AC/DC 120W DIN-Rail Power Supply

LIF120-20BxxR3 Series

MORNSUN®

RoHS

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 +70℃(Support high temperature 60℃ full load operation)
- High efficiency up to 94%, high reliability
- DC OK function(Supports single-machine fault alarms in direct parallel mode)
- Active PFC
- High I/O isolation test voltage up to 4000VAC
- 150% peak load output for 3 seconds
- DC ON output status indicator LED
- Output short circuit, over-current, over-voltage, over-temperature protection
- Operating altitude up to 5000m
- OVCIII @ EN62477 2000m
- Safety design refer to IEC/UL/BS EN 62368/61010

LIF120-20BxxR3 series is the cost-effective, standard rail installation, and energy-efficient green power supply provided by Mornsun for customers. For industrial control equipment, machines and other industrial equipment in harsh environments to provide high stability, high anti-interference power supply. The power supply is small, lightweight, compact, and standard rial mounted to save customers a lot of space. The products offer a high level of stability and immunity to noise, compliant with international IEC62368 standards for EMC and safety specifications design refer to IEC/EN/UL/BS EN 62368.

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)
--	LIF120-20B12R3	120	12V/10A	11.8-14.0	93.5	20000
	LIF120-20B24R3		24V/5A	23.5-28.0	94	20000
	LIF120-20B48R3		48V/2.5A	47.0-56.0	93.5	10000

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (Certified voltage)		100	--	240	VAC
	AC input		85	--	264	
	DC input		120	--	370	VDC
Input Frequency	Rated AC input(Certified voltage)		50	--	60	Hz
	AC input		47	--	63	
Input Current	Rated Input(Certified voltage)		--	--	1.5	A
	115VAC		--	1.2	1.5	
	230VAC		--	0.6	0.75	
Inrush Current	115VAC	Cold start	--	15	--	
	230VAC		--	30	--	
Leakage Current	240VAC		<1mA			
Power Factor	115VAC		--	0.95	--	--
	230VAC		--	0.93	--	
Start-up Delay Time	230VAC		--	500	3000	ms
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range		--	±1.0	--	%
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load		--	±0.5	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	12V/24V	--	--	100	mV
		48V	--	--	120	
Stand-by Power Consumption			--	2	--	W
Hold-up Time			--	40	--	ms
DC OK Signal	Resistive load		30VDC/1A Max.			
Short Circuit Protection	Recovery time < 10s after the short circuit disappear.		Hiccup mode, constant current works 3s, turn off 10s, continuous, self-recover			
Over-current Protection	230VAC, rated load	Normal temperature, high temperature	105% - 200% Io, self-recover			
		Low temperature	⩾105% full load after derating, self-recover			
Over-voltage Protection	12V		⩽18V (Out voltage hiccup)			
	24V		⩽35V (Out voltage hiccup)			
	48V		⩽60V (Out voltage hiccup)			
Over-temperature Protection	230VAC, 100% load	Over-temperature protection start	--	--	90	℃
		Over-temperature protection release	60	--	--	

Note: 1.*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;
2.*DC OK Signal: When the output voltage is normal, the relay is connected. When the output voltage is abnormal (<90%Vo), the relay is disconnected.

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <5mA	2500	--	--	VAC
	Input - output		4000	--	--	
	Output - ⏚		500	--	--	
Insulation Resistance	Input - ⏚	Ambient temperature：25±5℃ Relative humidity：Less than95%，uncondensed Test voltage：500VDC	100	--	--	MΩ
	Input - output		100	--	--	
	Output - ⏚		100	--	--	
Operating Temperature			-40	--	+70	℃
Storage Temperature			-40	--	+85	
Operating Humidity		Non-condensing	--	--	95	%RH
Storage Humidity			--	--	95	
Switching Frequency			--	100	--	KHz
Power Derating	Operating temperature derating	-40℃ to -25℃	3.33	--	--	%/℃
		+60℃ to +70℃	3.0	--	--	
	Input voltage derating	85VAC-100VAC	0.67	--	--	%/VAC
Safety Standards	12V/24V/48V		Design refer to EN62368-1, IEC/BS EN 62368-1			
Safety Class			CLASS I			
MTBF	MIL-HDBK-217F@25℃		> 300,000 h			

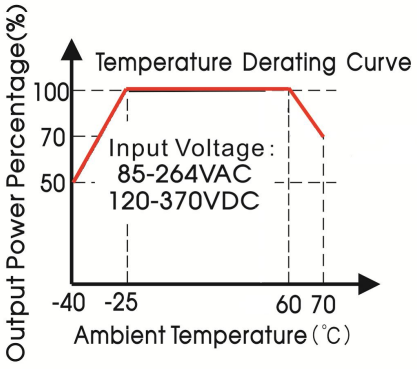
General Specifications

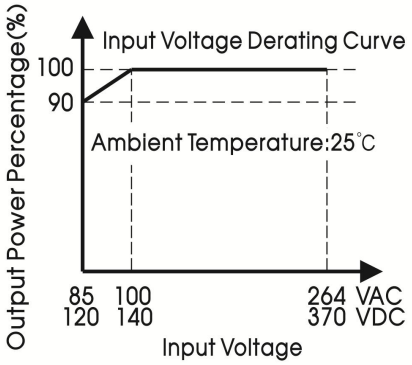
Case Material	Metal (AL5052, SPCC, SGCC)
Dimensions	110.00 x 32.00 x 124.00 mm
Weight	500g(Typ.)
Cooling Method	Natural air cooling

EMC Specifications

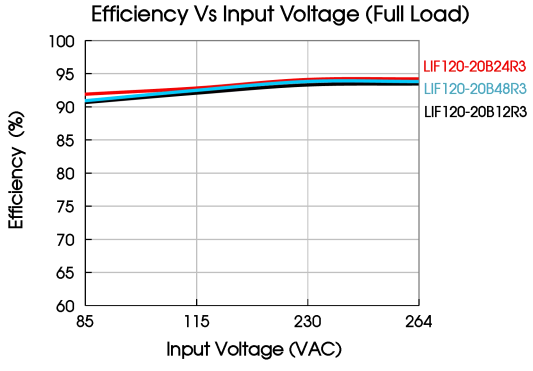
EMI	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
	Harmonic current	IEC/EN61000-3-2 CLASS A and CLASS D		
EMS	ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV		perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m		perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±2KV		perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV		perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s		perf. Criteria A
	MS	IEC/EN61000-4-8 30A/m		perf. Criteria A
	Voltage dips	IEC/EN61000-4-11	0% of 115Vac, 0Vac, 1 cycle	perf. Criteria A
			40% of 115Vac, 46Vac, 10/12 cycle	perf. Criteria C
			70% of 115Vac, 80.5Vac, 25/30 cycle	perf. Criteria A
			0% of 230Vac, 0Vac, 1 cycle	perf. Criteria A
			40% of 230Vac, 92Vac, 10/12 cycle	perf. Criteria A
			70% of 230Vac, 161Vac, 25/30 cycle	perf. Criteria A
	Voltage interruption	IEC/EN61000-4-11	0% of 200Vac, 0Vac, 250/300 cycle	perf. Criteria B
	Semi F-47	80% of 200Vac 160Vac 1000mS 70% of 200Vac 140Vac 500mS 50% of 200VAC 100Vac 200mS		perf. Criteria A

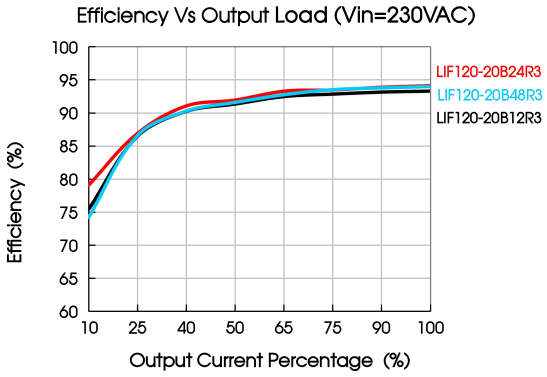
Product Characteristic Curve



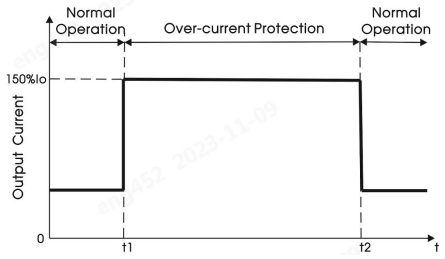


Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

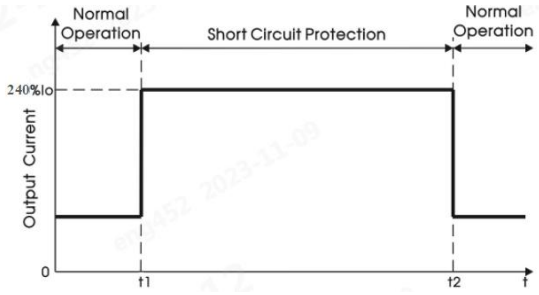




Over-current protection curve (Typ.)



Short circuit protection curve (Typ.)

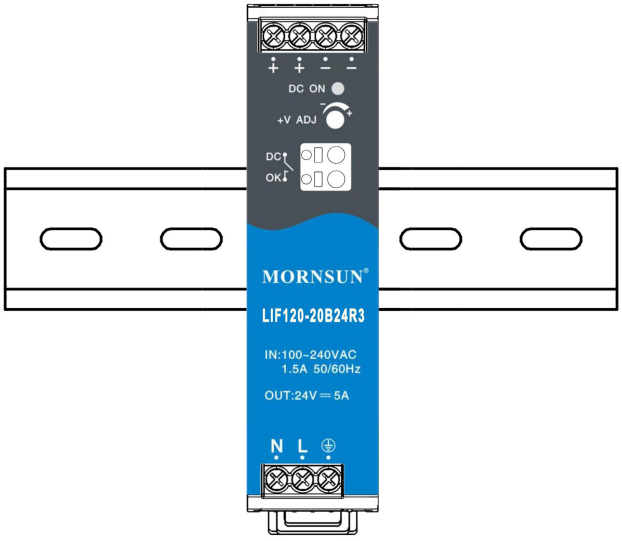


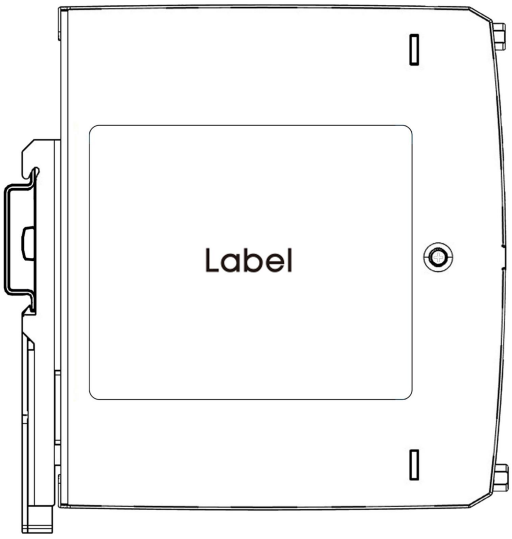
Remark :

1, Support maintaining rated stabilized voltage output for 3 seconds (duration from t1 to t2 in the diagram) under 1.5 times peak power load, and shut off the output if exceeding 3 seconds.

2, In dynamic power applications, such as those with peak power to low-power dynamic varying loads, the actual equivalent average output power must not exceed the rated power.

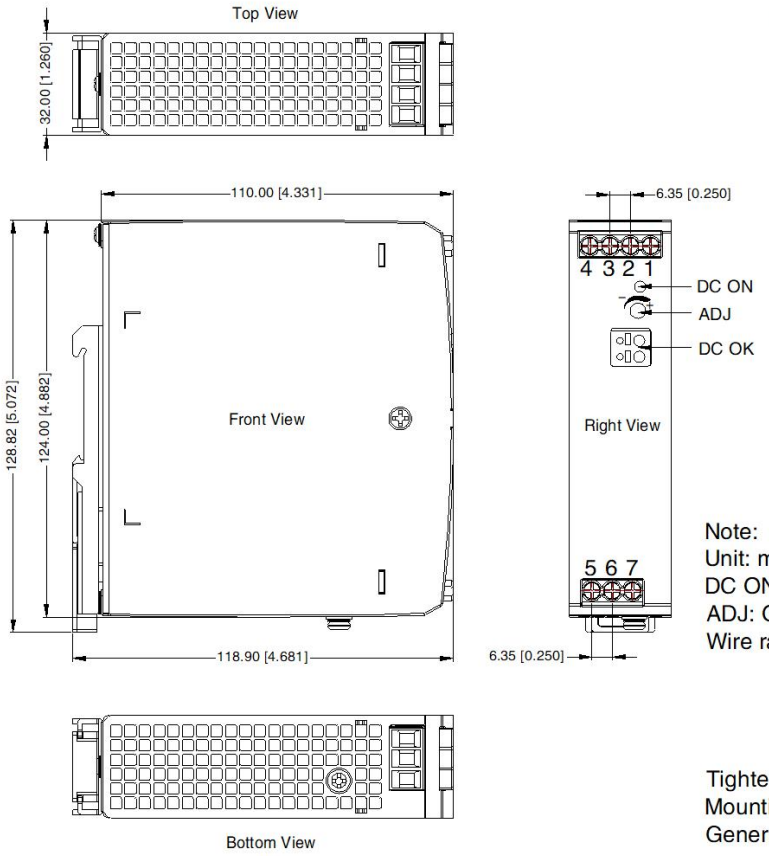
Installation Diagram





Note: 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: Input: 26–10AWG(12–10AWG for pin7)
Output: 12V: 18–10AWG
24V: 20–10AWG
48V: 22–10AWG
DC OK: 24–16AWG
Tightening torque: 0.79 ± 0.079 N・m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

WARNING Risk of electrical shock, fire, personal injury or death:
AVERTISSEMENT AVERTISSEMENT Risque de choc électrique, d'incendie, de blessures corporelles ou de décès :

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;
   N'utilisez pas l'alimentation électrique sans mise à la terre appropriée (Terre protectrice). Utilisez le terminal sur le bloc d'entrée pour la connexion terrestre et non pas une des vis sur le boîtier;
2. Turn power off before working on the device, protect against inadvertent re-powering;
   Éteignez l'alimentation avant de travailler sur l'appareil, protégez-vous contre la réénergisation accidentelle;
3. Make sure that the wiring is correct by following all local and national codes;
   Assurez-vous que le câblage est correct en suivant tous les codes locaux et nationaux;
4. Do not modify or repair the unit;
   Ne modifiez pas ou ne réparez pas l'appareil;
5. Do not open the unit as high voltages are present inside;
   Ne modifiez pas ou ne réparez pas l'appareil;
6. Use caution to prevent any foreign objects from entering the housing;
   Faire preuve de prudence pour empêcher les objets étrangers d'entrer dans le logement;
7. Do not use in wet locations or in areas where moisture or condensation can be expected;
   Faire preuve de prudence pour empêcher les objets étrangers d'entrer dans le logement;
8. Do not touch during power-on, and immediately after power-off, hot surfaces may cause burns;
   Ne touchez pas pendant l'alimentation et, immédiatement après l'alimentation, les surfaces chaudes peuvent causer des brûlures.
9. For ambient temperature ≤60℃, use ≥90℃ - copper wire only; for ambient temperature >60℃ to 85℃, use ≥105℃ - copper wire only; use only wires with a minimum dielectric strength of 300V (input) and 60V (output);
   Température ambiante ≤60℃, utiliser ≥90℃ - seulement fils de cuivre; Température ambiante >60℃ et 85℃, utiliser ≥105℃ - seulement fils de cuivre; Uniquement pour l'ulilisation de fils de cuivre d'une résisitance d'isolation minimale de 300V (d'entrée) et 60V (de sortie).

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com.Packaging bag number: 58220621;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<90% 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, see "Dimensions and Recommended Layout" ;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. The output voltage can be adjusted by the output adjustable resistance ADJ, turn it up clockwise;
11. The units are Open Type Power Supplies, which need to be mounted in a fire, mechanically and electrically safe enclosure;
12. If the equipment is used in a manner not specified by manufacture, the protection provided by the equipment may be impaired.

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