450-500 WATT MEDICAL & ITE POWER SUPPLIES

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 µA leakage current
- EN55011 /55032 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 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA 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
Over power protection:	Set at 105-140% of its maximum output power, Automatic recovery
Over voltage protection:	Set at 112-140% of its rated output voltage, latching by recycle input to reset
Short circuit protection:	Automatic recovery
Over temperature protection:	Latching by recycle input to reset
Temperature coefficient:	All outputs ±0.04% /℃ 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℃ to +70℃
Storage temperature:	-40℃ to +85℃
Relative humidity:	5% to 95% non-condensing
Temperature derating:	Derate from 100% at +50℃ linearly to 50% at +70℃, applicable to convection and forced-air cooling conditions

PM500 SERIES

RoHS

SAFETY STANDARD APPROVALS

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

TÜV EN 60601-1

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

TÜV EN 62368-1

GENERAL SPECIFICATIONS

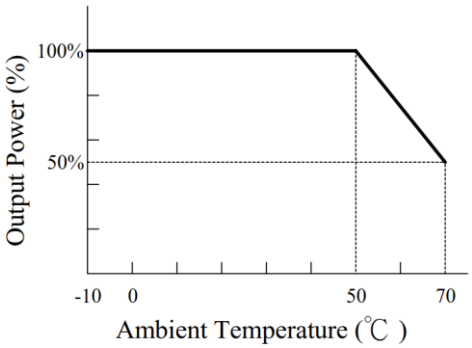
Switching frequency:	55-300 KHz
Efficiency:	Typical 90%
Hold-up time:	20 ms minimum at 110 VAC & 500 W
Line regulation:	±0.5% maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 A @ 230 VAC, at 25℃ cold start
Withstand voltage:	4000 VAC from input to output (2 MOPP) 1500 VAC from input to ground (1 MOPP) 1500 VAC from output to ground
MTBF:	100,000 hours at full load at 25℃ ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/ EN55032:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN60601-1-2, EN55024	
EN61000-4-2:	ESD, ±15 KV air and ±8 KV contact
EN61000-4-3:	Radiated immunity, 9-28 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±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

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

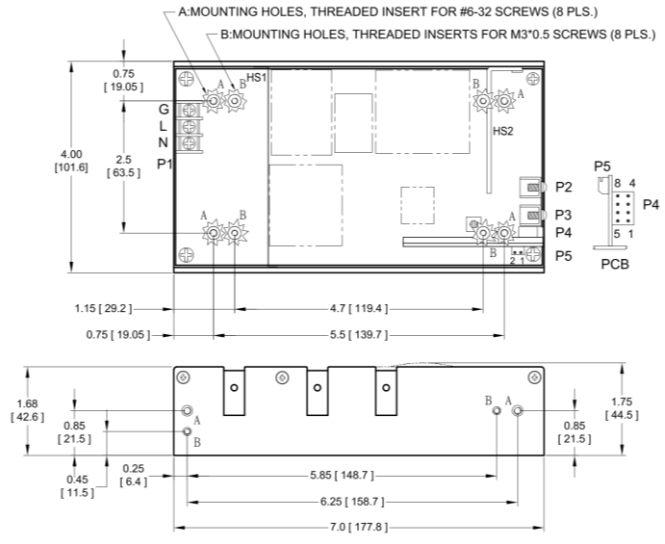
Model[1]	Output V1	Min. Current	Max. Current at convection	Max. Current at 30 CFM	Tol.	Ripple & Noise[3]	Max. Output Power[2]	Efficiency (typical) 115 /230 Vac
PM500-12B	12 V	0 A	29.17 A	37.50 A	±2%	120 mV	350 W /450 W	88 /90%
PM500-13B	15 V	0 A	23.34 A	30.00 A	±2%	150 mV	350 W /450 W	88 /90%
PM500-13-1B	18 V	0 A	22.23 A	27.78 A	±2%	180 mV	400 W /500 W	88 /90%
PM500-14B	24 V	0 A	16.67 A	20.84 A	±2%	240 mV	400 W /500 W	89 /91%
PM500-15B	28 V	0 A	14.29 A	17.86 A	±2%	280 mV	400 W /500 W	89 /91%
PM500-17B	36 V	0 A	11.12 A	13.89 A	±2%	360 mV	400 W /500 W	89 /91%
PM500-18B	48 V	0 A	8.34 A	10.42 A	±2%	480 mV	400 W /500 W	89 /91%
PM500-19B	57 V	0 A	7.02 A	8.78 A	±2%	570 mV	400 W /500 W	89 /91%

NOTES:

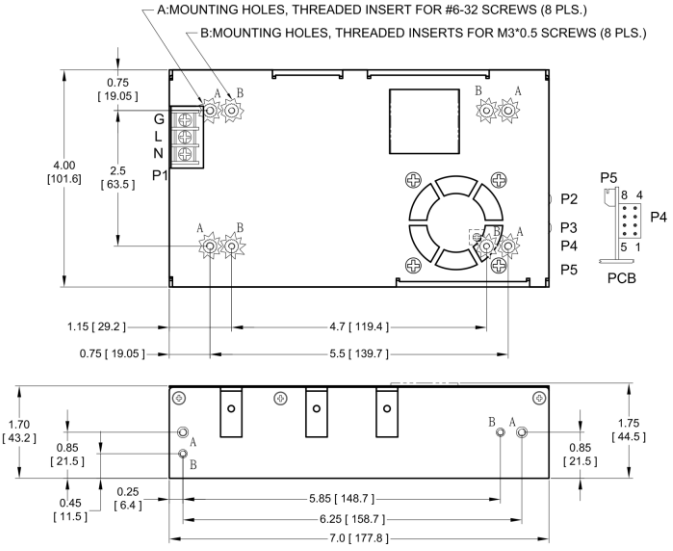
1. Change suffix “B” for U-Bracket form to “C” for enclosed form with cover and fan assembly, e.g. PM500-14C.
2. 350-400 W without moving air or 450-500 W with 30 CFM forced air provided by user for “B” version, 450-500 W for “C” version
3. Ripple and noise is maximum peak-to-peak voltage value measured 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.

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 51110-0851 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.

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

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