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

RoHS

3 years Warranty

FEATURES

- Input Voltage Range:165-264VAC/200-370VDC
- Low stand-by power consumption
- With charging function, it can charge the 24V output Lead-acidbattery as a power supply continuously when system connected with battery
- With charge and discharge management, battery status display, battery activation, external communications and control functions
- Output over-current, over-voltage protection and battery protection against reverse
- 2500VAC high isolation voltage
- Industrial grade operating temperature: -40℃ to +70℃
- Chassis mounting

MBP300-2A27D27M is a Mornsun AC/DC battery charging power converter. It has features including wide input voltage range, adapt to both DC and AC input, 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 activations function, which can be adjust by manual or automatically through external signals; 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 those need continuously power supply.

Selection Guide

Part No.	Output Power	rated Output Voltage and Current		Maximum Output Power	Efficiency (220VAC, %) Room temperature, Io=1.5A (disconnect the battery)
		(Vo/Io)	(VB/IB)		
MBP300-2A27D27M	40.5W	27V/1.0A	27V/0.5A	432W	80

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	165	--	264	VAC
	DC input	200	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	220VAC, Typical load	--	--	1.0	A
Inrush Current	220VAC	--	35	--	
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Current	Input voltage range，charge current (IB=0.5A)		--	1.0	10(15S) 16(1S)	A
Output Voltage Accuracy	Io=0-1A		--	±2	--	%
Line Regulation	Io=1A		--	±0.5	--	
Load Regulation	Rated Input Voltage		--	±1	--	
Battery Charge	Io=1A，IB≤0.01A	Floating Charge Voltage VB	--	27	--	V
	VB≤25V	Charge Current IB	0.4	0.5	0.6	A

Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	200	300	mV
Battery activation finished	Typical load	22.5	23	23.5	V
Battery under voltage	Typical load	21.5	22	22.5	
Battery Discharge Cut-off point	Typical load	20.5	21	21.5	
Battery Discharge Cut-off Delay Time	Typical load	10	20	30	s
Remote control contact time	Remote control activating function on/off, battery put into	--	0.5	2	
	Remote control battery exit (With Io, the bigger the Io, the shorter the time)	--	--	10	
Short Circuit Protection	Short circuit Vo, reachable battery (battery is not damaged)	Hiccup, continuous, self-recovery			
Over-voltage Protection	Reachable battery	⩽35 V			
Battery protection against reverse	No input, battery reverse access	The power module do not have output, without damaged (It is forbidden to exchange incoming batteries when the input is valid)			
The minimum load		0	--	--	%Load

Note:*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		2500	--	--	VAC
	Input-case			2500	--	--	
Impulse Voltage	Input-output	Apply 5kV impulse test voltage between input and output. 1.2/50us impact waveform, including three positive impulse and three negative impulse which time interval is no less than 5s. The passed module must have no disruptive discharge during the test.		5000	--	--	V
	Input-case			5000	--	--	
Isolation Resistance	Input-output	Room temperature		50	--	--	MΩ
	Input-case	Room temperature		50	--	--	
Operating Temperature*				-40	--	+70	℃
Storage Temperature				-40	--	+85	
Shell Operation temperature*				--	--	+85	
Storage Humidity				--	--	95	%RH
Power Derating		Operating Temperature Derating	-40℃ to -10℃	The peak current can only be applied after one minute after preheating (rated working conditions)			
			+55℃ to +70℃	When Shell temperature exceeds 85 ℃, module must intensify the power by increasing the heat sink or forced air cooling heat dissipation, and the peak current derating 50%			
		Input Voltage Derating		10A output, when the input voltage is lower than 175VAC, the output peak current derating to 70%; 16A output, when the input voltage is lower than 200VAC, the output peak current derating to 70%.			
MTBF				MIL-HDBK-217F@25℃＞100,000 h			

Note: *When the ambient temperature exceeds 55℃,it should be operating with the cooling method of force air cooling or post cooling to ensure that the module

Physical Specifications

Casing Material	Metal

Package Dimensions	168.00*79.00*30.00 mm
Weight	500g (Typ.)
Cooling method	Free air convection

EMC Specifications

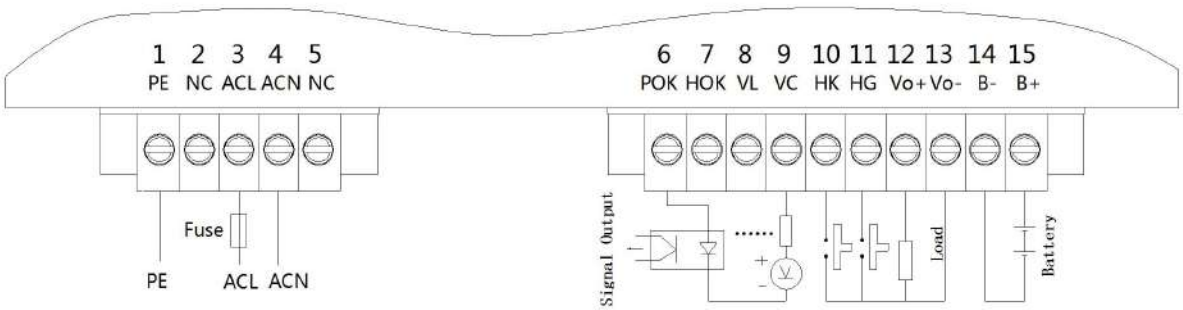
EMS	ESD	IEC/EN61000-4-2	Contact ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3	30V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV/line to ground ±4KV	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A
	PFM	IEC/EN61000-4-8	100A/m	perf. Criteria A
	Pulse magnetic field immunity	IEC/EN61000-4-9	1000A/m	perf. Criteria A
	Damped oscillatory magnetic	IEC/EN61000-4-10	100A/m	perf. Criteria A
	Ring wave immunity	IEC/EN61000-4-12	Common mode 2.5KV/ Differential mode 1.25KV	perf. Criteria A
	Oscillatory waves immunity	IEC/EN61000-4-18	Common mode 2.5KV/ Differential mode 1.25KV	perf. Criteria A

Wiring Description

1.Terminal Definition

Terminal No.	Terminal name	Definition	Terminal No.	Terminal name	Definition	Terminal No.	Terminal name	Definition
1	PE	Protective grounding	6	POK	Input loss alarm signal output terminal	11	HG	Remote activation quit contact terminal
2	NC	No electrical connection	7	HOK	Battery activated state signal output terminal	12	Vo+	Load output (+)
3	AC(L)	AC input L phase	8	VL	Battery under-voltage alarm signal output terminal	13	Vo-	Load output (-)
4	AC(N)	AC input N phase	9	VC	Power supply for alarm unit (+5v to +24V DC)	14	B-	Battery input (-)
5	NC	No electrical connection	10	HK	Remote activation start contact terminal	15	B+	Battery input (+)

2. Wiring diagram



Manual Instruction

Battery panel indicating light

Activating, yellow, battery activate indication. It lights when the battery is activated, If not, it is off;

Charging, green, charging indication. It lights when battery charging or AC input power is on, it lights off when the battery is Activated or AC power is off.

Discharging, red, battery discharge indication. It lights when the battery is discharging or activated. It goes off when the battery is charging or complete discharging.

Power panel button functions

Battery Start, press-button, battery manually put into;
Battery Stop, press-button, battery manually quit;
Activation Start, press-button, battery activation manually start;
Activation Stop, press-button, battery activation manually quit.

Button guide

Battery button:

Press the battery "start" button 1-2s when no AC input applied during the project debugging processt, then the battery is used to supply power to the load. And the discharge indication lights. Cut off the battery by press the battery "stop" button 1-2s.When the battery discharge into the under-voltage breakpoint, the battery will be automatically cut off; keep pressing the battery start-button can urgently force the battery supply the load when the battery voltage is lower than the under-voltage breakpoint.

Note: The battery "start" button and the battery "stop" button do not work when AC power supplying. The time of manual forced output function should not be too long, otherwise it damage the battery.

Activated button:

Press the activation "start" button 1-2s and activation start. At this point, the battery enters the activation state, and the power supply closes the output, the battery is discharged by load. When the battery is discharged to the activation exit point, the power supply automatically restart to power the load and charge the battery simultaneously. Press the activation "stop" button 1-2s, which can terminate the activation of the battery in advance.

Special attention:

In the activation state, if you start the force battery exit, the power circuit will be cut off and the load will be cut off. Unless the AC input activates the power supply, or the battery manually starts the power supply, can the battery supply circuit be restored. In order to ensure the normal power supply, this operation should be avoided.

Alarm terminal use guide

The alarm output terminal is the electronic node (See power principle and functional block diagram), and the +5V to +30V DC voltage are required to be input at the VC terminal (This power supply is supplied by the control unit of secondary FTU), When an alarm occurs, the alarm node is on or off. Alarm node load capacity is 0 - 5mA, and the voltage derating is 0.1-5V.

Alarm terminal	The alarm	Normal	Alarm	non-active	activation
VC	Positive input alarm	--	--	--	--
POK	Input loss alarm	on	off	--	--
HOK	Battery activated state	--	--	off	on
VL	Battery under voltage alarm	off	on	--	off

Use guide of battery

The power supply can be equipped with 7-24AHlead acid battery or colloidal maintenance-free battery, the battery is connected to the battery terminal(B+、B-) of the power supply.

Other precautions:

(1) Please correct connection according to the wiring diagram, , No live line wiring! Otherwise it will cause permanent damage to power!

(2) Please apply output wire with sectional area over 1.5mm², input terminal should add 3.15A/250Vac delay and slow Fuse.

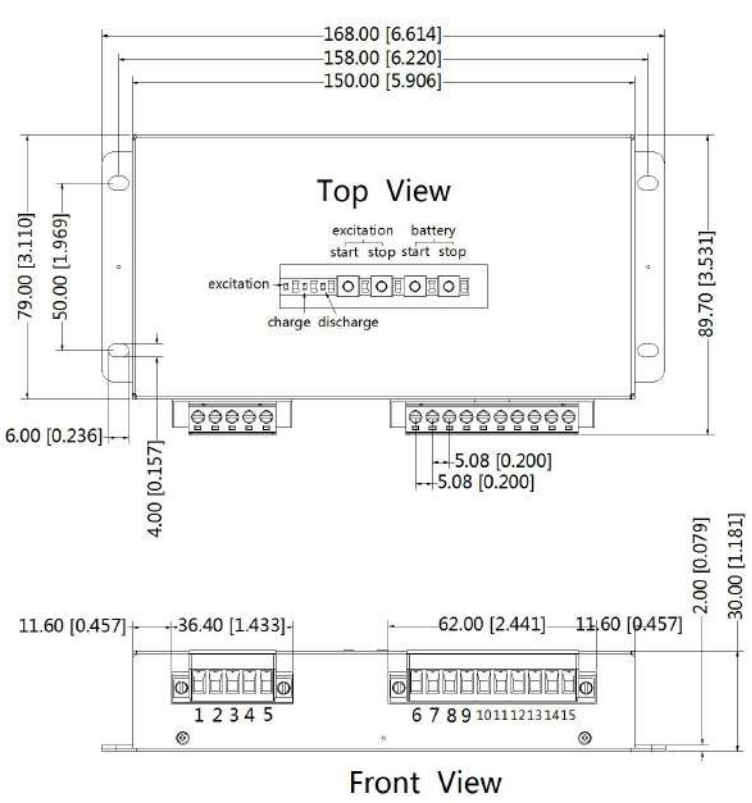
(3) The output of this product is not allowed to work in parallel.

(4) To further reduce the output ripple noise, the user can parallel connect with one 10-220uF electrolytic capacitor and 0.1-1uF multilayer ceramic capacitor on the output side.

(5) The PE terminal of this product should be reliably connected to the earth, in order to improve the capability of anti-interference and security performance.

(6) Casing will distribute heat during operating, in order to ensure the power dissipation is good. Please keep a certain space around the power supply to ensure the air flow smoothly, and keep the temperature sensitive device locating as far as possible from the power.

Appearance size, recommended printed map



Pin-Out			
Pin	Function	Pin	Function
1	PE	9	VC
2	NC	10	HK
3	ACL	11	HG
4	ACN	12	Vo+
5	NC	13	Vo-
6	POK	14	B-
7	HOK	15	B+
8	VL		

Note:
1.Unit:mm[inch]
2.Wire range : 28-12AWG
3.Tightening torque: Max 0.4 N·m
4.General tolerances:±2.0[±0.079]

Attention Matters in Application

- Detailed instructions:

(1) Please connect the circuit according to the wiring diagram correctly.

(2) The power supply can supply the load once the AC input power supplied. And charging the battery with constant current and voltage at the same time. After the battery is charging completed, the power module provide floating charge state automatically, to supplement the normal self discharge of battery.

(3) When AC power is off, the battery can also supply power. When the battery discharge and voltage reduce to under voltage alarm point, the module lights with under voltage alarming lights; when the battery discharge to the value lower than the over-discharge signal point, after a delay of 10-30s, the output of the module will be cut off, to avoid over discharge of the battery.

(4) When the load needs a large current, and exceeds the rated maximum current value of the module, the protection of the module will be shut off and the load current will be fully supplied by the battery. When the load current is less than the maximum current provided by the power supply, the module will automatically restart

(5) Starting of Battery Activation: When the battery is being in floating charge state for a long time, the battery should to be activated to avoid battery plate passivation. Activation can be done by using a external passive nodes to make HK and Vo- short circuit for more than 0.2S (Note external passive nodes should not be short for a longer time, otherwise the power can not automatically stop battery activation), then the power into activation state, When the power is switched off output, the battery begins to discharge. When the battery is discharged to the activation exit point voltage, the power automatic starting work to supply the load and charge the battery.

Stop of the Battery Activation: When the battery is being in activation state, using a external passive nodes to make HG and Vo- short circuit for more than 0.2S (Note external passive nodes should not be short for a long time, otherwise the power cannot restart the battery activation remotely).That is can terminate activation.

(6) Battery output have battery reverse polarity connection protection, When the battery is reverse polarity connected, the battery can not starting to supply the load .At this time, the power supply will not have output even when the AC input is normal (Battery reverse polarity).

Note: In the normal condition of power supply AC power supply, the polarity of charged anti-connection battery is forbidden, otherwise it will cause permanent damage to power.

(7) Discharge short circuit protection function, when the motor is plugged, the output load short circuit of the closing coil circuit will occur, the power supply can be effectively protected from damage.

Note: If the Vo output short circuit is prohibited, press the power panel battery "start" button, otherwise it maybe cause permanent damage to power.

Note:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number of Horizontal package: 58020022;
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℃, 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. 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 400-1080-300 Fax: 86-20-38601272 E-mail: sales@mornsun.cn