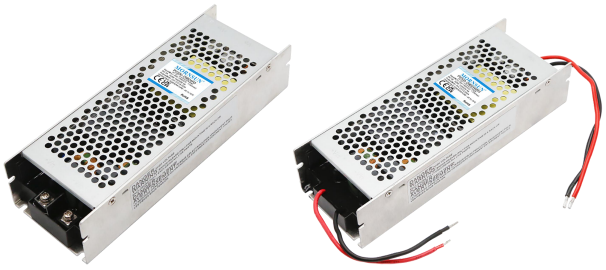
DC/DC Converter

PV200-29BxxR3 Series

MORNSUN®

200W isolation DC-DC converter with ultra-wide, ultra-high 250 - 1500VDC input for Renewable Energy



CE Report EN62109-1 UKCA BS EN62109-1 RoHS

FEATURES

- Ultra-wide 250 - 1500VDC input voltage range (Transient 1700VDC last for 10s)
- Industrial grade operating temperature -40℃ to +70℃
- High I/O isolation voltage up to 4000VAC
- High reliability, efficiency up to 93%
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Operating altitude up to 5000m
- EFT immunity meets Level 4
- Design refer to IEC62109

PV200-29BxxR3 series is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 250-1500VDC. The product features high efficiency, high reliability, high insulation and a high level of safety protection. This type of power supply is widely used in renewable energy industries, such as photo voltaic, power generation, energy storage, inverters and high voltage DC conversions. The converters provide multiple protection features and guarantee stable and safe operating environments even under abnormal working conditions.

Selection Guide

Certification	Part No.*	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 850VDC (%) Typ.	Capacitive Load (μF) Max.
EN	PV200-29B12R3	150	12V/12.5A	88	5000
	PV200-29B24R3	200	24V/8.333A	91	5000
	PV200-29B28R3		28V/7.143A	91	3500
	PV200-29B48R3		48V/4.167A	93	1250

Note: *Use suffix "W" for lead type version.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range			250	--	1500	VDC
Input Current	300VDC		--	--	1.2	A
	850VDC		--	--	0.45	
Inrush Current	850VDC	Cold start	--	100	150	
	1500VDC		--	180	280	
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)		110	--	240	VDC
	Under-voltage protection release (Input voltage rises from low to high)		120	--	250	
Input Reverse Polarity Protection			Available			
Start-up Delay Time*			--	1	2	s
External Input Fuse			6A/1500VDC (CCN:JFGA/JFGA7), required			
Hot Plug			Unavailable			

Note: *Start-up delay time test conditions: full voltage input range, full output load range (the cooling-time between input power-off and power-on again is greater than 10s.)

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	--	±1	±2	%
Line Regulation	Rated load	--	±0.1	±0.25	
Load Regulation	850VDC	--	±0.5	±1	
Stand-by Power Consumption	1500VDC	--	1	2	W
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	150	300	mV
Temperature Coefficient		--	±0.02	--	%/℃
Short Circuit Protection		Hiccup, continuous, self-recovery			

Over-current Protection			≥110 %Io, hiccup, self-recovery			
Over-voltage Protection	12V		≤20V	Output voltage clamp or hiccup		
	24V		≤32V			
	28V		≤35V			
	48V		≤58V			
Minimum Load			0	--	--	%
Hold-up Time	Room temperature, full load	850VDC input	--	20	--	ms
Note: *The "Tip and barrel method" is used for ripple and noise test, 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 <10mA		4000	--	--	VAC
	Input - PE			4000	--	--	
	Output - PE	Electric strength test for 1min., leakage current <5mA		2000	--	--	
Insulation Resistance	Input - output	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		100	--	--	MΩ
	Input - PE						
	Output - PE						
Operating Temperature				-40	--	+70	℃
Storage Temperature				-40	--	+85	
Storage Humidity		Non-condensing		--	--	95	%RH
Power Derating		Operating temperature derating	-40℃ to -25℃	2.67	--	--	%/℃
			+55℃ to +70℃	2.67	--	--	
		Input voltage derating	250 - 300VDC	0.8	--	--	%/VDC
		Altitude derating	2000m - 5000m	6.67	--	--	%/Km
Switching Frequency				--	65	--	kHz
Safety Standard				Design refer to UL1741 & EN62109-1, BS EN62109-1, IEC62109-1			
MTBF		MIL-HDBK-217F@25℃		≥300,000 h			

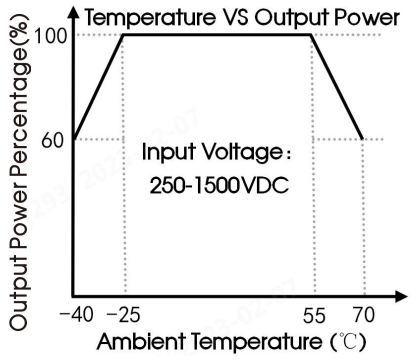
Mechanical Specifications

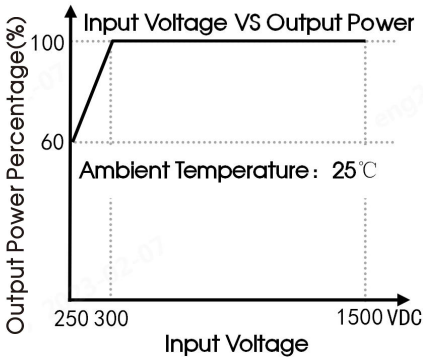
Case Material	Metal
Dimensions	201.00 x 70.00 x 42.00mm
Weight	620g (Typ.)
Cooling Method	Free air convection

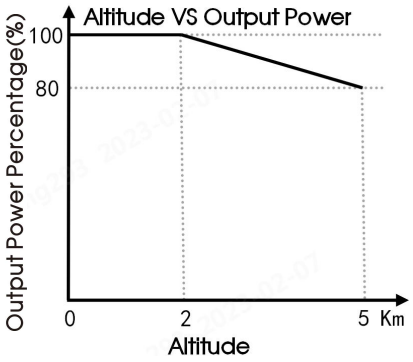
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS A	
	RE	CISPR32/EN55032 CLASS A	
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	Perf. Criteria B
	Surge	IEC/EN61000-4-5 Line to line ±1KV/ line to PE ±2KV	Perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	Perf. Criteria A
Note: For harsh EMC application environments, please consult FAE to add application circuits.			

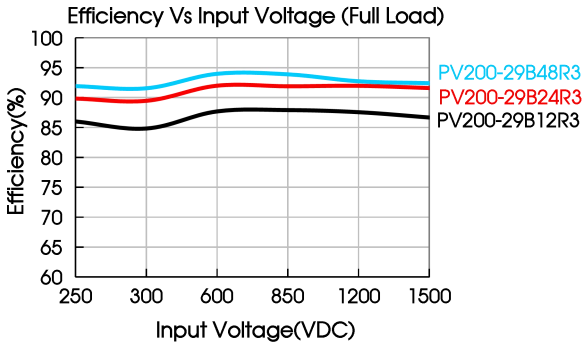
Product Characteristic Curve

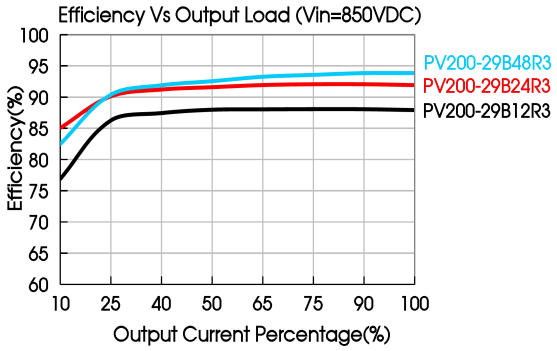






Note: 1.With an DC input between 250-300VDC, the output power must be derated as per temperature derating curves;
2.This product is suitable for applications using natural free air convection; for applications in closed environment please consult Mornsun FAE.





Design Reference

1. Typical application circuit

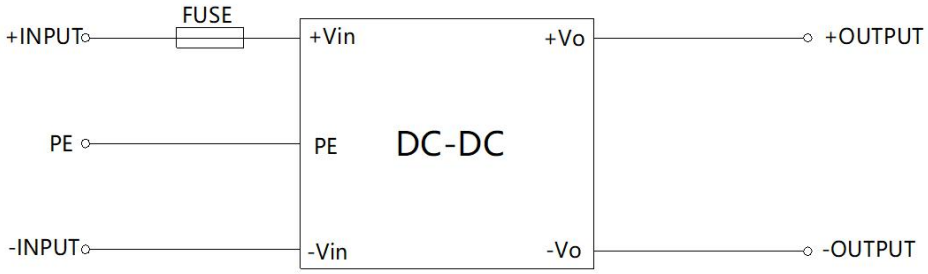


Fig. 1

Model	Recommended value
FUSE	6A/1500VDC (CCN:JFGA/JFGA7), required

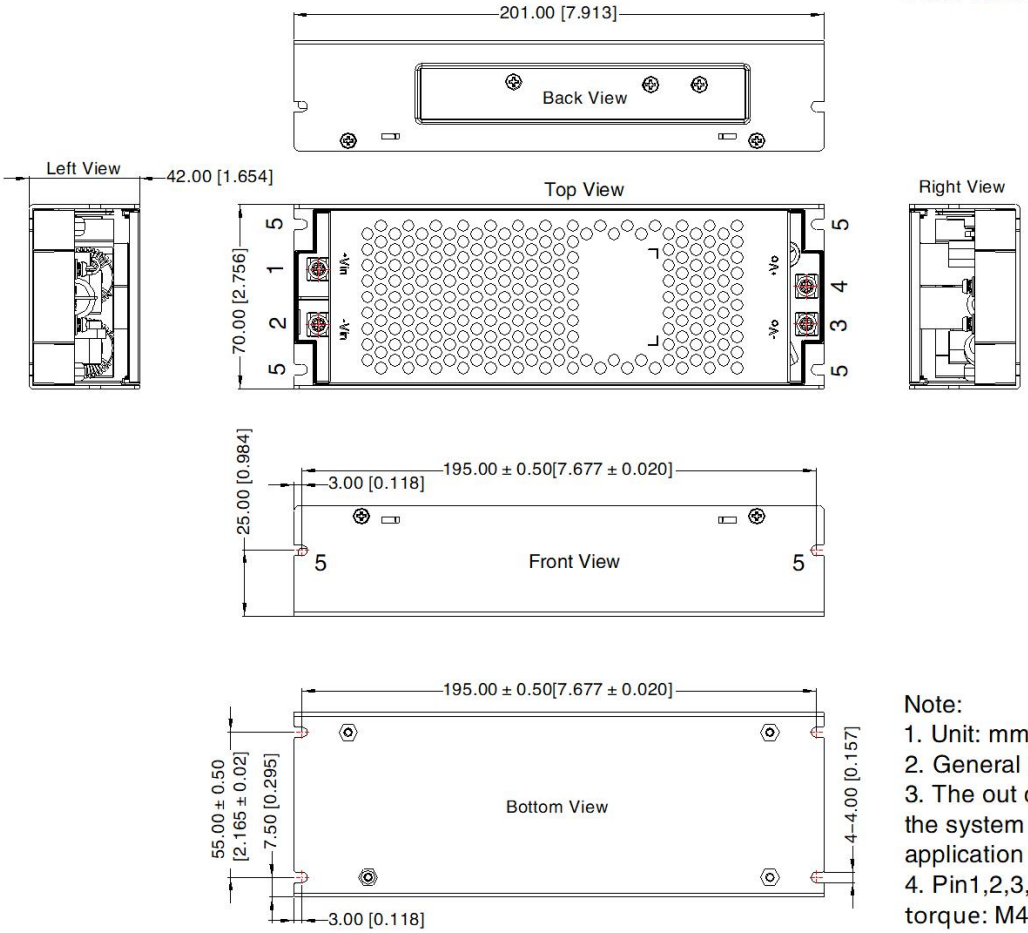
2. IMPORTANT SAFETY INSTRUCTIONS

Additional protective devices, such as lightning protector need to be added if there is an transient pulse voltage greater than 6KV at the input of PV products in system applications.

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

Dimensions and Recommended Layout (PV200-29BxxR3)

THIRD ANGLE PROJECTION

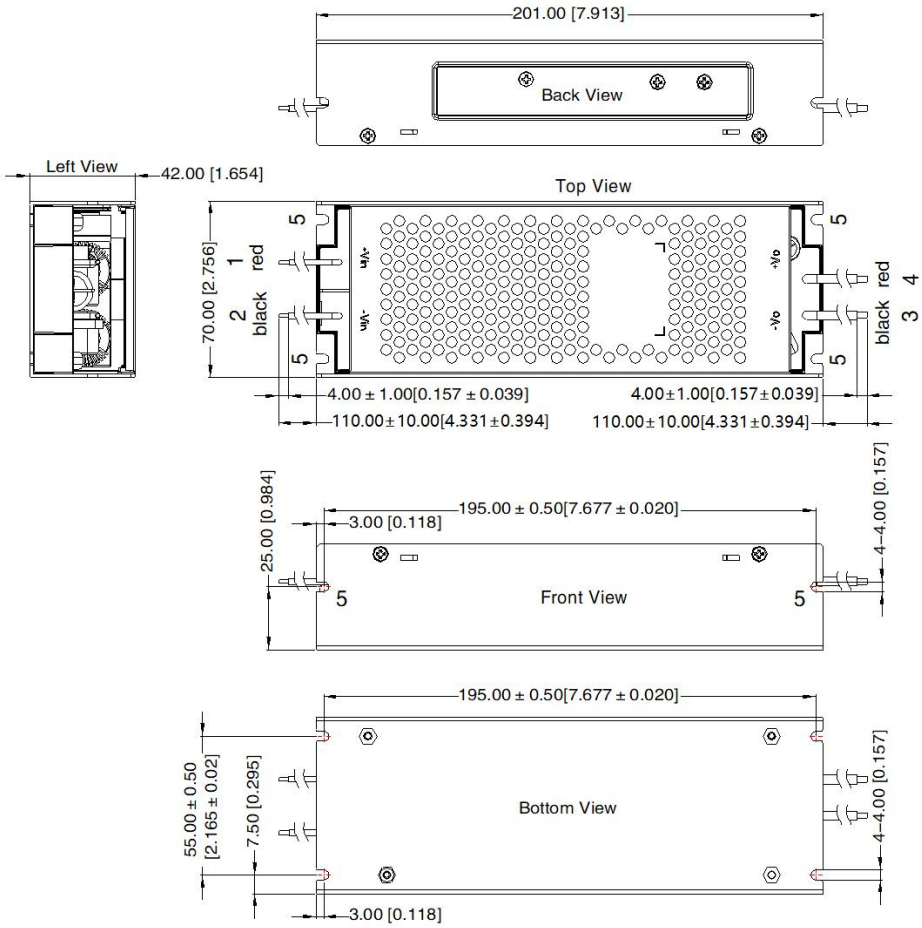


Pin-Out	
Pin	Mark
1	+Vin
2	-Vin
3	-Vo
4	+Vo
5	PE

Note:
1. Unit: mm[inch]
2. General tolerances: ± 1.00[± 0.039]
3. The out case needs to be connected to the system earth when products in application
4. Pin1,2,3,4 connector tightening torque: M4, 1.2N・m(max)

Dimensions and Recommended Layout (PV200-29BxxWR3)

THIRD ANGLE PROJECTION



Pin–Out	
Pin	Mark
1	+Vin
2	–Vin
3	–Vo
4	+Vo
5	PE

Note:
1. Unit: mm[inch]
2. General tolerances: ± 1.00[± 0.039]
3. The out case needs to be connected to the system earth when products in application
4. 1~2 wire spec.: UL3239 18AWG
   3~4 wire spec.: UL1015 14AWG

⚠WARNING:
1. CAUTION: "To reduce the risk of fire, connect only to a circuit provided with 6 amperes maximum branch-circuit over-current protection in accordance with the National Electrical Code, ANSI/NFPA70."
2. WARNING: REPLACE ONLY WITH THE SAME RATINGS AND TYPE OF FUSE; SHOCK HAZARD, ONLY FOR MOUNTING IN A RACK OR ENCLOSURE FULLY ENCLOSING ALL LIVE PARTS.
3. DANGER — HIGH VOLTAGE.

AVERTISSEMENT:
1. Avertissement: Pour réduire le risque d'incendie, veuillez connecter uniquement à des circuits de dérivation avec protection contre les surintensités conformes au code électrique national ANSI/ NFPA 70.
2. AVERTISSEMENT : N'UTILISER QUE DES FUSIBLES DE MÊMECALIBRE ET DE MÊME TYPE QUE LE FUSIBLE DORIGINE, risque de choc. Uniquement pour le montage dans un RACK ou un boîtier contenant entièrement toutes les parties sous tension.
3. DANGER ： HAUTE TENSION.

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220211;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, 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. In order to improve the efficiency, there will be audible noise generated when working at input voltage higher than 1000VDC, 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. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
8. If UL certification is required, an external lightning protection device (SVR=6000V) should be connected to the input.

Mornsun Guangzhou Science & Technology Co., Ltd.
Address: No.8 Nanyun 4th Road, Huangpu District, Guangzhou, China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com