CUS350MP-1000/CO2

SPECIFICATIONS (1/2)

PA644-01-01/CO2-B

ITEMS					MODEL	CUS350MP-1000-24 /CO2	CUS350MP-1000-30 /CO2	CUS350MP-1000-36 /CO2	CUS350MP-1000-48 /CO2
INPUT									
	Input Voltage Range			(*5)(*15)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC			
	Efficiency	Convection cooling	100/115VAC		%	90/91			
		(Typ.) (*2)	200/230VAC		%	93/94			
		Forced air cooling	100/115VAC		%	90/91			
		(Typ.) (*3)	200/230VAC		%	93/94			
	Input Current	Convection cooling	100/115VAC		A	4.0/3.6			
		(Typ.) (*2)	200/230VAC		A	2.0/1.7			
		Forced air cooling	100/115VAC		A	5.7/4.9			
		(Typ.) (*3)	200/230VAC		A	2.9/2.5			
	Inrush Current (Typ)			(*4)(*6)	100/200VAC	A	15/30 at 1st Inrush, 30/30 at 2nd Inrush		
	PFHC			(*4)	-	Designed to meet IEC61000-3-2			
	Power Factor (Typ)			(*4)	100/200VAC	-	0.98/0.93		
OUTPUT									
	Nominal Output Voltage					V	24	30	36	48
	Output Voltage Setting Accuracy			(*18)		-	±1%			
	Maximum Output Current	Convection cooling				A	14.6	11.65	9.7	7.3
		Forced air cooling				A	20.8	16.6	13.8	10.4
	Peak Output Current			(*1)		A	41.7	33.3	27.7	20.9
	Maximum Output Power	Convection cooling				W	350.4	349.5	349.2	350.4
		Forced air cooling				W	499.2	498.0	496.8	499.2
	Peak Output Power			(*1)		W	1000.8	999.0	997.2	1003.2
	Maximum Line Regulation			(*7)(*8)		mV	96	120	144	192
	Maximum Load Regulation			(*7)(*9)		mV	192	240	288	384
	Temperature Coefficient					-	Less than 0.02% / °C			
	Maximum Ripple & Noise				0≤Ta≤50°C	-	1% of output voltage			
				(*7)	-20≤Ta<0°C	-	2% of output voltage			
	Output Voltage Range					V	24.0 - 26.4	27.0 - 30.0	36.0 - 42.0	45.0 - 48.0
	Hold-up Time	Convection cooling (Typ.)(*2)				ms	20			
		Forced air cooling (Typ.) (*3)				ms	15			
	Leakage Current			(*12)		-	Less than 0.3mA			
	Over Current Protection			(*10)		A	42.2 -	33.7 -	28.0 -	21.2 -
	Over Voltage Protection			(*11)		V	28.1 -	31.1 -	44.1 -	50.1 -
FUNCTION									
	Remote ON/OFF Control			(*16)		-	Possible			
	Remote Sensing					-	None			
	Parallel Operation					-	None			
	Series Operation			(*16)		-	Possible			
	Standby Supply					-	5V / 0.3A			
ENVIRONMENT									
	Operating Temperature			(*13)		-	-20 - +70°C			
	Storage Temperature					-	-30 - +75°C			
	Operating Humidity					-	30 - 90%RH (No Condensing)			
	Storage Humidity					-	30 - 90%RH (No Condensing)			
	Vibration			(*17)		-	At no operating, 10 - 55Hz (Sweep for 1min) 19.6m/s^2 Constant, X,Y,Z 1hour each.			
	Shock			(*17)		-	Less than 196.1m/s^2 (time : 11 ± 5 ms)			
	Cooling			(*13)		-	Convection Cooling / Forced air cooling			
ISOLATION									
	Withstand Voltage					-	Input - FG : 2.0kVAC (10mA) 1xMOPP, Input - Output : 4.0kVAC (10mA) 2xMOPP Output - FG : 1.5kVAC (20mA) 1xMOPP for 1min			
	Isolation Resistance					-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC			
STANDARD AND COMPLIANCE									
	Safety					-	Approved by IEC/EN/UL/CSA 62368-1 (Altitude ≤ 5,000m) Approved by IEC/EN/ES/CSA 60601-1 (Altitude ≤ 4,000m) Approved by IEC/EN62477-1 (OVC III) (Altitude ≤ 2,000m) Designed to meet Den-an appendix 8 at 100VAC (creepage distance and clearance only)			
	Conducted Emission	Convection cooling		(*14)		-	Designed to meet EN55011/EN55032-B, FCC-ClassB, VCCI-B			
		Forced air cooling		(*14)		-	Designed to meet EN55011/EN55032-A, FCC-ClassA, VCCI-A			
	Radiated Emission	Convection cooling		(*14)		-	Designed to meet EN55011/EN55032-B, FCC-ClassB, VCCI-B			
		Forced air cooling		(*14)		-	Designed to meet EN55011/EN55032-A, FCC-ClassA, VCCI-A			
	Immunity			(*14)		-	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11 Designed to meet IEC60601-1-2			
	Line DIP					-	Designed to meet SEMI-F47 at 200VAC Only			
MECHANICAL									
	Weight (Typ.)					g	770			
	Size (W x H x D)					mm	88 x 44 x 183 (Refer to Outline Drawing)			
OTHERS									
	Coating					-	Coating on both sides of PCB			

CUS350MP-1000/CO2

SPECIFICATIONS (2/2)

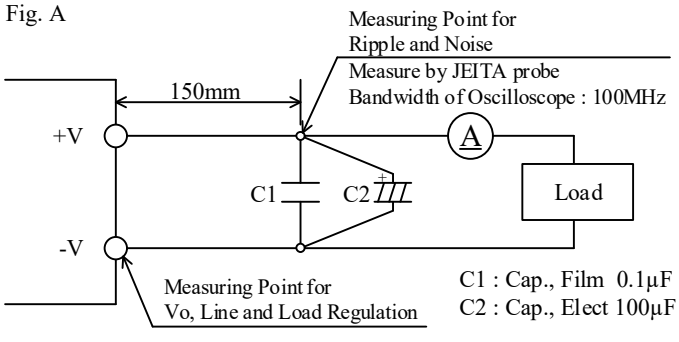
PA644-01-01/CO2-B

This product is with coating on both sides of PCB model that is objective to improve resistance against humidity and dust.
The coating is not to prevent moisture absorption and dust ingress completely since there is non coating area such as
the edge of discrete semiconductor lead and the shadowed part of discrete component.
*Read instruction manual carefully, before using the power supply unit.

=NOTES=

*1. Continuous peak output duration must be less than or equal to 5 sec with duty not more than 45%.
Peak output power for more than 5 sec will cause output to shut down and,
manual reset of power supply or remote control off/on is required to re-power on.
Peak loading is applicable for convection and forced air cooling.
When the peak loading condition, output derating is required.
For details, refer to peak output condition (PA644-01-03/CO2_).
*2. At Ta=25°C, nominal output voltage, maximum output power at convection cooling and standby supply is at no load.
*3. At Ta=25°C, nominal output voltage, maximum output power at forced air cooling and standby supply is at no load.
For details, refer to INPUT DERATING CURVE and OUTPUT DERATING CURVE (PA644-01-02/CO2_).
*4. At Ta=25°C, nominal output voltage, maximum output power at convection cooling and forced air cooling,
and standby supply is at no load.
*5. For cases where conformance is required to meet various safety specs (UL, CSA, EN),
input voltage range shall be from 100 - 240VAC (50-60Hz).
*6. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.
*7. Refer to Fig. A for measurement of Vo, line and load regulation, and ripple voltage.
*8. Input voltage from 90 to 265VAC at constant output current.
*9. Constant input voltage and output current from no load to maximum output current.
*10. Constant current mode protection with automatic recovery.
Over current condition for more than 1 sec will cause output to shut down.
Avoid to operate at over load or short circuit condition.
*11. Inverter shut down method. When OVP is triggered, output will be shut down,
and manual reset of power supply or remote control off/on is required to re-power on.
*12. Apply the appropriate measurement method according to the required standard: UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
*13. For details, Refer to OUTPUT DERATING CURVE (PA644-01-02/CO2_).
*14. The result is evaluated by TDK-Lambda standard measurement condition.
The power supply is considered as a component installed to an equipment.
The equipment should be re-evaluated to meet its EMC directives.
*15. When the input voltage is less than 90VAC, output derating is required.
Refer to INPUT DERATING CURVE (PA644-01-02/CO2_).
*16. Refer to instruction manual (PA644-04-01_).
*17. Using 4 mounting holes on baseplate.
The result is evaluated by TDK-Lambda standard measurement condition.
The equipment should be re-evaluated to meet its vibration and shock requirement.
*18. Output voltage setting at the time of shipment. At 100VAC, nominal output voltage and maximum output current.

Fig. A



CUS350MP-1000/CO2

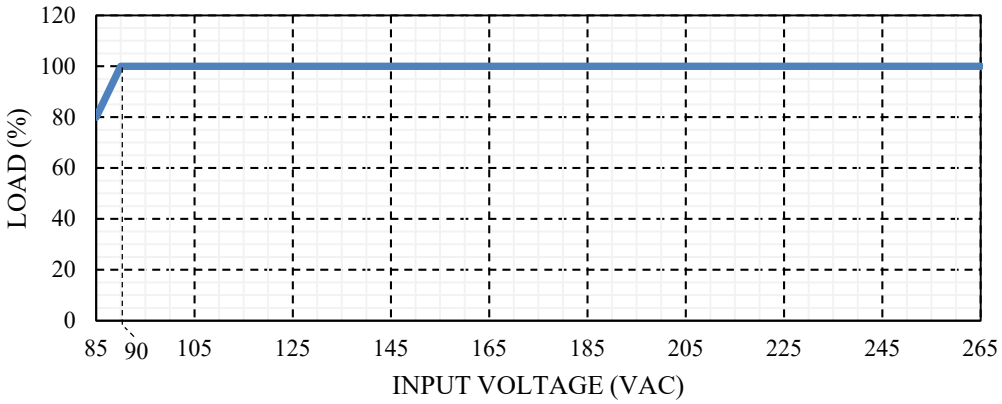
INPUT DERATING and OUTPUT DERATING (1/3)

PA644-01-02/CO2

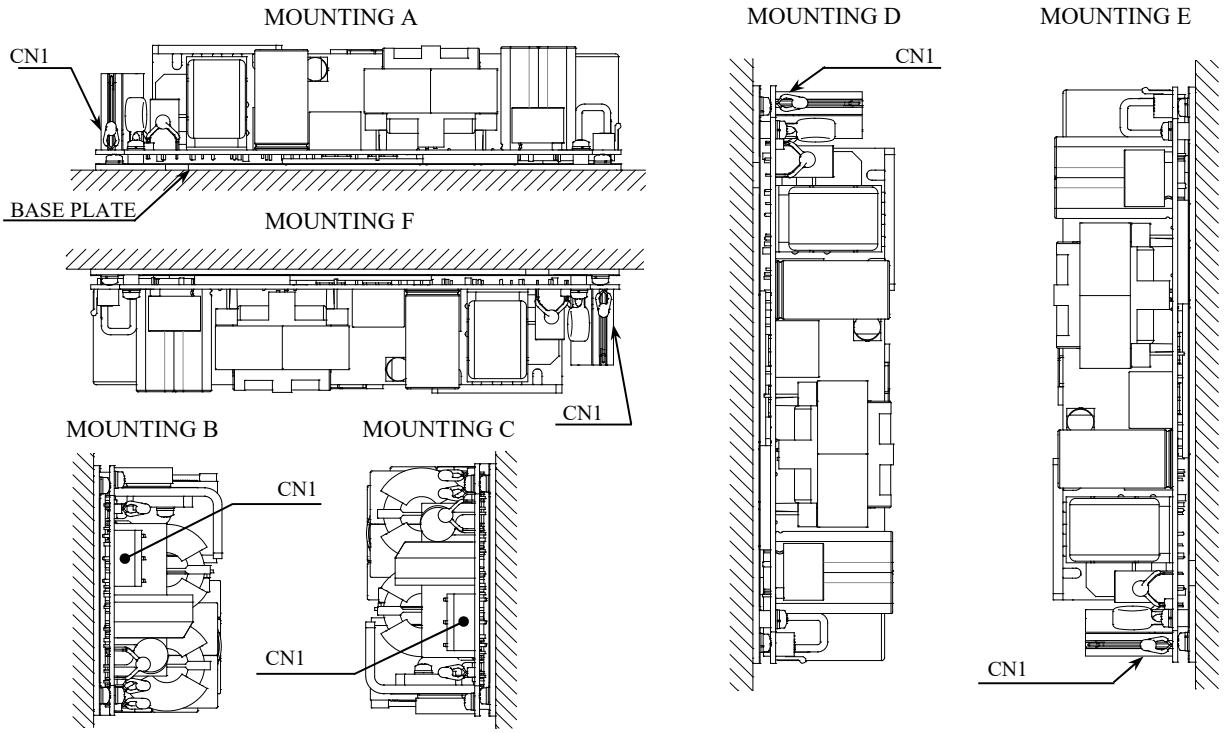
INPUT DERATING CURVE (OUTPUT CURRENT OR POWER VERSUS INPUT VOLTAGE)

Load (%) is percent of maximum output power and current. It must not exceed its specification and derating.
In the case of using in peak loading, please refer to INPUT DERATING CURVE (PA644-01-03/CO2_).
In addition, the OUTPUT DERATING CURVE must be considered.

INPUT VOLTAGE (VAC)	LOAD (%)
85	80
90 - 265	100



MOUNTING METHOD



CUS350MP-1000/CO2

INPUT DERATING and OUTPUT DERATING (2/3)

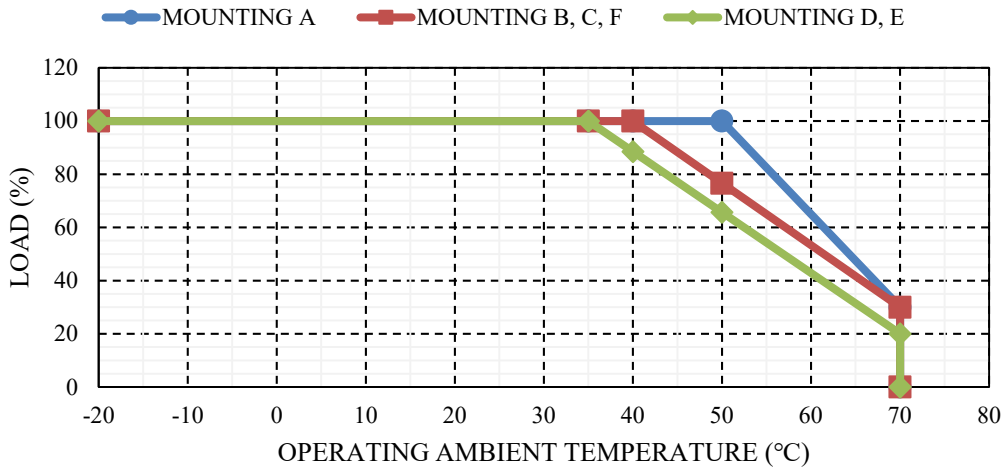
PA644-01-02/CO2

OUTPUT DERATING CURVE (OUTPUT CURRENT OR POWER VERSUS OPERATING AMBIENT TEMPERATURE)

1. CONVECTION COOLING

Load (%) is percent of maximum output power and current. It must not exceed its specification and derating.
The OUTPUT DERATING CURVE also must be considered at peak loading.

Ta (°C)	LOAD (%)		
	MOUNTING A	MOUNTING B, C, F	MOUNTING D, E
-20 - +20	100	100	100
35	100	100	100
40	100	100	88
50	100	76	65
70	30	30	20



CUS350MP-1000/CO2

INPUT DERATING and OUTPUT DERATING (3/3)

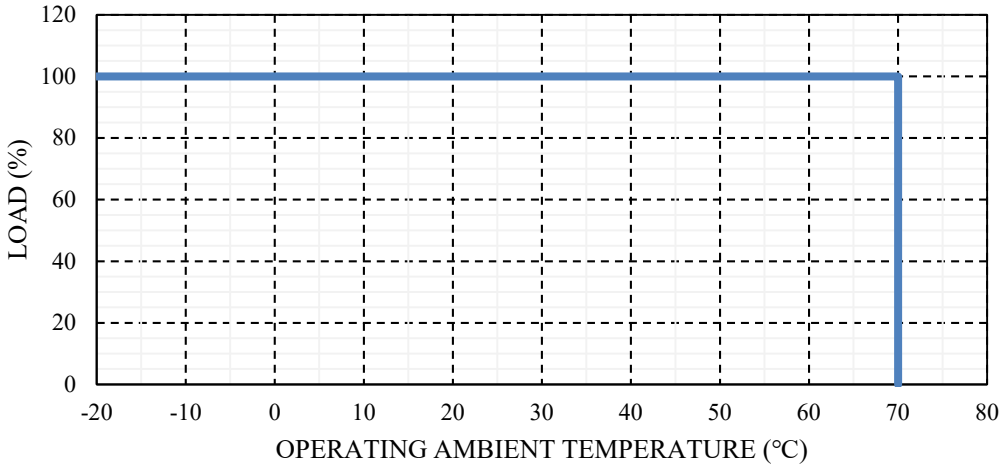
PA644-01-02/CO2

OUTPUT DERATING CURVE (OUTPUT CURRENT OR POWER VERSUS OPERATING AMBIENT TEMPERATURE)

2. FORCED AIR COOLING

Load (%) is percent of maximum output power and current. It must not exceed its specification and derating.
The OUTPUT DERATING CURVE also must be considered at peak loading.

Ta (°C)	LOAD (%)
	MOUNTING A-F
-20 - +70	100



Forced air cooling requires air velocity of more than 2.2m/s and air flow must be towards to C8, C9 and T1.
The components must be cooled by forced air.
The power supply is considered as a component installed, to an equipment.
The equipment should be re-evaluated and make sure to meet allowable component temperature.

For allowable component temperature and further detail, refer to instruction manual (PA644-04-01_).

CUS350MP-1000/CO2

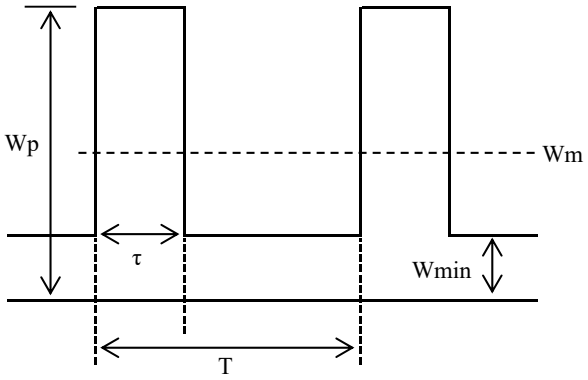
PEAK OUTPUT CONDITION (1/2)

PA644-01-03/CO2

PEAK OUTPUT CONDITION

Use this product to achieve its peak output power capability according to the following expression:
When the peak output power is more than 800W, pulse width of peak power (τ) must be less than or equal to 1 sec.
When input voltage is less than 170VAC, output derating is required. Refer input derating curve.

Peak output codition must be considered as per following expression, input derating curve and output derating curve.

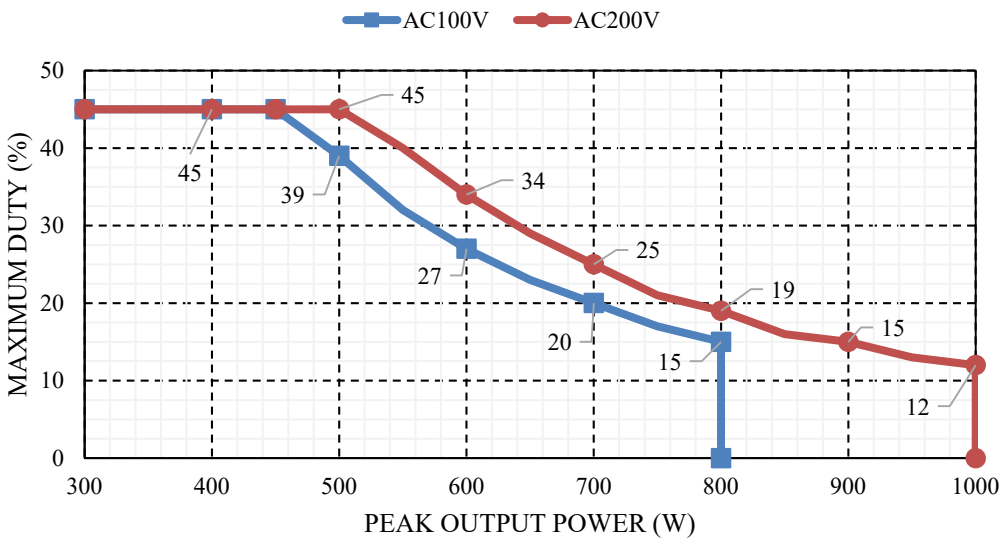


$$W_m \geq \sqrt{{W_p}^2 \times D + {W_{min}}^2 \times (1 - D)}$$

Wp : Peak output power (W)
Wm : Rated output power (W)
Wmin : Output power at light load (W)
τ : Pulse width of peak output current (sec)
T : Period (sec)
Duty, D : τ / T × 100%

PEAK OUTPUT POWER VERSUS PEAK PULSE WIDTH

INPUT VOLTAGE Vin (VAC)	PEAK OUTPUT POWER Wp (W)	PEAK PULSE WIDTH τ (sec)
85 ≤ Vin ≤ 265	800	5
170 ≤ Vin ≤ 265	1000	1



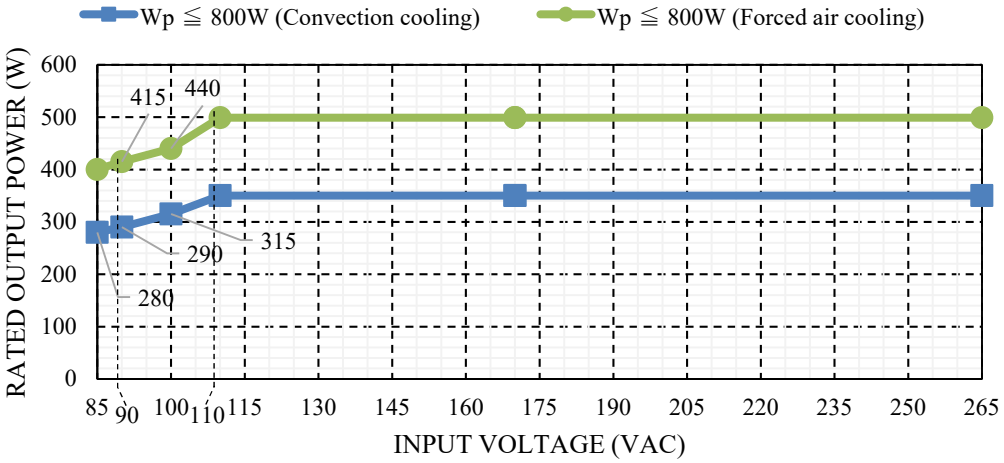
CUS350MP-1000/CO2

PEAK OUTPUT CONDITION (2/2)

PA644-01-03/CO2

INPUT DERATING CURVE at PEAK POWER IS LESS THAN OR EQUAL TO 800W

INPUT VOLTAGE (VAC)	RATED OUTPUT POWER (W)	
	CONVECTION COOLING	FORCED AIR COOLING
85	280	400
90	290	415
100	315	440
110 - 265	350.4	499.2



INPUT DERATING CURVE at PEAK POWER IS MORE THAN 800W UP TO 1000W

INPUT VOLTAGE (VAC)	RATED OUTPUT POWER (W)	
	CONVECTION COOLING	FORCED AIR COOLING
85 - 169	Not applicable	Not applicable
170 - 265	350.4	499.2