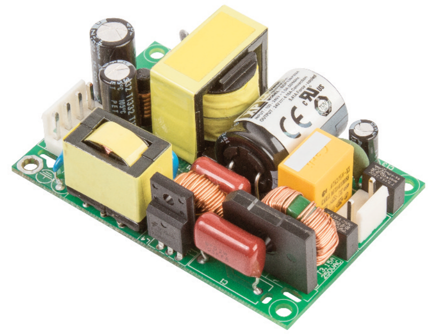
ECP130 Series

130 Watts

- 100 W Convection/130 W Forced-cooled Ratings
- 2" by 3" Footprint
- Low 1.1" Profile
- High Efficiency, up to 95%
- Medical and ITE Approvals
- High Power Density
- Less than 0.5 W No Load Input Power
- 3 Year Warranty



The ECP130 series is designed to minimize the no load power consumption and maximize efficiency to facilitate equipment design to meet the latest environmental legislation. Approved for medical and ITE applications, this range of single output AC-DC power supplies are packaged in a low profile 1.1" height with a foot print of just 2" by 3". The ECP130 provides up to 130 W force-cooled or 100 W convection-cooled leading to very high power densities of 19.7 W/in^3 or 15.1 W/in^3 respectively. The power supply contains two fuses and low leakage currents as required by medical applications and is safety approved to operate in a 80 °C ambient. The low profile and safety approvals covering ITE and medical standards along with conducted emissions to EN55011/22 level B allow the versatile ECP130 series to be used in a vast range of applications.

Dimensions:

ECP130:
3.00 x 2.00 x 1.10" (76.2 x 50.8 x 28.0 mm)

Models & Ratings

Output Power	Output Voltage	Output Current		Efficiency(2)	Model Number(3)
		Convection-cooled	Forced-cooled(1)		
130 W	12.0 V	8.33 A	10.83 A	93%	ECP130PS12
130 W	15.0 V	6.66 A	8.66 A	93%	ECP130PS15
130 W	18.0 V	5.55 A	7.22 A	93%	ECP130PS18
130 W	24.0 V	4.16 A	5.41 A	93%	ECP130PS24
130 W	28.0 V	3.57 A	4.64 A	93%	ECP130PS28
130 W	36.0 V	2.77 A	3.61 A	93%	ECP130PS36
130 W	48.0 V	2.08 A	2.70 A	93%	ECP130PS48

Notes

1. Requires 10 CFM.
2. Typical efficiency measured at full load and 230VAC input.
3. Add suffix '-S' for input and output screw terminals e.g. ECP130PS24-S

Summary

Characteristic		Minimum	Typical	Maximum	Units	Notes & Conditions
Input Range		85	115/230	264	VAC	Derate load from 100% at 90 VAC to 85% at 85 VAC
No Load Input Power				0.5	W	
Efficiency			95		%	230 VAC (see fig.1 & 2)
Operating Temperature		-30		+80	°C	See derating curve (fig.3)
Safety Approvals	ITE	IEC60950, UL60950-1, CSA 22.2 No.60950-1-11 Ed 2, EN60950-1, LVD				
	Medical	IEC60601-1 Ed 3.1 Including Risk Management, ANSI/AAMI ES60601-1 & CSA C22.2 No.6061-1:08, EN60601-1				

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	85	115/230	264	VAC	Derate output from 100% at 90 VAC to 85% at 85 VAC
Input Frequency	47	50/60	63	Hz	Agency approval, 47-63 Hz
Power Factor	0.8				230 VAC, 100% load EN61000-3-2 class A
Input Current - Full Load		1.3/0.65		A	115/230 VAC
Inrush Current		120		A	230 VAC cold start, 25 °C
Earth Leakage Current		20/40	50	µA	115/230 VAC/50 Hz (Typ), 264 VAC/60 Hz (Max)
No load Input Power			0.5	W	
Input Protection	F3.15 A/250 V Internal fuse fitted in line and neutral.				

Output - Main Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	12		48	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	50% load, 115/230 VAC
Output Voltage Adjustment				%	None
Minimum Load	0			A	No minimum load required
Start Up Delay			2	s	115/230 VAC full load.
Hold Up Time	10	15/11		ms	Min at full load, 115 VAC. Typical at 100W/ 130W
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	<2% from no load to 10% load, <1% above 10% load. 20 MHz bandwidth and 10 µF electrolytic capacitor 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	

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
Output to Ground	1500			VAC	1 MOPP
Switching Frequency	40		130	kHz	PFC
	50		135	kHz	Main converter
Power Density			19.7/15.1	W/in^3	Forced/convection-cooled
Mean Time Between Failure		680		kHrs	MIL-HDBK-217F, Notice 2 +25 °C GB
Weight		0.43(195)		lb(g)	

Efficiency Vs Load

Figure 1
ECP130PS12
12 V at 130 W

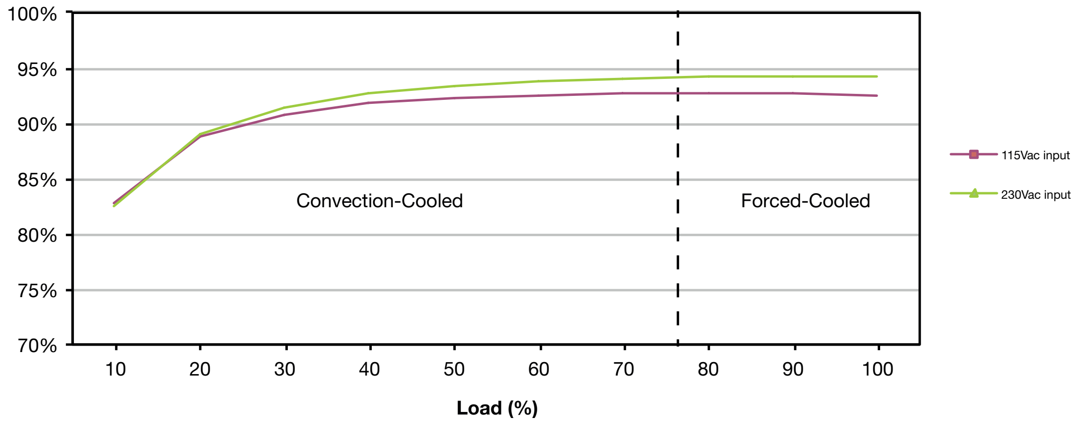
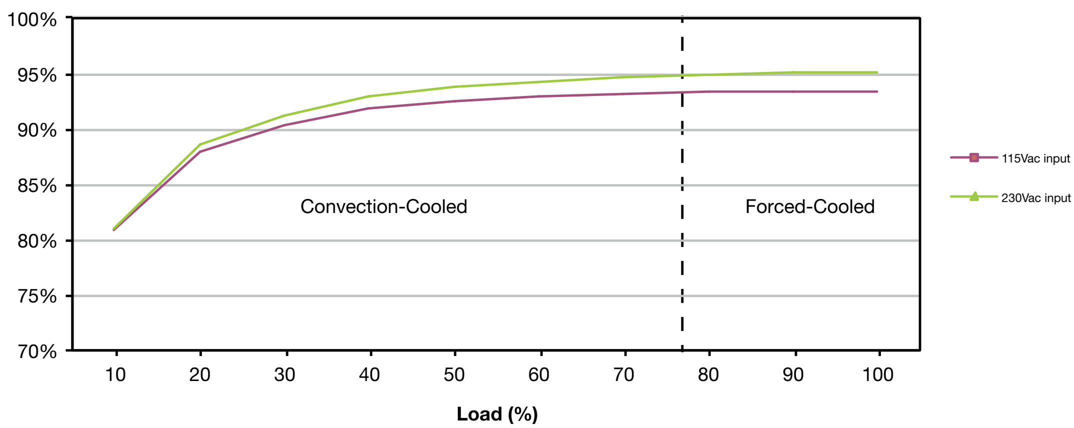


Figure 2
ECP130PS24
24 V at 130 W

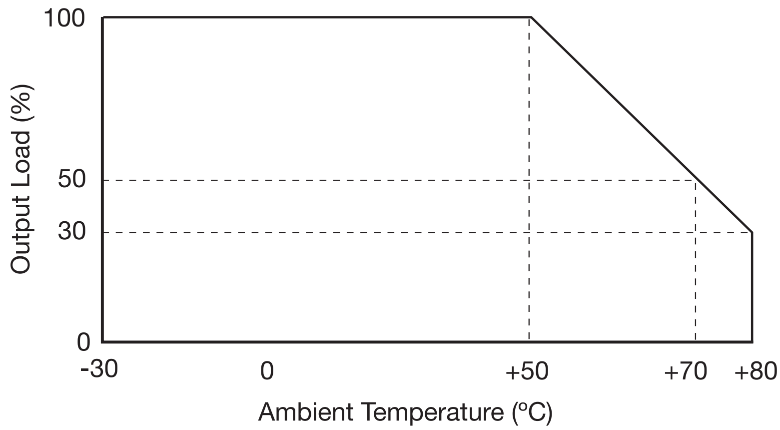


Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-30		+80	°C	See derating curve, fig.3
Storage Temperature	-40		+85	°C	
Cooling	10			CFM	Forced-cooled > 100W
Humidity	5		95	%RH	Non-condensing
Operating Altitude			5000	m	
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	EN55011/22	Class B		
Radiated	EN55011/22	Class A		Class B with King Core KSB RC 13 x 23 x 7 on input cable and KSB + 25 x 12 x 5 on output cable.
Harmonic Current	EN61000-3-2	Class A		
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	±8kV contact, ±15kV air	A	
Radiated	EN61000-4-3	3	A	
EFT	EN61000-4-4	3	A	
Surge	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	
		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	
		Dip 60% (40 VAC), 100 ms	B	Performance criteria A <25 W
		Dip 30% (70 VAC), 500 ms	A	
		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	
		Dip 60% (96 VAC), 100 ms	A	
		Dip 30% (168 VAC), 500 ms	A	
		Dip 100% (0 VAC), 5000 ms	B	

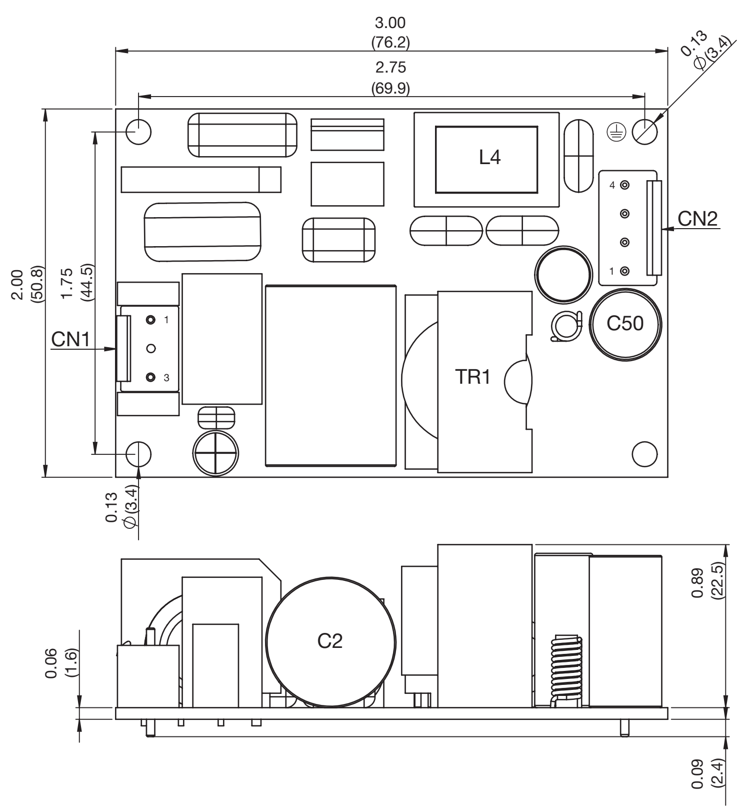
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60950-1:2005	Information Technology
UL	UL60950-1, CSA 22.2 No.60950-1-11 Ed 2	Information Technology
TUV	EN60950-1	Information Technology
CE	LVD	

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60601-1 Ed 3.1 Including Risk Management	Medical
UL	ANSI/AAMI ES60601-1: & CSA C22.2 No.6061-1:08	Medical
CE	EN60601-1	Medical

Isolation	Safety Standard	Notes & Conditions
Primary to Secondary	2 x MOPP (Means of Patient Protection)	IEC60601-1 Ed 3.1
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-4N and JST Series SVH-21T-P1.1 crimp terminals

Mounting hole marked with ⏚ must be connected to safety earth

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

Mates with JST housing VHR-6N and JST Series SVH-21T-P1.1 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
C50	105°C

Service Life

The estimated service life of the ECP130 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