

**HWS1000L/CO2**

**SPECIFICATIONS**

CA772-01-01/CO2-B

ITEMS		MODEL	HWS1000L -3/CO2	HWS1000L -5/CO2	HWS1000L -12/CO2	HWS1000L -15/CO2	HWS1000L -24/CO2	HWS1000L -36/CO2	HWS1000L -48/CO2	HWS1000L -60/CO2	
1	Nominal Output Voltage	V	3.3	5	12	15	24	36	48	60	
2	Maximum Output Current (Peak Output Current) (*1)	A	200	200	88	70	44 (51)	29	22 (25)	17	
3	Maximum Output Power (Peak Output Power) (*1)	W	660	1000	1056	1050	1056 (1224)	1044	1056 (1200)	1020	
4	Efficiency (Typ) (115/230VAC)	(*)2 %	75 / 77	79 / 81	82 / 84	82 / 84	84 / 86	84 / 86	84 / 86	84 / 86	
5	Input Voltage Range	(*)3 -	85 ~ 265VAC (47-63Hz) or 120 ~ 350VDC								
6	Input Current (Typ) (115/230VAC)	(*)2 A	8 / 4		12 / 6						
7	Inrush Current (Typ)	(*)4 -	20A/40A at 115VAC, 40A/40A at 230VAC, Ta=25°C (first inrush / second inrush)								
8	PFHC	-	Designed to meet IEC61000-3-2								
9	Power Factor (Typ) (115/230VAC)	(*)2 -	0.98 / 0.95								
10	Output Voltage Range	V	2.64~3.96	4.0~6.0	9.6~14.4	12.0~19.5	19.2~28.8	28.8~43.2	38.4~56.0	48.0~66.0	
11	Ripple and Noise (115/230VAC)	0≤Ta≤74°C	mV	120	120	150	150	150	200	200	200
		(*)5 -20≤Ta<0°C	mV	160	160	180	180	180	240	240	240
12	Line Regulation	(*)6,7 mV	20	20	48	60	96	144	192	240	
13	Load Regulation	(*)6,8 mV	30	30	72	90	144	216	288	360	
14	Temperature Coefficient	-	Less than 0.02%/°C								
15	Over Current Protection	(*)9 A	210~	210~	92.4~	73.5~	51.6~	30.5~	25.3~	17.9~	
16	Over Voltage Protection	(*)10 V	4.12~5.61	6.25~7.25	15.0~17.4	20.2~23.4	30.0~34.8	45.0~52.2	58.5~68.2	69.0~81.0	
17	Hold-Up Time (Typ) (115/230VAC)	(*)2 -	20ms								
18	Leakage current (Typ)	(*)11 -	0.1mA at 115VAC, 60Hz / 0.2mA at 230VAC, 60Hz								
19	Remote Sensing	-	Possible								
20	Remote ON/OFF control	-	Possible								
21	Monitoring Signal	-	ALM ( Open Collector Output )								
22	Parallel Operation	-	Possible								
23	Series Operation	-	Possible								
24	Operating Temperature	(*)12 -	- 20 ~ + 74°C (-20°C ~ +50°C: 100%, +74°C: 50%) 100% load start up at -40°C								
25	Operating Humidity	-	20 ~ 90% RH (No dewdrop)								
26	Storage Temperature	-	- 40 ~ +85°C								
27	Storage Humidity	-	10 ~ 95% RH (No dewdrop)								
28	Cooling	-	Forced air by build-in fan								
29	Withstand Voltage	-	Input - Output : 4.0kVAC (20mA), Input - FG : 2.0kVAC (20mA) Output - FG : 500VAC (100mA) (60V model: 651VAC(130mA)), Output - CNT/ALM/AUX : 100VAC (100mA) for 1min.								
30	Isolation Resistance	-	Input - FG, Input - Output and Output - FG: More than 50MΩ (500VDC) Output - CNT/ALM/AUX: More than 50MΩ (100VDC) at Ta=25°C and 70%RH								
31	Vibration	(*)13 -	Designed to meet MIL-STD-810F 514.5 Category 4, 10								
32	Shock (In package)	-	Designed to meet MIL-STD-810F 516.5 Procedure I,VI								
33	Safety	(*)14 -	Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1 (Expire date of 60950-1 : 20/12/2020), EN50178, UL60601-1, EN60601-1, CSA-C22.2 No.601.1-M90, Designed to meet DENAN, EN61010-1.								
34	Line Dip	-	Designed to meet SEMI-F47 (200VAC line only)								
35	EMI	-	Designed to meet VCCI-B, FCC-B, EN55011/EN55032-B								
36	Immunity	-	Designed to meet EN61000-4-2 (Level 2,3), -3 (Level 3), -4 (Level 3), -5 (Level 3,4), -6 (Level 3), -8 (Level 4), -11								
37	Weight (Typ)	-	2.3kg								
38	Dimension (W x H x D)	mm	150 x 61 x 240 (Refer to Outline Drawing)								

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

= NOTES=

\*1: ( ) : Peak Output Current is possible at 170~265VAC input range, operating period at Peak Output Current is less than 10sec, duty less than 35%.  
Average output power and current is less than Maximum Output Power and Maximum Output Current.

\*2: At Maximum Output Power, nominal input voltage, Ta = 25°C.

\*3: For cases where conformance to various safety specs ( UL, CSA, EN ) are required, to be described as 100 - 240VAC, 50 / 60Hz on name plate.

\*4: First/second inrush current, not applicable for the inrush current to Noise Filter for less than 0.2ms.

\*5: Please refer to Fig. A for measurement point of ripple and noise.

Ripple & noise are measured at 20MHz by using a twisted pair of load wires terminated with a 0.1uF and 47uF capacitor.

\*6: Measure line & load regulation at output terminal M4 tapped point.

\*7: 85 - 265VAC, constant load.

\*8: No load - Full load (Maximum power), constant input voltage.

\*9: Constant current limit with automatic recovery.

Avoid to operate at overload or dead short for more than 30 seconds.

\*10: OVP circuit will shutdown output, manual reset (Remote ON/OFF control reset or Re-power on).

\*11: Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.

Worst case: < 0.3mA at 264VAC, 63Hz (Normal Condition); < 0.5mA (Single Fault Condition)

\*12: Refer to Output Derating Curve (CA772-01-02/CO2-) for details of output derating versus ambient temperature.

- Load (%) is percent of Maximum Output Power and Maximum Output Current (Item 2 and 3).

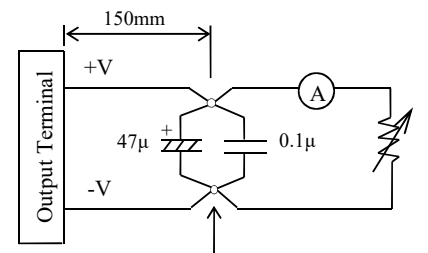
Do not exceed derating of Maximum Output Power and Maximum Output Current.

- 100% load start up at -40°C is possible. However, it may not fulfil all the specifications.

\*13: Category 4 exposure levels: Trunk transportation over U.S. highways, Composite two-wheeled trailer.

\*14: As for DENAN, designed to meet at 100VAC.

Fig. A

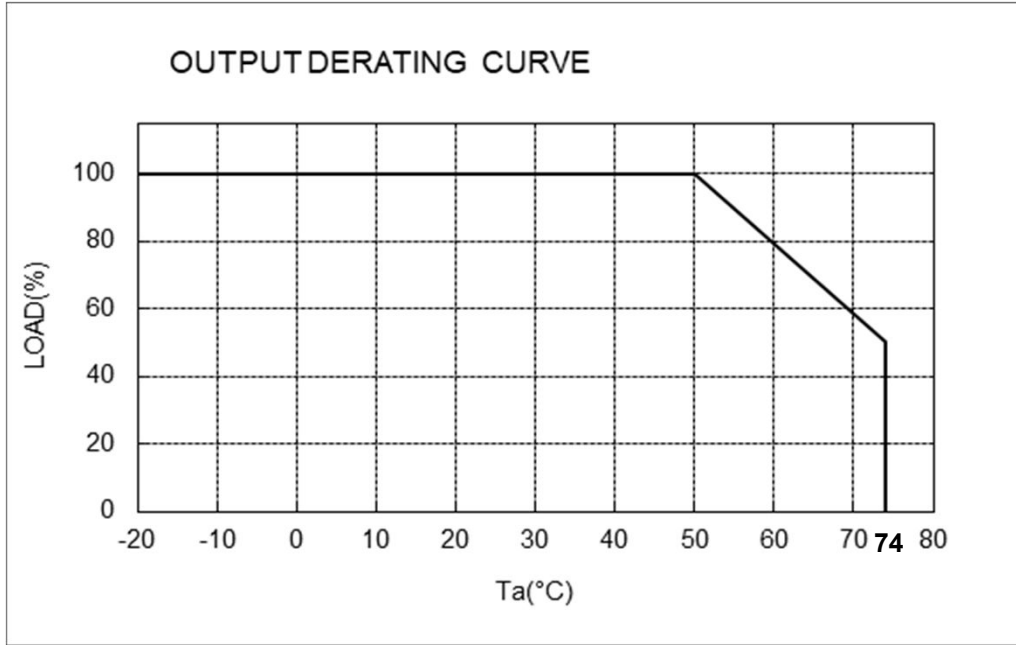


Measurement point for Ripple and Noise.

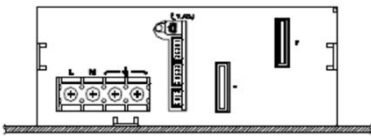
OUTPUT DERATING

CA772-01-02/CO2

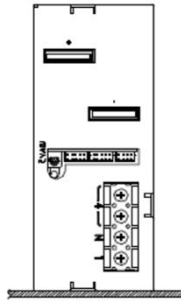
Ta(°C)	LOAD(%)
	Mounting A, B, C
-20~50	100%
74	50%



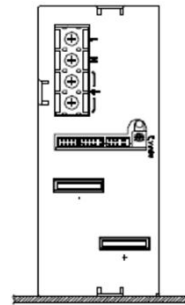
**Mounting A**



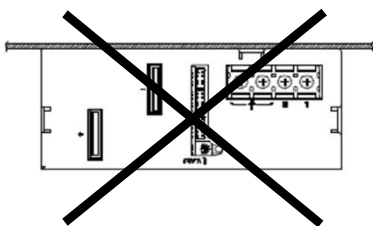
**Mounting B**



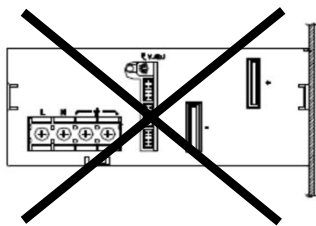
**Mounting C**



**Don't Use**



**Don't Use**



**Don't Use**

