

**Recommended Noise Filter
NAC-20-472**



High voltage pulse noise type : NAP series
Low leakage current type : NAM series
*The Noise Filter is recommended to connect with several devices.

- ① Series name
 - ② Output wattage
 - ③ Universal input
 - ④ Output voltage
 - ⑤ Optional *7
 - G : Low leakage current
 - E : Low leakage current and EMI class A
 - F : with Fan unit
 - T : Vertical terminal block
 - J : Connector type
 - C : with Coating
 - R : Remote ON/OFF
 - N1 : DIN rail
 - W : Alarms and Redundant operation
- Specification is changed at option, refer to Instruction Manual.

Please refer to derating curve, because the rated load current depends on cooling method that is convection cooling or forced air.

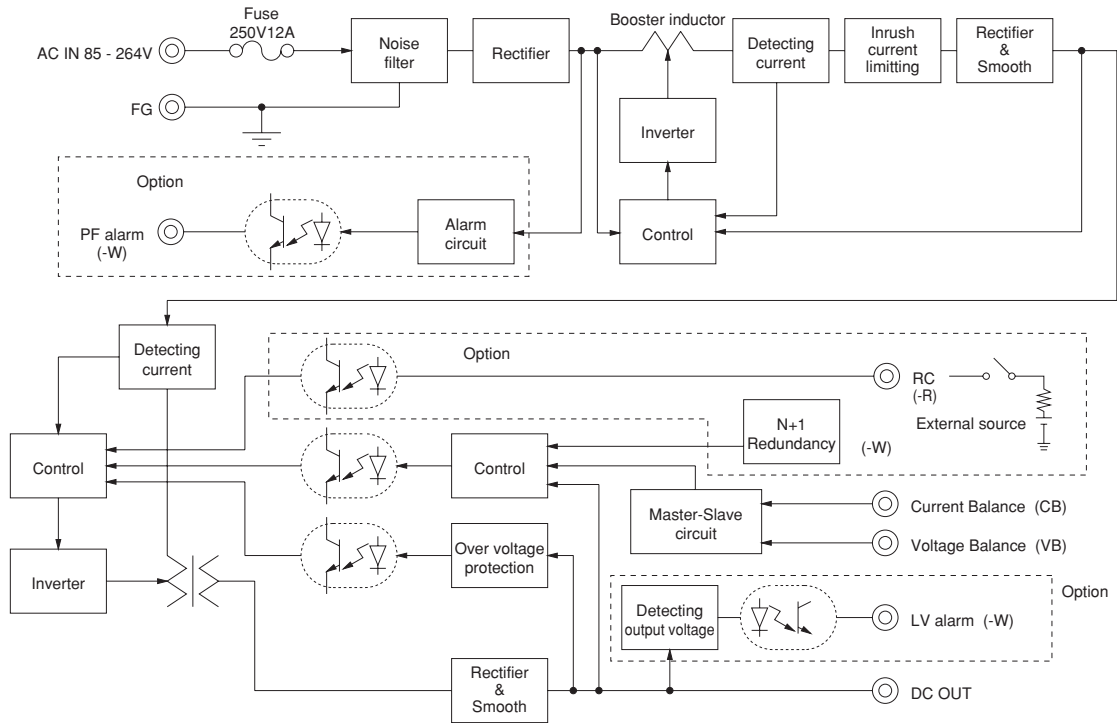
SPECIFICATIONS

	MODEL	ADA600F-24	ADA600F-30	ADA600F-36	ADA600F-48	
INPUT	VOLTAGE[V]	AC85 - 264 1 φ or DC 120 - 350 (AC64 or DC90 optionally available *6)				
	FREQUENCY[Hz]	50/60 (47 - 63) or DC				
	EFFICIENCY[%]	ACIN 100V	84typ (Io=100%)	86typ (Io=100%)	86typ (Io=100%)	86typ (Io=100%)
		ACIN 200V	86typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)	89typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.99typ (Io=100%)			
		ACIN 200V	0.98typ (Io=100%)			
INRUSH CURRENT[A]	ACIN 100V *1	20typ (Io=100%) (More than 3sec.to re-start)				
	ACIN 200V *1	40typ (Io=100%) (More than 3sec.to re-start)				
LEAKAGE CURRENT[ma]	0.75max (60Hz, According to IEC60950 and DEN-AN) (Io=100%)					
OUTPUT	VOLTAGE[V]	24	30	36	48	
	CURRENT[A]	ACIN 100V *2	14 (Peak 25) convection	11 (Peak 20) convection	9 (Peak 16.5) convection	6.5 (Peak 12.5) convection
		ACIN 100V *2	21 (Peak 25) forced air	16.5 (Peak 20) forced air	14 (Peak 16.5) forced air	10.5 (Peak 12.5) forced air
		ACIN 200V *2	15 (Peak 31) convection	12 (Peak 24.5) convection	10 (Peak 20.5) convection	7 (Peak 15.5) convection
		ACIN 200V *2	25 (Peak 31) forced air	20 (Peak 24.5) forced air	16.5 (Peak 20.5) forced air	12.5 (Peak 15.5) forced air
	LINE REGULATION[mV]	96max	120max	144max	192max	
	LOAD REGULATION[mV]	150max	180max	240max	300max	
	RIPPLE[mVp-p]	0 to +50°C *3	120max	160max	200max	200max
		-10 - 0°C *3	160max	230max	260max	300max
	RIPPLE NOISE[mVp-p]	0 to +50°C *3	150max	190max	230max	250max
		-10 - 0°C *3	180max	250max	280max	400max
	TEMPERATURE REGULATION[mV]	0 to +50°C	240max	300max	360max	480max
	DRIFT[mV]	*4	96max	120max	144max	192max
START-UP TIME[ms]	500max (ACIN 100V, Io=100%)					
HOLD-UP TIME[ms]	20typ (ACIN 100V, Io=100%)					
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	21.6 - 27.0	27.0 - 33.0	33.0 - 41.0	41.0 - 52.8		
OUTPUT VOLTAGE SETTING[V]	23.5 - 24.5	29.0 - 31.0	35.0 - 37.0	47.0 - 49.0		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 101% of peak current and recovers automatically				
	OVERVOLTAGE PROTECTION[V]	31 - 34.5	40 - 48	51 - 60	64 - 76	
	OPERATING INDICATION	LED (Green)				
	ALARM OUTPUT	Detecting low input voltage(PF), detecting low output voltage(LV). (Optional : -W, refer to Instruction Manual 5)				
ISOLATION	REMOTE ON/OFF(RC)	Requirement for external source (Option : -R, refer to Instruction Manual 5)				
	INPUT-OUTPUT · RC	*5	AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)			
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
ENVIRONMENT	OUTPUT · RC-FG	*5	AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)			
	OPERATING TEMP.,HUMID.AND ALTITUDE	-10 to +71°C, 20 - 90%RH (Non condensing) (Refer to DERATING CURVE), 3,000m (10,000feet) 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 ² (2G), 3minutes period. 60minutes each along X, Y and Z axis				
SAFETY AND NOISE REGULATIONS	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis				
	AGENCY APPROVALS	UL60950-1, C-UL(CSA60950-1), EN60950-1, EN60065, EN50178 Complies with DEN-AN and IEC60950-1 (At only AC input)				
	CONDUCTED NOISE	Complies with FCC-B, CISPR22-B, EN55022-B, VCCI-B				
	CE MARKING	Low Voltage Directive, EMC Directive				
OTHERS	HARMONIC ATTENUATOR	Complies with IEC61000-3-2				
	CASE SIZE/WEIGHT	65×127×195mm (W×H×D) (without terminal block) /1.5kg max				
	COOLING METHOD	Convection/Forced air				

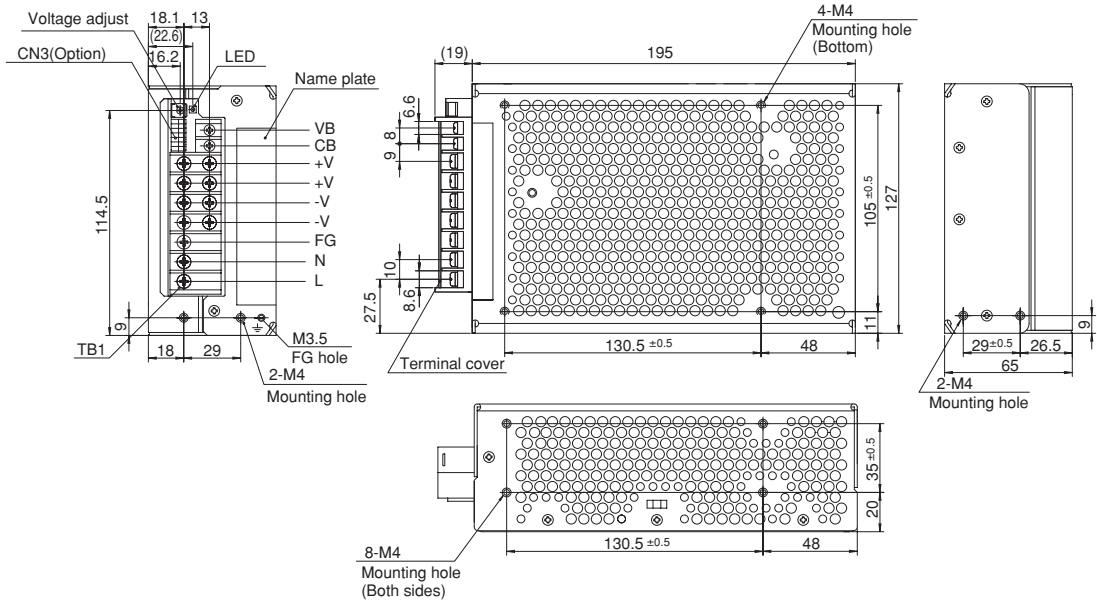
*1 The value is primary surge. The current of input surge to a built-in noise filter (0.2ms or less) is excluded.
*2 Peak loading for 10sec. And Duty 35% max. Refer to Instruction Manual 4. Forced air is shown in Instruction Manual 2.3.
*3 This is the value that measured on measuring board with capacitor of 22 μF within 150mm from output terminal. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to

KEISOKU-GIKEN: RM101).
*4 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.
*5 Applicable when remote control (optional) is added.
*6 Derating is required. Consult us for details.
* A sound may occur from power supply at pulse loading.
*7 Please contact us about safety approvals for the model with option.

Block diagram



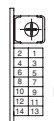
External view



※ Pin assign

Symbol	Function	Screw type
VB	Voltage balance	M3
CB	Current balance	
+V	Output terminal(+)	M4
-V	Output terminal(-)	
FG	Frame ground	
N	AC(N)	
L	AC(L)	

Average 21A max per pin for TB1



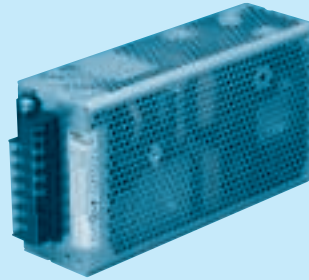
CN3(Optional)

Pin No.	Function
1	RC+ : Remote ON/OFF+(-R)
2	RC- : Remote ON/OFF(-R)
3-8	NC : N.C.
9	LV+ : LV Alarm(-W)
10	LV- : LV Alarm ground(-W)
11-12	NC : N.C.
13	PF+ : PF Alarm(-W)
14	PF- : PF Alarm ground(-W)

Connector	Mating connector	Terminal	Mfr.
CN3 S14B-PHDSS	PHDR-14VS	Chain:SPHD-002T-P0.5 Loose:BPHD-001T-P0.5 BPHD-002T-P0.5 *1	J.S.T

*1 Ratchet Hand is nothing

- ※ Tolerance : ±1
- ※ Weight : 1.5kg max
- ※ PCB material / thickness : FR-4 / 1.6mm
- ※ Chassis and cover material : aluminium
- ※ Dimensions in mm
- ※ Mounting torque : 1.2N · m(12.8kgf · cm) max
- ※ Screw tightening torque
- ※ M4 : 1.6N · m(16.9kgf · cm) max , M3 : 0.8N · m(8.5kgf · cm) max
- ※ I/O terminal for option-J and -I is shown in Instruction Manual 5.



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Low leakage current type : NAM series
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- ① Series name
 - ② Output wattage
 - ③ Universal input
 - ④ Output voltage
 - ⑤ Optional * 7
 - G : Low leakage current
 - E : Low leakage current and EMI class A
 - F : with Fan unit
 - T : Vertical terminal block
 - J : Connector type
 - C : with Coating
 - R : Remote ON/OFF
 - N1: DIN rail
 - W: Alarms and Redundant operation
- Specification is changed at option, refer to Instruction Manual.

Please refer to derating curve, because the rated load current depends on cooling method that is convection cooling or forced air.

SPECIFICATIONS

	MODEL	ADA750F-24	ADA750F-30	ADA750F-36	ADA750F-48	
INPUT	VOLTAGE[V]	AC85 - 264 1 φ or DC 120 - 350 (AC64 or DC90 optionally available *6)				
	FREQUENCY[Hz]	50/60 (47 - 63) or DC				
	EFFICIENCY[%]	ACIN 100V	86typ (Io=100%)	86typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)
		ACIN 200V	88typ (Io=100%)	88typ (Io=100%)	89typ (Io=100%)	89typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.99typ (Io=100%)			
		ACIN 200V	0.98typ (Io=100%)			
INRUSH CURRENT[A]	ACIN 100V *1	20typ (Io=100%) (More than 3sec.to re-start)				
	ACIN 200V *1	40typ (Io=100%) (More than 3sec.to re-start)				
LEAKAGE CURRENT[ma]		0.75max (60Hz, According to IEC60950 and DEN-AN) (Io=100%)				
OUTPUT	VOLTAGE[V]	24	30	36	48	
	CURRENT[A]	ACIN 100V *2	17 (Peak 42) convection	13.5 (Peak 33.5) convection	11 (Peak 28) convection	8 (Peak 21) convection
		ACIN 100V *2	25 (Peak 42) forced air	20 (Peak 33.5) forced air	16.5 (Peak 28) forced air	12.5 (Peak 21) forced air
		ACIN 200V *2	19 (Peak 63) convection	15 (Peak 50) convection	12.5 (Peak 42) convection	9 (Peak 31.5) convection
		ACIN 200V *2	31.5 (Peak 63) forced air	24.5 (Peak 50) forced air	20.5 (Peak 42) forced air	15.5 (Peak 31.5) forced air
	LINE REGULATION[mV]	96max	120max	144max	192max	
	LOAD REGULATION[mV]	150max	180max	240max	300max	
	RIPPLE[mVp-p]	0 to +50°C *3	120max	160max	200max	200max
		-10 - 0°C *3	160max	230max	260max	300max
	RIPPLE NOISE[mVp-p]	0 to +50°C *3	150max	190max	230max	250max
		-10 - 0°C *3	180max	250max	280max	400max
	TEMPERATURE REGULATION[mV]	0 to +50°C	240max	300max	360max	480max
	DRIFT[mV]	*4	96max	120max	144max	192max
START-UP TIME[ms]		500max (ACIN 100V, Io=100%)				
HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)				
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		21.6 - 27.0	27.0 - 33.0	33.0 - 41.0	41.0 - 52.8	
OUTPUT VOLTAGE SETTING[V]		23.5 - 24.5	29.0 - 31.0	35.0 - 37.0	47.0 - 49.0	
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 101% of peak current and recovers automatically				
	OVERVOLTAGE PROTECTION[V]	31 - 34.5	40 - 48	51 - 60	64 - 76	
	OPERATING INDICATION	LED (Green)				
	ALARM OUTPUT	Detecting low input voltage(PF), detecting low output voltage(LV). (Optional : -W, refer to Instruction Manual 5)				
	REMOTE ON/OFF(RC)	Requirement for external source (Option : -R, refer to Instruction Manual 5)				
ISOLATION	INPUT-OUTPUT · RC	*5 AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
	OUTPUT · RC-FG	*5 AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)				
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-10 to +71°C, 20 - 90%RH (Non condensing) (Refer to DERATING CURVE), 3,000m (10,000feet) 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 ² (2G), 3minutes period. 60minutes each along X, Y and Z axis				
	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	UL60950-1, C-UL(CSA60950-1), EN60950-1, EN60065, EN50178 Complies with DEN-AN and IEC60950-1 (At only AC input)				
	CONDUCTED NOISE	Complies with FCC-B, CISPR22-B, EN55022-B, VCCI-B				
	CE MARKING	Low Voltage Directive, EMC Directive				
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2				
OTHERS	CASE SIZE/WEIGHT	70×127×230mm (W×H×D) (without terminal block) /1.9kg max				
	COOLING METHOD	Convection/Forced air				

*1 The value is primary surge. The current of input surge to a built-in noise filter (0.2ms or less) is excluded.

*2 Peak loading for 10sec. And Duty 35% max. Refer to Instruction Manual 4. Forced air is shown in Instruction Manual 2.3.

*3 This is the value that measured on measuring board with capacitor of 22 μF within 150mm from output terminal. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to

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*4 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.

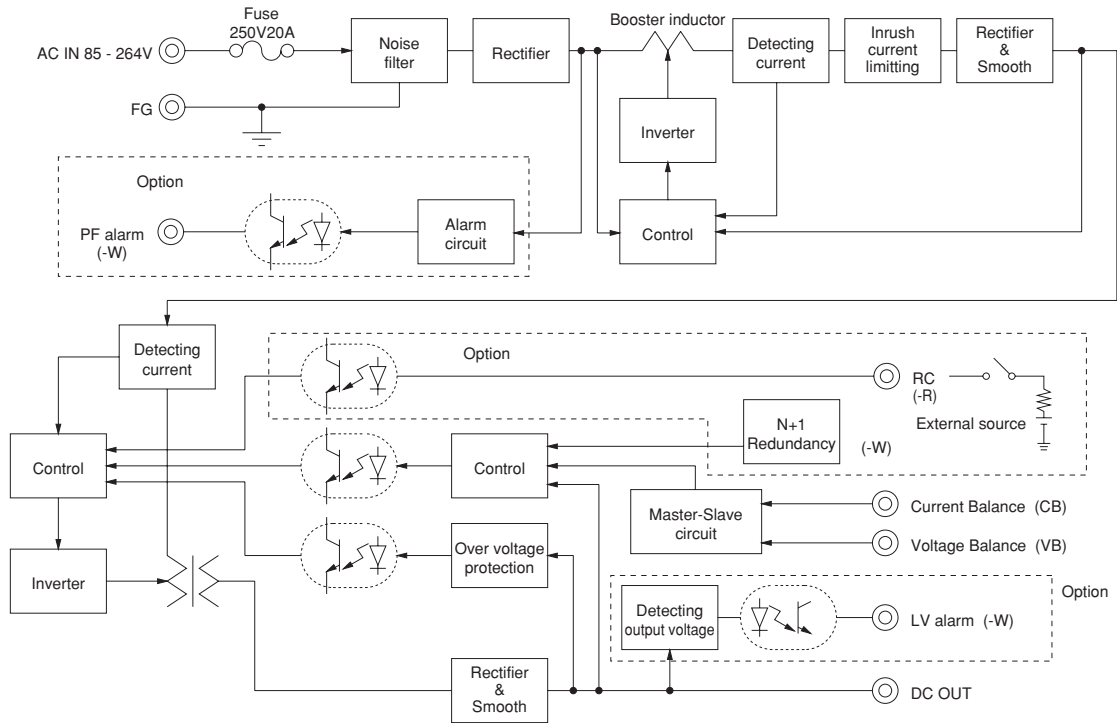
*5 Applicable when remote control (optional) is added.

*6 Derating is required. Consult us for details.

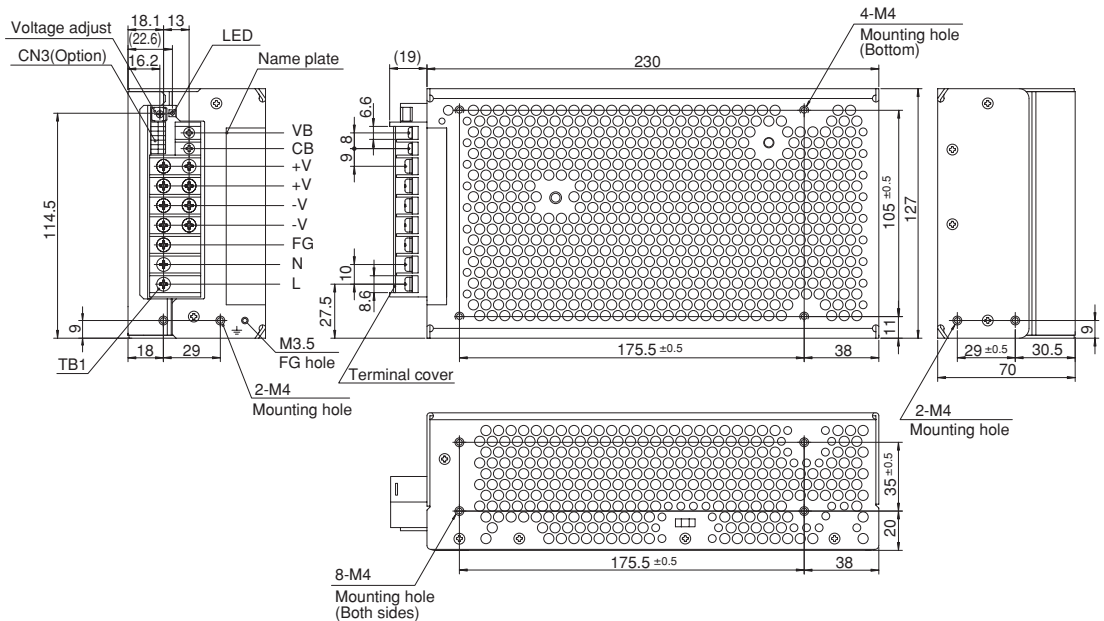
* A sound may occur from power supply at pulse loading.

*7 Please contact us about safety approvals for the model with option.

Block diagram



External view



※ Pin assign

Symbol	Function	Screw type
VB	Voltage balance	M3
CB	Current balance	
+V	Output terminal(+)	M4
-V	Output terminal(+)	
-V	Output terminal(-)	
-V	Output terminal(-)	
FG	Frame ground	
N	AC(N)	
L	AC(L)	

Average 21A max per pin for TB1

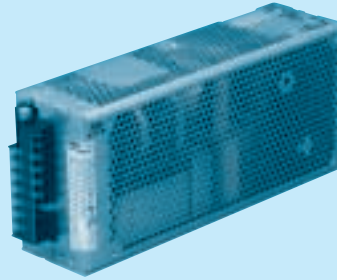
- ※ Tolerance : ±1
- ※ Weight : 1.9kg max
- ※ PCB material / thickness : FR-4 / 1.6mm
- ※ Chassis and cover material : aluminium
- ※ Dimensions in mm
- ※ Mounting torque : 1.2N · m(12.8kgf · cm) max
- ※ Screw tightening torque
- ※ M4 : 1.6N · m(16.9kgf · cm) max , M3 : 0.8N · m(8.5kgf · cm) max
- ※ I/O terminal for option-J and -T is shown in Instruction Manual 5.

CN3(Optional)

Pin No.	Function
1	RC+ : Remote ON/OFF+(-R)
2	RC- : Remote ON/OFF(-R)
3-8	NC : N.C.
9	LV+ : LV Alarm(-W)
10	LV- : LV Alarm ground(-W)
11-12	NC : N.C.
13	PF+ : PF Alarm(-W)
14	PF- : PF Alarm ground(-W)

Connector	Mating connector	Terminal	Mfr.
CN3	S14B-PH05S	PHDR-14VS	Chain:SPHD-002T-P0.5 Loose:BPHD-001T-P0.5 BPHD-002T-P0.5 ^{※1}

※1 Ratchet Hand is nothing



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 - E : Low leakage current and EMI class A
 - F : with Fan unit
 - T : Vertical terminal block
 - J : Connector type
 - C : with Coating
 - R : Remote ON/OFF
 - N1 : DIN rail
 - W : Alarms and Redundant operation
- Specification is changed at option, refer to Instruction Manual.

Please refer to derating curve, because the rated load current depends on cooling method that is convection cooling or forced air.

SPECIFICATIONS

	MODEL	ADA1000F-24	ADA1000F-30	ADA1000F-36	ADA1000F-48	
INPUT	VOLTAGE[V]	AC85 - 264 1 φ or DC 120 - 350 (AC64 or DC90 optionally available *6)				
	FREQUENCY[Hz]	50/60 (47 - 63) or DC				
	EFFICIENCY[%]	ACIN 100V	86typ (Io=100%)	86typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)
		ACIN 200V	88typ (Io=100%)	88typ (Io=100%)	89typ (Io=100%)	89typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.99typ (Io=100%)			
		ACIN 200V	0.98typ (Io=100%)			
INRUSH CURRENT[A]	ACIN 100V *1	20typ (Io=100%) (More than 3sec.to re-start)				
	ACIN 200V *1	40typ (Io=100%) (More than 3sec.to re-start)				
LEAKAGE CURRENT[ma]		0.75max (60Hz, According to IEC60950 and DEN-AN) (Io=100%)				
OUTPUT	VOLTAGE[V]	24	30	36	48	
	CURRENT[A]	ACIN 100V *2	21 (Peak 63) convection	16.5 (Peak 50) convection	14 (Peak 42) convection	10.5 (Peak 31.5) convection
		ACIN 100V *2	33 (Peak 63) forced air	26 (Peak 50) forced air	22 (Peak 42) forced air	16.5 (Peak 31.5) forced air
		ACIN 200V *2	25 (Peak 83) convection	20 (Peak 66) convection	16.5 (Peak 55) convection	11.5 (Peak 41.5) convection
		ACIN 200V *2	42 (Peak 83) forced air	33.5 (Peak 66) forced air	28 (Peak 55) forced air	21 (Peak 41.5) forced air
	LINE REGULATION[mV]	96max	120max	144max	192max	
	LOAD REGULATION[mV]	150max	180max	240max	300max	
	RIPPLE[mVp-p]	0 to +50°C *3	120max	160max	200max	200max
		-10 - 0°C *3	160max	230max	260max	300max
	RIPPLE NOISE[mVp-p]	0 to +50°C *3	150max	190max	230max	250max
		-10 - 0°C *3	180max	250max	280max	400max
	TEMPERATURE REGULATION[mV]	0 to +50°C	240max	300max	360max	480max
	DRIFT[mV]	*4	96max	120max	144max	192max
START-UP TIME[ms]		500max (ACIN 100V, Io=100%)				
HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)				
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		21.6 - 27.0	27.0 - 33.0	33.0 - 41.0	41.0 - 52.8	
OUTPUT VOLTAGE SETTING[V]		23.5 - 24.5	29.0 - 31.0	35.0 - 37.0	47 - 49	
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 101% of peak current and recovers automatically				
	OVERVOLTAGE PROTECTION[V]	31 - 34.5	40 - 48	51 - 60	64 - 76	
	OPERATING INDICATION	LED (Green)				
	ALARM OUTPUT	Detecting low input voltage(PF), detecting low output voltage(LV). (Optional : -W, refer to Instruction Manual 5)				
	REMOTE ON/OFF(RC)	Requirement for external source (Option : -R, refer to Instruction Manual 5)				
ISOLATION	INPUT-OUTPUT · RC	*5 AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
	OUTPUT · RC-FG	*5 AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)				
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-10 to +71°C, 20 - 90%RH (Non condensing) (Refer to DERATING CURVE), 3,000m (10,000feet) 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 ² (2G), 3minutes period. 60minutes each along X, Y and Z axis				
	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	UL60950-1, C-UL(CSA60950-1), EN60950-1, EN60065, EN50178 Complies with DEN-AN and IEC60950-1 (At only AC input)				
	CONDUCTED NOISE	Complies with FCC-B, CISPR22-B, EN55022-B, VCCI-B				
	CE MARKING	Low Voltage Directive, EMC Directive				
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2				
OTHERS	CASE SIZE/WEIGHT	75×127×280mm (W×H×D) (without terminal block) /2.5kg max				
	COOLING METHOD	Convection/Forced air				

*1 The value is primary surge. The current of input surge to a built-in noise filter (0.2ms or less) is excluded.

*2 Peak loading for 10sec. And Duty 35% max. Refer to Instruction Manual 4. Forced air is shown in Instruction Manual 2.3.

*3 This is the value that measured on measuring board with capacitor of 22 μF within 150mm from output terminal. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to

KEISOKU-GIKEN: RM101).

*4 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.

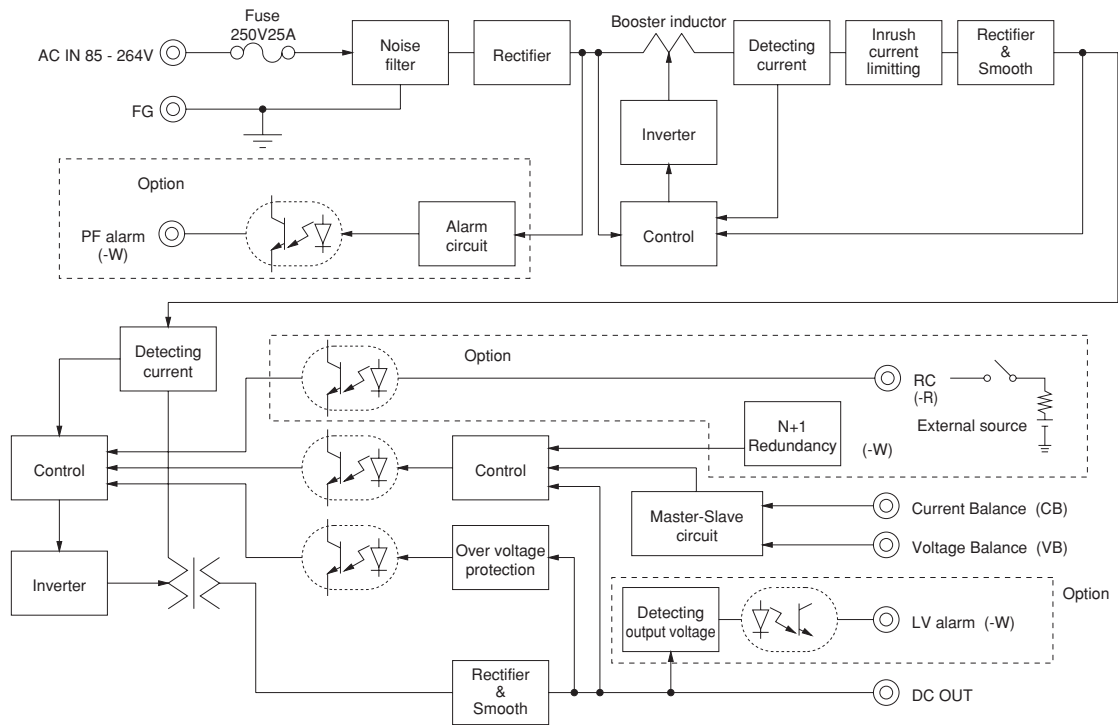
*5 Applicable when remote control (optional) is added.

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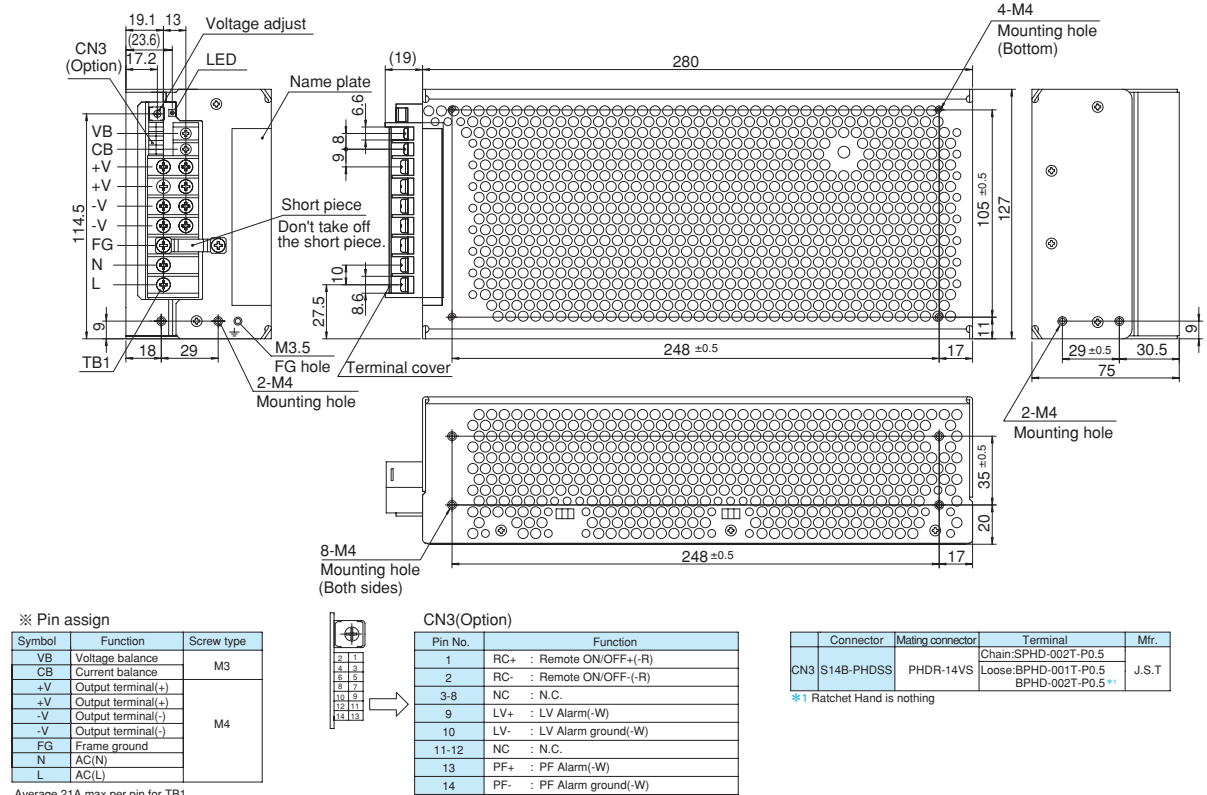
*7 A sound may occur from power supply at pulse loading.

*8 Please contact us about safety approvals for the model with option.

Block diagram



External view



Average 21A max per pin for TB1

- ※ Tolerance : ±1
- ※ Weight : 2.5kg max
- ※ PCB material / thickness : FR-4 / 1.6mm
- ※ Chassis and cover material : aluminium
- ※ Dimensions in mm
- ※ Mounting torque : 1.2N · m(12.8kgf · cm) max
- ※ Screw tightening torque
- ※ M4 : 1.6N · m(16.9kgf · cm) max, M3 : 0.8N · m(8.5kgf · cm) max
- ※ I/O terminal for option-J and -T is shown in Instruction Manual 5.