



# PM500 Medical & ITE Power Supplies (450-500W)



**Features:**

- BF Class insulation
- Operation altitude up to 5000 meters
- 100-240 VAC input with active PFC , >0.9 P.F.
- Less than 300 µA leakage current
- EN55011 / 55022 Class B conducted emissions
- Inhibit - TTL high to disable output
- Compliant with RoHS requirements
- Power consumption in standby mode less than 1W at standby power 5V/100mA

**Description:**

The PM500 series of AC-DC switching power supplies in a package of 4 x 7 x 1.7 inches are capable of delivering 450-500 watts of continuous power at 30 CFM forced air cooling or 350-400 watts at convection cooling. The units are constructed on a printed circuit board with a U-bracket for mechanical support and heat sinking. A cover and fan assembly can be added during manufacturing. They are designed for medical applications including those needing BF rated insulation and/or an operation altitude up to 5000 meters.

Model <sup>1</sup>	Output							Efficiency (typical) 115/230VAC
	V1	Min. Current <sup>4</sup>	Max. Current at convection	Max. Current At 30 CFM	Tol.	Ripple & Noise <sup>3</sup>	Max. Output Power <sup>2</sup>	
PM450-12B	12V	0.1A	29.17A	37.5A	±2%	120mV	350/450W	88/90%
PM450-13B	15V	0.1A	23.34A	30A	±2%	150mV	350/450W	88/90%
PM450-14B	18V	0.1A	22.23A	27.78A	±2%	180mV	400/500W	88/90%
PM450-15B	24V	0.1A	16.67A	20.84A	±2%	240mV	400/500W	89/91%
PM450-16B	28V	0.1A	14.29A	17.86A	±2%	280mV	400/500W	89/91%
PM450-17-1B	36V	0.1A	11.12A	13.89A	±2%	360mV	400/500W	89/91%
PM450-18B	48V	0.1A	8.34A	10.42A	±2%	480mV	400/500W	89/91%
PM450-19B	57V	0.1A	7.02A	8.78A	±2%	570mV	400/500W	89/91%

**NOTES:**

1. Change suffix "B" for U-Bracket form to "C" for enclosed form with cover and fan assembly, e.g. PM500-14C.
2. 350-400 W without moving air or 450-500 W with 30 CFM forced air provided by user for "B" version, 450-500 W for "C" version
3. Ripple and noise is maximum peak-to-peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.
4. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to the burst-mode operation of the control IC in them for energy saving.



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<b>Specifications</b>	
<b>Safety Standards &amp; EMC Specifications</b>	
Safety Standards	UL ES 60601-1, CSA C22.2 No. 60601-1 TU V EN 60601-1 UL 60950-1, CSA C22.2 No. 60950-1 TU EN 60950-1
EMI Standard	EN55011/EN55022, FCC, and VCCI Class B (radiated and conducted)
EMC Performance	EN61000-3-2: Harmonic distortion, Class A and D EN61000-3-3: Line flicker EN61000-4-2: ESD, $\pm 15$ KV air and $\pm 8$ KV contact EN61000-4-3: Radiated immunity, 10V/m EN61000-4-4: Fast transient/burst, $\pm 2$ KV EN61000-4-5: Surge, $\pm 1$ KV diff., $\pm 2$ KV com. EN61000-4-6: Conducted immunity, 10Vrms EN61000-4-8: Magnetic field immunity, 30 A/m EN61000-4-11: Voltage dip immunity, 30% reduction for 500ms, and 100% reduction for 10ms
*Consult with TT Electronics for information on additional country safety approvals	
<b>Input Specifications</b>	
Input Voltage Range	90 to 264 Vdc
Input Frequency Range	47 to 63Hz
Input Current	5.2 A (rms) @ 115VAC, 60Hz or 2.6 A (rms) for 230VAC, 50Hz
Earth Leakage Current	300 $\mu$ A max. @ 264 VAC, 60 Hz
Touch Current	100 $\mu$ A max. @ 264 VAC, 63 Hz
<b>Output Specifications</b>	
Ripple and Noise	1% peak to peak maximum
Remote Sense	Compensation for cable losses up to 0.5V
Overvoltage Protection	Set 112-140% of nominal output voltage
Short circuit protection	Protected to output short circuit conditions
Over temperature protection	Latching by recycle input to reset
Thermal Shutdown	Protected to over temperature conditions
Temperature Coefficient	All outputs $\pm 0.04\%/^{\circ}\text{C}$ maximum
Transient Response	Maximum excursion of 4%, recovering to 1% of final value within 500 us after a 25% step load change
Standby Power	5V at 2A maximum
Fan Power	12V at 300 mA maximum
<b>Environmental Specifications</b>	
Operating Temperature	-10 $^{\circ}$ C to +70 $^{\circ}$ C
Storage Temperature	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative Humidity	5% to 95% non-condensing
Temperature Derating	De-rate from 100% at +50 $^{\circ}$ C linearly to 50% at +70 $^{\circ}$ C, applicable to convection and forced-air cooling conditions
<b>General Specifications</b>	
Switching Frequency	55-300 KHz
Power Factor	>0.9
Hold-up Time	10ms minimum at 100 VAC
Turn on Delay Time	3s maximum at 100 VAC
Power Factor	0.95 Typical
Line Regulation	$\pm 0.5\%$ maximum at full load
Inrush Current	100A @ 115 Vac or 200A @ 230 Vac at 25 $^{\circ}$ C cold start
Withstand Voltage	4000 VAC input to output (2 MOOP) 1500 VAC input to ground (1 MOOP) 1500 VAC output to ground
MTBF	100,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F



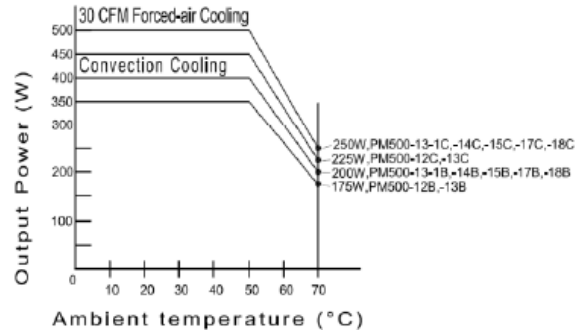
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## INTERFACE SIGNALS

- PFD:** TTL high for normal operation, low upon loss of input power, turn-on delay time 100-1000 ms, turn-off delay time 1 ms minimum
- Inhibit:** Requires an external TTL high level signal to inhibit outputs for standard models

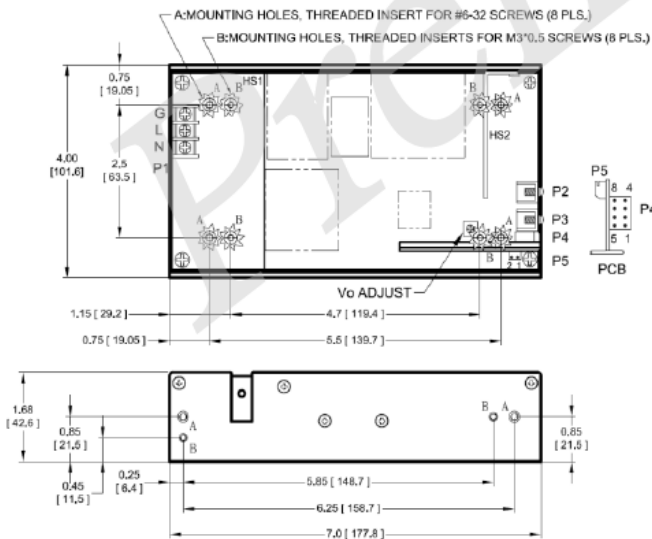
## Diagrams

## OUTPUT POWER DERATING CURVE

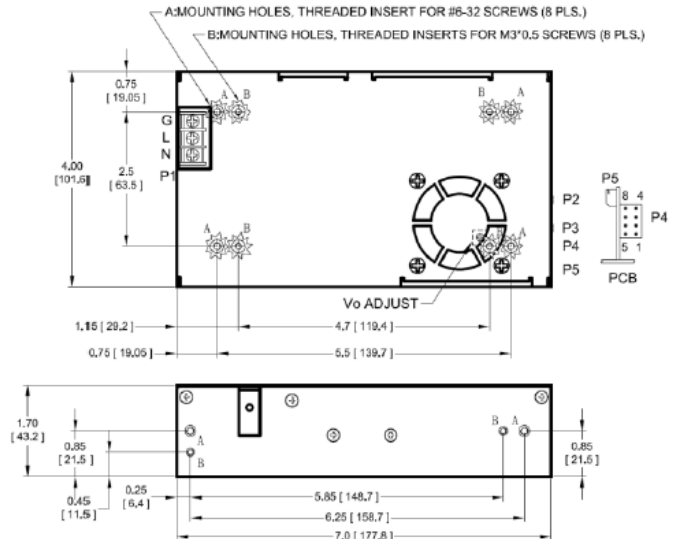


## MECHANICAL SPECIFICATIONS

### U-bracket Form



### Enclosed Form



### NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- Output connectors P2 and P3 are for M4x0.7 screw connections.
- Output connector P4 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P5 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kgs. (2.52 lbs.) approx. for enclosed form
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.



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## PIN CHART

PIN NO.	P1 (AC)			P2	P3	P5	
	1	2	3			1	2
<b>Polarity</b>	Ground	Live	Neutral	+V1	Common Return	Common Return	+12V Fan

PIN NO.	P4							
	1	2	3	4	5	6	7	8
<b>Polarity</b>	Common Return	+V1 Sense	-V1 Sense	PFD	Inhibit	+5V Standby	NC	NC