

HWS1000 Specifications (Read instruction manual carefully, before using the power supply unit.)

ITEMS/UNITS		MODEL	HWS1000 -3	HWS1000 -5	HWS1000 -6	HWS1000 -7	HWS1000 -12	HWS1000 -15	HWS1000 -24	HWS1000 -36	HWS1000 -48	HWS1000 -60	
Input	Voltage Range (*2)	V	AC85 - 265 or DC120 - 330										
	Frequency (*2)	Hz	47 - 63										
	Power Factor (100/200VAC)(typ) (*1)		0.98 / 0.95										
	Efficiency (100/200VAC)(typ) (*1)	%	71 / 73	76 / 78	79 / 81	80 / 82	82 / 85	83 / 85	85 / 87	85 / 88	86 / 88	85 / 88	
	Current (100/200VAC)(typ) (*1)	A	9.6 / 5.0 13.5 / 7.0										
	Inrush Current (100/200VAC)(typ) (*3)	A	20 / 40										
	Leakage Current (100/240VAC) (*10)	mA	1.2 max										
Output	Nominal Voltage	VDC	3.3	5	6	7.5	12	15	24	36	48	60	
	Maximum Current	A	200		167	134	88	70	46	30.7	23	18.4	
	Maximum Peak Current (*13)	A	-		160	100	80	58.5	39	29.2	23.4		
	Maximum Power	W	660	1000	1002	1005	1056	1050	1104				
	Maximum Peak Power (*13)	W	-		1200		1404						
	Maximum Line Regulation (*5)	mV	20		36	48	60	96	144	192	240		
	Maximum Load Regulation (*6)	mV	40		60	100	120	150		300	360		
	Temperature Coefficient		Less than 0.02%/°C										
	Ripple & Noise (*4)	0 to +71°C	mVp-p	120		150			200		400		
		-10 to 0°C	mVp-p	160		180			240		500		
	Hold-up Time (typ) (*9)	ms	20										
	Voltage Adjustable Range	VDC	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	
	Over Current Protection (*7)	A	>210.0		>175.3	>168.0	>105.0	>84.0	>61.4	>40.9	>30.6	>24.5	
Over Voltage Protection (*8)	VDC	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		
Remote Sensing		Possible											
Remote ON/OFF Control		Possible											
Parallel Operation		Possible											
Series Operation		Possible											
Monitoring Signal		PF (Open collector output)											
Line DIP		Built to meet SEMI-F47 (200VAC line only)											
Environment	Operating Temperature (*11)	°C	-10 to +71, start up -20 to +71										
		-10 to +40°C	%										
		+50°C	83.9		%								
		+71°C	%										
	Storage Temperature	°C	-30 to +85										
	Operating Humidity	%RH	10 - 90 (No Condensing)										
Storage Humidity	%RH	10 - 95 (No Condensing)											
Vibration		At no operating, 10 - 55Hz (sweep for 1min.) 19.6m/s ² constant, X, Y, Z 1hour each.											
Shock (In package)		Less than 196.1m/s ²											
Cooling		Forced air by blower fan											
Isolation	Withstand Voltage		Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output-FG : 500VAC (300mA) (60V model 651VAC (390mA)), Output-CNT:100VAC (100mA) for 1min.										
	Isolation Resistance		More than 100MΩ Output - FG : 500VDC More than 10MΩ Output - CNT 100VDC at 25°C and 70%RH										
Standards	Safety Standards (*12)		Approved by UL60950-1, CSA C22.2 No60950-1, EN60950-1,EN50178. Built to meet DENAN.										
	PFHC		Built to meet IEC61000-3-2										
	EMI		Built to meet EN55011/EN55022-B, FCC-ClassB, VCCI-ClassB, CISPR-ClassB.										
Mechanical	Immunity		Built 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										
	Weight (max)	g	3200										
	Size (W x H x D)	mm	126.5 x 82 x 240 (Refer to outline drawing)										

- (*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 100 - 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.)
- (*5) 85 - 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 then 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 100/200VAC, nominal output voltage and maximum output current.
- (*10) Measured by the each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
- (*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.
- (*12) As for DENAN, built to meet at 100VAC.
- (*13) Peak output current is less than 10 seconds, and duty 35% max.(200VAC Line only)

Recommended EMC Filter

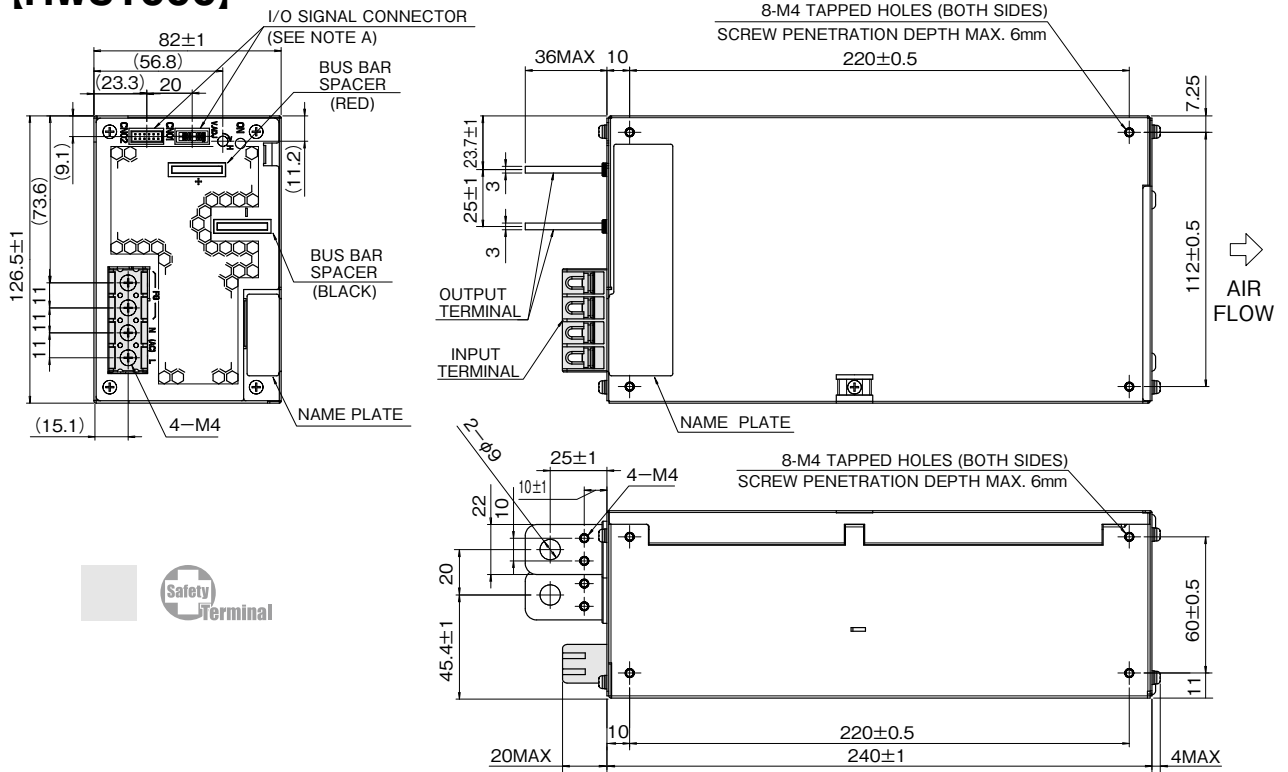


RSEN-2020

Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

[HWS1000]



[unit: mm]

[Chassis material:SPCC-SD]

NOTES

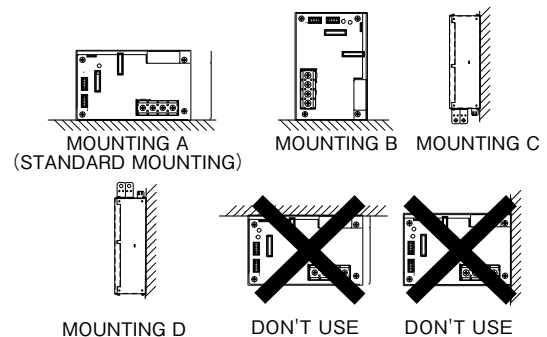
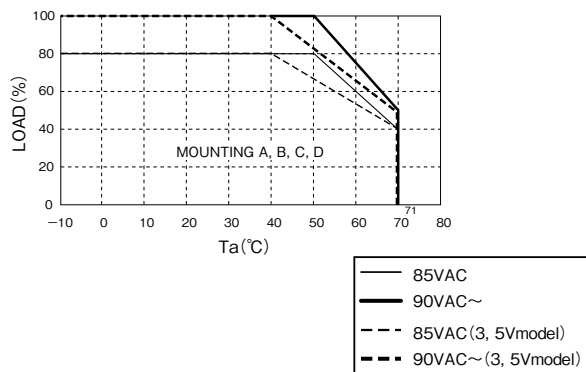
A : I/O SIGNAL CONNECTOR

- | | | |
|--------------------|-------------------------------|----------|
| CONNECTOR | : S12B-PHDS5 (LF) (SN) | (JST) |
| MATCHING HOUSING | : PHDR-12VS | (JST) |
| MATCHING CONTACT | : SPHD-002T-P0.5 (AWG28 - 24) | (JST) OR |
| | SPHD-001T-P0.5 (AWG26 - 22) | (JST) OR |
| | BPHD-001T-P0.5 (AWG26 - 22) | (JST) |
| HAND CRIMPING TOOL | : YRS-620 (SPHD-002T-P0.5) | (JST) |
| | YC-610R (SPHD-001T-P0.5) | (JST) |
| | YC-610R (BPHD-001T-P0.5) | (JST) |

ACCESSORIES

- * ATTACHED CONNECTOR SHORTING +S ~ +V, -S ~ -V, PV ~ REF & CNT ~ TOG ATTACHED ON CN02 AT SHIPMENT
- * A separate connector not included is required in order to utilize the power supply function.

Output Derating



*It cannot be used even the product is flipped vertically.

HWS1500 Specifications (Read instruction manual carefully, before using the power supply unit.)

ITEMS/UNITS	MODEL	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500	HWS1500					
		-3	-5	-6	-7	-12	-15	-24	-36	-48	-60					
Input	Voltage Range (*2)	AC85 - 265 or DC120 - 330														
	Frequency (*2)	47 - 63														
	Power Factor (100/230VAC)(typ) (*1)	0.98 / 0.94														
	Efficiency (100/200VAC)(typ) (*1)	%	72 / 75	77 / 81	79 / 82	81 / 83	82 / 85	83 / 87	84 / 88		86 / 90					
	Current (100/200VAC)(typ) (*1)	A	15.0 / 8.0		19.5 / 10.0		19.0 / 10.0									
	Inrush Current (100/200VAC)(typ) (*3)	A	20 / 40													
	Leakage Current (100/240VAC) (*10)	mA	1.5 max													
Output	Nominal Voltage	VDC	3.3	5	6	7.5	12	15	24	36	48	60				
	Maximum Current (100/200VAC)	A	300 / 300		250 / 250		200 / 200		125 / 125		100 / 100					
	Maximum Peak Current (*13)	A	-		300		240		-		105					
	Maximum Power (100/200VAC)	W	990 / 990		1500 / 1500				1560 / 1680		1512 / 1674		1536 / 1536			
	Maximum Peak Power (*13)	W	-		1800		-		2520				-			
	Maximum Line Regulation (*5)	mV	36			40		48		60		96		144		
	Maximum Load Regulation (*6)	mV	60			72		90		144		150		288		
	Temperature Coefficient	Less than 0.02%/°C														
	Ripple & Noise (*4)	+25 to +70°C	mVp-p	150									200		400	
		0°C	mVp-p	200				150				200				
		-10°C	mVp-p	220				200				240		400		
	Hold-up Time (typ) (*9)	ms	20			16		20								
	Voltage Adjustable Range	VDC	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				
Over Current Protection (*7)	A	>315.0		>262.5		>210.0		>131.2		>105.0		>68.2				
Over Voltage Protection (*8)	VDC	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 - 64.8	69.0 - 75.0					
Remote Sensing	Possible															
Remote ON/OFF Control	Possible															
Parallel Operation	Possible															
Series Operation	Possible															
Monitoring Signal	PF (Open collector output)															
Line DIP	Built to meet SEMI-F47 (200VAC Line only)															
Environment	Operating Temperature (*11)	°C	-10 to +70, start up -20 to +70													
	at Input Voltage 100VAC/200VAC	-10 to +40°C	W	990		1500				1560 / 1680		1512 / 1674		1536		
		+50°C	W	825		1250		1500				1560 / 1680		1512 / 1674		
		+60°C	W	660		1000		1125				1170 / 1260		1134 / 1255		
		+70°C	W	495		750				780 / 840		756 / 837		768		
Storage Temperature	°C	-30 to +85														
Operating Humidity	%RH	10 - 90 (No Condensing)														
Storage Humidity	%RH	10 - 95 (No Condensing)														
Vibration	At no operating, 10 - 55Hz (sweep for 1min.) 19.6m/s ² constant, X, Y, Z 1hour each.															
Shock (In package)	Less than 196.1m/s ²															
Cooling	Forced air by blower fan															
Isolation	Withstand Voltage	Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA), Output - CNT : 100VAC (100mA) Output - FG : 500VAC (300mA), (60V model 651VAC (390mA)) for 1min.														
	Isolation Resistance	More than 100MΩ Output - FG : 500VDC More than 10MΩ Output - CNT 100VDC at 25°C and 70%RH														
Standards	Safety Standards (*12)	Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1, EN50178. Built to meet DENAN.														
	PFHC	Built to meet IEC61000-3-2														
	EMI	Built to meet EN55011/EN55022-A, FCC-ClassA, VCCI-ClassA.														
Mechanical	Immunity	Built 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														
	Weight (typ)	g	4000				3800									
Size (W x H x D)	mm	126.5 x 82 x 280 (Refer to outline drawing)														

- (*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 100 - 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) 85 - 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 then 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 100/200VAC, nominal output voltage and maximum output current.
- (*10) Measured by the each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
- (*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.
- (*12) As for DENAN, built to meet at 100VAC.
- (*13) Peak output current is less than 10 seconds, and duty 35% max. (200VAC Line only)

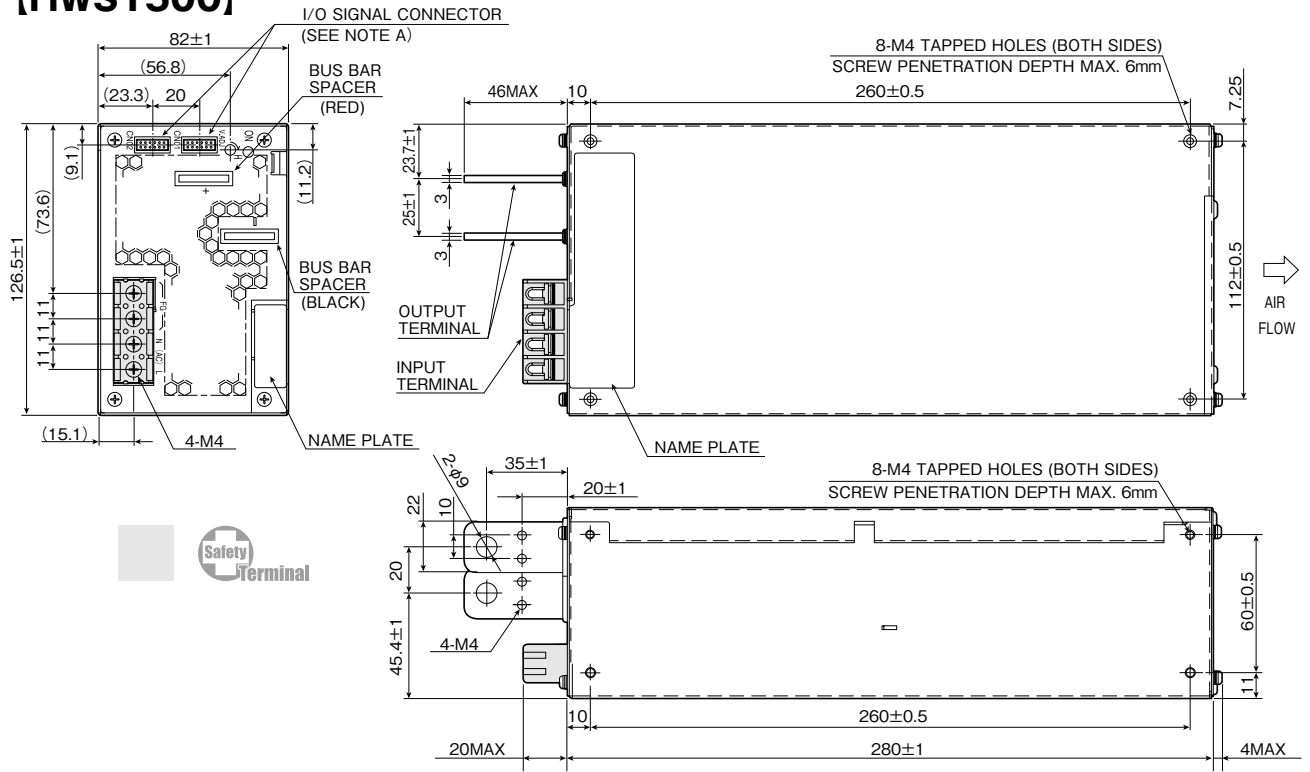
● Recommended EMC Filter



RSEN-2030
Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

[HWS1500]



[unit: mm]
[Chassis material:SPCC-SD]

NOTES

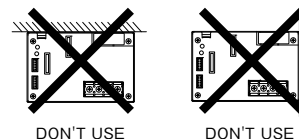
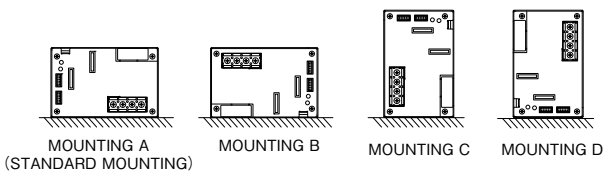
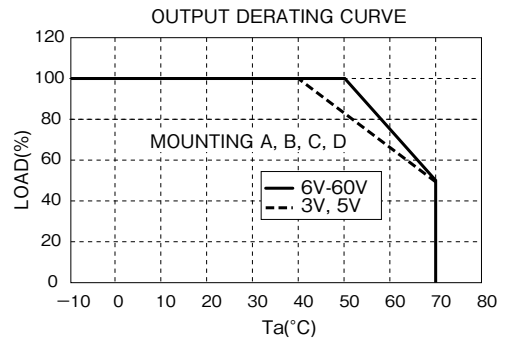
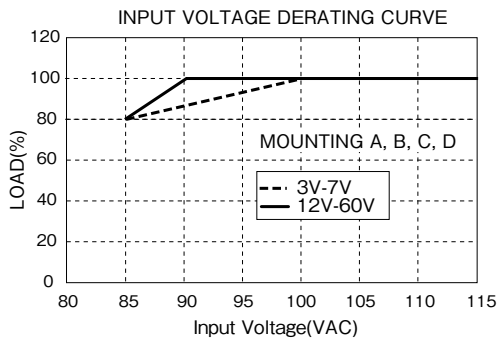
A : I/O SIGNAL CONNECTOR

CONNECTOR	: S12B-PHDSS (LF) (SN)	(JST)
MATCHING HOUSING	: PHDR-12VS	(JST)
MATCHING CONTACT	: SPHD-002T-P0.5 (AWG28 - 24) (JST) OR SPHD-001T-P0.5 (AWG26 - 22) (JST) OR BPHD-001T-P0.5 (AWG26 - 22) (JST)	
HAND CRIMPING TOOL	: YRS-620 (SPHD-002T-P0.5) (JST) YC-610R (SPHD-001T-P0.5) (JST) YC-610R (BPHD-001T-P0.5) (JST)	

ACCESSORIES

- * ATTACHED CONNECTOR
SHORTING +S ~ +V, -S ~ -V, PV ~ REF & CNT ~ TOG ATTACHED ON
CN01 AT SHIPMENT
- * A separate connector not included is required in order to utilize the power
supply function.

Output Derating



*It cannot be used even the product is flipped vertically.