



**200W Open Frame type Medical power supply > HBU200**

**HBU200 series**

V1.4

The HBU200 series of AC/DC switching mode power supplies provide 200 Watts of continuous output power. All supplies are UL94V-1 min compliant. All models meet FCC Part-18, CISPR-11 and EN55011 class B emission Limits, IEC 60601-1-2:2014 and are designed to comply with UL/cUL, TUV T-mark and conformity assessment in CE marking. All units are 100% burned in and tested.



**200W Open Frame Medical Grade Power Supply**

**FEATURES:**

- \* Wide Operating Voltage, 90 to 260 VAC, 47 to 63 Hz
- \* Single Output
- \* Protection: OVP, OLP, OTP
- \* Size : 2"x4"x1.75"
- \* Input to Output : 2MOPP
- \* High ESD immunity
- \* Suitable professional healthcare facility
- \* 3 year warranty



**APPLICATIONS:**

- \* Patient Monitor
- \* Ultrasound system
- \* Portable medical device
- \* Blood chemistry analyzer
- \* Medical Image

**GENERAL SPECIFICATION:**

- \* **Short Circuit Protection:** Auto Recovery
- \* **Cooling:** 150W full load at free air convection, 200W with 10CFM forced air.
- \* **Flammability Rating:** UL94V-1
- \* **Protection Classes:** Class I
- \* **Safety:** IEC60601-1 Edition3.1, ES60601-1:2005(R2012), CSAC22.2 NO.60601-1:14, EN60601-1:2006/A1:2013

**APPROVALS:**



**Electrical Characteristics:**

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
Vins	Safety Approval Input Voltage Range	Safety Approval & Specification in Label	100		240	VAC
Vin	Input Operate Voltage Range	Detail to see Fig.1	90		260	VAC
Fi	Input Frequency	Sine wave	47		63	Hz
PF	Power Factor Correction		0.90		1	
Po	Output Power Range	See Rating Chart			200	W
Iil	Low Line Input Current	Full Load, Vin=100VAC		3		A
Iih	High Line Input Current	Full Load, Vin=240VAC		1		A
Irl	Low Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=100VAC			50	A
Irh	High Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=240VAC			100	A
Ik	Safety Ground Leakage Current	Vin=240VAC, Fi=60Hz			0.25	mA
η	Efficiency	Full Load, Vin=230VAC, Detail to see Rating Chart				See Rating Chart
ΔVoi	Line Regulation	Full Load, Vin=100~120VAC or 200~240VAC			1	%
OVP	Over Voltage Protection	Latch off, recycle input to reset	112		132	%
OLP	Over Load Protection	Recovers automatically after fault condition is removed	102		150	%
ttr	Time of Transient Response	Io=Full Load to Half Load, Vin=110VAC			4	ms
thu	Hold-Up Time	Full Load, Vin=110VAC				See Rating Chart
ts	Start-up time	Full Load, Vin=100~240VAC			1	s
Ris	Insulation Resistance		50			MΩ
Tc	Temperature Coefficient	All Condition			±0.04	%/°C
HV	Dielectric Withstanding Voltage (P-S)	Primary to Secondary, limit current <10mA	4000			VAC
Vpg	Dielectric Withstanding Voltage (P-G)	Primary to PE, limit current <10mA	2828			VAC
EMI	EMC Emission	Compliance to EN55011 (CISPR11), EN60601-1-2	B			Class

**Environmental:**

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
To	Operating Temperature	Detail to see Fig.2 (Derate linearly from 100% load at 40°C to 50% load at 70°C)	-10		70	°C
Ts	Storage Temperature	10 ~ 95% RH	-40		85	°C
Ho	Operating Humidity	non-condensing	0		95%	RH
Hs	Storage Humidity		0		95%	RH
ESDa	Electro Static Discharge	Air Discharge, IEC61000-4-2			15	kV
ESDc	Electro Static Discharge	Contact Discharge, IEC61000-4-2			8	kV
MTBF	Mean Time Between Failure	Operating Temperature at 25°C, Calculated per MIL-HDBK-217F	200k			h
ELEV	Operating Altitude (Elevation)	All condition			5000	m
VBR	Vibration	10 ~ 500Hz, 10min./1cycle, 60min. each along X, Y, Z axes			5	G
Vsl	Surge Voltage	Line-Neutral			1	kV
Vsg	Surge Voltage	Line-PE & Neutral-PE			2	kV



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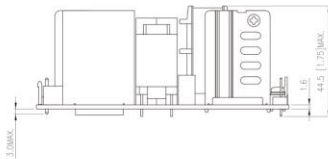
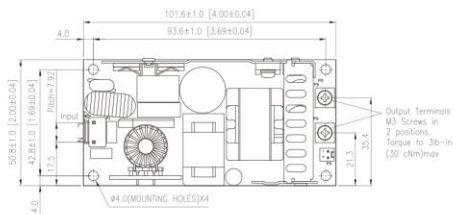
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**SPECIFICATION NOTE :**

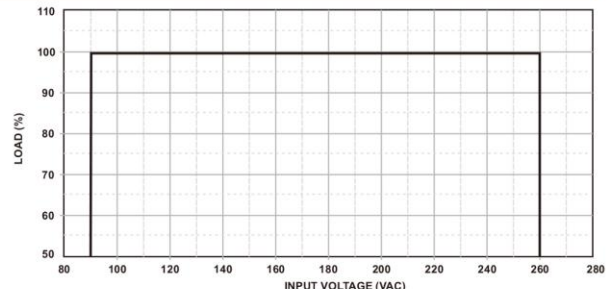
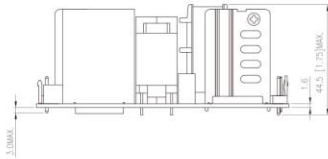
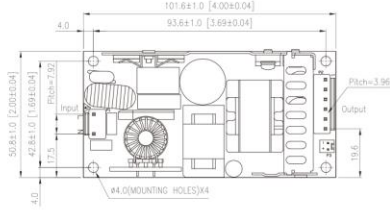
1. Output can provide up to peak load when the power supply starts up. Continuous staying in more than rated load is not allowed.
2. At factory, in 60% rated load condition, each output is checked to be within voltage accuracy.
3. Line regulation is defined by changing  $\pm 10\%$  of input voltage from nominal line at rated load.
4. Load regulation is defined by changing  $\pm 40\%$  of measured output load from 60% rated load.
5. The ripple is measured from peak to peak with a bandwidth-limit of 20MHz (Measured at the output connector with a 0.1uF ceramic capacitor and a 47uF electrolytic capacitor).
6. Hold up time is measured from the end of the last charging pulse to the time which the main output drops down to low limit of main output at rated load and nominal line.
7. Efficiency is measured at rated load, and nominal line.

**MECHANICAL DIMENSIONS: ( UNIT: mm [inch] )**

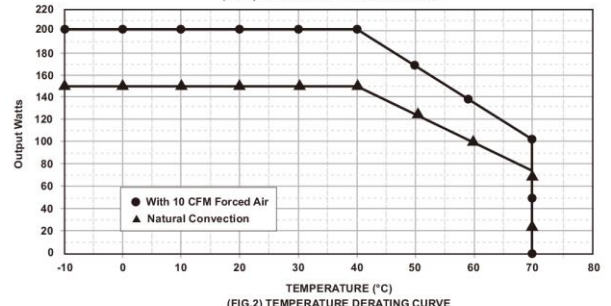
HBU200-105~107



HBU200-108~111



(FIG.1) INPUT VOLTAGE DERATING CURVE



(FIG.2) TEMPERATURE DERATING CURVE

**PIN CHART**

HBU200-105~107

MODEL	Screw Terminal	P5	P6
HBU200-105~107	out	RTN	

P3:With Optional Vo2

MODEL	PIN	1	2
HBU200-1XXP	Vo2	RTN	

HBU200-108~111

P2:Single Output

MODEL	PIN	1	2	3	4	5	6
HBU200-108~111	OUT	OUT	OUT	RTN	RTN	RTN	

P3:With Optional Vo2

MODEL	PIN	1	2
HBU200-1XXP	Vo2	RTN	

**PACKING :**

1. Net weight: 245g approx.
2. Input connector mates with JST housing VHR-3N and JST SVH series crimp terminal..
3. HBU200-108~111 output connector mates with JST housing VHR-6N and JST SVH series crimp terminal.

**Rating Chart:**

MODEL NO.	Voltage Range		Output Current			Maximum Output Power		Ripple & Noise	Total Regulation	Typ. Efficiency	Typ. No Load Consumption	Hold-Up Time
	Vo1	Optional Vo2	Vo1		Optional Vo2	Max1	Max2*					
			(VDC)	(VDC)								
HBU200-105(P)	12.0	12.0	12.5	16.67	0.1	150	200	120	$\pm 3$	90	0.21	20
HBU200-106(P)	15.0	12.0	10.0	13.33	0.1	150	200	150	$\pm 3$	90	0.21	20
HBU200-107(P)	19.0	12.0	7.89	10.52	0.1	150	200	190	$\pm 3$	90	0.21	20
HBU200-108(P)	24.0	12.0	6.25	8.33	0.1	150	200	240	$\pm 3$	91	0.21	20
HBU200-109(P)	30.0	12.0	5.00	6.66	0.1	150	200	240	$\pm 3$	91	0.21	20
HBU200-110(P)	36.0	12.0	4.16	5.55	0.1	150	200	240	$\pm 3$	92	0.21	20
HBU200-111(P)	48.0	12.0	3.12	4.16	0.1	150	200	240	$\pm 3$	92	0.21	20

\*With 10 CFM Forced Air to max load  
 \*Max1:Free Air Max2:Forced Air  
 \*\*"P" means with optional Vo2 (12V@0.1A)