

300W, 165 - 264VAC Input, Dual output  
AC/DC battery charging module power supply



RoHS

## FEATURES

- Specially designed for Distribution Automation terminal design, suitable for 220Vdc operating mechanism, and it can charge for capacitor of 50000uF/250V
- Maximum instantaneous power up to 340W
- With charging function, the 24V (6 - 30AH) output Lead-acid battery can be charged, when system connected with battery, it can be used as uninterrupted power supply
- Designed in accordance with the power-related requirements of the State Grid Corporation, the main technical indicators meet the relevant industry standards
- Battery reverse polarity protection, battery under voltage protection
- Output over-current, over-voltage protection
- 2.5KVAC high isolation voltage
- Industrial grade operating temperature: -40°C to +70°C
- Chassis mounting

MBP300-2A27D27220 is AC/DC battery charge power converter offered by Mornsun. It features wide input voltage range, taking both DC and AC input voltage, output over-current, over-voltage protection, strong ability in adapting power grid. This product has power working status display and Intelligent charging function, it can be used to charge the 24V lead-acid battery, when AC is power-off, the battery can supply power to the load; it has battery over discharge protection function. Designed specifically for distribution automation terminal (DTU / FTU). It is widely used in the power industry switch substations, power substation, RMU, Intelligent Package Substation, Intelligent Switch Controller and other industries which need uninterrupted power supply.

## Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current			Maximum Output Power	Efficiency (220VAC, %)
		(Vo1/Io1)	(VB/IB)	(Vo2/Io2)		
MBP300-2A27D27220	62.5W	27V/1.0A	27V/0.5A	220V/0.1A	340W (No more than 20s, 5 mins once)	80 (Io1=1A, Io2=0.1A, disconnect the battery)

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	165	220	264	VAC
	DC input	200	310	370	VDC
Input Frequency		47	50	63	Hz
Input Current	220VAC, Typical load	--	1.0	--	A
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Rated Output Current	Input voltage range	Io1	--	1	--
		Io2	--	0.1	--
Peak Output Current *	Input voltage range	Io1 (No more than 20s, 5 mins once, Io2 ≤ 0.1A)	--	--	6
		Io2 (No more than 20s, 5 mins once, Io1 ≤ 1A)	--	--	1.36
Output Voltage	Input voltage range	Vo1 (Disconnect the battery)	--	27	--
		Vo2 (Adjustable)	200	220	240
Line Regulation	Full load	Vo1	--	±0.5	--
		Vo2	--	±1	--

Load Regulation	0%-100% load	Vo1	--	±1	--	%
		Vo2	--	±5	--	
Ripple & Noise**	20MHz bandwidth (peak-to-peak value) (Io1=1A, Io2=0.1A, disconnect the battery)	Vo1	--	200	300	mV
		Vo2	--	2000	--	
Floating Charge Voltage	Room temperature, Io1=1A, Io2=0A	VB	--	27	--	VDC
Battery Charge Current	Room temperature, Io1=1A, Io2=0A	IB	--	0.5	--	A
Battery Discharge Cut-off point	Typical load	Vo1	20.5	21	21.5	VDC
Battery Discharge Cut-off Delay Time	Typical load		--	3	--	s
Battery Reverse Polarity Protection			The green and the red lights are turn off, when the battery has been connected.			
Short Circuit Protection	Input voltage range, disconnect the battery		Hiccup, Continuous, self-recovery			
Over-current Protection	Input voltage range, disconnect the battery	Io1	--	16	--	A
Over-voltage Protection	Input voltage range, disconnect the battery		--	--	34	VDC
Hold-up Time	Room temperature, 220VAC input , Po=20W		--	0.3	--	s
Note:						
* ① When the ambient temperature exceeds 50 ℃, Io1 and Io2 single peak current continuous output time can not exceed 15 s;						
② Io1 and Io2 can not simultaneously output peak current, product peak output power should not be more than 340W. (Battery charging power included)						
**Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation						

## General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min, leakage current setting value: 5mA	2500	--	--	VAC
	Input-case		2500	--	--	
	Output-case		2500	--	--	
	Output- output		1500	--	--	
Impulse Voltage	Input-output	Apply 5kV impulse test voltage between input and output. Add 1.2/50us impact waveform, including three positive impulse and three negative impulse whose time interval is no less than 5 seconds. And there should not have disruptive discharge during the test.	5000	--	--	V
	Input-case		5000	--	--	
	Output-case		5000	--	--	
Isolation Resistance	Input-output	Room temperature	50	--	--	MΩ
	Input-case	Room temperature	50	--	--	
	Output-case	Room temperature	50	--	--	
Operating Temperature*			-40	--	+70	℃
Storage Temperature			-40	--	+85	
Shell Operation temperature*			--	--	+80	
Storage Humidity			--	--	95	%RH
MTBF		MIL-HDBK-217F@25℃	> 100,000 h			
Note: *①When the ambient temperature exceeds 50 ℃, it should be taken the cooling method of force air cooling or post cooling to ensure that the module shield temperature is not more than 80℃.						
②When the ambient temperature is lower than -10℃, the product should be operated with rated load for 1mins, before it output 340W peak power.						

## Physical Specifications

Casing Material	Metal
Package Dimensions	200.00*102.00*45.00 mm
Weight	850g (Typ.)
Cooling method	Free air convection

EMC Specifications

EMS	ESD	IEC/EN61000-4-2	Contact ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3	30V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to ground ±4KV	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%,70%	perf. Criteria B

Principle block diagram

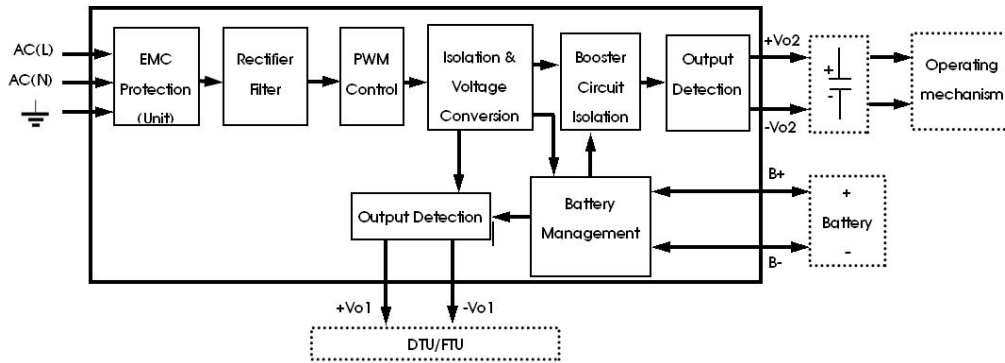
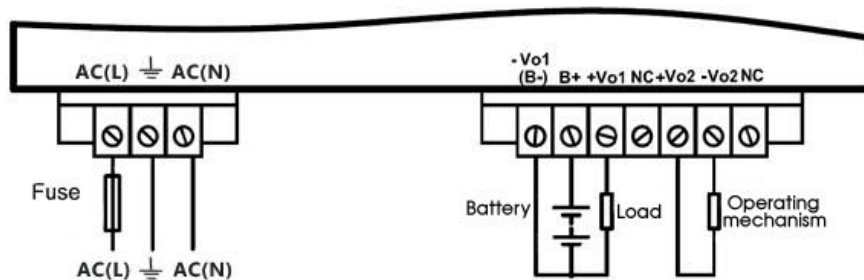


Fig1. Internal principle diagram

Wiring Description

1. Wiring diagram



2. Terminal Definition

Terminal No.	Terminal name	Definition
1	AC(L)	AC input L phase
2	⏏	Protective grounding
3	AC(N)	AC input N phase
4	-Vo1 (B-)	Control unit (-) Battery input (-)
5	B+	Battery input (+)
6	+Vo1	Control unit (+)
7	NC	No electrical connection
8	+Vo2	Operating mechanism (+)
9	-Vo2	Operating mechanism (-)
10	NC	No electrical connection

## Manual Instruction

### 1. Power supply status indicator

Charge, AC input power, green light on, the battery is in charging or floating charging status.

Discharge, AC input power off, green light off, red light on, the battery is in discharging status.

Reverse, when the input voltage off (or input voltage normal, Vo1 and Vo2 output normal), but the green and red light are all off, which shows that the battery is polarity reversed. Please check the wiring diagram to re-connect the battery.

Input voltage (VAC)	Output voltage (VDC)		Whether to connect the battery	LED		Power state
	Vo1	Vo2		green light	Red light	
220	27	220	no connect	on	off	Output normal
220	Battery voltage	220	connect	on	off	Output normal, battery charging
0	0	0	no connect	off	off	No output
0	0	0	connect	off	on	No output, battery access to normal
220→0	Battery voltage	220	connect	on→off	off→on	Output normal, battery from charging into the discharge
0	0	0	connect	off	off	No output, reverse connection of battery
220	27	220	connect	off	off	Output normal, reverse connection of battery

### 2. Use of Power

The power supply can work when input is AC the alternating current. The power input current to load is powered by power supply, meanwhile charge battery in constant current and voltage. After the battery is charged, power supply to floating charge state automatically, this moment, the power supply float voltage and current to normal self discharge of battery.

When AC input voltage off, the battery will continue to power for load, 0 switch time. When the battery output voltage is lower than the under voltage protection point and last for 3-10S, the power supply will turn off automatically.

Without AC input, pass external passive nodes make Vo1 and B+ in short circuit (short circuit time: 1-2S, but pin should not be short for a long time, otherwise the battery will lose the protection function.) that can enable the battery to start the output.

Vo2 output Voltage: 200Vdc – 240Vdc continuously adjustable, The user can adjust the output voltage to the knob with "output voltage adjustment".

### 3. Use of Battery

The power supply can be equipped with 24V, 6 - 30AH lead acid battery or colloidal maintenance-free battery. The battery is connected to the battery terminal(B+, B-) of the power supply.

We should make sure that the input voltage is off before connect or disconnect the battery. If the red light on after connected the battery, the battery connected normal; if the red light off when connected the battery, the battery polarity connected reverse, please check the wiring diagram to re-connect it.

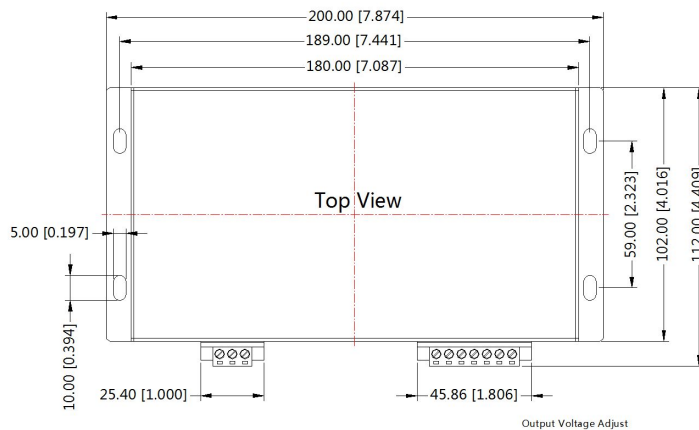
It is forbidden to short-circuit the battery.

After connect with the battery, the over-current protection and short-circuit protection of Vo1 will be disabled.

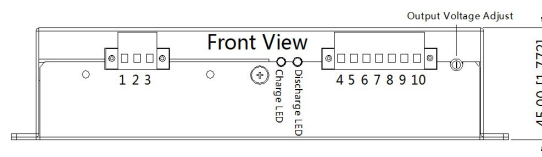
Simple calculation of battery charging time: Battery capacity C(AH)/ Charging current (A)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Pin-Out	
Pin	Function
1	AC(L)
2	⊥
3	AC(N)
4	-Vo1/B-
5	B+
6	+Vo1
7	NC
8	+Vo2
9	-Vo2
10	NC



Note:  
Unit: mm[inch]  
Wire range: 28-12 AWG  
Tightening torque: Max 0.4 N·m  
General tolerances: ±2.00[±0.079]

Attention Matters in Application

- (1) Output please use wire that cross area is more than 2.5mm<sup>2</sup>, input terminal should add 10A/250VAC Fuse.
- (2) Please correct connection according to the wiring diagram, do not connect wrongly, AC input terminal is strictly prohibited connected with other terminals wrong, otherwise will cause permanent damage to power.
- (3) Vo2 output peak current can not be long term work.
- (4) To further reduce the Vo1 output ripple noise, the user can in the Vo1 output parallel connection with one 470 – 1000uF/50V electrolytic capacitor and 1uF multilayer ceramic Capacitor.
- (5) The output of this product is not allowed to work in parallel.
- (6) The PE terminal of this product should be reliably connected to the earth, in order to improve the capability of anti-interference.
- (7) Casing will distribute heat when the power is during operating, in order to ensure the power dissipation is good, please keep a certain gap around the power supply to ensure the air flow smoothly, the temperature sensitive device as far as possible from the power.

- Note:
1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58220041;
  2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
  3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75% with nominal input voltage and rated output load;
  4. All index testing methods in this datasheet are based on our Company's corporate standards;
  5. We can provide product customization service, please contact our technicians directly for specific information;
  6. Specifications are subject to change without prior notice.

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