HWS30/HD

SPECIFICATIONS

A225-01-01/HD-A

	ITEMS / MODEL			HWS30 -3/HD	HWS30 -5/HD	HWS30 -12/HD	HWS30 -15/HD	HWS30 -24/HD	HWS30 -48/HD
1	Nominal Output Voltage		V	3.3	5	12	15	24	48
2	Maximum Output Current		A	6	6	2.5	2	1.3	0.65
3	Maximum Output Power		W	20	30	30	30	31.2	31.2
4	Efficiency (Typ) (*1)	100VAC	%	70	77	81	81	83	82
		200VAC	%	73	80	83	83	86	83
5	Input Voltage Range (*2)		-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC					
6	Input Current (100/200VAC)(Typ) (*1)		A	0.6/0.3	0.8/0.4				
7	Inrush Current(Typ) (*3)		-	14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start					
8	PFHC		-	Designed to meet IEC61000-3-2					
9	Output Voltage Range		V	2.97-3.96	4.0-6.0	9.6-14.4	12.0-18.0	19.2-28.8	38.4-52.8
10	Maximum Ripple & Noise	0≤Ta≤71°C	mV	120	120	150	150	200	200
	(*4)	-10≤Ta< 0°C	mV	160	160	180	180	240	240
11	Maximum Line Regulation (*5)		mV	20	20	48	60	96	192
12	Maximum Load Regulation (*6)		mV	40	40	96	120	192	384
13	Temperature Coefficient		-	Less than 0.02% / °C					
14	Over Current Protection (*7)		A	6.3 ≤	6.3 ≤	2.62 ≤	2.1 ≤	1.36 ≤	0.68 ≤
15	Over Voltage Protection (*8)		V	4.13-4.95	6.25-7.25	15.0-17.4	18.8-21.8	30.0-34.8	55.2-64.8
16	Hold-up Time (Typ) (*9)		-	20ms					
17	Leakage Current (*10)		-	Less than 0.5mA. 0.2mA(Typ) at 100VAC / 0.4mA(Typ) at 230VAC					
18	Remote Sensing		-	-					
19	Parallel Operation		-	-					
20	Series Operation		-	Possible					
21	Operating Temperature (*11)		-	-10 to +71°C (-10 to +50°C:100%,+60°C:60%,+71°C:20%) Guarantee Start up at -40 to -10°C					
22	Operating Humidity		-	30 to 90%RH (No dewdrop)					
23	Storage Temperature		-	-40 to +85°C					
24	Storage Humidity		-	10 to 95%RH (No dewdrop)					
25	Cooling		-	Convection Cooling					
26	Withstand Voltage		-	Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (100mA) for 1min					
27	Isolation Resistance		-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC					
28	Vibration (*12)		-	At no operating, 10 - 55Hz (Sweep for 1min) 19.6m/s^2 Constant, X,Y,Z 1hour each. Designed to meet MIL-STD-810F 514.5 Category 4, 10					
29	Shock (In package)		-	Less than 196.1m/s^2 Designed to meet MIL-STD-810F 516.5 Procedure I, VI					
30	Safety (*13)		-	Approved by UL60950-1, CSA60950-1, EN60950-1, EN50178 Designed to meet UL508, DENAN					
31	Line DIP		-	Designed to meet SEMI-F47 (200VAC Line only)					
32	Conducted Emission		-	Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B					
33	Radiated Emission		-	Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B					
34	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					
35	Weight(Typ.)		-	220g					
36	Size (W x H x D)		mm	26.5 x 82 x 95 (Refer to Outline Drawing)					

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

=NOTES=

*1. At 100/200VAC, Ta=25°C and maximum output power.
*2. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50/60Hz).
*3. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.
*4. Measure with JEITA RC-9131A probe, Bandwidth of scope :100MHz.
For start up at low ambient temperature and low input voltage, output ripple noise might not meet specification.
However, there is no overshoot at start up and output ripple noise specification can be met after one second.
*5. 85 - 265VAC , constant load.
*6. No load-Full load, constant input voltage.
*7. Foldback current limit with automatic recovery. Not operate at over load or dead short condition for more than 30seconds.
*8. OVP circuit will shutdown output, manual reset (Re power on).
*9. At 100/200VAC , Ta=25°C, nominal output voltage and maximum output current.
*10. Measured by the each measuring method of UL,CSA,EN and DENAN(at 60Hz).
*11. Ratings - Derating at standard mounting.
- Load (%) is percent of maximum output power or maximum output current, whichever is greater.
- As for other mountings, refer to derating curve (A225-01-02/HD-_).
- For conditions of start up at -40°C to -30°C, refer to derating curve (A225-01-04/HD-_).
- For conditions of start up at -30°C to -10°C, refer to derating curve (A225-01-05/HD-_).
*12. Category 4 exposure levels : Track transportation over U.S. highways, Composite two-wheeled trailer.
*13. As for DENAN, designed to meet at 100VAC.

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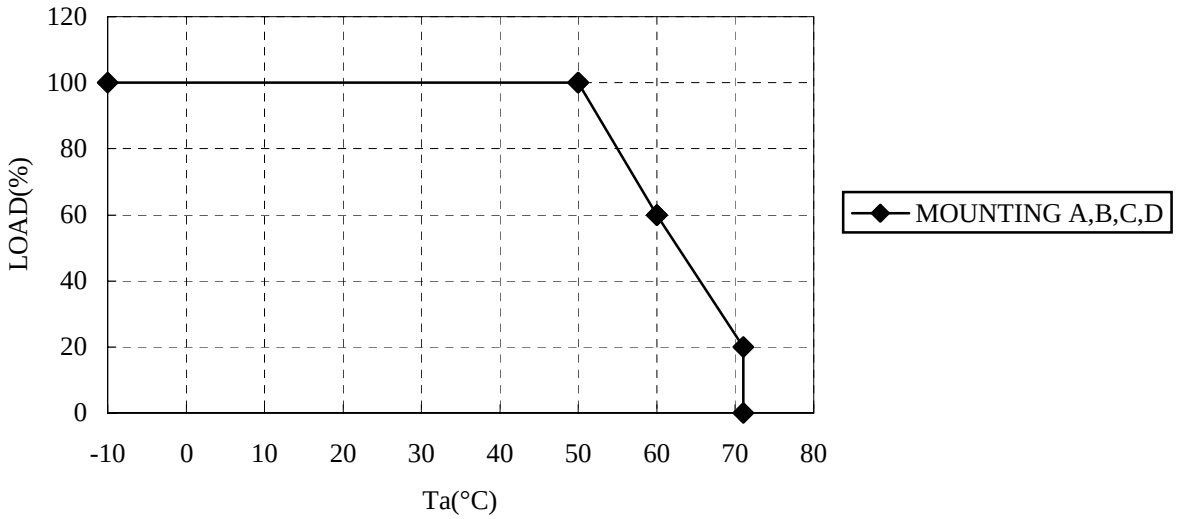
OUTPUT DERATING

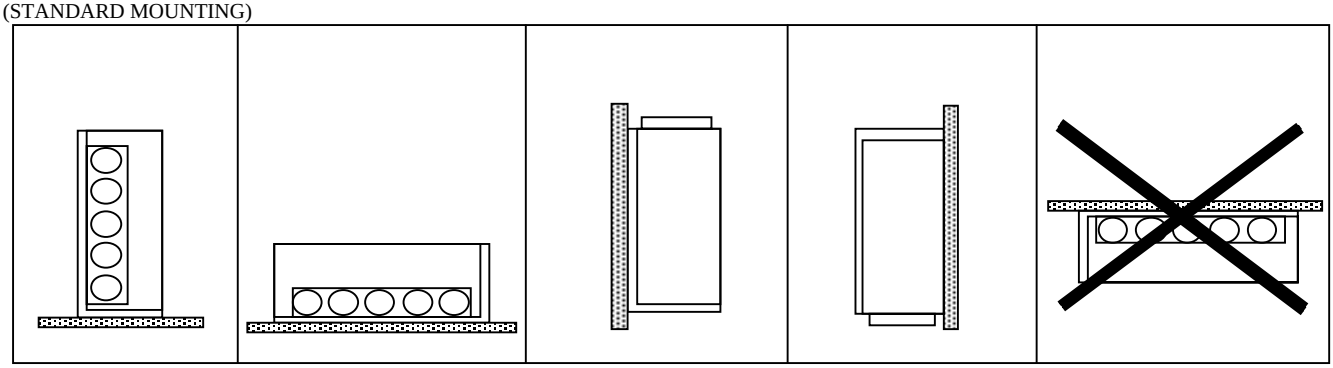
A225-01-02/HD

Ta(°C)	LOAD(%)
	MOUNTING A,B,C,D
-10 ~+30	100
40	100
50	100
60	60
71	20

OUTPUT DERATING CURVE



MOUNTING A (STANDARD MOUNTING) | MOUNTING B | MOUNTING C | MOUNTING D | DON'T USE



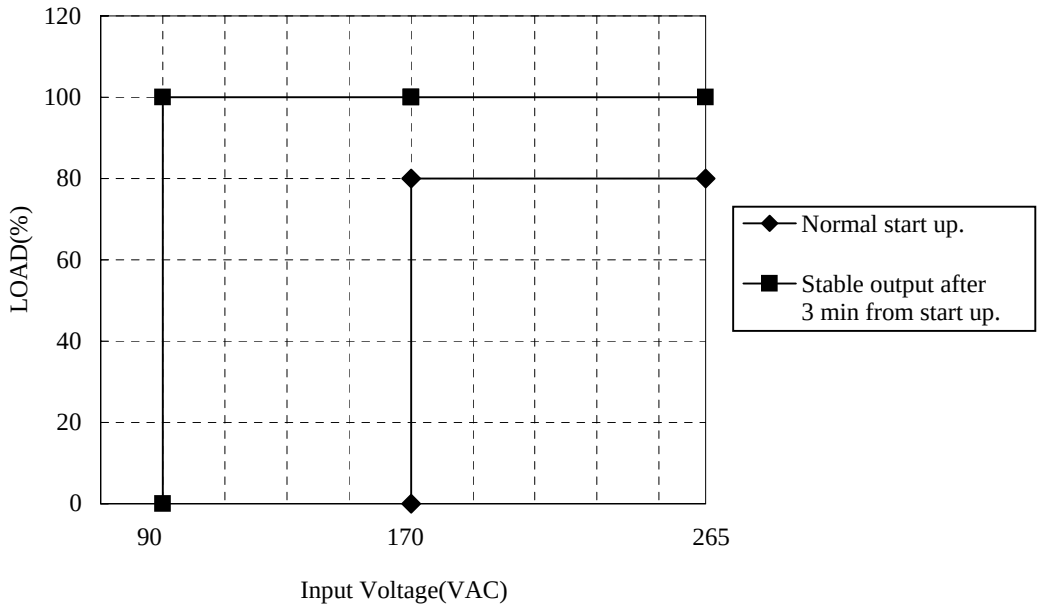
HWS30/HD

DERATING TO START UP AT Ta : -40 to -10°C

A225-01-04/HD

Input Voltage (VAC)	LOAD(%)	
	Normal start up.	Stable output after 3 min from start up.
90	-	100
170	80	100

DERATING CURVE



=NOTES=
*At Ta : -40 to -10°C.
*Output voltage : Nominal output voltage.
*Input voltage : Not operate at 85 - 90VAC, and not gradual start up.
*Do not use the load that is constant current mode.
*Avoid forced air cooling. It is assumed that inside of power supply is heated by self-heating within 3 minutes.
*No dewdrop.
*Output voltage might be unstable at no load. In that case, apply minimum output current.
*Pay attention to above items before using the unit. Incorrect usage could lead to unstable output voltage

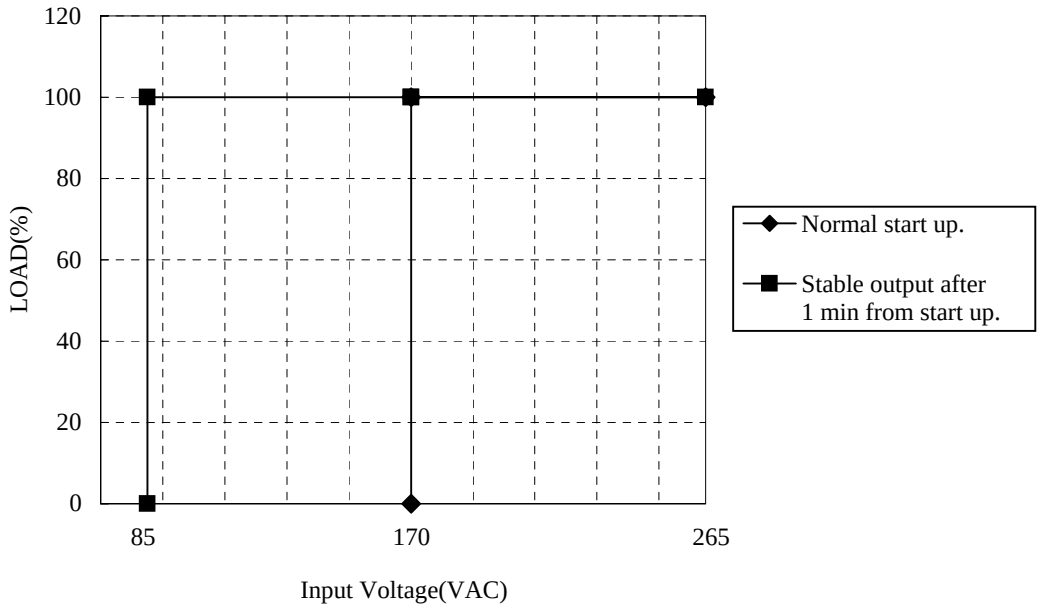
HWS30/HD

DERATING TO START UP AT Ta : -30 to -10°C

A225-01-05/HD

Input Voltage (VAC)	LOAD(%)	
	Normal start up.	Stable output after 1 min from start up.
85	-	100
170	100	100

DERATING CURVE



=NOTES=
*At Ta : -30 to -10°C.
*Output voltage : Nominal output voltage.
*Input voltage : Not gradual start up.
*Do not use the load that is constant current mode.
*Avoid forced air cooling. It is assumed that inside of power supply is heated by self-heating within 1 minutes.
*No dewdrop.
*Output voltage might be unstable at no load. In that case, apply minimum output current.
*Pay attention to above items before using the unit. Incorrect usage could lead to unstable output voltage