CA772-01-01A

	ITEMS / MODEL			HWS1000L -3	HWS1000L -5	HWS1000L -12	HWS1000L -15	HWS1000L -24	HWS1000L -36	HWS1000L -48	HWS1000L -60
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 in-rush 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).

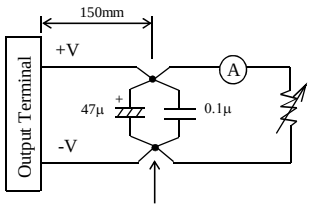
* 11: Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
Worst case: < 0.3mA at 264VAC, 63Hz (Normal Condition); < 0.5mA (Single Fault Condition)

* 12: Refer to Output Derating Curve (CA772-01-02_) 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.

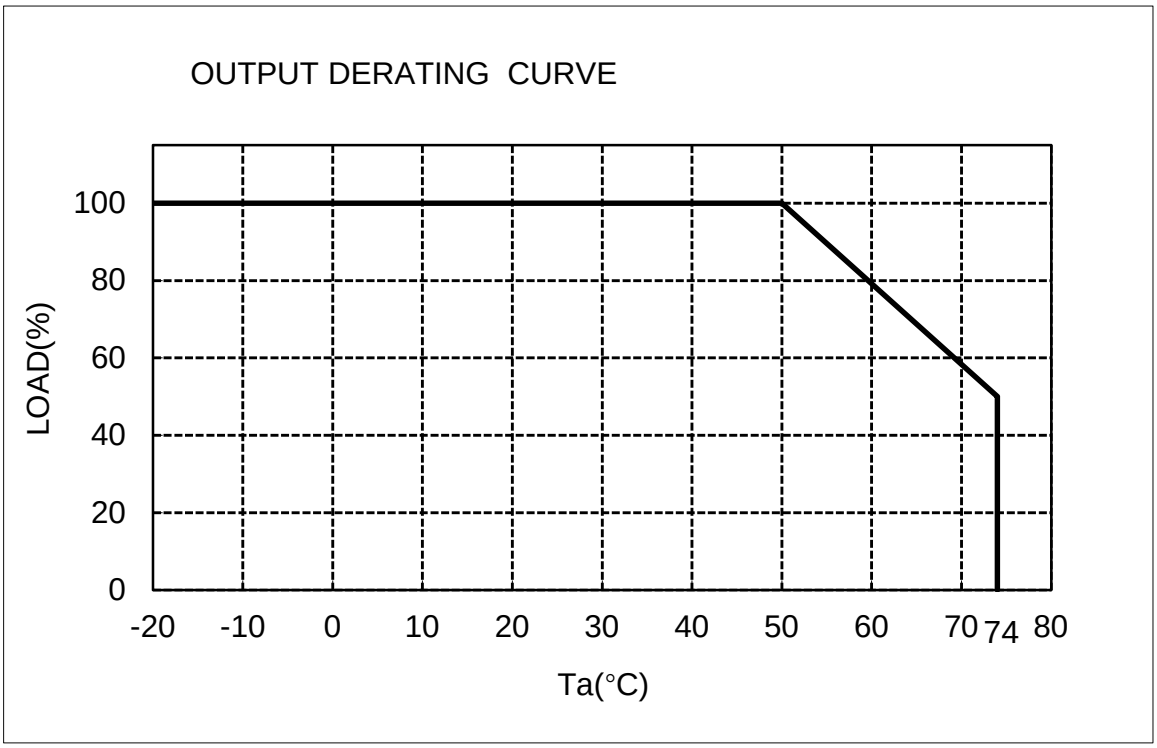
Fig. A



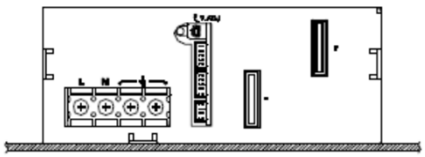
Measurement point for Ripple and Noise.

CA772-01-02

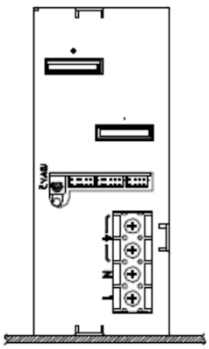
Ta(°C)	LOAD(%)
	Mounting A,B,C
-20~50	100%
74	50%



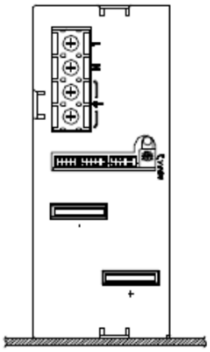
Mounting A



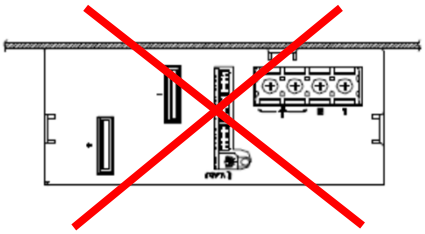
Mounting B



Mounting C



Don't Use



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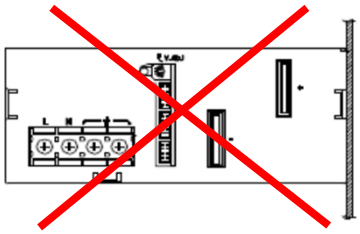

Don't Use