

70W isolated AC-DC converter with ultra-wide, ultra-high 85 - 900VAC input for coalmine



RoHS

## FEATURES

- Specially designed for electrical equipment in coal mining industry
- Ultra-wide 85 - 900VAC input voltage range
- Industrial grade operating temperature: -25°C to +70°C
- High I/O isolation test voltage of 4000VAC
- High reliability, high efficiency, long lifespan
- Output short circuit, over-current and over-voltage protection
- Immunity, EFT/Surge: ±4KV perf. Criteria B

PVA70-27B28-C is a special power supply designed for customers who provide electrical equipment for coal mining industry to meet the requirements of safety in providing power supply, easy mounting and technology innovation etc. It features ultra-wide input voltage range from 85 to 900VAC which covers 127/220/380/660VAC used in coal mining industry, high isolation voltage, excellent EMS performance, multiple protections and high efficiency. They are widely used in monitoring and security sectors of coal mining industry.

## Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 330VAC (%) Typ.	Capacitive Load (µF) Max.
PVA70-27B28-C	70W	28.5V/2460mA	87	800

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	--	900	VAC
Input Frequency		47	--	63	Hz
Input Current	127VAC	--	--	1.20	A
	330VAC	--	--	0.80	
	660VAC	--	--	0.50	
Inrush Current	330VAC	--	80	--	
	660VAC	--	140	--	
	900VAC	--	180	--	
External Input Fuse		3A/1000VAC, required			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	--	±2	--	%
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	10% - 100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth	--	100	150	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, hiccup, self-recovery			
Over-voltage Protection		≤40VDC			
Min. Load		0	--	--	%
Trim	The total output power remains unchanged	--	--	±10	
Hold-up Time	Room temperature, Full load	330VAC input	--	40	ms
		660VAC input	--	80	
Start-up Delay Time	85-900VAC	--	2	3	s

Note: \* The "Tip and barrel method" is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

\*\* Delay Time is tested over the full input voltage and the full output load range ( The cooling-time between input power-off and power-on again is greater than 15s).

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation	Input - output	Electric Strength Test for 1min., leakage current $\leq 3\text{mA}$	4000	--	--	VAC
	Input - PE	Electric Strength Test for 1min., leakage current $\leq 5\text{mA}$	3000	--	--	
	Output-PE		1000	--	--	
Insulation Resistance	500VDC	$\geq 50 \times 10^6$			$\Omega$	
Operating Temperature		-25	--	+70	$^{\circ}\text{C}$	
Storage Temperature		-40	--	+85		
Storage Humidity		--	--	95	%RH	
Power Derating	-25 $^{\circ}\text{C}$ to -10 $^{\circ}\text{C}$	2.6	--	--	%/ $^{\circ}\text{C}$	
	+50 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	2.0	--	--		
	85VAC - 100VAC	2.0	--	--	%/ $\text{VAC}$	
	850 VAC - 900VAC	0.3	--	--		
Switching Frequency		--	65	--	kHz	
Altitude		--	--	5000	m	
MTBF	MIL-HDBK-217F@25 $^{\circ}\text{C}$ $\geq 300,000$ h					

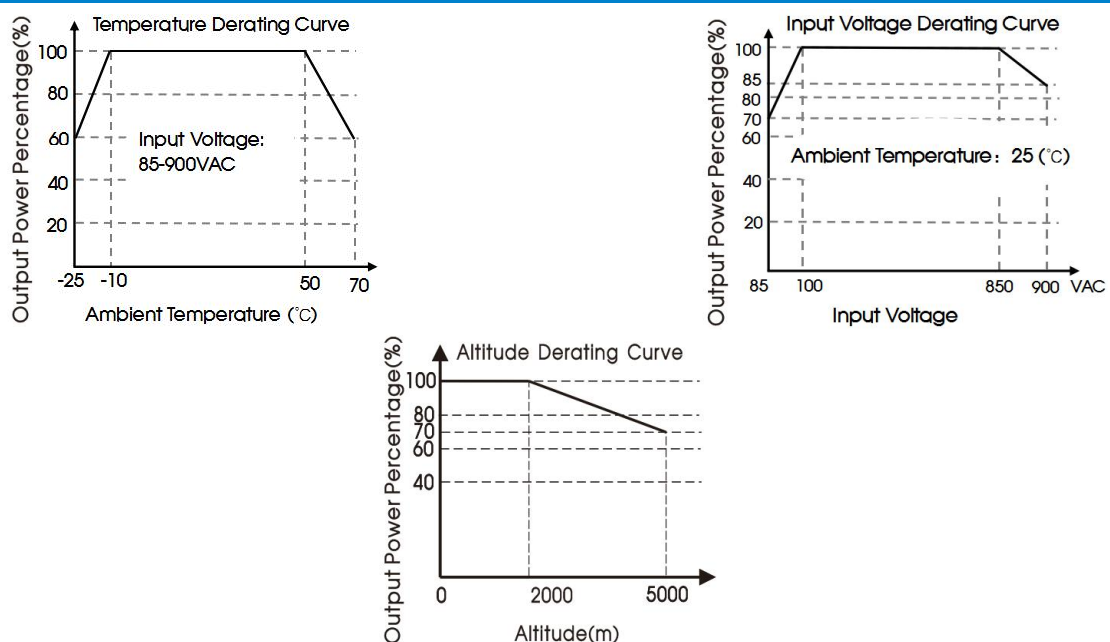
Mechanical Specifications

Case Material	metal
Dimensions	157.00 x 100.00 x 49.00 mm
Weight	520g (Typ.)
Cooling method	Free air convection

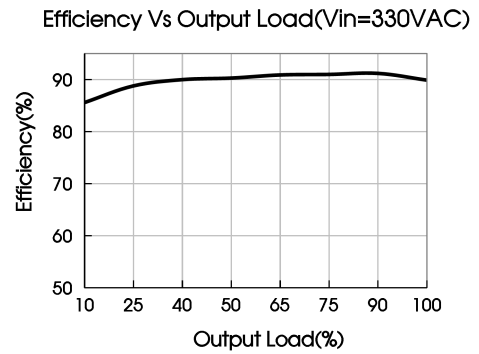
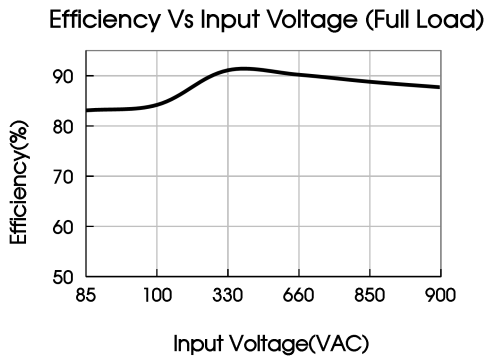
Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 4\text{kV}$	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line $\pm 2\text{KV}$ /line to ground $\pm 4\text{KV}$	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A

Product Characteristic Curve



Note: ① With an input between 85 - 100VAC/850 - 900VAC, the output power must be derated as per temperature derating curves;  
 ② For operation of this converter series in an altitude between 2000 - 5000m, the output power must be derated as per the altitude derating curve;  
 ③ This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.



## Design Reference

### 1. Typical application

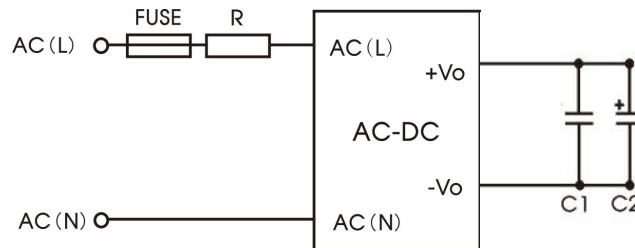


Fig. 1


Model	FUSE	C1	C2	R
PVA70-27B28-C	3A/1000VAC, required	1uF	10uF	1Ω / ≥5W

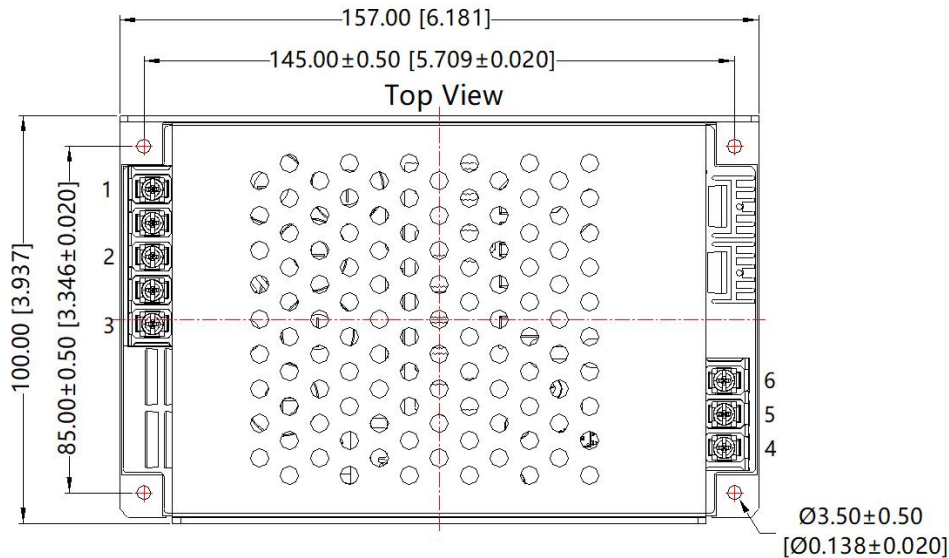
#### Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise.

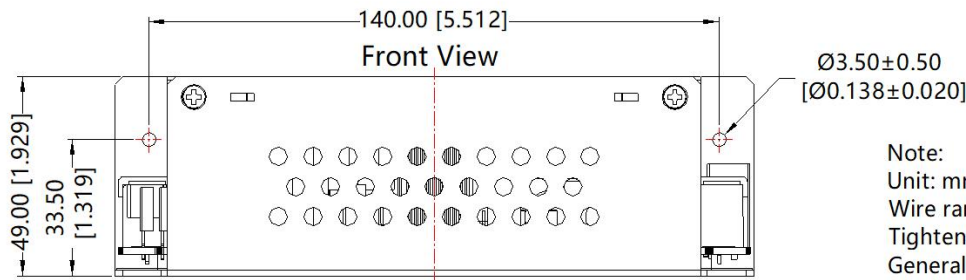
2. For more information Please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com).

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Function
1	PE
2	AC(L)
3	AC(N)
4	Trim
5,6	-Vo
7,8	+Vo



Note:  
Unit: mm[inch]  
Wire range: 22~12AWG  
Tightening torque: Max 0.4N·m  
General tolerances: ±1.00[±0.039]

Note:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220073;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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