AC/DC Switching Power Supply
FA120-600SXXG1N4 Series

Typical Features

- ◆ Wide input voltage range 85-900VAC
- ◆ No load power consumption≤1W
- ◆ Transfer efficiency 89%(typical)
- ◆ Switching frequency 65KHz
- ◆ Protections: short circuit, over current, over voltage protection
- ◆ Isolation Voltage 4000Vac
- ◆ Comply with CE and RoHS certification standards
- ◆ Designed specifically for coal mine electrical equipment

Application Field

FA120-600SXXG1N4 series ----- is a special high-voltage power supply designed and developed by Aipu for coal mine electrical customers, with the development requirements of equipment power supply safety, convenient installation, reliable application, and technological innovation. This series of power supplies has the advantages of global input voltage range, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, and high safety isolation. This series of products can be widely used in coal mine monitoring and security industries. When the product is used in an environment with relatively harsh electromagnetic compatibility, please refer to the application circuit provided by our company.

Typical Product List

Certificate	Part No.	Output Specification			Max. Capacitive Load	Ripple & Noise 20MHz(Max)	Efficiency @full load 380Vac (TYP)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(m A)	u F	mVp-p	%
/	FA120-600S24G1N4	120	24	5000	5000	120	88
	FA120-600S28G1N4	120	28	4300	3000	150	88
	FA120-600S35G1N4	120	35	3429	2000	150	89
	FA120-600S48G1N4	120	48	2500	2000	150	90

Note 1: The typical value of output efficiency is based on the product being aged at full load for half an hour.

Note 2: The full load efficiency (%, TYP) in the table fluctuates by ±2%. The full load output efficiency is equal to the total output power divided by the input power of the power module.

Note 3: The ripple and noise test method uses the twisted pair test method. For specific test methods and matching, please refer to the following (Ripple & Noise Test Instructions).

Note 4: Due to limited space, the above is only a partial product list. If you need products outside the list, please contact our sales department.

Input Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	330	900	VAC
	DC input	-	-	-	VDC
Input Frequency Range	-	47	50	63	Hz

Input Current	100VAC	-	-	2.5	A
	330VAC	-	-	1.0	
Surge Current	660VAC	-	-	270	A
	900VAC	-	-	360	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Hot Plug	-	Unavailable			
Remote Control Terminal	-	Unavailable			
Recommended External Input Fuse	-	6A/1000VAC, necessary			

Output Specifications

Items		Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	Vo	-	±2.0	±3.0	%
Line Regulation		Nominal load	Vo	-	-	±1.0	%
Load Regulation		Nominal input voltage, 10%~100% load	Vo	-	-	±2.0	%
No Load Power Consumption		Input 85VAC		-	-	1.0	W
		Input 900VAC		-	-		
Minimum Load		Single Output		0	-	-	%
Start-up Delay Time		Nominal input voltage (full load)		-	3000	-	mS
Power-off Holding Time		Input 300VAC(full load)		-	150	-	mS
		Input 660VAC(full load)		-	350	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-5.0	-	+5.0	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Short-Circuit Protection				Self-recovery after short circuit is eliminated			Hiccup
Drift Coefficient		-		-	±0.03%	-	%/℃
Over-current Protection		Input nominal voltage		≥110% Io self-recovery			Hiccup
Over-voltage Protection		Output 24VDC		≤30			VDC
		Output 28VDC		≤35			
		Output 35VDC		≤45			
		Output 48VDC		≤55			

General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-25	-	+70	℃
	The temperature derating needs to be performed based on the temperature derating curve. The derating curve can be found in the following (product characteristic curve).				
Storage Temperature	-	-40	-	+80	
Soldering Temperature	Wave soldering	260±4℃, timing 5-10S			
	Manual soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output, test 1min, leakage current≤3mA	4000	-	-	VAC
Insulation Resistance	Input-Output@DC500V	50	-	-	MΩ
Vibration	-	10-55Hz,10G,30Min,along X,Y,Z			
Safety Class	-	CLASS Ⅰ			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			

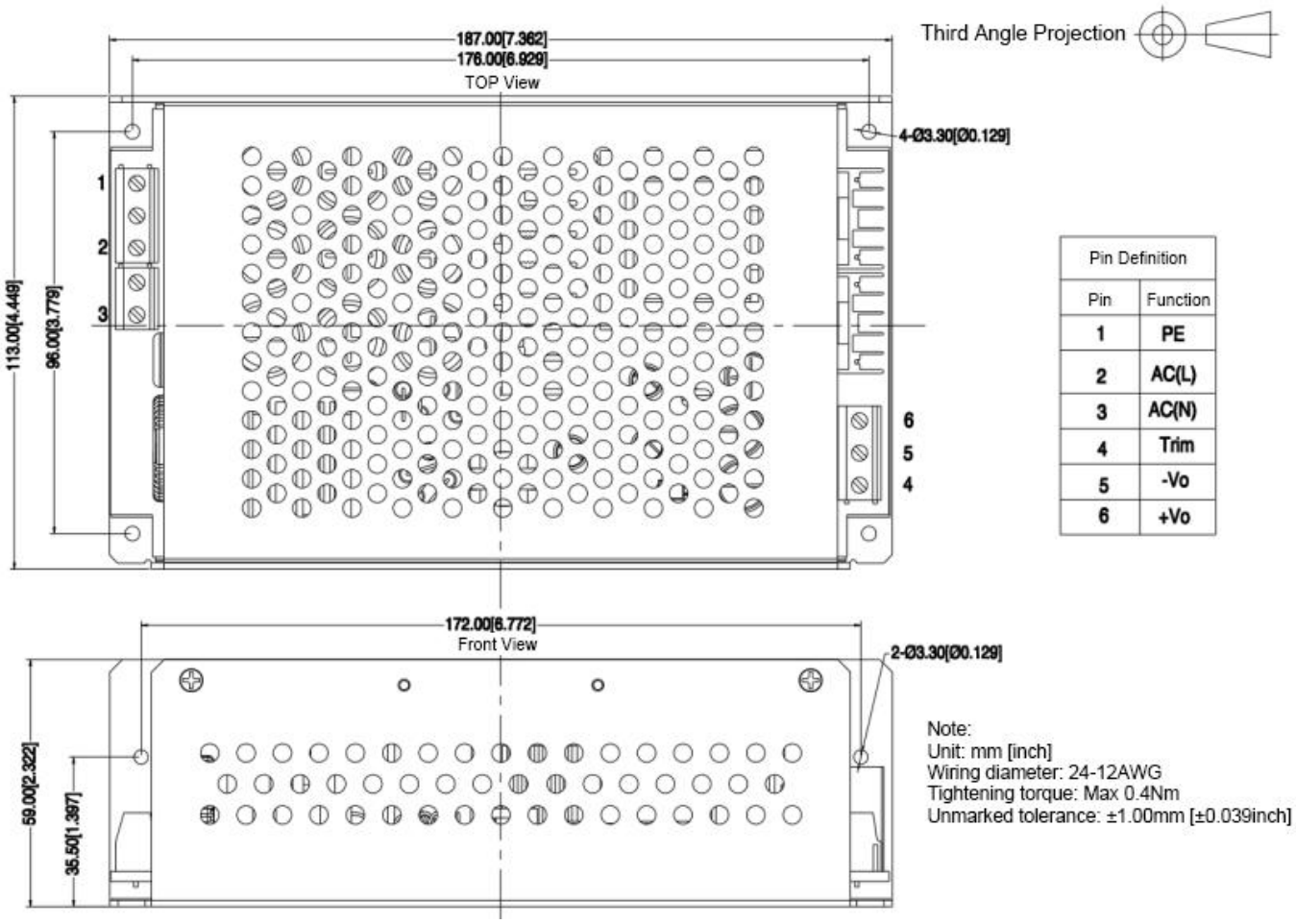
Physical Characteristics

Case Material		Metal
Dimension	Horizontal packaging	187.0X113.0X59.0mm
Weight		850g（TYP）
Cooling Method		Natural air cooling

Electromagnetic Compatibility(EMC) Characteristics

Total Items	Sub Items	Standard	Class
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV Perf.Criteria B
	RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV Perf.Criteria B
	EFT	IEC/EN61000-4-4	±4KV Perf.Criteria B

Packing Dimension



Pin Definition	
Pin	Function
1	PE
2	AC(L)
3	AC(N)
4	Trim
5	-Vo
6	+Vo

Packing Code	L x W x H	
G1	187.0X113.0X59.0mm	7.362X4.449X2.323inch

Pin Definition

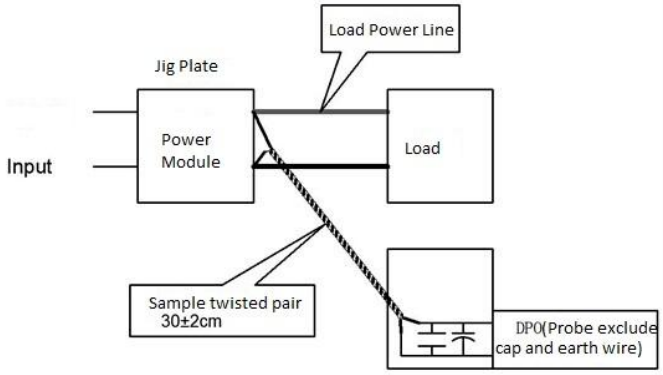
Pin-out	1	2	3	4	5	6
Single(S)	PE	AC（L）	AC（N）	Trim	-Vo	+Vo

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

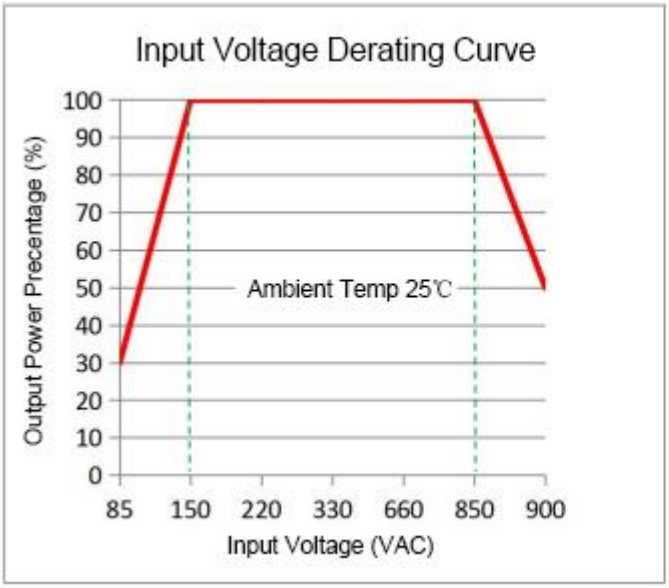
Test Method:

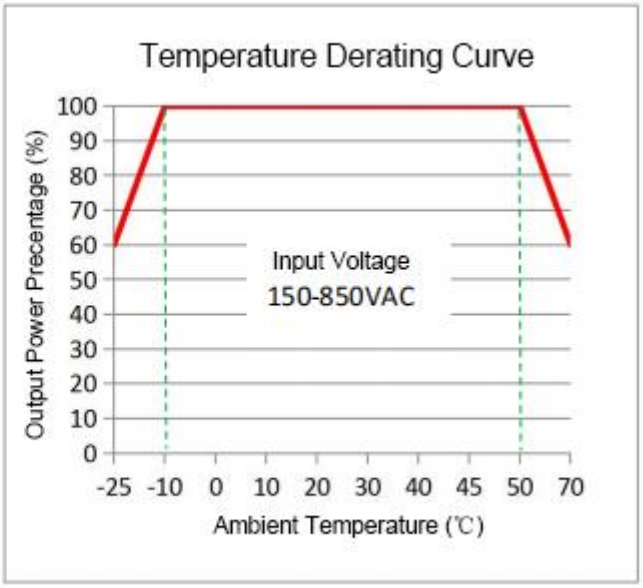
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve



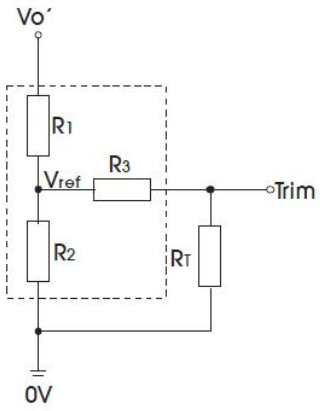


Note

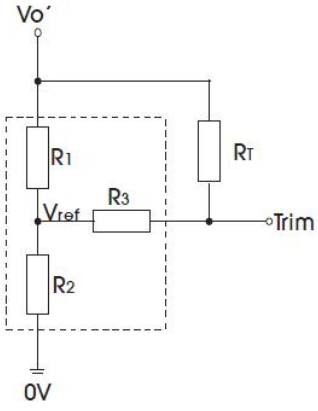
1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~150VAC/850~900VAC.

2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Use of Trim & Calculation of Trim Resistance



Trim up



Trim down

Calculation of Trim Resistance:

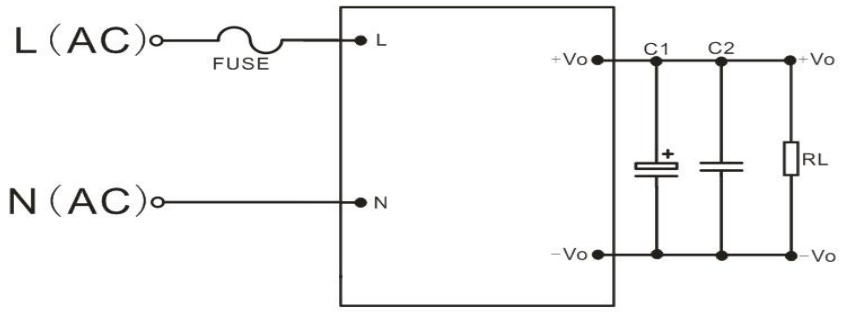
$$up:\ R_T=\frac{aR_2}{R_2-a}-R_3 \qquad a=\frac{Vref}{Vo'-Vref}\cdot R_1$$

$$down:\ R_T=\frac{aR_1}{R_1-a}-R_3 \qquad a=\frac{Vo'-Vref}{Vref}\cdot R_2$$

R_T is the Trim resistor
α is a custom parameter with no actual meaning
Vo' is the actual required voltage increase or decrease

Vout (VDC)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
24	10.55	1.2	1	2.5
28	12.33	1.2	1	2.5
35	19.86	1.5	1	2.5
48	27.50	1.5	1	2.5

1. Typical Application Circuit



Recommended Circuit 1

Component Code	Component	Recommended Value
FUSE	Fuse	6A/1000VAC, necessary
C1	High frequency electrolytic capacitors	10uF/50V
C2	Ceramic capacitors	1uF/50V

Note:

1. The product should be used within the specification range, otherwise it will cause permanent damage to the product;
2. The product input terminal must be connected to a fuse;
3. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
4. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
5. Unless otherwise specified, the above data are measured at Ta=25℃, humidity<75%, input nominal voltage and output rated load (pure resistance load);
6. All the above index test methods are based on our company's standards;
7. The above are the performance indicators of the product models listed in this manual. Some indicators of non-standard model products will exceed the above requirements. For specific circumstances, please contact our technical personnel directly
8. Our company can provide product customization;
9. Product specifications are subject to change without prior notice. Please pay attention to the latest manual published on our official website.

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