



SPECIFICATION

For

SWITCHING POWER SUPPLY

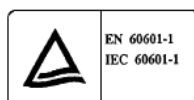
M/N: MPM-U30R

Revisions History

REV.	Dec. 19 th 2008	Update based on prototype.
REV.	Feb. 23 th 2009	Update derating curves.
REV.	Mar. 16 th 2009	Update mechanical dimension.(Height)
REV.	Mar. 24 th 2009	Update derating curves.
		Update mechanical draws.
REV.	Jul. 15 th 2009	Update the information of Safety Approvals in section 6.
		Adding description of two optional requirements in section 8.
REV.	Aug 6 th 2009	Revise description of section 1 and 4, the efficiency of section 3 is 91%.
		Update derating curves.
REV.	Aug 19 th 2009	Adding the voltage of fan at section 7.
		Adding option at section 8.
REV.	Sep 21 st 2009	Correcting the derating curves.
REV.	Oct 20 th 2009	Revised the EMS Specification.
REV.	Feb. 10 th 2010	Update derating curves and adding mechanical drawing with cover provided.
REV.	Mar. 15 th 2010	Adding the drawing and spec of screws for fix bottom enclosure.
REV.	Aug. 20 th 2010	UL 60601-1 1 st edition approved.



BF direct patient
contact rated



FEATURES

- 300W convection cooling 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%
- Design to meet medical standard IEC 60601-1, EN 60601-1, UL 60601-1 type BF rated

1. Description

MPM-U30R is a fan-less 300W medical, U-frame, dual output switching power supply with active PFC.

Output Voltage	Min. Output Current	Rated Output Current	Max. Output Current	Total Regulation <small>(Note 1)</small>	Ripple & Noise p-p <small>(Note 2)</small>	Initial Setting Accuracy <small>(Note 3)</small>
+36V	0A	8A	9.7A	±2%	±1%	1%
+5V <small>(Note 4)</small>	0A	1.5A	2A	±5%	50mV	5%

Total Output Power (Note 5): total maximum power is rated 300W, peak 360W max. 5 seconds with convection cooling; max. 360W continuously with 23.3CFM forced air cooling at 50°C environment temperature.

Note: 1) Total regulation is measured a setting output voltage. Input voltage is from 90-264VAC and output from 0W to 360W.

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

3) Voltage setting is at 60% rated load and 25°C ambient temperature.

4) +5V output is floating.

5) The maximum output power should not get over than 360W.

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	Compensates for wire voltage drop.
Short Circuit Protection	Fully protected against short circuit. Automatic recovery upon of short circuit 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. The trigger point is between 37.3-41.1V.
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.



5. Part number coding

MPM-U30 X - W

Output voltage
X = R: +36Vdc, +5Vdc

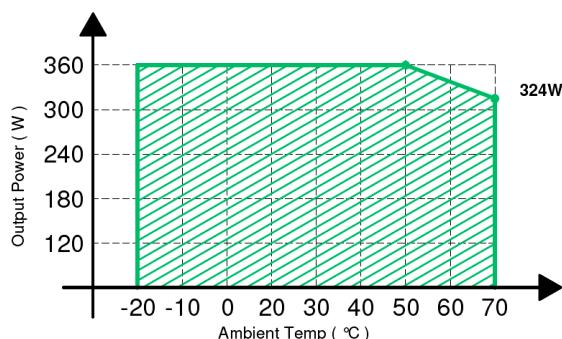
Option
W = C: with cover assembled.
W = D: voltage dips criteria A complies.
W = E: with European terminal blocks both input CN1 and output CN2.
W = S: with direction reverse protection available in two pieces serial connection application.

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

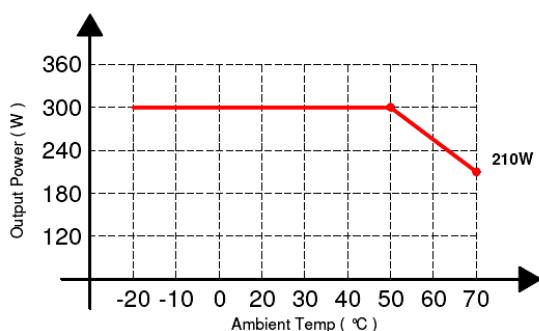
6. Environment Specification

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

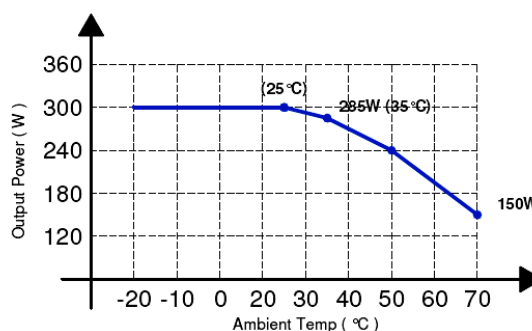
Derating curves



: With 23.3 CFM forced air cooling



**Convection cooled
(MPM-U30R)**



**Convection cooled with optional cover
(MPM-U30R-C)**



7. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Approvals	UL, UL 60601-1 1 st edition CB, IEC 60601-1: 2005 3 rd edition TUV, EN 60601-1: 2006 3 rd edition				approved
Leakage Current	Patient Leakage Current (Primary to Earth Gnd) (Secondary to Earth Gnd)	BF		150 100	Type uA uA
EMI ^(Note 1)	EN 60601-1-2: 2001 EN 55011 / EN 55022	B 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 IEC 61000-4-3: 2002, 10V/m IEC 61000-4-4: 2004, 2KV line & PE IEC 61000-4-5: 2001, 1KV line to line, 2KV line to PE IEC 61000-4-6: 2004, 10V/m IEC 61000-4-8: 2001, 3A/m IEC 61000-4-11: 2004, Voltage dips >95%, 0.5 cycle Voltage dips 30%, 25 cycles Voltage dips 60%, 5 cycles Voltage interruptions >95%, 250 cycles	A A A A A A A A A-B* B			Criteria

* 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/-0.5mm.
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. +36V 2. 0V 3. 0V 4. +5V CN3 Pin 1. Remote Sense + 2. Remote Sense - FAN ^(Note 1) Pin 1. + 2. -

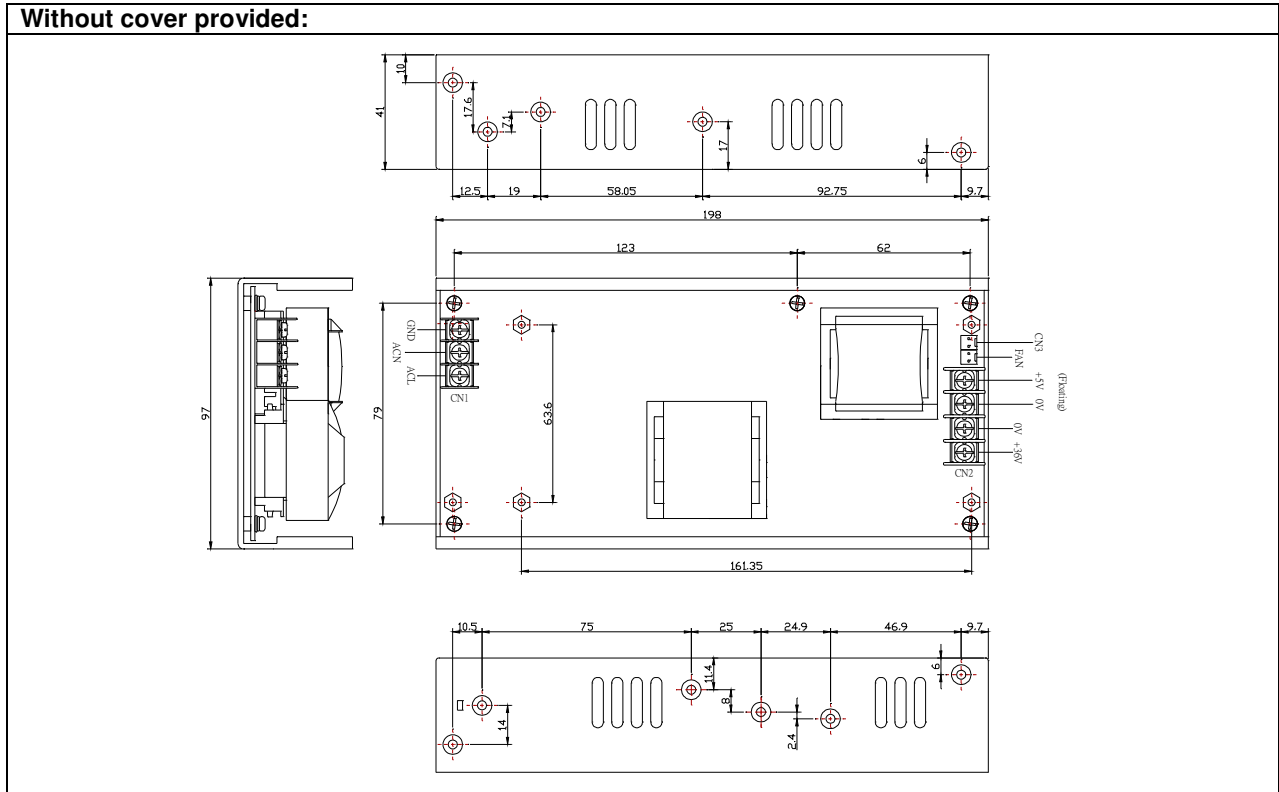
Note: 1) The voltage of fan is the same with the output voltage of power supply.

※The mechanical drawing is on next page.

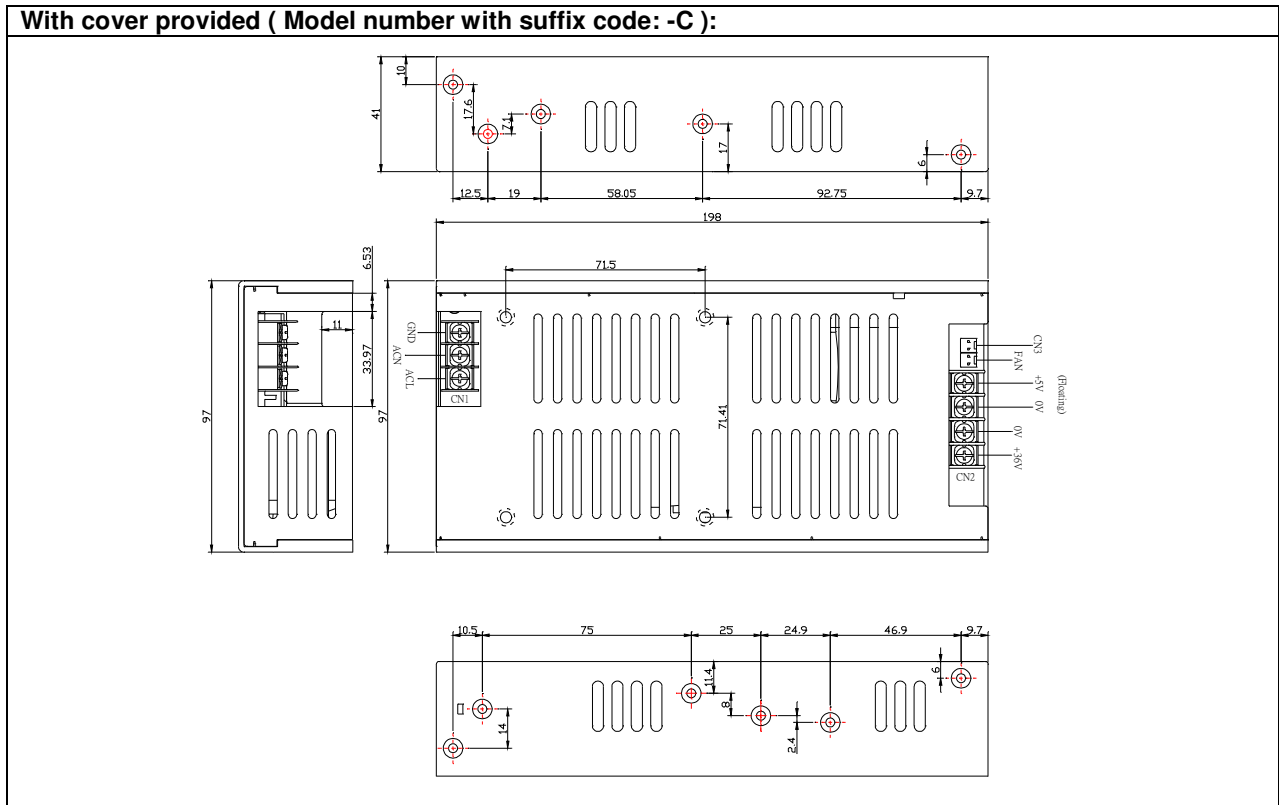


Mechanical drawing

Without cover provided:

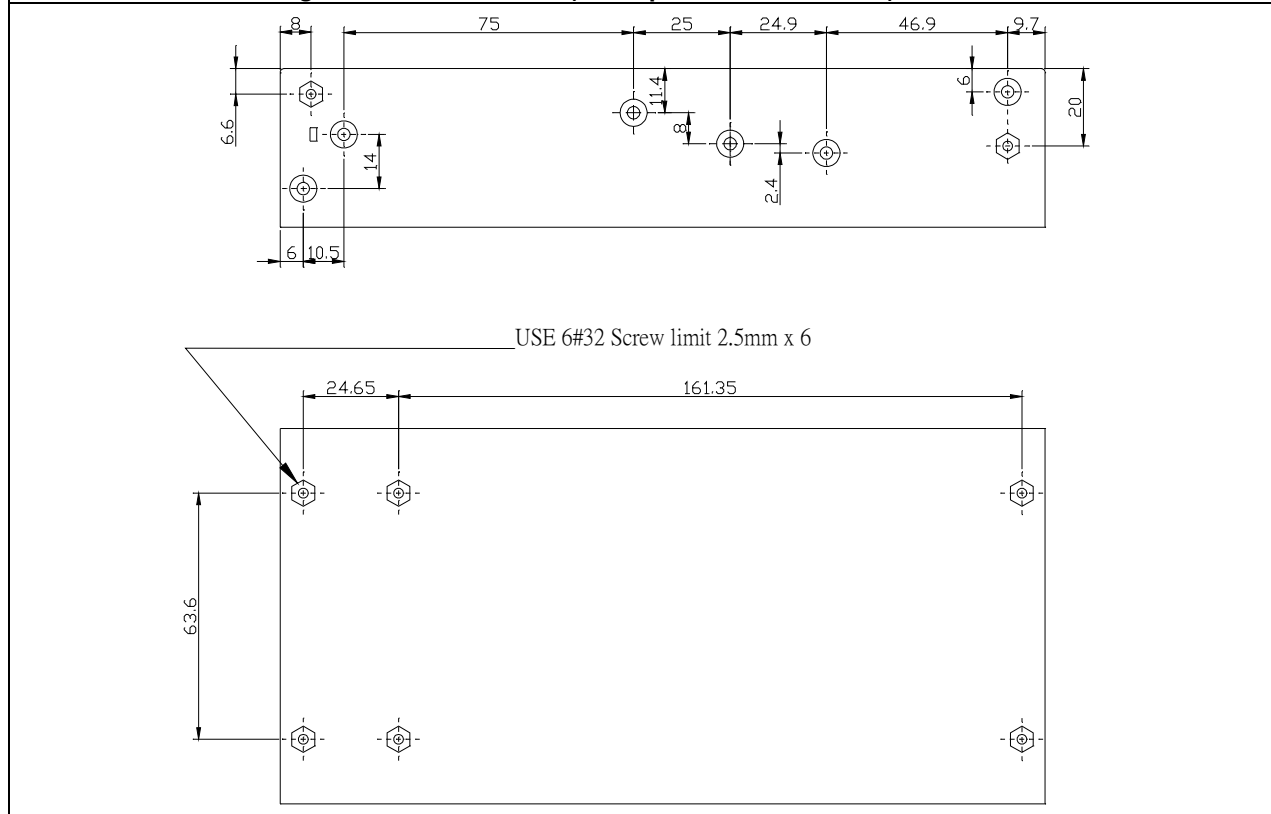


With cover provided (Model number with suffix code: -C):





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



9. Option

Parameter	Conditions/Description	<i>* Please contact us for the availability and pricing</i>
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	Criteria A is only at output loading under (TBD) W condition; When output loading above (TBD) W, it will be criteria B. Order part number with suffix code “-D”	
Available for two pieces in serial connection	Order part number with suffix code “-S”, with direction reverse protection available in two pieces serial connection application.	