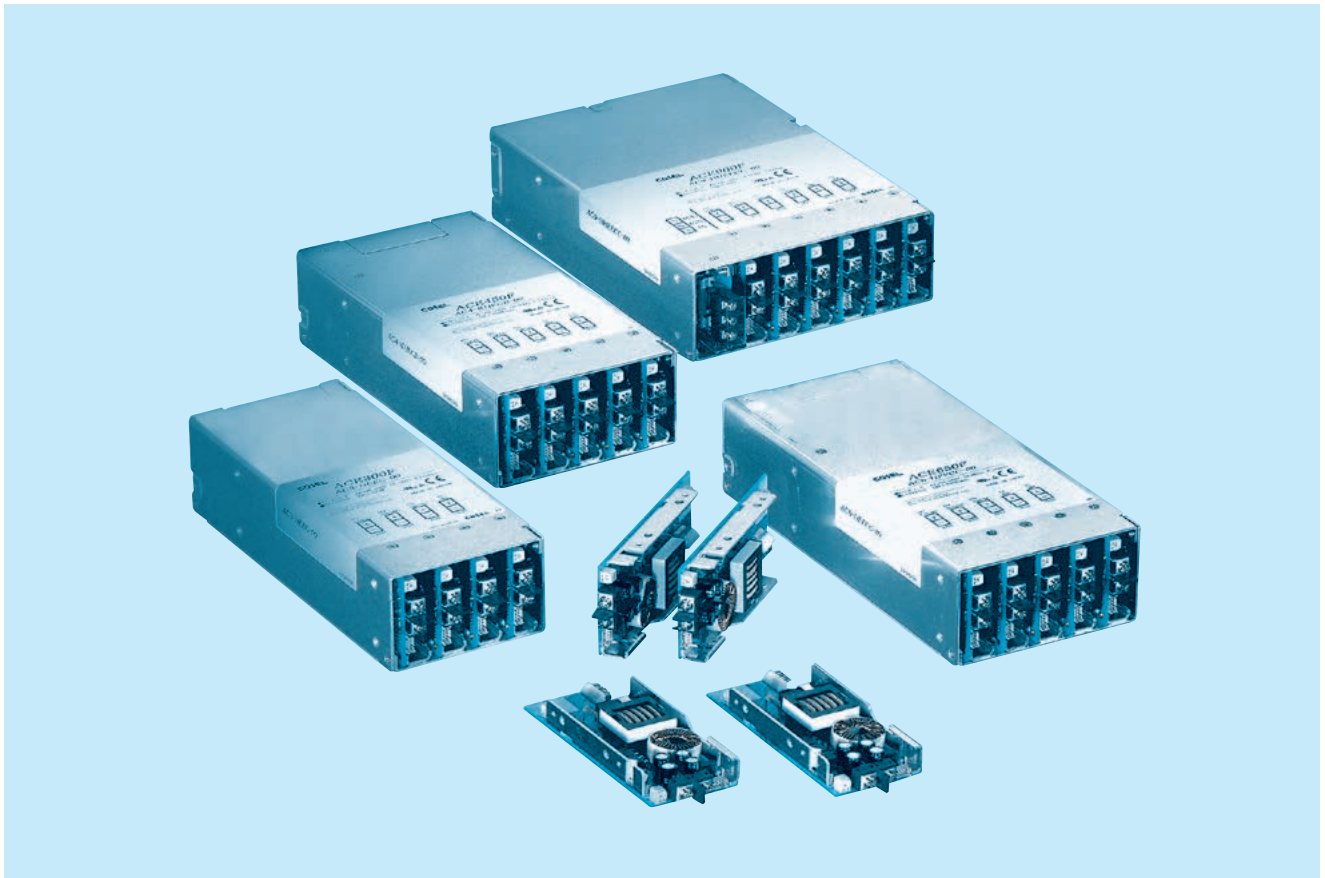


ACE-series



Feature

Flexible modular system architecture provides various output configuration
 Harmonic attenuator (Complies with IEC61000-3-2)
 Universal input (AC85 - 264V)
 Remote ON/OFF control, alarm

Safety agency approvals

UL60950-1, C-UL (CSA60950-1), EN62368-1
 Complies with DEN-AN
 UL60601-1, C-UL (CSA601.1), EN60601-1 approvals (optional)

EMI

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

3-year warranty

CE marking

Low Voltage Directive
 RoHS Directive

UKCA marking

Electrical Equipment Safety Regulations
 RoHS Regulations

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

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

IEC60601-1-2 (2014), EN60601-1-2 (2015) (optional)

ACE series

AC - - -

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

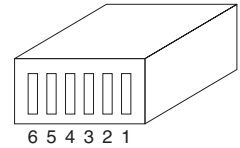


Example recommended EMI/EMC filter
 ACE300F NAC-06-472
 ACE450F NAC-10-472
 ACE650F NAC-20-472
 ACE900F NAC-20-472



High voltage pulse noise type : NAP series
 Low leakage current type : NAM series
 * A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

- ① Abbreviation type name of ACE series
- ② Abbreviation power of ACE series
 3 : ACE300F
 4 : ACE450F
 6 : ACE650F
 9 : ACE900F
- ③ Slot 6 Output module
- ④ Slot 5 Output module
- ⑤ Slot 4 Output module
- ⑥ Slot 3 Output module
- ⑦ Slot 2 Output module
- ⑧ Slot 1 Output module
- ⑨ Parallel code
- ⑩ Option (series code) *8
 Refer to instruction manual 6.1
 Safety : UL60601-1, EN60601-1
 Refer to instruction manual 8. for details.



Slot

* The number of slot is different depending on the model.

* Empty slot is code:O

* 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.

SPECIFICATIONS

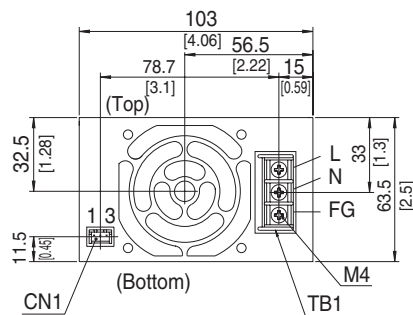
	MODEL	ACE300F	ACE450F	ACE650F	ACE900F
INPUT	VOLTAGE[V]	AC85 - 264 1 φ / DC120 - 350 (option=-U AC70 or DC100 - refer to instruction manual 6)			
	FREQUENCY[Hz]	47 - 63			
	CURRENT[A]	AC100V *1 3.7typ	5.7typ	8.0typ	11typ
		AC200V *1 2.0typ	3.1typ	4.2typ	5.7typ
	POWER FACTOR	AC100V *1 0.99typ			
		AC200V *1 0.95typ			
	INRUSH CURRENT [A]	AC100V *2 15 / 30typ *7			15 / 50typ *7
		AC200V *2 30 / 30typ *7			30 / 50typ *7
	EFFICIENCY[%]	AC100V *1 74typ	75typ	77typ	77typ
		AC200V *1 78typ	78typ	80typ	80typ
OUTPUT	LEAKAGE CURRENT[mA]	AC100V *3 0.5max			
		AC230V *3 0.95max			
	NUMBER OF SLOT	4	5	5	6
	TOTAL OUTPUT[W]	AC90 - 150V *4 250	400	600	800 (Peak 1k)
		AC170 - 264V *4 300	450	650	900 (Peak 1k)
	START-UP TIME[ms]	500max (ACIN100V, Io=100%)			
	HOLD-UP TIME[ms] *1	20typ (ACIN100V, Io=100%)			
	AUXILIARY POWER (AUX)	12V 0.1A (Only for Remote ON/OFF) (option=-J 5V0.1A)			
	ALARM (PR)	FAN alarm, LINE alarm			
ISOLATION	INPUT-OUTPUT, RC, AUX	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, AUX(PR)-FG *5	AC500V 1minute, Cutoff current=100mA, DC500V 50MΩ min (At Room Temperature)			
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE *4	-20 to +70°C, 20 - 90%RH (Non condensing) 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	19.6m/s ² (2G), 10 - 55Hz, 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), EN62368-1, Complies with DEN-AN (At only AC input) UL60601-1, EN60601-1 (At only AC input), Complies with IEC60601-1-2 4th Ed. (Refer to instruction manual 8)			
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR22-B and EN55022-B			
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 *9			
OTHERS	CASE SIZE *6	103X63.5X254mm (W×H×D) [4.06×2.5×10 inches]	127X63.5X254mm (W×H×D) [5×2.5×10 inches]	127X63.5X279mm (W×H×D) [5×2.5×10.98 inches]	177.5X63.5X254mm (W×H×D) [6.99×2.5×10 inches]
	WEIGHT[kg]	1.7max	2.2max	2.4max	3.0max
	COOLING METHOD	Forced cooling (built-in)			

*1 In case of modular power supply, the value changes by composing and load factor of installed output modules. The values in specifications mean each the model are composed of voluntary modules that are 5V (code : C), 12V (code : E), 24V (code : H) and the output power is total

output wattage under the prescribed conditions.
 *2 More than 3sec. to restart. Io=100%
 *3 Complies with IEC62368-1 and DEN-AN 60Hz and 100% load.
 *4 Refer to "Derating" in detail.
 *5 Each output module, RC and AUX are isolated.

*6 Case size contains neither the terminal blocks, screw nor.
 *7 Primary inrush current / Secondary inrush current.
 *8 Please contact us about safety approvals for the model with option.
 *9 Please contact us about class C.
 * A sound may occur from power supply at pulse loading.

ACE300F external view



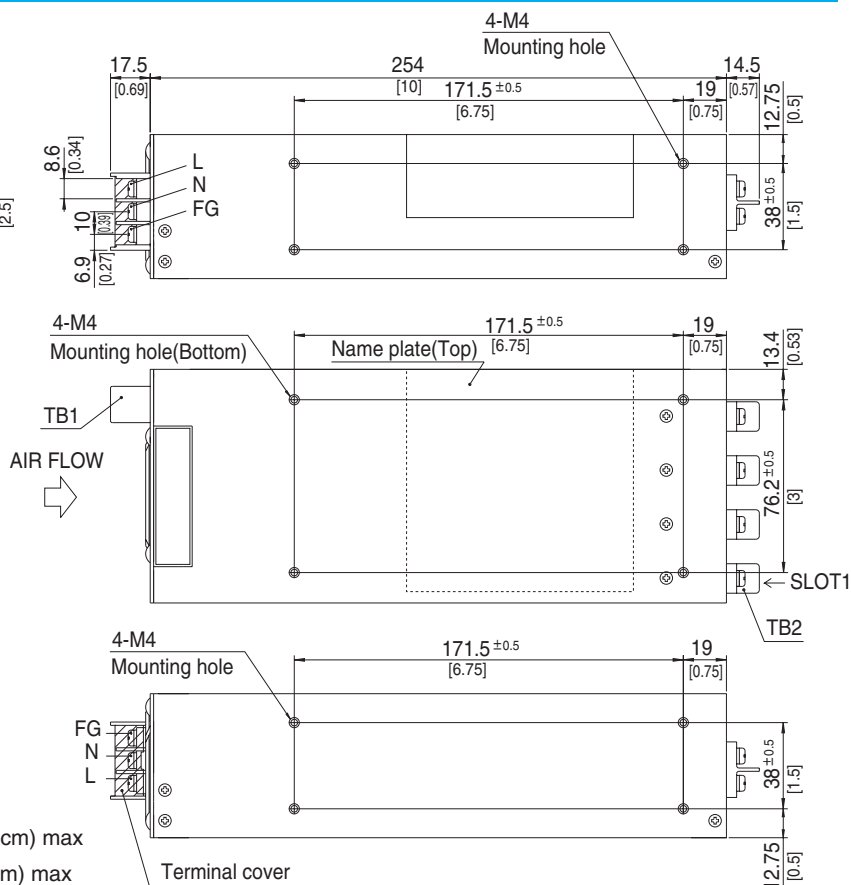
Pin connection and function of CN1

Pin No.	Function
1	G : Auxiliary power ground
2	PR : PR alarm
3	AUX : Auxiliary power (only remote ON/OFF)

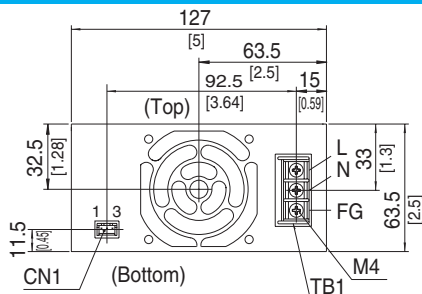
Mating connector and terminal of CN1

Connector	Mating connector	Terminal	Mfr.
CN1	S3B-XH-A	XHP-3	J.S.T.
		Reel : SXH-001T-P0.6	
		Bulk : BXH-001T-P0.6	

- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 1.7kg max
- ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis material : Aluminium
- ※ Dimensions in mm, []=inches
- ※ Mounting torque : $1.2\text{N} \cdot \text{m}$ (12.8kgf $\cdot$ cm) max
- ※ Screw tightening torque M4 : $1.6\text{N} \cdot \text{m}$ (16.9kgf $\cdot$ cm) max
- ※ M3 : $0.8\text{N} \cdot \text{m}$ (8.5kgf $\cdot$ cm) max



ACE450F external view



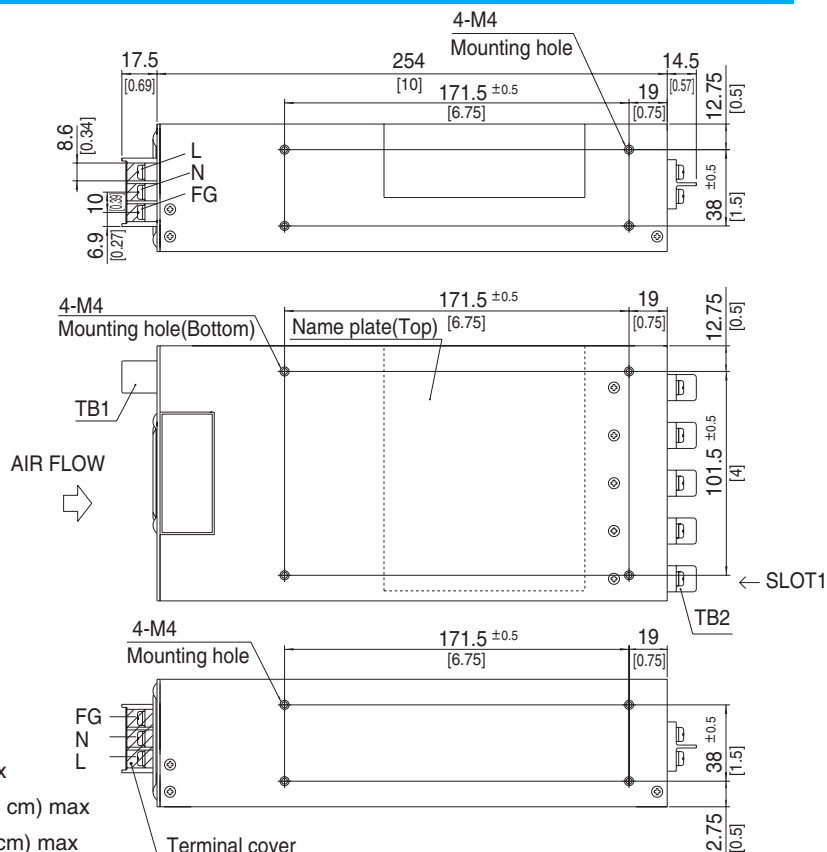
Pin connection and function of CN1

Pin No.	Function
1	G : Auxiliary power ground
2	PR : PR alarm
3	AUX : Auxiliary power (only remote ON/OFF)

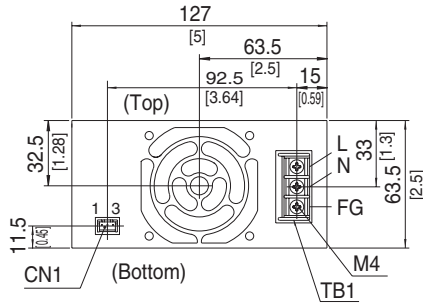
Mating connector and terminal of CN1

Connector	Mating connector	Terminal	Mfr.
CN1	S3B-XH-A	XHP-3	J.S.T.
		Reel : SXH-001T-P0.6	
		Bulk : BXH-001T-P0.6	

- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 2.2kg max
- ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis material : Aluminium
- ※ Dimensions in mm, []=inches
- ※ Mounting torque : $1.2\text{N} \cdot \text{m}$ (12.8kgf $\cdot$ cm) max
- ※ Screw tightening torque M4 : $1.6\text{N} \cdot \text{m}$ (16.9kgf $\cdot$ cm) max
- ※ M3 : $0.8\text{N} \cdot \text{m}$ (8.5kgf $\cdot$ cm) max



ACE650F external view



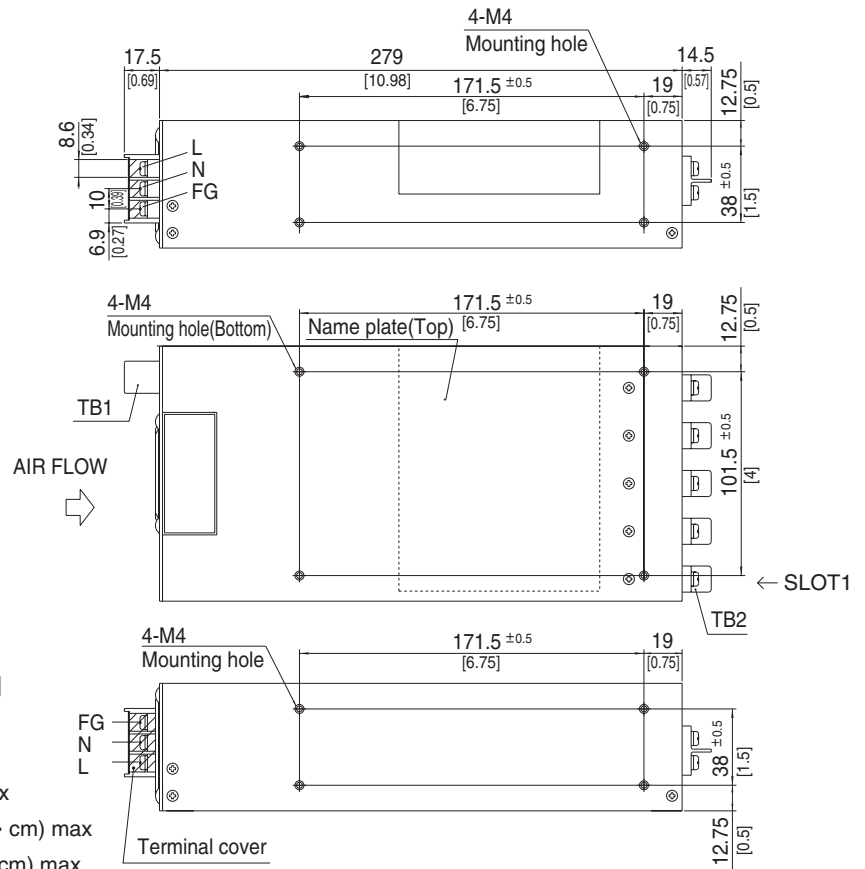
Pin connection and function of CN1

Pin No.	Function
1	G : Auxiliary power ground
2	PR : PR alarm
3	AUX : Auxiliary power (only remote ON/OFF)

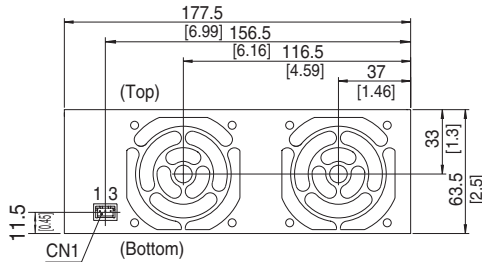
Mating connector and terminal of CN1

Connector	Mating connector	Terminal	Mfr.
CN1	S3B-XH-A	XHP-3	Reel : SXH-001T-P0.6 Bulk : BXH-001T-P0.6
			J.S.T.

- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 2.4kg max
- ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis material : Aluminium
- ※ Dimensions in mm, []=inches
- ※ 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



ACE900F external view



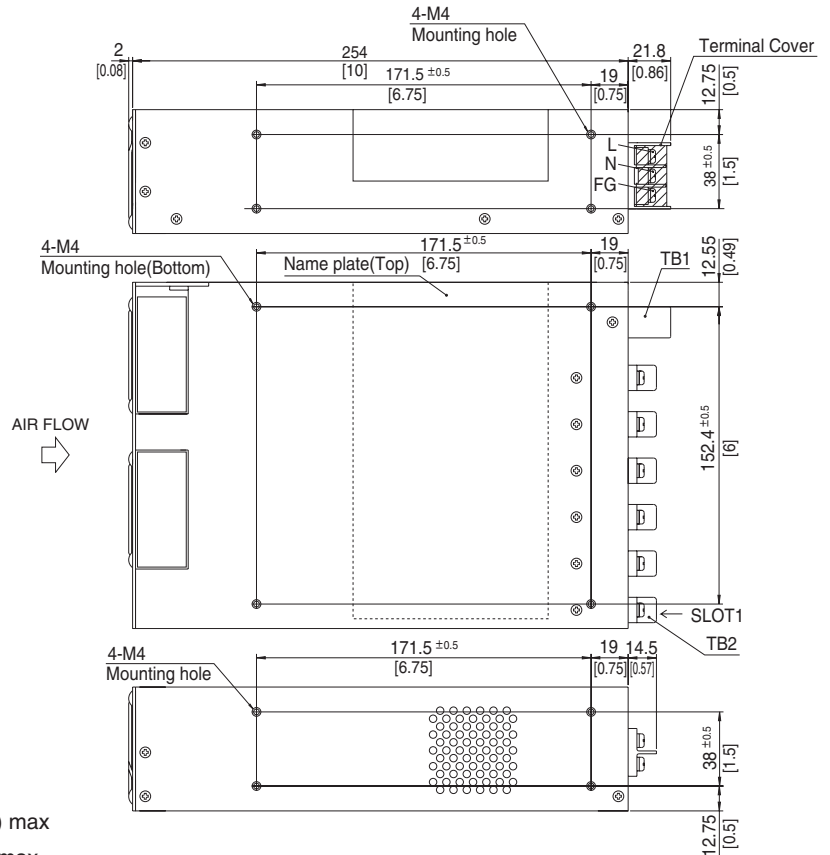
Pin connection and function of CN1

Pin No.	Function
1	G : Auxiliary power ground
2	PR : PR alarm
3	AUX : Auxiliary power (only remote ON/OFF)

Mating connector and terminal of CN1

Connector	Mating connector	Terminal	Mfr.
CN1	S3B-XH-A	XHP-3	Reel : SXH-001T-P0.6 Bulk : BXH-001T-P0.6
			J.S.T.

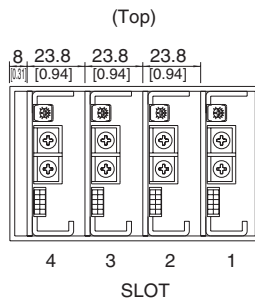
- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 3kg max
- ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis material : Aluminium
- ※ Dimensions in mm, []=inches
- ※ Mounting torque : 1.2N · m (12.8kgf · cm) max
- ※ Screw tightening torque M4 : 1.6N · m (16.9kgf · cm) max
- ※ M3 : 0.8N · m (8.5kgf · cm) max



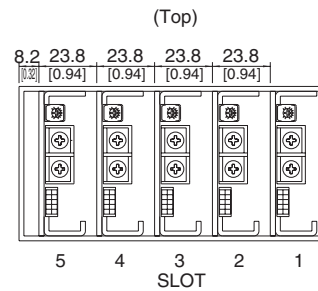
Output module and connector pin assign

1. Output side view

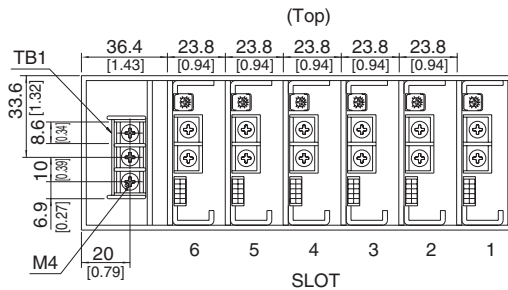
ACE300F Output side view



ACE450F/650F Output side view

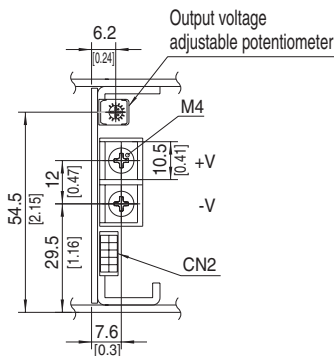


ACE900F Output side view

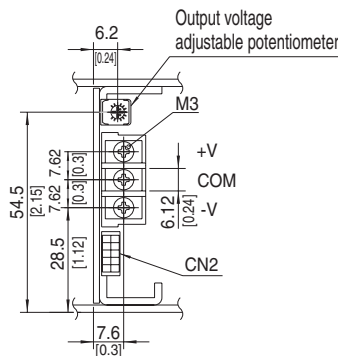


※Tolerance : ± 1 [± 0.04]
 ※Dimensions in mm, [] = inches

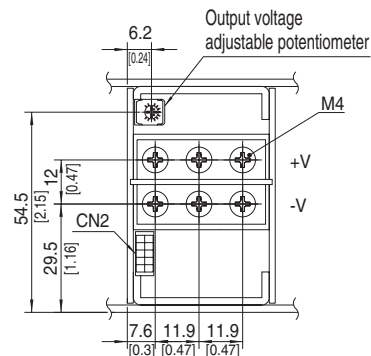
2. Output module side view and connector pin assign



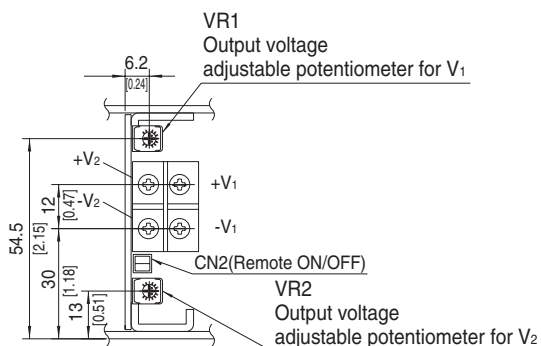
Module : A-K,L,M,N,P,R



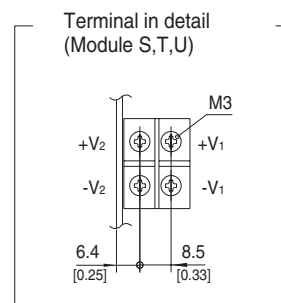
Module : Y,W,Z,9,Q,V



Module : 2A-2K



Module : S,T,U



※Tolerance : ± 1 [± 0.04]
 ※Dimensions in mm, [] = inches

Output module and connector pin assign

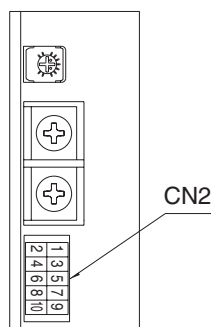
●CN2 connector pin assign except module S,T,U

Mating connector and terminal of CN2 in Output Module

Connector	Mating connector	Terminal	Mfr.
CN2	S10B-PHDSS	PHDR-10VS	J.S.T.
		Chain : SPHD-002T-P0.5 Loose : BPHD-001T-P0.5 BPHD-002T-P0.5 *1	

※ The housing for the remote sensing unused is mounted on CN2 of each output module (applying module : A - K, 2A - 2K).

*1 Please consult J.S.T for a non-standard crimping tool.



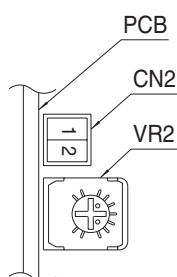
Pin connection and function of CN2 in Output Module

Pin No.	Function	
	Applying module : A - K, 2A - 2K	Applying module : L, M, N, P, R, Y, W, Z, 9, Q, V
1	RC+ : Remote ON/OFF +	RC+ : Remote ON/OFF +
2	RC- : Remote ON/OFF -	RC- : Remote ON/OFF -
3	N/C : N.C.	N/C : N.C.
4	N/C : N.C.	N/C : N.C.
5	LV+ : LV alarm	LV+ : LV alarm
6	LV- : LV alarm ground	LV- : LV alarm ground
7	+M : Self sensing terminal. (Do not wire for external connection.)	N/C : N.C.
8	+S : + Remote sensing	N/C : N.C.
9	-M : Self sensing terminal. (Do not wire for external connection.)	N/C : N.C.
10	-S : - Remote sensing	N/C : N.C.

●CN2 connector pin assign of module S,T,U

Mating connector and terminal of CN2 in Output Module

Connector	Mating connector	Terminal	Mfr.
CN2	S2B-PH-K-S	PHR-2	J.S.T.
		Chain:SPH-002T-P0.5S Loose:BPH-002T-P0.5S	



Pin connection and function of CN2 in Output Module

Pin No.	Function
1	Remote ON/OFF +
2	Remote ON/OFF -

Assembling and Installation Method

Installation method

■ Fans for forced air cooling are built in.

Ensure that the inlet (rear) and outlet (output terminal) vents are not blocked, to prevent disruption of the airflow.

*Option with reversed airflow (-F) is also available.

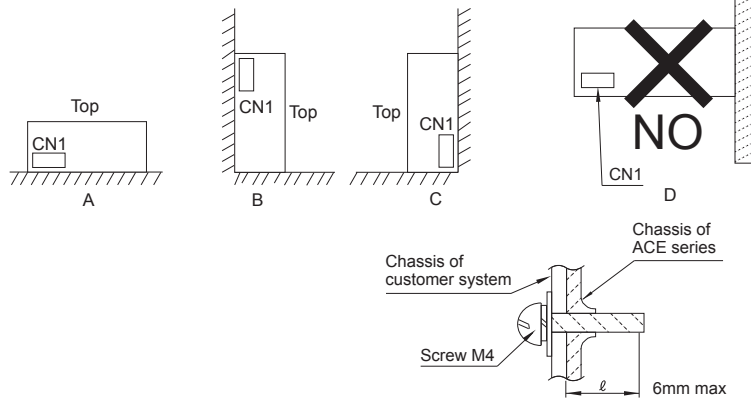
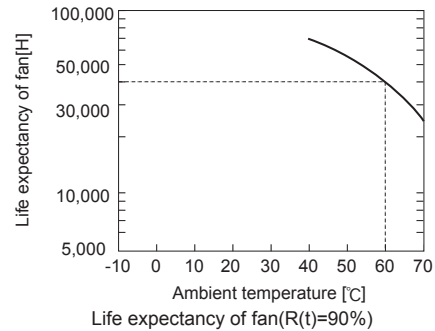
■ If the unit is used in a dusty environment, an air filter should be used so the cooling efficiency of the fan is not reduced.

■ If the fan stops, the thermal protection may be activated, shutting down the output. Life expectancy of the fan varies depending on usage conditions; therefore regular inspections of the fan are required for increased reliability. Should the fan become non-operational over the course of time, it can be replaced. Refer to the optional parts section of this catalog.

■ When mounting the power supply with screws, it is recommended that this be done as shown in right figure. If other methods are used, be sure the weight of the power supply is taken into account.

■ Avoid installation method 2 as shown in Fig. D, which can cause stress on the mounting holes.

■ Maximum length of mounting screws is 6mm (Refer to right figure.).



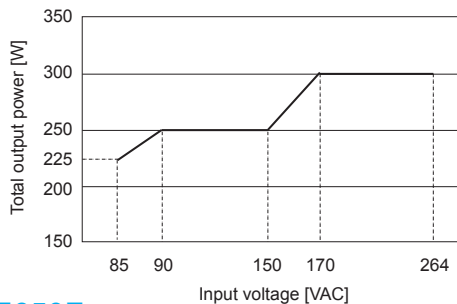
Derating

■ The ACE series comprises power supplies consisting of a combination of output modules. Make sure each output module is used within specifications, and that the total output power of all modules is equal to, or less than the rated total output power.

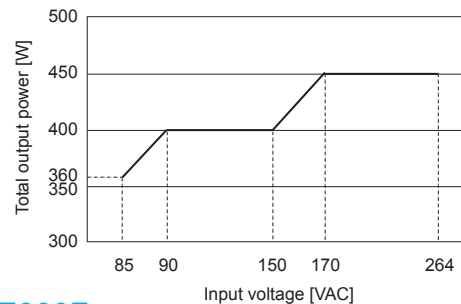
Refer to instruction manual 5 for Definition of load factor.

Derating curve for input voltage

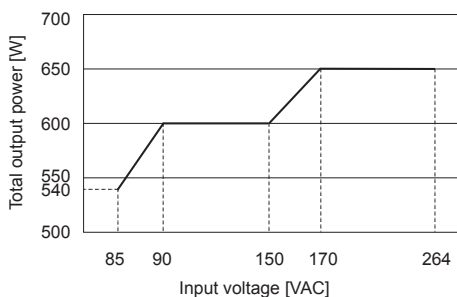
● ACE300F



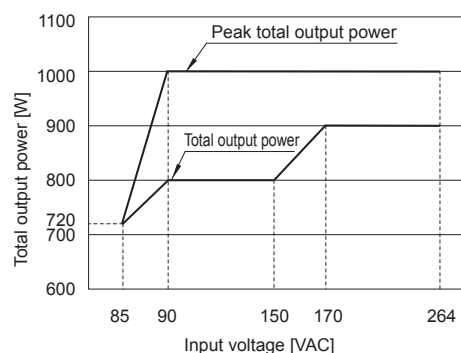
● ACE450F



● ACE650F



● ACE900F

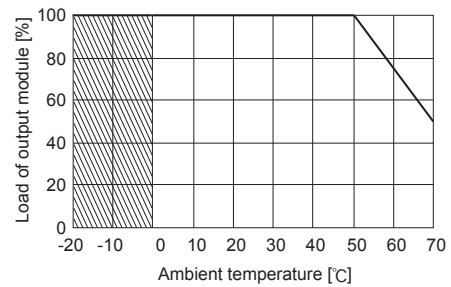


*Refer to instruction manual 4 for Peak total output power.

Derating

Ambient temperature derating

- The derating curve for the ambient temperature (inlet temperature for cooling) of output modules is shown in right figure.
- Operation within the hatched area will result in different ripple and ripple noise specifications.



Instruction Manual

- ◆ It is necessary 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/ACE/>
 Before using our product <https://en.cosel.co.jp/technical/caution/index.html>

ACE



NOTICE



Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
Input module of ACE300F	Active filter	80	3.7*1	250V 8A	SCR	FR-4		Yes	No	No
Input module of ACE450F	Active filter	80	5.7*2	250V 10A	SCR	FR-4		Yes	No	No
Input module of ACE650F	Active filter	80	8.0*3	250V 15A	SCR	FR-4		Yes	No	No
Input module of ACE900F	Active filter	80	11*4	250V 20A	SCR	FR-4		Yes	No	No
Output module A-K	Forward converter	120	—	—	—	FR-4		Yes	Yes*5	Yes*7
Output module 2A-2K	Forward converter	120	—	—	—	FR-4		Yes	Yes*5	Yes*7
Output module L,M,N,P,R	Forward converter	120	—	—	—	FR-4		Yes	Yes*5	No
Output module Y,W,Z,9,Q,V	Forward converter	120	—	—	—	FR-4		Yes	Yes*6	No
Output module S,T,U	Forward converter	120	—	—	—	FR-4		Yes	Yes*6	No

*1 Input current is based on Model AC3-HHEC-00 outputs 250W at AC100V.

*2 Input current is based on Model AC4-HHECC-00 outputs 400W at AC100V.

*3 Input current is based on Model AC6-HHECC-00 outputs 600W at AC100V.

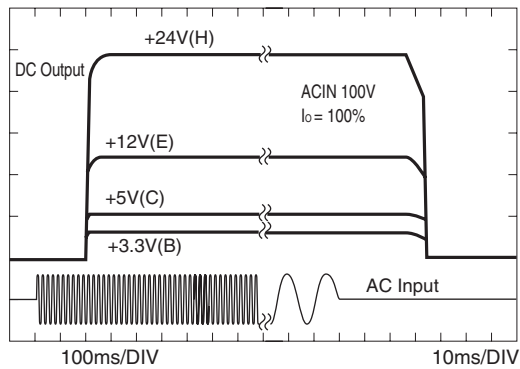
*4 Input current is based on Model AC9-HHECC-00 outputs 800W at AC100V.

*5 Series operation is possible with the same output modules.

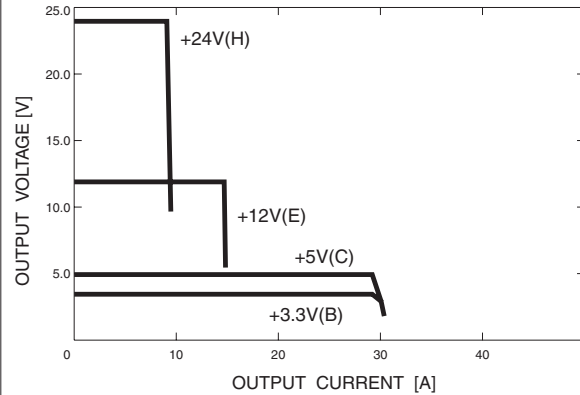
*6 Series operation is possible, but series bar cannot be set by the series code.

*7 Parallel operation is possible with the same output voltage module.

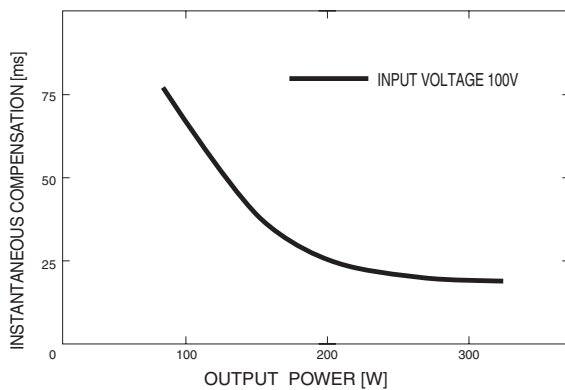
● **RISE TIME & FALL TIME**



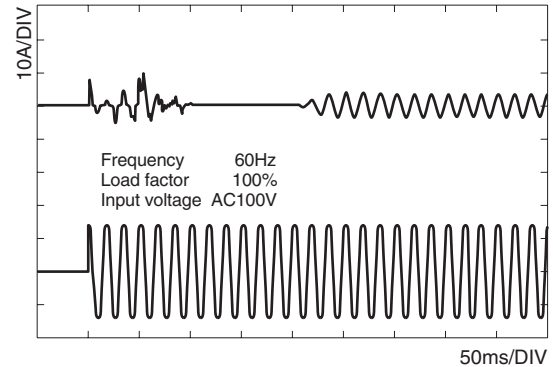
● **OVER CURRENT CHARACTERISTICS**



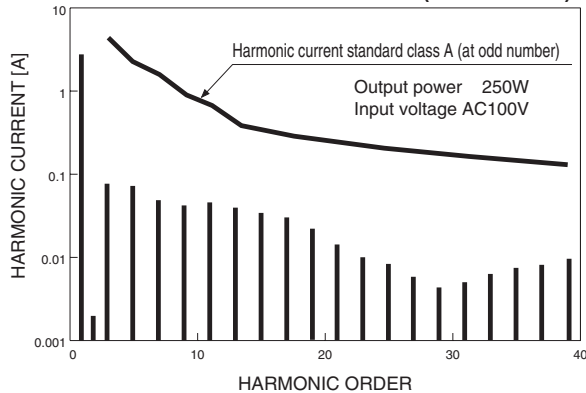
● **INSTANTANEOUS INTERRUPTION COMPENSATION (AC3-HEEC-00)**



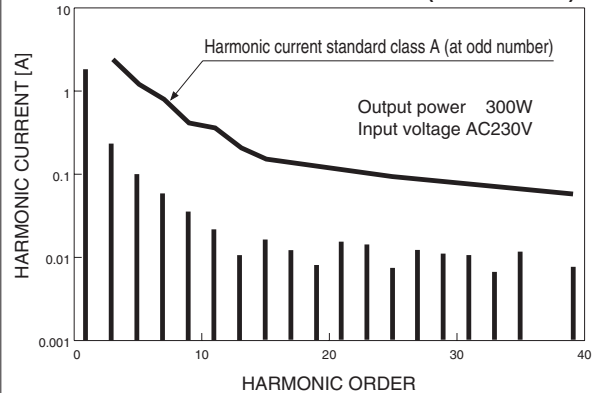
● **INRUSH CURRENT (AC3-HEEC-00)**



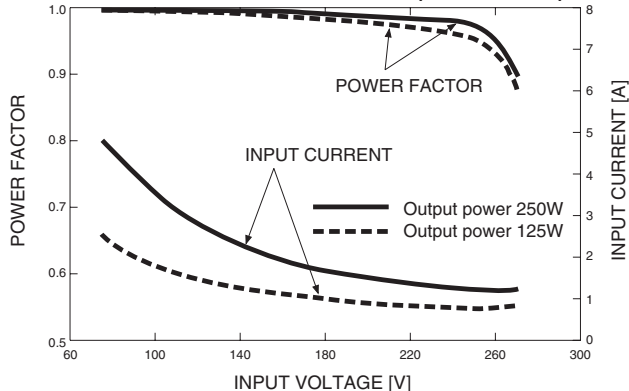
● **INPUT HARMONIC CURRENT AC100V (AC3-HEEC-00)**



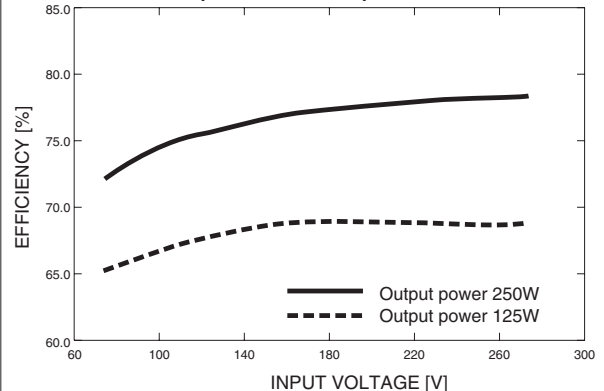
● **INPUT HARMONIC CURRENT AC230V (AC3-HEEC-00)**



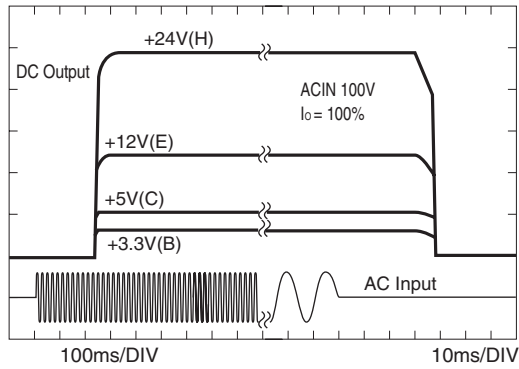
● **POWER FACTOR & INPUT CURRENT (AC3-HEEC-00)**



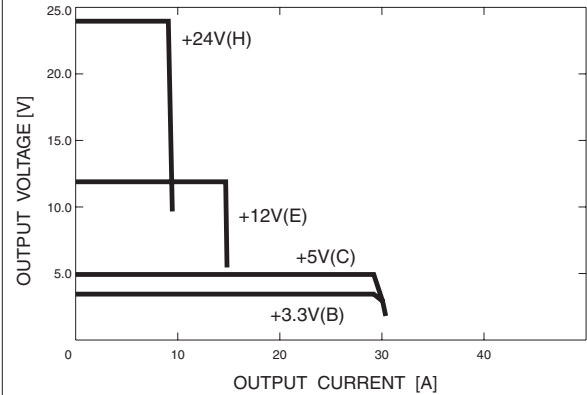
● **EFFICIENCY (AC3-HEEC-00)**



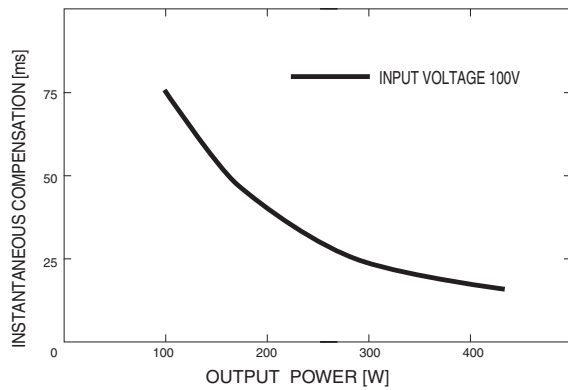
● **RISE TIME & FALL TIME**



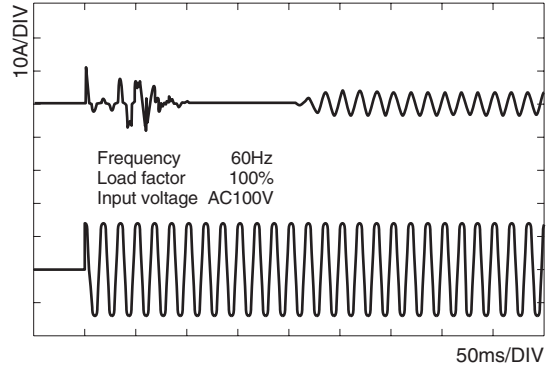
● **OVER CURRENT CHARACTERISTICS**



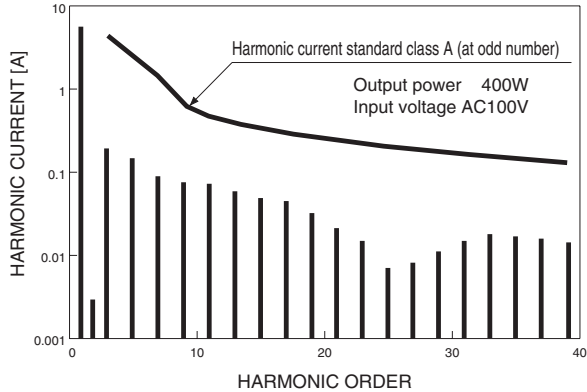
● **INSTANTANEOUS INTERRUPTION COMPENSATION (AC4-HHECC-00)**



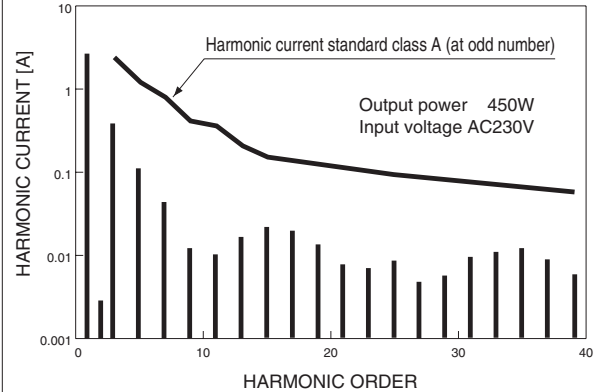
● **INRUSH CURRENT (AC4-HHECC-00)**



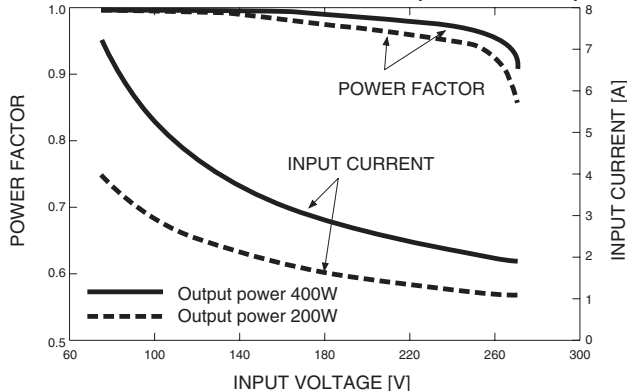
● **INPUT HARMONIC CURRENT AC100V (AC4-HHECC-00)**



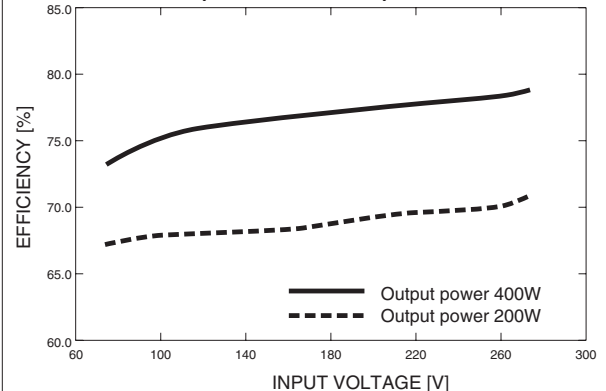
● **INPUT HARMONIC CURRENT AC230V (AC4-HHECC-00)**



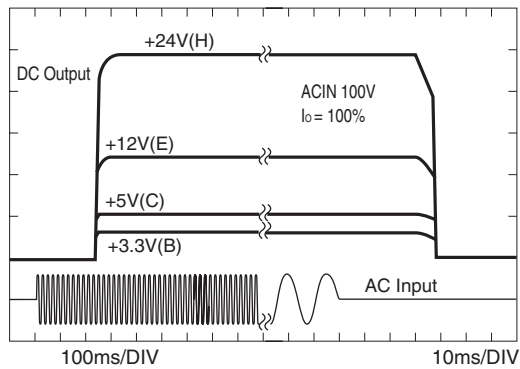
● **POWER FACTOR & INPUT CURRENT (AC4-HHECC-00)**



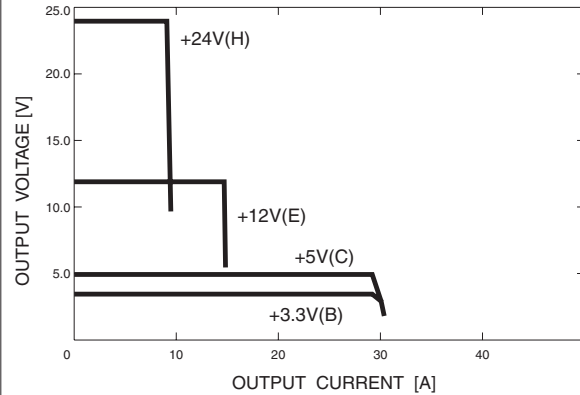
● **EFFICIENCY (AC4-HHECC-00)**



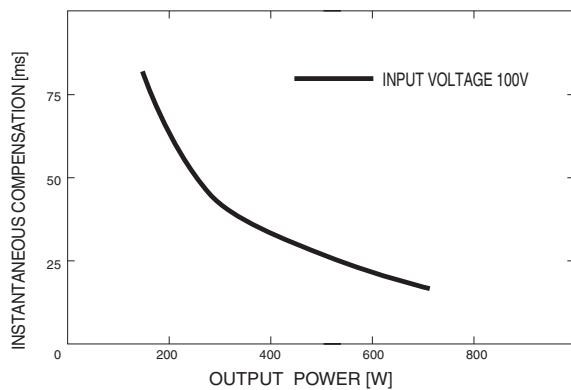
● **RISE TIME & FALL TIME**



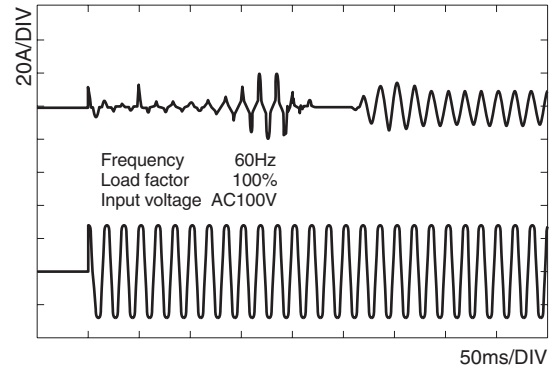
● **OVER CURRENT CHARACTERISTICS**



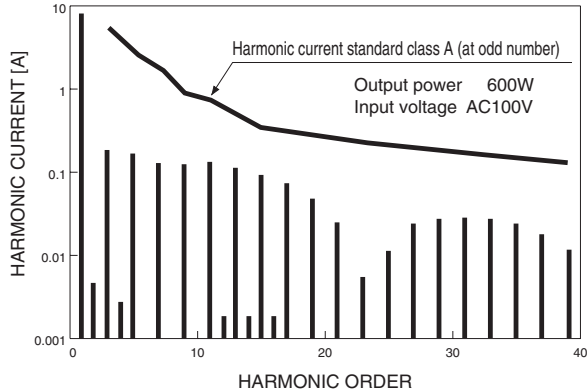
● **INSTANTANEOUS INTERRUPTION COMPENSATION (AC6-HHECC-00)**



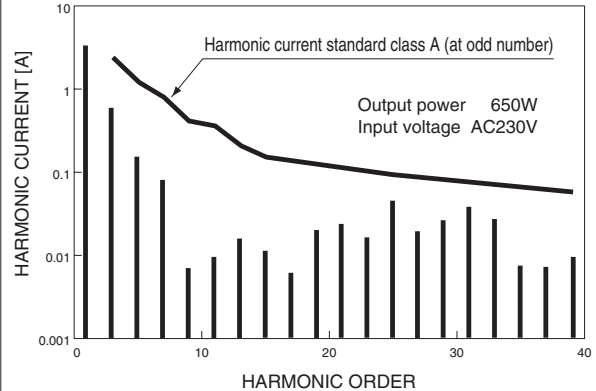
● **INRUSH CURRENT (AC6-HHECC-00)**



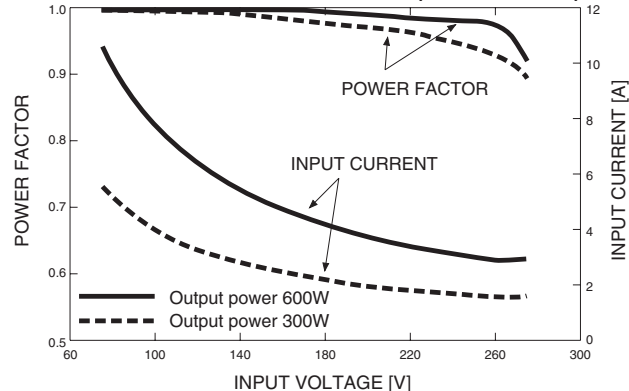
● **INPUT HARMONIC CURRENT AC100V (AC6-HHECC-00)**



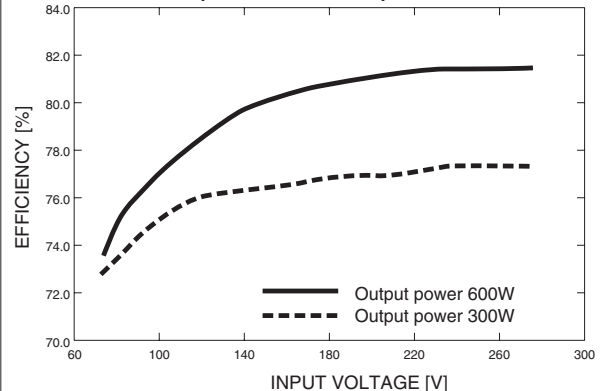
● **INPUT HARMONIC CURRENT AC230V (AC6-HHECC-00)**



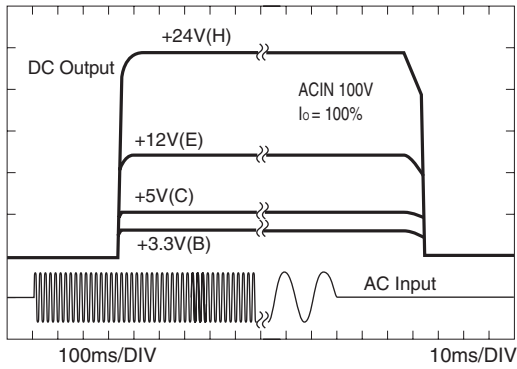
● **POWER FACTOR & INPUT CURRENT (AC6-HHECC-00)**



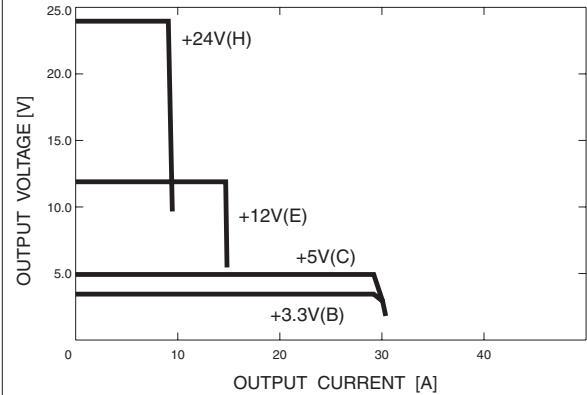
● **EFFICIENCY (AC6-HHECC-00)**



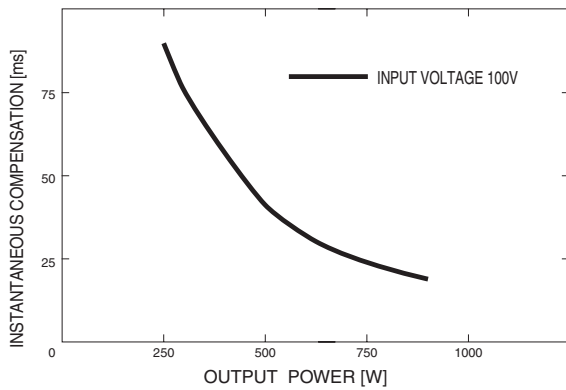
● RISE TIME & FALL TIME



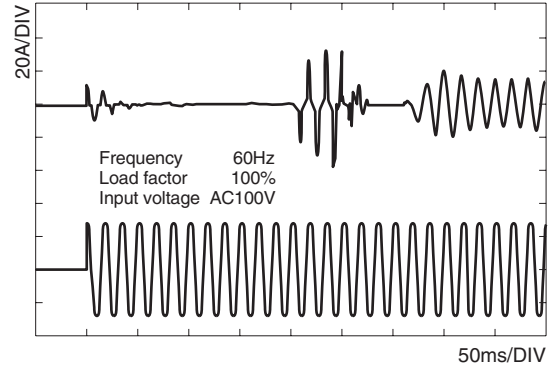
● OVER CURRENT CHARACTERISTICS



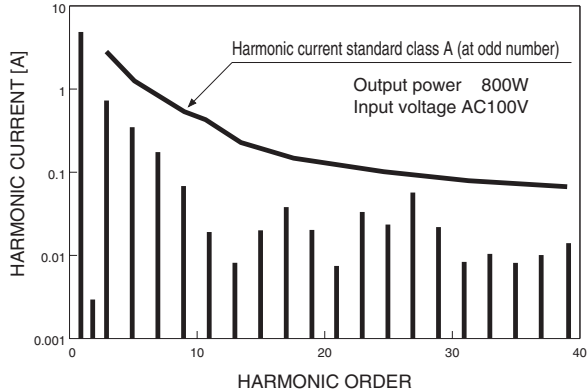
● INSTANTANEOUS INTERRUPTION COMPENSATION (AC9-HHECC-00)



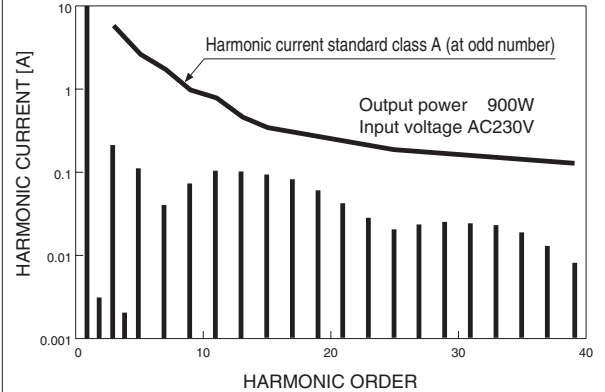
● INRUSH CURRENT (AC9-HHECC-00)



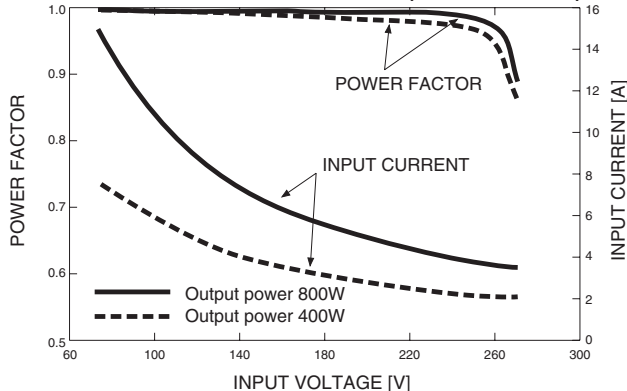
● INPUT HARMONIC CURRENT AC100V (AC9-HHECC-00)



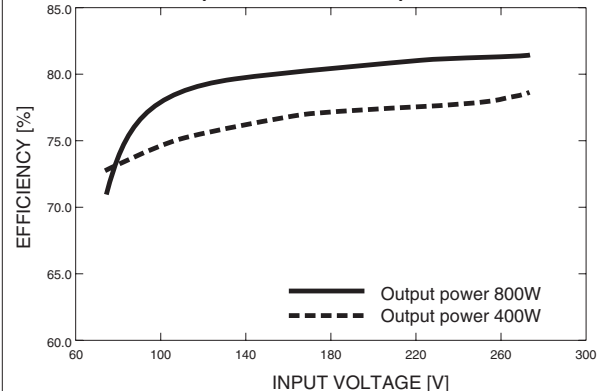
● INPUT HARMONIC CURRENT AC230V (AC9-HHECC-00)



● POWER FACTOR & INPUT CURRENT (AC9-HHECC-00)



● EFFICIENCY (AC9-HHECC-00)



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