

SPECIFICATIONS

DA033-01-01/HD-E

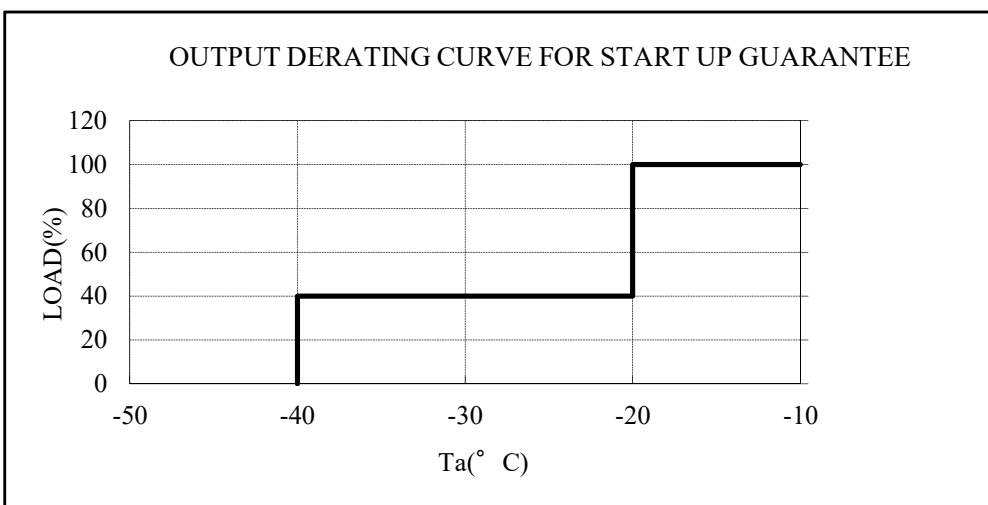
ITEMS	MODEL	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T	HWS1800T			
		-3/HD	-5/HD	-6/HD	-7/HD	-12/HD	-15/HD	-24/HD	-36/HD	-48/HD	-60/HD			
1	Nominal Output Voltage	V	3.3	5	6	7.5	12	15	24	36	48	60		
2	Maximum Output Current	A	300	300	250	200	125	100	75	50	37.5	30		
3	Peak output Current (*12)	A	-	-	300	240	150	120	105	70	52.5	42		
4	Maximum Output Power	W	990	1500	1500	1500	1500	1500	1800	1800	1800	1800		
5	Peak Output Power (*12)	W	-	-	1800	1800	1800	1800	2520	2520	2520	2520		
6	Efficiency (200VAC)(Typ) (*1)	%	75	81	82	84	84	84	88	88	90	90		
7	Input Voltage Range (*2)	-	3 phase 170 - 265VAC (47-63Hz)											
8	Input Current (200VAC)(Typ) (*1)	A	4.5	6.0				7.0						
9	Inrush Current (Typ) (*3)	A	40A at 200VAC											
10	Power Factor (200VAC)(Typ) (*1)	-	0.94											
11	Output Voltage Range	V	2.64-3.96	4.0-6.0	4.8-7.2	6.0-9.0	9.6-14.4	12.0-18.0	19.2-28.8	28.8-43.2	38.4-52.8	48.0-66.0		
12	Maximum Ripple & Noise (*4)	+25+71°C	mV	150	150	150	150	200	200	250	250	300	400	
		0°C	mV	200	200	200	200	200	200	250	250	300	400	
		-10°C	mV	220	220	220	220	250	250	300	300	400	600	
13	Maximum Line Regulation (*5)	mV	36	36	36	40	48	60	96	144	192	240		
14	Maximum Load Regulation (*6)	mV	60	60	60	60	72	90	144	216	288	360		
15	Temperature Coefficient	-	Less than 0.02%/°C											
16	Over Current Protection (*7)	A	315.0-	315.0-	303.0-	242.4-	151.5-	121.2-	106.0-	70.7-	53.0-	42.4-		
17	Over Voltage Protection (*8)	V	4.12-4.62	6.25-7.0	7.5-8.4	9.37-10.5	15.0-17.4	18.7-21.8	30.0-34.8	45.0-49.7	55.2-60.0	69.0-75.0		
18	Hold-up Time (Typ) (*9)	-	20ms						18ms					
19	Leakage Current (*10)	-	2.6mA MAX at 240VAC											
20	Remote Sensing	-	Possible											
21	Remote ON/OFF control	-	Possible											
22	Monitoring Signal	-	PF (Open Collector Output)											
23	Output Voltage External Control	-	Possible											
24	Parallel Operation	-	Possible											
25	Series Operation	-	Possible											
26	Operating Temperature (*11)	-	-10 - +71°C, Guarantee Start up -40 - -10°C											
		-10 - +40°C	W	990	1500				1800					
		+50°C	W	825	1250	1500				1680				
		+60°C	W	660	1000	1125				1300				
		+71°C	W	495	750				900					
27	Operating Humidity	-	10 - 90%RH (No Condensing)											
28	Storage Temperature	-	-40 - +85°C											
29	Storage Humidity	-	10 - 95%RH (No Condensing)											
30	Cooling	-	Forced Air By Blower Fan											
31	Withstand Voltage	-	Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output-FG : 500VAC (300mA), (60V model 651 VAC(390mA)), Output-CNT:100VAC (100mA) for 1min.											
32	Isolation Resistance	-	More than 100Mohm Output - FG ... 500VDC More than 10Mohm Output - CNT ... 100VDC at 25°C and 70%RH											
33	Vibration (*13) (*14)	-	At no operating, 10 - 55Hz (Sweep for 1min.)											
		-	19.6m/s <sup>2</sup> Constant, X,Y,Z 1h each. Designed to meet MIL-STD-810F 514.5 Category 4 figure 514.5C-1, Category 10											
34	Shock (In package) (*14)	-	Less than 196.1m/s <sup>2</sup> Designed to meet MIL-STD-810F 516.5 Procedure I											
35	Safety	-	Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1 (Expire date of 60950-1 : 20/12/2020)											
36	Line DIP	-	Designed to meet SEMI-F47											
37	Conducted Emission	-	Designed to meet EN55011/EN55032-A, FCC-A, VCCI-A											
38	Radiated Emission	-	Designed to meet EN55011/EN55032-A, FCC-A, VCCI-A											
39	Immunity	-	Designed to meet IEC61000-4-2(Level 2,3), -3(Level 3), -4(Level 3), -5(Level 3,4), -6(Level 3), -8(Level 4), -11											
40	Weight (Typ)	g	4000					3800						
41	Size (W x H x D)	mm	126.5 x 82 x 280 ( Refer to Outline Drawing )											
42	Other	-	PCB Coating on solder side and component side.											

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

=NOTES=

- \*1. At Ta=25°C and maximum output power.
- \*2. For cases where conformance to various safety specs (UL, CSA, EN) are required, input voltage range will be 200 - 240VAC (50/60Hz).
- \*3. First in-rush current. Not applicable to the first 0.2ms in-rush current flowing into the power supply noise filter.
- \*4. Measure with JEITA RC-9131A probe, Bandwidth of scope :100MHz.(at 100uF electric capacitor and 0.47uF film capacitor on the test fixture board.)  
Ripple noise spec for ambient temperature between -10 to 25 is a linearity value with respect to the -10 degrees C and 25 degrees C specs.
- \*5. 170 - 265VAC , constant load.
- \*6. No load-Full load, constant input voltage.
- \*7. Constant current limit with automatic recovery. Over current condition for more than 5 seconds will cause the output to shutdown.  
Output current exceeding maximum rated output current for more than 10 seconds continuously will result to output shutdown.
- \*8. OVP circuit will shut down output, manual reset (Power cycle) or ON/OFF CNT signal reset.
- \*9. At 200VAC (50/60Hz), nominal output voltage and maximum output current.
- \*10. Measured by the each measuring method of UL, CSA and EN (at 60Hz), Ta=25°C.
- \*11. Ratings - Derating at standard mounting.  
- As for other mountings, refer to derating curve ( DA033-01-02\_ ).  
- For conditions of start up at -40°C - -10°C, refer to derating curve (DA033-01-03/HD- ).
- \*12. Peak output current is less than 10 seconds, and duty 35% max.
- \*13. Category 4 exposure levels : Truck transportation over U.S. highways.
- \*14. It is compulsory to fix BRACKET onto product for MIL-STD-810F 514.5 and MIL-STD-810F 516.5. Refer to DA033-01-04/HD- .

Ta(°C)	LOAD(%)
	MOUNTING A,B,C,D
	170V~265V
-40 ~-20	40
-20	100
-10	100



==NOTES==

- \*1. Input voltage : Not gradual start up.
- \*2. No dewdrop.
- \*3. Output voltage becomes more stable by performing the following.
  - a) Electrolytic capacitor is added to an output.
    - +3.3V,+5V,+6V : LXZ 10V 5600uF (NIPPON CHEMI-CON) x 3 parallel
    - +7.5V : LXZ 16V 3900uF (NIPPON CHEMI-CON) x 3 parallel
    - +12V : LXZ 25V 2700uF (NIPPON CHEMI-CON) x 3 parallel
    - +15V : LXZ 25V 2700uF (NIPPON CHEMI-CON) x 3 parallel
    - +24V : LXZ 35V 1800uF (NIPPON CHEMI-CON) x 3 parallel
    - +36V : LXZ 50V 1000uF (NIPPON CHEMI-CON) x 3 parallel
    - +48V : LXZ 63V 820uF (NIPPON CHEMI-CON) x 3 parallel
    - +60V : LXV 100V 270uF (NIPPON CHEMI-CON) x 3 parallel
  - b) Remote sensing function is used.
    - Connect “+S” terminal to “+” terminal of the electrolytic capacitor
    - and “-S” terminal to “-” terminal of the electrolytic capacitor with sensing wires.
- \*4. Pay attention to above items before using the unit. Incorrect usage could lead to unstable output voltage.

**POWER SUPPLY MOUNTING FOR MIL-STD**

When MIL vibration(MIL-STD-810F 514.5 Category 4 figure 514.5C-1, Category 10) & MIL shock(MIL-STD-810F 516.5 Procedure I) specification is necessary, mount the power supply using the BRACKET or equivalent.

Fix one set of BRACKET to the power supply with sixteen M4 screws when mounting the power supply.

Two pieces of BRACKET is considered as one set.

The M4 screw is 8mm in length, washer and spring washer are also required.

Screw must not penetrate into power supply by more than 6mm.

