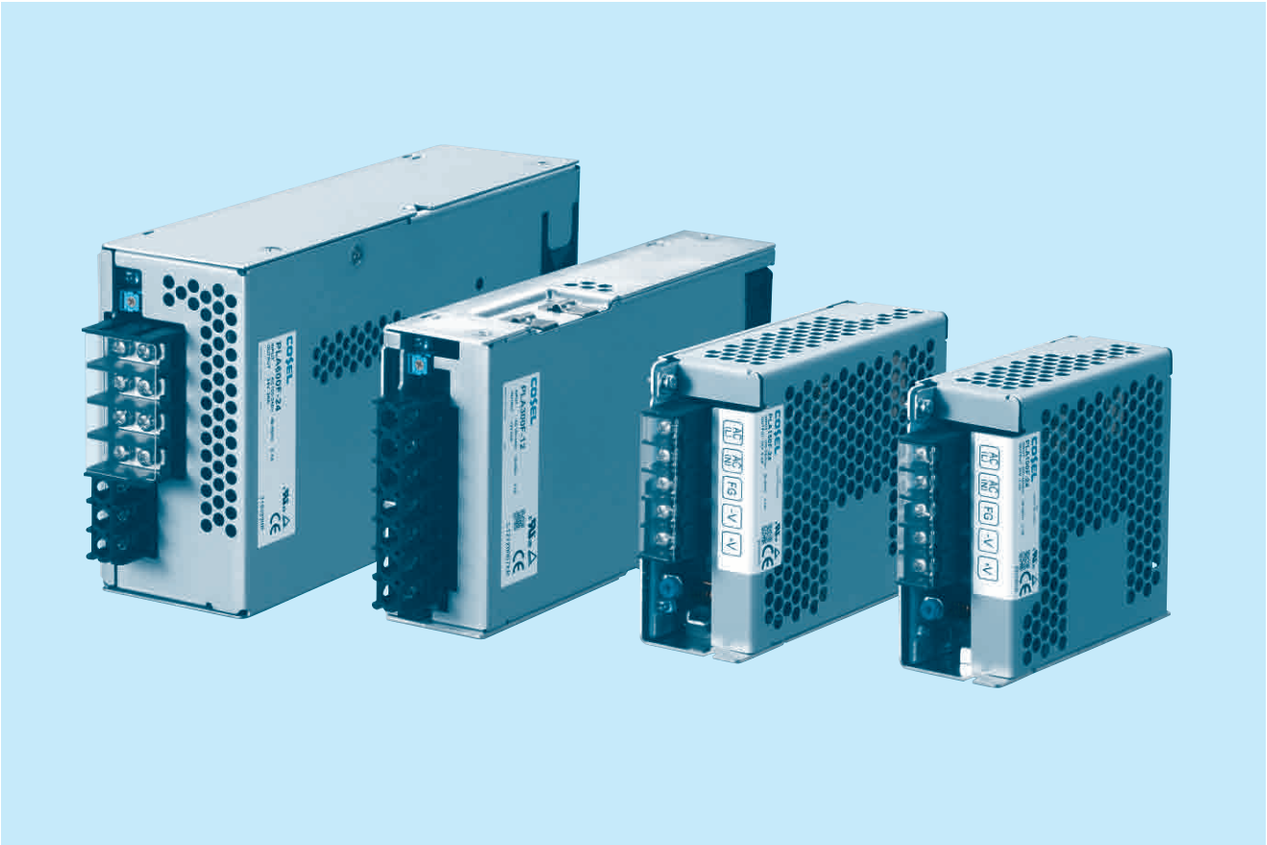
COSEL

PLA

Power Factor Correction | World wide | Cost Effective | Safety Approvals | EMI | Inrush current limiting | OCP | OVP

PLA-series



Feature

Low Profile (100, 150, 300W : 1U size. 600W : 2U size)
Wide temperature range (-20℃ to +70℃, Derating is required)
Harmonic attenuator (Complies with IEC61000-3-2 class A)
Universal input (AC85 - 264V, Derating is required)
Low power consumption at no load
Screw hold type terminal block (Only PLA300F and PLA600F)
Complies with SEMI F-47 (Option-U : Refer to instruction manual)
Various option

Safety agency approvals

UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178
UL508 (PLA100F-150F:24V, 36V, 48V) approved
Complies with DEN-AN

5-year warranty (Refer to Instruction Manual)

CE marking

Low Voltage Directive

EMI

Complies with FCC-B, CISPR22-B, EN55011-B, EN55022-B, VCCI-B

EMC Compliance : EN61204-3, EN61000-6-2

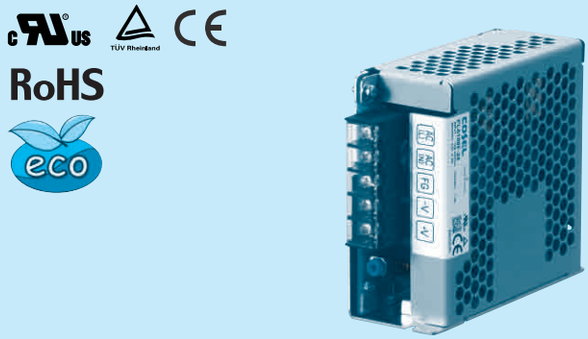
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

COSEL AC-DC Power Supplies Enclosed type

PLA100F

Ordering information

PL ① A ② 100 ③ F ④ -□ ⑤ -□ ⑥



Recommended EMI/EMC Filter NAC-04-472

High voltage pulse noise type : NAP series
Low leakage current type : NAM series

✻The EMI/EMC Filter is recommended to connect with several devices.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional ✻7
C : with Coating
R : Remote on/off (Required external power source)
J : Connector interface
T : Vertical terminal block
L : Lower power consumption (0.5W max at AC240Vin, no load, ErP-compliant)

Refer to instruction manual 5.1 about optional.

SPECIFICATIONS

✻ Please consider "PBA100F-5-N" about 5V output with case cover.

	MODEL		PLA100F-12	PLA100F-15	PLA100F-24	PLA100F-36	PLA100F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required at AC85V - 115V. Refer to instruction manual 1.1 and 3.2) ✻3 (DC input ✻3)				
	CURRENT[A]	ACIN 100V	1.2typ (Io=90%)				
		ACIN 115V	1.1typ (Io=100%)				
		ACIN 230V	0.6yp (Io=100%)				
	FREQUENCY[Hz]		50 / 60 (47 - 63) (DC input and 440Hz ✻3)				
	EFFICIENCY[%]	ACIN 100V	82typ (Io=90%)	83typ (Io=90%)	85typ (Io=90%)	86typ (Io=90%)	86typ (Io=90%)
		ACIN 115V	82typ (Io=100%)	83typ (Io=100%)	85typ (Io=100%)	86typ (Io=100%)	86typ (Io=100%)
		ACIN 230V	85typ (Io=100%)	86typ (Io=100%)	88typ (Io=100%)	89typ (Io=100%)	89typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.98typ (Io=90%)				
		ACIN 115V	0.98typ (Io=100%)				
		ACIN 230V	0.95typ (Io=100%) ✻ Power factor correction is stopped at AC250V or more.				
	INRUSH CURRENT[A]	ACIN 100V	16typ (Io=90%) Ta=25℃ at cold start				
		ACIN 115V	16typ (Io=100%) Ta=25℃ at cold start				
		ACIN 230V	32typ (Io=100%) Ta=25℃ at cold start				
	LEAKAGE CURRENT[mA]		0.75max (ACIN 115V / 240V, 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)				
OUTPUT	VOLTAGE[V]		12	15	24	36	48
	CURRENT[A]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)				
		ACIN 115V-264V	8.4	6.7	4.3	2.8	2.1
	WATTAGE[W]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)				
		ACIN 115V-264V	100.8	100.5	103.2	100.8	100.8
	LINE REGULATION[mV] ✻4		48max	60max	96max	144max	192max
	LOAD REGULATION [mV] ✻4	Io=30 to 100%	100max	120max	150max	150max	300max
		Io=0 to 30%	Burst operation (Please contact us about detail)				
	RIPPLE[mVp-p] ✻1 Io: load factor	0 to +40℃	120max	120max	120max	150max	150max
		-10 to 0℃	160max	160max	160max	200max	400max
		Io=0 to 30%	500max	500max	500max	500max	500max
	RIPPLE NOISE[mVp-p] ✻1 Io: load factor	0 to +40℃	150max	150max	150max	200max	200max
		-10 to 0℃	180max	180max	180max	240max	500max
		Io=0 to 30%	600max	600max	600max	600max	600max
	TEMPERATURE REGULATION[mV]	0 to +40℃	120max	150max	240max	360max	480max
		-10 to +40℃	180max	180max	290max	440max	600max
	DRIFT[mV] ✻2		48max	60max	96max	144max	192max
	START-UP TIME[ms]		500typ (ACIN 115V, Io=100%) Ta=25℃				
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)				
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		10.80 to 13.20	13.50 to 16.50	21.60 to 26.40	32.40 to 39.60	43.20 to 52.80
	OUTPUT VOLTAGE SETTING[V]		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]		13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	41.40 to 50.40	54.00 to 67.20
	OPERATING INDICATION		LED (Green)				
	REMOTE SENSING		Not provided				
	REMOTE ON/OFF		Optional (Required external power source. Option -R)				
ISOLATION	INPUT-OUTPUT・RC ✻9		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 ✻9		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)				
	OUTPUT-RC ✻9		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)				
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ✻5		-20 to +70℃ (Output derating is required), 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max				
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max				
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axes				
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axes				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178 UL508 (24Vout or more) Complies with DEN-AN				
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B				
	HARMONIC ATTENUATOR ✻8		Complies with IEC61000-3-2 class A				

SPECIFICATIONS

OTHERS	CASE SIZE/WEIGHT		41×97×109mm [1.61×3.82×4.29 inches] (Excluding terminal block and screw) (W×H×D) / 500g max
	COOLING METHOD		Convection
WARRANTY	WARRANTY	∗6	5-year (Depends on the used condition)

∗1 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.6.
Ripple and ripple noise spec is change at Io=0～30% by low power mode.

∗2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.

∗3 Derating is required. As for DC input, please contact us.

∗4 Please contact us about dynamic load and input response.
Also, please measure output voltage in average mode because of burst operation at 30% load or less.

∗5 Derating is required. Please refer to instruction manual 3.2.

∗6 As for detail condtion, please refer to instruction manual 3.3.

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

∗8 Please contact us about other class.

∗9 RC terminal is applied at option -R. And RC terminal is isolated from input, output and FG.

∗ To meet the specifications, do not operate over-loaded condition.

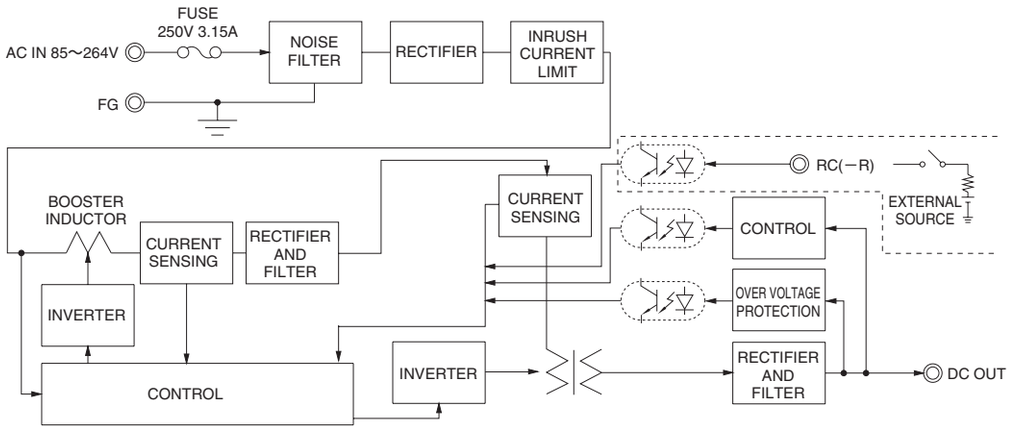
∗ Parallel operation is not possible.

∗ A sound may occur from power supply at peak loading.

Features

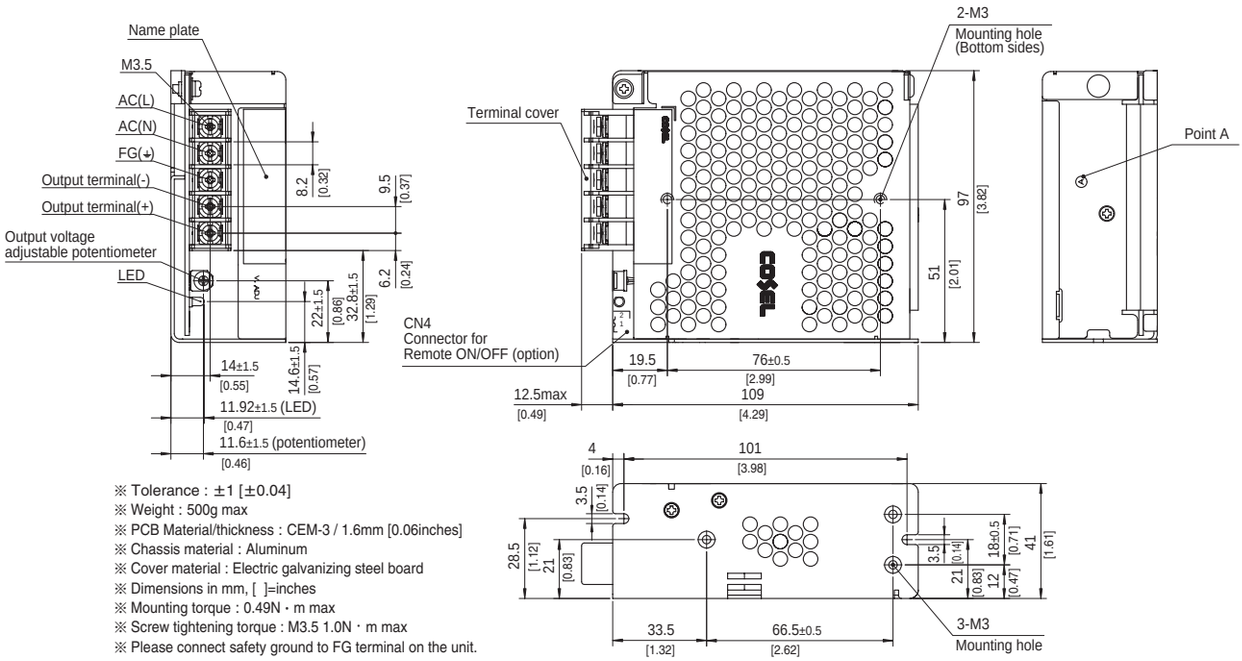
- **Compact design (Depth: 109mm 4.29inches)**
- **High efficiency (88%typ PLA100F-24, AC230Vin, 100% load)**
- **Low power consumption (1.5W typ AC240Vin, no load at standard model)**
- **Lower power consumption (0.5Wmax AC240Vin, no load at option -L: refer to instruction manual)**
- **UL508 approved, and complies with SEMI F-47 (Depends on the used condition)**
- **Various option (Optional connectors : Vertical terminal block, Connector wiring)**

Block diagram



External view

External size of option R, J and T is different from standard model, and refer to "5 Option and others" of instruction manual for detail.



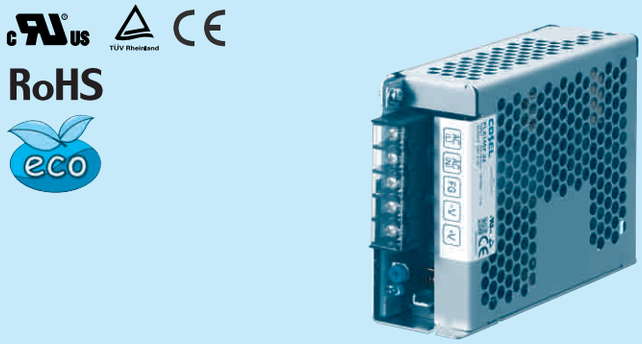
※ Tolerance : ±1 [±0.04]
※ Weight : 500g max
※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]
※ Chassis material : Aluminum
※ Cover material : Electric galvanizing steel board
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 0.49N・m max
※ Screw tightening torque : M3.5 1.0N・m max
※ Please connect safety ground to FG terminal on the unit.

COSEL AC-DC Power Supplies Enclosed type

PLA150F

Ordering information

PL ① A ② 150 ③ F ④ -□ ⑤ -□ ⑥



Recommended EMI/EMC Filter
NAC-04-472

High voltage pulse noise type : NAP series
Low leakage current type : NAM series
✻The EMI/EMC Filter is recommended to connect with several devices.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional ✻7
C : with Coating
R : Remote on/off (Required external power source)
J : Connector interface
T : Vertical terminal block
L : Lower power consumption (0.5W max at AC240Vin, no load, ErP-compliant)

Refer to instruction manual 5.1 about optional.

SPECIFICATIONS

✻ Please consider "PBA150F-5-N" about 5V output with case cover.

	MODEL		PLA150F-12	PLA150F-15	PLA150F-24	PLA150F-36	PLA150F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required at AC85V - 115V. Refer to instruction manual 1.1 and 3.2) ✻3 (DC input ✻3)				
	CURRENT[A]	ACIN 100V	1.7typ (Io=90%)				
		ACIN 115V	1.6typ (Io=100%)				
		ACIN 230V	0.8yp (Io=100%)				
	FREQUENCY[Hz]		50 / 60 (47 - 63) (DC input and 440Hz ✻3)				
	EFFICIENCY[%]	ACIN 100V	84typ (Io=90%)	84typ (Io=90%)	87typ (Io=90%)	87typ (Io=90%)	87typ (Io=90%)
		ACIN 115V	84typ (Io=100%)	84typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)
		ACIN 230V	87typ (Io=100%)	87typ (Io=100%)	90typ (Io=100%)	90typ (Io=100%)	90typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.98typ (Io=90%)				
		ACIN 115V	0.98typ (Io=100%)				
		ACIN 230V	0.95typ (Io=100%) ✻ Power factor correction is stopped at AC250V or more.				
	INRUSH CURRENT[A]	ACIN 100V	16typ (Io=90%) Ta=25℃ at cold start				
		ACIN 115V	16typ (Io=100%) Ta=25℃ at cold start				
		ACIN 230V	32typ (Io=100%) Ta=25℃ at cold start				
	LEAKAGE CURRENT[mA]		0.75max (ACIN 115V / 240V, 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)				
OUTPUT	VOLTAGE[V]		12	15	24	36	48
	CURRENT[A]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)				
		ACIN 115V-264V	12.5	10	6.4	4.2	3.2
	WATTAGE[W]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)				
		ACIN 115V-264V	150.0	150.0	153.6	151.2	153.6
	LINE REGULATION[mV] ✻4		48max	60max	96max	144max	192max
	LOAD REGULATION [mV] ✻4	Io=30 to 100%	100max	120max	150max	150max	300max
		Io=0 to 30%	Burst operation (Please contact us about detail)				
	RIPPLE[mVp-p] ✻1 Io: load factor	0 to +40℃	120max	120max	120max	150max	150max
		-10 to 0℃	160max	160max	160max	200max	400max
		Io=0 to 30%	500max	500max	500max	500max	500max
	RIPPLE NOISE[mVp-p] ✻1 Io: load factor	0 to +40℃	150max	150max	150max	200max	200max
		-10 to 0℃	180max	180max	180max	240max	500max
		Io=0 to 30%	600max	600max	600max	600max	600max
	TEMPERATURE REGULATION[mV]	0 to +40℃	120max	150max	240max	360max	480max
		-10 to +40℃	180max	180max	290max	440max	600max
	DRIFT[mV] ✻2		48max	60max	96max	144max	192max
	START-UP TIME[ms]		500typ (ACIN 115V, Io=100%) Ta=25℃				
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)				
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		10.80 to 13.20	13.50 to 16.50	21.60 to 26.40	32.40 to 39.60	43.20 to 52.80
	OUTPUT VOLTAGE SETTING[V]		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]		13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	41.40 to 50.40	54.00 to 67.20
	OPERATING INDICATION		LED (Green)				
	REMOTE SENSING		Not provided				
	REMOTE ON/OFF		Optional (Required external power source. Option -R)				
ISOLATION	INPUT-OUTPUT・RC ✻9		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 ✻9		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)				
	OUTPUT-RC ✻9		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)				
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ✻5		-20 to +70℃ (Output derating is required), 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max				
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max				
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axes				
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axes				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178 UL508 (24Vout or more) Complies with DEN-AN				
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B				
	HARMONIC ATTENUATOR ✻8		Complies with IEC61000-3-2 class A				

SPECIFICATIONS

OTHERS	CASE SIZE/WEIGHT	41×97×129mm [1.61×3.82×5.08 inches] (Excluding terminal block and screw) (W×H×D) / 600g max
	COOLING METHOD	Convection
WARRANTY	WARRANTY ＊6	5-year (Depends on the used condition)

＊1 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.6.
Ripple and ripple noise spec is change at Io=0～30% by low power mode.

＊2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.

＊3 Derating is required. As for DC input, please contact us.

＊4 Please contact us about dynamic load and input response.
Also, please measure output voltage in average mode because of burst operation at 30% load or less.

＊5 Derating is required. Please refer to instruction manual 3.2.

＊6 As for detail condtion, please refer to instruction manual 3.3.

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

＊8 Please contact us about other class.

＊9 RC terminal is applied at option -R. And RC terminal is isolated from input, output and FG.

＊ To meet the specifications, do not operate over-loaded condition.

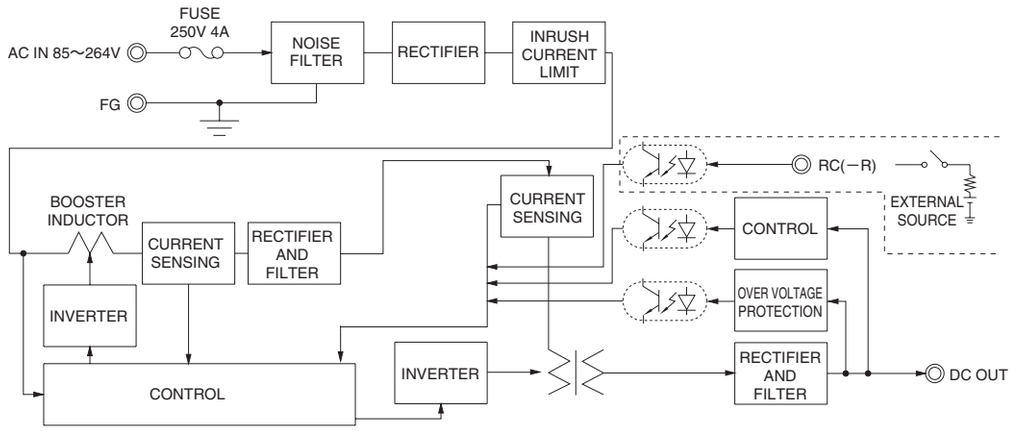
＊ Parallel operation is not possible.

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

Features

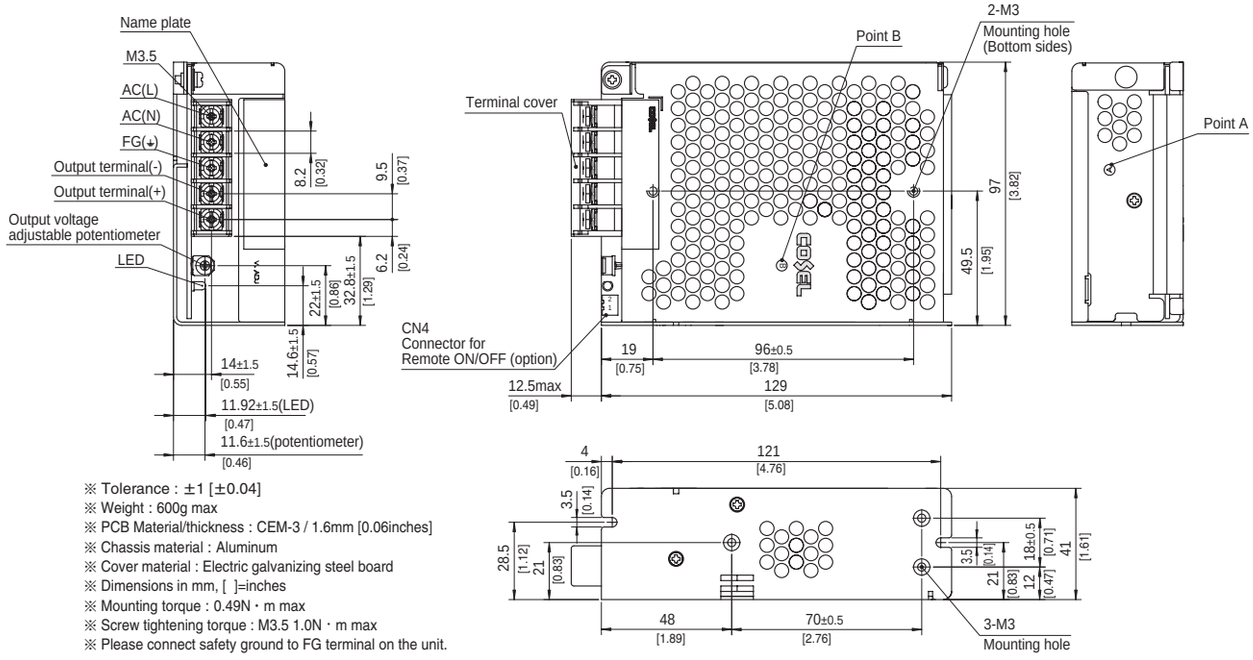
- **Compact design (Depth: 129mm 5.08inches)**
- **High efficiency (90%typ PLA150F-24, AC230Vin, 100% load)**
- **Low power consumption (1.5W typ AC240Vin, no load at standard model)**
- **Lower power consumption (0.5Wmax AC240Vin, no load at option -L: refer to instruction manual)**
- **UL508 approved, and complies with SEMI F-47 (Depends on the used condition)**
- **Various option (Optional connectors : Vertical terminal block, Connector wiring)**

Block diagram



External view

External size of option R, J and T is different from standard model, and refer to "5 Option and others" of instruction manual for detail.



※ Tolerance : ±1 [±0.04]
※ Weight : 600g max
※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]
※ Chassis material : Aluminum
※ Cover material : Electric galvanizing steel board
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 0.49N・m max
※ Screw tightening torque : M3.5 1.0N・m max
※ Please connect safety ground to FG terminal on the unit.

COSEL AC-DC Power Supplies Enclosed type

PLA300F

Ordering information

PL	A	300	F	-□	-□
①	②	③	④	⑤	⑥

Recommended EMI/EMC Filter
NAC-06-472

High voltage pulse noise type : NAP series
Low leakage current type : NAM series
✻The EMI/EMC Filter is recommended to connect with several devices.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional ✻7
C : with Coating
G : Low leakage current
V : External potentiometer for output voltage adjustment
U : Low input voltage stop (Complies with SEMI F-47)
R : Remote on/off (Required external power source)
F4: Low speed fan
T2: Horizontal terminal block (Not screw hold type)

Refer to instruction manual 5.1 about optional.

SPECIFICATIONS

	MODEL		PLA300F-5	PLA300F-12	PLA300F-15	PLA300F-24	PLA300F-36	PLA300F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required at AC85V - 115V. Refer to instruction manual 1.1 and 3.2) ✻3 (DC input and AC265 - 277V input ✻3)					
	CURRENT[A]	ACIN 100V	3.1typ (Io=90%)	3.4typ (Io=90%)				
		ACIN 115V	3.0typ (Io=100%)	3.3typ (Io=100%)				
		ACIN 230V	1.5typ (Io=100%)	1.7typ (Io=100%)				
	FREQUENCY[Hz]		50 / 60 (47 - 63) (DC input and 440Hz ✻3)					
	EFFICIENCY[%]	ACIN 100V	73typ (Io=90%)	78typ (Io=90%)	80typ (Io=90%)	84typ (Io=90%)	84typ (Io=90%)	84typ (Io=90%)
		ACIN 115V	74typ (Io=100%)	78typ (Io=100%)	80typ (Io=100%)	84typ (Io=100%)	84typ (Io=100%)	84typ (Io=100%)
		ACIN 230V	77typ (Io=100%)	81typ (Io=100%)	83typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)	87typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.98typ (Io=90%)					
		ACIN 115V	0.98typ (Io=100%)					
		ACIN 230V	0.95typ (Io=100%)					
	INRUSH CURRENT[A]	ACIN 100V	20typ (Io=90%) Ta=25℃ at cold start					
		ACIN 115V	20typ (Io=100%) Ta=25℃ at cold start					
		ACIN 230V	40typ (Io=100%) Ta=25℃ at cold start					
	LEAKAGE CURRENT[mA]		0.75max (ACIN 115V / 240V, 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)					
OUTPUT	VOLTAGE[V]		5	12	15	24	36	48
	CURRENT[A]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)					
		ACIN 115V-264V	50	25	20	12.5	8.4	6.3
	WATTAGE[W]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)					
		ACIN 115V-264V	250	300	300	300	302.4	302.4
	LINE REGULATION[mV] ✻4		20max	48max	60max	96max	144max	192max
	LOAD REGULATION[mV] ✻4		40max	100max	120max	150max	150max	300max
	RIPPLE[mVp-p] ✻1	0 to +50℃	80max	120max	120max	120max	150max	150max
		-10 to 0℃	140max	160max	160max	160max	160max	400max
	RIPPLE NOISE[mVp-p] ✻1	0 to +50℃	120max	150max	150max	150max	200max	200max
		-10 to 0℃	160max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50℃	50max	120max	150max	240max	360max	480max
		-10 to +50℃	75max	180max	180max	290max	440max	600max
	DRIFT[mV] ✻2		20max	48max	60max	96max	144max	192max
	START-UP TIME[ms]		300typ (ACIN 115V, Io=100%)					
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)					
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		4.50 to 5.50	10.80 to 13.20	13.50 to 16.50	21.60 to 26.40	32.40 to 39.60	43.20 to 52.80
	OUTPUT VOLTAGE SETTING[V]		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]		5.75 to 7.00	13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	41.40 to 50.40	55.20 to 67.20
	OPERATING INDICATION		LED (Green)					
	REMOTE SENSING		Not provided					
	REMOTE ON/OFF		Optional (Required external power source. Option -R)					
ISOLATION	INPUT-OUTPUT · RC ✻10		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 ✻10		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)					
	OUTPUT-RC ✻10		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)					
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ✻5		-20 to +70℃ (Output derating is required), 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max					
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max					
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axes					
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axes					
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN					
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B					
	HARMONIC ATTENUATOR ✻9		Complies with IEC61000-3-2 class A					

SPECIFICATIONS

OTHERS	CASE SIZE/WEIGHT		102×41×190mm [4.02×1.61×7.48 inches] (Excluding terminal block and screw) (W×H×D) / 1.0kg max
	COOLING METHOD	∗8	Forced cooling (internal fan)
WARRANTY	WARRANTY	∗6	5-year (Depends on the used condition)

∗1 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.6.

∗2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.

∗3 Derating is required. As for DC input, 440Hz input and AC265 to 277V input, please contact us.

∗4 Please contact us about dynamic load and input response.

∗5 Derating is required. Please refer to instruction manual 3.2.

∗6 As for detail condtion, please refer to instruction manual 3.3.

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

∗8 Fan speed is changed by load factor.

∗9 Please contact us about other class.

∗10 RC terminal is applied at option -R. And RC terminal is isolated from input, output and FG.

∗ To meet the specifications, do not operate over-loaded condition.

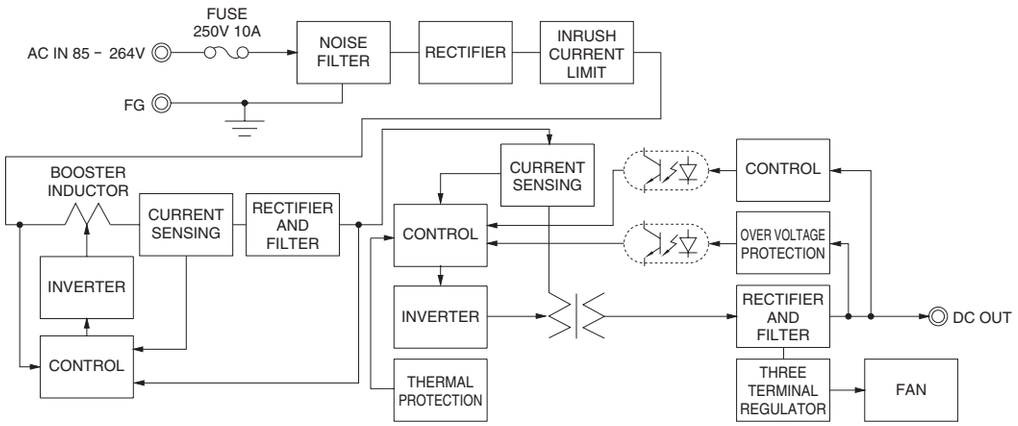
∗ Parallel operation is not possible.

∗ A sound may occur from power supply at peak loading.

Features

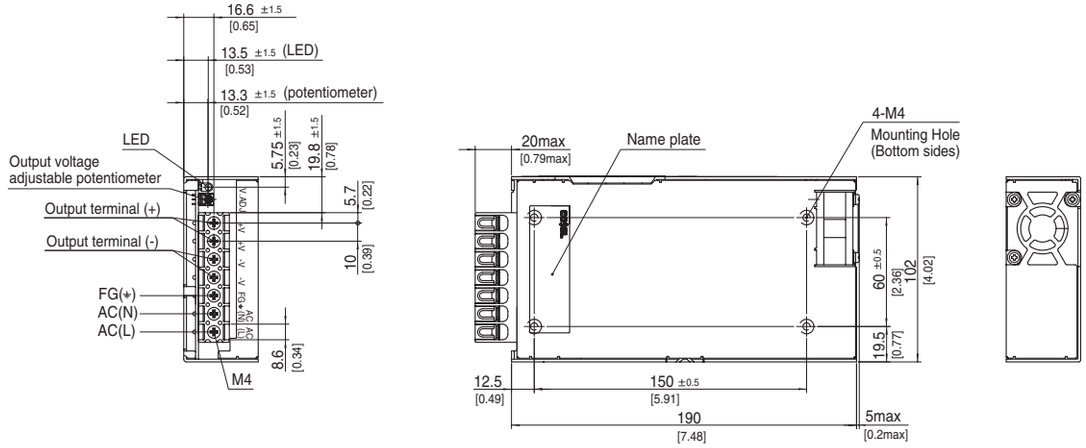
- Economical model
- Long lifetime (Refer to instruction manual)
- Low profile (41mm, 1.61 inch = meet to 1U height)
- Wide temperature range (-20℃ to +70℃ Refer to instruction manual)
- Screw hold type terminal block
- Fan speed control (At no load condition)
- Various option
- Complies with SEMI F-47 (Option-U: Refer to instruction manual)

Block diagram



External view

External size of option V, option R and option T2 is different from standard model, and refer to "5. Option and Others" of instruction manual for detail.



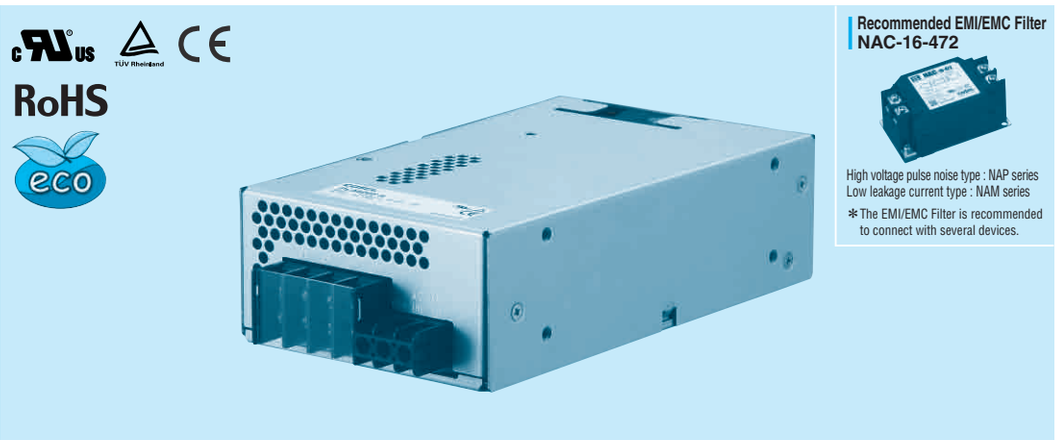
※ Tolerance : ±1 [±0.04]
※ Weight : 1.0kg max
※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]
※ Chassis material : Aluminum
※ Case material : Electric galvanizing steel board
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 1.2N・m max
※ Screw tightening torque : 1.6N・m max
※ Please connect safety ground to FG terminal on the unit.

COSEL AC-DC Power Supplies Enclosed type

PLA600F

Ordering information

PL ① A ② 600 ③ F ④ -□ ⑤ -□ ⑥



Recommended EMI/EMC Filter
NAC-16-472

High voltage pulse noise type : NAP series
Low leakage current type : NAM series

✻The EMI/EMC Filter is recommended to connect with several devices.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional ✻7
C : with Coating
G : Low leakage current
V : External potentiometer for output voltage adjustment
U : Low input voltage stop (Complies with SEMI F-47)
W: Parallel operation, LV alarm Remote sensing
R : Remote on/off (Required external power source)
F4: Low speed fan
T2: Horizontal terminal block (Not screw hold type)

Refer to instruction manual 5.1 about optional.

SPECIFICATIONS

	MODEL		PLA600F-5	PLA600F-12	PLA600F-15	PLA600F-24	PLA600F-36	PLA600F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required at AC85V - 115V. Refer to instruction manual 1.1 and 3.2) ✻4 (DC input and AC265 - 277V input ✻4)					
	CURRENT[A]	ACIN 100V	6.2typ (Io=90%)	6.7typ (Io=90%)				
		ACIN 115V	6.0typ (Io=100%)	6.5typ (Io=100%)				
		ACIN 230V	3.0typ (Io=100%)	3.2typ (Io=100%)				
	FREQUENCY[Hz]		50 / 60 (47 - 63) (DC input and 440Hz ✻4)					
	EFFICIENCY[%]	ACIN 100V	74typ (Io=90%)	81typ (Io=90%)	81typ (Io=90%)	84typ (Io=90%)	85typ (Io=90%)	85typ (Io=90%)
		ACIN 115V	75typ (Io=100%)	81typ (Io=100%)	81typ (Io=100%)	84typ (Io=100%)	85typ (Io=100%)	85typ (Io=100%)
		ACIN 230V	77typ (Io=100%)	84typ (Io=100%)	84typ (Io=100%)	88typ (Io=100%)	88typ (Io=100%)	88typ (Io=100%)
	POWER FACTOR	ACIN 100V	0.98typ (Io=90%)					
		ACIN 115V	0.98typ (Io=100%)					
		ACIN 230V	0.95typ (Io=100%)					
	INRUSH CURRENT[A]	ACIN 100V	20/40typ (Io=90%) (Primary inrush current /Secondary inrush current) (More than 3sec to re-start)					
		ACIN 115V	20/40typ (Io=100%) (Primary inrush current /Secondary inrush current) (More than 3sec to re-start)					
		ACIN 230V	40/40typ (Io=100%) (Primary inrush current /Secondary inrush current) (More than 3sec to re-start)					
	LEAKAGE CURRENT[mA]		1.5max (ACIN 115V / 240V, 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)					
OUTPUT	VOLTAGE[V]		5	12	15	24	36	48
	CURRENT[A]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)					
		ACIN 115V-264V	100	50	40	25	16.7	12.5
	WATTAGE[W]	ACIN 85-115V	Output derating is required at ACIN 115V or less (refer to instruction manual 3.2)					
		ACIN 115V-264V	500	600	600	600	601.2	600
	LINE REGULATION[mV] ✻8		20max	48max	60max	96max	144max	192max
	LOAD REGULATION[mV] ✻8		40max	100max	120max	150max	150max	300max
	RIPPLE[mVp-p] ✻1	0 to +50℃	80max	120max	120max	120max	150max	150max
		-20 to 0℃	140max	160max	160max	160max	160max	400max
	RIPPLE NOISE[mVp-p] ✻1	0 to +50℃	120max	150max	150max	150max	200max	200max
		-20 to 0℃	160max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50℃	50max	120max	150max	240max	360max	480max
		-20 to +50℃	75max	180max	180max	290max	440max	600max
	DRIFT[mV] ✻2		20max	48max	60max	96max	144max	192max
	START-UP TIME[ms]		300typ (ACIN 115V, Io=100%)					
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)					
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		4.50 to 5.50	10.80 to 13.20	13.50 to 16.50	21.60 to 26.40	32.40 to 39.60	43.20 to 52.80
	OUTPUT VOLTAGE SETTING[V]		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]		5.75 to 7.00	13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	41.40 to 50.40	55.20 to 67.20
	OPERATING INDICATION		LED (Green)					
	REMOTE SENSING		Optional (Option -W)					
	REMOTE ON/OFF		Optional (Required external power source. Option -R)					
ISOLATION	INPUT-OUTPUT · RC ✻3		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 ✻3		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)					
	OUTPUT-RC ✻3		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At room temperature)					
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ✻5		-20 to +70℃ (Output derating is required), 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max					
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max					
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axes					
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axes					
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN					
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B					
	HARMONIC ATTENUATOR ✻10		Complies with IEC61000-3-2 class A					

SPECIFICATIONS

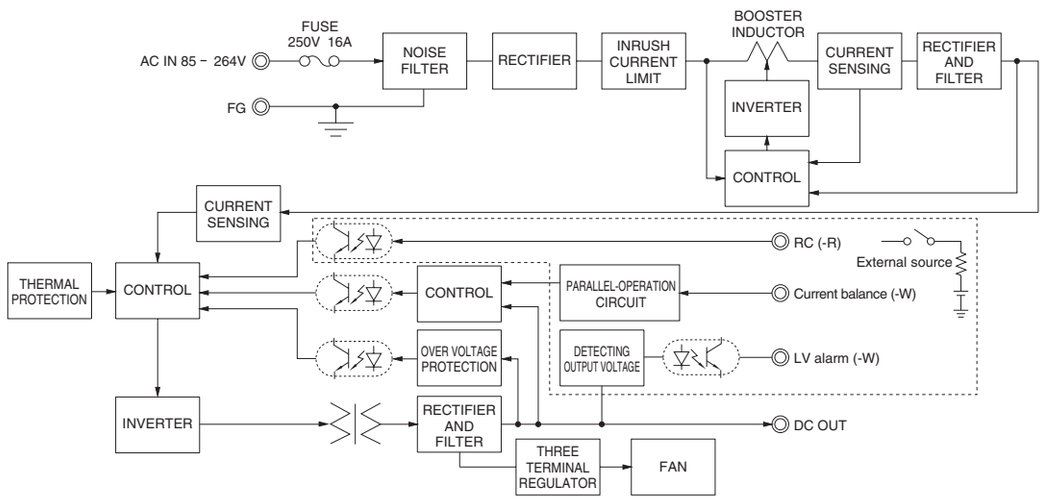
OTHERS	CASE SIZE/WEIGHT		120×61×215mm [4.72×2.40×8.46 inches] (Excluding terminal block and screw) (W×H×D) / 2.0kg max
	COOLING METHOD	※9	Forced cooling (internal fan)
WARRANTY	WARRANTY	※6	5-year (Depends on the used condition)

※1 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.6.
※2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.
※3 RC terminal is applied at option -R. And RC terminal is isolated from input, output and FG.
※4 Derating is required. As for DC input, 440Hz input and AC265 to 277V input, please contact us.
※5 Derating is required. Please refer to instruction manual 3.2.
※6 As for detail condtion, please refer to instruction manual 3.3.
※7 Please contact us about safety approvals for the model with option.
※8 Please contact us about dynamic load and input response.
※9 Fan speed is changed by load factor.
※10 Please contact us about other class.
※ To meet the specifications, do not operate over-loaded condition.
※ Parallel operation with other model is not possible. In case of parallel operation with same model, please use option -W.
※ A sound may occur from power supply at peak loading.

Features

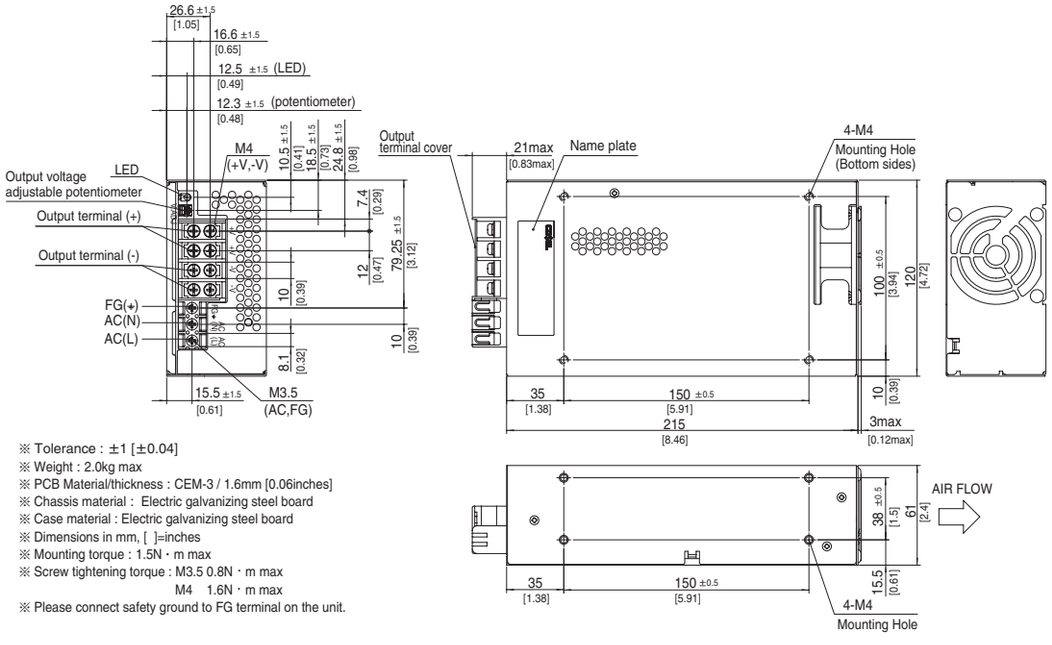
- Economical model
- Long lifetime (Refer to instruction manual)
- Low profile (61mm, 2.40 inch = meet to 2U height)
- Wide temperature range (-20℃ to +70℃ Refer to instruction manual)
- Screw hold type terminal block (Only input and FG terminal)
- Fan speed control (At no load condition)
- Various option
- Complies with SEMI F-47 (Option-U: Refer to instruction manual)

Block diagram



External view

External size of option V, option W, option R and option T2 are different from standard model, and refer to ”5. Option and Others” of instruction manual for detail.



※ Tolerance : ±1 [±0.04]
※ Weight : 2.0kg max
※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]
※ Chassis material : Electric galvanizing steel board
※ Case material : Electric galvanizing steel board
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 1.5N・m max
※ Screw tightening torque : M3.5 0.8N・m max
M4 1.6N・m max
※ Please connect safety ground to FG terminal on the unit.

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A] ∗1	Rated input fuse	Inrush current protection circuit	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
PLA100F	Active filter	40 to 160	1.2	250V 3.15A	Thermistor	CEM-3	Yes		Yes	No
	Flyback converter	20 to 150 ∗2								
PLA150F	Active filter	40 to 160	1.7	250V 4A	Thermistor	CEM-3	Yes		Yes	No
	Flyback converter	20 to 150 ∗2								
PLA300F	Active filter	60	3.4	250V 10A	Thermistor	CEM-3	Yes		Yes	No
	Forward converter	140								
PLA600F	Active filter	60	6.7	250V 16A	SCR	CEM-3		Yes	Yes	∗3
	Forward converter	220								

∗1 The value of input current is at ACIN 100V and 90% load.
∗2 Burst mode frequency is changed by the used condition. Please contact us about detail.
∗3 Available by option -W. Please refer to instruction manual "5. Option and Others".

1 Function PLA-12

1.1 Input Voltage Range ---- PLA-12
1.2 Inrush Current Limiting ---- PLA-12
1.3 Overcurrent Protection ---- PLA-12
1.4 Overvoltage Protection ---- PLA-12
1.5 Thermal Protection ---- PLA-12
1.6 Output Ripple and Ripple Noise ---- PLA-13
1.7 Output Voltage Adjustment ---- PLA-13
1.8 Isolation ---- PLA-13
1.9 Low Power Consumption ---- PLA-13
1.10 Remote ON/OFF ---- PLA-13
1.11 Remote Sensing ---- PLA-13
1.12 LV Alarm ---- PLA-13

2 Series Operation and Parallel Operation PLA-13

2.1 Series Operation ---- PLA-13
2.2 Parallel Operation ---- PLA-14

3 Assembling and Installation Method PLA-14

3.1 Installation Method ---- PLA-14
3.2 Derating ---- PLA-14
3.3 Expected Life and Warranty ---- PLA-15

4 Ground PLA-16

5 Option and Others PLA-16

5.1 Outline of Options ---- PLA-16
5.2 Others ---- PLA-20

1 Function

1.1 Input Voltage Range

■Input voltage range of the power supplies is from AC85V to AC264V (please see SPECIFICATIONS for details).
■To comply with safety standards, input voltage range is AC100-AC240V(50/60Hz).
■If input value doesn't fall within above range, a unit may not operate in accordance with specifications and/or start hunting or fail.
If you need to apply a square waveform input voltage, which is commonly used in UPS and inverters, please contact us.
■When the input voltage changes suddenly, the output voltage might exceed the specification. Please contact us.
■When DC input voltage is applied, external DC fuse is required for the protection. Please contact us about detail.

● PLA100F, PLA150F

■Power factor correction circuit will be stopped at AC250Vin or more. The operation is normal except decreasing the power factor. Please contact us about detail.
■Operation stop voltage is set at a lower value by output power derating.
・Use Conditions

	Maximum output power
PLA100F	40W
PLA150F	60W

Input AC50V (DC70V)
Duty 1s/30s

✻Please avoid using continuously for more than 1 second under above conditions. Doing so may cause a failure.

● PLA300F, PLA600F

■By using -U option, it is possible to operate at input voltage dip condition that is lower than AC85V. Output derating is required (Refer to 5. Option and Others). Please contact us for details.

1.2 Inrush Current Limiting

■An inrush current limiting circuit is built-in.
■If you need to use a switch on the input side, please select one that can withstand an input inrush current.

● PLA100F, PLA150F, PLA300F

■Thermistor is used in the inrush current limiting circuit. When you turn the power ON/OFF repeatedly within a short period of time, please have enough intervals so that a power supply cools down before being turned on.

● PLA600F

■Thyristor technique is used in the inrush current limiting circuit. When you turn the power ON/OFF repeatedly within a short period of time, please have enough intervals so that the inrush current limiting circuit becomes operative.
■When the switch of the input is turned on, the primary inrush current and secondary inrush current will be generated because the thyristor technique is used for the inrush current limiting circuit.

1.3 Overcurrent Protection

■An overcurrent protection circuit is built-in and activated at 105% of the rated current. A unit automatically recovers when a fault condition is removed.
Please do not use a unit in short circuit and/or under an overcurrent condition.
■Intermittent Operation Mode
When the overcurrent protection circuit is activated and the output voltage drops to a certain extent, the output becomes intermittent so that the average current will also decrease.

1.4 Overvoltage Protection

■An overvoltage protection circuit is built-in. If the overvoltage protection circuit is activated, shut down the input voltage, wait more than 3 minutes and turn on the AC input again to recover the output voltage. Recovery time varies depending on such factors as input voltage value at the time of the operation.
Remarks :
Please avoid applying a voltage exceeding the rated voltage to an output terminal. Doing so may cause a power supply to malfunction or fail. If you cannot avoid doing so, for example, if you need to operate a motor, etc., please contact us for details.

1.5 Thermal Protection

● PLA100F, PLA150F

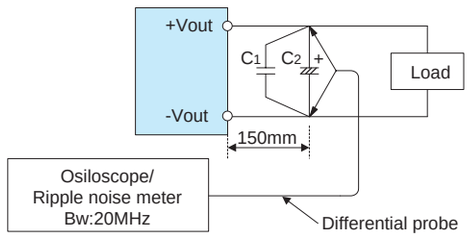
■PLA100F and PLA150F do not have thermal protection.

● PLA300F, PLA600F

■A thermal protection circuit is built-in.
The thermal protection circuit may be activated under the following conditions and shut down the output.
①When a current and a temperature continue to exceed the values determined by the derating curve.
②When a fan stops or air flow is blocked from the fan and weakens.
If the thermal protection circuit is activated, shut off the input voltage and eliminate all the overheating conditions. To recover the output voltage, have enough time to cool down the unit before turning on the input voltage again.

1.6 Output Ripple and Ripple Noise

■Output ripple noise may be influenced by measurement environment, measuring method fig.1.1 is recommended.



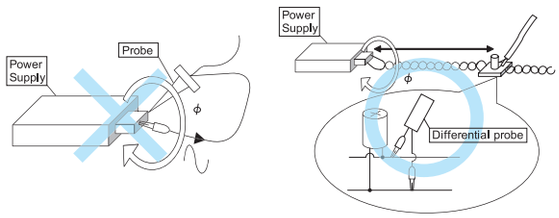
C1 : Film capacitor 0.1μF
C2 : Aluminum electrolytic capacitor 22μF

Fig.1.1 Measuring method of Ripple and Ripple Noise

Remarks :

When GND cable of probe with flux of magnetic force from power supply are crossing, ripple and ripple noise might not measure correctly.

Please note the measuring environment.



Bad example Good example

Fig.1.2. Example of measuring output ripple and ripple noise

1.7 Output Voltage Adjustment

■To increase an output voltage, turn a built-in potentiometer clockwise. To decrease the output voltage, turn it counterclockwise.

■When output voltage is adjusted, it should be turned slowly.

● PLA300F, PLA600F

■We are offering an Option -V, which doesn't have a built-in potentiometer but instead enables you to adjust the output voltage by using an external potentiometer (please see 5 Option and Others).

1.8 Isolation

■For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for the start (shut down). Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied voltage, at ON/OFF of a timer.

1.9 Low Power Consumption

● PLA100F, PLA150F

■Low power consumption function is built-in in PLA100F and PLA150F. (No load power consumption: 1.5W typ)

■In 0 to 30% load, switching power loss is reduced by burst operation. By this function, ripple and ripple noise specification are changed.

■Ripple and ripple noise are changed by used condition. Please contact us about detail.

■When power consumption is measred, please measure it by average mode. The value is changed by environment.

1.10 Remote ON/OFF

● PLA100F, PLA150F, PLA600F

■Option -R is available to provide a remote ON/OFF function. Please see "5. Option and Others" for details.

● PLA300F

■Please contact us about this function.

1.11 Remote Sensing

● PLA100F, PLA150F, PLA300F

■These models do not have this function.

● PLA600F

■Option -W is available to provide a remote sensing function. Please see "5. Option and Others" for details.

1.12 LV Alarm

● PLA100F, PLA150F, PLA300F

■These models do not have this function.

● PLA600F

■Option -W is available to provide an alarms function. Please see "5. Option and Others" for details.

2 Series Operation and Parallel Operation

2.1 Series Operation

■You can use a power supply in series operation. The output current in series operation should be lower than the rated current of a power supply with the lowest rated current among power supplies that are serially connected. Please make sure that no current exceeding the rated current flows into a power supply.

● PLA100F, PLA150F

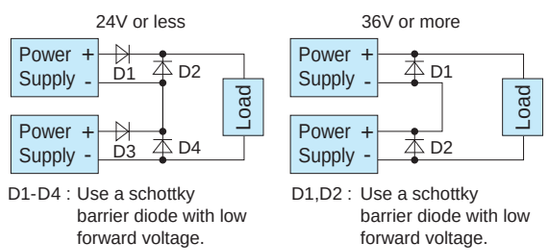


Fig.2.1 Examples of connecting in series operation 1

● PLA300F, PLA600F

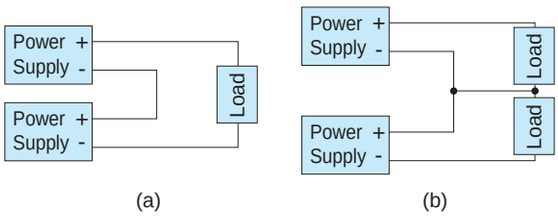


Fig.2.2 Examples of connecting in series operation 2

2.2 Parallel Operation

■Redundancy operation is available by wiring as shown below.

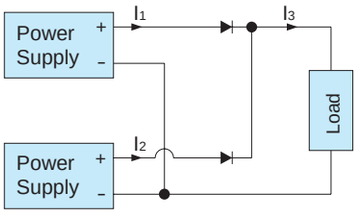


Fig.2.3 Example of redundancy operation

■Even a slight difference in output voltage can affect the balance between the values of I_1 and I_2.
Please make sure that the value of I_3 does not exceed the rated current of a power supply.

$I_3 \leqq$ the rated current value

● PLA100F, PLA150F, PLA300F

■Parallel operation is not possible.

● PLA600F

■Available by option -W. Please refer to instruction manual “5. Option and Others”.

3 Assembling and Installation Method

3.1 Installation Method

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

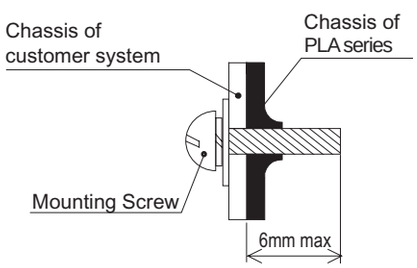
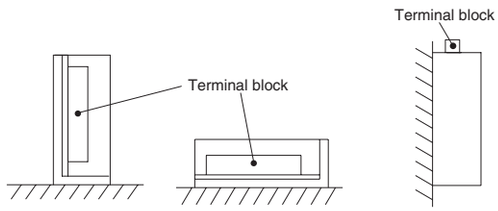


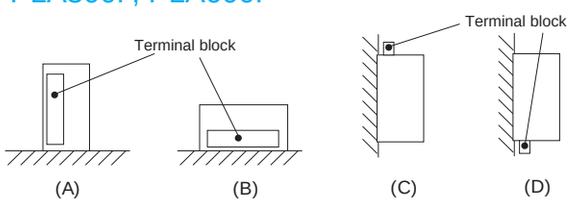
Fig.3.1 Mounting screw

● PLA100F, PLA150F

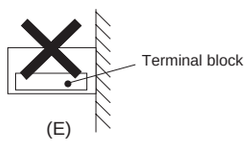


■If you use two or more power supplies side by side, please keep a sufficient distance between them to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in the derating curve.

● PLA300F, PLA600F



Not available



■Avoid installation method (E), which can cause stress on the mounting holes.

■Fan for forced cooling is built-in. Do not block the ventilation at suction side (terminal block and vent hole side) and its opposite side.

■When unit operates at dusty place, attach air-filter to dust into the unit. In this case, avoid poorly ventilated environments.

■When internal fan stops, thermal protection circuit works which stops the output. To keep reliability of the unit, periodic maintenance of the fan is required.

■Expected life of fan (R(t) = 90%) is different by the used condition.

3.2 Derating

■Input Voltage Derating Curve
Input voltage derating curve is shown in Fig.3.2.

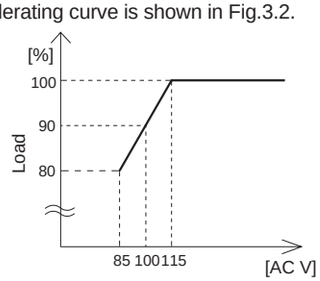


Fig.3.2 Input voltage derating curve

■Ambient Temperature Derating Curve
Derating curve depending on an ambient temperature is shown in Fig.3.3 to Fig.3.6.

✻Specifications for ripple and ripple noise change in the shaded area.

● PLA100F, PLA150F

(1) Temperature of point A and point B

When using it,it is necessary to radiate heat by the heat of the power supply.

Table 3.1 shows the relation between the upper limit temperature (Point A and Point B).

Please consider the ventilation so that the convection which is enough for the whole power supply is provided.

And temperature of Point A and Point B please become lower than upper limit temperature.

The expectancy life in the upper bound temperature (Point A and Point B) is three years.

Please refer to External View for the position of Point A and Point B.

Table.3.1 Temperature of point A and point B

Model	All direction	
	Point A	Point B
PLA100F	81℃ max	—
PLA150F	85℃ max	78℃ max

(2) Derating curve in ambient temperature

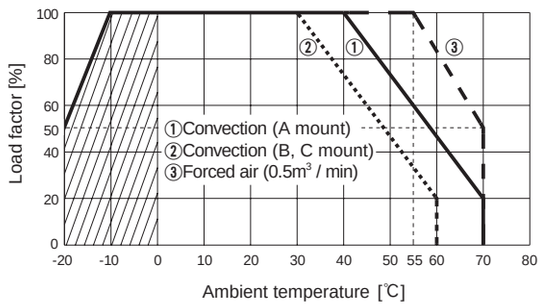


Fig.3.3 Ambient temperature derating curve for PLA100F/150F-12, -15

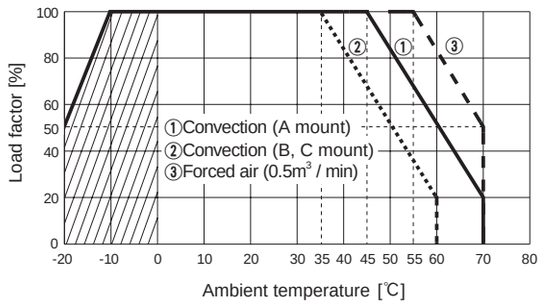


Fig.3.4 Ambient temperature derating curve for PLA100F/150F-24, -36, -48

Ambient temperature should be measured in 5 to 10cm from power supply to avoid own heat-up. About detail of ambient temperature, please contact us.

● PLA300F

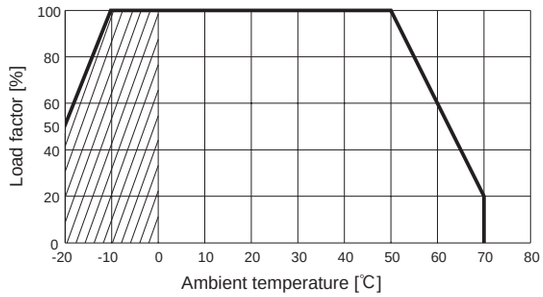


Fig.3.5 Ambient temperature derating curve for PLA300F

Ambient temperature should be measured in front of terminal block. Please note about temperature raise of the input and output cable. About detail of ambient temperature, please contact us.

● PLA600F

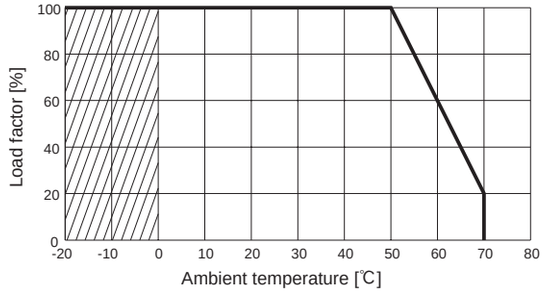


Fig.3.6 Ambient temperature derating curve for PLA600F

Ambient temperature should be measured in front of terminal block. Please note about temperature raise of the input and output cable. About detail of ambient temperature, please contact us.

3.3 Expected Life and Warranty

■Expected Life

Please see the following tables for expected life.

● PLA100F, PLA150F

Table 3.2 Expected lifetime (PLA100F/PLA150F)

Mounting Method	Cooling Method	Average ambient temperature	Expected lifetime [years]	
			Io≦50%	Io≦100%
A	Convection	Ta = 30℃	10	5
		Ta = 40℃	5	3
B, C	Convection	Ta = 20℃	10	5
		Ta = 30℃	5	3
A, B , C	Forced air cooling	Ta = 40℃	10	5
		Ta = 55℃	5	3

● PLA300F, PLA600F

Table3.3 Expected lifetime (PLA300F/PLA600F)

Mounting	Cooling method	Average ambient temperature	Expected lifetime [years]	
			Io<=50%	Io<=100%
All direction	Forced air cooling (internal fan)	Ta = 30℃	10	7
		Ta = 40℃	7	5
		Ta = 50℃	5	3

✻This lifetime includes a built-in fan lifetime.

■Fans should be exchanged on a regular basis. Their expected lifetime (R (t) = 90%) depends on use conditions as shown in Fig.3.7

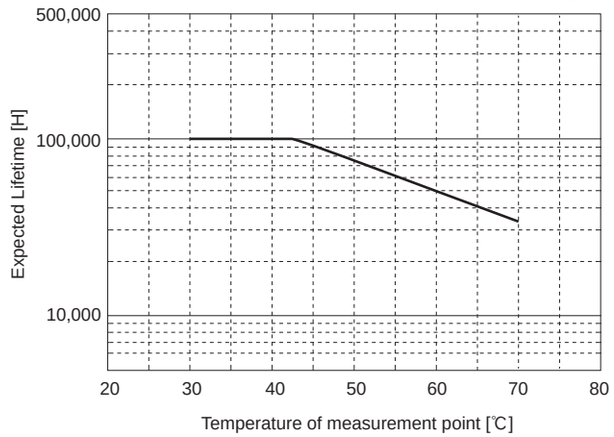


Fig.3.7 Expected lifetime of fan

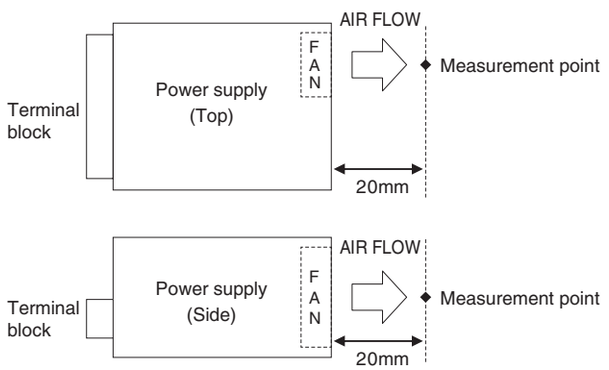


Fig.3.8 Temperature of measurment point for fan lifetime

■Warranty

Please see the following table for warranty. The warranty period is 5 years maximum.

● PLA100F, PLA150F

Table 3.4 Warranty (PLA100F/PLA150F)

Mounting	Cooling method	Average ambient temperature	Warranty [years]	
			Io<=50%	Io<=100%
A	Convection	Ta = 30℃	5	5
		Ta = 40℃	5	3
B, C	Convection	Ta = 20℃	5	5
		Ta = 30℃	5	3
A, B , C	Forced air cooling	Ta = 40℃	5	5
		Ta = 55℃	5	3

Table 3.5 Warranty (PLA300F/PLA600F)

Mounting	Cooling method	Average ambient temperature	Warranty [years]	
			Io<=50%	Io<=100%
All direction	Forced air cooling (internal fan)	Ta = 40℃	5	5
		Ta = 50℃	5	3

4 Ground

■When installing the power supply with your unit, ensure that the input FG terminal is connected to safety ground of the unit.

5 Option and Others

5.1 Outline of Options

● -C (PLA100F, PLA150F, PLA300F, PLA600F)

・Option -C units have coated internal PCB for better moisture resistance.

● -G (PLA300F, PLA600F)

・Option -G units are low leakage current type.
・Differences from standard versions are summarized in Table 5.1.

Table 5.1 Low leakage current type

Leakage Current (AC240V 60Hz)	0.15mA max
Conducted Noise	N/A
Output Ripple Noise	Please contact us for details about Ripple Noise

✻ This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal block. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM-103).

● -V (PLA300F, PLA600F)

・Option -V units have a connector for external potentiometer instead of a built-in potentiometer.
・Appearance of Option -V units is different from that of standard units. Please contact us for details.
・If power is turned on while CN3 is open, output voltage decreases significantly.

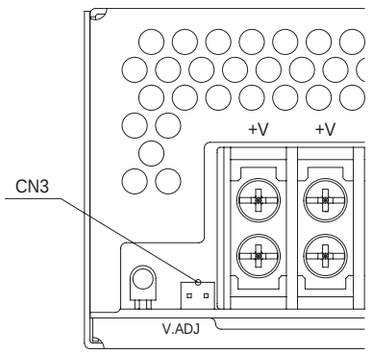


Fig.5.1 Front view of option-V (PLA600F)

● -U (PLA300F, PLA600F)

・Operation stop voltage of Option -U units is set at a lower value than that of a standard version to support low input voltage.
・Use Conditions (Conditions of SEMI F-47 compliant)

Maximum output power ✻( ) is 5V output model.

PLA300F	120W (100W)
PLA600F	240W (200W)

Input AC50V
Duty 1s/30s

✻Please avoid using continuously for more than 1 second under above conditions. Doing so may cause a failure.

● -R (PLA100F, PLA150F, PLA600F)

・You can control output ON/OFF in Option -R units. An external DC power supply is connected and it should be applied a voltage to a remote ON/OFF connector to control it.
・Appearance is changed from standard model.
・There is a lineup of optional harnesses. Refer to option parts.
・Please contact us for details.

Table.5.2 Remote on/off operating conditions

Model Name	Built-in Resistor Ri [Ω]	Voltage between RC and RCG [V]		Input Current [mA]
		Output ON	Output OFF	
PLA100F, PLA150F, PLA600F	780	4.5 - 12.5	0 - 0.5	(20max)

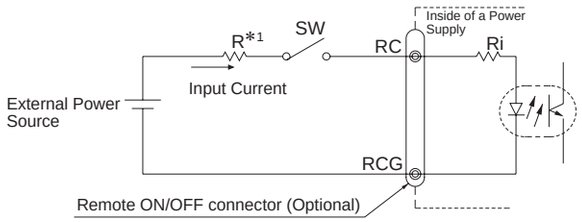


Fig.5.2 Example of using a remote ON/OFF circuit

✻1 If the output of an external power supply is within the range of 4.5 - 12.5V, you do not need a current limiting resistor R. If the output exceeds 12.5V, however, please connect the current limiting resistor R.

To calculate a current limiting resistance value, please use the following equation.

$$R[\Omega]=\frac{Vcc-(1.1+Ri\times 0.005)}{0.005}$$ Vcc : External Power Source

✻Please wire carefully. If you wire wrongly, the internal components of a unit may be damaged.
✻Remote ON/OFF circuits is isolated from input, output and FG circuits .

■PLA100F/PLA150F Remote on/off control
・CN4 is added. Please contact us for detail.
・Start up time will be delay when on/off term is very short. Please keep 2 seconds for on/off cycle.

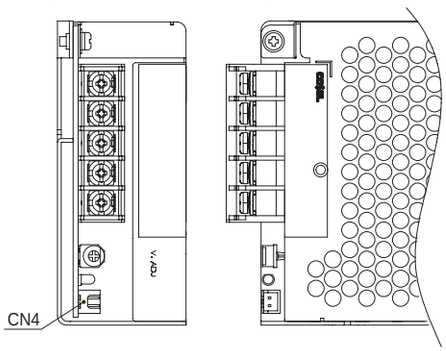


Fig.5.3 Example of option -R (PLA100F, PLA150F)

Table 5.3 Mating connectors and terminals on CN4

Connector		Housing	Terminal	Mfr
CN4	B2B-XH-A	XHP-2	BXH-001T-P0.6 or SXH-001T-P0.6	J.S.T.

■PLA600F Remote on/off control

・CN1 is added. Please contact us for detail.

・Appearance is changed from standard model.

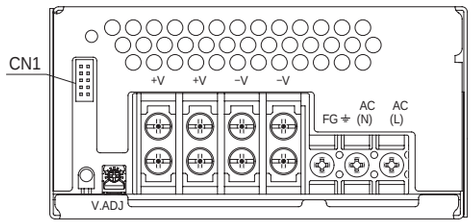


Fig.5.4. Front view of option -R (PLA600F)

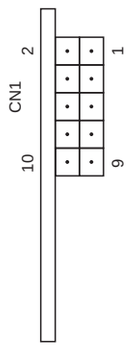


Fig.5.5. Pin number

Table 5.4. Pin configuration and function of CN1

PIN	FUNCTION
1	- :N.C.
2	- :N.C.
3	RC :Remote ON/OFF
4	RCG:Remote ON/OFF(GND)
5	- :N.C.
6	- :N.C.
7	- :N.C.
8	- :N.C.
9	- :N.C.
10	- :N.C.

Table 5.5 Mating connectors and terminals on CN1

Connector		Housing	Terminal	Mfr
CN1	S10B-PHDSS	PHDR-10VS	Reel :SPHD-002T-P0.5 Loose :BPHD-001T-P0.5 :BPHD-002T-P0.5	J.S.T.

● -W (PLA600F only)

・Remote sensing, low output voltage alarm (LV alarm) and parallel operation function are built-in to this model.

・Appearance is changed from standard model.

・There is a lineup of optional harnesses. Refer to option parts.

・Please contact us for details.

・Differences from standard versions are summarized in Table 5.6.

Table 5.6 Specification differences of Option -W

Load regulation	1.5 times of standard spec.
Ripple	1.5 times of standard spec.
Ripple noise	1.5 times of standard spec.

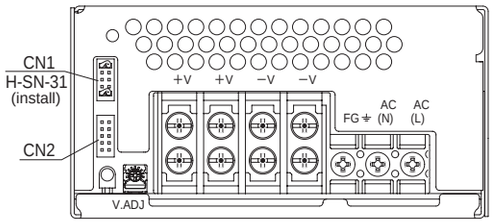


Fig.5.6 Front view of option -W

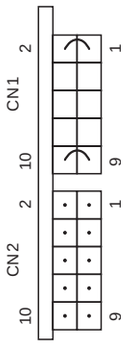


Fig.5.7. Pin number

Table 5.7. Pin configuration and function of CN1 and CN2

PIN	FUNCTION
1	+M :Self sensing terminal (Don't wire for external function)
2	+S :+Sensing
3	- :N.C.
4	- :N.C.
5	LV :LV alarm
6	LVG :LV alarm (GND)
7	CB :Current balance
8	- :N.C.
9	-M :Self sensing terminal (Don't wire for external function)
10	-S :-Sensing

Table 5.8. Mating connectors and terminals on CN1 and CN2

Connector		Housing	Terminal	Mfr
CN1 CN2	S10B-PHDSS	PHDR-10VS	Reel :SPHD-002T-P0.5 Loose :BPHD-001T-P0.5 :BPHD-002T-P0.5	J.S.T.

■LV alarm

LV alarm operating conditions are shown in Table 5.9 and internal circuit is shown in Fig.5.8. LV alarm is isolated from input, output and FG.

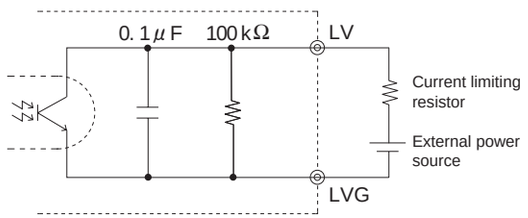


Fig.5.8 LV internal circuit

Table 5.9 LV alarm operating conditions

	Alarm	Output of alarm
LV	If the output voltage drops below the rating, the alarm signal is output from LV and LVG terminal. Note : ①This becomes unstable in the event of output overcurrent (intermittent overcurrent). ②The alarm signal is not output for parallel operation that does not use OR diodes.	Open collector method Good : Low (0 - 0.8V, 10mA max) Fail : High or Open 50V 10mA max

■Parallel operation

In case of parallel operation, please make the following process.

① Before wiring, output voltage should be set to the required voltage at first to each power supply. Each output voltage differences must be less than 0.1V or 1% of the rated output voltage, whichever smaller.

② Please connect each wire refer to Fig 5.9. And please use same length and same type wire to connet each load line.

③ As variance of output current drew from each power supply is maximum 15%, the total output current must not exceed the value determined by the following equation.

$$\begin{bmatrix}\text{Output current in}\\ \text{parallel operation}\end{bmatrix} = \begin{bmatrix}\text{The rated}\\ \text{current per unit}\end{bmatrix} \times (\text{Number of unit}) \times 0.85$$

✻Please confirm that each output current is within the rated current.

・When the output voltage adjustment is required after wiring, retry the above process from ① again.

・When the number of units in parallel operation increases, input current increases at the same time. Adequate wiring design for input circuitry is required, such as circuit pattern, wiring and current capacity for equipment.

・In parallel operation, the maximum operative number of units is 5.

・It is not possible to work as master and booster operation.

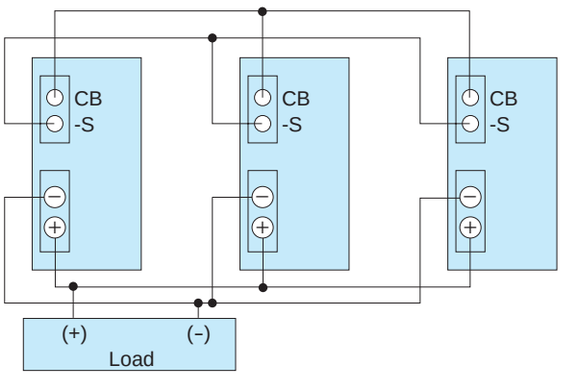


Fig.5.9 Parallel operation condition

・When the output current is less than 10% of rated output current, the output voltage fluctuates occasionally. The minimum current is different depending on the model and the number of parallel operation. Please contact us.

・When output cable is not same length from each power supplies, output current value will not be balanced at each units. Please set the cable length as same as possible.

■Remote sensing

・These models have a built-in remote sensing function.
If you do not use the remote sensing function, you can short out between +S and +M and between -S and -M on CN1.
When the power supplies are shipped from a factory, they come with a dedicated harness (H-SN-31) being mounted on CN1. If you do not use the remote sensing function, you can use the power supplies as they are.

・Please see Fig.5.10 if you do not use the remote sensing function.
Please see Fig.5.11 if you use the remote sensing function.

・When you use the remote sensing function, please wire from +S and -S on CN1. Harnesses are available for your purchase.
Please contact us for details.
When you use the remote sensing, please note the followings.

① Wire carefully. When a connection of a load line becomes loose (due to such factors as loose screw), the load current flows to the sensing line and internal circuits of the power supply may be damaged.

② Use a sufficiently thick wire to connect between the power supply and the load and keep the line drop at 0.3V or below.

③ If the sensing line is long, connect C1 and R1.

④ Use a twisted pair wire or a shielded wire as the sensing line.

⑤ Do not draw the output current from +M, -M, +S or -S.

⑥ When the remote sensing function is used, the output voltage of the power supply may show an oscillating waveform or the output voltage may dramatically fluctuate because of an impedance of wiring and load conditions.
Please check and evaluate carefully before using the remote sensing function.
If the output voltage becomes unstable, we suggest you to try the followings.
- Remove the remote sensing line on the minus side and short out between -S and -M.
- Connect C1, R1 and R2.
Please contact us for details.

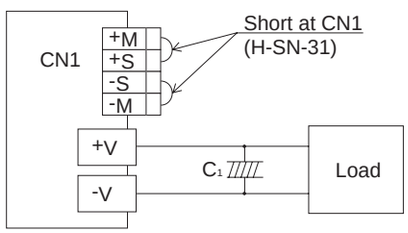


Fig.5.10 When not using remote sensing function

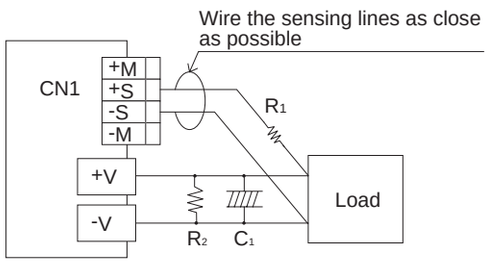


Fig.5.11 When using remote sensing function

● -T (PLA100F, PLA150F)

・Option -T units have vertically positioned screws on a terminal block.
・Please contact us for details about appearance.

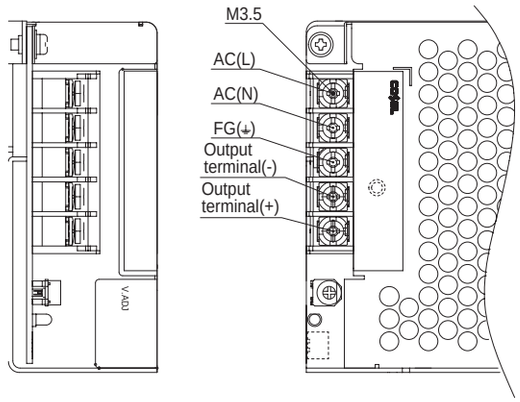


Fig.5.12 Example of option -T(PLA100F)

● -J (PLA100F, PLA150F)

・Option -J units have AMP connectors instead of a terminal block.
・Dedicated harnesses are available for your purchase. Please see Optional Parts for details.
・Please contact us for details about appearance.
・Please do not apply more than 5A per 1 pin.

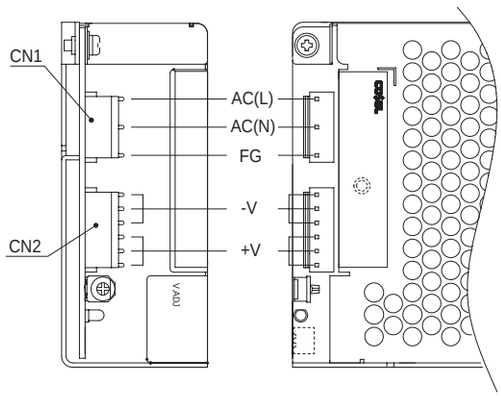


Fig.5.13 Example of option -J (PLA100F)

Table.5.10 Mating connectors and terminals on CN1 and CN2 in option -J

I/O Connector		Matching Housing	Terminal
CN1	1-1123724-3	1-1123722-5	Reel : 1123721-1
			Loose : 1318912-1
CN2	1-1123723-6	1-1123722-6	Reel : 1123721-1
			Loose : 1318912-1

(Mfr. Tyco electronics AMP)

● -L (PLA100F, PLA150F)

■In this Option -L unit, no load power consumption is smaller than standard model.
[No load power consumption]
Option -L : 0.5W max
Standard model (Reference) : 1.5W typ
Condition: AC240V input, Io=0A
■Option -L specification is changed from standard model specification as below.
・Dynamic load response
・Start-up condition at low temperature

Please contact us about detail.

5.2 Others

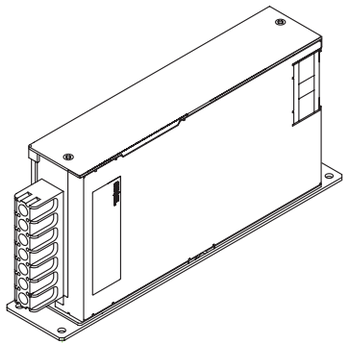
■While turning on the electricity, and for a while after turning off, please don't touch the inside of a power supply because there are some hot parts in that.
■When a mass capacitor is connected with the output terminal (load side), the output might become the stop or an unstable operation. Please contact us for details when you connect the capacitor.
■In case of input voltage stop at no load, output voltage is kept for several minutes because of low power consumption. Please be careful in maintenance, to avoid electrical shock.
■In PLA300F and PLA600F, thermal protection will be activated by internal fan stop. Please have the regularly maintenance for improving reliability.

■PLA Series Attachment

BASE Attachment

Plate model	Applicable to model
F-PLA300-1	PLA300F
F-PLA600-1	PLA600F

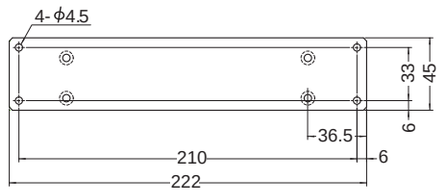
Example
(PLA300F)



〈TOP VIEW〉(Unit : mm) (Tolerance : ±1)

F-PLA300-1

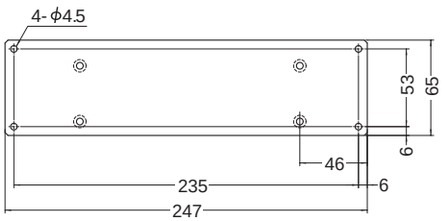
Size



✱ Material : SEHC
✱ Thickness : 3.2

F-PLA600-1

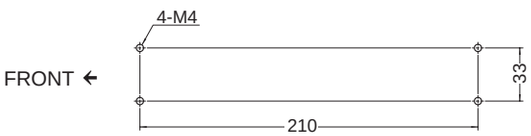
Size



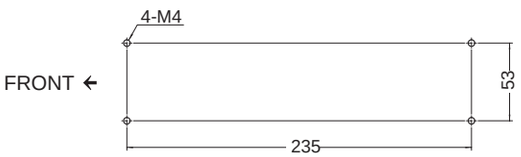
✱ Material : SEHC
✱ Thickness : 3.2

✱ M4 × 8ℓ Flat screw is requested when mounting.

Mounting hole size



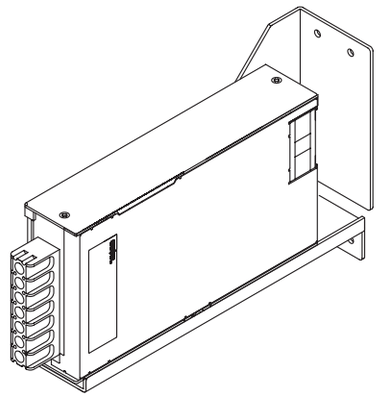
Mounting hole size



FRONT Attachment

Plate model	Applicable to model
F-PLA300-2	PLA300F
F-PLA600-2	PLA600F

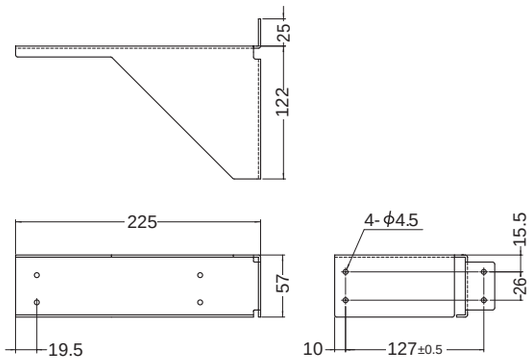
Example
(PLA300F)



(Unit : mm) (Tolerance : ±1)

F-PLA300-2

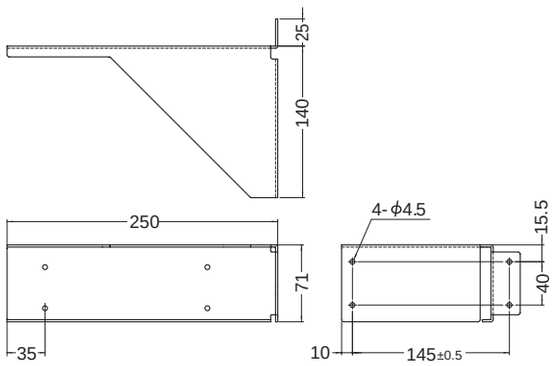
Size



✱ Material : SEHC
✱ Thickness : 2.0

F-PLA600-2

Size

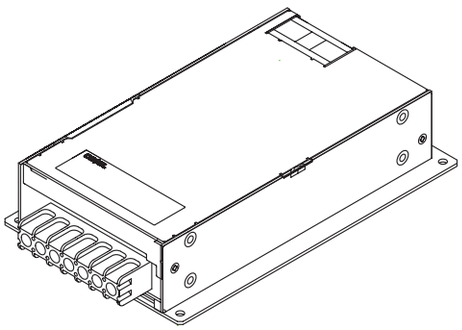


✱ Material : SEHC
✱ Thickness : 2.0

BASE Attachment

Plate model	Applicable to model
F-PLA300-1	PLA300F
F-PLA600-1	PLA600F

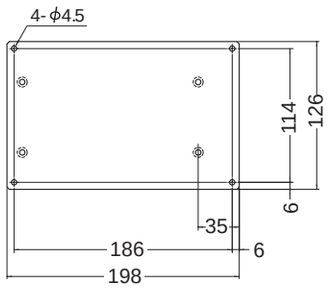
Example
(PLA300F)



〈TOP VIEW〉 (Unit : mm) (Tolerance : ±1)

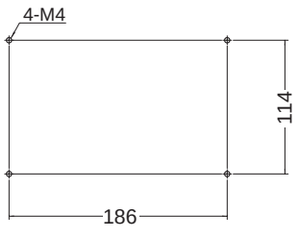
F-PLA300-3

Size



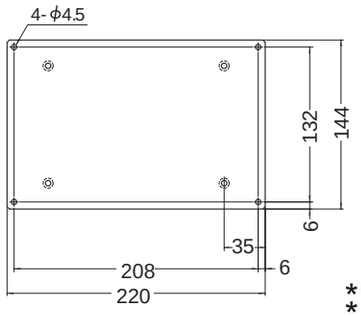
✱ Material : SEHC
✱ Thickness : 3.2

Mounting hole size



F-PLA600-3

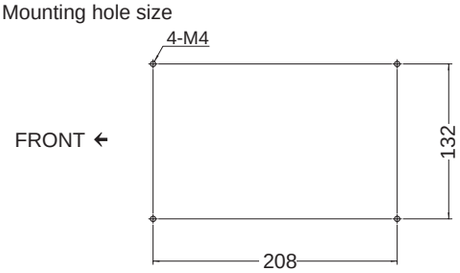
Size



✱ Material : SEHC
✱ Thickness : 3.2

✱ M4 × 8ℓ Flat screw is requested when mounting.

Mounting hole size



Harness to use the function is prepared in PLA series.

PLA Series

The latest information is in our websit

Mating harness

Model	Harness model #	Contents
PLA100F, PLA150F	H-IN-22	Input harness when I/O interface is connector type (option : -J)
	H-OU-37	Output harness when I/O interface is connector type (option : -J)
	H-RC-1	Harness for using option : -R
PLA300F,PLA600F	H-SN-18	Harness for using option : -V
PLA600F	H-PA-9	Harness for parallel operation (option: -W)
	H-SN-32	Harness for using all functions of option -W and -R
	H-SN-33	Harness for using all functions except remote sensing of option -W and -R
	H-RC-5	Harness for using a function of option -R

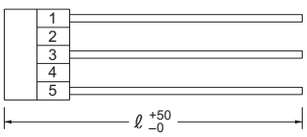
✻ These harnesses are used for product which includes option.

●Model number

H-IN-22

Housing : 1-1123722-5 (Tyco Electronics AMP)
Pin : 1123721-1 or 1318912-1 (Tyco Electronics AMP)

●Type



●Wire

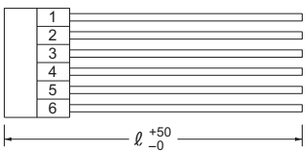
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	UL1015	18	green	500
2				
3	UL1015	18	white	500
4				
5	UL1015	18	black	500

●Model number

H-OU-37

Housing : 1-1123722-6 (Tyco Electronics AMP)
Pin : 1123721-1 or 1318912-1 (Tyco Electronics AMP)

●Type



●Wire

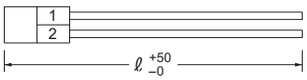
Pin #	Wire	AWG	Color	Length ℓ (mm)
1 - 3	UL1015	18	red	500
4 - 6	UL1015	18	black	500

●Model number

H-RC-1

Housing : XHP-2 (J.S.T.)
Pin : SXH-001T-P0.6 (J.S.T.)

●Type



●Wire

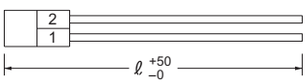
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	UL1007	22	orange	500
2	UL1007	22	blue	500

●Model number

H-SN-18

Housing : PHR-2 (J.S.T.)
Pin : SPH-002T-P0.5S (J.S.T.)

●Type



●Wire

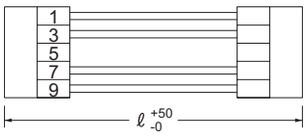
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	UL1007	26	yellow	500
2	UL1007	26	orange	500

●Model number

H-PA-9

Housing : PHDR-10VS(J.S.T.)
Pin : SPHD-002T-P0.5(J.S.T.)

●Type



●Wire

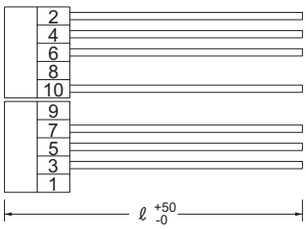
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	-	-	-	-
2	UL1061	28	red	270
3	UL1061	28	orange	270
4	UL1061	28	purple	270
5	-	-	-	-
6	-	-	-	-
7	UL1061	28	green	270
8	-	-	-	-
9	-	-	-	-
10	UL1061	28	black	270

●Model number

H-SN-32

Housing : PHDR-10VS(J.S.T.)
Pin : SPHD-002T-P0.5(J.S.T.)

●Type



●Wire

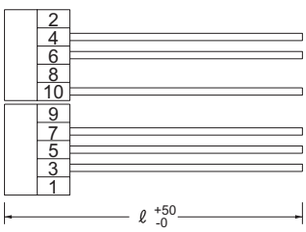
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	-	-	-	-
2	UL1061	28	red	500
3	UL1061	28	orange	500
4	UL1061	28	purple	500
5	UL1061	28	yellow	500
6	UL1061	28	blue	500
7	UL1061	28	green	500
8	-	-	-	-
9	-	-	-	-
10	UL1061	28	black	500

●Model number

H-SN-33

Housing : PHDR-10VS(J.S.T.)
Pin : SPHD-002T-P0.5(J.S.T.)

●Type



●Wire

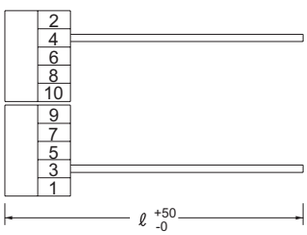
Pin #	Wire	AWG	Color	Length ℓ (mm)
1	-	-	-	-
2	-	-	-	-
3	UL1061	28	orange	500
4	UL1061	28	purple	500
5	UL1061	28	yellow	500
6	UL1061	28	blue	500
7	UL1061	28	green	500
8	-	-	-	-
9	-	-	-	-
10	UL1061	28	black	500

●Model number

H-RC-5

Housing : PHDR-10VS(J.S.T.)
Pin : SPHD-002T-P0.5(J.S.T.)

●Type



●Wire

Pin #	Wire	AWG	Color	Length ℓ (mm)
1	-	-	-	-
2	-	-	-	-
3	UL1061	28	orange	500
4	UL1061	28	purple	500
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-
8	-	-	-	-
9	-	-	-	-
10	-	-	-	-