WLP120 Series

FiDUS
power in motion...

120 Watts

- Low profile and high power density
- 3 x 2” footprint
- Convection cooled 100W
- <0.3W No load input power
- EN55022 Level B conducted & radiated
- 5 Year warranty

The WLP120 series of ultra compact, open frame AC-DC power modules offer 100W convection cooled and 120W fan cooled in a market leading 3” x 2” package. They are chassis mount, low noise, low no load (<0.3W), with a wide operating temperature of –40 to 70°C, in a range of voltages from 12V to 58V and all come with a FiDUS 5 year warranty.

Dimensions:

3 x 2 x 1.18” (76.2 x 50.8 x 30mm)

Models & Ratings

INSTALLATION ADVICE PG5

Model Number(1)	Output Power	Output voltage	Output Current		Efficiency(2)
			Maximum convection	300LFM Fan cooled	
LFWLP120-1301	120W	12V	8.33A	10.00A	90%
LFWLP120-1302	120W	15V	6.66A	8.00A	90%
LFWLP120-1303	120W	24V	4.16A	5.00A	91%
LFWLP120-1304	120W	48V	2.08A	2.50A	93%
LFWLP120-1305	120W	30V	3.33A	4.00A	91%
LFWLP120-1306	120W	58V	1.72A	2.07A	93%

Notes

1. For screw terminal version replace **3** above for **0**. Example ‘LFWLP120-1**0**01’
2. At 100% load, 230VAC
3. Cover kit available LFWLP120-CK

Key specifications

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
AC Input range	85		264	VAC	No derating
Operating temperature	-40		70	°C	See derating curve p3. Ripple can be 10% or more between -40 and 0°C, start-up guaranteed.
Efficiency	See ratings table above				
Dimensions	3 x 2 x 1.18” (76.2 x 50.8 x 30mm)				
EMC	EN55022 Level B conducted and radiated EN61000-3 and EN61000-4, harmonics, flicker, Surge, EFT, ESD, conducted and radiated, GB17625				
Safety	IEC60950-1, EN60950-1, UL60950-1, CSA22.2 No 60950-1, CE, GB4943, GB9254				

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Input

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Input voltage	85		264	VAC	No derating
Input frequency	47		63	Hz	
Power factor	0.95				EN61000-3-2 class A compliant, at full load.
Input current (rms)			1.2	A	At 115VAC
			0.65		At 230VAC max
Inrush current			<25	A	115VAC cold start at 25°C
			<45		230VAC cold start at 25°C
No load input power			<0.3	W	

Output

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Output voltage	12		58	VDC	See Model & Ratings table
Output Voltage Adjust		±3		%	
Set point accuracy			±1	%	
Line regulation			±0.5	%	
Load regulation			±1	%	
Minimum load	0			%	
Transient response			4	%	25% step change, 0.1A/uS slew, 50% duty 50hz, in 5ms
Ripple & Noise			1	%	All models measured with 0.1uF ceramic and 10uF electrolytic capacitor. 20 MHz bandwidth. At rated line and full load
Hold up time		>10		ms	At full load.
Overload protection		110		%	
Short circuit protection					Trip and restart. Automatic recovery
Overvoltage protection	110		140	%	Latching, requires manual power reset.

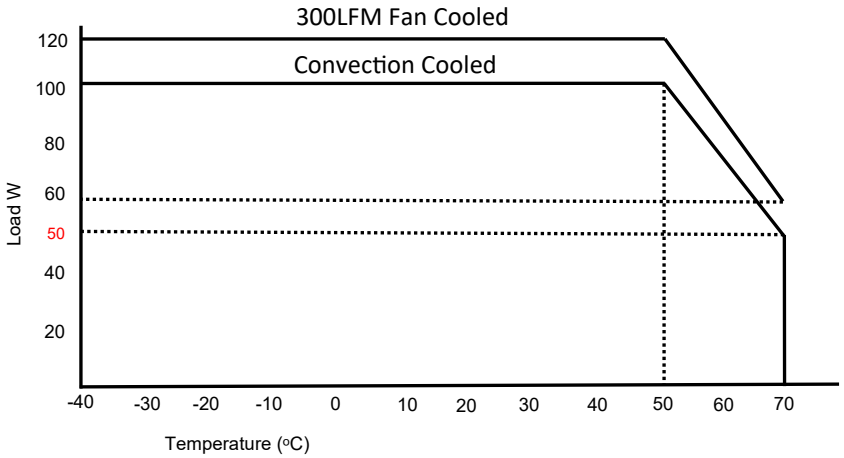
General

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	Please see reatings table on page 1				
Isolation: Input to Output	3000			VAC	
Input to Ground	1500			VAC	
Switching frequency		60		KHz	
Power density			16.95	W/In^3	
MTBF	>3			MHrs	As per Telcordia-SR332– issue 3
Weight			200	g	

Environmental

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating temperature	-40		70	°C	Derate above 50°C at 2.5% per °C Please see derating curve on page 3
Storage temperature	-40		85	°C	
Cooling					Convection cooled / fan cooled 300LFM
Altitude	16000		40000	ft	16000 operating 40000 non operating
Humidity	5		95	% RH	Non condensing

Derating curve



EMC: Emissions

	Standard	Test level	Criteria	Notes & Conditions
Conducted	EN55032	B		CISPR22-B, FCC PART15-B
Radiated	EN55032	B		With ferrite king core K5B RC 25x12x15-M on input
Harmonic current	EN61000-3-2	Class D		
Voltage flicker	EN61000-3-3			

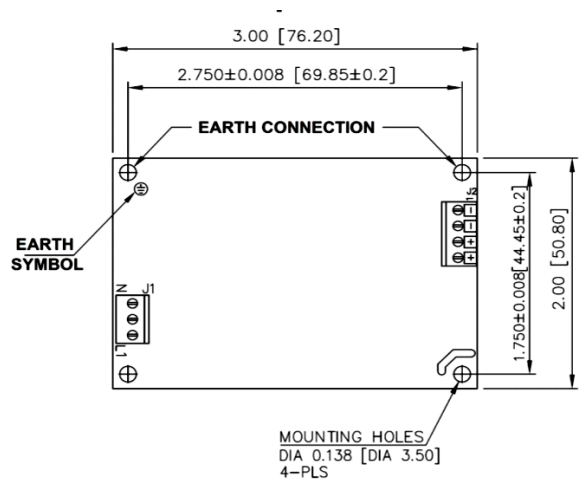
EMC: Immunity

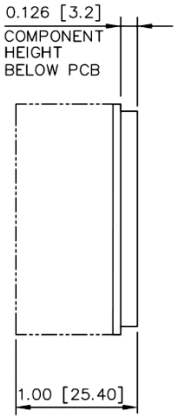
	Standard	Test level	Criteria	Notes & Conditions
ESD	EN61000-4-2	3	A	±6 contact, ±8 air.
Radiated	EN61000-4-3	3	A	10V/m 80MHz-2.7GHz sine wave 80% AM 1KHz
EFT	EN61000-4-4	3	A	2KV Power, 1KV I/O 5KHz (Ed4)
Surges	EN61000-4-5	Installation Class 3	A	1KV Live-Neutral, 2KV Live/Neutral—Earth
Conducted	EN61000-4-6	3	A	10V, 0.15 to 80MHz sine wave 80AM 1KHz
Magnetic Fields	EN61000-4-8	3	A	
Voltage Dips and Interruptions	EN61000-4-11		A,B	

Safety Approvals

	Safety standard	Notes & Conditions
UL/CSA	UL60950-1 2nd Ed., CSA 22.2 No 60950-1-07 2nd Ed.	E150565
CB	IEC60950-1 2nd Ed. 2006/A2:2013	Test cert NO88701
EU	EN60950-1 2nd Ed. 2006/A2:2013	Nemko No P15220324
CE		2011/65/EU RoHS Directive and 2014/35/EU Low voltage directive
Equipment protection class		Class I

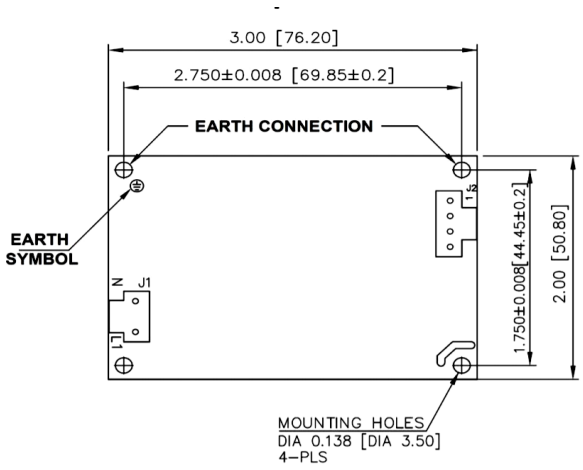
Mechanical Details

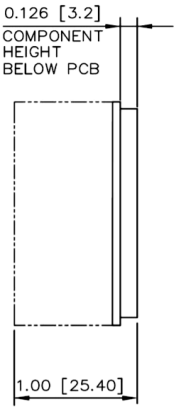


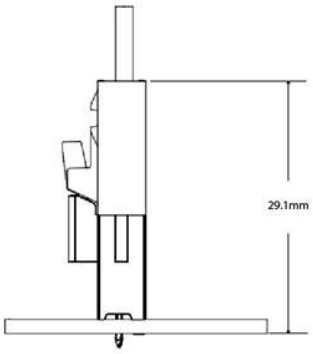


J1: Input Connector[2]	
Pin Connections	
Pin	Function
1	AC Line
2	AC Neutral

J2: Output Connector[3]	
Pin Connections	
Pin	Function
1	-Vout
2	-Vout
3	+Vout
4	+Vout





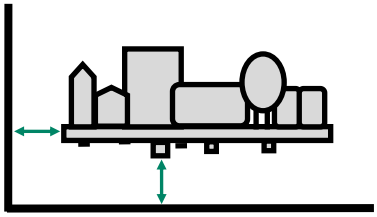


Notes

1. All dimensions shown in Inches [mm]
2. J1: Input connector details for Molex version: 1722861103 mating part: Molex: 1722561003 or equivalent
3. J2: Output connector details for Molex version: 172286-1104 mating part Molex: 172256-1104 or equivalent
4. For screw terminal max wire size AWG16
5. When molex version is used the height of the housing on the connector increases the installed height to 29.1mm from the base of the PCB. Please allow sufficient bend radius for chosen conductors

Installation Advice

Safety

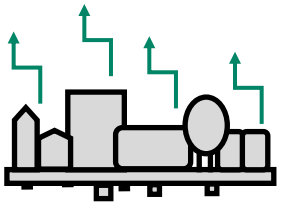


On installation customers must consider the required creepage and clearance distances between the PSU and the end-equipment enclosure. These distances vary depending on the installation class and safety standard requirements.

For **Class I** installations there should be 3-4mm between any part of the PSU and any earthed metal part of the enclosure. 3mm is acceptable for IT applications, 4mm required for medical applications. In Class I installations the PSU earth point must be connected to system safety ground.
For **Class II** installations distances may need to be increased if being installed into a surrounding metal enclosure.
Ensure consideration of components on the underside of the PCB or low lying spills when measuring clearance distances between the PSU and the end-equipment. Also top surface especially in tight enclosures such as 1U boxes. An insulation material can be used between PSU and metal if smaller gap required.

FiDUS recommends installing the PSU on 6mm stand offs typically, but check the distances.

EMC

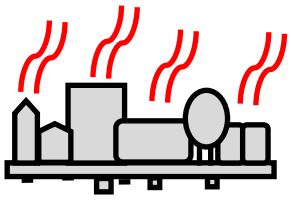


Conducted and radiated emissions compliance is a common application consideration. It is important to remember that even when using a properly filtered PSU, an application may still not achieve compliance if it is not designed to minimise emissions. That being said, there are a number of things that can be done to optimise EMC performance either as best practice, or if you are struggling for compliance:

1) Connect all marked EMI ground points to earth. Often these are combined with the safety earth point (in class I installations), but on some power supplies there may be additional earth tags or mounting points.
2) Minimise the length of input/output wiring where possible and try to maintain max distance of the conductors from the PSU, to prevent noise pick up. Avoid bundling input and output cables together. A common component to avoid placing wiring near is the PFC inductor in power factor corrected power supplies.
3) Apply additional filtering before the PSU input (ensure consideration of which frequencies there are issues with before selecting a filter).
4) When using an open frame PSU, mount the supply on a metal plate and connect EMI mounting points.
5) In multi circuit systems, decouple the circuits locally.
6) Ferrites added between the PSU and system input connector and/or the DC output cables can help in reducing radiated noise issues in systems. If seen, issues are commonly in the 30-150MHz area.

For more detailed assistance, if you still have any concerns with compliance, please get in contact with our Engineering department who are on hand to assist with any queries.

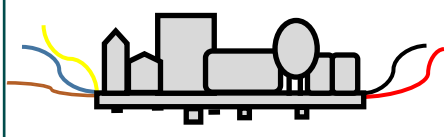
Thermal



Thermal management is an important consideration when thinking about equipment service life. Electrolytic capacitors within the PSU wear with time and are typically the first end-of-life failure. Keeping the operation temperature of key components within the PSU, such as the electrolytic capacitors, as low as possible is paramount. As a general rule, for every 10°C drop in the operating temperature of the electrolytic capacitators you double their lifetime, and thus the lifetime of the power supply. When looking at thermal performance it is helpful to test under a worst-case set of conditions, to ensure component temperatures are in an acceptable range for the required service life. Then consider the impact of operational time, load and temperature profile to estimate a more realistic lifetime for your PSU.

Also, many FiDUS power supplies offer a *Peak Power* rating to provide for customers with pulsing loads. When using a peak power capability customers must consider:
1) Peak duration rating: the maximum length of time the peak can be drawn for
2) Duty cycle: the frequency with which the peak can be drawn. (e.g. 10% duty cycle, 1 second on:9 seconds off)
3) Average power value: datasheets will state the maximum average power acceptable with peak power PSUs.
If any of these elements are exceeded the supply may overheat, with performance and lifetime suffering as a result.

Connectivity



All FiDUS Power engineering samples requested will arrive with a free of charge loom kit for ease of testing.

The loom kit connects to the input/output terminals of the PSU and provides the customer with bare wire ends to connect with.

The loom kits can also prove advantageous for ease of installation in production. Please contact sales if you are interested in including the loom kit in your quotation.
Alternatively the input/output connector and mating part details can be found in the attached table.

	Part Number	Mating Part Number
Input	Molex: 172286-1103	Molex: 172256-1103
Output	Molex: 172286-1104	Molex: 172256-1104
Loom Kit	N/A	