



450-500W Open Frame type Medical power supply < PM500

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.

FEATURES

- BF Class insulation
- Operation altitude up to 5000 meters
- 100-240 VAC input with active PFC
- Less than 300 μ A 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 5 V /100 mA

INPUT SPECIFICATIONS

Input voltage: 90-264 VAC
 Input frequency: 47-63 Hz
 Input current: 5.2 A (rms) @115 VAC, 60 Hz
 2.6 A (rms) @ 230 VAC, 50 Hz
 Earth leakage current: 300 μ A max. @ 264 VAC, 63 Hz
 Touch current: 100 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current: See rating chart.
 Maximum output power: See rating chart.
 Ripple and noise: 1% peak to peak maximum
 Remote sense: Compensation for cable losses up to 0.5V
 Overvoltage protection: Set at 112-140% of nominal output voltage
 Overcurrent protection: Protected to output short circuit conditions
 Thermal shutdown: Protected to over temperature conditions
 Temperature coefficient: All outputs \pm 0.04% / $^{\circ}$ 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: 5 V at 500 mA maximum
 Fan power: 12 V at 300 mA maximum

ENVIRONMENTAL SPECIFICATIONS

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: Derate from 100% at +50 $^{\circ}$ C linearly to 50% at +70 $^{\circ}$ C, applicable to convection and forced-air cooling conditions

PM500 SERIES



CE
RoHS

SAFETY STANDARD APPROVALS



UL ES 60601-1, CSA C22.2 No. 60601-1
 File No. E178020



TUV EN 60601-1



UL 62368-1, CSA C22.2 No. 62368-1



TUV EN 62368-1

GENERAL SPECIFICATIONS

Switching frequency: 85 KHz (typical)
 Efficiency: Typical 90%
 Hold-up time: 20 ms minimum at 110 VAC & 500 W
 Line regulation: \pm 0.5% maximum at full load
 Inrush current: 30 A @ 115 VAC, or 60 A @ 230 VAC, at 25 $^{\circ}$ C cold start
 Withstand voltage: 4000 VAC from input to output (2 MOPP)
 1500 VAC from input to ground (1 MOPP)
 1500 VAC from output to ground
 MTBF: 100,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F

EMC Performance

EN55011/EN55022: Class B conducted, class B radiated
 FCC: Class B conducted, class B radiated
 VCCI: Class B conducted, class B radiated
 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, 10 V/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, 10 Vrms
 EN61000-4-8: Magnetic field immunity, 30 A/m
 EN61000-4-11: Voltage dip immunity, 30% reduction for 500 ms and 100% reduction for 10 ms



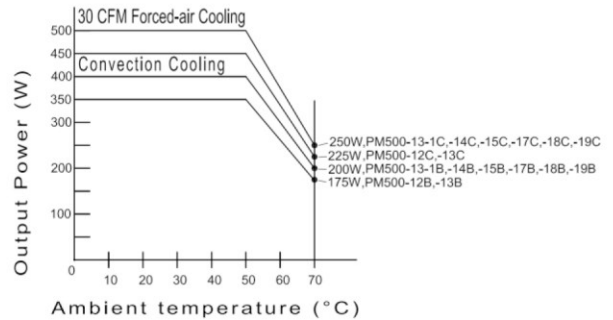
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INTERFACE SIGNALS

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

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	V1	Min. Current ⁽⁴⁾	Output				Ripple & Noise ⁽³⁾	Max. Output Power ⁽²⁾	Efficiency (typical) 115 /230 Vac
			Max. Current at convection	Max. Current at 30 CFM	Tol.	Max. Output			
PM500-12B	12 V	0.1 A	29.17 A	37.50 A	±2%	120 mV	350 W /450 W	88 /90%	
PM500-13B	15 V	0.1 A	23.34 A	30.00 A	±2%	150 mV	350 W /450 W	88 /90%	
PM500-13-1B	18 V	0.1 A	22.23 A	27.78 A	±2%	180 mV	400 W /500 W	88 /90%	
PM500-14B	24 V	0.1 A	16.67 A	20.84 A	±2%	240 mV	400 W /500 W	89 /91%	
PM500-15B	28 V	0.1 A	14.29 A	17.86 A	±2%	280 mV	400 W /500 W	89 /91%	
PM500-17B	36 V	0.1 A	11.12 A	13.89 A	±2%	360 mV	400 W /500 W	89 /91%	
PM500-18B	48 V	0.1 A	8.34 A	10.42 A	±2%	480 mV	400 W /500 W	89 /91%	
PM500-19B	57 V	0.1 A	7.02 A	8.78 A	±2%	570 mV	400 W /500 W	89 /91%	

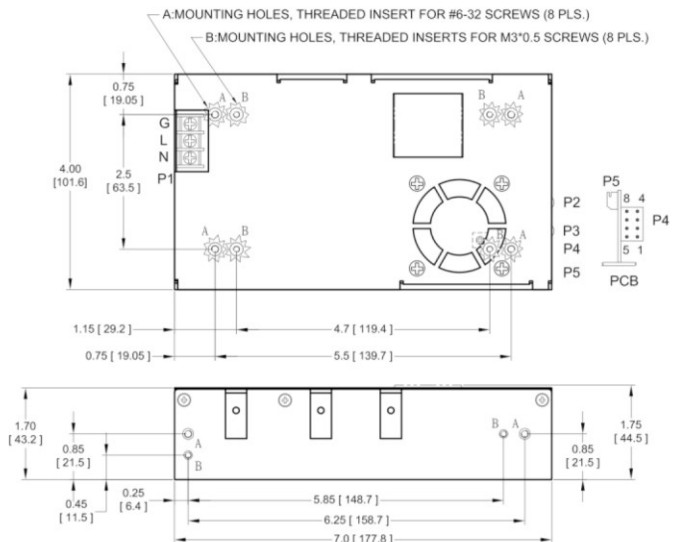
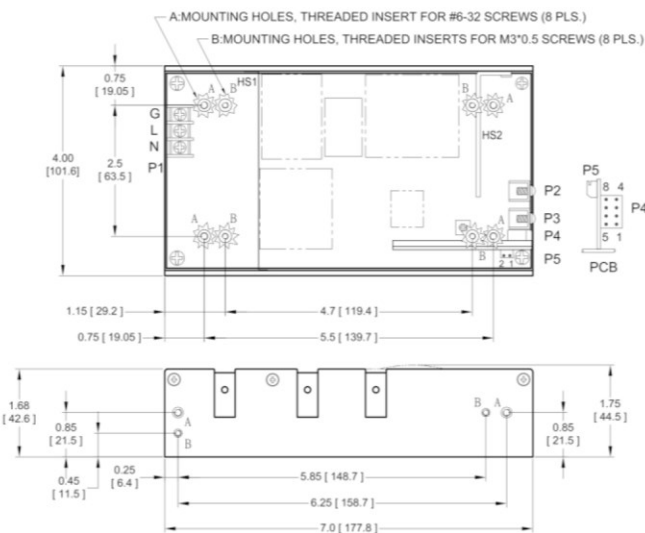
NOTES:

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.

MECHANICAL SPECIFICATIONS

U-bracket Form

Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
4. Output connectors P2 and P3 are for M4x0.7 screw connections.
5. Output connector P4 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
6. Fan connector P5 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
7. Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kgs. (2.52 lbs.) approx. for enclosed form
8. 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
Polarity	Ground	Live	Neutral	+V1	Common Return	Common Return	+12V Fan

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