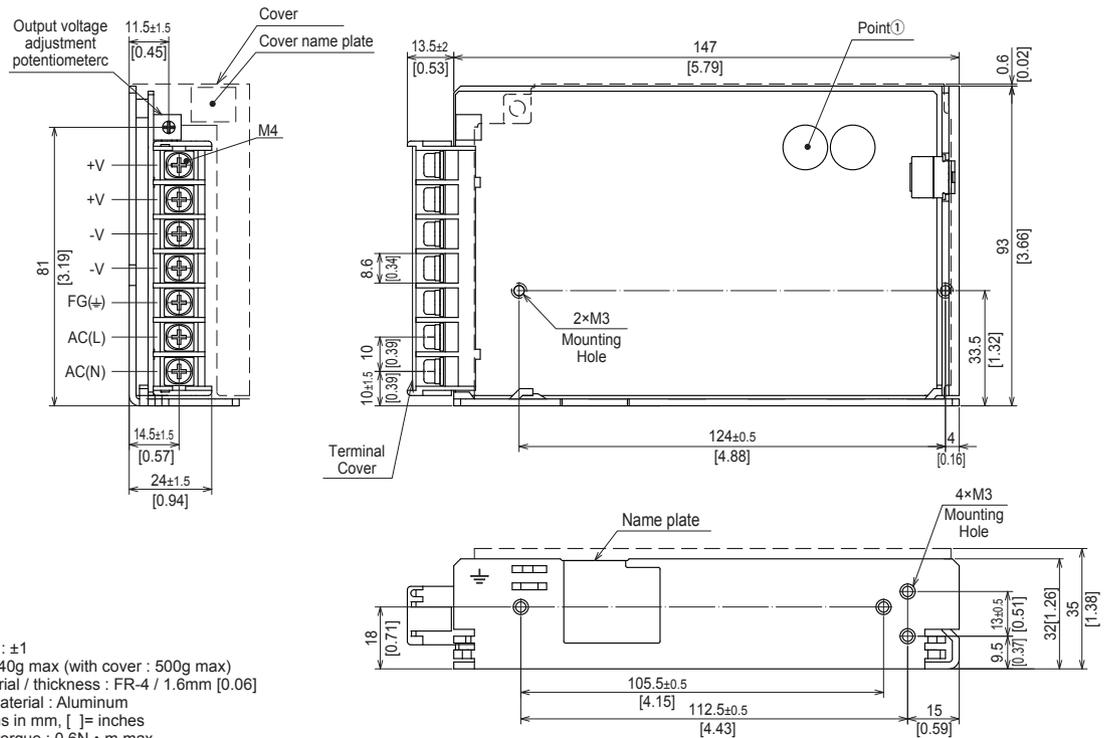
(Equivalent to KEISOKU-GIKEN:RM104).  
 Ripple and ripple noise spec is change at Io=0 to 15% by burst operation.  
 \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Parallel operation is not possible.  
 \* Sound noise may be generated by power supply in case of pulse load.

## Block diagram



## External view

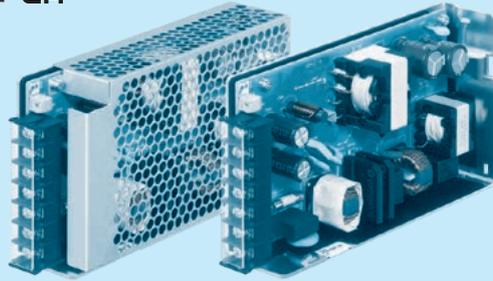
\*External size of option J1, N1 and V is different from standard model and refer to 8 option of instruction manual for details.



- \* Tolerance :  $\pm 1$
- \* Weight : 440g max (with cover : 500g max)
- \* PCB Material / thickness : FR-4 / 1.6mm [0.06]
- \* Chassis material : Aluminum
- \* Dimensions in mm, [ ] = inches
- \* Mounting torque : 0.6N · m max
- \* Screw tightening torque : M4 1.6N · m max
- \* Please connect safety ground to the FG terminal on the unit.
- \* Point ① is the thermometry points. Please refer to Instruction Manual 4.

# PDA150F

① PD ② A ③ 150 ④ F ⑤ -□ ⑥ -□



Example recommended EMI/EMC filter  
NAC-06-472



High voltage pulse noise type : NAP series  
Low leakage current type : NAM 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 \*1
- N : with cover
- C : with Coating
- G : LOW leakage current
- J1 : VH(J.S.T.) Connector type (only -12, -15, -24, -36, -48)
- N1 : with DIN rail and Cover
- T5:UL508[24V]

For option details, refer to Instruction Manual 8.1.

\* 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	PDA150F-3R3	PDA150F-5	PDA150F-12	PDA150F-15	PDA150F-24	PDA150F-36	PDA150F-48
MAX OUTPUT WATTAGE[W]	*2 99	150	156	150	156	154.8	158.4
DC OUTPUT	*2 3.3V 30A	5V 30A	12V 13A	15V 10A	24V 6.5A	36V 4.3A	48V 3.3A

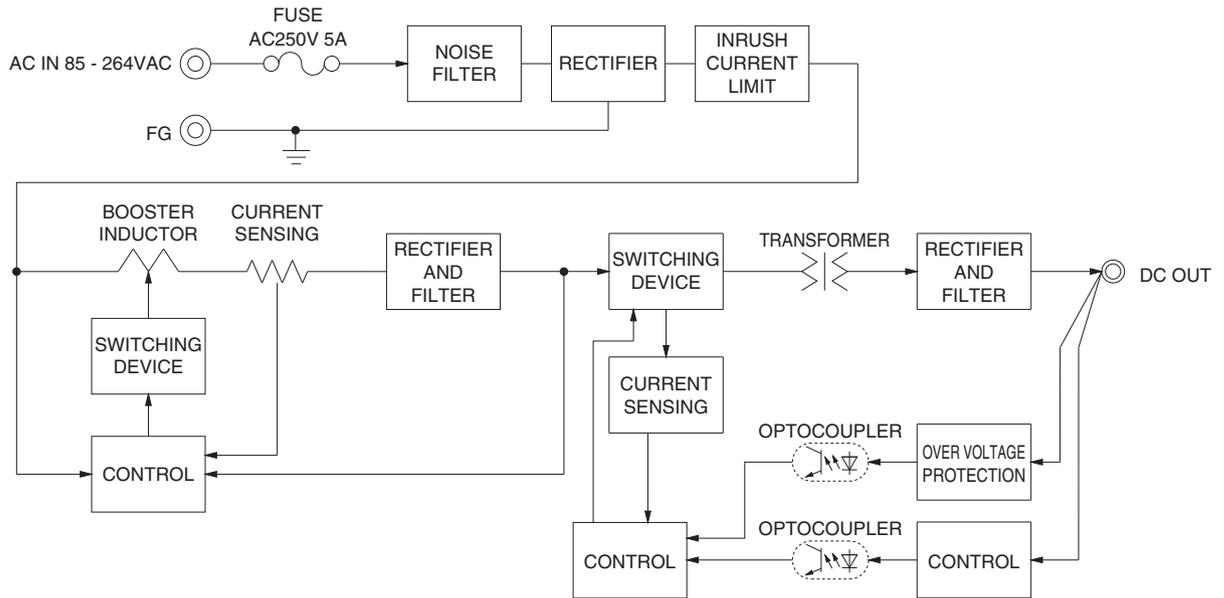
## SPECIFICATIONS

	MODEL	PDA150F-3R3	PDA150F-5	PDA150F-12	PDA150F-15	PDA150F-24	PDA150F-36	PDA150F-48	
INPUT	VOLTAGE[VAC]	*2 85 - 264 1 φ (Refer to Instruction Manual 1.1)							
	CURRENT[A]	ACIN 100V	1.2typ	1.8typ					
		ACIN 230V	0.6typ	0.9typ					
	FREQUENCY[Hz]	50 / 60 (45 - 66)							
	EFFICIENCY[%]	ACIN 100V	84.0typ	85.0typ	87.0typ	88.5typ	87.0typ	88.0typ	
		ACIN 230V	86.0typ	87.5typ	89.0typ	89.5typ	89.0typ	90.0typ	
	POWER FACTOR (lo=100%)	ACIN 100V	0.97typ	0.97typ					
		ACIN 230V	0.84typ	0.87typ					
INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%) at cold start							
	ACIN 230V	35typ (lo=100%) at cold start							
LEAKAGE CURRENT[mA]	0.4 / 0.75 max (ACIN 100V / 240V, 60Hz, lo=100%, According to IEC62368-1, and DEN-AN)								
OUTPUT	VOLTAGE[V]	3.3	5	12	15	24	36	48	
	CURRENT[A]	30	30	13	10	6.5	4.3	3.3	
	LINE REGULATION[mV]	*3 20max	20max	48max	60max	96max	144max	192max	
	LOAD REGULATION[mV]	*3 40max	40max	100max	120max	150max	240max	240max	
	RIPPLE[mVp-p]	0 to +50°C	80max	80max	120max	120max	120max	150max	150max
		-20 to 0°C	140max	140max	160max	160max	160max	200max	200max
		lo=0 to 15%	300max	300max	360max	500max	500max	500max	500max
	RIPPLE NOISE[mVp-p]	0 to +50°C	120max	120max	150max	150max	150max	250max	250max
		-20 to 0°C	160max	160max	180max	180max	180max	300max	300max
		lo=0 to 15%	360max	360max	400max	600max	600max	600max	600max
	TEMPERATURE REGULATION[mV]	0 to +50°C	50max	50max	120max	150max	240max	360max	480max
		-20 to +50°C	60max	60max	150max	180max	290max	450max	600max
	DRIFT[mV]	*5 20max	20max	48max	60max	96max	144max	192max	
	START-UP TIME[ms]	120typ (ACIN 100V, lo=100%)							
HOLD-UP TIME[ms]	20typ (ACIN 100V, lo=100%)								
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.85 to 3.63	4.00 to 5.50	10.00 to 13.20	13.20 to 18.00	19.20 to 27.00	28.80 to 39.60	39.00 to 53.00		
OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	36.00 to 37.44	48.00 to 49.92		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION	4.00 to 5.25	5.75 to 7.00	15.00 to 18.00	20.00 to 25.00	30.00 to 37.00	43.00 to 50.00	58.00 to 67.00	
	REMOTE SENSING	Not provided							
ISOLATION	INPUT-OUTPUT	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)							
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩ min (At Room Temperature)							
	OUTPUT-FG	500VAC 1minute, Cutoff current = 25mA, 500VDC 100MΩ min (At Room Temperature)							
ENVIRONMENT	OPERATING TEMPERATURE,HUMID	*2 -20 to +70°C, 20 - 90%RH (Non condensing)							
	STORAGE TEMPERATURE,HUMID	-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, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN							
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B							
	HARMONIC ATTENUATOR	*6 Complies with IEC61000-3-2 (Class A)							
OTHERS	CASE SIZE/WEIGHT	34 X 93 X 168mm [1.34x3.66x6.61 inches] (without terminal block) (W X H X D) / 530g max (with cover : 600g max)							
	COOLING METHOD	*2 Convection/Forced air (Refer to "Derating")							

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.  
 \*4 This is the value that measured on measuring board with capacitor of 22 μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter

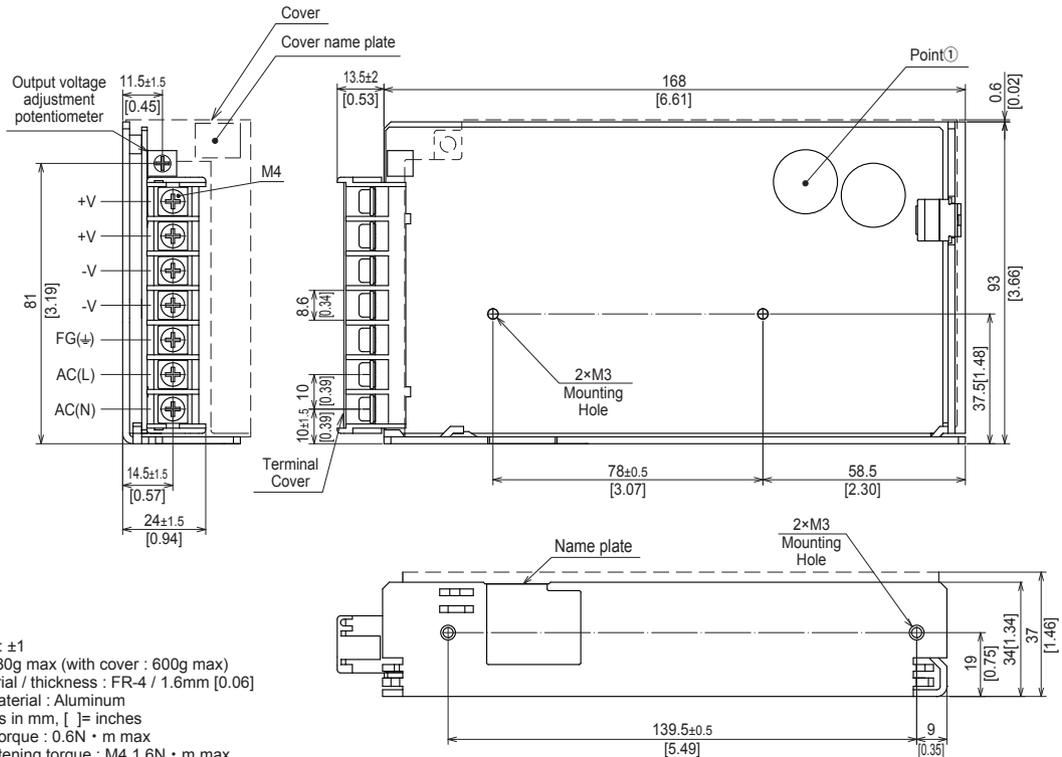
(Equivalent to KEISOKU-GIKEN:RM104).  
 Ripple and ripple noise spec is change at lo=0 to 15% by burst operation.  
 \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Parallel operation is not possible.  
 \* Sound noise may be generated by power supply in case of pulse load.

## Block diagram



## External view

\*External size of option J1, N1 and V is different from standard model and refer to 8 option of instruction manual for details.



- \* Tolerance : ±1
- \* Weight : 530g max (with cover : 600g max)
- \* PCB Material / thickness : FR-4 / 1.6mm [0.06]
- \* Chassis material : Aluminum
- \* Dimensions in mm, [ ] = inches
- \* Mounting torque : 0.6N · m max
- \* Screw tightening torque : M4 1.6N · m max
- \* Please connect safety ground to the FG terminal on the unit.
- \* Keep drawing current per pin below 20A for TB1.
- \* Point ① is the thermometry points. Please refer to Instruction Manual 4.

# PDA300F

① PD ② A ③ 300 ④ F ⑤ -□ ⑥ -□



Example recommended EMI/EMC filter  
NAC-06-472



High voltage pulse noise type : NAP series  
Low leakage current type : NAM 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 \*1
- C : with Coating
- G : LOW leakage current
- N1 : with DIN rail

For option details, refer to Instruction Manual 8.1.

MODEL	PDA300F-3R3	PDA300F-5	PDA300F-12	PDA300F-15	PDA300F-24	PDA300F-36	PDA300F-48
MAX OUTPUT WATTAGE[W]	198	300	324	330	336	324	336
DC OUTPUT	ACIN 100V	3.3V 60A	5V 60A	12V 27A	15V 22A	24V 14A	36V 9A
	ACIN 230V	3.3V 60A	5V 60A	12V 27A	15V 22A	24V 14 (16.5) A	36V 9A

## SPECIFICATIONS

	MODEL	PDA300F-3R3	PDA300F-5	PDA300F-12	PDA300F-15	PDA300F-24	PDA300F-36	PDA300F-48	
INPUT	VOLTAGE[VAC]	85 - 264 1φ (Refer to Instruction Manual 1.1)							
	CURRENT[A]	ACIN 100V	2.9typ	4.1typ					
		ACIN 230V	1.4typ	1.9typ					
	FREQUENCY[Hz]	50 / 60 (45-66)							
	EFFICIENCY[%]	ACIN 100V	70.0typ	75.0typ	79.0typ	80.5typ	82.0typ	81.0typ	82.5typ
		ACIN 230V	72.5typ	78.0typ	82.0typ	84.0typ	84.5typ	84.5typ	86.0typ
	POWER FACTOR (Io=100%)	ACIN 100V	0.99typ						
ACIN 230V		0.95typ							
INRUSH CURRENT[A]	ACIN 100V	20typ (Io=100%) at cold start							
	ACIN 230V	40typ (Io=100%) at cold start							
LEAKAGE CURRENT[mA]	0.4 / 0.75 max (ACIN 100V / 240V, 60Hz, Io=100%, According to IEC62368-1, and DEN-AN)								
OUTPUT	VOLTAGE[V]	3.3	5	12	15	24	36	48	
	CURRENT[A]	ACIN 100V	60	60	27	22	14	9	7
		ACIN 230V	60	60	27	22	14 (16.5)	9	7
	LINE REGULATION[mV]	20max	20max	48max	60max	96max	144max	192max	
	LOAD REGULATION[mV]	40max	40max	100max	120max	150max	150max	300max	
	RIPPLE[mVp-p]	0 to +50°C	80max	80max	120max	120max	120max	150max	150max
		-20 to 0°C	140max	140max	160max	160max	160max	160max	400max
	RIPPLE NOISE[mVp-p]	0 to +50°C	120max	120max	150max	150max	150max	200max	200max
		-20 to 0°C	160max	160max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50°C	40max	50max	120max	150max	240max	360max	480max
		-20 to +50°C	60max	75max	180max	180max	290max	440max	600max
	DRIFT[mV]	12max	20max	48max	60max	96max	144max	192max	
	START-UP TIME[ms]	300typ (ACIN 100V, Io=100%)							
	HOLD-UP TIME[ms]	35typ (ACIN 100V, Io=100%)							
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.64 to 3.96	3.96 to 6.00	8.25 to 13.20	10.50 to 16.50	16.50 to 26.40	25.20 to 39.60	38.40 to 56.00		
OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	36.00 to 37.44	48.00 to 49.92		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION[V]	4.30 to 6.30	6.50 to 8.00	14.40 to 18.60	18.00 to 23.30	28.80 to 37.20	43.20 to 54.00	57.60 to 80.00	
	REMOTE SENSING	Provided							
ISOLATION	REMOTE ON/OFF	Provided							
	INPUT-OUTPUT-RC	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩmin (At Room Temperature)							
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩmin (At Room Temperature)							
	OUTPUT·RC·AUX-FG	500VAC 1minute, Cutoff current = 100mA, 500VDC 100MΩmin (At Room Temperature)							
	OUTPUT-RC-AUX	500VAC 1minute, Cutoff current = 100mA, 500VDC 100MΩ min (At Room Temperature)							
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-20 to +70°C (Refer to "Derating"), 20 - 90%RH (Non condensing)							
	STORAGE TEMP., HUMID. 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 (At only AC input)	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN							
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B							
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (Class A)							
OTHERS	CASE SIZE/WEIGHT	102x42x170mm [4.02x1.65x6.69 inches] (without terminal block and screw) (WXHXD) /1.0kg max							
	COOLING METHOD	Forced cooling (internal fan)							

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.

\*2 Derating is required. Please contact us for DC input.

\*3 ( ) means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual in detail.

\*4 This is the value measured on measuring board with capacitor of 22μF within 150mm from output terminal.  
Measured by 20MHz Oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN : RM-104).

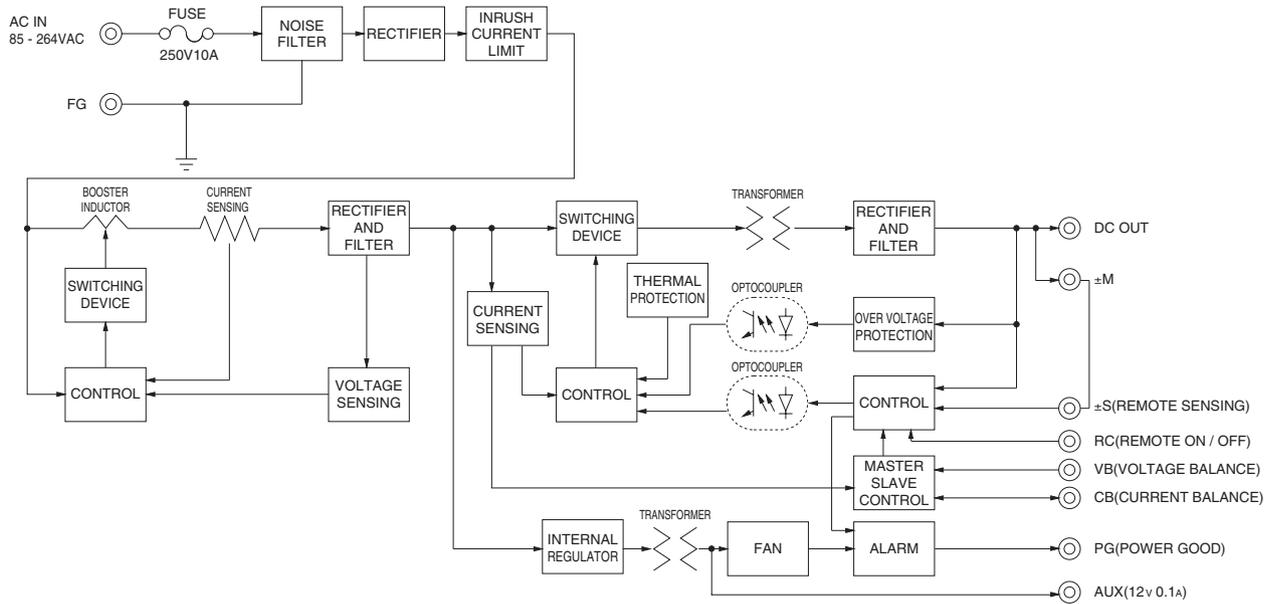
\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

\*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.

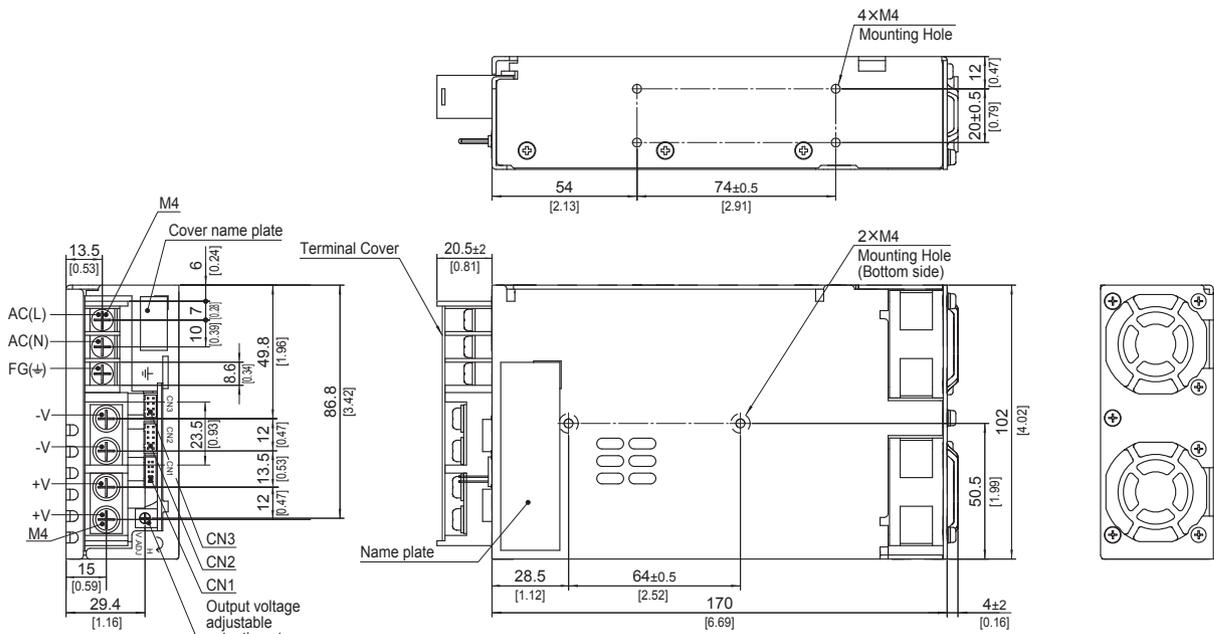
\* To meet the specification, do not operate overload condition.

\* Sound noise may be generated by power supply in case of pulse load.

## Block diagram



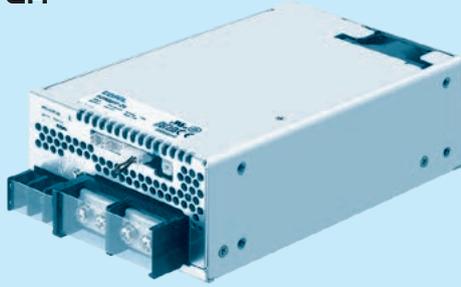
## External view



- \* Dimensions in mm, [ ]=inches
- \* Tolerance : ±1 [±0.04]
- \* Weight : 1.0kg max
- \* PCB Material/thickness : FR-4/1.6mm [0.06]
- \* Chassis material : Aluminum
- \* Mounting torque : 1.2N • m max
- \* Screw tightening torque : M4 : 1.6N • m max
- \* The housing for the remote sensing unused is mounted on CN1
- \* Please connect safety ground to FG terminal on the unit

# PDA600F

PD A 600 F - □ - □  
 ① ② ③ ④ ⑤ ⑥



Example recommended EMI/EMC filter  
**NAC-10-472**



High voltage pulse noise type : NAP series  
 Low leakage current type : NAM 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 \*1
- C: with Coating
- G: LOW leakage current

For option details, refer to Instruction Manual 8.1.

MODEL	PDA600F-3R3	PDA600F-5	PDA600F-12	PDA600F-15	PDA600F-24	PDA600F-36	PDA600F-48
MAX OUTPUT WATTAGE[W]	396	600	636	645	648	648	624
DC OUTPUT	ACIN 100V	3.3V 120A	5V 120A	12V 53A	15V 43A	24V 27A	48V 13A
	ACIN 230V	3.3V 120A	5V 120A	12V 53A	15V 43A	24V 27(31)A	48V 13A

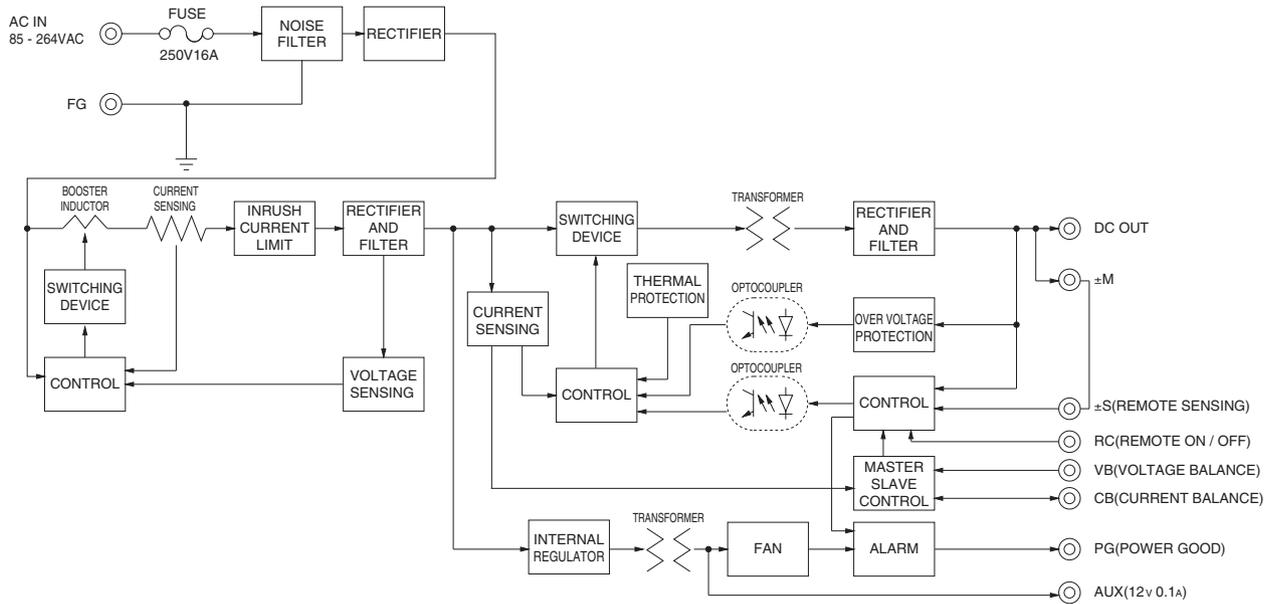
## SPECIFICATIONS

	MODEL	PDA600F-3R3	PDA600F-5	PDA600F-12	PDA600F-15	PDA600F-24	PDA600F-36	PDA600F-48	
INPUT	VOLTAGE[VAC]	85 - 264 1 φ (Refer to Instruction Manual 1.1)							
	CURRENT[A]	ACIN 100V	5.2typ	7.9typ					
		ACIN 230V	2.5typ	3.4typ					
	FREQUENCY[Hz]	50 / 60 (45-66)							
	EFFICIENCY[%]	ACIN 100V	73.5typ	78.5typ	83.0typ	83.5typ	85.5typ	84.5typ	86.0typ
		ACIN 230V	75.5typ	81.0typ	85.5typ	86.5typ	88.0typ	87.0typ	89.0typ
	POWER FACTOR (Io=100%)	ACIN 100V	0.98typ						
ACIN 230V		0.95typ							
INRUSH CURRENT[A]	ACIN 100V	20/40typ (Io=100%) (Primary / Secondary inrush current) (More than 3 sec. to re-start)							
	ACIN 230V	40/40typ (Io=100%) (Primary / Secondary inrush current) (More than 3 sec. to re-start)							
LEAKAGE CURRENT[mA]	0.4 / 0.75 max (ACIN 100V / 240V, 60Hz, Io=100%, According to IEC62368-1, and DEN-AN)								
OUTPUT	VOLTAGE[V]	3.3	5	12	15	24	36	48	
	CURRENT[A]	ACIN 100V	120	120	53	43	27	18	13
		ACIN 230V	120	120	53	43	27 (31)	18	13
	LINE REGULATION[mV]	20max	20max	48max	60max	96max	144max	192max	
	LOAD REGULATION[mV]	40max	40max	100max	120max	150max	150max	300max	
	RIPPLE[mVp-p]	0 to +50°C	80max	80max	120max	120max	120max	150max	150max
		-20 to 0°C	140max	140max	160max	160max	160max	160max	400max
	RIPPLE NOISE[mVp-p]	0 to +50°C	120max	120max	150max	150max	150max	200max	200max
		-20 to 0°C	160max	160max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50°C	40max	50max	120max	150max	240max	360max	480max
		-20 to +50°C	60max	75max	180max	180max	290max	440max	600max
	DRIFT[mV]	12max	20max	48max	60max	96max	144max	192max	
	START-UP TIME[ms]	400typ (ACIN 100V, Io=100%)							
	HOLD-UP TIME[ms]	35typ (ACIN 100V, Io=100%)							
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	2.64 to 3.96	3.96 to 6.00	8.25 to 13.20	10.50 to 16.50	16.50 to 26.40	25.20 to 39.60	38.40 to 56.00		
OUTPUT VOLTAGE SETTING[V]	3.30 to 3.40	5.00 to 5.15	12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	36.00 to 37.44	48.00 to 49.92		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION[V]	4.30 to 6.30	6.50 to 8.00	14.40 to 18.60	18.00 to 23.30	28.80 to 37.20	43.20 to 54.00	57.60 to 80.00	
	REMOTE SENSING	Provided							
REMOTE ON/OFF	Provided								
ISOLATION	INPUT-OUTPUT-RC	3,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩmin (At Room Temperature)							
	INPUT-FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 100MΩmin (At Room Temperature)							
	OUTPUT-RC-AUX-FG	500VAC 1minute, Cutoff current = 100mA, 500VDC 100MΩmin (At Room Temperature)							
	OUTPUT-RC-AUX	500VAC 1minute, Cutoff current = 100mA, 500VDC 100MΩ min (At Room Temperature)							
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-20 to +70°C (Refer to "Derating"), 20 - 90%RH (Non condensing)							
	STORAGE TEMP., HUMID. 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 (At only AC input)	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN							
	CONDUCTED NOISE	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part15-B, FCC Part18-B, VCCI-B							
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (Class A)							
OTHERS	CASE SIZE/WEIGHT	120×61×190mm [4.72×2.4×7.48 inches] (without terminal block and screw) (W×H×D) /1.6kg max							
	COOLING METHOD	Forced cooling (internal fan)							

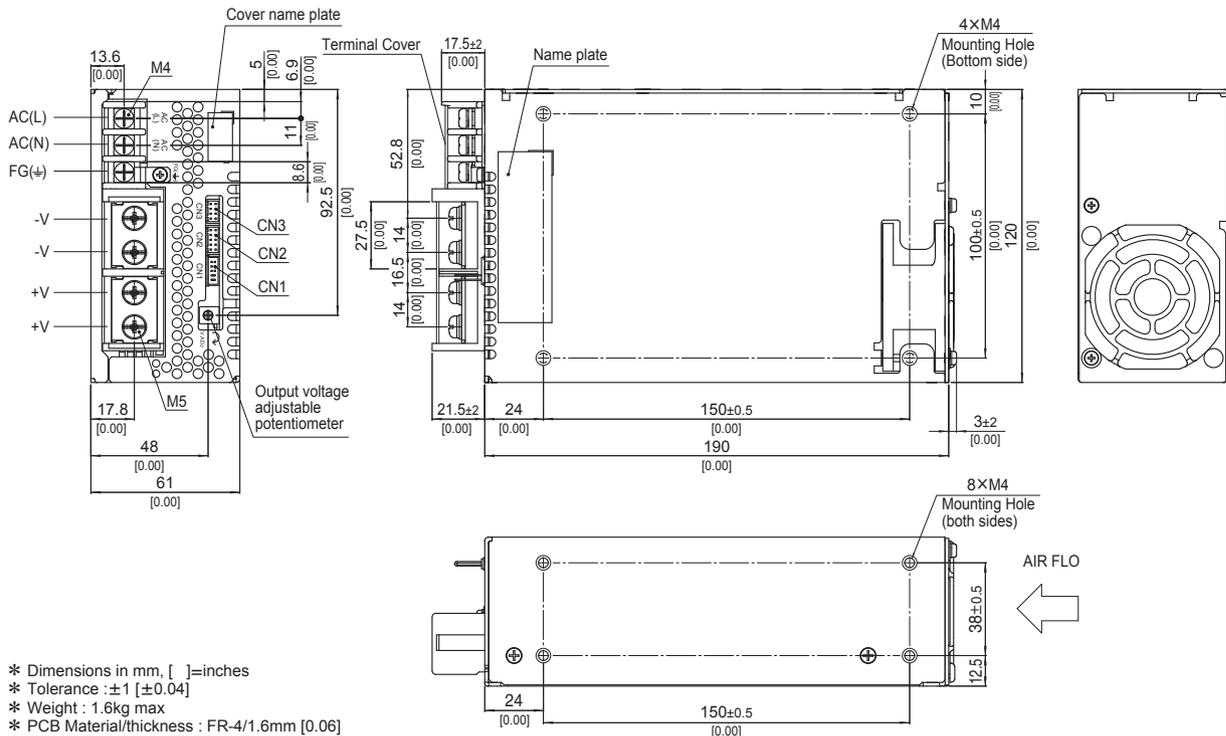
\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.  
 \*2 Derating is required. Please contact us for DC input.  
 \*3 ( ) means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual in detail.  
 \*4 This is the value measured on measuring board with capacitor of 22μF within 150mm from output terminal.  
 Measured by 20MHz Oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN : RM-104).

\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.  
 \*6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.  
 \* To meet the specification, do not operate overload condition.  
 \* Sound noise may be generated by power supply in case of pulse load.

## Block diagram



## External view

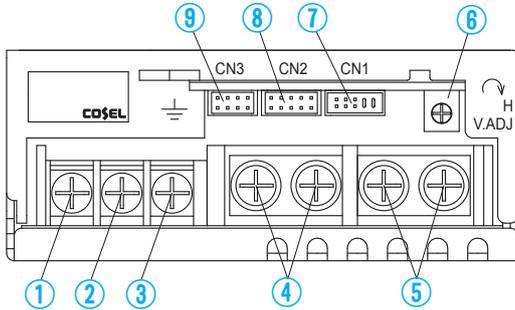


- \* Dimensions in mm, [ ]=inches
- \* Tolerance :±1 [±0.04]
- \* Weight : 1.6kg max
- \* PCB Material/thickness : FR-4/1.6mm [0.06]
- \* Chassis material : Aluminum
- \* Mounting torque : 1.2N · m max
- \* Screw tightening torque
  - M4 : 1.6N · m max
  - M5 : 2.5N · m max
- \* The housing for the remote sensing unused is mounted on CN1
- \* Please connect safety ground to FG terminal on the unit

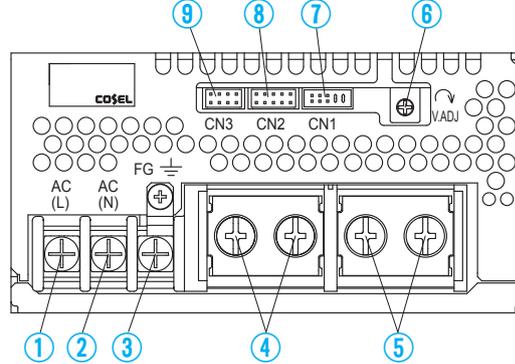
## Terminal Blocks

\* The following information covers PDA300F - 600F. Please see External View for PDA15F - 150F.

### ● PDA300F

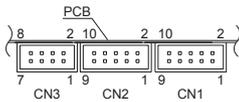


### ● PDA600F



- ① AC (L) } Input Terminals 85 - 264VAC  $\phi$  45 - 66Hz
- ② AC (N) }
- ③ Frame ground (M4  $\perp$ )
- ④ -Output
- ⑤ +Output
- ⑥ Output voltage adjustable potentiometer
- ⑦ CN1 } Connectors
- ⑧ CN2 }
- ⑨ CN3 }

### ● PDA300F, 600F Pin Configuration



Pin Configuration and Functions of CN1 and CN2

Pin No.	Function
1	+M : Self sensing terminal. (Do not wire for external connection.)
2	+S : +Sensing
3	-M : Self sensing terminal. (Do not wire for external connection.)
4	-S : -Sensing
5	VB : Voltage balance
6	CB : Current balance
7	TRM : Adjustment of output voltage
8	-S : -Sensing
9	RC2 : Remote ON/OFF
10	RCG : Remote ON/OFF (GND)

Pin Configuration and Functions of CN3

Pin No.	Function
1	-S : -Sensing
2	-S : -Sensing
3	AUX : Auxiliary output (12V 0.1A)
4	RC1 : Remote ON/OFF
5	AUXG : Auxiliary output (GND)
6	N.C. : No connection
7	PG : Alarm
8	PGG : Alarm (GND)

\* Common signs among CN1, CN2 and CN3 such as -S represent the same potential.

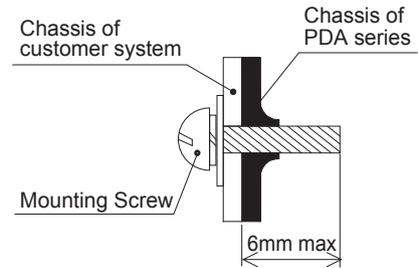
Matching connectors and terminals on CN1, CN2 and CN3

Connector	Housing	Terminal	Mfr.
CN1	PHDR-10VS	Reel : SPHD-002T-P0.5	J.S.T.
CN2		Loose : BPHD-001T-P0.5	
CN3	PHDR-08VS		

Assembling and Installation Method

Installation method

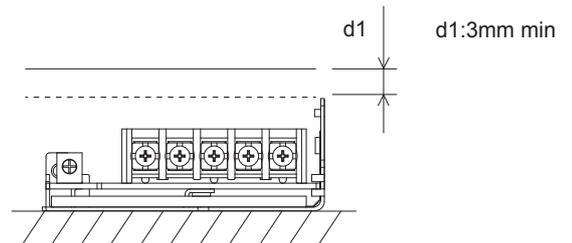
■ Do not insert a screw more than 6mm from the outside of a power supply to keep enough insulation distance between the screw and internal components.



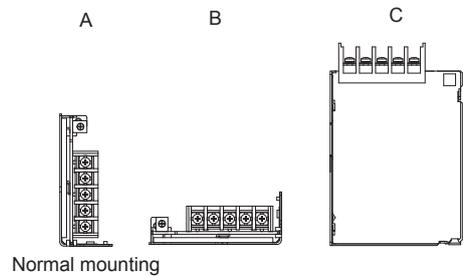
● PDA15F, PDA30F, PDA50F, PDA100F, PDA150F

■ For the metal chassis, keep the distance  $d_1$  for isolation between component and metal chassis.

The  $d_1$  dimension is the distance required for insulation and does not satisfy cooling conditions. For cooling conditions, please refer to "Derating" and section 3 of the instruction manual.

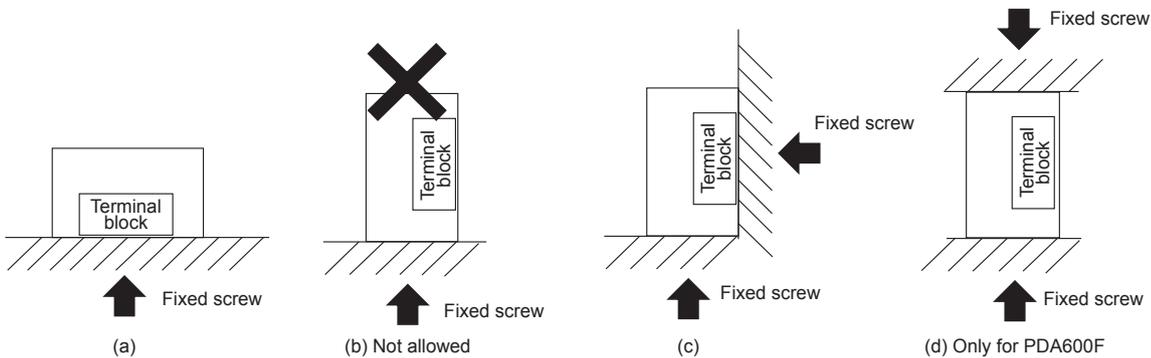


- If you use two or more power supplies side by side, please keep a sufficient distance between them to allow enough air ventilation.
- Ambient temperature around each power supply should not exceed the temperature range shown in "Derating".



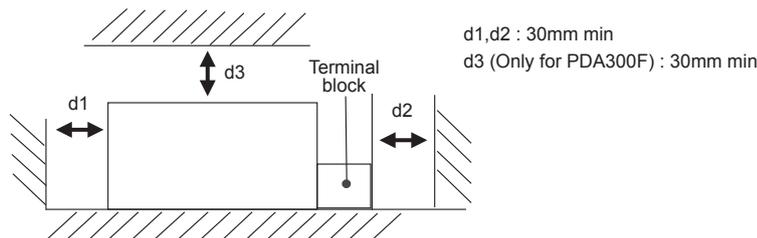
● PDA300F, PDA600F

■ If you need to secure a power supply by screws, securely fix it, taking into consideration of its weight. You can install it in any direction.



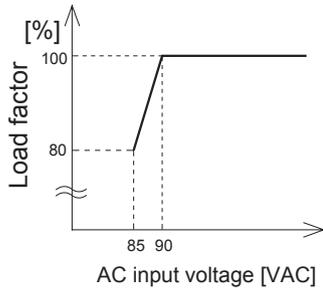
■ If you use a power supply in a dusty environment, it can cause a failure. Please consider taking such countermeasures as installing an air filter near the suction area of the system to prevent a failure.

■ The power supplies have a built-in forced cooling fan. Do not block ventilation at the suction side and its opposite side.

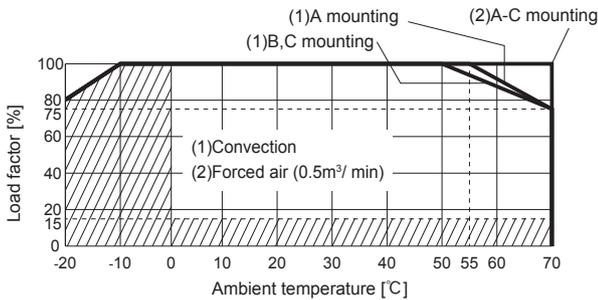


**Derating**

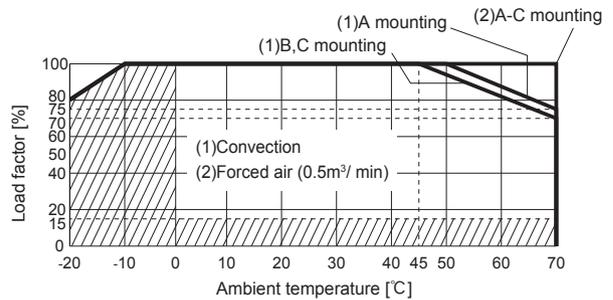
- Derating curve for input voltage  
PDA15F, PDA30F



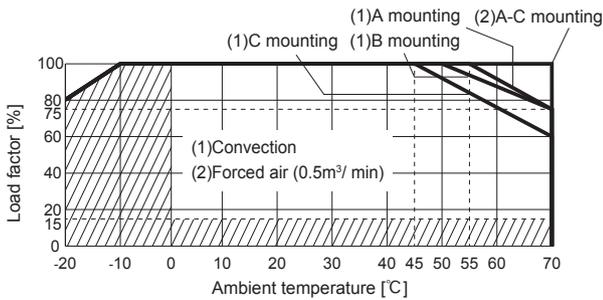
- PDA15F  
Ambient temperature derating curve  
(Reference value)



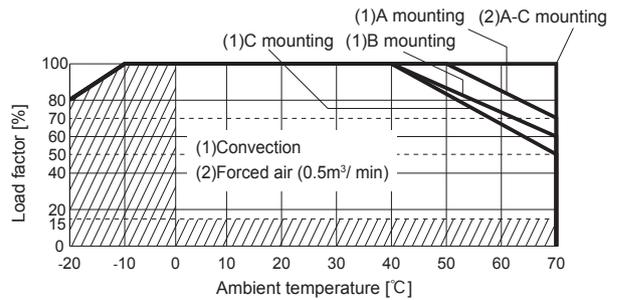
- PDA15F-□-N  
Ambient temperature derating curve  
(Reference value)



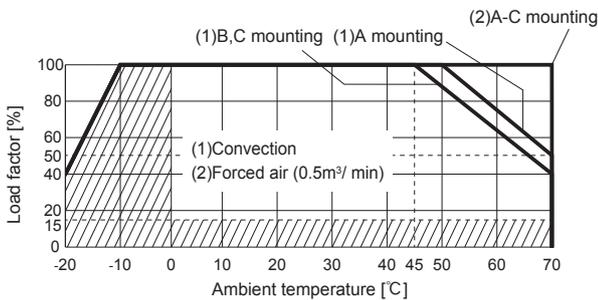
- PDA30F  
Ambient temperature derating curve  
(Reference value)



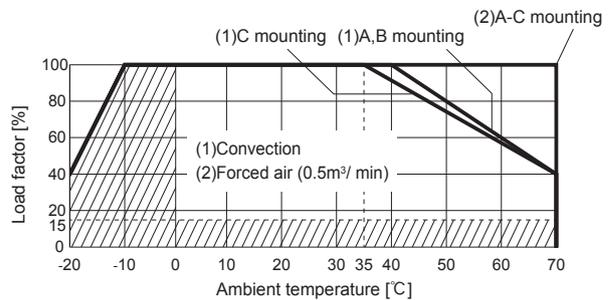
- PDA30F-□-N  
Ambient temperature derating curve  
(Reference value)



- PDA50F-3R3, -5  
Ambient temperature derating curve  
(Reference value)

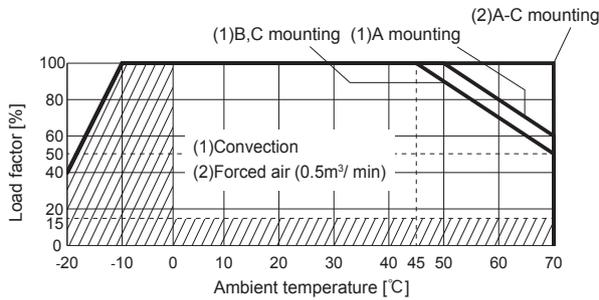


- PDA50F-3R3-N, -5-N  
Ambient temperature derating curve  
(Reference value)

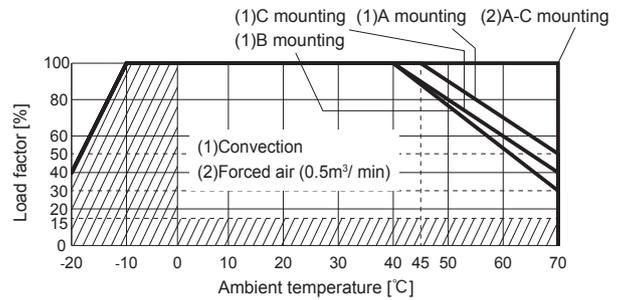


Derating

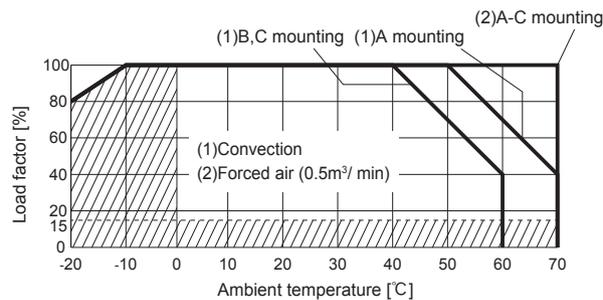
- PDA50F-12, -15, -24, -36, -48  
Ambient temperature derating curve  
(Reference value)



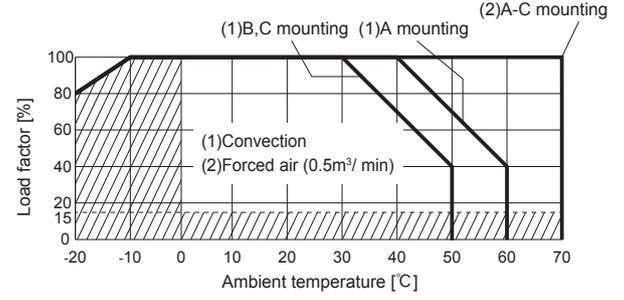
- PDA50F-12-N, -15-N, -24-N, -36-N, -48-N  
Ambient temperature derating curve  
(Reference value)



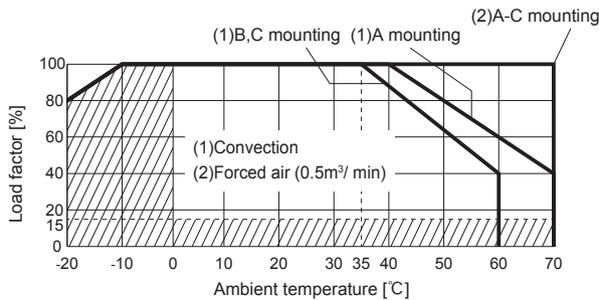
- PDA100F  
Ambient temperature derating curve  
(Reference value)



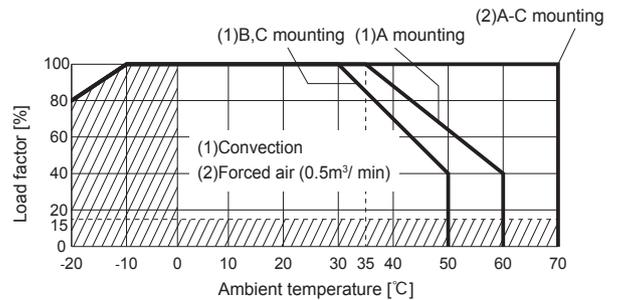
- PDA100F-□-N  
Ambient temperature derating curve  
(Reference value)



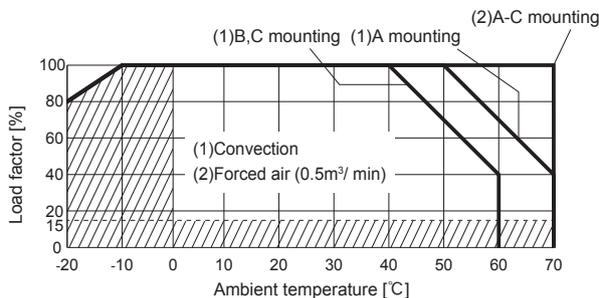
- PDA150F-3R3, -5  
Ambient temperature derating curve  
(Reference value)



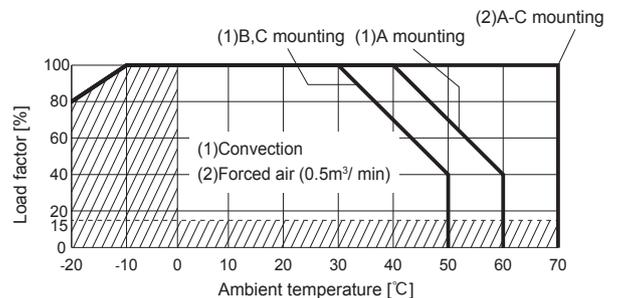
- PDA150F-3R3-N, -5-N  
Ambient temperature derating curve  
(Reference value)



- PDA150F-12, -15, -24, -36, -48  
Ambient temperature derating curve  
(Reference value)



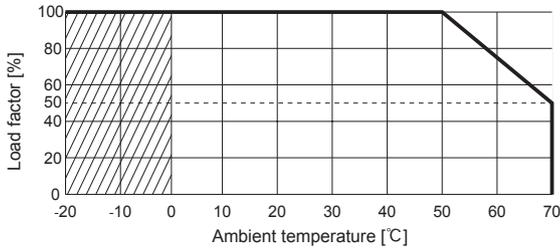
- PDA150F-12-N, -15-N, -24-N, -36-N, -48-N  
Ambient temperature derating curve  
(Reference value)



## Derating

- The operating ambient temperature is different by with / without chassis cover or mounting position.
- In the hatched area, the specification of Ripple, Ripple Noise is different from other area.
- The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be influenced by the heat from the power supply.
- Please make sure the maximum component temperature rise given in Instruction manual 4 is not exceeded.
- Please contact us for more information about operating ambient temperature.

### ● PDA300F, PDA600F Ambient temperature derating curve (Reference value)



- In the hatched area, the specification of Ripple, Ripple Noise is different from other area.
- Derating curve depending on an ambient temperature (temperature of air sucked in for a cooling purpose) is shown above.

## Instruction Manuals

- ◆ Please see catalog and instruction manual before you use.

## Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz] *1 *2	Input current *3 [A]	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
					Material	Single sided	Double	Series operation	Parallel operation
PDA15F	Flyback converter	20 to 125	0.35	Thermistor	CEM-3	Yes	-	Yes	No
PDA30F	Flyback converter	30 to 130	0.62	Thermistor	CEM-3	Yes	-	Yes	No
PDA50F	Flyback converter	25 to 130	1.05	Thermistor	CEM-3	Yes	-	Yes	No
PDA100F	Active filter	20 to 250	1.3	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	45 to 110							
PDA150F	Active filter	20 to 250	1.8	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	45 to 110							
PDA300F	Active filter	65	4.1	Thermistor	FR-4		Yes	Yes	Yes
	Forward converter	140							
PDA600F	Active filter	65	7.9	SCR	FR-4		Yes	Yes	Yes
	Forward converter	220							

\*1 The value changes depending on input and load.

\*2 At light load, burst operation is performed to reduce input power. The switching frequency is changed by using condition. Please contact us for more details.

\*3 The value of input current is at ACIN 100V and rated load.

\*1, \*2 are only for PDA15F-150F