ADF960-1B-xx Series

DESCRIPTIONS

AC-DC 960W DIN-Rail Power Supply



RoHS

CE Report EN62368-1

UKCA Report BS EN 62368-1

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
- Output short circuit, over-current, over-voltage, over-temperature protection
- Safety according to IEC/UL62368, UL508, GB4943

APPLICATIONS

- Industrial Control Equipment
- Machine Control
- Instrumentation
- Power
- New Energy
- Semiconductor Industry

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/BS EN	ADF960-1B-24	960	1248	24V/40A	24-28	95	10000
EN/BS EN	ADF960-1B-48	960	1248	48V/20A	48-55	95	5000

Note:*The product picture is for reference only, for details, please refer to the actual product.

Specifications

Product Specifications	Item		Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	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	Output Voltage Accuracy		Full load range		--	±1	--	%
	Line Regulation		Rated load		--	±0.5	--	
	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			
General Specifications	Isolation Test*	Input - ⏚	Electric strength test for 1min., leakage current <10mA		2000	--	--	VAC
		Input - output			4000	--	--	
		Output - ⏚			500	--	--	
	Insulation	Input - ⏚	Ambient temperature: 25 ± 5℃		100	--	--	MΩ

	Resistance	Input - output	Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		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 Class				CLASS I			
	MTBF		MIL-HDBK-217F@25℃		≥250,000 h			
	Warranty		Ambient temperature: <50℃		3 years			
Mechanical Specifications	Case Material		Metal (AL5052, SPCC)					
	Dimensions		110.00mm × 124.00mm × 127.00mm					
	Weight		1680g (Typ.)					
	Cooling Method		Free air convection					

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	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 (EMS)	ESD	IEC/EN61000-4-2	Contact1±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

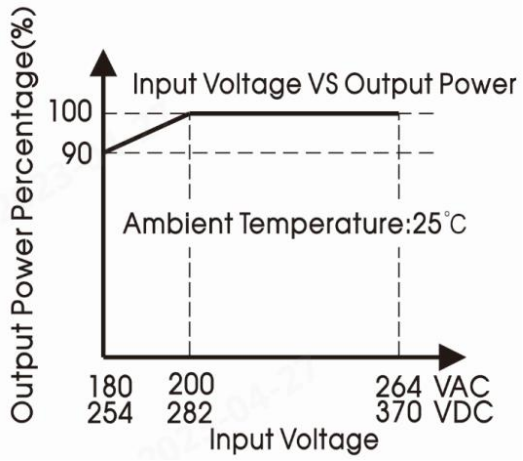
Note: *perf. Criteria:

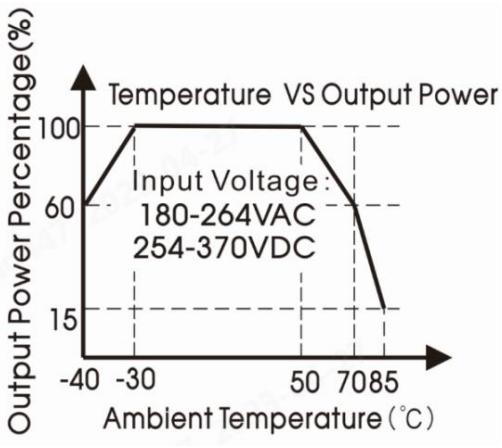
A: The equipment shall continue to operate as intended without operator intervention;

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.

Characteristic Curve

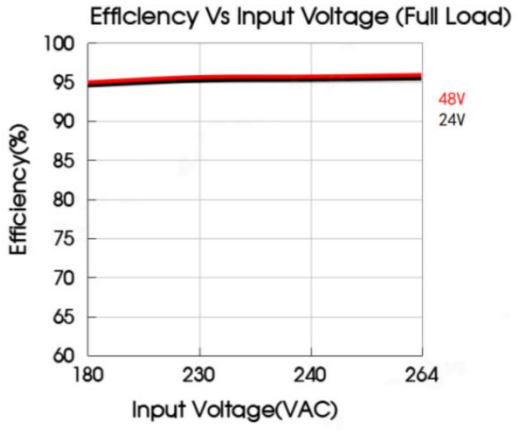


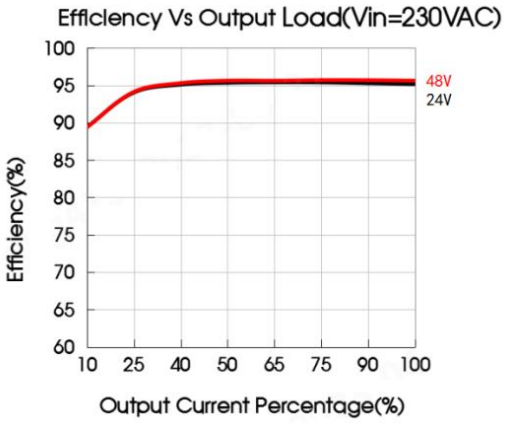


Note: 1.All curves are for 24V output, measured at input 230VAC, 50Hz, output Io, ambient temperature 25℃, unless otherwise stated;

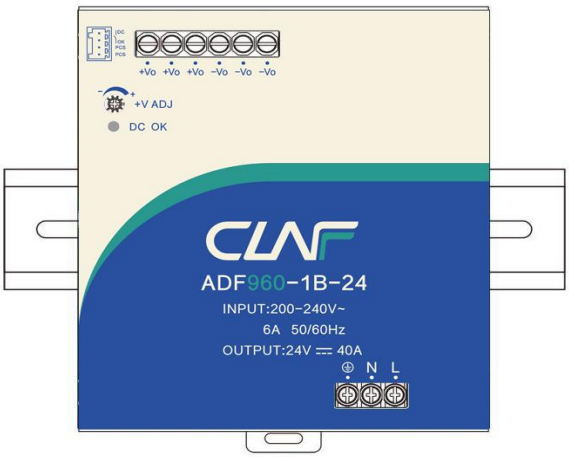
2.With an AC input voltage between 180-200VAC and a DC input between 254-282VDC the output power must be derated as per the temperature derating curves;

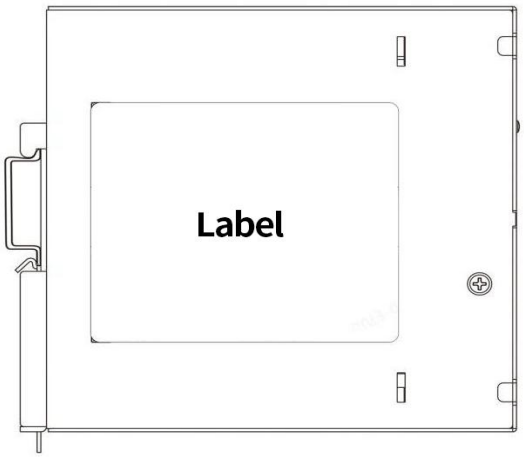
3.This product is suitable for use in a natural air cooling environment





Installation Diagram





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.	



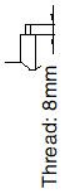
Product



Phillips screwdriver
Slotted screwdriver
Diameter : 3mm

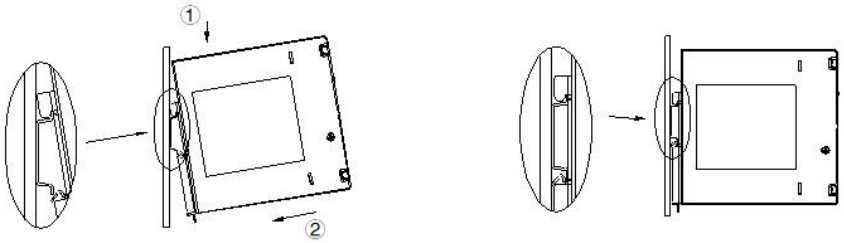


TS35/7.5 or TS35/15



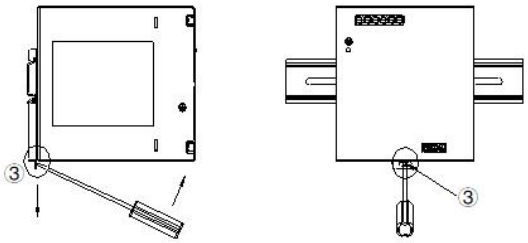
Installation steps ①–②

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

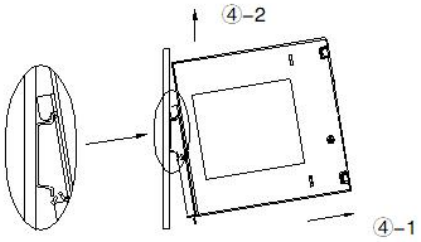


②Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly Steps ③–④

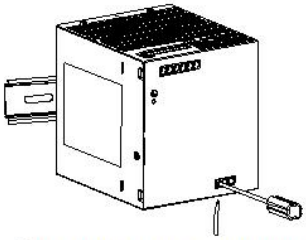


③After inserting the slotted screwdriver into the square groove at the bottom of the buckle, push the slider of the buckle downward in the direction shown in the figure.

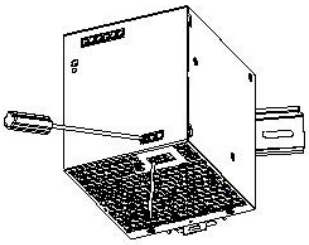


④Hold the bottom of the product and push it outwards while pushing down the slider, then lift the product up to take the product out of the DIN rail.

Wiring / Unwiring Steps ⑤–⑥



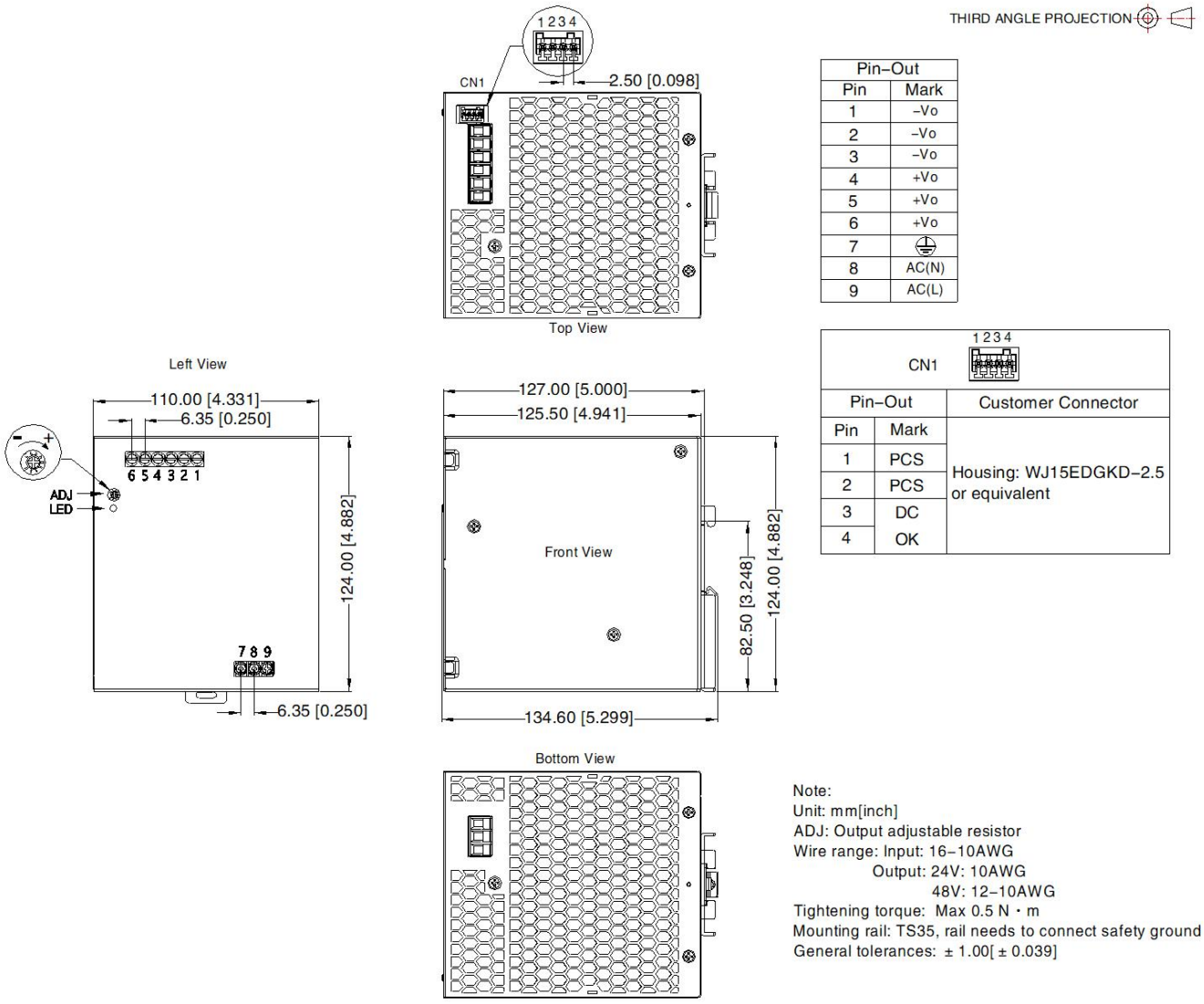
⑤Turn the Phillips screwdriver to the left to loosen the terminal screws, insert the head of the wire into the bottom of the terminal, and then turn the screwdriver to the right to tighten the terminal screws



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).

Dimensions and Recommended



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

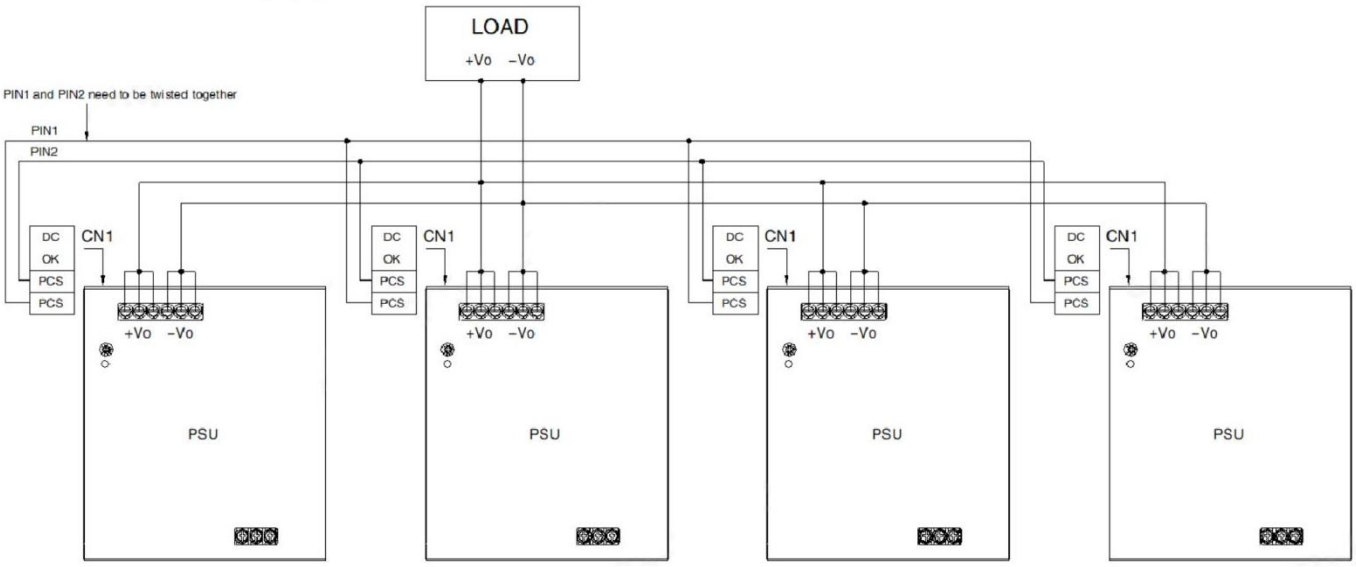
CN1 1 2 3 4

Pin–Out		Customer Connector
Pin	Mark	
1	PCS	Housing: WJ15EDGKD–2.5 or equivalent
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]

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



Note:

1. 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;
2. The room temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. 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;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
7. The output voltage can be adjusted by the ADJ, clockwise to increase;
8. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.