ADTF960-xxS Series

DESCRIPTIONS

960W, AC/DC DIN-Rail Power Supply



RoHS

FEATURES

- Wide 3x 320-575VAC and 450-820VDC Input voltage range
- Operating ambient temperature range: -40℃ to +70℃
- Active PFC, PF up to 0.95
- Standard DIN-Rail mounting
- High efficiency, high reliability
- DC OK, Supporting parallel (3+1 current sharing)
- Double-sided conformal coating
- Output short circuit, over-current, over-voltage protection, over-temperature protection
- Operating altitude up to 5000m
- Safety according to UL/EN/IEC62368, EN/IEC61000, UL/EN61010, CISPR32/EN55032, UL508

APPLICATIONS

- Industrial control equipment
- Factory automation and mechanical
- Electrical equipment

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current(Vo/Io)	Output Voltage Adjustable Range ADJ(V)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
--	ADTF960-24S	960	24V/40A	24-28	95	40000
	ADTF960-48S		48V/20A	48-56	96	20000
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)		380	--	480	VAC
		AC input		320	--	575	VAC
		DC input		450	--	820	VDC
	Input Voltage Frequency	Rated input (Certified voltage)		50	--	60	Hz
		AC input		47	--	63	
	Input Current	Rated input (Certified voltage)		--	--	2	A
		400VAC		--	--	2	
		500VAC		--	--	1.5	
	Inrush Current	400VAC	Cold start	--	60	--	
	Power Factor	400VAC	Normal temperature, rated load	0.94	0.95	--	--
		500VAC		0.93	0.94	--	
	Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)		275	--	--	VAC
		Under-voltage protection release (Input voltage rises from low to high)		--	--	305	
	Input Fuse	Built-in fuse		6.3A/600V			
	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	--	--	
	Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	24V	--	--	180	mV
			48V	--	--	250	
	Temperature Coefficient			--	±0.03	--	%/℃
	Hold-up Time	400VAC		--	20	--	ms
		500VAC		--	20	--	
	Short Circuit Protection			Constant current mode, continuous, self-recover			
	Over-current Protection			105% - 130% Io, Constant current mode, automatic recover after fault condition is removed			
	Over-voltage Protection	24V		≤35VDC (Hiccup, self-recover)			
		48V		≤63VDC (Hiccup, self-recover)			
	Over-temperature Protection			Output voltage turn off, self-recover after fault elimination			
General Specifications	Isolation	Input - ⏚	Electric strength test for 1min, leakage current < 10mA	2000	--	--	VAC
		Input - output	Electric strength test for 1min, leakage current < 5mA	4000	--	--	
		Output - ⏚	Electric strength test for 1min,	500	--	--	

			leakage current < 10mA				
		Output - DC OK	Electric strength test for 1min, leakage current < 1mA	500	--	--	
	Insulation Resistance	Input - ⏚	Environment temperature: 25±5℃ Relative humidity: < 95%, non-condensing Test voltage: 500VDC	100	--	--	MΩ
		Input - output		100	--	--	
		Output - ⏚		100	--	--	
	Touch Leakage Current		3x 480VAC	--	--	2	mA
	Operating Temperature			-40	--	70	℃
	Storage Temperature			-40	--	85	
	Operating Humidity		Non-condensing	20	--	90	%RH
	Storage Humidity			10	--	95	
	Switching Frequency			55	--	75	kHz
	Power Derating	Operating temperature derating	-40℃ to -30℃	5	--	--	%/℃
			-30℃ to +50℃	0	--	--	
			+50℃ to +70℃	2.5	--	--	
		Input voltage derating	320VAC - 340VAC (Three phase operation)	1	--	--	%/VAC
	Safety Class			CLASS I, ANSI/ISA71.04-2013			
	MTBF		MIL-HDBK-217F@25℃	≥250,000 h			
	Pollution Degree			2			
Functional Specifications	Current Sharing Accuracy		When multiple units are connected in parallel, the sub-modules shunt more than 50% of the rated load	-5	--	+5	%
	DC OK Signal		Resistive load	30VDC/1A Max.			
	LED Signal		Main output status indication / Normal output > 90%Vo	Green On			
Mechanical Specifications	Case Material		Metal (AL5052, SPCC)				
	Dimensions		110.00mm x 124.00mm x 127.00mm				
	Weight		1650g (Typ.)				
	Cooling Method		Free air convection				

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

Electromagnetic Compatibility (EMC)

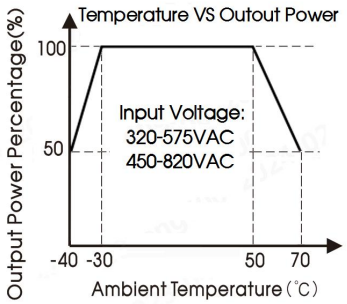
Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
		Harmonic current	IEC/EN61000-3-2 CLASS A	
		Voltage flicker	EN61000-3-3	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EFT (Input)	IEC/EN61000-4-4 ±4KV	perf. Criteria A
		EFT (Output)	IEC/EN61000-4-4 ±2KV	perf. Criteria A
		EFT (DC OK)	IEC/EN61000-4-4 ±1KV	perf. Criteria A
		Surge (Input)	IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV	perf. Criteria A
		Surge (Output)	IEC/EN61000-4-5 Vo+ to Vo- ±500V/Vo+/Vo- to PE ± 1KV	perf. Criteria A
		Surge (DC OK)	IEC/EN61000-4-5 DC OK to PE ±1KV	perf. Criteria A
		CS	IEC/EN61000-4-6 20 Vr.m.s	perf. Criteria A
		PFMF	IEC/EN61000-4-8 30A/m	perf. Criteria A
		Voltage variations*	IEC61000-6-2/IEC61000-4-11	70% Un, 25/30 cycle(50/60Hz) 40% Un, 0/12 cycle(50/60Hz) 0% Un, 1 cycle	perf. Criteria B
		Voltage interruptions*	IEC61000-6-2/IEC61000-4-11	0%Un,250/300 cycle(50/60Hz)	perf. Criteria C

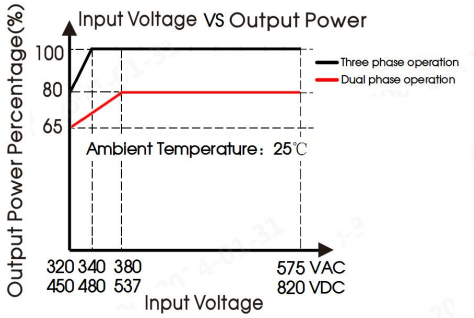
Note: *Un is the maximum input nominal voltage.

Environmental Characteristics

	Item	Operating Conditions	Standard
Environmental Characteristics	High and Low Temperature Working	+70℃, -40℃	GB2423.1, IEC60068-2-1
	Sinusoidal Vibration	10 - 500Hz, 2G, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
	Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
	High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
	High Temperature Aging	+50℃	GB2423.2, IEC60068-2-2
	Normal Temperature Aging	+25℃	GB2423.1, IEC60068-2-1
	Temperature Shock	-40℃ to +85℃	GB2423.22, IEC60068-2-14
	Temperature Cycle	-30℃ to +50℃	GB2423.22, IEC60068-2-14
	Hot and Humid	+70℃, 85%RH	GB2423.50, IEC60068-2-67

Characteristic Curve

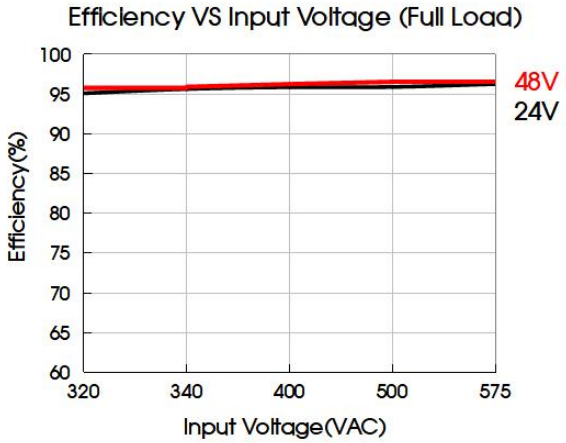


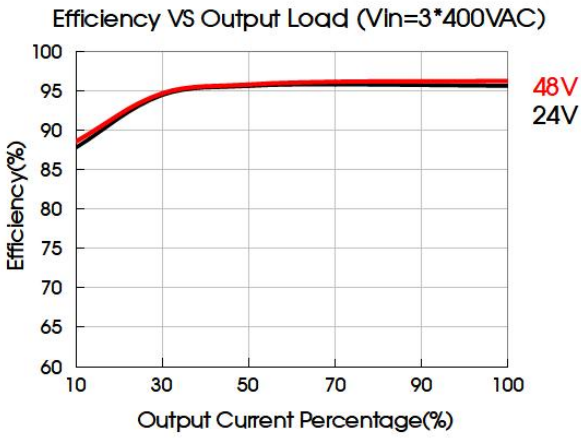


Note:

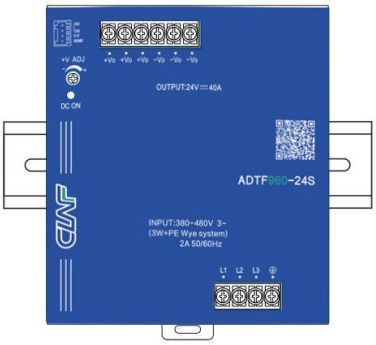
1. With an AC input voltage between 320-340VAC/320-380VAC and a DC input between 450-480VDC/450-537VDC, the output power must be derated as per the temperature derating curves.

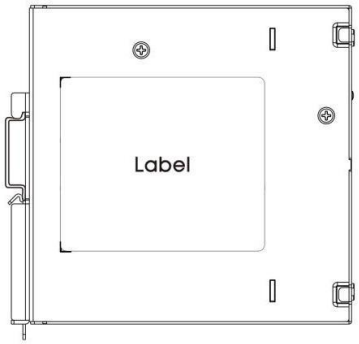
2. This product is suitable for applications using air cooling.





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.	



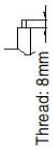
Product



Phillips screwdriver
Slotted screwdriver
Diameter : 3mm

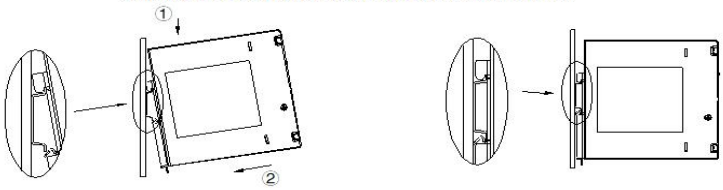


TS35/7.5 or TS35/15



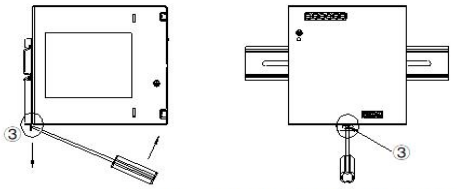
Installation steps ①–②

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

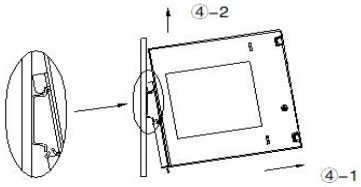


②Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly Steps③–④

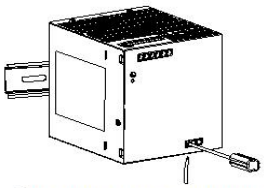


③After inserting the slotted screwdriver into the square groove at the bottom of the buckle, push the slider of the buckle downward in the direction shown in the figure.

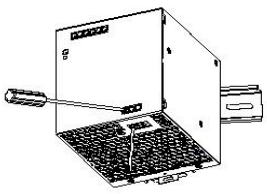


④Hold the bottom of the product and push it outwards while pushing down the slider, then lift the product up to take the product out of the DIN rail.

Wiring / Unwiring Steps ⑤–⑥



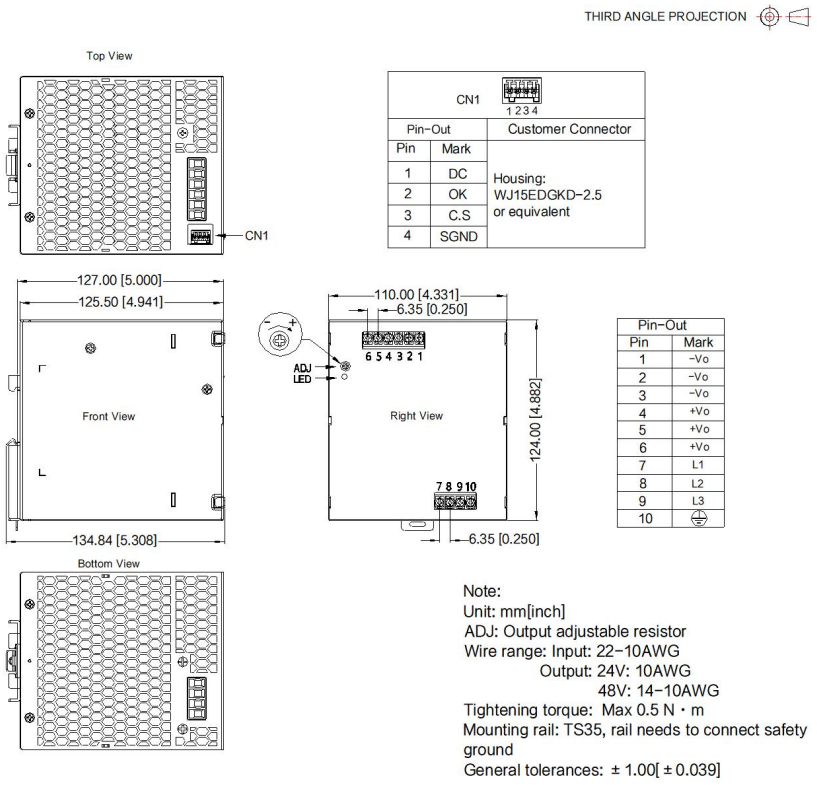
⑤Turn the Phillips screwdriver to the left to loosen the terminal screws, insert the head of the wire into the bottom of the terminal, and then turn the screwdriver to the right to tighten the terminal screws



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



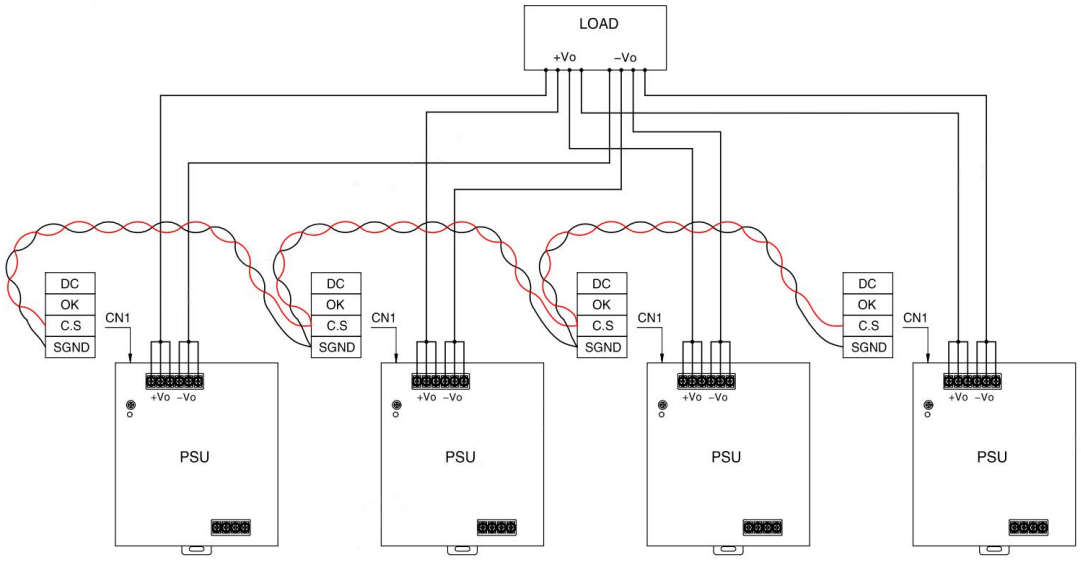
CN1		
Pin-Out		Customer Connector
Pin	Mark	Housing: WJ15EDGKD-2.5 or equivalent
1	DC	
2	OK	
3	C.S	
4	SGND	

Pin-Out	
Pin	Mark
1	-Vo
2	-Vo
3	-Vo
4	+Vo
5	+Vo
6	+Vo
7	L1
8	L2
9	L3
10	⏚

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: Input: 22-10AWG
Output: 24V: 10AWG
48V: 14-10AWG
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, please consult our FAE for details.
4. The power supply should be connected to the load with short and thick parallel wires.



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. Use copper conductors only;
   N'utiliser que des conducteurs en cuivre;
10. OPEN EQUIPMENT: Adequate protection against contact with live parts and ingress of dust and water must be ensured through installation in a suitable enclosure(e.g. control cabinet, control box console or similar).

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 3.5℃/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. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to the earth (⏚)of system when the terminal equipment in operating;
8. The output voltage can be adjusted by the ADJ, clockwise to increase;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. 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.