



FEATURES

- Input voltage range:
12V: 10-15VDC
24V: 20-28VDC
48V: 42-54VDC
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 99.5%
- Compatible with various installation methods
- Support output 2 times voltage backdown
- Supporting for N+1 parallel redundancy
- Safety according to EN62368
- 5 years warranty

FS-A(B)xxW is one of Mornsun Enclosed Switching/Din-Rail parallel redundancy module. It can be used with enclosed, Din-rail, module power supply and other series. It features wide input voltage range, wide operating temperature, cost-effective, high efficiency and high reliability. It offers excellent EMC performance and meet EN62368 standards and it is widely used in areas of industrial, electricity, security, telecommunications etc.

Selection Guide

Certification	Part No.*	Nominal Input Voltage (V)	Nominal Output Current* (A) Max.	Voltage Drop Vin-Vo (V) Max.	Efficiency (%) Typ.
--	FS-A60W	12	60	0.2	99.5
	FS-A32W	24	32		
	FS-B16W	48	16		

Note: 1.*Use suffix "A4S" for Din-rail package option;

2.*When the output voltage is greater than the rated voltage, the power cannot exceed the maximum output power of the power supply.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	DC input	12V	10	12	15	VDC
		24V	20	24	28	
		48V	42	48	54	
Output Power	DC input	12V	0	--	720	W
		24V	0	--	768	
		48V	0	--	768	
Anti-backflow Voltage	Full load range, back-flow voltage slope $\leq 1V/ms$	12V	--	--	24	VDC
		24V	--	--	48	
		48V	--	--	75	
Parallel Redundancy	All Load Range	Support				
Output Hot Plug*	All Load Range	Support				

Note: *During hot swap, the output voltage cannot exceed the maximum anti-backflow voltage of the power supply.

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input/output - ⊕	Electric strength test for 1min., leakage current < 3mA	1500	--	--	VAC
Insulation	Input/output - ⊕	Test voltage: 500VDC	50	--	--	MΩ

Resistance					
Operating Temperature			-40	--	+85
Storage Temperature			-40	--	+85
Storage Humidity	Non-condensing		10	--	95
Operating Humidity			20	--	95
Power Derating	Operating temperature derating	+50°C to +85°C	2.5	--	--
Safety Standard	Design refer to EN62368-1				
Safety Class	CLASS I				
MTBF	MIL-HDBK-217F@25°C		>300,000 h		
Warranty	Ambient temperature: <40°C		5 years		

Mechanical Specifications

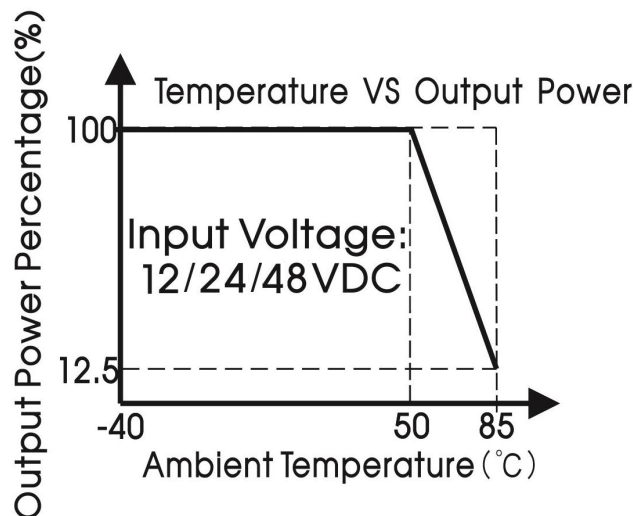
Case Material	Metal (AL5052, SGCC)				
Dimensions	FS-A(B)xxW	55.00mm x 60.00mm x 26.50mm			
	FS-A(B)xxWA4S	68.30mm x 67.70mm x 26.50mm			
Weight	FS-A(B)xxW	92g (Typ.)			
	FS-A(B)xxWA4S	105g (Typ.)			
Cooling Method	Natural air cooling				

Electromagnetic Compatibility (EMC)

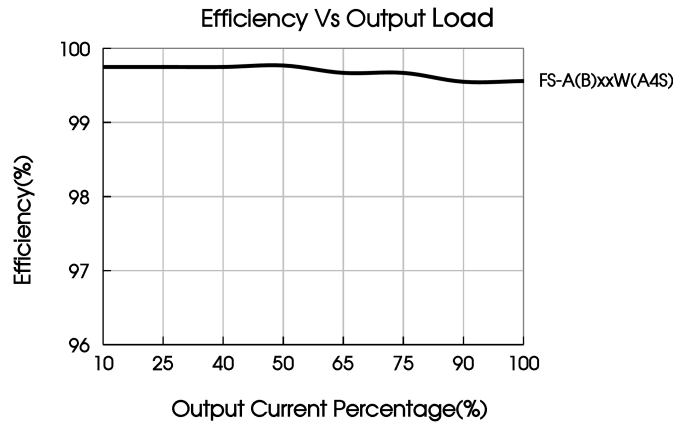
Emissions	CE	CISPR32/EN55032 CLASS B			
	RE	CISPR32/EN55032 CLASS B			
Immunity*	ESD	IEC/EN 61000-4-2	Contact ±8KV/Air ±15KV		Perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV		perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line ±0.5KV/line to ground ±1KV		perf. Criteria A
	MS	IEC/EN61000-4-8	30A/m		perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s		perf. Criteria A

Note: *For immunity test, please add AC-DC module at front of FS-A(B)xx(A4S) (Mornsun LI, LM(F) series products are recommended); The output voltage accuracy deviation is less than 1.2V, which meets perf. Criteria A.

Product Characteristic Curve

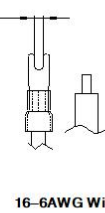
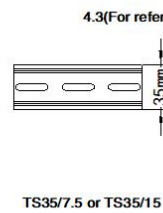
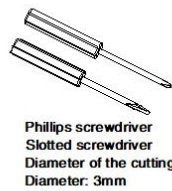
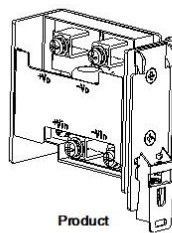


Note: This product is suitable for applications using natural air cooling, for applications in closed environment please consult Mornsun FAE.

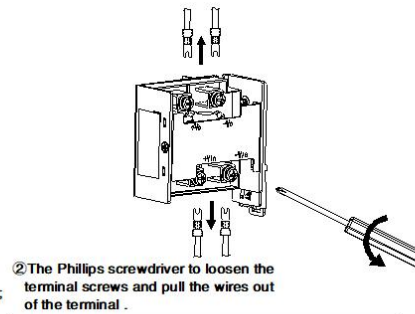
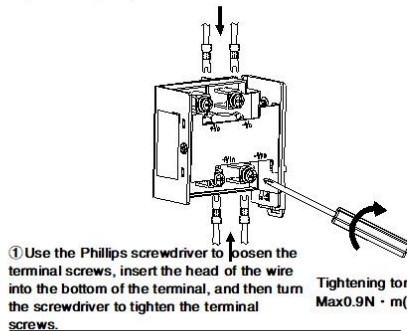


Installation Diagram

Materials required in the installation		
1	Product	1 PCS
2	Phillips screwdriver Slotted screwdriver	1 PCS
3	TS35/7.5 or TS35/15	1 PCS
4	16-6AWG wire	/ PCS
The content is for reference only. Regarding the actual wire diameter and tightening torque, refer to the dimensional drawing.		

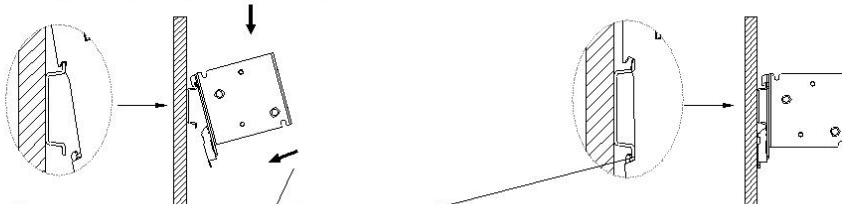


Wiring / Unwiring Steps ①-②



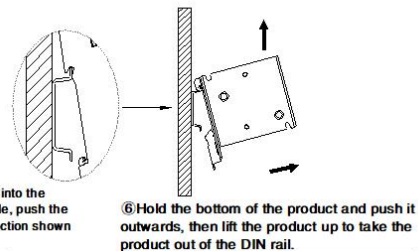
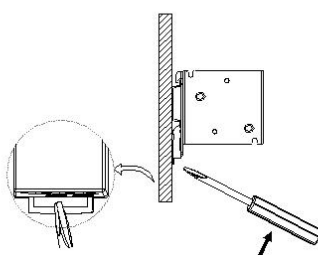
Installation Steps ③-④

③ Clamp the buckle of the product into the TS35 DIN rail;



④ Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly Steps ⑤-⑥

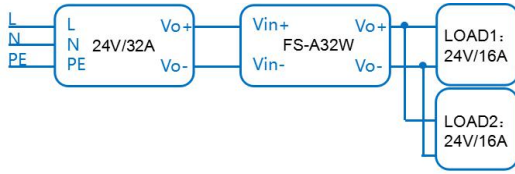


Note: Keep the following installation clearances: 20mm on the top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

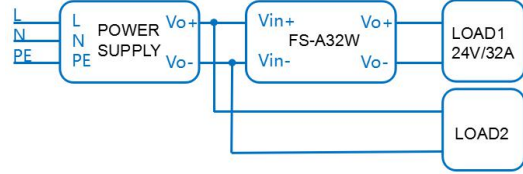
Typical Application

1. Anti-backflow Application Diagram

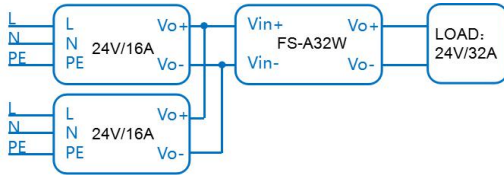
① Single-module anti-backflow system:
24V/32A is used as an example



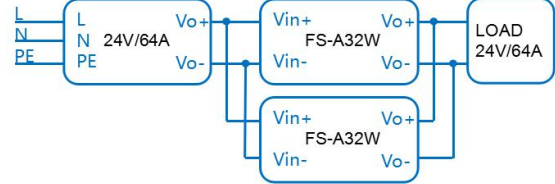
② Specific load anti-backflow system:
24V/32A is used as an example



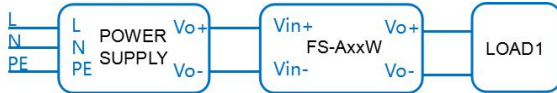
③ Single-module anti-backflow system:
24V/32A is used as an example



④ n module anti-backflow system:
24V/32A is used as an example



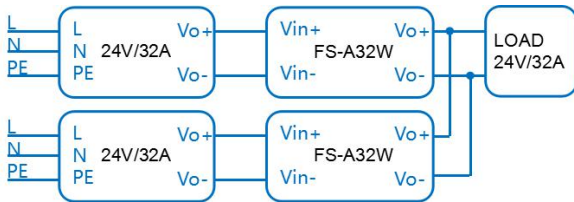
2. Hot Plug Application Diagram



Using FS module, the influence of hot swap load LOAD1 on POWER SUPPLY can be reduced.

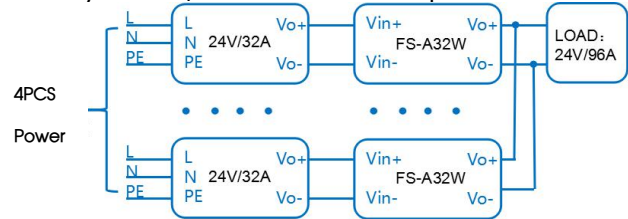
3. Parallel Redundancy Application Diagram

① 1+1 Redundant System: 24V/32A is used as an example



② n+1 Redundant System:


The 3+1 system 24V/96A is used as an example

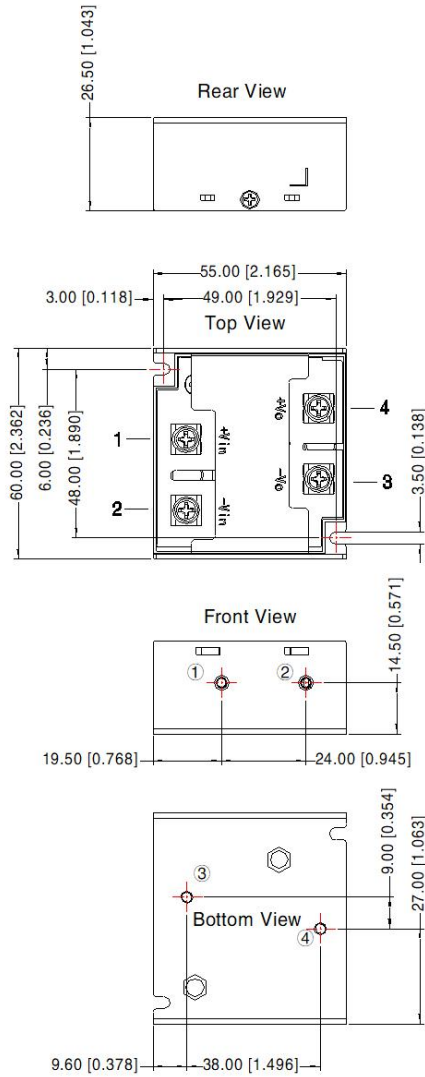


- Note: 1. Please add AC-DC module at front of FS-A(B)xx(A4S) (Mornsun LI, LM(F) series products are recommended);
2. When used in parallel, the voltage difference of all inputs should not exceed 0.02V, or the current difference is within 5%;
3. Do not use short circuit for a long time, do not use constant current products for short circuit test.

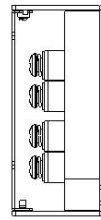
Dimensions and Recommended Layout

FS-A(B)xxW

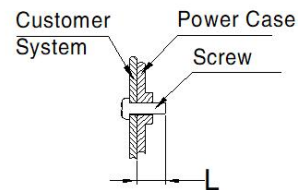
THIRD ANGLE PROJECTION 



Right View



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



Position	Screw Spec.	L(max)	Torque(max)
① - ④	M3	4mm	0.4N · m

Note:

Unit: mm[inch]

Wire range: 12V: 8-6 AWG

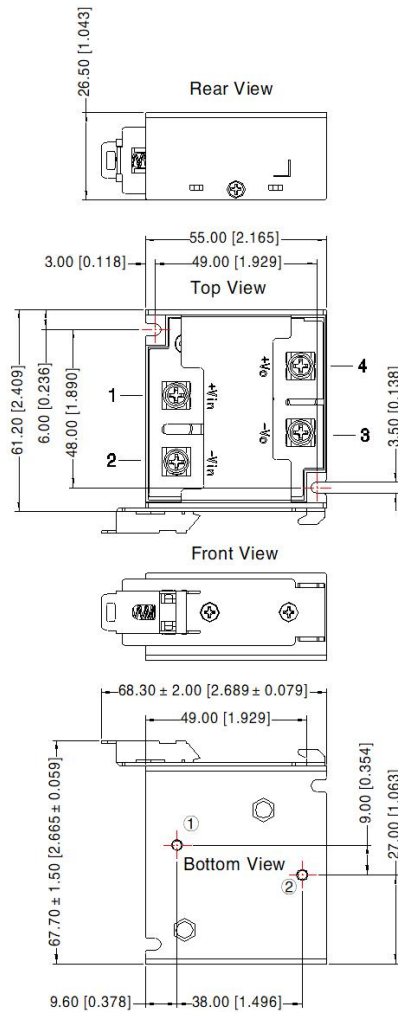
24V: 12-6 AWG

48V: 16-6 AWG

Tightening torque: M4, Max 0.9N.m

General tolerances: $\pm 1.00 [\pm 0.039]$

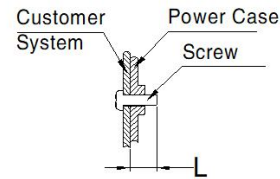
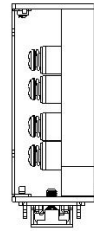
FS-A(B)xxWA4S



THIRD ANGLE PROJECTION

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

Right View



Position	Screw Spec.	L(max)	Torque(max)
① - ②	M3	4mm	0.4N · m

Note:

Unit: mm[inch]

Wire range: 12V: 8-6 AWG

24V: 12-6 AWG

48V: 16-6 AWG

Tightening torque: M4, Max 0.9N.m

Mounting rail: TS35, rail needs to connect safety ground

General tolerances: ± 1.00 [± 0.039]

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220692 (FS-A(B)xxW), 58220694 (FS-A(B)xxWA4S);
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% RH with nominal input voltage and rated output load;
- The ambient temperature derating of $5^{\circ}\text{C}/1000\text{m}$ is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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