COSEL

Medical electric equipment | Power Factor Correction | World wide | Safety Approvals | EMI | Inrush current limiting | OCP | OVP | Remote ON/OFF | Parallel Operation | 1U | Pulse Load

AEA-series

Feature

High power & peak power
High efficiency
Low profile (41mm, 1.61 inch = meet to 1U height)
For medical electric equipment (ANSI/AAMI ES60601, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
Suitable for BF application (Output-FG : 1MOPP, Input-Output : 2MOPP)
OVC III (according to EN62477-1)
Complies with SEMI F47 (Refer to Instruction Manual)
UL508 (Optional)

Safety agency approval

UL62368-1, ANSI/AAMI ES60601-1
C-UL (CAN/CSA62368-1, CAN/CSA60601-1)
EN62368-1, EN60601-1 3rd
Complies with IEC60601-1-2 4th Ed.
EN62477-1 (OVC III)
UL508 (Optional)

5-year warranty (Refer to Instruction Manual)

CE marking

Low Voltage Directive
RoHS Directive

EMI

Complies with FCC-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, VCCI-B

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

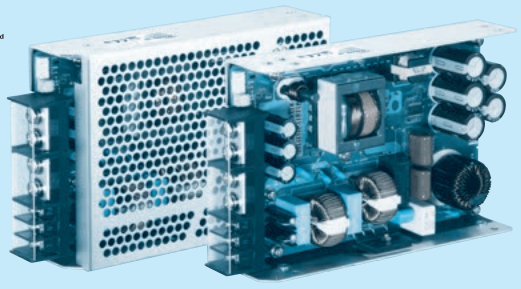
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

COSEL AC-DC Power Supplies Medical Type

AEA600F

Ordering information

AE	A	600	F	-□□	-□
①	②	③	④	⑤	⑧



Example recommended EMI/EMC filter
EAC-20-472

High voltage pulse noise type : EAP series
Low leakage current type : EAM series

*Use of an EMI/EMC filter is recommended when a power supply is connected with several devices so that additional filtering is necessary.
*Make sure that your final application will meet the required EMC standard by measuring the EMI level of the power supply used together with an EMI/EMC filter.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑧Optional *1
C : with Coating
N : with cover
T : Vertical terminal block
J : Connector type
R3 : with Subfeatures (5V1A AUX,12V1A AUX Remote ON/OFF, Alarm)
T5 : UL508
P5 : shutdown type overcurrent protection
For option details, refer to instruction manual 6.1.

Please refer to derating curve, because the rated load current depends on cooling method that is convection cooling or forced air.
*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		AEA600F-24	AEA600F-36	AEA600F-48
MAX OUTPUT WATTAGE[W]		600	601.2	600
DC OUTPUT (forced air)	ACIN 100V	24V 20.0 (Peak 42.0) A	36V 13.4 (Peak 28.0) A	48V 10.0 (Peak 21.0) A
	ACIN 230V	24V 25.0 (Peak 52.5) A	36V 16.7 (Peak 35.0) A	48V 12.5 (Peak 26.3) A

SPECIFICATIONS

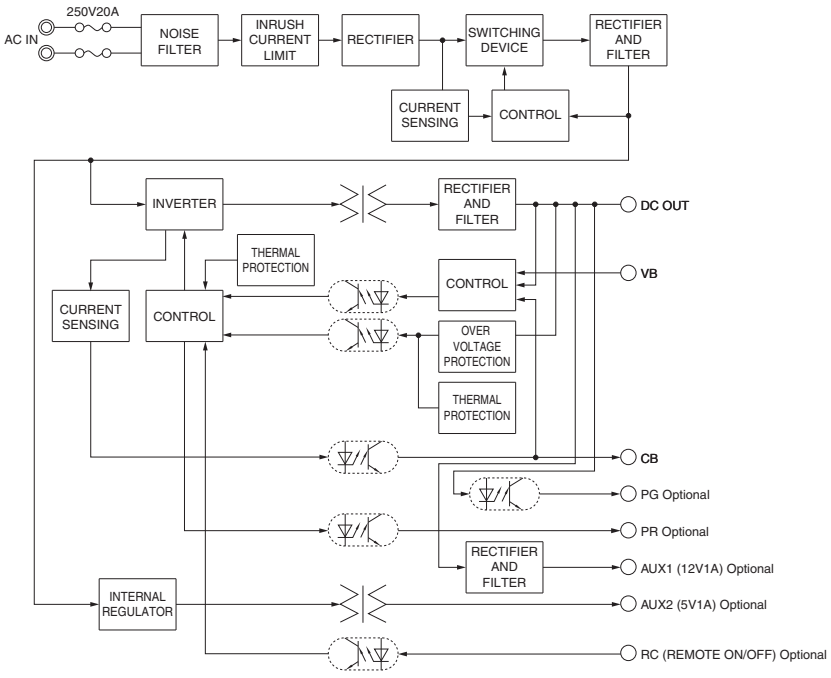
	MODEL		AEA600F-24	AEA600F-36	AEA600F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required at AC85V - 170V. See "Derating")		
	CURRENT[A]	ACIN 100V	5.7typ (Io=20A)	5.7typ (Io=13.4A)	5.7typ (Io=10A)
		ACIN 230V	2.9typ (Io=25A)	2.9typ (Io=16.7A)	2.9typ (Io=12.5A)
	FREQUENCY[Hz]		50/60 (45 - 66)		
	EFFICIENCY[%]	ACIN 100V	92.0%typ (Io=20A)	92.0%typ (Io=13.4A)	92.0%typ (Io=10A)
		ACIN 230V	94.5%typ (Io=25A)	95.0%typ (Io=16.7A)	95.0%typ (Io=12.5A)
	POWER FACTOR	ACIN 100V	0.98typ (Io=20A)	0.98typ (Io=13.4A)	0.98typ (Io=10A)
		ACIN 230V	0.95typ (Io=25A)	0.95typ (Io=16.7A)	0.95typ (Io=12.5A)
	INRUSH CURRENT[A] *2	ACIN 100V	20/40typ (Io=20A)	20/40typ (Io=13.4A)	20/40typ (Io=10A)
		ACIN 230V	40/40typ (Io=25A)	40/40typ (Io=16.7A)	40/40typ (Io=12.5A)
	LEAKAGE CURRENT[mA]		0.3max (ACIN 240V 60Hz, Io=100%, According to IEC60601-1)		
OUTPUT	VOLTAGE[V]		24	36	48
	CURRENT (convection) [A]	ACIN 230V	17.5	11.7	8.8
	CURRENT (forced air) [A]	ACIN 230V	25.0	16.7	12.5
	PEAK CURRENT[A]	ACIN 230V	52.5	35.0	26.3
	LINE REGULATION[mV]		96max	144max	192max
	LOAD REGULATION[mV]		150max	240max	300max
	RIPPLE[mVp-p] *3	0 to +50℃	120max	200max	200max
		-20 to 0℃	200max	300max	350max
	RIPPLE NOISE[mVp-p] *3	0 to +50℃	150max	230max	250max
		-20 to 0℃	230max	350max	500max
	TEMPERATURE REGULATION[mV]	0 to +50℃	240max	360max	480max
	DRIFT[mV]	*4	96max	144max	192max
	START-UP[ms]		750typ (ACIN 100V, Io=100%)		
	HOLD-UP[ms]		20typ (ACIN 230V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		21.6 to 26.4	32.4 to 39.6	43.2 to 52.8
	OUTPUT VOLTAGE SETTING[V]		23.5 to 24.5	35.0 to 37.0	47.0 to 49.0
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 101% of peak current and recovers automatically *5		
	OVERVOLTAGE PROTECTION[V]		30 to 33.6	45 to 50.4	60 to 69.6
	ALARM		Optional (Input voltage alarm : PR, Output voltage alarm : PG)		
	REMOTE ON/OFF		Optional		
	AUX1		Optional (12V1A)		
	AUX2		Optional (5V1A)		
ISOLATION	INPUT-OUTPUT · PR · PG · RC · AUX *6		AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP		
	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP		
	OUTPUT · PR · PG · RC · AUX-FG *6		AC1,500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP		
	OUTPUT · AUX1-PR · PG · RC · AUX2 *6		AC100V 1minute, Cutoff current = 25mA, DC100V 10MΩ min (At Room Temperature)		
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-20 to +70℃, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max		
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max		
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis		
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis		
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL62368-1,ANSI/AAMI ES 60601-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1,CAN/CSA-C22.2 No.60601-1) EN62368-1,EN60601-1 3rd EN62477-1 (OVCIII) UL508 (Optional), Complies with IEC60601-1-2 4th Ed.		
	CONDUCTED NOISE		Complies with FCC Part15 classB, VCCI-B, CISPR32-B, EN55011-B, EN55032-B		
	HARMONIC ATTENUATOR *7		Complies with IEC61000-3-2 (Class A)		
OTHERS	CASE SIZE/WEIGHT		41×127×186mm [1.61×5×7.32 inches] (W×H×D) (without terminal block) / 1.0kg max		
	COOLING METHOD		Convection/Forced air		

*1 The listed options may affect the published standard specifications. Please contact us for detailed product specification
*2 The current of input surge to a built-in EMI/EMS Filter (0.2ms or less) is excluded.
*3 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKUGIKEN:RM104). Please refer to the instruction manual 1.8.
*4 Drift is the change in DC output for an eight hours period after a half-hour warm-up at 25C.
*5 The output is shut down when the overcurrent protection continues.
*6 Applicable when AUX and remote control (optional) is added.
*7 Please contact us about another class.
*Sound noise may be generated by power supply in case of pulse load.

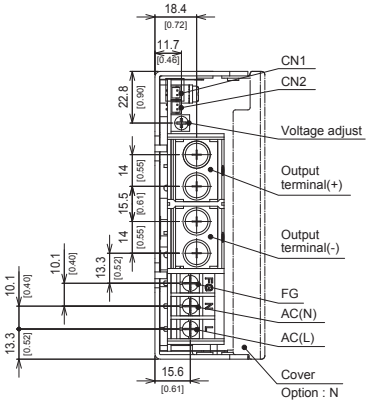
Features

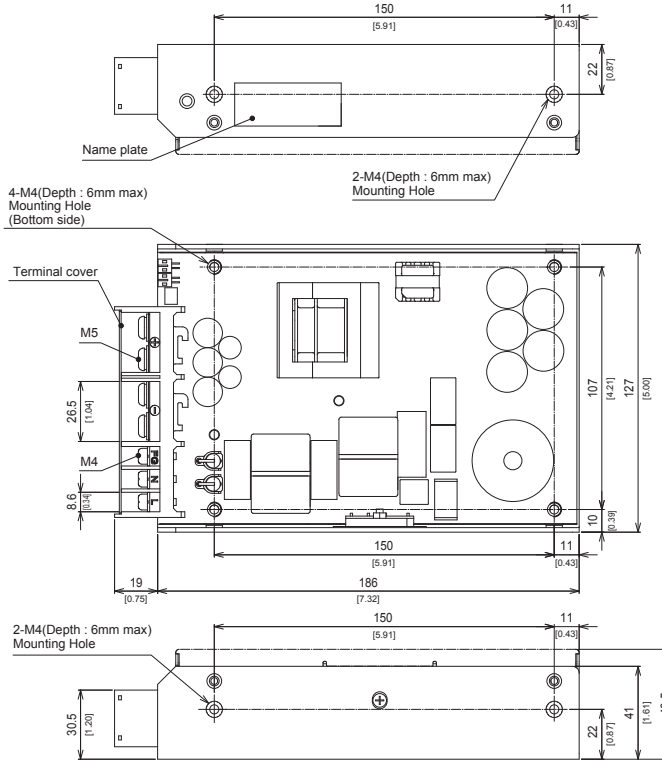
- High power & peak power
- High efficiency : 94% typ (Input Voltage 230V, Output Voltage 24V)
- Low profile (41mm, 1.61 inch = meet to 1U height)
- For medical electric equipment (ANSI/AAMI ES60601, EN60601-1 3rd, IEC60601-1-2 4th Ed.)
- Suitable for BF application (Output-FG : 1MOPP, Input-Output : 2MOPP)
- OVC III (according to EN62477-1)
- Complies with SEMI F47 (Refer to Instruction Manual)
- With AUX1 (12V 1A), AUX2 (5V 1A) (Optional)

Block diagram



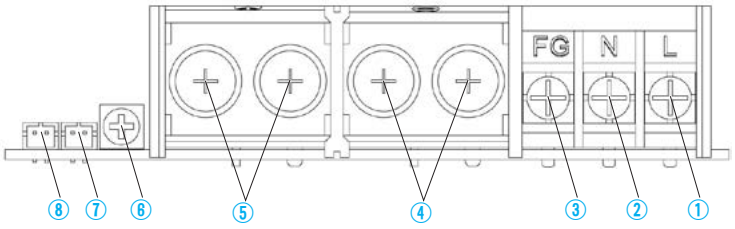
External view



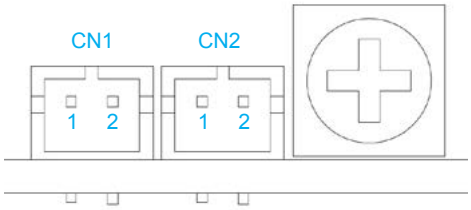


✻ Dimensions in mm [inch]
✻ Tolerance : ±1
✻ Weight : 1.0kg max (with Cover : 1.1kg max)
✻ PCB Material/thickness : FR-4/1.6mm
✻ Chassis Material : Aluminum
✻ Mounting torque : 1.2N・m max
✻ Input and output terminal screw tightening torque
M4 1.6N・m max
M5 2.5N・m max
✻ Please connect safety ground to mounting hole on the unit.

Terminal Blocks



① AC (L) (M4)
② AC (N) (M4)
③ Frame ground (M4)
④ − Output (M5)
⑤ + Output (M5)
⑥ Output voltage adjustable potentiometer
⑦ CN2 connector
⑧ CN1 connector



Pin Configuration and Functions of CN1, CN2

Pin No.	Function	
1	VB	Voltage Balance
2	CB	Current Balance

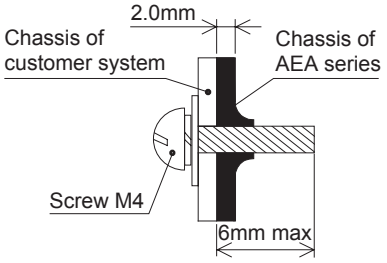
Matching connectors and terminals

Connector	Housing	Terminal	Mfr
CN1 CN2	S2B-PH-K-S	PHR-2	Real : SPH-002T-P0.5S Loose : BPH-002T-P0.5S	J.S.T.

Assembling and Installation Method

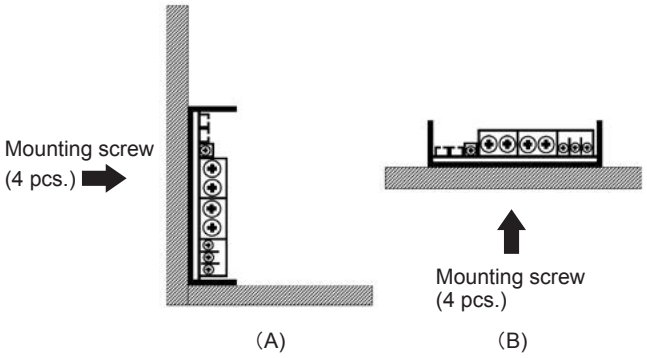
Installation method

■The screw should be inserted up to 6mm max from outside of the power supply to keep a distance between inside parts and an isolation.

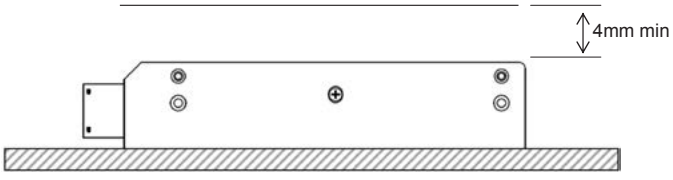


■When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in “derating”.

■Fix firmly, considering weight, though it can be used by the installation method shown in right figure.

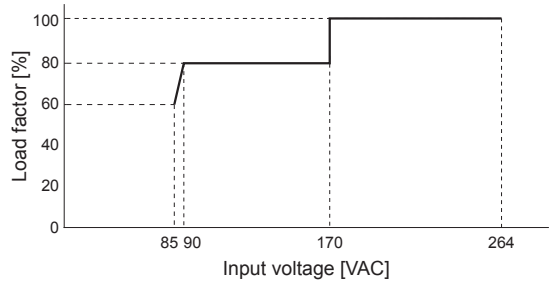


■If mounting on a metal chassis, keep at least 4 mm between the top of the power supply and the chassis for insulation between the components and the chassis.
If the distance between the top of the power supply and the chassis is less than 4mm, insert an insulating sheet with reinforced insulation between the power supply unit and metal chassis.
The following distance is not satisfactory for cooling condition. Please refer to “Derating” for cooling method.



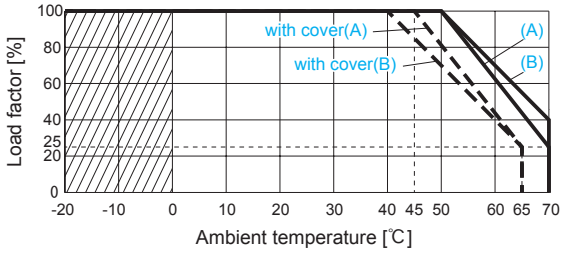
Derating

● AEA600F Derating curve depends on Input voltage



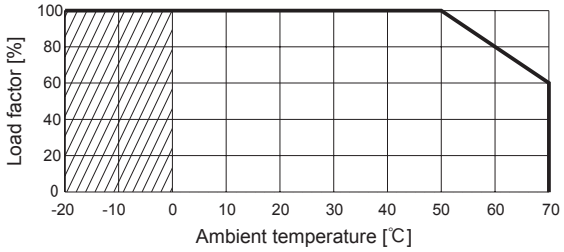
● AEA600F Ambient temperature Derating Curve (convection cooling)

100% Load factor in each derating curve means the rated current (convection cooling) in Specifications.
In the hatched area, the specification of Ripple and Ripple Noise are different from other area.



● AEA600F Ambient temperature Derating Curve (forced air cooling)

100% Load factor in each derating curve means the rated current (forced air cooling) in Specifications.
In the hatched area, the specification of Ripple and Ripple Noise are different from other area.



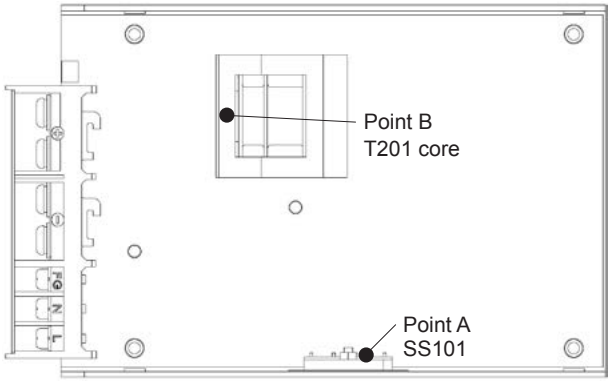
■Forced air cooling

① Please satisfy the below temperature at Point A and Point B under the forced air cooling. The Point A/B position is shown in the next figure.

・ Point A 90℃ or less and Point B 80℃ or less at Ta = 50℃

・ Point A 110℃ or less and Point B 100℃ or less at Ta = 70℃

② The forced air should be given to whole of the product.



Instruction Manual

◆ It is neccessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual https://www.cosel.co.jp/redirect/catalog/en/AEA/
Before using our product https://en.cosel.co.jp/technical/caution/index.html

AEA NOTICE

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A] ∗1	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
					Material	Single sided	Double sided	Series operation	Parallel operation
AEA600F	Active filter	65	5.7 (Peak 11.1)	Relay	FR-4	-	Yes	Yes	Yes
	LLC resonant converters	70 - 200							

∗1 The value of input current is at ACIN 100V and rated load (peak).