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PBL500 Series

AC-DC Power Supplies

XP Power

500 Watts

- 450-500W forced cooled
- 250W convection cooled
- Class II applications
- Medical (BF) safety approvals
- U-channel 4″ x 7″ package
- 5V standby & 12V fan supply
- AC OK, inhibit & remote sense
- Class B conducted & radiated emissions
- 3 year warranty



The Class II PBL500 series of AC-DC switching power supplies, in a package of just 4 x 7 x 1.56 inches, deliver 450-500 watts of continuous power with forced air cooling or 250 watts with convection cooling. The units are constructed on a U-Channel 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 with an operation altitude up to 5000 meters.

Dimensions:

PBL500 (U-channel):
7.1 x 4.00 x 1.56″ (180.34 x 101.6 x 39.62 mm)

PBL500 (Covered) :
7.1 x 4.00 x 2.64″ (180.34 x 101.6 x 67.05 mm)

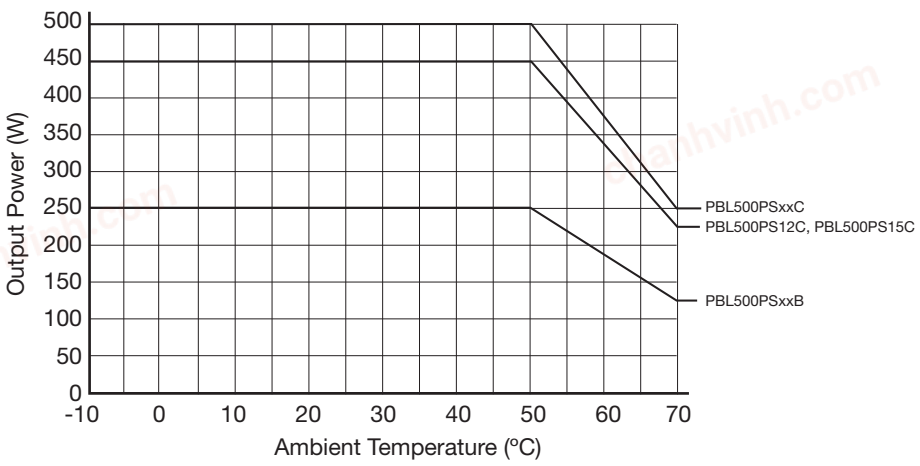
Models & Ratings

Output Voltage V1	Output Current V1		Standby Supply V2	Fan Supply V3	Output Power		Ripple & Noise[3]	Model Number[1]
	Convection	Forced			Convection	Forced[2]		
12 V	20.83 A	37.50 A	5.0 V / 2.0 A	12.0 V / 0.3 A	250 W	450 W	120 mV	PBL500PS12B
15 V	16.67 A	30.00 A					150 mV	PBL500PS15B
18 V	13.89 A	27.78 A				500 W	180 mV	PBL500PS18B
24 V	10.42 A	20.84 A					240 mV	PBL500PS24B
28 V	8.93 A	17.86 A					280 mV	PBL500PS28B
36 V	8.94 A	13.89 A					360 mV	PBL500PS36B
48 V	5.21 A	10.42 A					480 mV	PBL500PS48B
57 V	4.38 A	8.78 A					570 mV	PBL500PS57B

Notes

1. For covered version, replace B in the part number with C, e.g PBL500PS12C. V3 not available on covered version.
2. 250 W without moving air or 450-500 W with 30 CFM forced air provided by the user. 450-500 W for '-C' version
3. Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20 MHz bandwidth, at rated line voltage and output load, and with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor.

Temperature Derating Curve



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Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	80		264	VAC	Derate to 90% at 85 VAC & 80%at 80 VAC
Input Frequency	47		63	Hz	
Input Current - Full Load		5.2/2.6		A (rms)	115/230 VAC, 60/50 Hz
Inrush Current		30/60		A	115 VAC/230 VAC at 25 °C, cold start

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage (V1)	12		57	VDC	See Models and Ratings table
Tolerance			±2	%	Line and Load Regulation, 0.1% minimum load required to meet specification
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 25% step load change
Ripple & Noise			1	% pk-pk	20 MHz bandwidth, see model table notes
Overvoltage Protection	112		140	%	Latching
Overcurrent Protection	115		140	%	Trip & restart characteristic
Thermal Shutdown					Protected for overtemperature conditions, latching
Temperature Coefficient			±0.04	%/°C	
5 V Standby Supply (V2)		5		V	At 2.0 A
Fan Supply (V3)		12		V	At 300 mA
Patient Leakage Current		50	80	µA	264 VAC, 63 Hz

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+70	°C	Derate Linearly from 100% load at +50 °C to 50% load at +70 °C
Storage Temperature	-40		+85	°C	
Humidity	5		95	%RH	Non-condensing
Cooling					Integral temperature controlled fan. Fan speed based on temperature of transformer T1, internally monitored. Fan will not rotate until T1 temperature reaches approx. 30 °C and reaches full speed when T1 temperature reaches approx. 60 °C.

General

Characteristic		Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			90		%	230 VAC, 100% load
Isolation	Input to Output	4000			VAC	2 x MOPP
	Input to Case	4000			VAC	2 x MOPP
	Output to Case	1500			VAC	1 x MOPP
Switching Frequency	PFC	55	65	75	kHz	Fixed
	Main Converter	90		300		Variable
	Standby Converter	80		120		Variable
Hold Up Time		20			ms	At 110 VAC & 500 W
Mean Time Between Failure			100,000		Hrs	MIL-HDBK-217F, Full load at 25 °C GB
Weight			2.23 (1011.5)		lb (g)	PBL500PSxxB
			2.52 (1143.0)			PBL500PSxxC

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Signals & Controls

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5 V total voltage drop.
Inhibit	To inhibit, apply TTL high signal.
AC OK	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.

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011	Class B	
Radiated	EN55011	Class B	
Harmonic Current	EN61000-3-2	Class A	
Voltage Fluctuations	EN61000-3-3		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	4	A	±8 kV contact, ±15 kV air
Radiated	EN61000-4-3	10 V/m	A	
EFT	EN61000-4-4	±2 kV	A	
Surges	EN61000-4-5	Installation class 3	A	±1 kV differential/ ±2 kV common mode
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic Field	EN61000-4-8	30 A/m	A	
Dips and Interruptions	100 VAC/50 Hz	Dip 30% (70 VAC), 500ms	A	
		Dip 60% (40 VAC), 100ms	B	
		Int >95% (0 VAC), 10ms	A	
		Int 100% (0 VAC), 20ms	A	
		Int 100% (0 VAC), 5000ms	B	
	240 VAC/50 Hz	Dip 30% (168 VAC), 500ms	A	
		Dip 60% (96 VAC), 100ms	A	
		Int >95% (0 VAC), 10ms	A	
		Int 100% (0 VAC), 20ms	A	
		Int 100% (0 VAC), 5000ms	B	

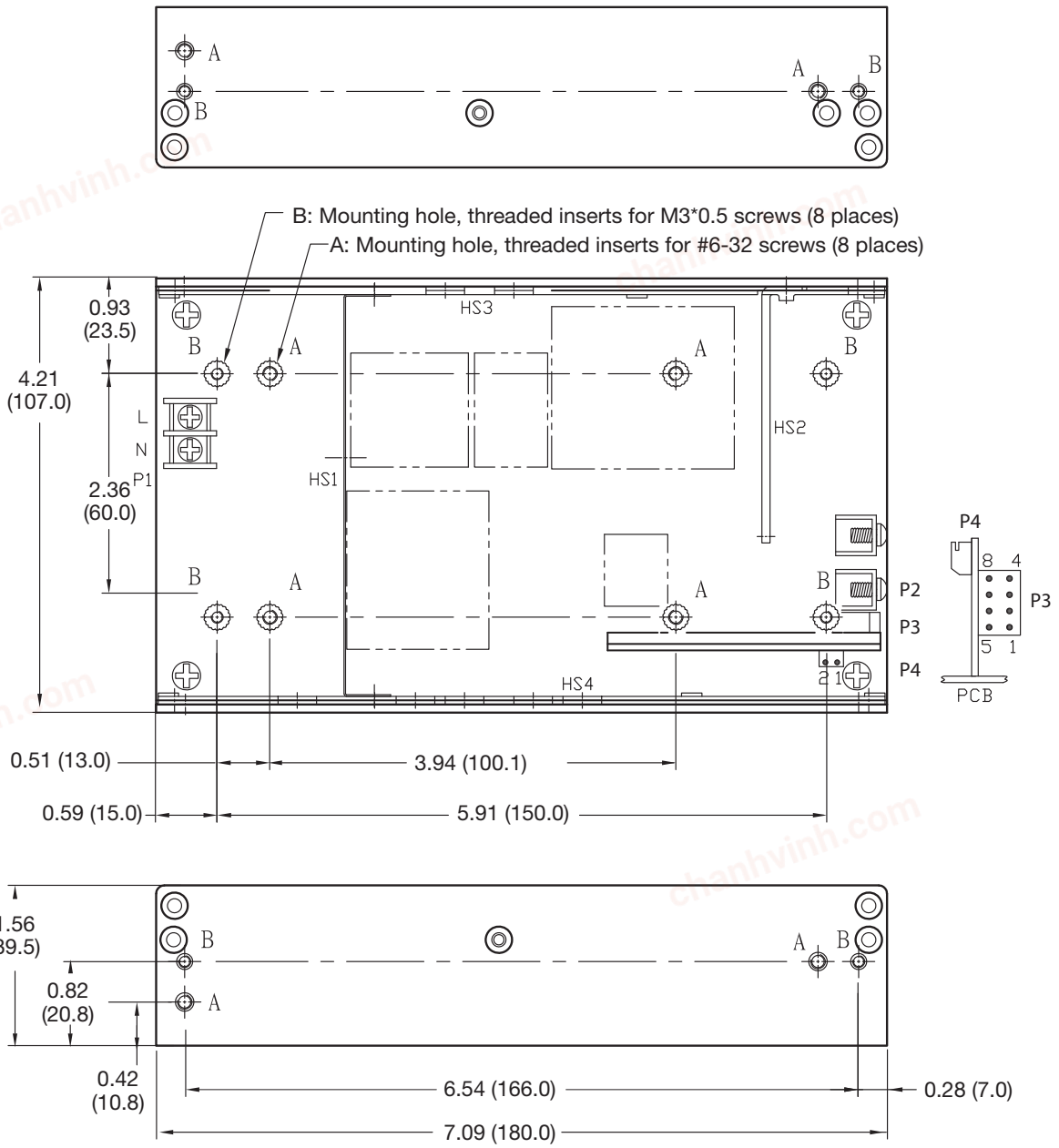
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60601-1	Medical
UL	ES60601-1, CSA C22.2 No.60601-1	Medical
TUV	EN60601-1	Medical

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Mechanical Details

PBL500PSxxB



Input Connector - P1	
Pin 1	L
Pin 2	N

Output Connector - P2	
Pin 1	V1+
Pin 2	V1 Return

P3			
Pin 1	Common Return	Pin 5	Inhibit
Pin 2	+V1 Sense	Pin 6	+5V Standby
Pin 3	-V1 Sense	Pin 7	N/C
Pin 4	AC OK	Pin 8	N/C

Output Connector - P4	
Pin 1	Common Return
Pin 2	+V3

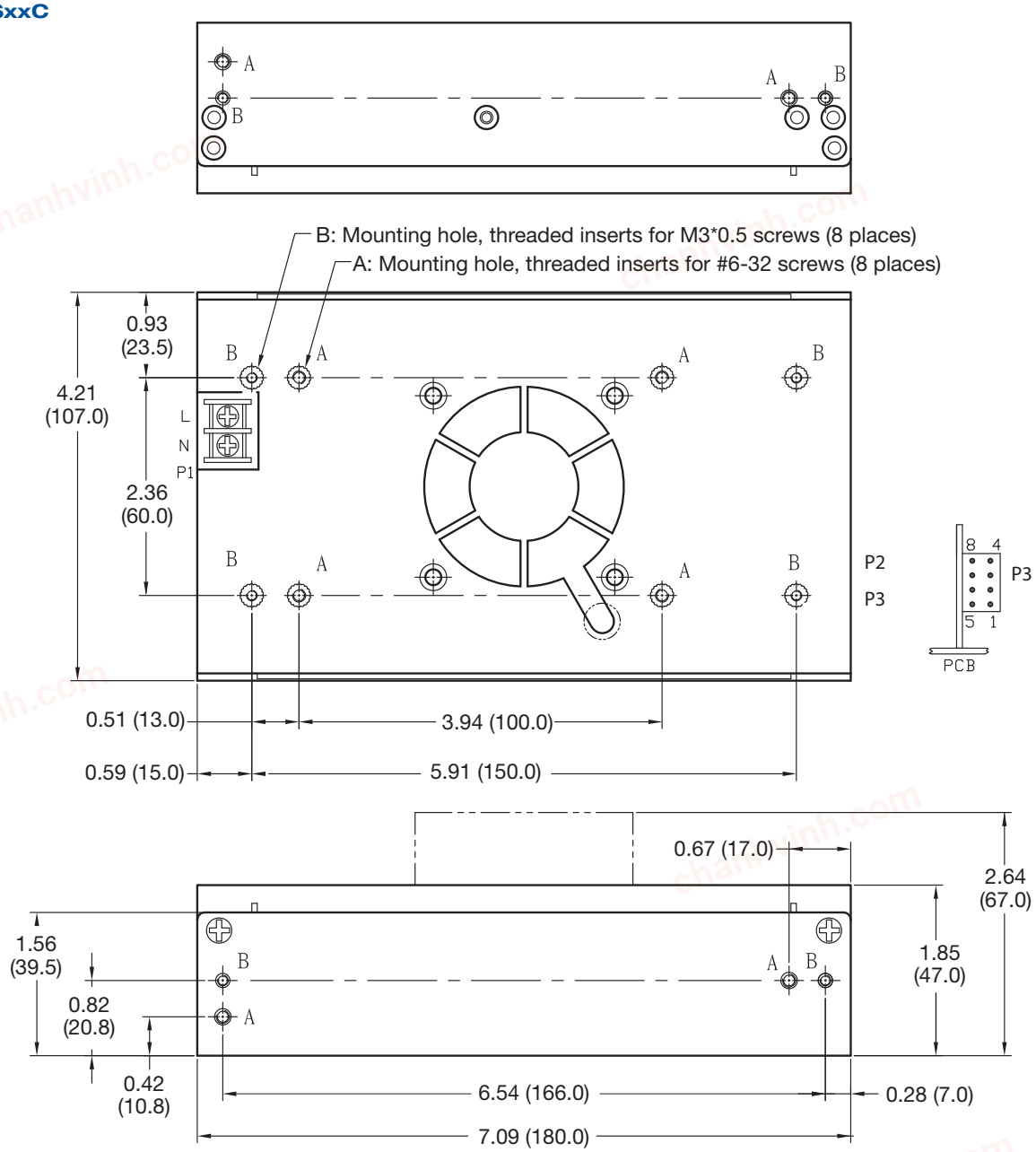
Notes

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 connector P2 is M4x0.7 screw connections.
5. Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
6. Fan connector P4 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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Mechanical Details

PBL500PSxxC



Input Connector - P1	
Pin 1	L
Pin 2	N

Output Connector - P2	
Pin 1	V1+
Pin 2	V1 Return

P3			
Pin 1	Common Return	Pin 5	Inhibit
Pin 2	+V1 Sense	Pin 6	+5V Standby
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