

70W isolated AC-DC converter with ultra-wide, ultra-high 85 - 1300VAC input for coalmine



FEATURES

- Specially designed for electrical equipment in coal mining industry
- Input voltage up to 1400VAC (Transient, duration: 30s)
- Ultra-wide 85 - 1300VAC and 120 - 1840VDC input voltage range
- Industrial grade operating temperature: -30°C to +70°C
- High I/O isolation voltage up to 5000VAC
- High reliability, high efficiency, long lifespan
- Ultra-wide input Inrush current: ≤25A
- Output short circuit, over-current, over-voltage protection
- Operating altitude up to 5000m
- EFT/Surge immunity meets Level 4

PVA70-26BxxR2 series 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. And it is regulated AC-DC/DC-DC converter with an ultra-wide and ultra-high DC input of 120-1840VDC or AC input of 85-1300VAC. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation, which covers 127/220/380/660/1140VAC 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. Effective protection is added for transformers and isolated optocouplers. The design refers to GB/T 3836.4-2021 standards. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)*	Efficiency at 330VAC (%) Typ.	Capacitive Load (μF) Max.
PVA70-26B24R2	70	24V/2.917A	21.6-26.4	87	2000
PVA70-26B28R2		28V/2.5A	25.2-30.8	87	1800
PVA70-26B35R2		35V/2.0A	31.5-38.5	89	1000

Note: *During output voltage regulation, the load must be ≥10%.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	Transient (30s)	--	--	1400	VAC
			85	--	1300	
	DC input		120	--	1840	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	127VAC		--	--	1.2	A
	330VAC		--	--	0.8	
	660VAC		--	--	0.5	
	1140VAC		--	--	0.3	
Inrush Current	660VAC	Cold start	--	20	--	
	1140VAC		--	25	--	
Start-up Delay Time			--	--	1	s
Required External Input Fuse			1500VAC/3A, required (brand: Adler models: A851300Q00 base models: BH300)			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All 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)	≤150VAC	--	--	300	mV
		>150VAC	--	--	200	
Stand-by Power Consumption	220VAC		--	2	3	W
	660VAC		--	3	4	
	1140VAC		--	4	5	
Temperature Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			110% - 350% Io, hiccup, self-recovery			
Over-voltage Protection	24V		≤35V	Output voltage clamp or hiccup		
	28V		≤40V			
	35V		≤45V			
Hold-up Time	Full load	660VAC	--	50	--	ms

Note: *The "parallel cable" method is used for ripple and noise test, with a 0.1uf & 10uf parallel capacitor, please refer to PV Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - output	Electric Strength Test for 1min., leakage current ≤3mA	5000	--	--	VAC
	Input - PE		4000	--	--	
	Output - PE		1500	--	--	
Insulation Resistance	Input - output	Test voltage: 500VDC	100	--	--	MΩ
	Input - PE					
	Output - PE					
Operating Temperature			-30	--	+70	°C
Storage Temperature			-40	--	+85	
Storage Humidity	Non-condensing		--	--	95	%RH
Output Power Derating	Operating temperature derating	-30°C to -10°C	2.5	--	--	% / °C
		+50°C to +60°C	1.5	--	--	
		+60°C to +70°C	3.0	--	--	
	Input voltage derating	85 - 100VAC	2.0	--	--	% / VAC
		100 - 127VAC	0.74	--	--	
Altitude derating	2000 - 5000m		10.0	--	--	% / Km
MTBF	MIL-HDBK-217F@25°C		≥300,000 h			

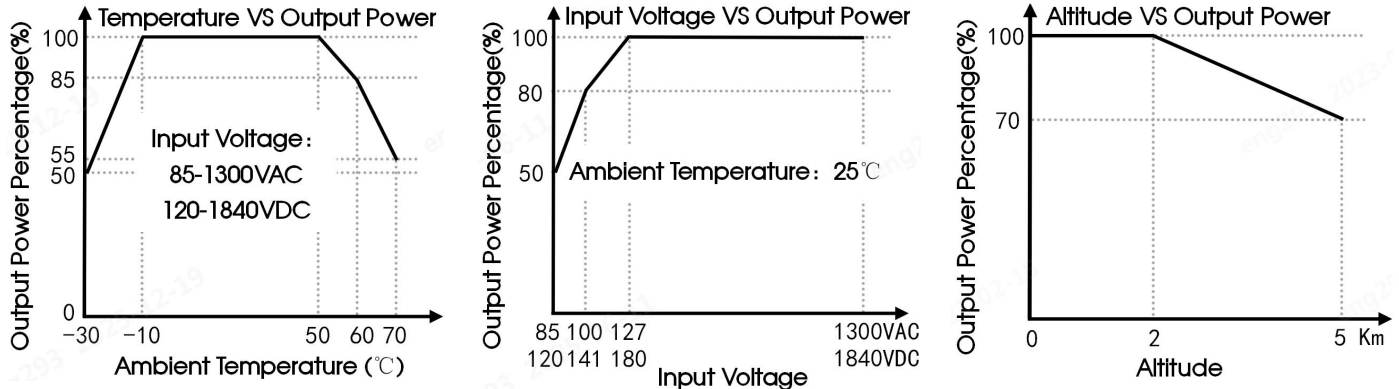
Mechanical Specifications

Dimensions	157.00 x 100.00 x 49.00mm
Weight	520g (Typ.)
Cooling Method	Free air convection

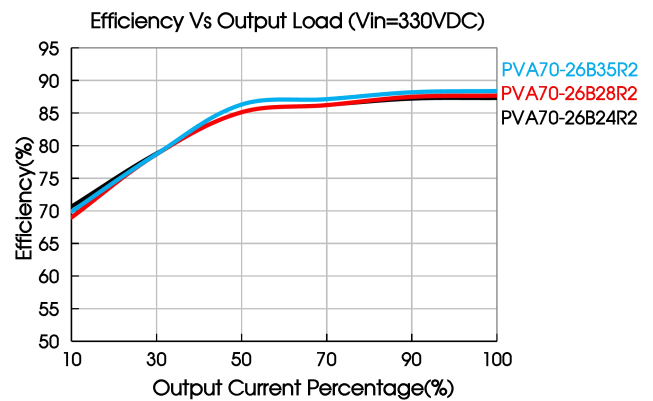
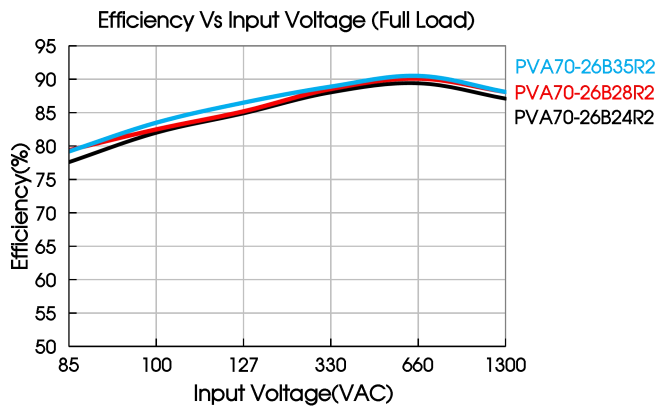
Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line ±2KV/ line to PE ±4KV	Perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
	PFMF	IEC/EN61000-4-8	30A/m	Perf. Criteria A

Product Characteristic Curve



Note: 1. With an AC input between 85 - 127VAC and a DC input between 120 - 180VDC, the output power must be derated as per temperature derating curves; 2. This product is suitable for applications using free air convection; for applications in closed environment please consult Mornsun FAE.



Design Reference

1. Typical application

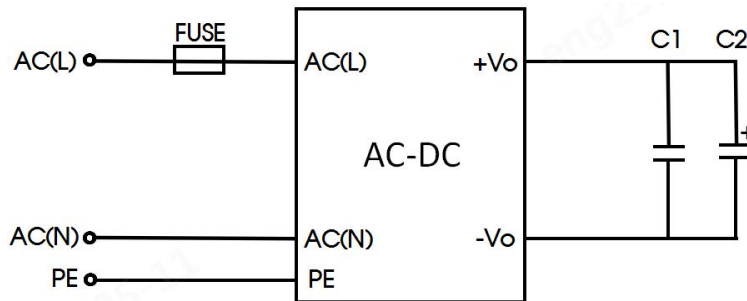


Fig. 1

Part No.	FUSE	C1	C2
PVA70-26BxxR2	1500VAC/3A, required (brand: Adler models: A851300Q00 base models: BH300)	1uF/50V	100uF/50V

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 to filter high-frequency noise.

2. EMC compliance recommended circuit

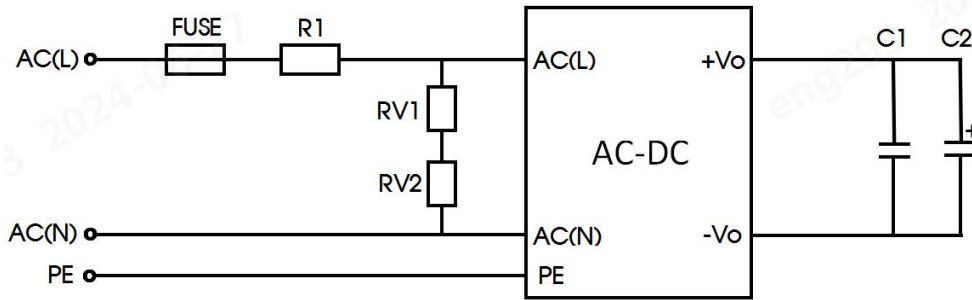


Fig. 2

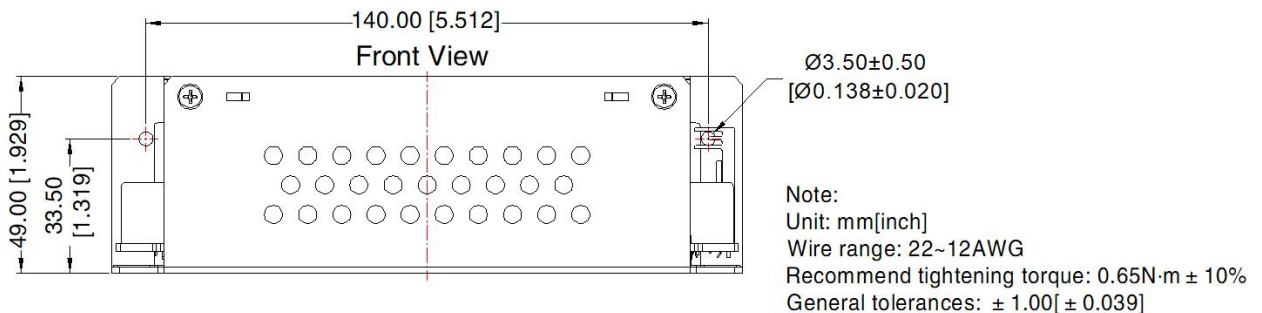
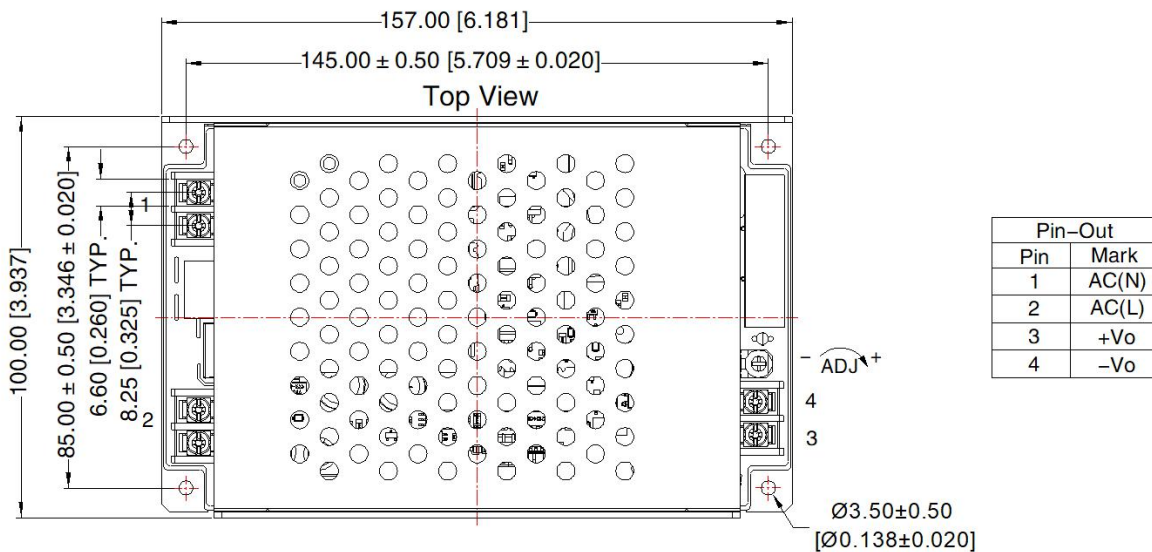
Component	Recommended value
FUSE	1500VAC/3A, required (brand: Adler models: A851300Q00 base models: BH300)
R1	0.6Ω /20W
RV1/RV2	AC input: 14D122K/DC input: 14D142K
C1	1uF/50V
C2	100uF/50V

Note: 1.Please refer to Fig 1 for common applications;
2.If the electromagnetic compatibility environment is harsh, please refer to Fig 2;
3.This recommended list based on full input voltage, output load range. If it works under other input voltages, please consult FAE for parameter optimization.

3. For additional information please refer to application notes on www.mornsun-power.com.

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note:

1. For additional information on Product Packaging please refer to 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. The output voltage can be adjusted by the ADJ, clockwise to increase;
7. 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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