



# SPECIFICATION

For

SWITCHING POWER SUPPLY

**M/N: MPM-U303**

## Revisions History

REV.	Mar. 16 <sup>th</sup> 2009	Update mechanical dimension (Height).
REV.	Apr. 20 <sup>th</sup> 2009	Update description of point 1 and derating curve of point 5.
REV.	Jul. 15 <sup>th</sup> 2009	Update the information of Safety Approvals in section 6.
		Adding description of two optional requirements in section 8.
REV.	Aug. 19 <sup>th</sup> 2009	Update the photograph of power supply.
		Adding the voltage of fan at section 7.
REV.	Oct. 8 <sup>th</sup> 2009	Adding detailed description of the special condition of criteria A.
REV.	Oct. 13 <sup>rd</sup> 2009	Revised the min. output current.
REV.	Feb. 9 <sup>th</sup> 2010	Updating the efficiency can up to 91%, derating curves with start up at -20°C and adding mechanical drawing with cover provided.
REV.	Mar. 15 <sup>th</sup> 2010	Adding the drawing and spec of screws for fix bottom enclosure.
REV.	Aug. 20 <sup>th</sup> 2010	UL 60601-1 1 <sup>st</sup> edition approved.



BF direct patient  
contact rated



CB

C<sub>RU</sub> US

## FEATURES

- 300W convection cooled and 360W forced air cooling single output medical power supply
- Active PFC meets Class D
- Conducted EMI meets CISPR/FCC Class B
- High Efficiency up to 91%
- Adjustable output range
- Design to meet medical standard IEC 60601-1, EN 60601-1, UL 60601-1 type BF rated

## 1. Description

MPM-U303 is a fan-less 300W, U-frame, switching power supply with PFC function for medical application.

Model Number	Output Voltage range <sup>(Note 1)</sup>	Min. Output Current	Rated Output Power	Max. Output Power	Total Regulation <sup>(Note 2)</sup>	Ripple & Noise p-p <sup>(Note 3)</sup>	Initial Setting Accuracy <sup>(Note 4)</sup>
MPM-U303	+12-14V / 12V	0 A	300W	360W	±2%	±1%	1%

**Total Output Power:** total maximum power is rated 300W, peak 360W max. 5 seconds with convection cooled; max. 360W continuously with 40.6CFM forced air cooling at 50°C environment temperature.

Note: 1) Output voltage can be adjusted by variable resistor with nominal 12V which would be adjusted at factory.

2) Total regulation is measured a setting output voltage. Input voltage is from 90-264VAC and output from 0W to 360W.

3) Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.

4) Voltage setting is at nominal AC input voltage, 60% rated load and 25°C.

## 2. Input Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Input Voltage	Continuous input range	90	115/230	264	VAC
Input Frequency	AC input.	47	50/60	63	Hz
Hold Up Time		16			ms
Inrush Current				60	A

## 3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	AC 230V input, rated load			91	%
Minimum load					See Chart of Description
Ripple & Noise	Rated load, 20MHz bandwidth				See Chart of Description
Total Regulation	On condition of a setting output voltage, input voltage from 90-264VAC and output from 0W to 360W.				See Chart of Description

## 4. Interface Signals and Internal Protection

Parameter	Conditions/Description
Remote Voltage sense <sup>(Note 1)</sup>	Compensates for wire voltage drop.
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.
Over Voltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will shut down the outputs to prevent damaging external circuits.
Over Temperature Protection	When the power supply operating over the temperature or over load limit, the power supply will be shut down automatically to protect itself.

Note: 1) Only applies to 12~13V output.

## 5. Part number coding



MPM-U30X-W

**Output voltage**  
 X = 3: +12Vdc  
 X = 3-1: +13.8Vdc

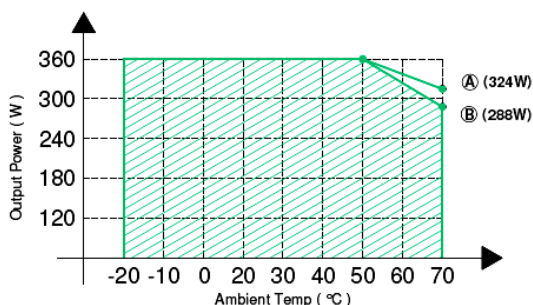
**Option**  
 W = C: with cover assembled.  
 W = D: voltage dips criteria A complies.  
 W = E: with European terminal blocks both input CN1 and output CN2.

[Confirm availability of P/N with Magic Power.](#)

### 6. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Storage Temperature		-20		+85	°C
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			2K 4K	Meter
Operating Temperature	Could be start up at -20°C Derate above 50°C to a maximum temperature of 70°C as curves below:	-20		+50 +70	°C

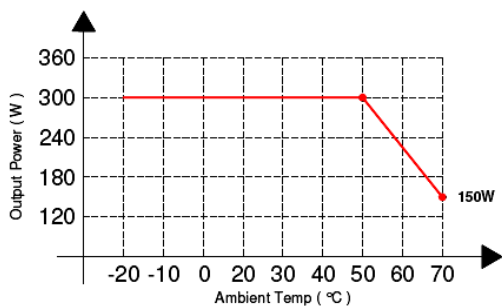
#### Derating curves



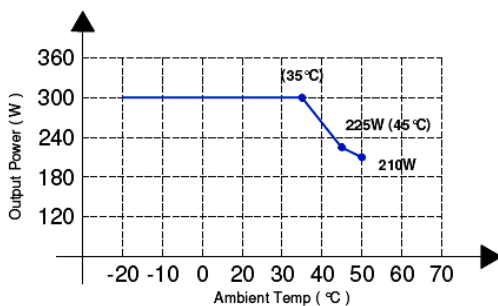
Ⓐ 14V output ( Maximum adjustable output voltage )

Ⓑ 12V output ( Minimum adjustable output voltage )

: With 23.3 CFM forced air cooling ( Applies to all output voltage )



**Convection cooled**  
( MPM-U303 ; 12V & 14V output )



**Convection cooled with optional cover**  
( Model number with suffix code: -C )

### 7. Safety Approvals, EMI and EMS Specification



Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Approvals	UL, UL 60601-1				1 <sup>st</sup> edition
	CB, IEC 60601-1: 2005				3 <sup>rd</sup> edition
	TUV, EN 60601-1: 2006				3 <sup>rd</sup> edition
Leakage Current	Patient Leakage Current at 264Vac, 63Hz normal condition	BF			Type
	(Primary to Earth GND)			150	uA
	(Secondary to Earth GND)			100	uA
EMI <sup>(Note 1)</sup>	EN 60601-1-2: 2001	B			
	EN 55011 / EN 55022	B			Class
PFC	EN 61000-3-2: 2000 & EN 610003-3: 2001	D			
EMS	IEC 61000-4-2: 2001, 8KV air discharge, 6KV contact discharge	A			
	IEC 61000-4-3: 2002, 10V/m	A			
	IEC 61000-4-4: 2004, 2KV line & PE	A			
	IEC 61000-4-5: 2001, 1KV line to line, 2KV line to PE	A			
	IEC 61000-4-6: 2004, 10V/m	A			
	IEC 61000-4-8: 2001, 3A/m	A			
	IEC 61000-4-11: 2004, Voltage dips >95%, 0.5 cycle	A			
		Voltage dips 30%, 5 cycles	A		
	Voltage dips 60%, 25 cycles	A-B*			
	Voltage interruptions >95%, 250 cycles	B			

\* Criteria A option by request separately, find section 9 for detail.

Note: 1) As a build-in type power supply, the power supply needs to be installed in a suitable enclosure to pass the EMI/EMC tests. The final assembly has to comply with the valid EMI/EMC and safety.

### 8. Mechanical

Parameter	Conditions/Description
Dimension	198 (L) x 97 (W) mm, tolerance +/- 0.4mm, with (H) 41 mm, tolerance +0/-0.5 mm.
Connector	CN1 --- AC input: 3 Positions Terminal Blocks, European type by request.
	CN2 --- DC output: 4 Positions Terminal Blocks, European type by request.
	CN3 --- Output remote sense: 2 Positions
Pin Assignment	CN1 Pin 1. L 2. N 3.GND
	CN2 Pin 1. V+ 2. V+ 3. V- 4. V-
	CN3 Pin 1. Remote Sense + 2. Remote Sense -
	FAN <sup>(Note 1)</sup> Pin 1. V+ 2. V-

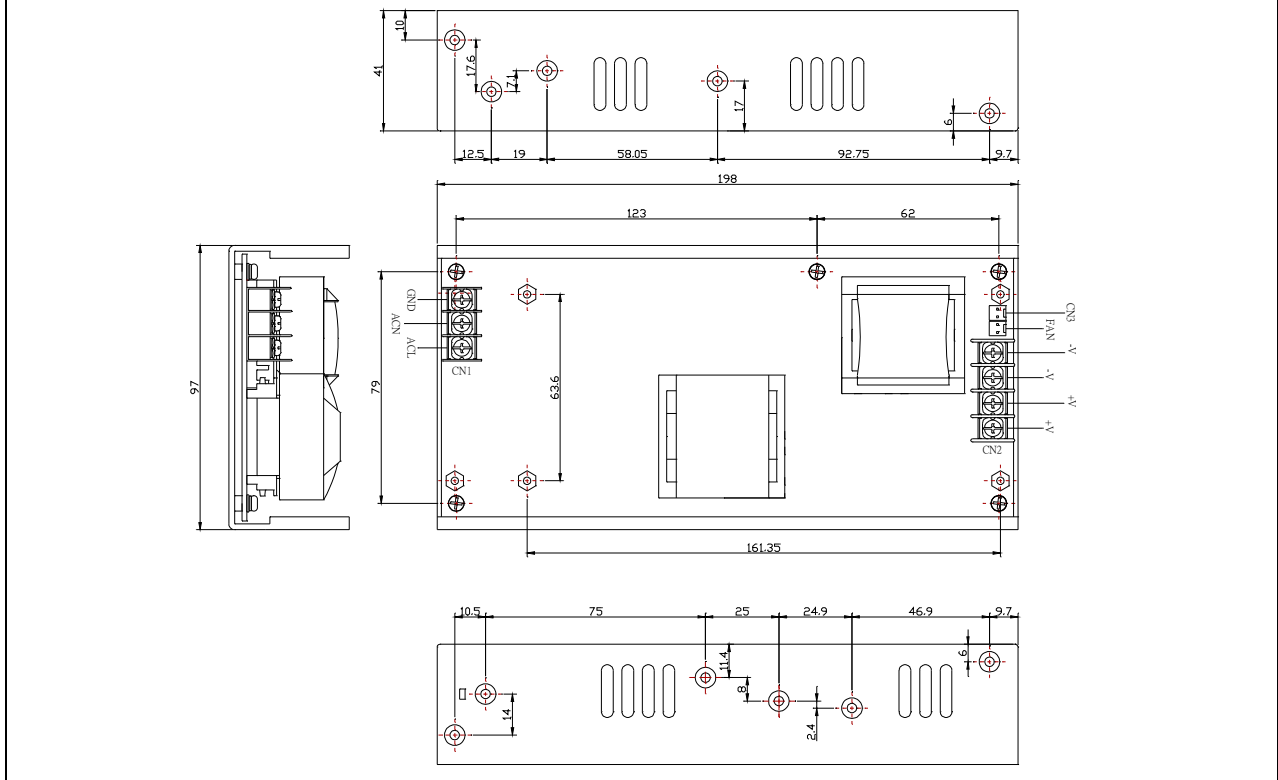
Note: 1) The voltage of fan is the same with the output voltage of power supply.

※The mechanical drawing is on next page.

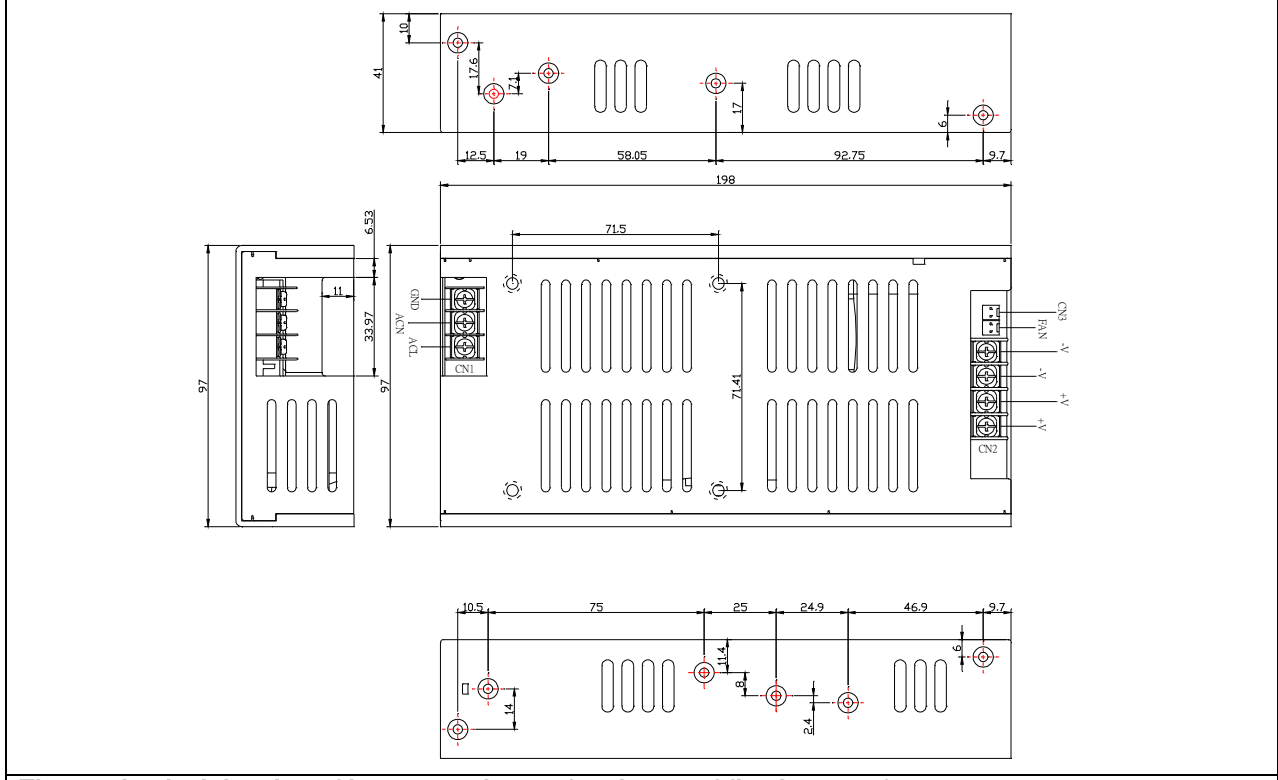
Mechanical drawing



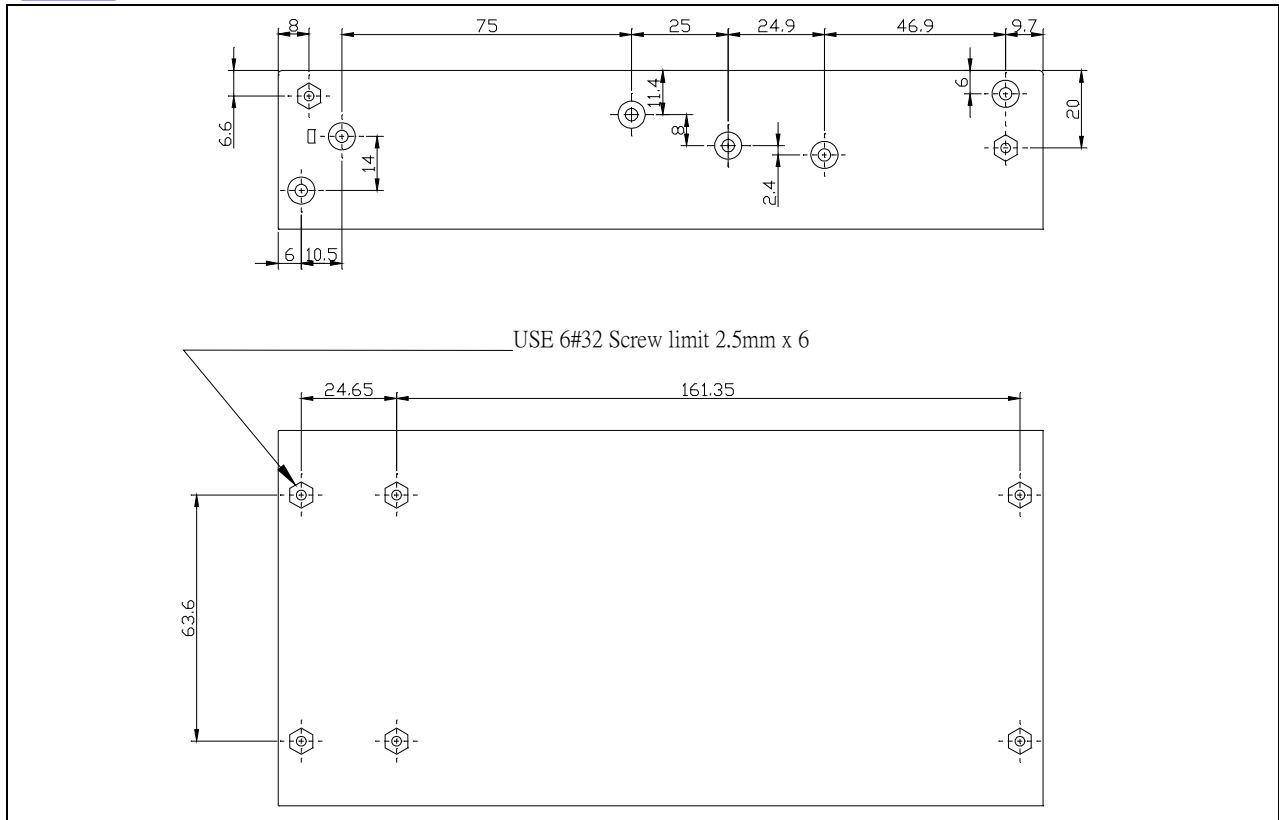
Without cover provided:



With cover provided ( Model number with suffix code: -C ):



The mechanical drawing of bottom enclosure ( and spec of fixed screws ):



### 9. Option

*\* Please contact us for the availability and pricing*

Parameter	Conditions/Description
Cover (P/N 831-U30U)	Order part number with suffix code "-C", with cover assembled.
European terminal block appliance	Order part number with suffix code "-E" with European terminal blocks both input CN1 and output CN2.
DIP criteria A (for MPM-U303 only)	Criteria A is only at output loading under 240W condition; When output loading above 240W, it will be criteria B. Order part number MPM-U303-D.
UPS charger module	Additional module available by request separately for UPS charger function.
Multi outputs module	Additional module available by request separately for multi outputs.