

## CUS600M

## SPECIFICATIONS

CA878-01-01B

ITEMS		MODEL		CUS600M-12	CUS600M-19	CUS600M-24	CUS600M-28	CUS600M-32	CUS600M-36	CUS600M-48
1	Nominal Output Voltage	V		12	19	24	28	32	36	48
2	Maximum Output Current @ Convection cooling	A		33.4	21.1	16.7	14.3	12.5	11.1	8.4
2	Maximum Output Current @ Forced air cooling	(*12)	A	50.0	31.6	25.0	21.5	18.8	16.7	12.6
	Peak Output Current	(*15)	A	50.0	31.6	25.0	21.5	18.8	16.7	12.6
3	Maximum Output Power @ Convection cooling	W		400.8	400.9	400.8	400.4	400.0	399.6	403.2
3	Maximum Output Power @ Forced air cooling	(*12)	W	600.0	600.4	600.0	602.0	601.6	601.2	604.8
	Peak Output Power	(*15)	W	600.0	600.4	600.0	602.0	601.6	601.2	604.8
4	Standby Supply	(*16)	-				5V @ 2A(max)			
5	Efficiency @ Convection cooling (Typ.)	(*14)	%	93.9 / 95.5	93.9 / 95.5	94.5 / 96.0	94.5 / 96.0	94.5 / 96.0	94.5 / 96.0	94.5 / 96.0
	Efficiency @ Forced air cooling (Typ.)	(*14)	%	93.0 / 95.0	93.0 / 95.0	93.5 / 95.5	93.7 / 95.7	93.7 / 95.7	93.7 / 95.7	93.7 / 95.7
6	Input Voltage Range	(*2)	-				85 - 265 VAC (47-63Hz)			
7	Input Current @ Convection cooling (Typ.)	(*1)	A				4.0 / 2.0			
	Input Current @ Forced air cooling (Typ.)	(*1)	A				6.0 / 3.0			
8	In-rush Current (Typ.)	(*1)(*3)	-				25A / 50A at Cold Start			
9	PFHC	-					Built to meet IEC61000-3-2, Class A			
10	Power Factor (Typ.)	(*1)	-				0.99/0.95			
11	Output Voltage Range	(*1)(*4)	V				Fixed (Shipment condition: $\pm 2.5\%$ )			
12	Maximum Ripple & Noise @ Convection cooling	(*1)(*4)(*5)	mV	240	360	360	360	480	480	480
	Maximum Ripple & Noise @ Forced air cooling	(*1)(*4)(*5)	mV	240	360	360	360	480	480	480
13	Maximum Line Regulation	(*4)(*6)	mV	60	90	120	140	160	180	240
14	Maximum Load Regulation	(*4)(*7)	mV	120	180	240	280	320	360	480
15	Power Consumption @ Remote Off	(*13)	-				< 0.5W @ 230VAC			
16	Temperature Coefficient	(*4)	-				Less than 0.02% / °C			
17	Over Current Protection	(*8)	A	>52.5	>33.2	>26.3	>22.6	>19.7	>17.5	>13.2
18	Over Voltage Protection	(*9)	V	13.8 ~ 16.2	21.8 ~ 25.7	27.6 ~ 32.4	32.2 ~ 37.8	36.8 ~ 43.2	41.4 ~ 48.6	55.2 ~ 64.8
19	Hold-up time (Typ.)	(*1)	-				22ms @ 400W, 14ms @ 600W			
20	Leakage Current	(*10)	-				0.2mA max @ 265VAC, 60Hz			
21	Remote ON/OFF control	(*15)	-				Possible			
22	Power Good	(*15)	-				Possible			
23	Parallel Operation	-	-				-			
24	Series Operation	(*15)	-				Possible			
25	Operating Temperature	(*11)	-				-20°C - +70°C			
26	Operating Humidity	-	-				10 - 95%RH (No condensing)			
27	Storage Temperature	-	-				-40°C - +85°C			
28	Storage Humidity	-	-				10 - 95%RH (No condensing)			
29	Cooling	(*12)	-				Convection or Forced Air Cooling			
30	Withstand Voltage	-	-				Input-FG : 2kVAC (20mA) 1x MOPP Input-Output : 4kVAC (20mA) 2x MOPP Output-FG : 1.5kVAC (20mA) 1x MOPP			
31	Isolation Resistance	-	-				More than 100MΩ at 25°C, 70%RH, Output - FG : 500VDC			
32	Vibration	-	-				At no operating, 10-55Hz (Sweep for 1min.) Maximum 19.6m/s <sup>2</sup> X,Y,Z 1 hour each			
33	Shock	-	-				Less than 196m/s <sup>2</sup>			
34	Safety	-	-				Approved by IEC/EN62368-1, UL62368-1, CSA62368-1 Approved by IEC/EN60601-1, ES60601-1, CSA-C22.2 No.60601-1			
35	EMI	(*1)	-				Designed to meet EN55011-B, EN55032-B, FCC-Class B			
36	Immunity	(*17)	-				Designed to meet IEC60601-1-2; 2015 (Ed.4), IEC61000-4-2, -3, -4, -5, -6, -8, -11			
37	Weight (Typ.)	g					470			
38	Size (L x W x H)	mm					127 x 76.2 x 37 (Refer to Outline Drawing)			

\*Read instruction manual carefully, before using the power supply unit.

=NOTES=

\*1. At 115VAC/230VAC, Ta=25°C, Nominal output voltage and maximum output power.

\*2. For cases where conformance to various safety specs (UL, CSA, EN) are required, input voltage range will be 100 ~ 240VAC (50-60Hz).

Output derating required when Vin is less than 115VAC, refer to output derating curve for details.

\*3. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

\*4. Please refer to Fig. A for measurement of Vo, line and load regulation and ripple voltage.

\*5. Ripple &amp; noise are measured at 20MHz by using a 150mm twisted pair of load wires terminated with a 0.1uF and 100uF capacitor.

\*6. 85~265VAC, constant load.

\*7. No load - full load, constant input voltage.

\*8. Hiccup with automatic recovery, however power supply may be latched for protection when output is shorted and manual reset is required (Repower on).

Avoid to operate at over load or short circuit condition.

\*9. OVP circuit shut down the output, manual reset (Repower on) to resume output voltage.

\*10. Measured by the each measuring method of UL, CSA, and EN (at 60Hz), Ta=25°C.

\*11. Refer to output derating curve for details of output derating versus

input voltage, ambient temperature and mounting method.

- Load (%) is percent of maximum output power or maximum output current.

- Do not exceed its derating of Maximum Load for both Main Output Channel and Standby Supply.

\*12. Forced air cooling with air velocity more than 2.7m/s, measured at component side, The entire components must be cooled.

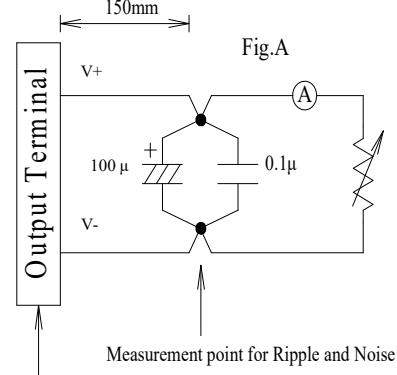
\*13. The power consumption refers to input power during Remote off and Standby Supply is at no load condition.

\*14. At 115VAC/230VAC, Ta=25°C, Nominal output voltage and maximum output power, and Standby Supply at no load.

\*15. Refer to Instruction Manual for details.

\*16. Please refer to various output derating curves for Standby Supply.

\*17. Refer to Immunity Test Data for details.



## OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

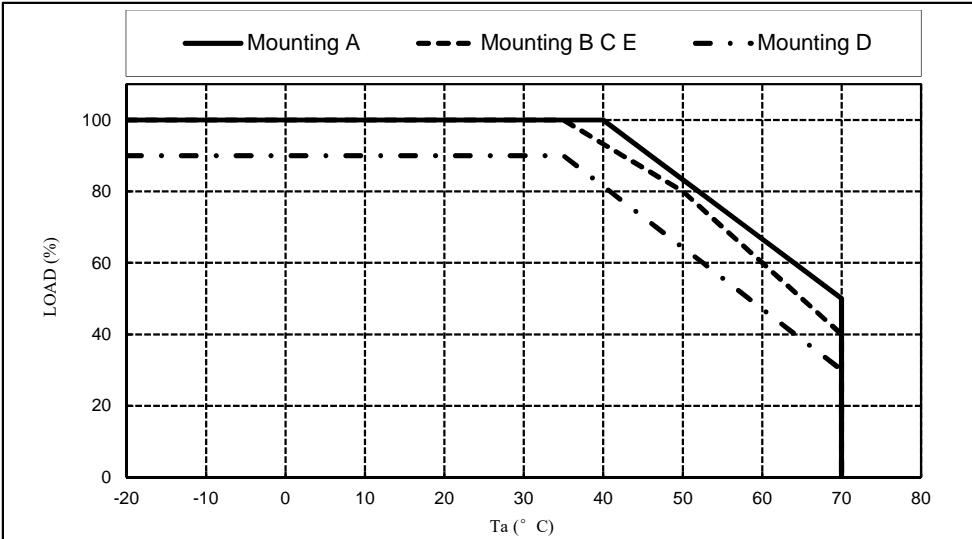
## 1. CONVECTION COOLING @ UNIVERSAL INPUT (85-265Vac)

**CONDITION A:** Output Derating Curve for Main Output Channel only, Standby Supply must be Zero Load.

Output derating versus input voltage should be considered. Please refer to the output derating versus input voltage curve for detail.

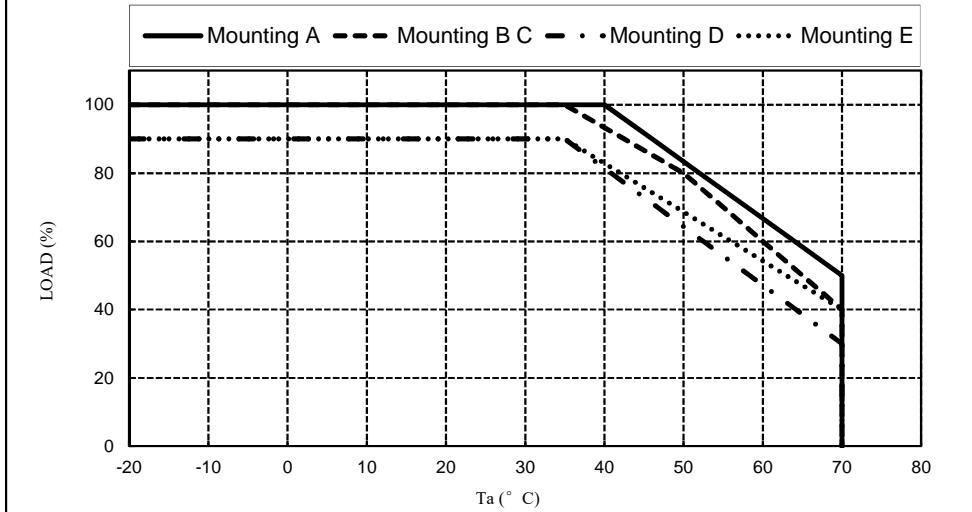
MODEL: CUS600M-19/24/28/32/36/48

Ta (°C)	Mounting A	Mounting B C E	Mounting D
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	90
40	100	93.3	81.4
50	83.3	80	64.3
60	66.7	60	47.1
70	50	40	30



MODEL: CUS600M-12

Ta (°C)	Mounting A	Mounting B C	Mounting D	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	90	90
40	100	93.3	81.4	82.9
50	83.3	80	64.3	68.6
60	66.7	60	47.1	54.3
70	50	40	30	40



## OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

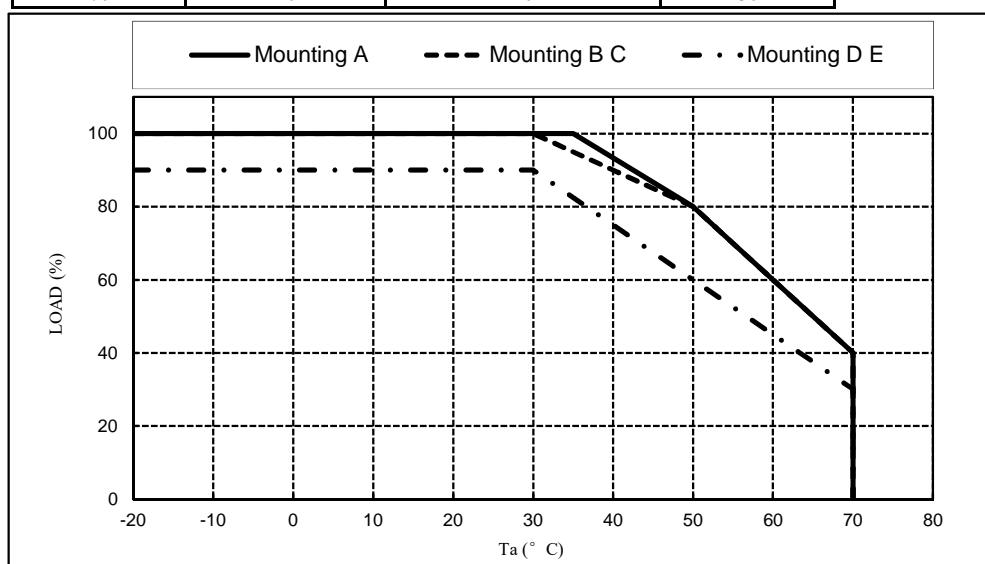
## 1. CONVECTION COOLING @ UNIVERSAL INPUT (85-265Vac)

**CONDITION B:** Output Derating Curve for both Main Output Channel and Standby Supply.

Output derating versus input voltage should be considered. Please refer to the output derating versus input voltage curve for detail.

MODEL: CUS600M-12/19/24/28/32/36/48

Ta (°C)	Mounting A	Mounting B C	Mounting D E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	90
35	100	95	82.5
40	93.3	90	75
50	80	80	60
60	60	60	45
70	40	40	30



## OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

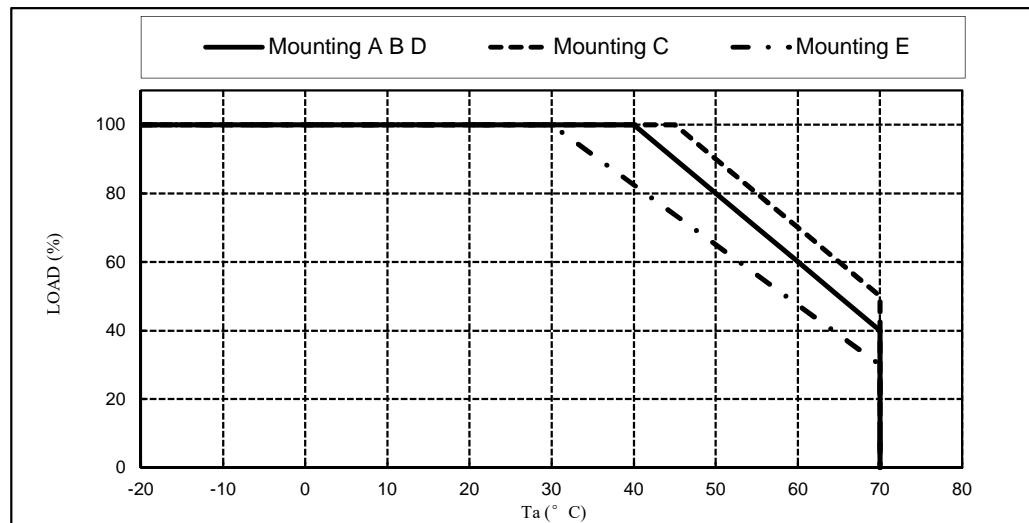
## 2. CONVECTION COOLING @ HIGH LINE INPUT (176-265Vac)

**CONDITION :** Output Derating Curve for both Main Output Channel and Standby Supply.

Strictly for 176 - 265V AC Input Voltage Range only.

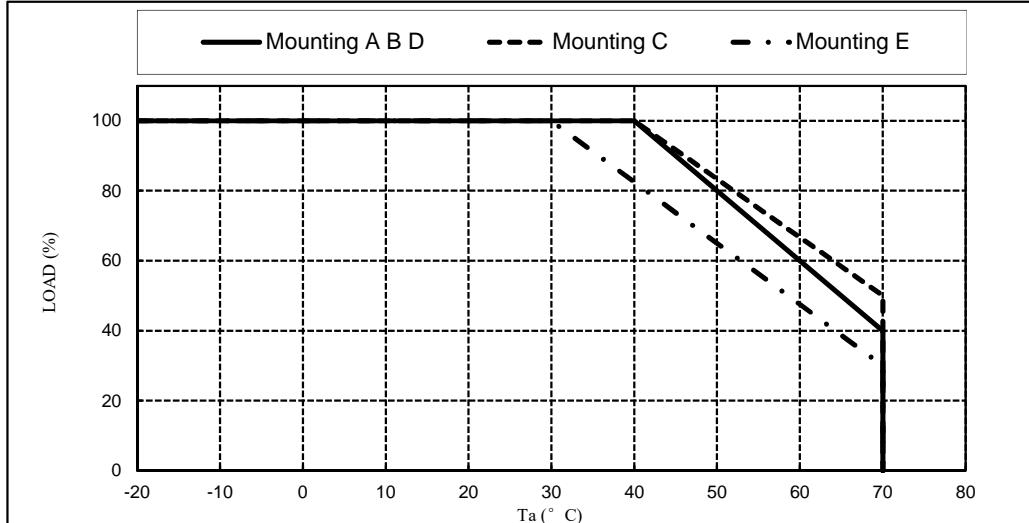
MODEL: CUS600M-19/24/28/32/36/48

Ta (°C)	Mounting A B D	Mounting C	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	100
40	100	100	82.5
45	90	100	73.8
50	80	90	65
60	60	70	47.5
70	40	50	30



MODEL: CUS600M-12

Ta (°C)	Mounting A B D	Mounting C	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	100
40	100	100	82.5
50	80	83.3	65
60	60	66.7	47.5
70	40	50	30



## OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

## 3. FORCED AIR COOLING @ UNIVERSAL INPUT (85-265Vac)

**CONDITION:** Output Derating Curve for Main Output Channel only.

Standby supply could be operated at rated load for entire ambient temperature range @ Forced Air Cooling.

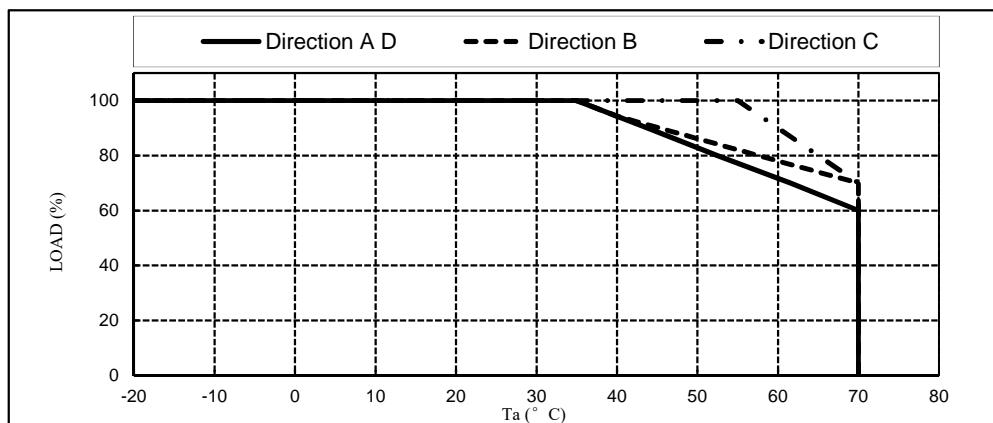
Forced air cooling with air velocity more than 2.7m/s, measured at component side, The entire components must be cooled.

Both Standby Supply and Main Output Channel derating versus input voltage should be considered.

Please refer to the output derating versus input voltage curve for detail.

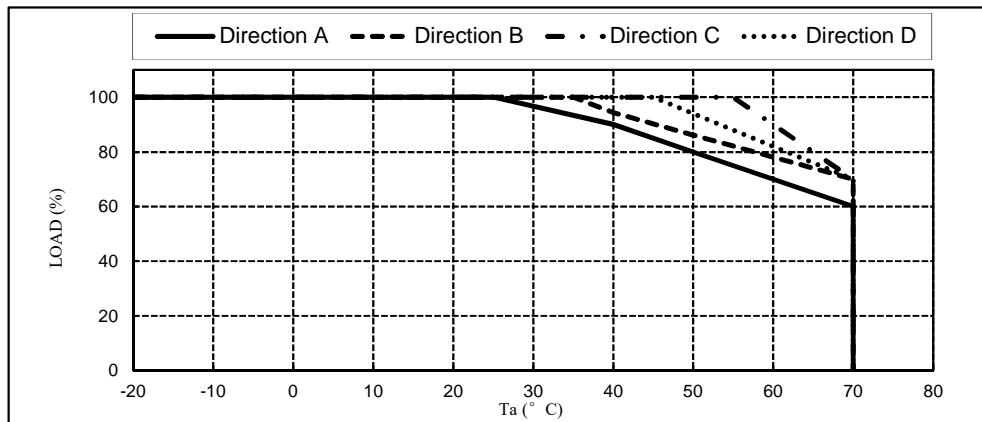
MODEL: CUS600M-19/24/28/32/36/48

Ta (°C)	Direction A D	Direction B	Direction C
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	100
40	94.3	94.3	100
50	82.8	86.2	100
55	77.1	82.1	100
60	71.4	78	90
70	60	70	70



MODEL: CUS600M-12

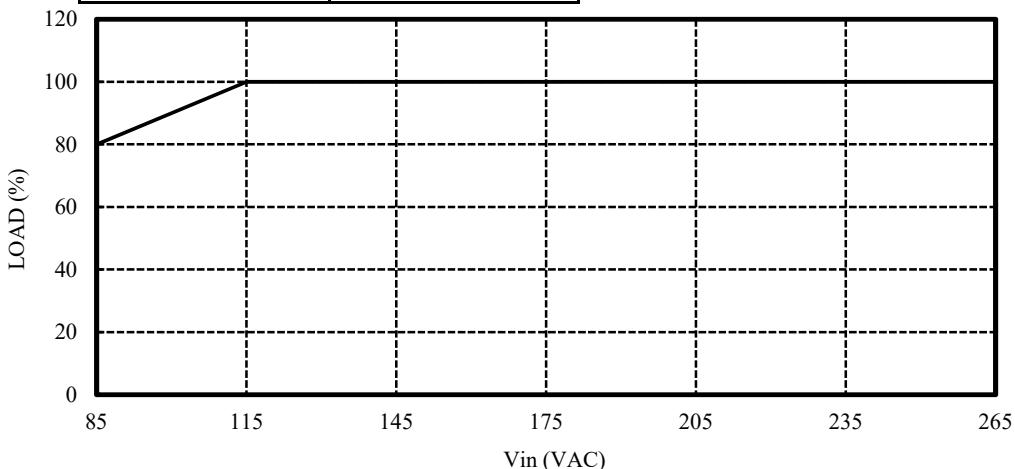
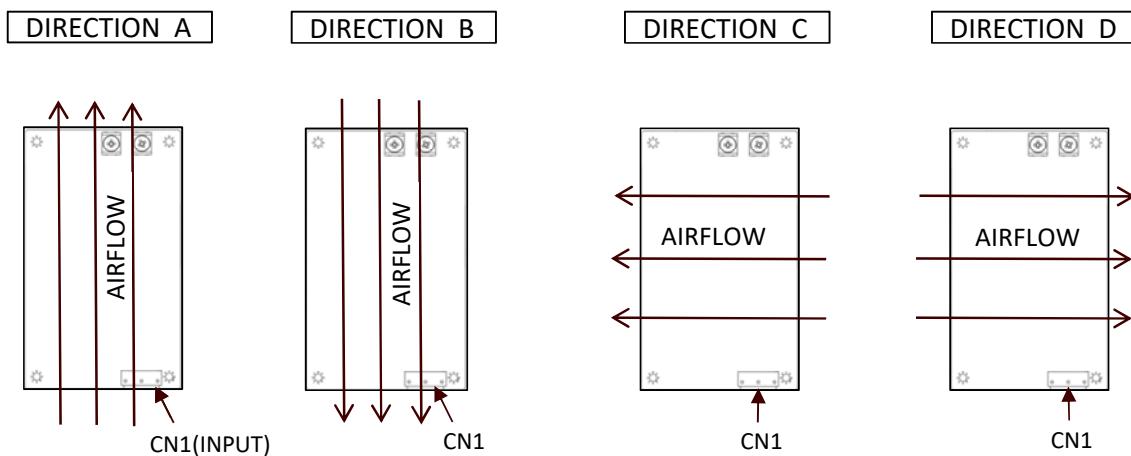
Ta (°C)	Direction A	Direction B	Direction C	Direction D
	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +25	100	100	100	100
35	93.3	100	100	100
40	90	94.3	100	100
45	85	90.2	100	100
50	80	86.2	100	94
55	75	82.1	100	88
60	70	78	90	82
70	60	70	70	70



**OUTPUT DERATING VERSUS INPUT VOLTAGE**

**CONDITION:** Output Derating versus Input Voltage Must be Considered as per following curve for all models, all mounting conditions, convection and forced air cooling for entire operating temperature range.

INPUT VOLTAGE (VAC)	LOAD (%)
85	80
115~265	100

**AIR FLOW DIRECTION****MOUNTING METHOD**