AC/DC 960W DIN-Rail Power Supply

LIF960-22Bxx Series

MORNSUN®

CE Report EN62368-1 UKCA BS EN 62368-1 RoHS

FEATURES

- Universal 180 - 264VAC or 254 - 370VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40℃ to +85℃
- Efficiency up to 95%
- 130% peak load
- Supports 3+1 parallel to increase power and current sharing
- Active PFC, PF>0.95
- DC OK function
- Double-sided conformal coating
- Operating altitude up to 5000m
- 3 years warranty
- Output short circuit, over-current, over-voltage, over-temperature protection
- Safety according to IEC/UL62368, UL508, GB4943

LIF960-22Bxx series is Mornsun featuring a cost-effective, energy efficient green power supply solution for standard DIN-rail mounting. Up to 95% efficiency can greatly improve power supply reliability and service life. With good EMC performance and compliant with international standards of IEC/EN/UL/BS EN62368, UL61010, UL508, GB4943 for EMC and safety. They are widely used in industrial control equipment, imachine control, instrumentation, power, new energy and other industries.

Selection Guide

Certification	Part No.*	Output Power (W)	Transient Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)
EN	LIF960-22B24	960	1248	24V/40A	24-28	95	10000
	LIF960-22B48	960	1248	48V/20A	48-55	95	5000

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (Certified voltage)		200	--	240	VAC
	AC input		180	--	264	
	DC input		254	--	370	VDC
Input Voltage Frequency	Rated input (Certified voltage)		50	--	60	Hz
	AC input		47	--	63	
Input Current	Rated input (Certified voltage)		--	--	6	A
	230VAC		--	--	6	
Inrush Current	230VAC	Cold start	--	50	--	
Power Factor	230VAC		--	0.95	--	--
Start-up Delay Time	230VAC, rated load		--	1000	--	ms
Input Fuse	Built-in fuse		--	10	--	A
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	--	

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Load Regulation	0% - 100% load		--	±1	--	
Minimum Load			0	--	--	
Stand-by Power Consumption			--	9	--	W
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	24V	--	--	180	mV
		48V	--	--	250	
Temperature Coefficient			--	0.03	--	%/℃
Hold-up Time	230VAC, rated load		--	20	--	ms
DC OK Signal	Resistive load		30VDC/7A Max.			
Over-current Protection	230VAC, rated load	Normal temperature, high temperature	110% - 140% Io, hiccup, self-recover			
		Low temperature	⩾110% full load after derating, hiccup, self-recover			
Short Circuit Protection			Hiccup mode, constant current works 3s(Typ.), turn off 17s(Typ.), continuous, self-recover			
Over-voltage Protection	24V		⩽35VDC(Hiccup or clamping, self-recover)			
	48V		⩽63VDC(Hiccup or clamping, self-recover)			
Over-temperature Protection	230VAC, 100% load		Output-off, self-recover			

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 <10mA		2000	--	--	VAC
	Input - output			4000	--	--	
	Output - ⏚			500	--	--	
Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-40	--	85	℃
Storage Temperature				-40	--	85	
Operating Humidity		Non-condensing		10	--	95	%RH
Storage Humidity				10	--	90	
Switching Frequency		PFC		55	--	75	KHz
		DC-DC		50	--	80	
		Auxiliary source		--	65	--	
Power Derating		Operating temperature derating	-40℃ to -30℃	4	--	--	%/℃
			+50℃ to +70℃	2	--	--	
			+70℃ to +85℃	3	--	--	
		Input voltage derating	180VAC-200VAC	0.5	--	--	%/VAC
Leakage Current		264VAC, 60Hz	Touch current	<0.5mA			
			Earth leakage current	<5mA			
Safety Standard				EN62368-1, BS EN62368-1 (Report) Design refer to UL61010-1, IEC/UL62368-1, UL508, GB4943.1			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25℃		⩾250000 h			
Warranty		Ambient temperature: <50℃		3 years			

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Mechanical Specifications

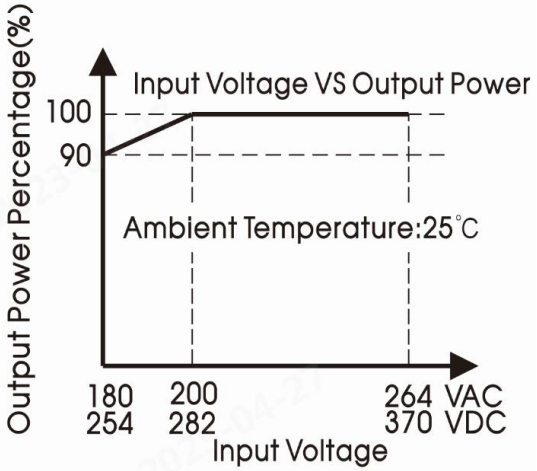
Case Material	Metal (AL5052, SPCC)
Dimensions	110.00mm x 124.00mm x 127.00mm
Weight	1680g (Typ.)
Cooling Method	Air cooling

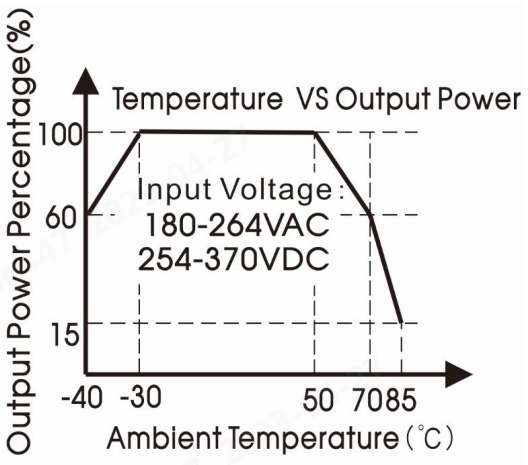
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32 EN55032 150K - 30MHz		CLASS B
	RE	CISPR32 EN55032 30MHz - 1GHz		CLASS B
	Harmonic current	IEC/EN61000-3-2		CLASS A and CLASS D
	Voltage flicker	EN61000-3-3		
Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	
	EFT	IEC/EN61000-4-4	±4KV	
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to ground ±4KV	
	MS	IEC/EN61000-4-8	30A/m	
	CS	IEC/EN61000-4-6	0.15 - 80MHz 10Vr.m.s	
	Voltage dips	IEC/EN61000-4-11	0% of 200Vac, 0Vac, 20ms	perf. Criteria C
			40% of 200Vac, 80Vac, 200ms	perf. Criteria C
			70% of 200Vac, 140Vac, 500ms	perf. Criteria A

Note: *perf. Criteria:
A: The equipment shall continue to operate as intended without operator intervention;
B: After the test, the equipment shall continue to operate as intended without operator intervention;
C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Product Characteristic Curve





Note: 1.All curves are for 24V output, measured at input 230VAC, 50Hz, output Io, ambient temperature 25℃, unless otherwise stated;
2.With an AC input voltage between 180-200VAC and a DC input between 254-282VDC the output power must be derated as per the temperature derating curves;
3.This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

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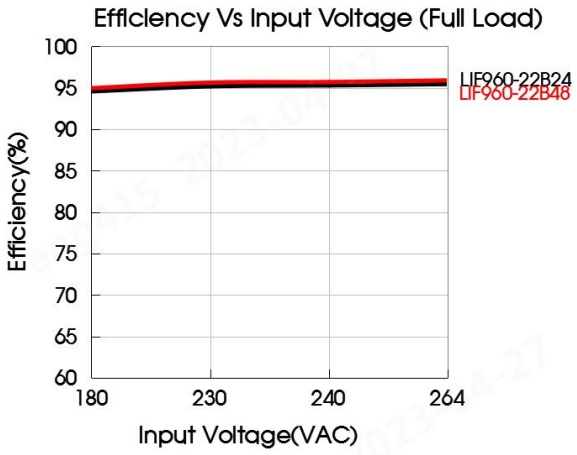
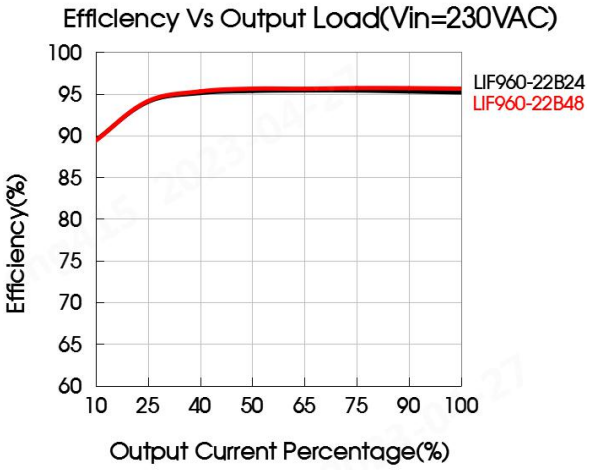
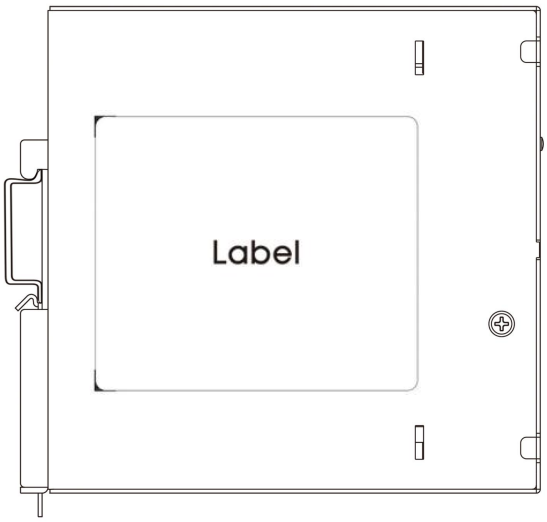




Installation Diagram



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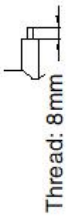
Materials required in the installation		
1	Product	1PCS
2	Phillips screwdriver Slotted screwdriver	1PCS
3	TS35/7.5 or TS35/15	1PCS
4	24–10AWG Wire	/ PCS
5	The content is for reference only. Regarding the actual wire diameter and tightening torque, refer to the dimensional drawing.	

Product

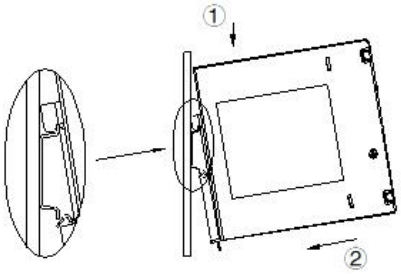
Phillips screwdriver
Slotted screwdriver
Diameter : 3mm

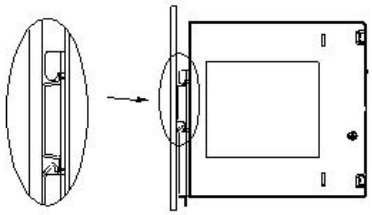
TS35/7.5 or TS35/15



Installation steps ①–②

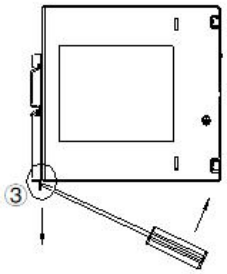
①Clamp the buckle of the product into the TS35 DIN rail.

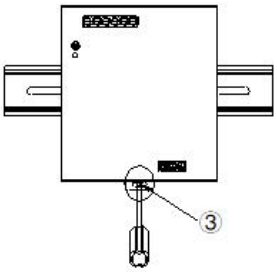




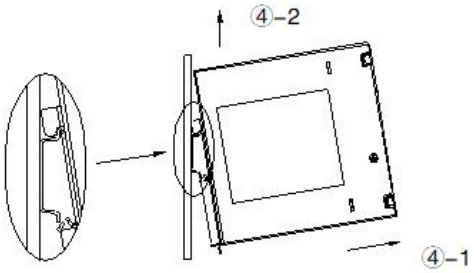
②Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly Steps ③–④



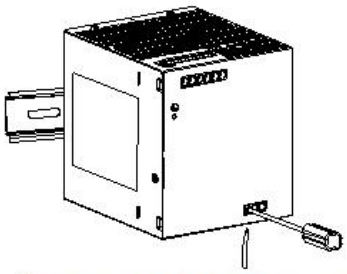


③After inserting the slotted screwdriver into the square groove at the bottom of the buckle, push the slider of the buckle downward in the direction shown in the figure.

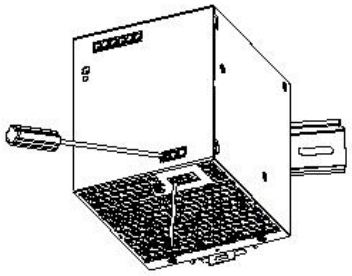


④Hold the bottom of the product and push it outwards while pushing down the slider, then lift the product up to take the product out of the DIN rail.

Wiring / Unwiring Steps ⑤–⑥



⑤Turn the Phillips screwdriver to the left to loosen the terminal screws, insert the head of the wire into the bottom of the terminal, and then turn the screwdriver to the right to tighten the terminal screws



⑥Turn the Phillips screwdriver to the left to loosen the terminal screw and pull the wire out of the bottom of the terminal

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).

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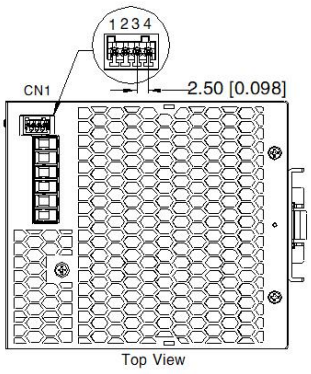
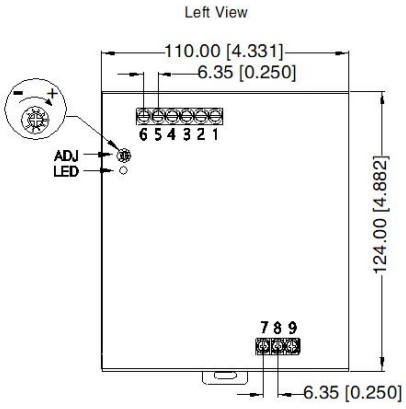
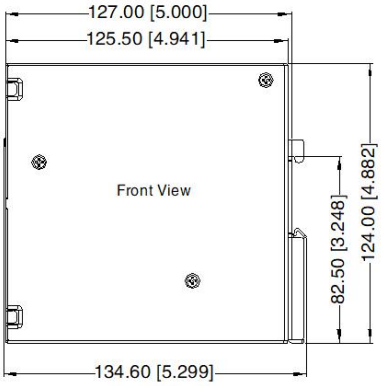
Dimensions and Recommended Layout

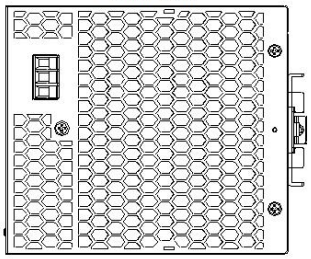
THIRD ANGLE PROJECTION



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







CN1 1 2 3 4		
Pin–Out		Customer Connector
Pin	Mark	Housing: WJ15EDGKD–2.5 or equivalent
1	PCS	
2	PCS	
3	DC	
4	OK	

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: Input: 16–10AWG
Output: 24V: 10AWG
48V: 12–10AWG
Tightening torque: Max 0.5 N・m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

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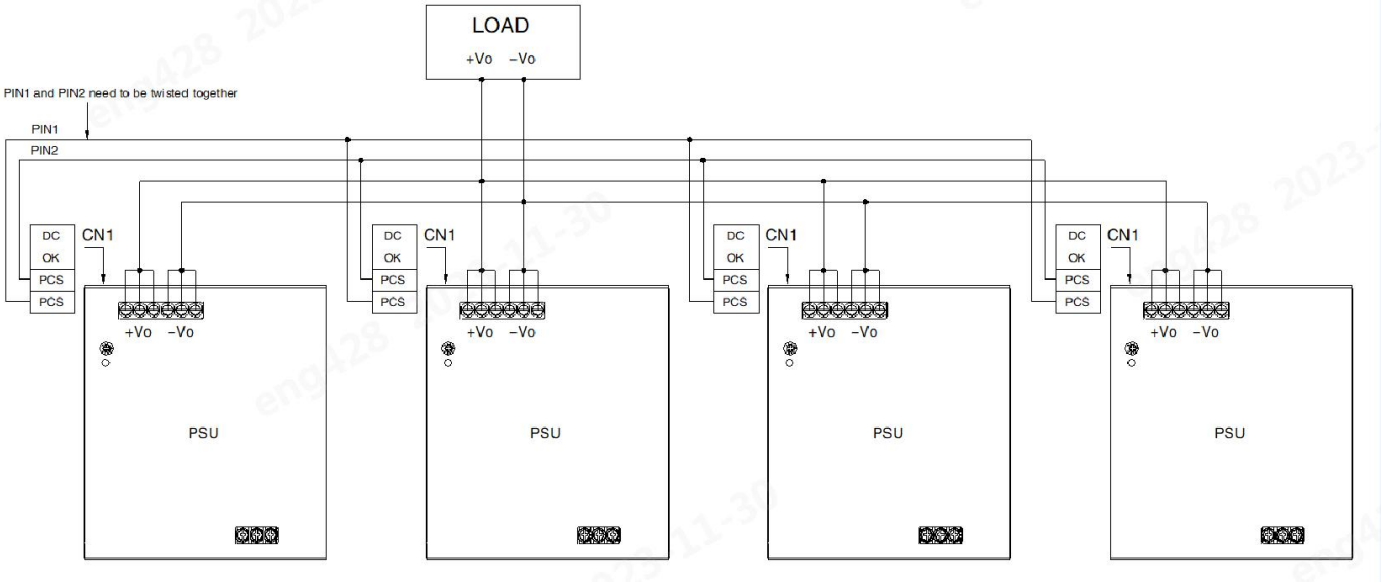
Parallel function description

1. The wiring method of parallel operation is shown in the figure below(PCS parallel connection)

2. The output voltage difference between the parallel units should be as small as possible

3. Supports 3+1 parallel to increase power and current sharing, please consult our FAE for details.

4. The power supply should be connected to the load with short and thick parallel wires



Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220653;
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 PE (⏚) of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the ADJ, clockwise to increase;
10. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
11. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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