AC/DC 120W Enclosed Switching Power Supply

LIF120-10BxxR2S-EX Series

MORNSUN®

RoHS

3 years Warranty

FEATURES

- Universal 85 - 264VAC or 120 - 370 VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency, high reliability
- DC OK function
- DC ON output status indicator LED
- Active PFC
- Output short circuit, over-current, over-voltage, over-temperature protection

LIF120-10BxxR2S-EX is Mornsun AC-DC converter series featuring a cost-effective, energy efficient explosion-proof solution for standard DIN-rail mounting. The products offer a high level of stability and immunity to noise, compliant with international IEC62368 standands for EMC and safety specifications meet IEC/EN/UL62368, IEC/EN60079. These light weight AC-DC converters also have an extremely compact design for space saving and are ideal for applications such as industrial control equipment, machinery, and all kinds of applications in a harsh environments. The power supply meets the 'ec' increased safety and 'nC' enclosed-break type n explosion-proof certification, and is suitable for explosive environments where the equipment protection level is Gc in zone 2.

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)
ATEX/IECEx/ EN/UL (Pending)	LIF120-10B12R2S-EX	120	12V/10A	11.8-14.0	92	80,000
	LIF120-10B24R2S-EX		24V/5A	23.5-28.0	93	50,000
	LIF120-10B48R2S-EX		48V/2.5A	47.0-53.0	93.5	30,000

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input		100	--	240	VAC
	AC input		85	--	264	
	DC input		120	--	370	VDC
Input Frequency	AC input		47	--	63	Hz
Input Current	115VAC		--	--	1.5	A
	230VAC		--	--	0.75	
Inrush Current	115VAC	Cold start	--	10	15	
	230VAC		--	20	30	
Leakage Current	240VAC		<1mA			
Power Factor	115VAC		--	0.98	--	--
	230VAC		--	0.94	--	
Start-up Delay Time	230VAC		--	300	1000	ms
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	--	±1	--	%
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Minimum Load		0	--	--	%
Stand-by Power Consumption		--	1.2	2	W
Hold-up Time		15	--	--	ms
DC OK Signal		30VDC/1A Max.			

Short Circuit Protection	Recovery time < 10s after the short circuit disappear.			Constant current hiccup mode (constant current mode works 1s and stop 10s) continuous, self-recovery			
Over-current Protection	230VAC, rated load	Normal temperature, high temperature		105% - 200% Io, self-recovery			
		Low temperature		⩾105% full load after derating, self-recovery			
Over-voltage Protection	12V			⩽18V (Hiccup, self-recovery after the abnormality is removed)			
	24V			⩽35V (Hiccup, self-recovery after the abnormality is removed)			
	48V			⩽60V (Hiccup, self-recovery after the abnormality is removed)			
Over-temperature Protection	230VAC, 30% load	Over-temperature protection start		--	--	105	℃
		Over-temperature protection release		60	--	--	

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information.

General Specifications

Item		Operating Conditions			Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <15mA			1500	--	--	VAC
	Input - output				3000	--	--	
	Output - ⏚				500	--	--	
Insulation Resistance	Input - ⏚	At 500VDC			100	--	--	MΩ
	Input - output				100	--	--	
	Output - ⏚				100	--	--	
Operating Temperature					-40	--	+85	℃
Storage Temperature								
Operating Humidity		Non-condensing			20	--	90	%RH
Storage Humidity					--	--	95	
Switching Frequency					--	100	--	KHz
Power Derating		Operating temperature derating	-40℃ to -30℃		5	--	--	%/℃
			+50℃ to +85℃	85VAC-164VAC	2	--	--	
			+60℃ to +85℃	165VAC-264VAC	2.8	--	--	
		Input voltage derating		85VAC-100VAC	1.67	--	--	%/VAC
Safety Standards					Design refer to EN62368-1, IEC/EN60079-0, IEC/EN60079-7, IEC/EN60079-15, UL61010-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25℃			> 300,000 h			

General Specifications

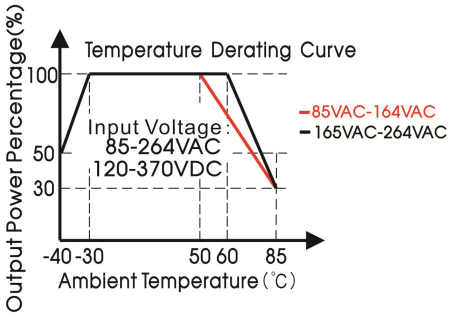
Case Material	Metal (AL1100, SPCC) and Plastic (PC940)
Dimensions	110.00 x 32.00 x 124.00mm
Weight	500g (Typ.)
Cooling Method	Free air convection

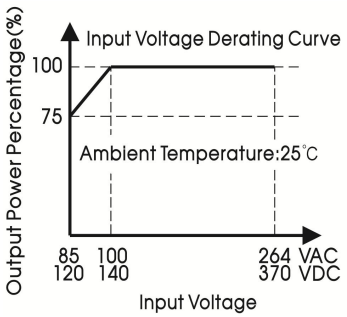
EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic current	IEC/EN61000-3-2 CLASS A and CLASS D	
EMS	ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±4KV	perf. Criteria A

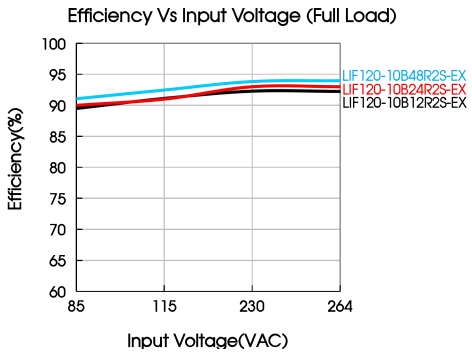
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

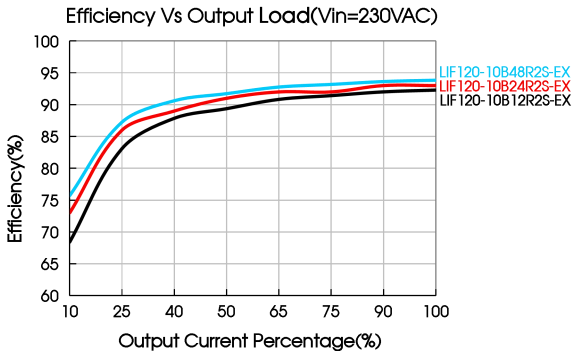
Product Characteristic Curve





Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Explosion Proof Information

The power supply is equipment intended for use in explosive atmospheres classified as Zone 2, EPL Gc.The equipment is protected by type of protection Ex 'ec' and the relay inside is protected by type of protection Ex 'nC' sealed device. It's a well performance AC-DC module with one-phase input and single output. It has functions such as output over-current protection, output over-voltage protection, output short circuit protection, over-temperature protection and so on, with well combined regulation and high efficiency. When input voltage is between 85VAC - 164VAC, and ambient temperature is between +50℃ to +85℃, power derating off 2.0%/K is required; when input voltage is between 165VAC - 264VAC, and ambient temperature is between +60℃ to +85℃, power derating off 2.8%/K is required.

ATEX contents

1. Satisfied standard

This product complies with the EU Explosion proof certification ATEX directive 2014/34/EU.

EN IEC 60079-0:2018	Equipment - General requirements
EN IEC 60079-7:2015+A1:2018	Equipment protection by increased safety "e"
EN 60079-15:2010	Equipment protection by type of protection "n"

2. Specific conditions for safe use while the equipment services in explosive gas atmosphere:
① The equipment shall only be used in an area of pollution degree 2 or lower, as defined in EN60664-1;
② The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with EN60079-0;
③ Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment;
④ The equipment shall be installed according to EN60079-14;
⑤ The ambient temperature (Tamb), as specified above, has to be seen as the temperature of the surrounding atmosphere where the equipment is installed at (Operating temperature);
⑥ Minimum 5mm mounting clearances shall be remained between top, bottom, left, right and back to other device or side.

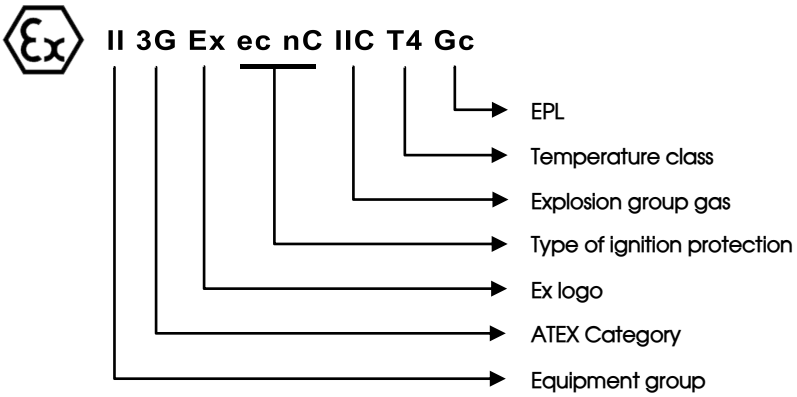
IECEx contents

1. Satisfied standard

IEC 60079-0:2017	Equipment - General requirements
IEC 60079-7:2017	Equipment protection by increased safety "e"
IEC 60079-15:2017	Equipment protection by type of protection "n"

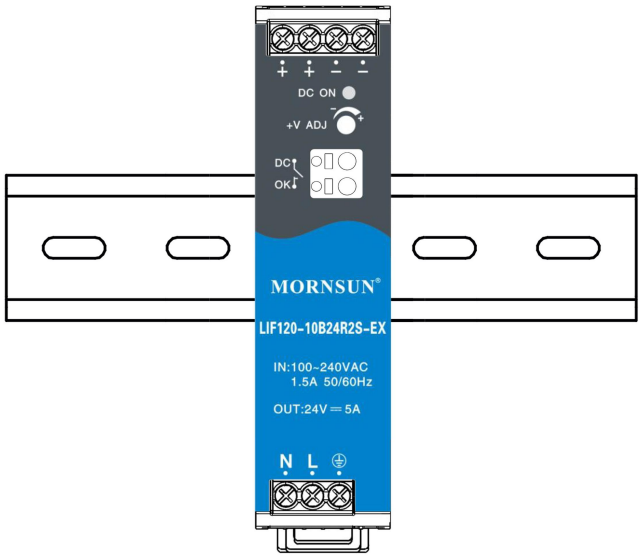
2. Specific conditions of use while the equipment services in explosive gas atmosphere:
   ① The equipment shall only be used in an area of pollution degree 2 or lower, as defined in IEC60664-1;
   ② The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with IEC60079-0;
   ③ Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment;
   ④ The equipment shall be installed according to IEC60079-14;
   ⑤ The ambient temperature (Tamb), as specified above, has to be seen as the temperature of the surrounding atmosphere where the equipment is installed at (Operating temperature);
   ⑥ Minimum 5mm mounting clearances shall be remained between top, bottom, left, right and back to other device or side.

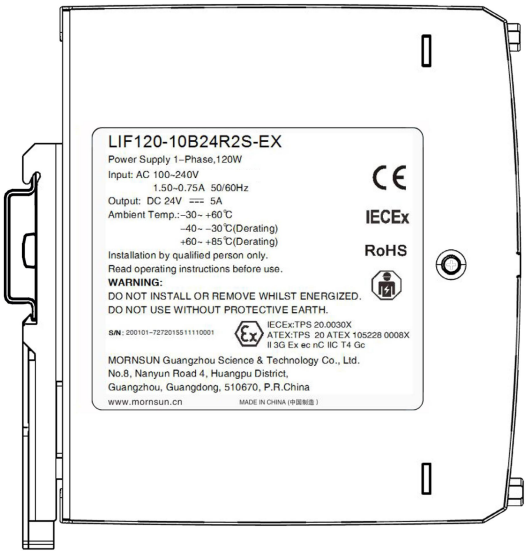
Ex marking description:



Note:
1. This device is designed for convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid (e.g. cable conduits) by more than 30%;
2. Prior to starting installation, ensure that no explosive gas mixtures are present; no live lines, connectors or plugs may be connected or disconnected if an ex-plosive gas mixture is present;
3. A visual inspection of the power supply device is to be performed once per year.

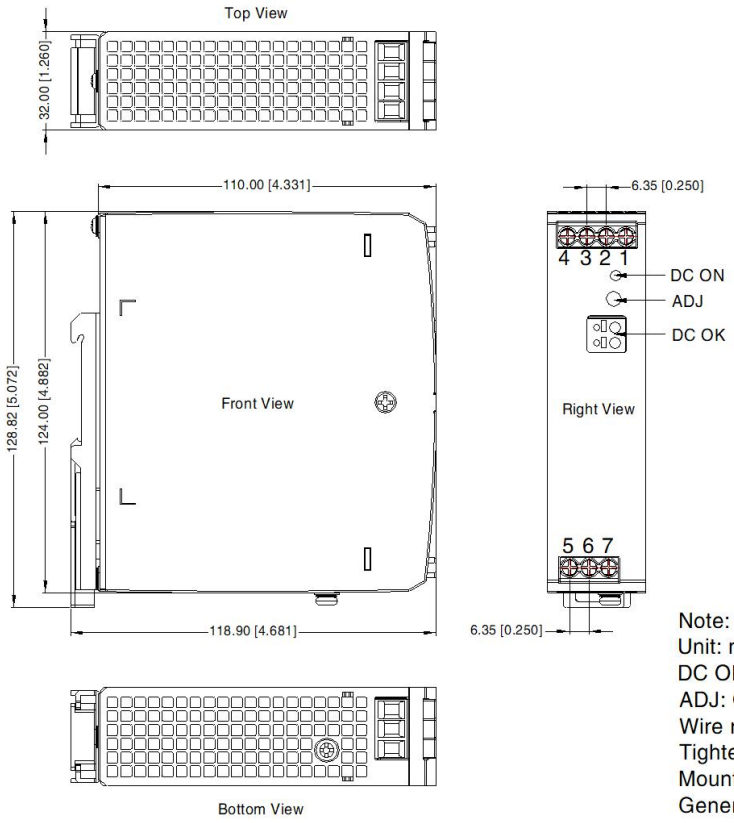
Installation Diagram





Notice: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

Pin–Out	
Pin	Mark
1	–Vo
2	–Vo
3	+Vo
4	+Vo
5	AC(N)
6	AC(L)
7	⏚

Note:
Unit: mm[inch]
DC ON: Output status indicator LED
ADJ: Output adjustable resistor
Wire range: 26–10 AWG
Tightening torque: Max 0.4 N·m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220189;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% RH with nominal input voltage and rated output load;
3. The room temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The out case needs to be connected to the earth (⏚) of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the output adjustable resistance ADJ, turn it up clockwise;
10. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

⚠ WARNING Risk of electrical shock, fire, personal injury or death:

1. Do not use the power supply without proper grounding (Protective Earth). Use the terminal on the input block for earth connection and not one of the screws on the housing;
2. Turn power off before working on the device, protect against inadvertent re-powering;
3. Make sure that the wiring is correct by following all local and national codes;
4. Do not modify or repair the unit;
5. Do not open the unit as high voltages are present inside;
6. Use caution to prevent any foreign objects from entering the housing;
7. Do not use in wet locations or in areas where moisture or condensation can be expected;
8. Do not touch during power-on, and immediately after power-off, hot surfaces may cause burns.

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