

650 Watts

- Medical (BF) Safety Approvals
- 4" x 8" Package
- 5V Standby & 12V Fan Supply
- AC OK, Inhibit & Remote Sense
- Class B Conducted & Radiated Emissions
- 3 Year Warranty



The PBR650 series of AC-DC switching power supplies, in a package of just 4 x 8 x 2.58 inches, deliver 600-650 watts of continuous power. They are designed for medical applications including those needing BF rated insulation with an operation altitude of up to 5000m.

Dimensions:

PBR650:

8.00 x 4.00 x 2.58" (203.2 x 101.6 x 65.5 mm)

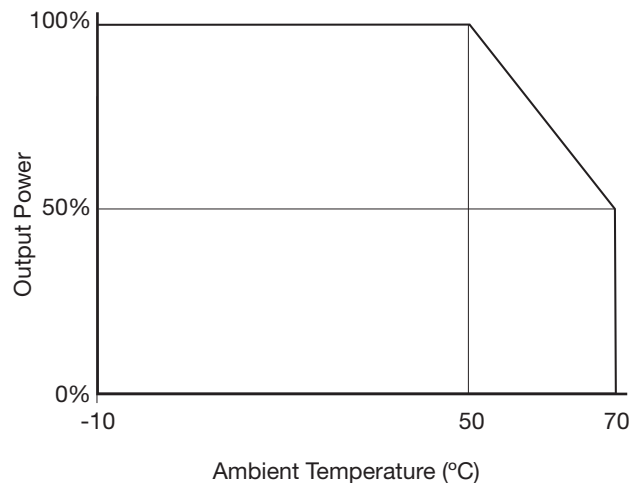
Models & Ratings

Output Voltage V1	Output Current V1 ⁽²⁾		Standby Supply V2	Ripple & Noise ⁽¹⁾	Model Number
	Nominal	Peak ⁽³⁾			
12 V	50.00 A	55.00 A	5.0 V / 0.2 A	120 mV	PBR650PS12
15 V	40.00 A	44.00 A		150 mV	PBR650PS15
18 V	36.12 A	40.00 A		180 mV	PBR650PS18
24 V	27.09 A	30.00 A		240 mV	PBR650PS24
28 V	23.22 A	25.50 A		280 mV	PBR650PS28
36 V	18.06 A	20.00 A		360 mV	PBR650PS36
48 V	13.55 A	15.00 A		480 mV	PBR650PS48
57 V	11.41 A	12.50 A		570 mV	PBR650PS57

Notes

1. 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.
2. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to burst-mode operation of the control IC for energy saving.
3. Peak current available for 15s max, 10% duty cycle, average power not to exceed nominal power rating.

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		8.4/4.2		A (rms)	115/230 VAC, 60/50 Hz
Earth Leakage Current		225	275	µA	264 VAC, 63 Hz

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	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	115		140	%	Latching
Overcurrent Protection	115		140	%	Trip & restart characteristic
Thermal Shutdown					Protected for overtemperature conditions
Temperature Coefficient			±0.04	%/°C	
5 V Standby Supply			5	V	At 200 mA
Fan Supply			12	V	At 500 mA
Standby 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

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		90		%	230 VAC, 100% load
Isolation: Input to Output Input to Ground Output to Ground	4000			VAC	2 x MOPP
	1500			VAC	1 X MOPP
	1500			VAC	1 X MOPP
Switching Frequency		85		kHz	
Hold Up Time	12	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		190,000		Hrs	MIL-HDBK-217F, Full load at 25 °C GB
Weight		4.4 (2000)		lb (g)	

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/EN55032	Class B	
Radiated	EN55011/EN55032	Class B	
Harmonic Current	EN61000-3-2	Class A	
Voltage Fluctuations	EN61000-3-3		

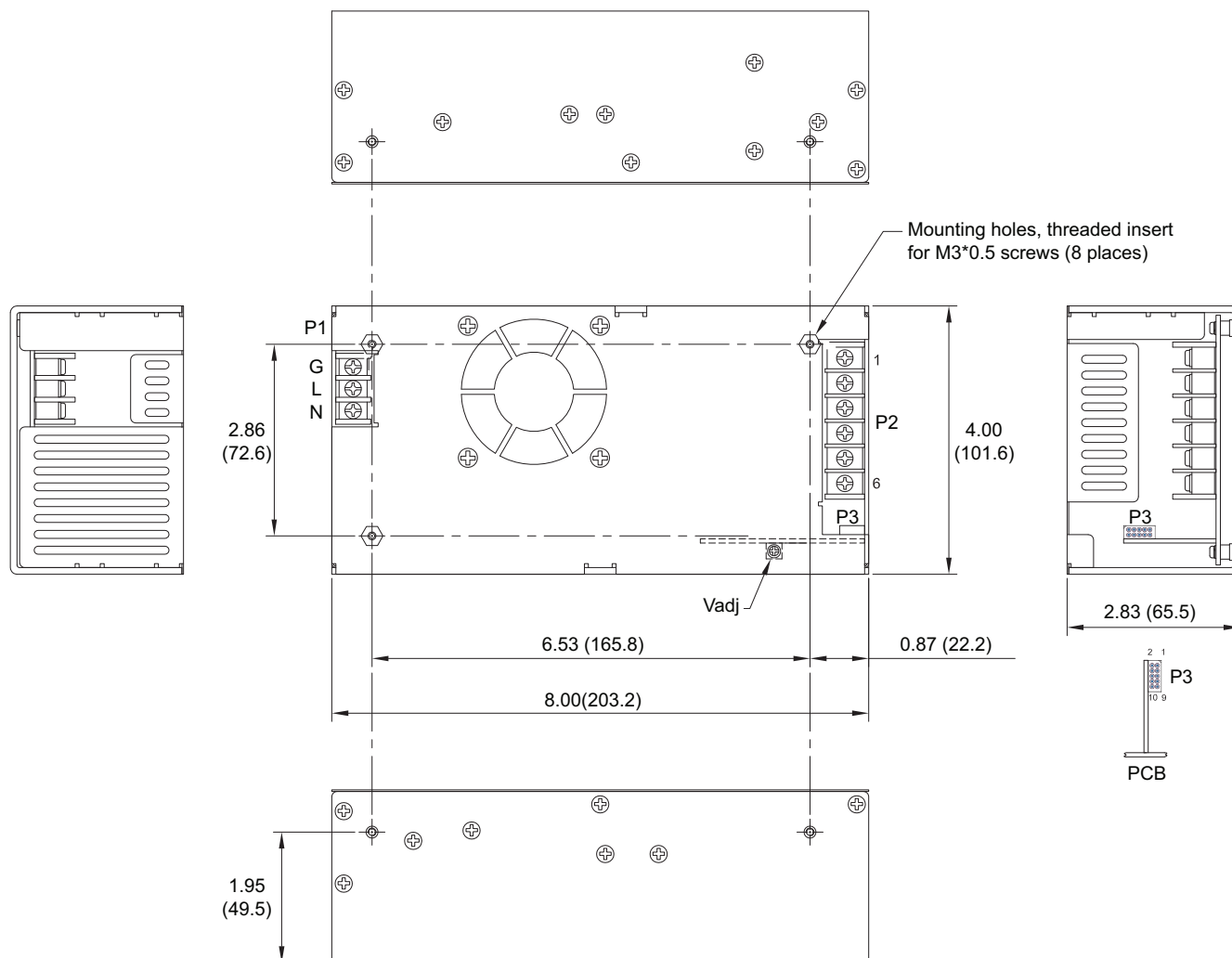
EMC: Immunity

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 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/60 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	IEC60950-1	Information Technology
	IEC62368-1	Information Technology
	IEC60601-1 Including Risk Management	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

Mechanical Details



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

Mates with JST VHR-3N housing and SVH-21T-P1.1 crimps

Output Connector - P2	
Pin 1	+V1
Pin 2	+V1
Pin 3	+V1
Pin 4	Com
Pin 5	Com
Pin 6	Com

Mates with JST VHR-6N housing and SVH-21T-P1.1 crimps

P3	
Pin 1	+V1 Sense
Pin 2	+V1 Sense
Pin 3	AC OK
Pin 4	Common Return
Pin 5	N/C
Pin 6	N/C
Pin 7	Inhibit
Pin 8	N/C
Pin 9	+5V Standby
Pin 10	+5V Standby Return

Mates with Molex 22-01-1022 housing and 2759 crimps

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 are M4x0.7 screw connections.
- Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Weight: 2.0 Kg (2.23 lbs.) approx.
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.