

500 Watts

- 450-500W Forced Cooled
- 350-400W Convection Cooled
- ITE & Medical (BF) Safety Approvals
- U-Channel 4" x 7" Package
- 5V Standby & 12V Fan Supply
- Power OK, Inhibit & Remote Sense
- Class B Conducted & Radiated Emissions
- 3 Year Warranty



The PBR500 series of AC-DC switching power supplies, in a package of just 4 x 7 x 1.7 inches, deliver 450-500 watts of continuous power with forced air cooling or 350-400 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 both ITE/Industrial and medical applications including those needing BF rated insulation with an operation altitude up to 5000 meters.

Dimensions:

PBR500:
7.0 x 4.00 x 1.70" (177.8 x 101.6 x 44.5 mm)

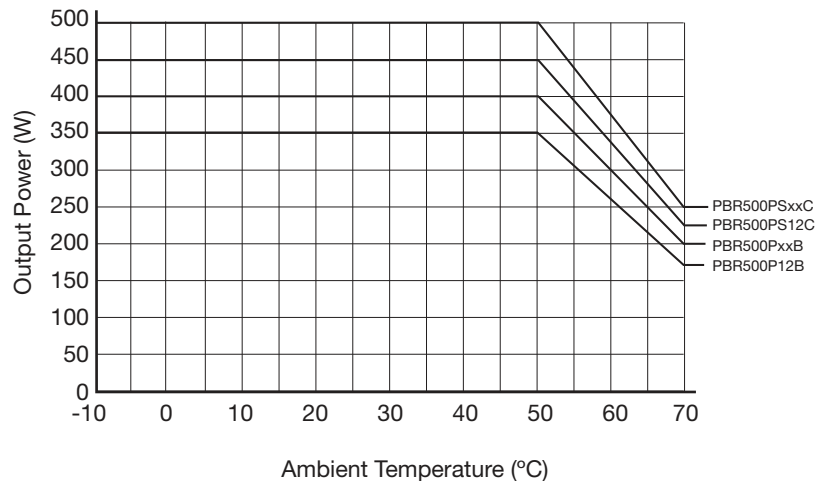
Models & Ratings

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	29.17 A	37.50 A	5.0 V / 0.5 A	12.0 V / 0.3 A	350 W	450 W	120 mV	PBR500PS12B
15 V	23.34 A	30.00 A					150 mV	PBR500PS15B
18 V	22.23 A	27.78 A					180 mV	PBR500PS18B
24 V	16.67 A	20.84 A			400 W	500 W	240 mV	PBR500PS24B
28 V	14.29 A	17.86 A					280 mV	PBR500PS28B
36 V	11.12 A	13.89 A					360 mV	PBR500PS36B
48 V	8.34 A	10.42 A					480 mV	PBR500PS48B
57 V	7.02 A	8.78 A					570 mV	PBR500PS57B

Notes

1. For covered version, replace B in the part number with C, e.g PBR500PS12C. V3 not available on covered version.
2. 350-400 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 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor.

Temperature Derating Curve



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
Earth Leakage Current		200	250	µA	264 VAC, 63 Hz

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 500 mA
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 Ground	1500			VAC	1 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 110 VAC & 500 W
Inrush Current			30/60		VAC	115 VAC/230 VAC at 25 °C, cold start
Mean Time Between Failure			100,000		Hrs	MIL-HDBK-217F, Full load at 25 °C GB
Weight			2.23 (1011.5)		lb (g)	PBR500PSxx
			2.52 (1143.0)			PBR500PSxx-C

Signals & Controls

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5V total voltage drop.
Inhibit	The inhibit, apply TTL high signal.
Power OK (P _{OK})	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.

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011/EN55032	Class B	
Radiated	EN55011/EN55032	Class B	
Harmonic Current	EN61000-3-2	Class A	
Voltage Fluctuations	EN61000-3-3		

EMC: Immunity

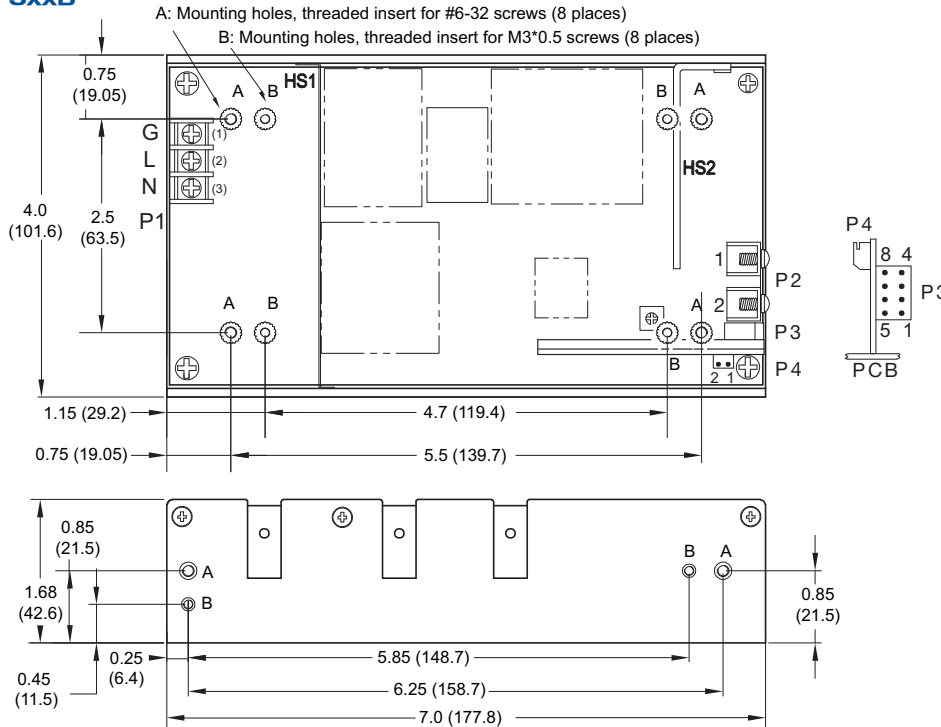
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	4	A	±8 kV contact, ±15 kV air
Radiated	EN61000-4-3	10 V/m	A	
EFT	EN61000-4-4	±2 kV	A	
Surges	EN61000-4-5	Installation class 3	A	±1 kV differential/ ±2 kV common mode
Conducted	EN61000-4-6	10 V _{rms}	A	
Magnetic Field	EN61000-4-8	30 A/m	A	
Dips and Interruptions	400 W (100 VAC/60 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	
	400 W (230 VAC/50 Hz)	Dip 30% (161 VAC), 500ms	A	
		Dip 60% (92 VAC), 100ms	A	
		Int >95% (0 VAC), 10ms	A	
		Int 100% (0 VAC), 20ms	A	
		Int 100% (0 VAC), 5000ms	B	
	500 W (100 VAC/60 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	
	500 W (230 VAC/50 Hz)	Dip 30% (161 VAC), 500ms	A	
Dip 60% (92 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	IEC62368-1	Information Technology
	IEC60601-1	Medical
UL	ES60601-1, CSA C22.2 No.60601-1	Medical
	UL62368-1, CSA C22.2 No. 62368-1	Information Technology
TUV	EN60601-1	Medical
	EN62368-1	Information Technology
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Mechanical Details

PBR500PSxxB



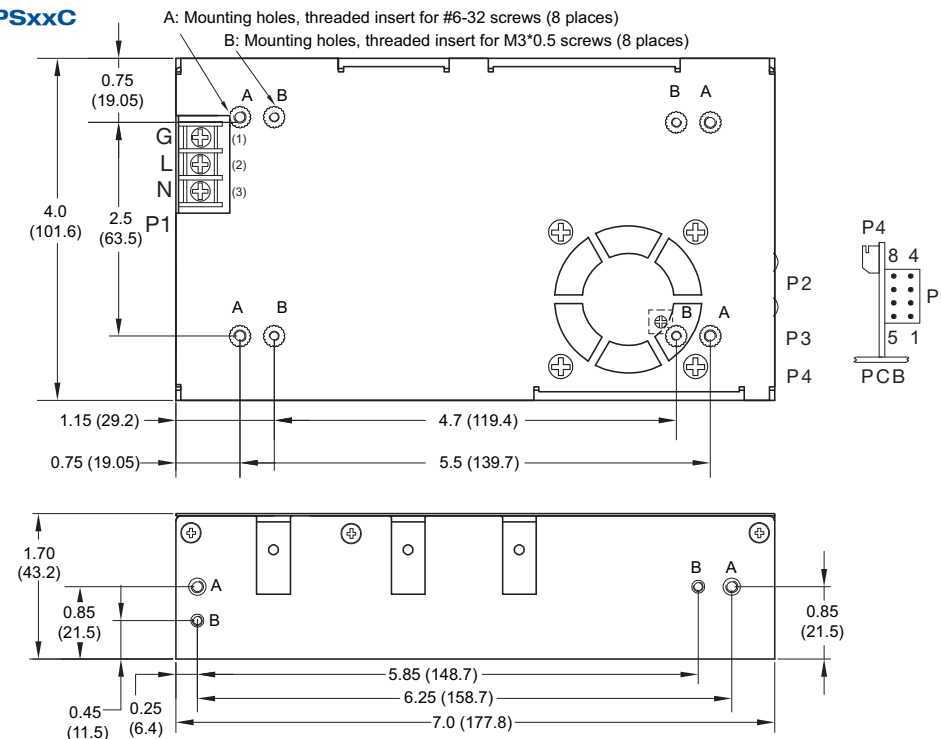
Input Connector - P1	
Pin 1	G
Pin 2	L
Pin 3	N

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

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

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

PBR500PSxxC



Notes

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- Output connector P2 is M4x0.7 screw connections.
- Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kgs. (2.52 lbs.) approx. for enclosed form
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.

Thermal Considerations

In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded. Temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of direct air flow). See below for component locations.

Temperature Measurements (At Maximum Ambient)	
Component	Max Temperature °C
T1 Coil	120°C
L1, LF1, LF2 Coil	120°C
EC1	105°C
EC8	105°C

Service Life

The estimated service life of the PBR500 is determined by the cooling arrangements and load conditions experienced in the end application. Due to the uncertain nature of the end application this estimated service life is based on the actual measured temperature of key capacitors within the product when installed by the end application,

The graph below expresses the estimated lifetime of a given component temperature and assumes continuous operation at this temperature.

Estimated Service Life vs Component Temperature

