PBL500 series

500W Fan cooled **250W** Convection cooled

AC-DC power supplies

The Class II PBL500 series of AC-DC switching power supplies, in a package of just 180.3 x 101.6 x 39.6mm deliver 450-500W of continuous power with forced air cooling or 250W with convection cooling. The units are constructed on a U channel for mechanical support and heat sinking. A covered version with integral fan is available to order.

They are designed for medical applications including those needing BF rated insulation with an operation altitude up to 5000 meters.

Features

- 450-500W fan cooled
- 250W convection cooled
- Class II applications
- Medical (BF) safety approvals
- U channel 180.3 x 101.6 mm footprint, 39.6mm profile
- 5VDC/2A standby, 12VDC/0.3A fan supply
- Power OK, inhibit & remote sense
- Class B conducted & radiated emissions
- 3 year warranty

Applications

Healthcare

Medical Diagnostics

Home Healthcare

Dimensions

PBL500 (U channel):
180.3 x 101.6 x 39.6mm (7.1" x 4.0" x 1.56")

PBL500 (Covered):
180.3 x 101.6 x 67.0mm (7.1" x 4.0" x 2.64")

More resources

Click the link or scan the code

→ xppower.com

Models & ratings

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

Notes:

1. For covered version with integral fan, replace B in the part number with C, e.g PBL500PS12C. V3 not available on covered version.
2. 250W convection cooled or 450-500W with 51m³/h (30cfm) forced air cooling provided by the user. 450-500W for 'C version'.
3. Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20MHz bandwidth, at rated line voltage and output load, and with a 10µF tantalum capacitor in parallel with a 0.1µF ceramic capacitor.

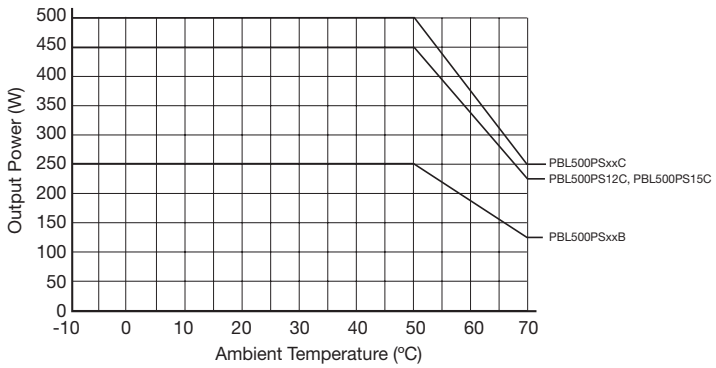
Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage	80		264	VAC	Derate to 90% at 85VAC & 80% at 80VAC
Input frequency	47		63	Hz	
Input current - full load		5.2/2.6		A (rms)	115/230VAC, 60/50Hz
No load input power			1	W	When inhibit used
Inrush current		30/60		A	115VAC/230VAC at 25°C, cold start
Input protection	Internal fuse fitted in line and neutral				

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 500µs for a 25% step load change
Ripple & noise			1	% pk-pk	20MHz bandwidth, see model table notes
Overvoltage protection	112		140	ms	Latching
Overcurrent protection	105		140	ms	Trip & restart characteristic
Thermal shutdown	Protected for overtemperature conditions, latching				
Temperature coefficient			±0.04	%/°C	
Standby supply (V2)		5		V	At 2.0A
Fan supply (V3)		12		V	At 300mA
Patient leakage current		50	80	µA	264VAC, 63Hz

Derating curve



Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	0		+70	°C	Derate linearly from 100% load at 40°C to 50% load at 60°C, safety approved to 40°C
Storage temperature	-10		+85		
Humidity	5		95	%RH	Non-condensing
Cooling (C version)	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.				
Operating altitude			5000	m	

General

Characteristic		Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency			90		%	230VAC, 100% load
Isolation:	input to output	4000			VAC	2 x MOPP
	input to ground	4000			VAC	2 x MOPP
	output to ground	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 110VAC & 500W
Power density				0.684 (11.2)	W/cm³ (W/in³)	
Mean time between failure			100,000		Hrs	MIL-HDBK-217F, Full load at 25°C GB
Weight			1.01 (2.23)		Kg (lb)	PBL500PSxxB
			1.14 (2.52)			PBL500PSxxC

Signals & controls

Characteristic	Notes & conditions
Remote Sense	Compensates for 0.5V total voltage drop.
Inhibit	To inhibit, apply TTL high signal.
Power OK (POK)	TTL high for normal operation, monitors input bus and output voltage. Turn on delay 100-1000ms, 1ms warning of loss of output following loss of input power.

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032/EN55011	Class B	
Radiated			
Harmonic currents	EN61000-3-2	Class A	
Voltage flicker	EN61000-3-3		

Emissions - immunity

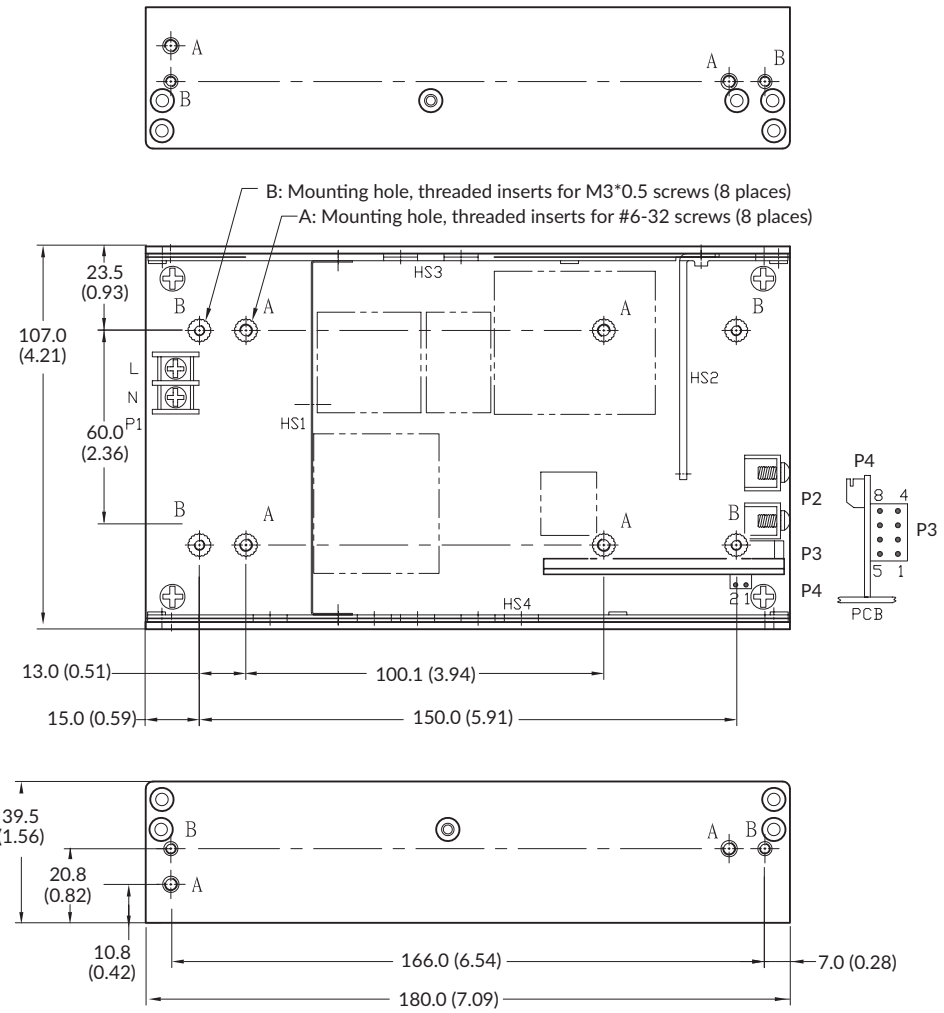
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	4	A	±8kV contact, ±15kV air
Radiated immunity	EN61000-4-3	10V/m	A	
EFT/burst	EN61000-4-4	±2kV	A	
Surge	EN61000-4-5	3	A	+/-2kV L-N
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic field	EN61000-4-8	30 A/m	A	
Dips and interruptions	100VAC/50Hz	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	
	240VAC/50Hz	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	Standard	Notes & conditions
UL	IEC60601-1	Medical
EN	ES60601-1, CSA C22.2 No.60601-1	Medical
CB	EN60601-1	Medical
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Mechanical details

PBL500PSxxB



Input connector - P1	
Pin 1	L
Pin 2	N

V1 output connector P2	
Pin 1	+V1 main output
Pin 2	-V1 (common return)

Signals & controls connector P3			
Pin 1	Common Return	**Pin 5**	Inhibit
Pin 2	+V1 Sense	**Pin 6**	+V2 5VDC standby
Pin 3	-V1 Sense	**Pin 7**	+V2 5VDC standby
Pin 4	POK	**Pin 8**	Common Return

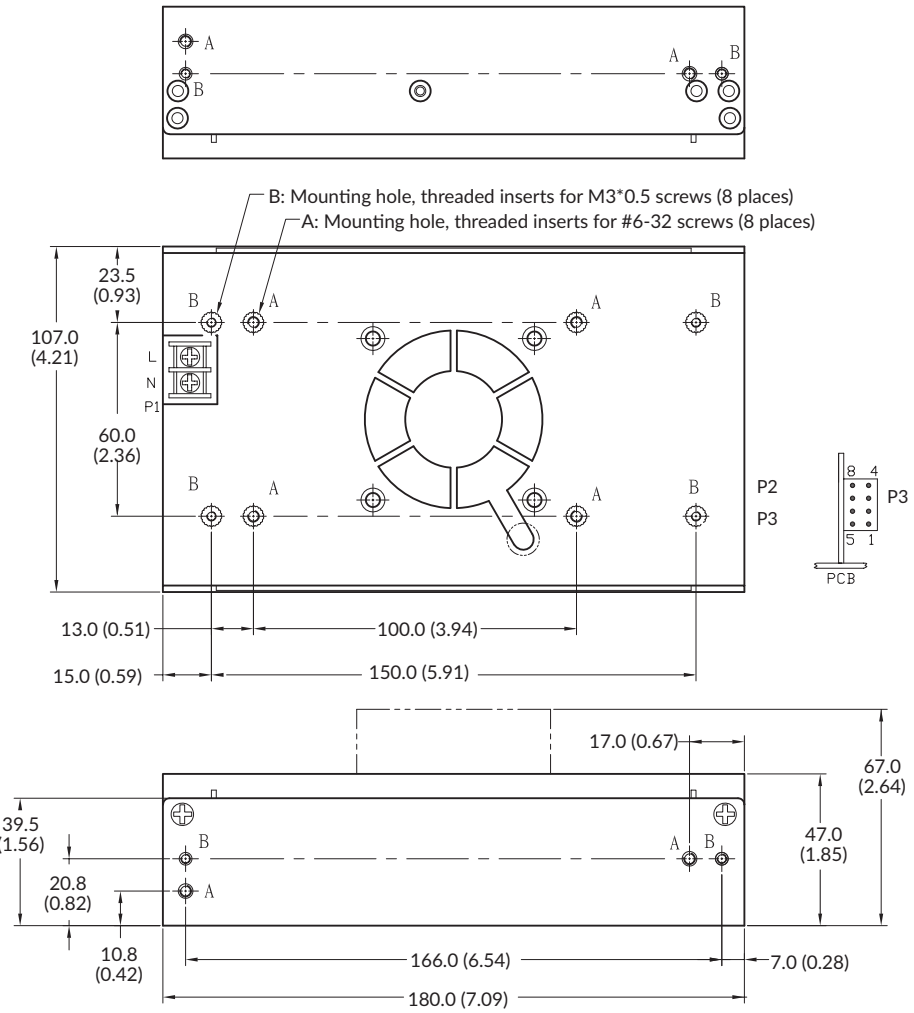
V3 output connector P4	
Pin 1	Common Return
Pin 2	+V3 12VDC fan

Notes:

1. Dimensions shown in mm (inches)
2. Tolerance 0.5 (0.02) 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: 1.01Kg (2.23lbs) approx.
8. Maximum penetration of fixing screws is 4mm from the outer surface of chassis.

Mechanical details

PBL500PSxxC



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V1 output connector P2	
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Signals & controls connector P3			
Pin 1	Common Return	Pin 5	Inhibit
Pin 2	+V1 Sense	Pin 6	+V2 5VDC standby
Pin 3	-V1 Sense	Pin 7	+V2 5VDC standby
Pin 4	AC OK	Pin 8	Common Return

Notes:

1. Dimensions shown in mm (inches)
2. Tolerance 0.5 (0.02) 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. Weight: 1.14Kg. (2.52lbs) approx.
7. Maximum penetration of fixing screws is 4mm from the outer surface of chassis.