# 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<br>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

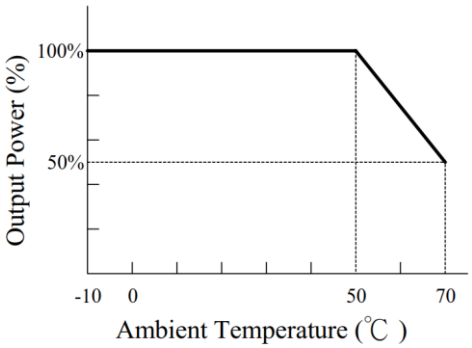
| | |
|---|---|
| Switching frequency: | 55-300 KHz |
| Efficiency: | Typical 90% |
| Hold-up time: | 20 ms minimum at 110 VAC & 500 W |
| Line regulation: | ±0.5% maximum at full load |
| Inrush current: | 30 A @ 115 VAC, or 60 A @ 230 VAC, at 25℃ cold start |
| Withstand voltage: | 4000 VAC from input to output (2 MOPP)<br>1500 VAC from input to ground (1 MOPP)<br>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

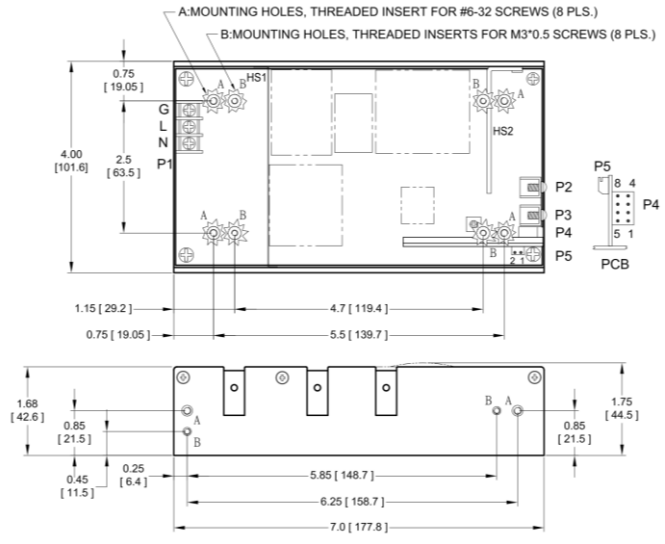
| Model[1] | Output V1 | Min. Current | Max. Current at convection | Max. Current at 30 CFM | Tol. | Ripple & Noise[3] | Max. Output Power[2] | Efficiency (typical) 115 /230 Vac |
|---|---|---|---|---|---|---|---|---|
| PM500-12B | 12 V | 0 A | 29.17 A | 37.50 A | ±2% | 120 mV | 350 W /450 W | 88 /90% |
| 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:

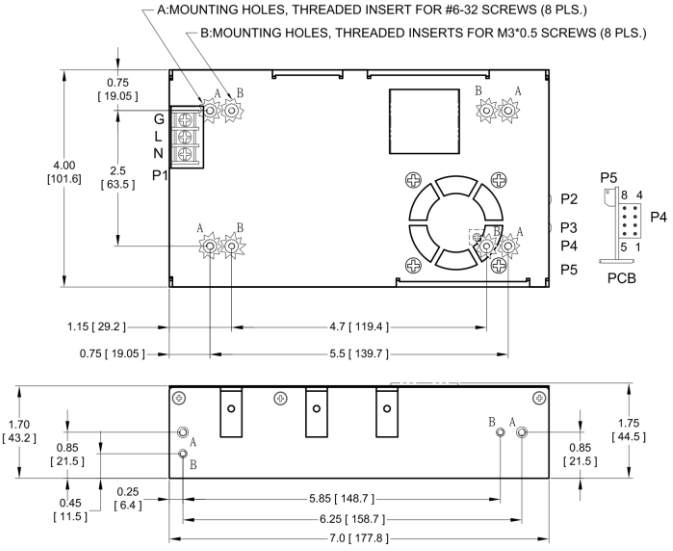
1. Change suffix “B” for U-Bracket form to “C” for enclosed form with cover and fan assembly, e.g. PM500-14C.
2. 350-400 W without moving air or 450-500 W with 30 CFM forced air provided by user for “B” version, 450-500 W for “C” version
3. Ripple and noise is maximum peak-to-peak voltage value measured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