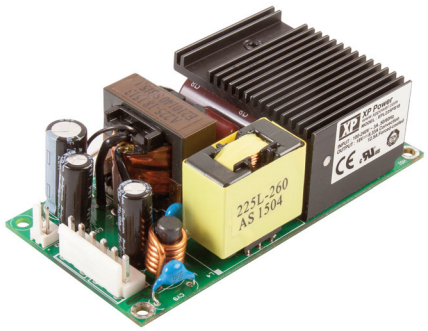
EPL225 Series

AC-DC Power Supplies

XP Power

225 Watts

- 150W convection/ 225W forced-cooled ratings
- 2″ by 4″ footprint
- Low 1.26″ profile
- 12V fan output
- High efficiency, up to 95%
- ITE & medical approvals
- High power density
- Less than 0.5W no load input power
- Class I and II operation
- 3 year warranty



Dimensions:

EPL225:
4.00 x 2.00 x 1.26″ (101.6 x 50.8 x 32.3 mm)

The EPL225 series maximises efficiency across the load range and minimises no load power consumption minimising heat dissipation, reducing running costs and enabling compliance with the latest environmental goals and legislation. Fully approved for ITE and Industrial applications the EPL225 provides up to 150W when convection cooled and up to 225W when force cooled at just 10 CFM. A 12V 0.5A fan supply is included to support force cooled applications. The small footprint, low profile, low noise and comprehensive safety agency approvals allow this versatile product to be used in a wide range of ITE and industrial applications with either Class I or Class II earth arrangements.

Models & Ratings

Output Power	Output Voltage	Output Current		Fan Output[3,4]	Efficiency[2]	Model Number
		Convection-cooled	Forced-cooled[1]			
225 W	12.0 V	12.50 A	18.75 A	12 V/0.5 A	93%	EPL225PS12
225 W	15.0 V	10.00 A	15.00 A	12 V/0.5 A	93%	EPL225PS15
225 W	18.0 V	8.33 A	12.50 A	12 V/0.5 A	93%	EPL225PS18
225 W	24.0 V	6.25 A	9.38 A	12 V/0.5 A	93%	EPL225PS24
225 W	28.0 V	5.36 A	8.04 A	12 V/0.5 A	93%	EPL225PS28
225 W	36.0 V	4.16 A	6.25 A	12 V/0.5 A	93%	EPL225PS36
225 W	48.0 V	3.10 A	4.69 A	12 V/0.5 A	93%	EPL225PS48

Notes

1. Requires 10 CFM.
2. Minimum average efficiencies measured at 25%, 50%, 75% & 100% of 225 W load and 230 VAC input.
3. Typical voltage, actual regulated voltage will be in range of 9.8 to 13.1V
4. Regulation of the fan output requires a minimum load of 10W on the main output.

Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range	80	115/230	264	VAC	Derate load from 100% at 90VAC to 85% at 85VAC and 80% at 80VAC
No Load Input Power			0.5	W	
Efficiency		95		%	230 VAC (see fig.1 & 2)
Operating Temperature	-20		+70	°C	See derating curve (fig.3)
EMC	Conducted: EN55011/32, Class B, Radiated: EN55011/22, Class A (Class B with external core, see EMC Emissions for details)				
Safety Approvals	IEC62368-1, EN62368-1, UL62368-1, CSA22.2 No. 234 per cUL, IEC60601: 2005 + A1, ES60601: 2005/(R)2012 CSA C22.2 No.60601-1: 2014, EN60601: 2006 + A12				

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	80	115/230	264	VAC	Derate load from 100% at 90VAC to 85% at 85VAC and 80% at 80VAC
Input Frequency	47	50/60	63	Hz	
Power Factor		>0.9			230 VAC, 100% load EN61000-3-2 class A EN61000-3-2 class C > 145W
Input Current - Full Load		2.2/1.1		A	115/230 VAC
Inrush Current		120		A	230 VAC cold start, 25 °C
Earth Leakage Current		80/140	230	µA	115/230 VAC/50 Hz (Typ), 264 VAC/60 Hz (Max)
No load Input Power			0.5	W	
Input Protection	T4.0 A/250 V Internal fuse fitted in line and neutral.				

Output - Main Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage - V1	12		48	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	50% load, 115/230 VAC
Output Voltage Adjustment-V1				%	None
Minimum Load	0			A	
Start Up Delay			2	s	115/230 VAC full load.
Hold Up Time	10	20/13		ms	Min at full load, 115 VAC. Typical at 150W/ 225W
Drift			±0.02	%	After 20 min warm up
Line Regulation			±0.5	%	90-264 VAC
Load Regulation			±0.5	%	0-100% load.
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 50-75% and 75-50% load step
Over/Undershoot			7	%	Full load
Ripple & Noise			1	% pk-pk	20 MHz bandwidth and 10 µF electrolytic capacitator in parallel with 0.1 µF ceramic capacitator.
Overvoltage Protection	110		140	%	Vnom, recycle input to reset
Overload Protection	110		170	% I nom	
Short Circuit Protection					Trip & Restart
Temperature Coefficient			0.02	%/°C	
Overtemperature Protection				°C	Measured internally, Auto Resetting

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		95		%	230 VAC (see fig. 1 & 2)
Isolation: Input to Output	4000			VAC	2 MOPP
Input to Ground	1500			VAC	1 MOPP, Class I only
Output to Ground	1500			VAC	1 MOPP, Class I only
Switching Frequency	40		130	kHz	PFC
	50		95	kHz	Main converters
Power Density			22/14.6	W/in³	Forced/convection-cooled
Mean Time Between Failure		300		kHrs	MIL-HDBK-217F, Notice 2 +25 °C GB
Weight		0.43(195)		lb(g)	

Efficiency Vs Load

Figure 1
EPL225PS12
12 V at 225 W

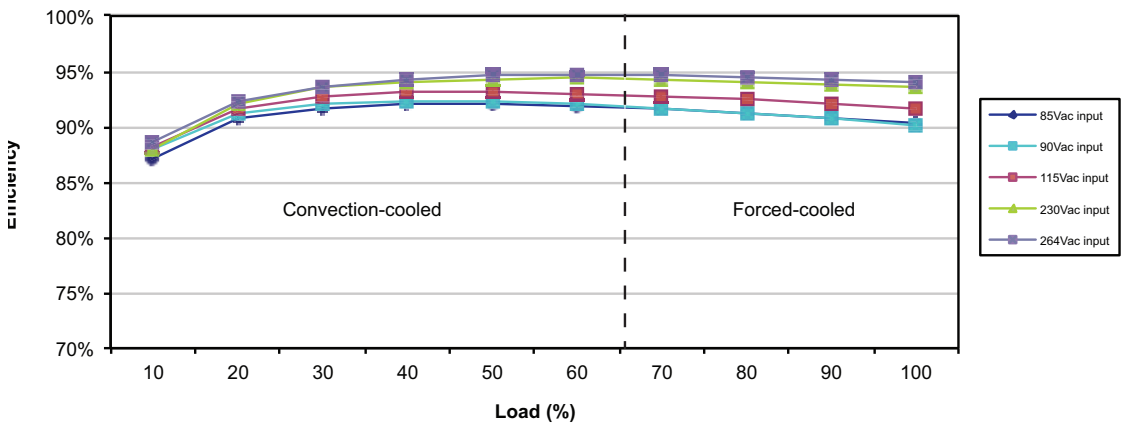
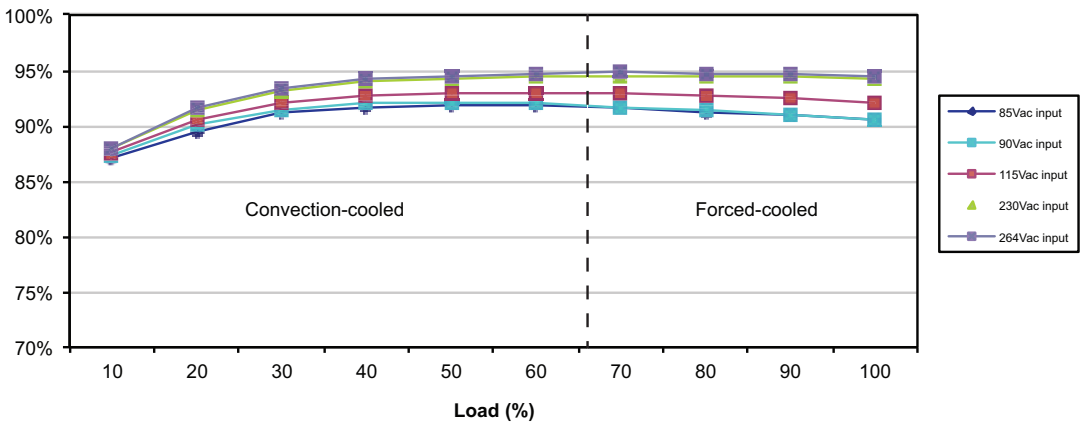


Figure 2
EPL225PS24
24 V at 225 W

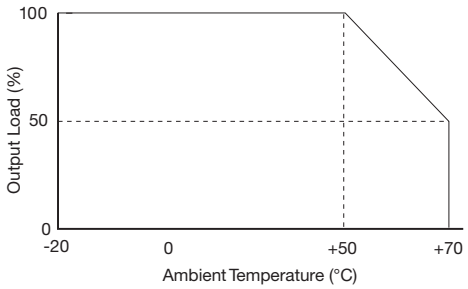


Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20		+70	°C	See derating curve, fig.3
Storage Temperature	-40		+85	°C	
Cooling	10			CFM	Forced-cooled > 150W
Humidity	5		95	%RH	Non-condensing
Operating Altitude			5000	m	Medical: 4000m max
Shock	±3 x 30g shocks in each plane, total 18 shocks. 30g = 11ms (+/- 0.5msecs), half sine. Conforms to EN60068-2-27				
Vibration	Single axis 10-500 Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				

Temperature Derating Curve

Figure 3



EMC: Emissions

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Conducted	EN55011/32	Class B		
Radiated	EN55011/32	Class A		Class B with King Core K5B RC 13*23*7 on input cable.
Harmonic Current	EN61000-3-2	Class A		Meet Class C for loads above 145W
Voltage Functions	EN61000-3-3			

EMC: Immunity

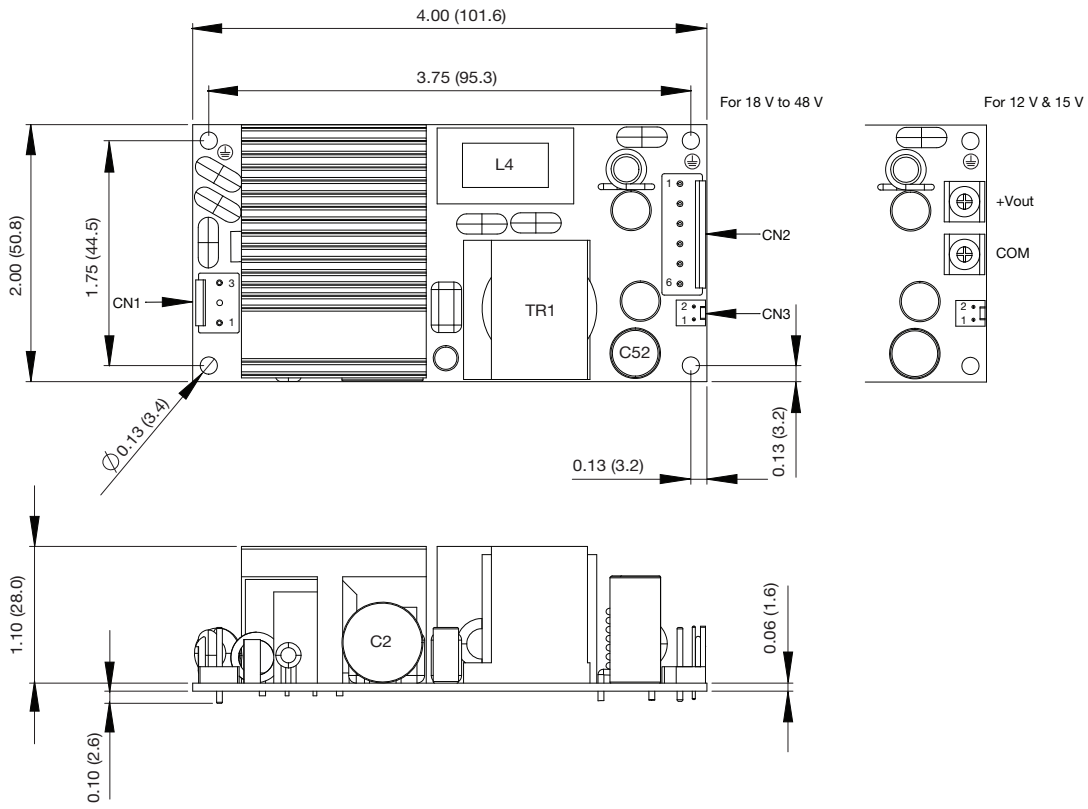
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Medical Device EMC	IEC60601-1-2	Ed.4.0 : 2014	as below	
Low Voltage PSU EMC	EN61204-3	High severity level	as below	
ESD	EN61000-4-2	4	A	±8kV contact, ±15kV air
Radiated	EN61000-4-3	3	A	
EFT	EN61000-4-4	3	A	
Surges	EN61000-4-5	Installation class 3	A	
Conducted	EN61000-4-6	3	A	
Magnetic Fields	EN61000-4-8	4	A	
Dips and Interruptions	EN55024 (100 VAC)	Dip >95% (0 VAC), 8.3 ms	A	
		Dip 30% (70 VAC), 416 ms	A	At 200 W
		Dip >95% (0 VAC), 4160 ms	B	
	EN55024 (240 VAC)	Dip >95% (0 VAC), 10.0 ms	A	
		Dip 30% (168 VAC), 500 ms	A	
		Dip >95% (0 VAC), 5000 ms	B	
	EN60601-1-2 (100 VAC)	Dip 100% (0 VAC), 10.0 ms	A	
		Dip 100% (0 VAC), 20 ms	A	At 120 W
		Dip 60% (40 VAC), 100 ms	A	Derate Output Power to 30W
		Dip 30% (70 VAC), 500 ms	A	At 200 W
		Dip 100% (0 VAC), 5000 ms	B	
	EN60601-1-2 (240 VAC)	Dip 100% (0 VAC), 10.0 ms	A	
		Dip 100% (0 VAC), 20 ms	A	At 150 W
		Dip 60% (96 VAC), 100 ms	A	At 170 W
		Dip 30% (168 VAC), 500 ms	A	
		Dip 100% (0 VAC), 5000 ms	B	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60950-1:2005 + A1:2009 + A2: 2013, IEC62368-1	Information Technology
	IEC60601: 2005 + A1	Medical
UL	UL60950-1 (2011), CSA 22.2 No.60950-1-11 Ed 2, UL62368-1	Information Technology
	ES60601: 2005/(R)2012 CSA C22.2 No.60601-1: 2014	Medical
TUV	EN60950-1: 2006 + A11: 2009 + A1:2010 + A12: 2012, EN62368-1	Information Technology
	EN60601: 2006 + A12	Medical
CE	LVD	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Isolation	Safety Standard	Notes & Conditions
Primary to Secondary	2 x MOPP (Means of Patient Protection)	
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	1 x MOPP (Means of Patient Protection)	

Mechanical Details



CN1 - Input Connector	
Pin 1	Line
Pin 2	Not Fitted
Pin 3	Neutral

Mates with JST housing
VHR-3N and JST Series
SVH-21T-P1.1 crimp terminals

Mounting holes marked with ⏚ must be connected to safety earth for Class I operation

CN2 - Output Connector	
Pin 1	+Vout
Pin 2	+Vout
Pin 3	+Vout
Pin 4	Com
Pin 5	Com
Pin 6	Com

Mates with JST housing
VHR-6N and JST Series
SVH-21T-P1.1 crimp terminals

CN3 - Fan Connector	
Pin 1	Fan -
Pin 2	Fan +

Mates with Molex housing
22-01-1022 and 2759 crimp terminals

Notes

1. All dimensions shown in inches (mm).
   Tolerance: ±0.02 (0.5)
2. Weight: 0.43 lbs (195 g) approx.

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 thermocouples placed on the hottest part of the component (out of direct air flow). See Mechanical Details for component locations.

Temperature Measurements (At Maximum Ambient)	
Component	Max Temperature °C
TR1 Coil	120°C
L4 Coil	120°C
C2	105°C
C52	105°C

Service Life

The estimated service life of the EPL225 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 with in the product when installed by the end application,

The graph below expresses the estimated lifetime based on the temperature of these key components based on the average temperature over the lifetime of the equipment.

Estimated Service Life vs Component Temperature

Figure 4