SPECIFICATION

For

SWITCHING POWER SUPPLY

M/N: MPM-U305-19(-C)

Revision

Version	Revise Date	Change Items
Rev. 01	Aug. 20. 2010	UL 60601-1 1st edition approved.
Rev. 02	Aug. 25. 2010	Changing the part number coding.
Rev. 03	Nov. 4. 2010	Updating spec of fixed screws.
Rev. 04	Nov. 10. 2010	Revising part number coding.
Rev. 05	Mar. 28. 2011	Update the safety approved status.
Rev. 06	Nov. 7. 2011	Revised the derating curves.
Rev. 07	Apr. 5. 2012	Revised the height dimension with cover provided.
Rev. 08	Feb. 8. 2018	Changed new form.
Rev. 09	Mar. 9. 2018	1.Added Designed to meet IEC 60601-1-2 4th ed. EMC. 2.Changed EMC and Safety Approvals.

MPM-U305-19(-C) 300W Medical AC / DC

BF direct patient contact

FEATURES

- ✓ 300W convection cooled and 350W forced air cooling single output medical power supply.
- ✓ Active PFC meets Class D EN 61000-3-2 and EN 61000-3-3.
- ✓ Conducted EMI meets CISPR/FCC Class B.
- ✓ High Efficiency up to 91%.
- ✓ Adjustable output range.
- ✓ Design to meet medical standard IEC 60601-1(2nd & 3rd), EN 60601-1(3rd), UL 60601-1 type BF rated.
- ✓ Designed to meet IEC 60601-1-2 4th ed. EMC.

Models & Ratings

Model Number	Rated Output Power	Max. Output Power	Output Voltage	Min. Current
MPM-U305-19	300 W	350 W	19 V	0 A

Total Output Power: Total maximum power is rated 300W, peak 350W max. 5 seconds with convection cooling; max. 350W continuously with 23.3CFM forced air cooling at 50˚C environment temperature.

Note:

3. Model no. coding:

M P M – U 3 0 X – W

(1) (2)

(1)

Output voltage
X = 5-19: +19Vdc
X = 5: +24Vdc
X = 5-28: +28Vdc

(2)

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

Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	90	115 / 230	264	VAC	Continuous input range.
Input Frequency	47	50 / 60	63	Hz	AC input.
Efficiency			91	%	AC 230V input, rated load, 19V output.
Operating Temperature	-20		+70	˚C	Derate above 50˚C to a maximum temperature of 70˚C as curves below.
Weight		956		g	
Dimensions	198 (L) x 97 (W) mm, tolerance +/- 0.4mm, with (H) 41 mm, tolerance +0/-0.5 mm.				
EMC	EN 60601-1-2: 2001, EN 55011 / EN 55022, EN 61000-3-2: 2000, EN 610003-3: 2001, IEC 61000-4-2: 2001, IEC 61000-4-3: 2002, IEC 61000-4-4: 2004, IEC 61000-4-5: 2001, IEC 61000-4-6: 2004, IEC 61000-4-8: 2001, IEC 61000-4-11: 2004				
Safety Approvals	IEC 60601-1: 1988+A1+A2 (2nd edition), IEC 60601-1: 2005 (3rd edition), EN 60601-1: 2006 (3rd edition) UL 60601-1, 1st Edition, 2006-04-26, CAN/CSA-C22.2 No. 601.1-M90, 2005				

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	90	115 / 230	264	VAC	Continuous input range.
Input Frequency	47	50 / 60	63	Hz	AC input.
Inrush Current			60	A	
Leakage Current		150		μA	Primary to Earth GND.
		100			Secondary to Earth GND.
Input Protection	Non-user serviceable internally located AC input line fuse. Fuse：6.3A / 250VAC * 2pcs				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		19		VDC	
Initial Set Accuracy		1		%	Voltage setting is at 60% rated load and 25°C.
Minimum Load		0		A	
Hold Up Time	16			mS	
Total Regulation		±2		%	Total regulation is measured a setting output voltage. Input voltage is from 90-264VAC and output from 0W to 350W.
Ripple & Noise		240		mV	Measured at rated load by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10μF Electrolytic Capacitor and a 0.1uF Ceramic Capacitor.
Remote Voltage sense	Compensates for wire voltage drop.				
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.				
Overvoltage 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 29.7-32.9V.				
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.				

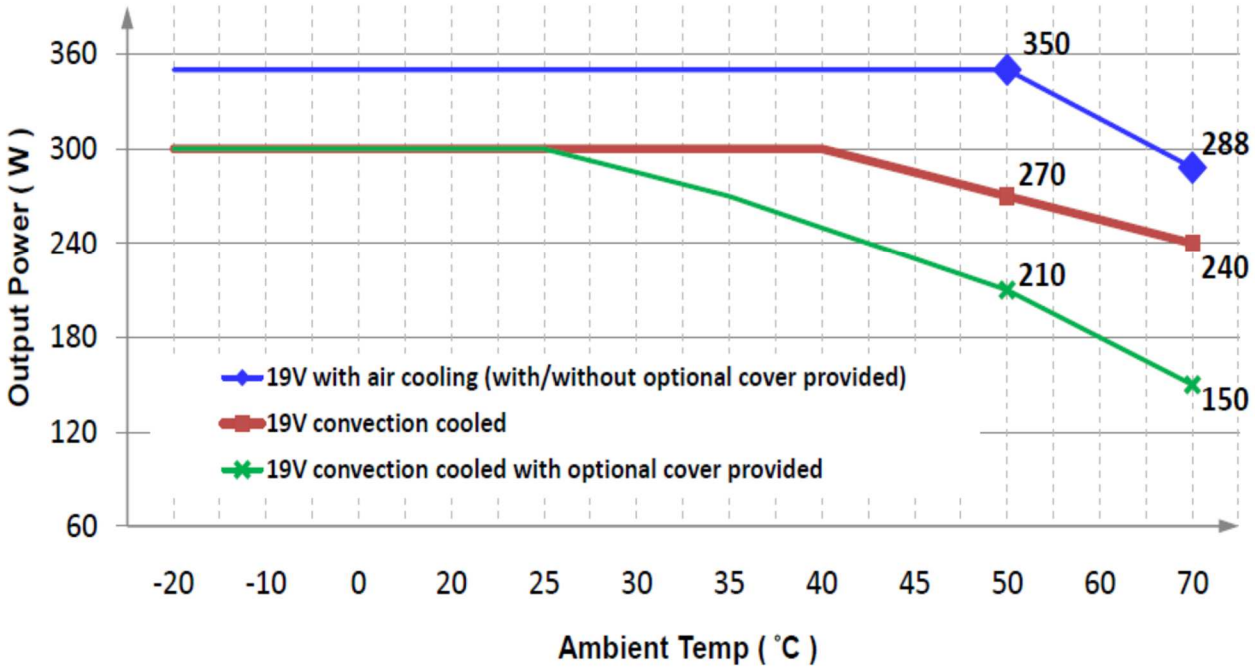
General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			91	%	AC 230V input, rated load, 24V output.
Switching Frequency		65		KHZ	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20		+70	˚C	Derate above 50˚C to a maximum temperature of 70˚C as curves below.
Storage Temperature	-20		+85	°C	
Relative Humidity	5		95	%RH	Non-condensing.
Cooling		23.3		CFM	Forced-cooled @ 350W
Operating / Non-Operating Altitude		3000 / 4000		m	

Derating curve



Derating curves of 19V output (MPM-U305-19, MPM-U305-19-C)

EMC: Emissions

Phenomenon	Standard	Class	Notes & Conditions
Conducted	EN 60601-1-2: 2001 EN 55011 / EN 55022	B	
Radiated	EN 60601-1-2: 2001 EN 55011 / EN 55022	B	
Harmonic Current	EN 61000-3-2	D	
Voltage Flicker	EN 61000-3-3	D	

EMC: Immunity

Phenomenon	Standard	Criteria	Notes & Conditions
ESD	IEC 61000-4-2: 2001	A	8KV air discharge, 6KV contact discharge
Radiated	IEC 61000-4-3: 2002	A	10V/m, 80 - 2700MHz
EFT	IEC 61000-4-4: 2004	A	2KV line & PE
Surges	IEC 61000-4-5: 2001	A	1KV line to line, 2KV line to PE
Conducted	IEC 61000-4-6: 2004	A	10V
Power Magnetic	IEC 61000-4-8: 2001	A	3A/m
Dips and Interruptions	IEC 61000-4-11: 2004	A A A-B* B	DIP: >95%, 0.5 cycle DIP: 30%, 25 cycles DIP: 60%, 5 cycles INT: >95%, 250 cycles

* Criteria A option by request separately, find Option for detail.

Note:

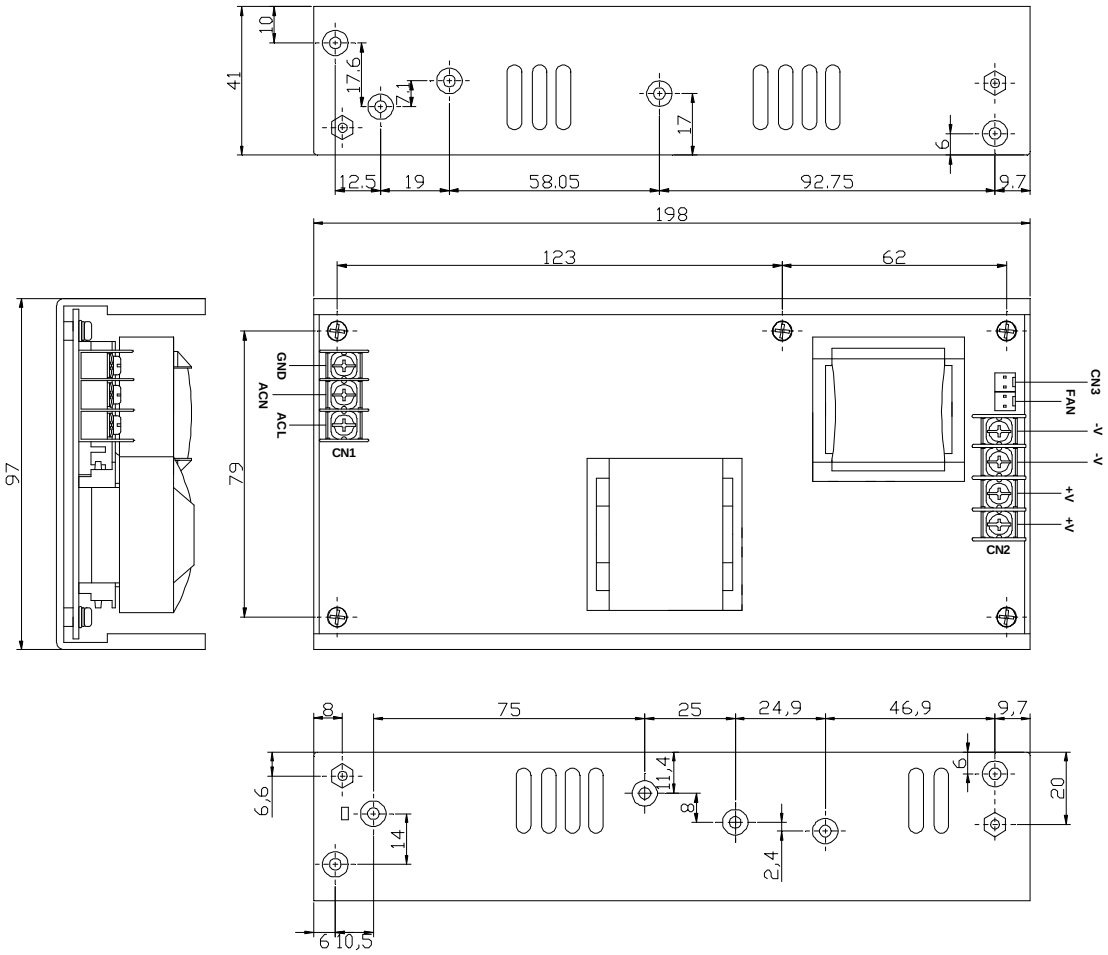
1. As a build-in type power supply, the power supply needs to be installed in a suitable enclosure to pass the EMI/EMC tests. The final assembly has to comply with the valid EMI/EMC and safety.

Safety Approvals

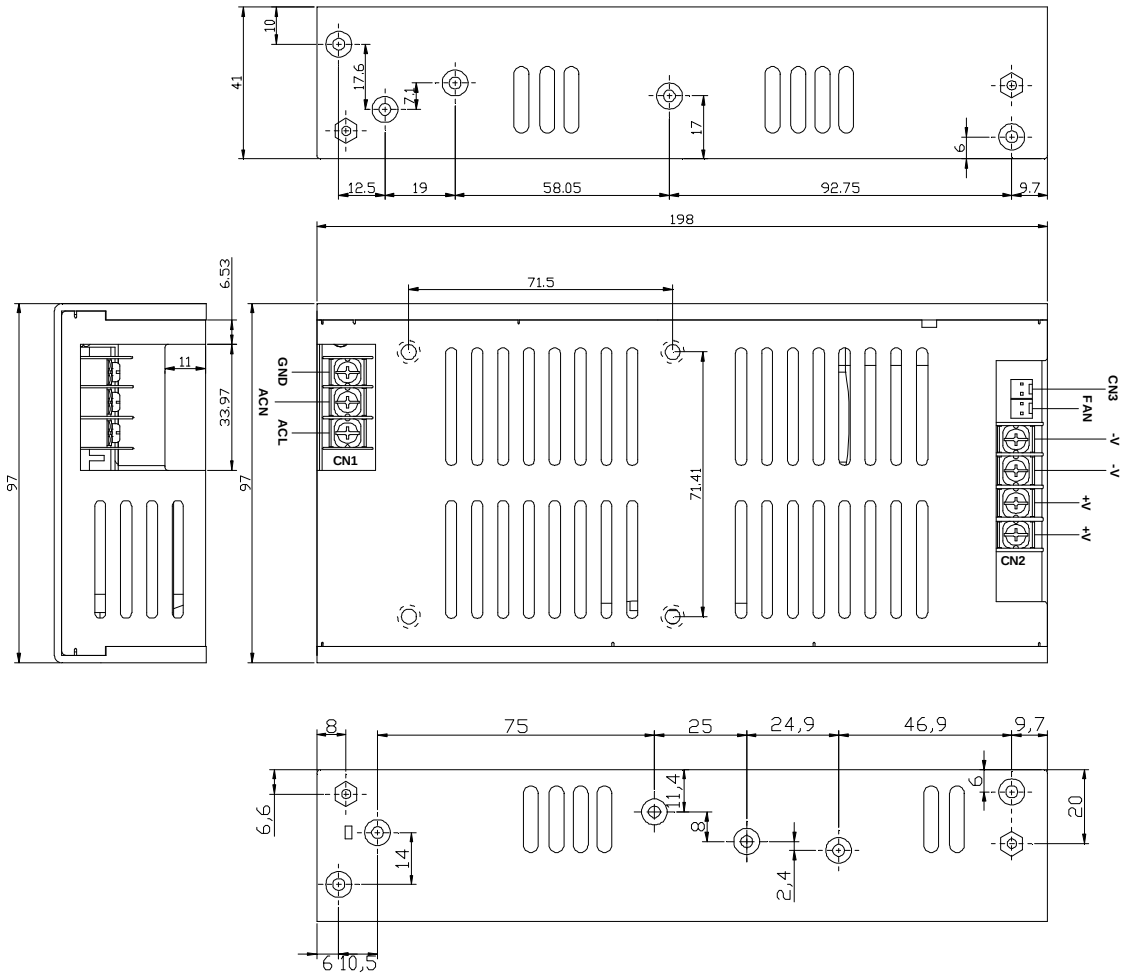
Safety Agency	Safety Standard	Notes & Conditions
TUV	EN 60601-1: 2006 (3rd edition)	Designed to meet.
CB	IEC 60601-1: 1988+A1+A2 (2nd edition) IEC 60601-1: 2005 (3rd edition)	Approved.
UL/cUL	UL 60601-1, 1st Edition, 2006-04-26 CAN/CSA-C22.2 No. 601.1-M90, 2005	Approved.

Mechanical Details

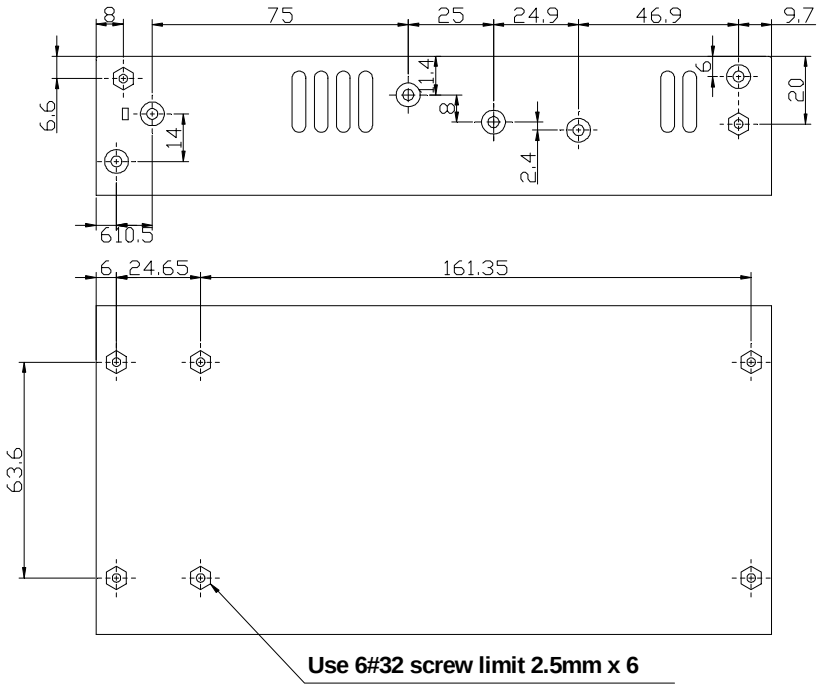
Without cover provided
SIZE：198 (L) x 97 (W) mm, tolerance +/- 0.4mm, with (H) 41 mm, tolerance +0/-0.5 mm.

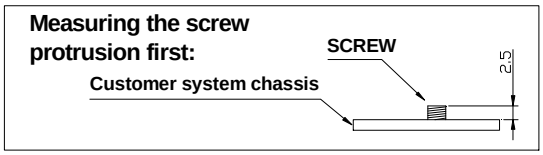


With cover provided (Model number with suffix code: -C):



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





Parameter	Conditions/Description				
Dimension (Note 2)	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 (Note 1)	Pin	1. V+		2. V-

Note:
1. The voltage of fan is the same with the output voltage of power supply.
2. The tolerance of height would be ± 0.5mm when with cover provided (model number with suffix code: -C).

1. 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 “–ET”, with European terminal blocks both input CN1 and output CN2.
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.
Redundant module (P/N 900-RD30)	Additional module available by request separately for redundant function.
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.

Thermal Considerations

In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded.
Temperature should be monitored using J type thermocouples placed on the hottest part of the component (out of any direct air flow). See Mechanical Details for component locations.

Temperature Measurements at max. amb.	
Component	Max Temperature
T1	110℃
Q1A	120℃
D5	120℃
C7, C7A, C7B, C7C	105℃
C21, C22, C22A	105℃