

180W Fan cooled

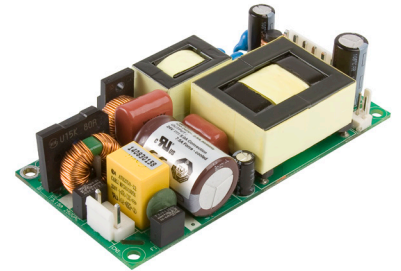
120W Convection cooled

AC-DC power supplies

The ECP180 series is suitable for both class I and class II applications. The series has been designed to minimise no load power consumption and maximise efficiency facilitating equipment design to meet the latest environmental legislation and minimising power loss and heating within equipment enclosures.

Approved for medical (2 x MOPP), industrial electronics and ITE applications, The power supply contains two fuses and low leakage currents as required for medical applications and is safety approved to operate in a +70°C ambient temperature.

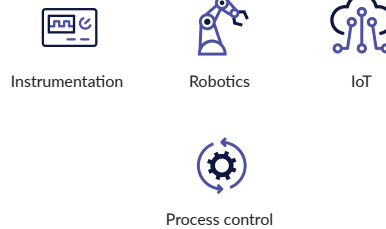
The low profile and safety approvals covering ITE and medical standards for both class I and class II applications along with conducted emissions meeting EN55011/32 level B allow the versatile ECP180 series to be used in a vast range of applications.



Features

- ▶ 180W fan cooled 120W convection cooled
- ▶ 101.6 x 50.8 mm (4" x 2") footprint, 25.4mm profile
- ▶ Regulated single outputs 12V to 48VDC
- ▶ Input range 85 to 264VAC
- ▶ High efficiency – up to 94%
- ▶ Medical (2 x MOPP) & ITE approvals
- ▶ 4.0kVAC input to output isolation
- ▶ Class I & class II applications
- ▶ <0.5W no load input power
- ▶ 12VDC/0.5A fan supply
- ▶ -20°C to +70°C operating temperature
- ▶ Full load to +50°C
- ▶ 3 year warranty

Applications



Dimensions

101.6 x 50.8 x 25.4mm (4.00" x 2.00" x 1.00")

Documentation

Click the link or scan the code

→ xppower.com



Models & ratings

Model number	Output voltage V1	Output current V1		Ripple & noise ⁽²⁾ pk-pk	Fan Output	Efficiency ⁽³⁾
		Convection	Fan cooled ⁽¹⁾			
ECP180PS12	12V	10.00A	15.00A	120mV	12V/0.5A	92%
ECP180PS15	15V	8.00A	12.00A	150mV	12V/0.5A	92%
ECP180PS24	24V	5.00A	7.50A	240mV	12V/0.5A	93%
ECP180PS28	28V	4.30A	6.43A	280mV	12V/0.5A	93%
ECP180PS36	36V	3.33A	5.00A	360mV	12V/0.5A	94%
ECP180PS48	48V	2.50A	3.75A	480mV	12V/0.5A	94%

Notes:

1. Requires 16.99m³/h (10CFM).
2. Measured with 20MHz bandwidth and 10µF electrolytic capacitor in parallel with 0.1µF ceramic capacitor
3. Minimum average efficiencies measured at 25%, 50%, 75% & 100% of 180W load and 230VAC input.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input voltage - operating	85	115/230	264	VAC	100% power at 100-264VAC, linear derate to 90% at 90VAC and 85% at 85VAC
Input frequency	47	50/60	63	Hz	Agency approval 47-63Hz
Power factor		>0.9			230VAC, 100% load EN61000-3-2 class A EN61000-3-2 class C >145W
Input current - full load		1.8/0.9		A	115/230VAC
Inrush current		80		A	230VAC cold start, +25°C
Earth leakage current		85/150	230	μA	115/230VAC/50Hz (Typ.), 264VAC/60Hz (Max.)
No load input power			0.5	W	
Input protection	F3.15A/250V Internal fuse fitted in line and neutral				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage - V1	12		48	VDC	See Models & Ratings
Initial set accuracy			±1	%	50% load, 115/230VAC
Minimum load	0			A	
Start up delay			2	s	115/230VAC full load, see application notes
Hold up time	10	17/11		ms	Min. at full load, 115VAC. Typical at 120W/180W
Drift			±0.02	%	After 20 min warm up
Line Regulation			±0.5	%	90-264VAC
Load Regulation			±0.5	%	0-100% load
Transient Response - V1			4	%	Recovery within 1% in less than 500μs for a 50-75% and 75-50% load step
Over/Undershoot - V1		4		%	Full load
Ripple & Noise			1	% pk-pk	20MHz bandwidth & 10μF electrolytic capacitor in parallel with 0.1μF ceramic capacitor, see application notes
Overvoltage Protection	110		140	%	Vnom, recycle input to reset
Overload Protection	110		160	% I nom	Output 1, auto reset, see application notes
Short Circuit Protection	Trip and restart, see application notes				
Temperature Coefficient			0.02	%/°C	
Overtemperature Protection				°C	Measured internally, autoresetting

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		94		%	230VAC full load, see application notes
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	65		130	kHz	PFC converter
	60		90		Main converter
Power density			22	W/in ³	Forced-cooled
			15		Convection-cooled
Mean time between failure		300		khrs	MIL-HDBK-217F, Notice 2 +25°C GB
Weight			0.51(230)	lb (g)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20		+70	°C	Baseplate temperature, see application notes
Storage Temperature	-40		+85	°C	
Cooling	10			CFM	Fan-cooled >120W
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 10-500Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				

Emissions - EMC

Phenomenon	Standard	Test Level	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 and K5B T 25*12*15 on output cable
Harmonic Current	EN61000-3-2	Class A	Meet Class C for loads above 145W
Voltage Fluctuations	EN61000-3-3		

Immunity - EMC

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions	
Low Voltage PSU EMC	EN61204-3	High severity level	As below		
Radiated Immunity	EN61000-4-3	3	A		
EFT/Burst	EN61000-4-4	3	A		
Surge	EN61000-4-5	Installation class 3	A	Line to line	
Conducted	EN61000-4-6	3	A		
Dips and Interruptions	EN55035 (100VAC)	Dip >95% (0 VAC), 8.3ms	A		
		Dip 30% (70 VAC), 416ms	A		
		Dip >95% (0 VAC), 4160ms	B		
	EN55035 (240VAC)	Dip >95% (0 VAC), 10.0ms	A		
		Dip 30% (168 VAC), 500ms	A		
		Dip >95% (0 VAC), 5000ms	B		
	EN60601-1-2 (100VAC)	Dip >95% (0 VAC), 10.0ms	A		
		Dip 60% (40 VAC), 100ms	B	Derate output power to 18W for criteria A	
		Dip 30% (70 VAC), 500ms	A		
	EN60601-1-2 (240VAC)	Dip >95% (0 VAC), 10.0ms	A		
		Dip 60% (96 VAC), 100ms	A		
		Dip 30% (168 VAC), 500ms	A		
		Dip >95% (0 VAC), 5000ms	B		

Safety approvals

Certification	Standard	Notes & Conditions
CB	IEC62368-1	Audio/video, information and communication technology
	IEC60601-1 Ed 3 including Risk Management	Medical
UL	UL62368-1, CAN/CSA C22.2 No.62368-1-14 Ed 2	Audio/video, information and communication technology
	ANSI/AAMI ES60601-1:2005 & CSA C22.2, No.60601-1:08	Medical
EN	EN62368-1: 2014/A11:2017	Audio/video, information and communication technology
	EN60601-1: 2006	Medical
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	
	Means of Protection	Category
Primary to Secondary	2 x MOPP	IEC60601-1 Ed. 3
Primary to Earth	1 x MOPP	IEC60601-1 Ed. 3
Secondary to Earth	1 x MOPP	IEC60601-1 Ed. 3

Application notes

Thermal considerations

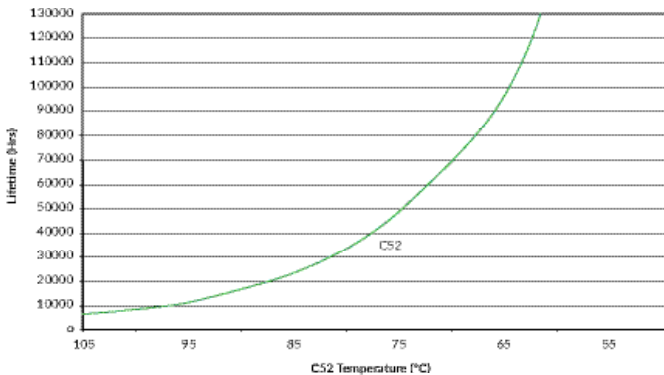
In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded. Temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of direct air flow). See mechanical details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

Temperature Measurements	
Component	Max. Temperature °C
TR1 Coil	110°C
L1 Coil	120°C
Q1 Body	120°C
C2	105°C
C52	105°C

Service life

The estimated service life of the ECP180 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 a key capacitor 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.

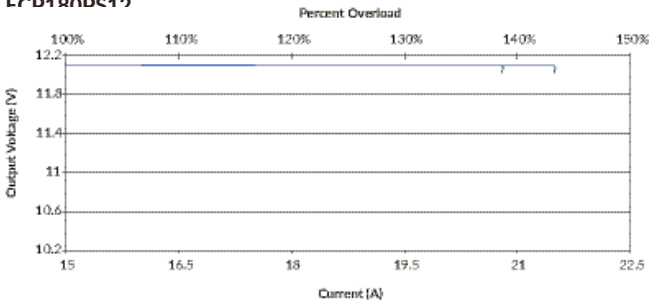
Estimate service life vs component temperature



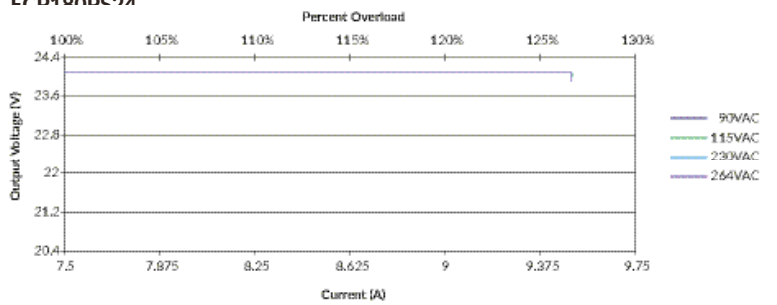
Application notes

Output Short Circuit Profile

ECP180PS12

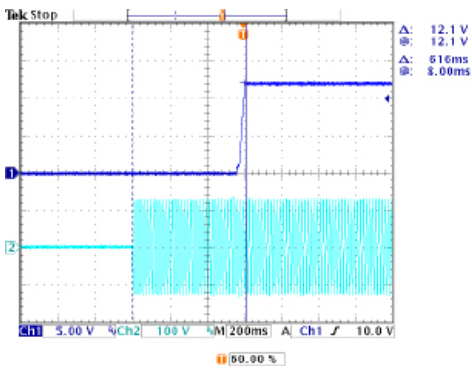


ECP180PS24



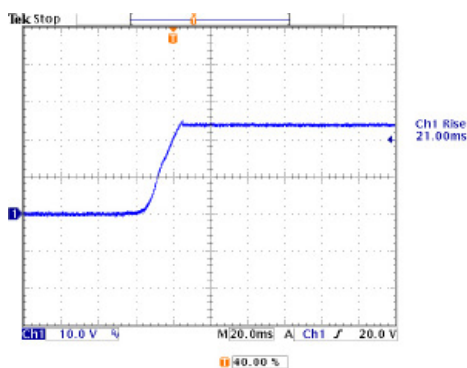
Output start up time

ECP180PS12 90VAC full load



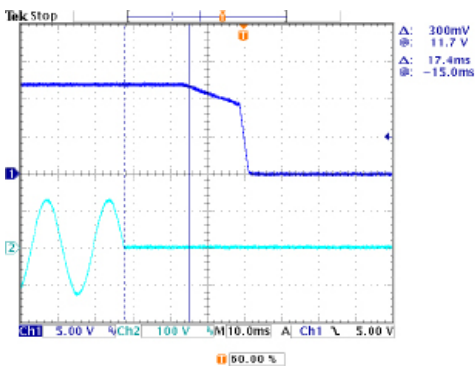
Output rise time

ECP180PS24 90VAC full load



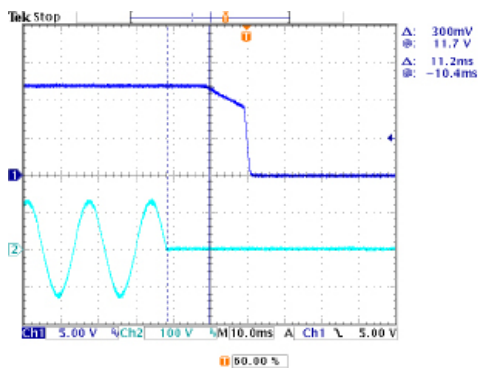
Output hold up time

ECP180PS12 90VAC 120W load



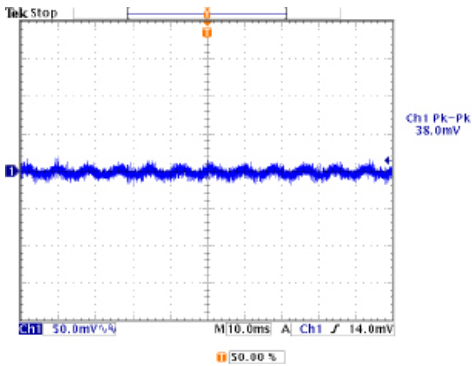
Output hold up time

ECP180PS12 90VAC full load



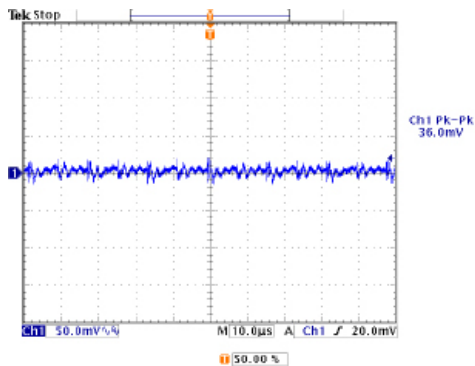
Output ripple and noise

ECP180PS12 at 264VAC & full load, low frequency



Output ripple and noise

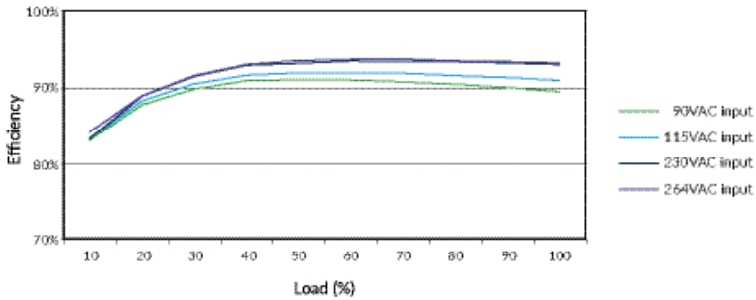
ECP180PS12 at 264VAC & full load, high frequency



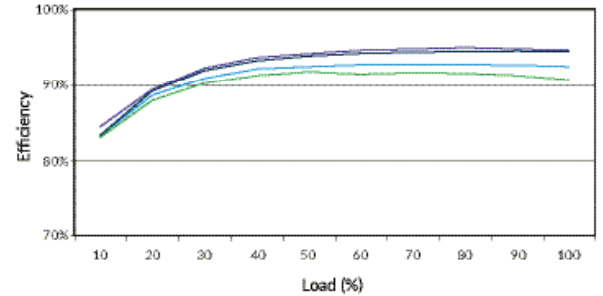
Application notes

Efficiency vs load

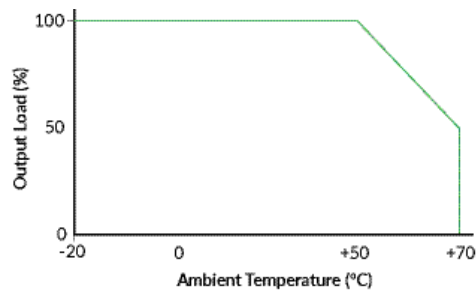
ECP180PS12



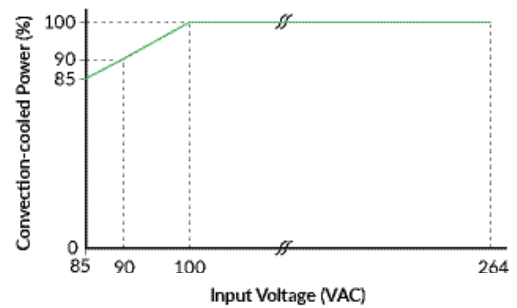
ECP180PS24



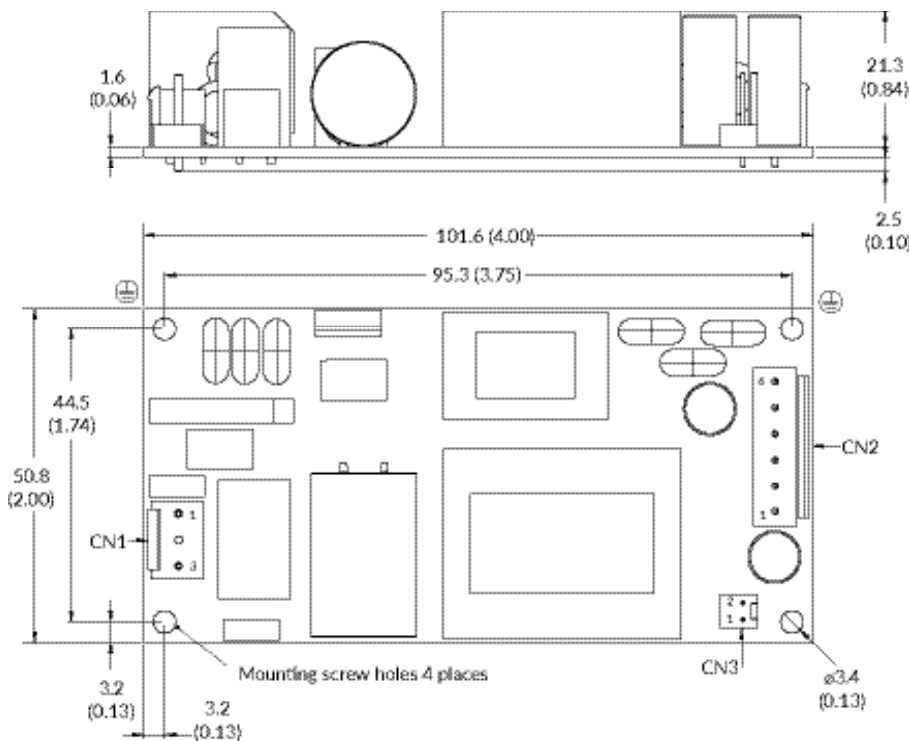
Temperature derating curve



Input voltage derating curve



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

CN2 - Output connector	
Pin 1	+Vout
Pin 2	+Vout
Pin 3	+Vout
Pin 6	-Vout
Pin 7	-Vout
Pin 8	-Vout

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

Mounting hole marked with \oplus must be connected to safety earth for class I applications and connected together for class II applications for optimum EMC performance

Notes:

1. All dimensions in mm (inches). Tolerance .xx = 0.50 (±0.02)

2. Weight: 230g (0.51lbs)