



Size: 1.34in x 4.76in x 4.88in  
(34mm x 121mm x 124mm)

### FEATURES

- Universal 85-277VAC or 120-390VDC Input
- DC OK Function
- 150% Peak Load
- Active PFC
- Double Sided Conformal Coating, Salt-Spray Proof, Explosion-Proof
- Operating Altitude up to 5000m
- OVC II, OVC III (Design Refers to EN62477, 2000m)
- High Efficiency
- Output Short Circuit, Over Current, Over Voltage, and Over Temperature Protection
- Pollution Degree 2
- Safety According to ATEX, IECEx Increased Safety Type Explosion Proof Certification
- Safety According ANSI/ISA 71.04-2013 G3 Anticorrosion Test
- Safety According to IEC/UL62368, EN60335, E62477, and UL508

### DESCRIPTION

The PSDMF120 series of AC/DC converters offers up to 120 watts of power in a 1.34" x 4.76" x 4.88" DIN rail package. This series consists of single output models with a wide input voltage range of either 85-277VAC or 120-390VDC. Each model features high efficiency, active PFC, and DC OK function. It is protected against output short circuit, over current, over voltage, and over temperature conditions and has safety according to IEC/UL62368, EN60335, E62477, and UL508.

### MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current	Output Voltage Adjustable Range <sup>(1)</sup>	Output Power	Maximum Capacitive Load	Ripple & Noise	Efficiency
PSDMF120-12S	85-277VAC (120-390VDC)	12V	10A	12-14V	120W	80000µF	100mV	93%
PSDMF120-24S		24V	5A	24-28V	120W	50000µF	100mV	94%
PSDMF120-48S		48V	2.5A	48-55V	120W	25000µF	100mV	94.5%

### SPECIFICATIONS

All specifications are based on Ta=25°C, Humidity <75%, Nominal Input Voltage, and Rated Output Load unless otherwise noted. We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
	<b>INPUT SPECIFICATIONS</b>					
Input Voltage Range	Rated Input (Certified Voltage)		100		240	VAC
	AC Input		85		277	
	DC Input		120		390	VDC
Maximum Input Voltage	Lasts for 2h without damage				305	VAC
Input Voltage Frequency			47		63	Hz
Input Switching Voltage				80		VAC
Input Turn-Off Voltage				60		VAC
Input Current	115VAC				1.5	A
	230VAC				0.75	
Inrush Current	Cold Start	115VAC		15		A
		230VAC		30		
Power Factor	Room temperature, full load	115VAC	0.98			
		230VAC	0.95			
Input Fuse	Built-In Fuse			8		A
Hot Plug			Unavailable			
<b>OUTPUT SPECIFICATIONS</b>						
Output Voltage			See Table			
Output Voltage Accuracy	Full Load Range			±1.0		%
Line Regulation	Rated Load			±0.5		%
Load Regulation	0%-100% Load			±0.5		%
Stand By Power Consumption					5	W
Power Consumption <sup>(2)</sup>	230VAC, Rated Load			8		W
Output Power			See Table			
Output Current			See Table			
Minimum Load			0			%
Maximum Capacitive Load			See Table			
Ripple & Noise <sup>(3)</sup>	20MHz bandwidth (Peak-to-Peak Value)				100	mV
Hold-Up Time				35		ms
Start-Up Delay Time	115VAC/230VAC, rated load				3000	ms
DC OK Signal	Resistive Load		30VDC/1A Max.			

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SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
<b>PROTECTION</b>						
Short Circuit Protection <sup>(2)</sup>			Hiccup Mode, Constant Current works 1s (Typ.) Turn off 10S, continuous, self-recovery			
Over Current Protection <sup>(2)</sup>	115VAC/230VAC	Room Temperature	110	150		%
		High Temperature, Low Temperature	105			
Over Voltage Protection	Hiccup, Self-Recovery	12V Output		≤18		VDC
		24V Output		≤35		
		48V Output		≤60		
Over Temperature Protection <sup>(4)</sup>	230VAC, Rated Load	Over Temperature Protection Start			90	°C
		Over Temperature Protection Release	60			
<b>ENVIRONMENTAL SPECIFICATIONS</b>						
Operating Temperature			-40		+85	°C
Storage Temperature			-40		+85	°C
Operating Humidity	Non-Condensing		5		95	%RH
Storage Humidity	Non-Condensing		5		90	%RH
Altitude					5000	m
Power Derating	Operating Temperature Derating	-40°C to -25°C	3.34			%/°C
		+60°C to +70°C	3.75			
		+70°C to +85°C	3.17			
	Input Voltage Derating	85VAC-100VAC	1			%/VAC
	Output Voltage Derating	48V 53VDC-56VDC	6.67			%/VDC
MTBF	MIL-HDBK-217F @25°C		980,000			H
	MIL-HDBK-217F @40°C		878,000			
<b>GENERAL SPECIFICATIONS</b>						
Typ. Efficiency	400VAC		See Table			
Switching Frequency <sup>(5)</sup>	PFC		40		130	KHz
	DC-DC		50		130	
	Auxiliary Source			65		
Isolation Test	Electric Strength Test for 1min. Leakage Current <5mA (Isolation test need to remove the screw at the mark ⊕) <sup>(6)</sup>	Input-⊕	2500			VAC
		Input-Output	4000			
		Output-⊕	500			
	Electric Strength Test for 1min. Leakage Current <2mA	DC OK – Output	500			
Insulation Resistance	500VDC	Input-⊕	500			MΩ
		Input-Output	500			
		Output-⊕	500			
Leakage Current	240VAC	Input-Output			0.5	mA
		Input-⊕			0.88	
High and Low Voltage Crossing			NB/T 31111-2017			
<b>PHYSICAL SPECIFICATIONS</b>						
Weight			1.92lbs (870g)			
Dimensions (L x W x H)			1.89in x 4.76in x 4.88in (48mm x 121mm x 124mm)			
Case Material			Metal (AL5052, SUS304)			
Cooling			Free Air Convection			
<b>SAFETY CHARACTERISTICS</b>						
Safety Standards/Certifications			Design Refers to	UL508, UL61010, EN/IEC62368, IEC60664		
Safety Class			Class I			
Emissions	CE (Input Port)	CISPR32 EN55032	150K-30MHz	Class B		
	CE (Output Port)	CISPR32 EN55032	150K-30MHz	Class A		
	RE	CISPR32 EN55032	30MHz – 2GHz	Class B		
	Voltage Flicker	EN61000-3-3				
	Harmonic Current	IEC/EN61000-3-2		Class A and Class D		

**SPECIFICATIONS**

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SPECIFICATION	TEST CONDITIONS			Min	Typ	Max	Unit
<b>SAFETY CHARACTERISTICS (Cont.)</b>							
Immunity <sup>(7)</sup>	ESD	IEC/EN61000-4-2	Contact ±8kV/Air ±15kV				Perf. Criteria A
	RS	IEC/EN61000-4-3	20V/m				Perf. Criteria A
	EFT (Input Port)	IEC/EN61000-4-4	±4kV				Perf. Criteria A
	EFT (Output Port)	IEC/EN61000-4-4	±2kV				Perf. Criteria A
	Surge (Input Port)	IEC/EN61000-4-5	L to N ±3kV/L or N to PE ±6kV				Perf. Criteria A
	Surge (Output Port)	IEC/EN61000-4-5	Line to Line ±1kV/line to ground ±2kV				Perf. Criteria A
	MS	IEC/EN6100-4-8	30A/m				Perf. Criteria A
	AC Power Port Harmonics	IEC61000-4-13	Class 3				Perf. Criteria A
	Harmonic and Network Signal	IEC61000-4-13	Class 3				Perf. Criteria A
	Low Frequency Immunity	IEC61000-4-13	Class 3				Perf. Criteria A
	CS	IEC/EN61000-4-6	0.15-80MHz 20Vr.m.s				Perf. Criteria A
	Voltage Dips	IEC/EN61000-4-11	0% of 100VAC, 0VAC, 20ms				Perf. Criteria A
			40% of 100VAC, 40VAC, 200ms				Perf. Criteria C
			70% of 100VAC, 70VAC, 500ms				Perf. Criteria A
			0% of 200VAC, 0VAC, 20ms				Perf. Criteria A
40% of 200VAC, 80VAC, 200ms						Perf. Criteria A	
Voltage Interruption	IEC/EN61000-4-11	70% of 200VAC, 140VAC, 5000ms				Perf. Criteria A	
		0% of 200VAC, 0VAC, 5000ms				Perf. Criteria C	

**NOTES**

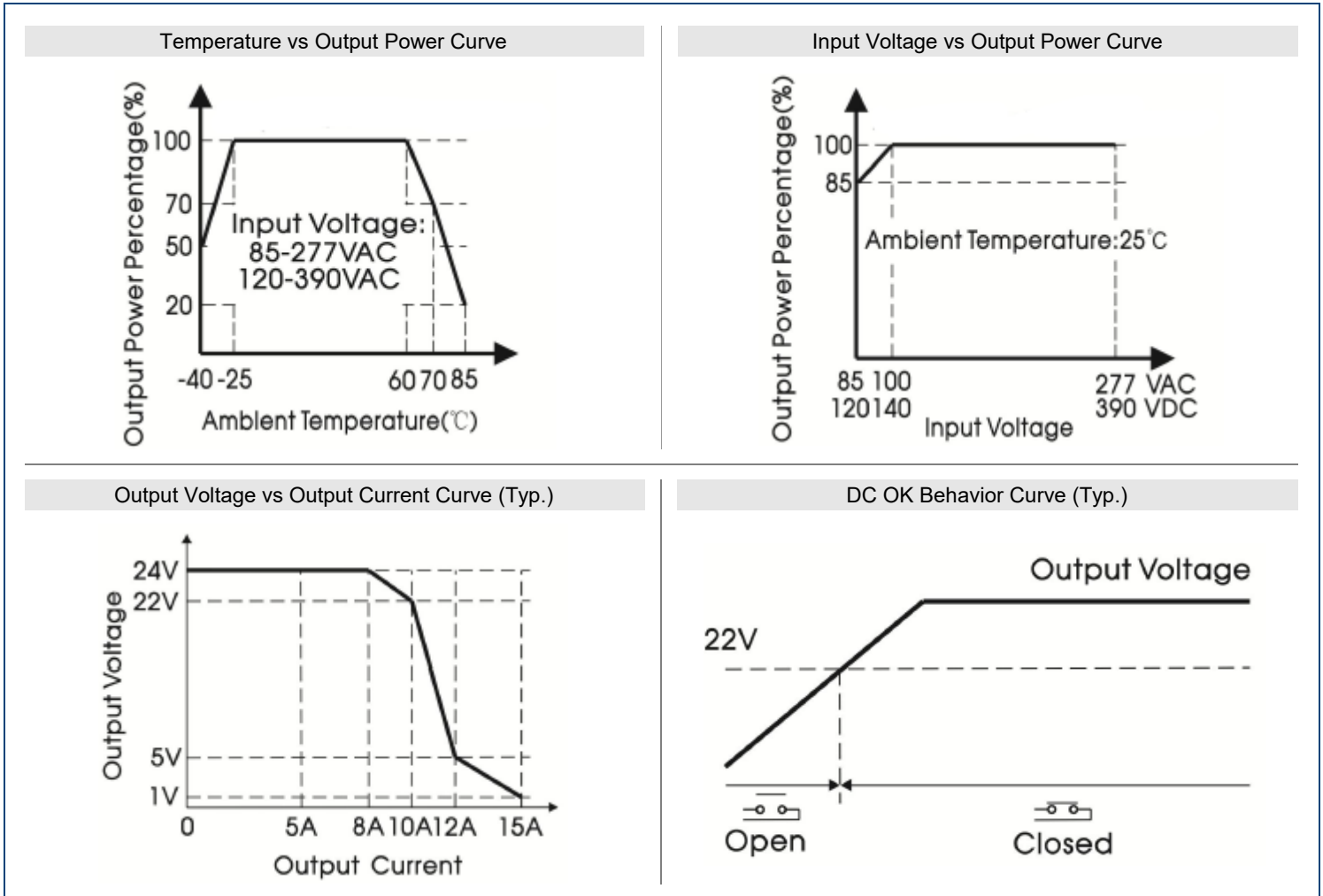
- When the output voltage rises, the total power of the product should not exceed the rated power
- See characteristic curve for more details.
- The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor. Contact factory for more information.
- Over Temperature Protection: put the product into a high temperature box. After the ambient temperature stabilizes, increase the temperature slightly (3°C to 5°C) and the load remains unchanged. After the product reaches thermal equilibrium, increase the temperature until the product triggers over-temperature protection.
- Power supply has 3 converters with three different switching frequencies. Auxiliary source frequency is nearly constant, other switching frequencies depend on input voltage and load.
- The gas discharge tube built into the device effectively protects the power supply against damage by asymmetric disturbance variables (eg EN61000-4-5). Each power supply continuously withstanding voltage test will cause extremely high load to the power supply. Therefore, unnecessary loading or damage to the power supply due to excessive test voltage should be avoided. If necessary, disconnect the gas discharge tube built into the device to use a higher test voltage. After successful completion of the test, reconnect the gas discharge tube. Contact factory for more specific operation methods.
- Perf. Criteria:
  - The equipment shall continue to operate as intended without operator intervention
  - After the test, the equipment shall continue to operate as intended without operator intervention
  - 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 manufacturers instructions.
- The room temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m.
- 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.
- Customization is available, contact factory for more details.
- Out case needs to be connected to PE of system when the terminal equipment is in operation.
- Output voltage can be adjusted by the ADJ, clockwise to increase.
- Our products should be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

\*Due to advances in technology, specifications subject to change without notice.

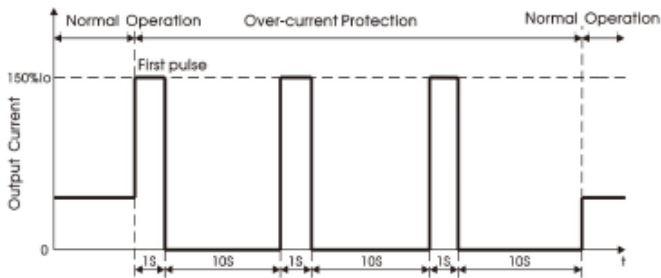
**ENVIRONMENTAL CHARACTERISTICS**

Item	Operation Conditions	Standard
High and Low Temperature Working	+85°C, -40°C	GB243.1, IEC60068-2-1
Sinusoidal Vibration	10-500Hz, 2g, three directions of X,Y,Z axis	GB2423.10, IEC60068-2-6
Salt Mist	+35°C, 5%NaCl, 48h	GB2423.17, IEC60068-2-11
Alternating Hot and Humid	+25°C, 95%RH - +60°C, 95%RH	GB2423.4, IEC60068-2-30
Low Temperature Storage	-40°C	GB2423.1, IEC60068-2-1
High Temperature Storage	+85°C	GB2423.2, IEC60068-2-2
High Temperature Aging	+60°C	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25°C	GB2423.1, IEC60068-2-1
Temperature Shock	-40°C to +85°C	GB2423.22, IEC60068-2-14
Temperature Cycle	-25°C to +60°C	GB2423.22, IEC60068-2-14
Hot and Humid	+85°C, 85%RH	GB2423.50, IEC60068-2-67
High Temperature Elevation	+60°C, 54KPa	GB2423.26, IEC60068-2-41
Low Temperature Elevation	-25°C, 54KPa	GB2423.25, IEC60068-2-40
Constant Humid and Hot	+40°C, 95%TH	GB2423.3, IEC60068-2-78
Random Vibration	5-10Hz, ASD 0.3-10g <sup>2</sup> /Hz, three directions of X,Y,Z axis	GB/T 4798.2-2008, IEC60721-3-2
Sinusoidal Vibration Response	10-150Hz, 1g, three directions of X,Y,Z axis	GB/T 11287-2000, IEC60255-21-1
Sinusoidal Impulse Response	15g, pulse duration 11ms, three times in each direction of X,Y,Z axis	GB/T 114537-1993, IEC60255-21-2
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

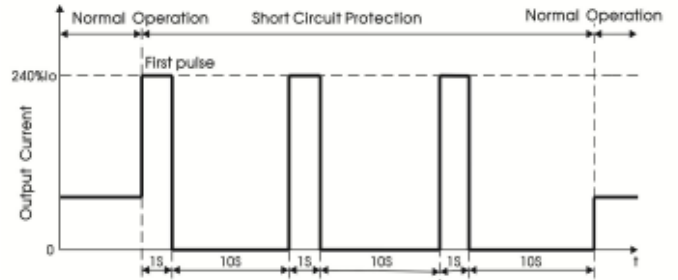
**CHARACTERISTIC CURVES**



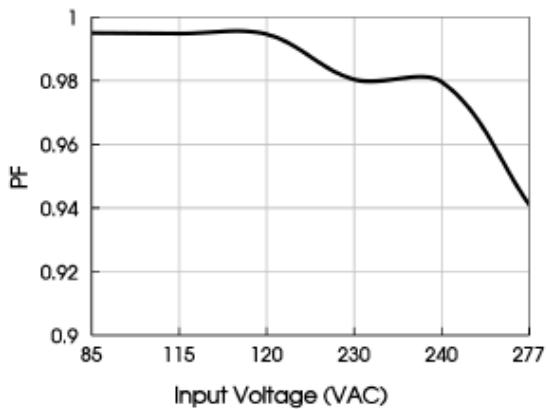
Over-Current Protection Curve (Typ.)



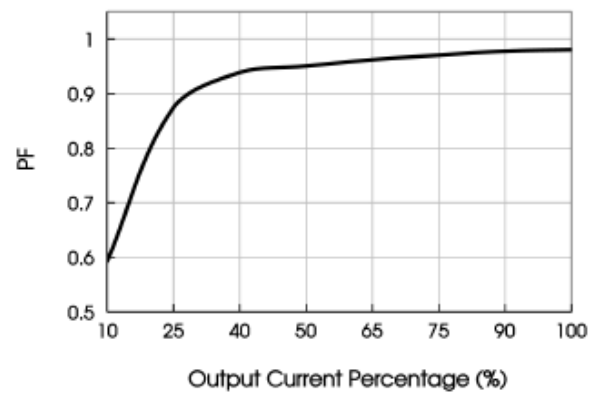
Short Circuit Protection Curve (Typ.)



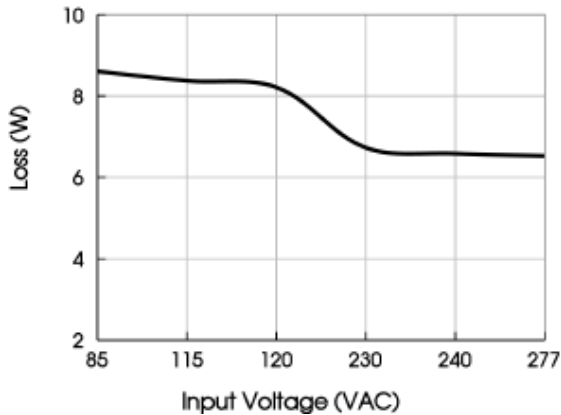
PF vs Input Voltage (Full Load)



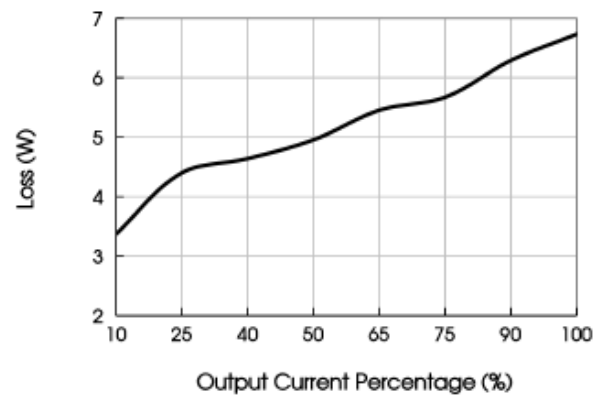
PF vs Output Load (Vin=230VAC)



Load vs Input Voltage (Full Load)

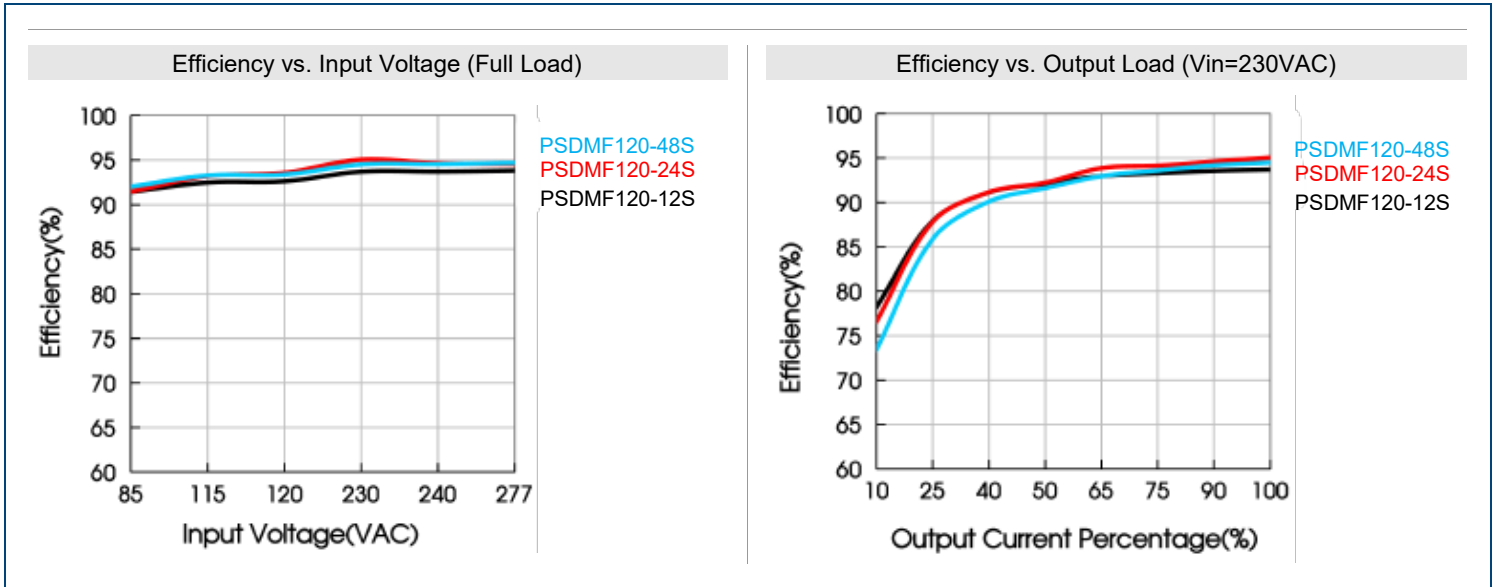


Loss vs Output Load (Vin=230VAC)

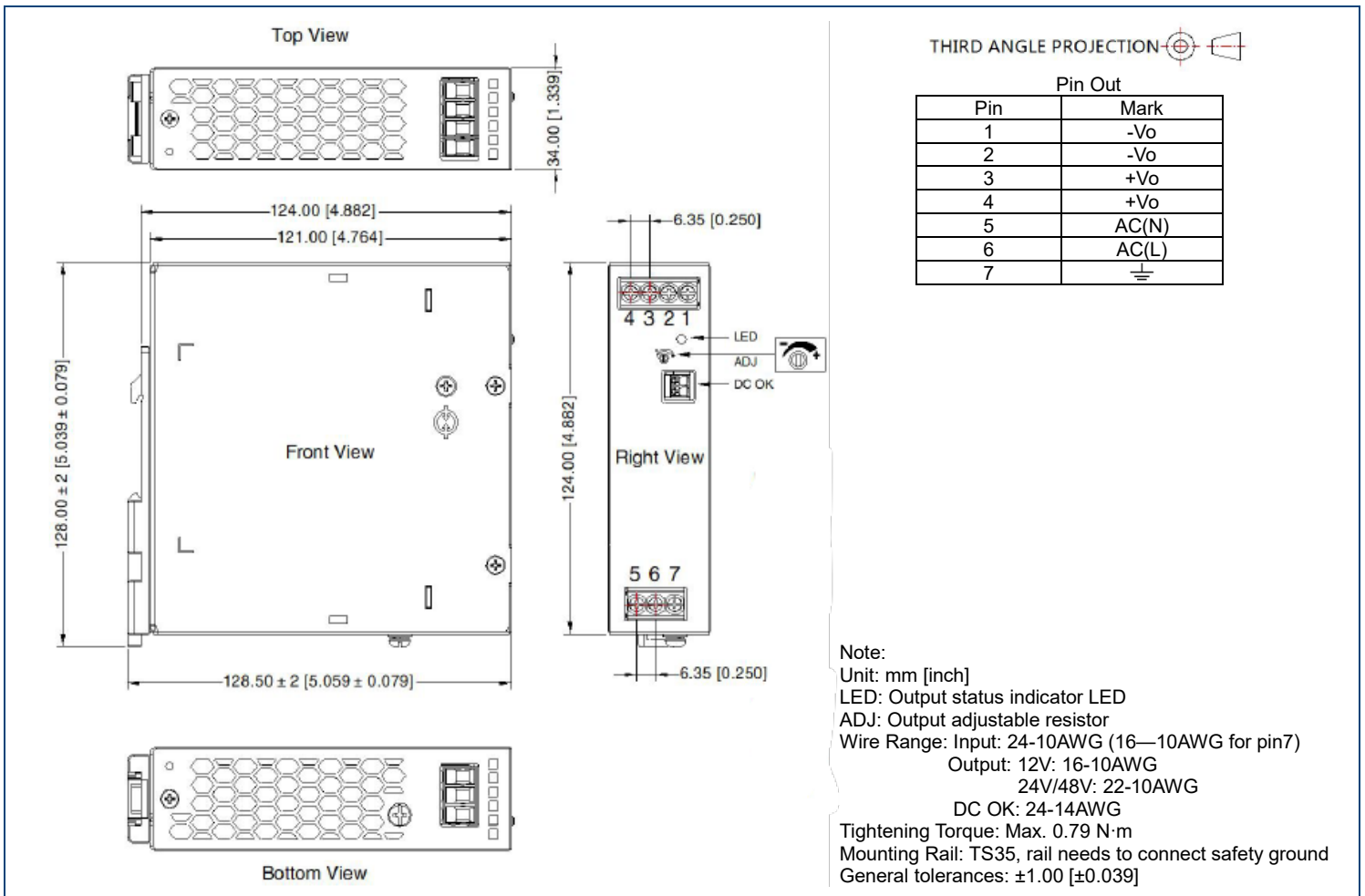


- Notes:
1. All curves are for 24V output, measured at input 230VAC, 50Hz, output  $I_o$ , ambient temperature 25°C, unless otherwise stated.
  2. Output Voltage vs Output Current Curve shows that the product will enter the overload state when the rated output current increases to 100% - 150% (typ.) and enter the overcurrent protection when the current  $>150\%I_o$  (typ.) and the output voltage will decrease with the increase of the output current. When the output current increases to a certain value, the product will enter the constant current mode.
  3. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output 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 contact factory.

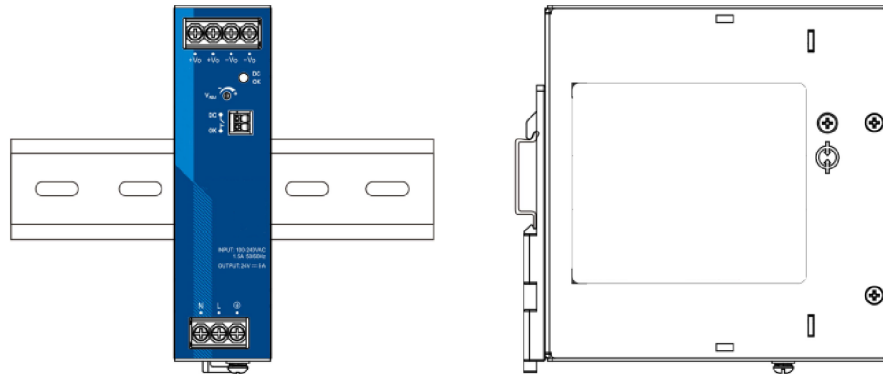
EFFICIENCY CURVES



MECHANICAL DRAWINGS



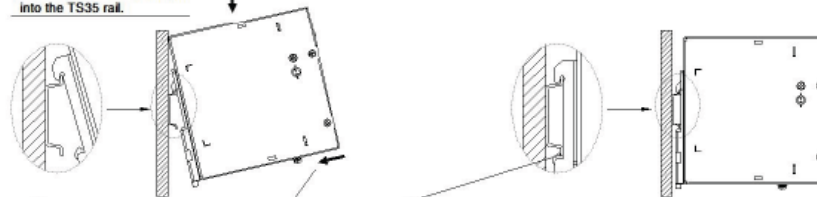
INSTALLATION DIAGRAM



Bill Of Material		
1	Product	1 PCS
2	Phillips screwdriver Slotted screwdriver	1 PCS
3	TS35/7.5 or TS35/15	1 PCS
	24-10AWG wires	/PCS
4	All above is only for reference, the actual wiring diameter and locking torque refer to the appearance size diagram	

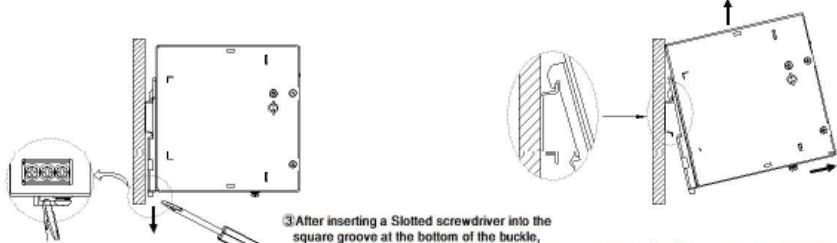
Installation steps ①-②

① Put the product buckle down into the TS35 rail.



② Push the product perpendicular to the TS35 rail until hear the sound of the clip snapping into the rail.

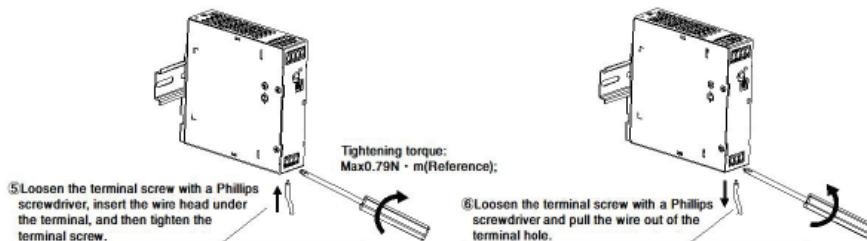
Disassembly steps ③-④



③ After inserting a Slotted screwdriver into the square groove at the bottom of the buckle, push the sliding part of the buckle downward according to the direction shown.

④ Push the bottom of the product outwards and take it out upwards.

Connecting/Disconnecting Steps ⑤-⑥

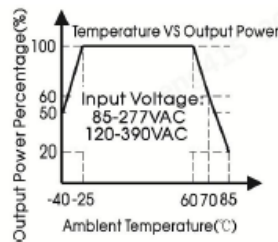
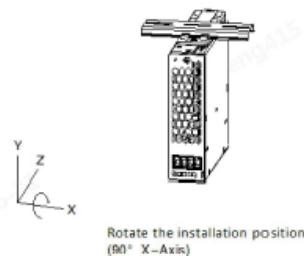
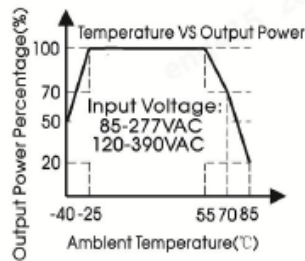
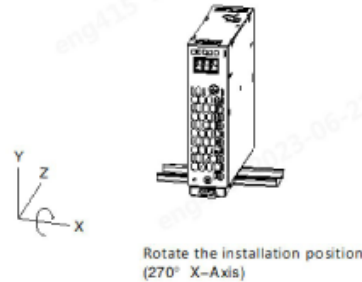
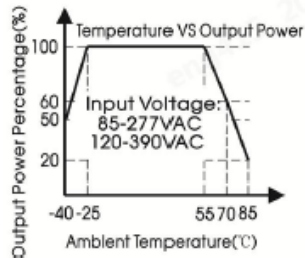
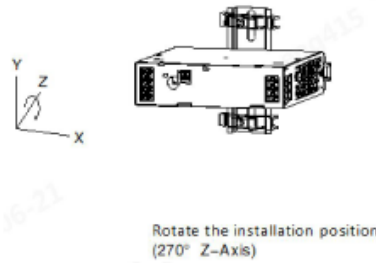
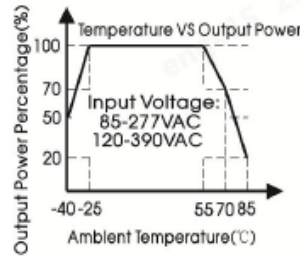
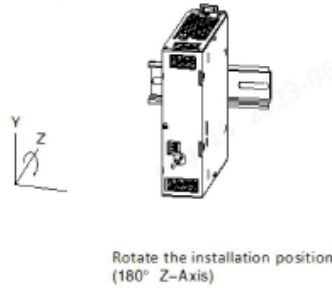
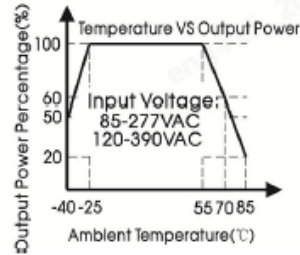
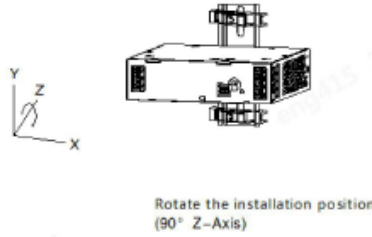
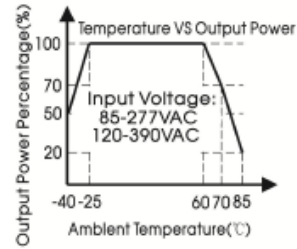
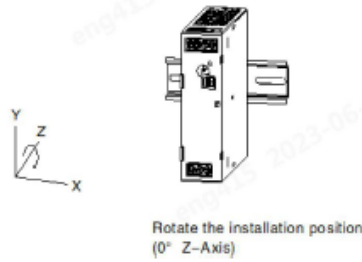


⑤ Loosen the terminal screw with a Phillips screwdriver, insert the wire head under the terminal, and then tighten the terminal screw.

Tightening torque:  
Max0.79N · m(Reference);

⑥ Loosen the terminal screw with a Phillips screwdriver and pull the wire out of the terminal hole.

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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**WARNING**

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.
9. For ambient temperature  $\leq 60^{\circ}\text{C}$  use  $\geq 90^{\circ}\text{C}$  copper wire only, for ambient temperature  $> 60^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ , use  $\geq 105^{\circ}\text{C}$  – copper wire only; use only wires with a minimum dielectric strength of 300V (input) and 60V (output).

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**COMPANY INFORMATION**

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

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