HWS3000G/RF

A291-01-01/RF-B

SPECIFICATIONS (1/3)

ITEMS \ MODEL			HWS3000G -24/RF	HWS3000G -48/RF	HWS3000G -60/RF	HWS3000G -130/RF
INPUT RATING						
Input Voltage Range (*13)(*23)		-	85- 265VAC (47-63Hz)			
Efficiency (Typ.)	100/115VAC	%	89	90	90	91
(*2)	200/230VAC	%	91	92	92	93
Input Current (Typ.)	100/115VAC	A	17.4	17.3	17.2	17.1
(*2)	200/230VAC	A	17.4	17.2	17.2	17.1
Power Factor (Typ.)	100VAC	-	0.97			
(*2)	200VAC	-	0.95			
Inrush Current (Typ.)	100VAC	A	30 at 1st Inrush, 80 at 2nd Inrush			
(*2)(*3)	200VAC	A	60 at 1st Inrush, 80 at 2nd Inrush			
Leakage Current (*4)		-	LESS THAN 0.85 mA (240VAC , 60Hz)			
OUTPUT RATING						
Nominal Output Voltage		V	24	48	60	130
Maximum Output Voltage (*1)		V	28.8	52.8	66.0	156.0
Maximum Output Current (85VAC≤Vin≤132VAC) (*24)		A	62.5	31.3	25	11.6
Maximum Output Current (170VAC≤Vin≤265VAC) (*24)		A	125	62.6	50	23.2
Maximum Output Power (85VAC≤Vin≤132VAC)		W	1500	1502.4	1500	1508
Maximum Output Power (170VAC≤Vin≤265VAC)		W	3000	3004.8	3000	3016
CONSTANT VOLTAGE MODE						
Output Voltage Range by adjustment trimmer (*1)		V	19.2 - 28.8	38.4 - 52.8	48.0 - 66.0	104.0 - 156.0
Output Voltage Range by Programming (*1)(*5)		V	0 - 28.8	0 - 52.8	0 - 66.0	0 - 156.0
Maximum Line Regulation (*6)		mV	96	192	240	520
Maximum Load Regulation (*7)		mV	192	384	480	1040
Temperature Coefficient		-	0.02%/°C			
Maximum Ripple & Noise	0 ≤ Ta ≤ 70°C	mVp-p	300	400	500	866
(*8)	-20 ≤ Ta < 0°C	mVp-p	360	480	600	1083
Hold-up Time (Typ.)		-	20ms at 1500W, 10ms at 3000W			
Remote Sensing		-	Possible			
Output Voltage External Control Using CV Terminal		-	Apply external voltage or current : 1 - 5V or 4 - 20mA Output Voltage : 0% - Nominal output voltage			
Output Voltage External Control Using Modbus RTU (*17)		-	0 - 4,000 (Output Voltage : 0% - Nominal output voltage)			
CONSTANT CURRENT MODE						
Output Current External Control Range (*1)(*11) (85VAC≤Vin≤132VAC)		A	0 - 62.5	0 - 31.3	0 - 25.0	0 - 11.6
Output Current External Control Range (*1)(*11) (170VAC≤Vin≤265VAC)		A	0 - 125.0	0 - 62.6	0 - 50.0	0 - 23.2
Maximum Line Regulation (85VAC≤Vin≤132VAC) (*6)		mA	250	125.2	100	46.4
Maximum Line Regulation (170VAC≤Vin≤265VAC) (*6)		mA	500	250.4	200	92.8
Maximum Load Regulation (85VAC≤Vin≤132VAC) (*12)		mA	500	250.4	200	92.8
Maximum Load Regulation (170VAC≤Vin≤265VAC) (*12)		mA	1000	500.8	400	185.6
Temperature Coefficient		-	0.02% / °C			
Output Current External Control Using CC Terminal (85VAC≤Vin≤132VAC)		-	Apply external voltage or current : 1 - 3V or 4 - 12mA Output Current : 0% - Maximum output Current			
Output Current External Control Using Modbus RTU (*17) (85VAC≤Vin≤132VAC)		-	0 - 2,000 Output Current : 0% - Maximum output Current			
Output Current External Control Using CC Terminal (170VAC≤Vin≤265VAC)		-	Apply external voltage or current : 1 - 5V or 4 - 20mA Output Current : 0% - Maximum output Current			
Output Current External Control Using Modbus RTU (*17) (170VAC≤Vin≤265VAC)		-	0 - 4,000 Output Current : 0% - Maximum output Current			

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SPECIFICATIONS (2/3)

ITEMS \ MODEL			HWS3000G -24/RF	HWS3000G -48/RF	HWS3000G -60/RF	HWS3000G -130/RF
PROTECTION						
Over Current Protection (85VAC≤Vin≤132VAC)	(*9)	A	65.6 <	32.8 <	26.2 <	12.1 <
Over Current Protection (170VAC≤Vin≤265VAC)	(*9)	A	131.2 <	65.7 <	52.5 <	24.3 <
Over Voltage Protection	(*10)	V	30.4 - 31.5	56.1 - 58.1	70.2 - 72.6	165.1 - 170.3
ANALOG PROGRAMMING AND MONITORING						
Remote ON/OFF Control		-	Possible			
Parallel Operation	(*14)	-	Possible, Current balancing function is provided			
Series Operation	(*15)	-	Possible, Voltage balancing function is provided			
Output Voltage Monitor using VB terminal	(*16)	-	Output Voltage : 0% - Nominal output voltage VB terminal voltage : 1 - 5V			
Output Current Monitor using CB terminal (85VAC≤Vin≤132VAC)	(*16)	-	Output Current : 0% - Maximum output Current CB terminal voltage : 1 - 3V			
Output Current Monitor using CB terminal (170VAC≤Vin≤265VAC)	(*16)	-	Output Current : 0% - Maximum output Current CB terminal voltage : 1 - 5V			
Monitoring Signal		-	Power Fail(VPF, CPF), AC Fail(ACF) (Open Collector Output)			
COMMUNICATION						
Digital Communication	(*17)	-	Modbus RTU (RS-485)			
AUXILIARY OUTPUT						
Output Voltage (Typ.)		V	5			
Maximum Output Current		A	2			
ENVIRONMENT						
Operating Temperature	(*18)	-	-20 to +70°C, Guarantee Start up : -40 to -20°C			
Storage Temperature		-	-40°C to +85°C			
Operating Humidity		-	20 to 90%RH (Non Condensing)			
Storage Humidity		-	10 to 95%RH (Non Condensing)			
Vibration	(*19)(*20)	-	At no operating, 10 - 55Hz (Sweep for 1min) 19.6m/s^2 Constant, X,Y,Z 1hour each. Designed to meet MIL-STD-810G 514.7 Category4, 10			
Shock	(*19)(*20)	-	Less than 196m/s^2 Designed to meet MIL-STD-810G 516.7 Procedure I, VI			
Cooling	(*21)	-	Forced air cooling : Intake Air (Internal FAN)			
ISOLATION						
Withstand Voltage		-	Input-FG : 2.0kVAC (20mA) for 1min. Input-Output : 3.0kVAC (20mA) for 1min. Input-Signal, AUX : 3.0kVAC (20mA) for 1min. Output-Signal, AUX : 2.0kVAC (20mA) for 1min. Output-FG : 1.5kVAC (20mA) for 1min.			
Isolation Resistance		-	More than 100MΩ at 25°C and 70%RH, Output - FG 500VDC			
STANDARD AND COMPLIANCE						
Safety	(*13)	-	Approved by IEC/EN/UL/CSA 62368-1 (Altitude ≤ 5,000m) Approved by IEC/EN62477-1 (OVC III) (Altitude ≤ 2,000m) Designed to meet Den-an Appendix 12 (J62368-1)			
Conducted Emission	(*19)	-	Designed to meet EN55011/EN55032-A, FCC-ClassA, VCCI-A			
Radiated Emission	(*19)	-	Designed to meet EN55011/EN55032-A, FCC-ClassA, VCCI-A			
Harmonic Current	(*19)	-	Designed to meet IEC61000-3-2			
Immunity	(*19)(*22)	-	Designed to meet IEC61000-6-2 (IEC61000-4-2, -3, -4, -5, -6, -8, -11)			
Line DIP	(*19)	-	Designed to meet SEMI-F47 (at 200VAC)			

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SPECIFICATIONS (3/3)

ITEMS \ MODEL			HWS3000G -24/RF	HWS3000G -48/RF	HWS3000G -60/RF	HWS3000G -130/RF
MECHANICAL						
	Weight (Typ.)	kg	2.3			
	Size (W x H x D)	mm	150x 61 x 270 (Refer to Outline Drawing)			

*Read Instruction Manual (A291-04-01_) carefully, before using the power supply unit.

=NOTES=

*1. When using the product above the nominal output voltage, derate the output current so that the maximum output power is not exceeded. Please refer to Fig. A.
(*a) Limited by maximum output power value

*2. Ta=25°C, nominal output voltage and maximum output power.

*3. Not applicable for the inrush current to Noise Filter for less than 0.2ms.

*4. Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C.

*5. Output voltage external control range using CV terminal and communication function.

*6. 85 - 132VAC / 170 - 265VAC, constant load.

*7. No load - Full load, constant input voltage.

*8. Please refer to Instruction Manual (A291-04-01_) for measurement of ripple noise voltage.

*9. Constant current limit with automatic recovery.
If the overcurrent condition continues for more than 30 seconds, the output will shut down.
A dynamic overload, such as an output short circuit, will cause the output to shut down.

*10. OVP circuit will shut the output down, manual reset.

*11. Output voltage external control range using CC terminal and communication function.

*12. Minimum output voltage - Nominal output voltage, constant input voltage, maximum output current operation.

*13. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 120VAC / 200 - 240VAC (50 - 60Hz).

*14. Up to 10 units.

*15. Up to 3 units.

*16. Use a measuring instrument whose input impedance is 500kΩ or more.

*17. <Communication function example>
- Control of output voltage and output current. - Remote ON/OFF control.
- Product status including product life can be monitored.
- Operation history can be obtained. (OCP,OVP,AC Fail, etc.) etc.
Refer to instruction manual (A291-04-01_) and communication manual (A291-04-02_).

*18. Output Derating
- Refer to OUTPUT CURRENT vs. AMBIENT TEMPERATURE (A291-01-02_).
At -40 to -20°C, the electrical characteristics are not guaranteed.

*19. The specifications are based on TDK-Lambda standard measurement conditions.
The power supply is considered a component which will be installed into a final equipment.
The final equipment should be re-evaluated that it meets EMC, vibration and shock requirement.

*20. Mounting A only.

*21. Variable speed fan. Fan noise is 45dB (typ) at 25°C and 70% load.

*22. Signal and control ports interface cables length: Less than 3m, DC output power port cables length: Less than 30m.

*23. When changing the input voltage from 100Vac line to 200Vac line, or from 200Vac line to 100Vac line, first cut off the input and wait 60 seconds before changing.

*24. Please refer to Fig.B for maximum output power of each input voltage.

Fig.A

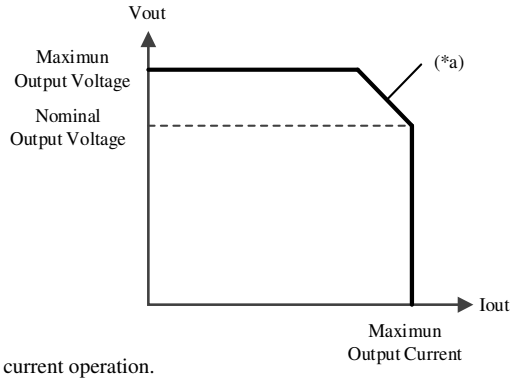
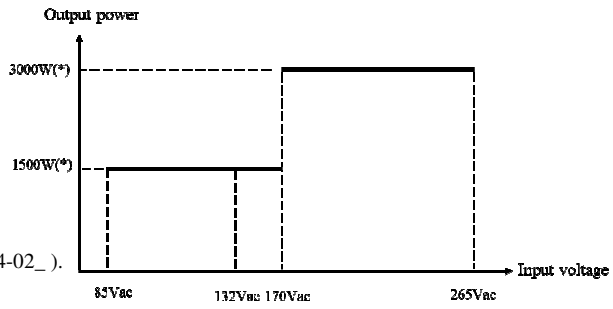


Fig.B



(*) Maximum output power depends on output voltage.
Refer to output ratings for values.