medical

SINPRO

MBU500 series

V1.4

508.6W Open Frame Medical Grade Power Supply

The MBU500 series of AC/DC switching mode power supplies provide 508.6 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.

RoHS2 2011/65/EU

5K

FEATURES:

* Wide Operating Voltage, 90 to 264 VAC, 47 to 63 Hz
* Single Output
* Protection: OVP, OLP, OTP, OCP
* Size : 3”x5”x1.38”
* Input to Output : 2MOPP
* High power density
* Suitable professional healthcare facility
* 5 year warranty

APPLICATIONS:

* Patient Monitor
* Ultrasound system
* Blood chemistry analyzer
* Medical Image

APPROVALS:

c UL us CE CB

GENERAL SPECIFICATION:

* **Short Circuit Protection**: Auto Recovery
* **Cooling**: 240W full load at air convection, 508.6W with 25 CFM 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

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		264	VAC
Fi	Input Frequency	Sine wave	47		63	Hz
PF	Power Factor Correction		0.95		1	
Po	Output Power Range	See Rating Chart			508.6	W
Iil	Low Line Input Current	Full Load, Vin=115VAC		5.6		A
Iih	High Line Input Current	Full Load, Vin=240VAC		2.4		A
Irl	Low Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=115VAC			60	A
Irh	High Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=230VAC			120	A
Ik	Leakage Current	Vin=240VAC, Fi=60Hz (Input-Output)		0.15	0.3	mA
η	Efficiency	Full Load, Vin=230VAC, Detail to see Rating Chart	See Rating Chart			
▵Voi	Line Regulation	Full Load, Vin=100~120VAC or 200~240VAC			1	%
OVP	Over Voltage Protection		112		132	%
OLP	Over Load Protection	Recovers automatically after fault condition is removed	110		150	%
ttr	Time of Transient Response	Io=Full Load to Half Load, Vin=115VAC			4	ms
thu	Hold-Up Time	Full Load, Vin=230VAC	See Rating Chart			
ts	Start-up time	Full Load, Vin=115~240VAC			2	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	2000			VAC
EMI	EMC Emission	Compliance to EN55011 (CISPR11), EN60601-1-2 (Conducted)	B			Class
EMI	EMC Emission	Compliance to EN55011 (CISPR11), EN60601-1-2 (Radiated)	A			Class

Environmental:

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
To	Operating Temperature	Detail to see Fig.2 (Derate linearly from 100% load at 50°C to 50% load at 70°C)	-40		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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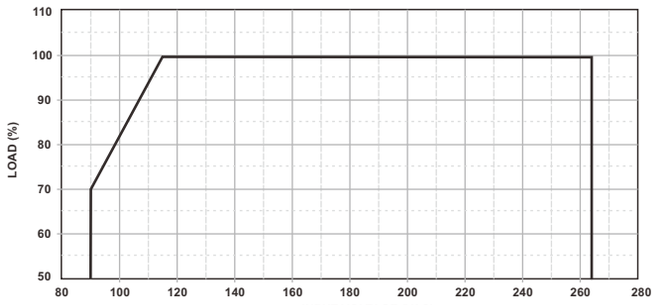
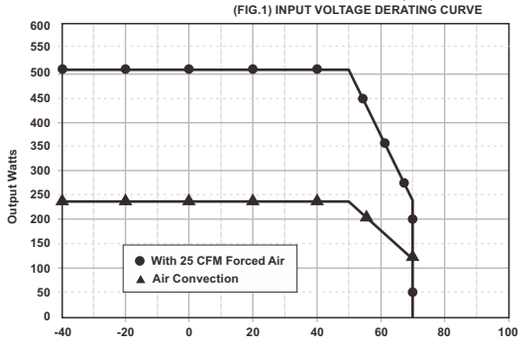
SPECIFICATION NOTE :

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 ±10% of input voltage from nominal line at rated load.
4. Load regulation is defined by changing ±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.

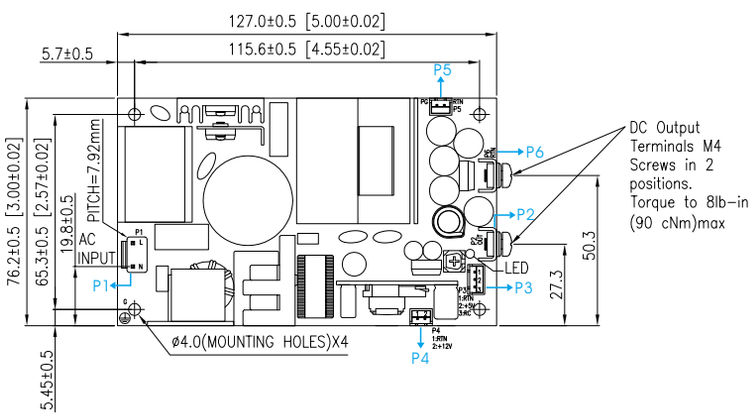


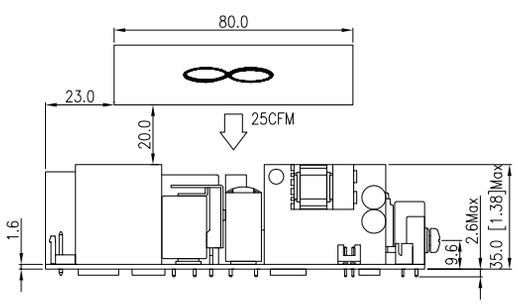
(FIG.1) INPUT VOLTAGE DERATING CURVE



(FIG.2) TEMPERATURE DERATING CURVE

MECHANICAL DIMENSIONS: (UNIT: mm [inch])





PIN CHART

Main Output (Vo1)

MODEL \ Output Terminals	P2	P6
MBU500-105P~111P	OUT	RTN

P3:5V Standby power (Optional)

MODEL \ PIN	1	2	3
MBU500-105P~111P	RTN	+5V	Remote Control

Turns the output ON/OFF by electrical or dry contact.
* Pin 3 shorts to Pin2 : Power ON
* Pin 3 shorts to Pin1(RTN) : Power OFF

P4:FAN Output (12V)

MODEL \ PIN	1	2
MBU500-105P~111P	RTN	+12V

P5:PG (5V)

MODEL \ PIN	1	2
MBU500-105P~111P	PG	RTN

PACKING :

1. Net weight : 450g approx.
2. Input connector mates with JST housing VHR-3N and JST SVH series crimp terminal.
3. P2 and P6 output terminals M4 screws in 2 positions, torque to 8 lb-in(90 cNm).
4. P3 connector mates with JST housing XHP-3 and JST SXH series crimp terminals.
5. P4 and P5 connector mates with JST housing XHP-2 and JST SXH series crimp terminals.

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	FAN output	Vo1		FAN output									
	(VDC)	(VDC)	Max1 (A)	Max2 (A)	Max1 (A)	Max2 (A)	Max1 (W)	Max2 (W)	(mVp-p)	(%)	(%)	(W)	Max1 (ms)	Max2(230VAC) (ms)
MBU500-105(P)	12.0	12.0	19.69	41.67	0.1	0.3	240	508.6	120	±3	90	1	16	12
MBU500-106(P)	15.0	12.0	15.75	33.33	0.1	0.3	240	508.6	150	±3	90	1	16	12
MBU500-107(P)	19.0	12.0	12.44	26.31	0.1	0.3	240	508.6	190	±3	90	1	16	12
MBU500-108(P)	24.0	12.0	9.85	20.83	0.1	0.3	240	508.6	240	±3	91	1	16	12
MBU500-109(P)	30.0	12.0	7.88	16.66	0.1	0.3	240	508.6	300	±3	91	1	16	12
MBU500-110(P)	36.0	12.0	6.56	13.88	0.1	0.3	240	508.6	360	±3	92	1	16	12
MBU500-111(P)	48.0	12.0	4.92	10.41	0.1	0.3	240	508.6	480	±2	92	1	16	12

*Max1:Air convection Max2:With 25 CFM Forced Air
*"P" means with standby output : (5V@0.5A) Air convection ; (5V@1A) Forced Air
*Fan output(Max2) could provide 0.5A peak current.