Specification

Project NO.	**PYW000257-18033**	**Model.**	**AFCF-700D36+13.8B**
Rev.	**S01**	**Engineer.**	**Huang Tujun**

Prepared		**Date**	
Checked		**Date**	
Approved		**Date**	

Change Reason and content:

Sign:

DONGGUAN PYW ELECTRONICS TECH. CO.,LTD.

■Feature ：

- High voltage input: Rated 180 ~ 264Vac, support a wide voltage range of 150~280Vac normal operation
- LED working instruction
- Comprehensive protection function: input undervoltage, output overload/short circuit/overvoltage/overtemperature
- Constant voltage, constant current output, suitable for battery backup power supply system applications, can use lead-acid battery power supply
- When the AC input is on or off, the backup battery continuously removes or switches the power supply
- Backup battery voltage detection function, battery undervoltage protection, overtemperature protection
- Compatible with SR232/TTL communication (optional), can detect the main input voltage, output voltage and current, backup battery voltage, temperature, etc

★ Picture for reference

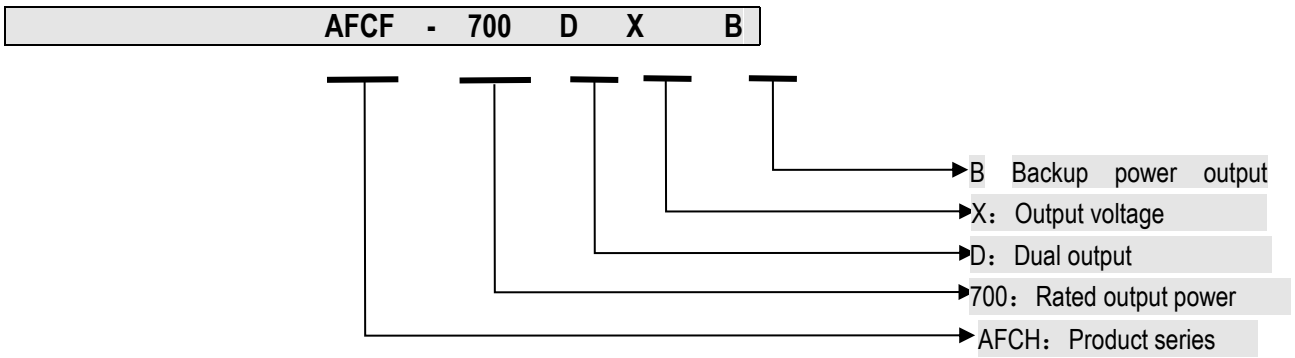
■Specifications

Product name Note 1		AFCF-700D36+13.8B		AFCF-700D36+13.8B		AFCF-700D36+13.8		AFCF-700D36+13.8	
Output	Rated output voltage	Main road	Charging	Main road	Charging	Main road	Charging	Main road	Charging
		36V	14.5V	36V	28V	36V	42V	36V	43.8V
	Rated output current	18A	5A	18A	3A	18A	2A	18A	2A
	Rated output current	0~18A	0～5A	0~18A	0～3A	0~18A	0～2A	0~18A	0～2A
	Rated output power	700W		700W		700W		700W	
	Ripple noise 0~50℃ 2	<360 mV(600mV on battery)	<550 mV	<360 mV(600mV on battery)	<550 mV	<360 mV(600mV on battery)	<400 mV	<360 mV(600mV on battery)	<400 mV
	Output control range	non-tunable	non-tunable	non-tunable	non-tunable	non-tunable	non-tunable	non-tunable	non-tunable
	Output setting range	36±1.08V	14.5±0.2	36±1.08V	28±0.2V	36±1.08V	28±0.2V	36±1.08V	43.8±0.2V
	Voltage regulation	±3.0%	±0.2V	±3.0%	±0.56V	±3.0%	±0.56V	±3.0%	±0.56V
	Output start time	≤2S (230Vac input, Full load)							
	Output hold time	≥10mS(230Vac input, Full load)							
	Voltage overshoot	<5.0%							
	Dynamic characteristic	V1：25%-50%Load:< ±5% 50%-75%Load: <±5%							
Input	Input voltage range	180Vac~264Vac (Support 150V~280Vac long-term work)							
	Rated input voltage	200Vac~240Vac/50Hz~60Hz							
	Starting voltage	150±10Vac							
	Efficiency (typical	Main: 92% Battery: 90%							
	Stand by power consumption	/							
	Input current (Max.)	<4A							
	Starting impulse	<80A@230Vac Cold start							
Charge management	Battery detection	When the system detects that the voltage is lower than 9V, it determines that the battery is connected incorrectly, not connected, and the charging circuit will not open							
	Charging process	Constant current charging voltage 10-14.2V, > 14.2V (±0.2) when entering the floating charging stage charging current is 1A, the battery will be disconnected after full (14.5V±0.2), the detection voltage is lower than 13.8V (±0.2V) will be recharged (charging current error ±10%)							
Protection function	Input power failure protection	Ac input undervoltage (≦150V) or power failure, can automatically switch to battery power without interruption; Ac input recovery (≧165V), automatic and uninterrupted switching of AC power supply (switching amplitude ≤ 10%VOUT recovery time ≤ 100mS)							
	Input overvoltage protection	When AC input overvoltage (≧280V±10V), turn off the main power output, and restore the main power output when the voltage returns to the rated value。							
	Backup battery undervoltage protection	If the BAT voltage is lower than 10.2±0.3V, the battery is automatically cut off and the output is stopped. The AC can be restarted only after the AC is powered on. In a mandatory emergency, the power supply is stopped below 9.6V±0.3V and can be restarted only after the AC is powered on.							
	Output overpower	Main road: 110%~150% swing machine, self-recovery							
	Output overvoltage	Main road: 110%~150% swing machine, self-recovery							

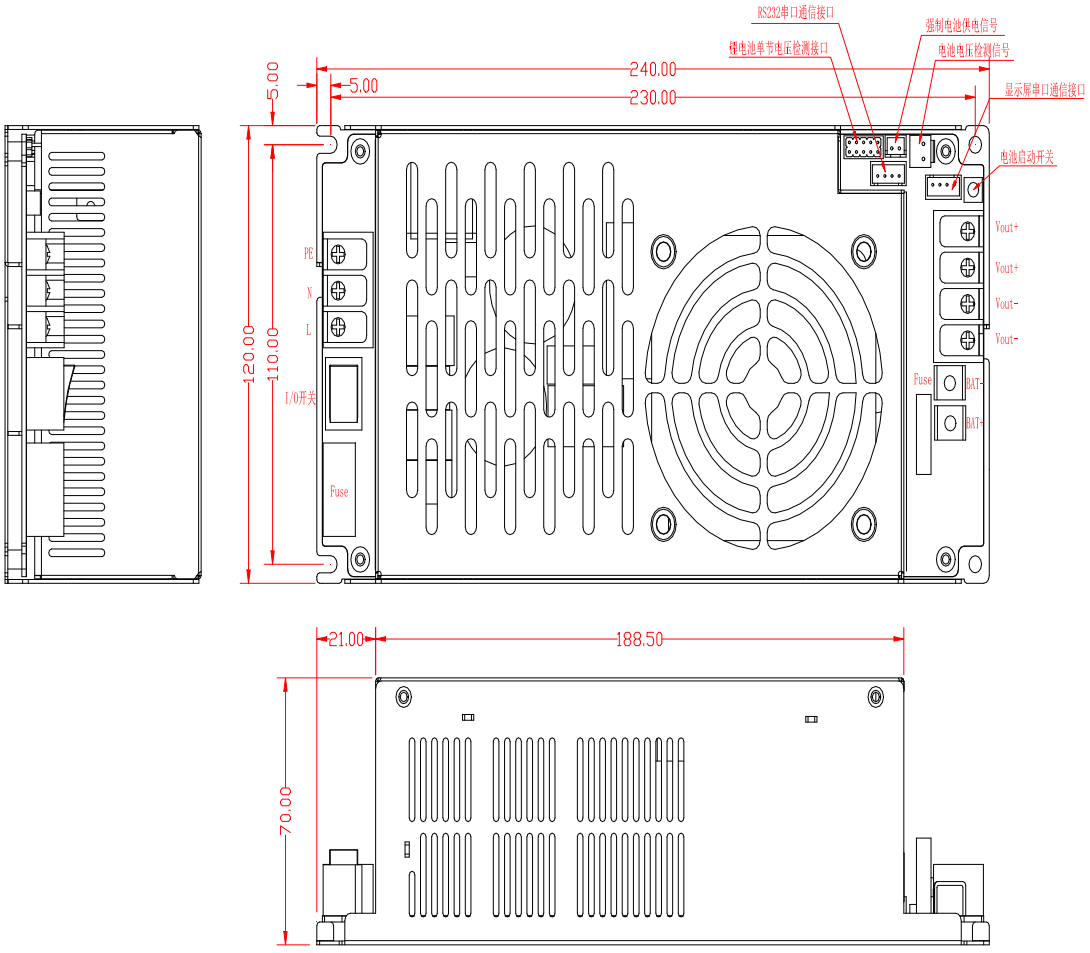
	Output overcurrent	Main road: 110%~150% swing machine, self-recovery	
	Output short-circuit	Main road: Swing machine, self-recovery	
	Battery overcharge	Charging voltage > 14.7V±0.2V Disconnect the charging circuit	
	Battery reverse	No ignition, no component damage, no serious heating, no circuit work	
	Battery leakage protection	When there is no AC power supply, the static current is less than 550uA after the battery overdischarge protection	
Working environment	Operating temperature	-20℃~50℃; 20%~90%RH No condensing	
	Store temperature and	-40℃~85℃; 10%~95%RH No condensing	
	Vibration	10 ~ 500Hz, 2G 10min./1cycle, period for60min. each along X,Y, Z axes	
	Strike	20G/11mS pulse ,3 times at each X,Y,Z axes	
	Altitude	5000m	
Safety and EMC	Safety standard	GB4943/EN60950/EN62368/GB17945 Refer to □ Certification	
	Leakage current	Primary side - secondary side ≤0.25mA Primary side - Earth ≤3.5mA	
	Insulation strength	Input - Output: 3.0KVac/10mA/ 1min(without housing, single power supply test), no flare, no breakdown	
		Input - Ground: 1.5KVac/10mA/ 1min, no flare-out, no breakdown (with a detonator, the ground screw at the detonator must be removed during the test)	
		Output - Earth: 500Vac/10mA/ 1min, no flare, no breakdown	
	Insulation impedance	Under normal temperature and humidity conditions	Input/output: ≥100M ohms@500Vdc
			Enter - Earth: ≥100M ohms@500Vdc
			Output - Earth: ≥100M ohms@500Vdc
		Constant humid heat: temperature 40℃±2℃, humidity 93%±3%	Input/output: ≥2M ohms@500Vdc
			Input - Earth: ≥2M ohms@500Vdc
			Output - Earth: ≥2M ohms@500Vdc
	Harmaonic current	EN61000-3-2,-3	
	Electromagnetic interference EMI	Conduction disturbance emission CE	EN55032 Class A
		Radiation disturbance emission RE	EN55032 Class A
	Electromagnetic immunity Conduction disturbance	Electrostatic discharge rejection ESD	Shell: Part that can be reached by hand during normal operation: IEC61000-4-2: contact discharge ±6KV, air discharge ±8KV, criterion A (power on during test)
			Shell: Parts that can be reached by the hand during normal operation: IEC61000-4-2: contact discharge ±8KV, air discharge ±10KV, criterion A (no power on during test)
			Signal interface inner conductor: IEC61000-4-2: Contact discharge ±2KV criterion A (power on during test)
		Conductive immunity CS	IEC61000-4-6 Criterion A (System)
		Radiation immunity RS	IEC61000-4-3 Criterion A (System)
		Electrical fast pulse group immunity EFT	IEC61000-4-4 level4, Criterion A (System)
		Surge immunity surge	IEC61000-4-5 level4, criterion A (system), differential mode 4KV, common mode 4KV
		Voltage DIPS, short interruptions and slow immunity	IEC61000-411, drop to 70%U, duration of 100mS, at 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° all phases meet criterion A; The fall to 0%U for A duration of 10mS meets criterion A at all phases of 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° The other conditions satisfy criterion A
Other	Size (L * W * H)	240mm×120mm×70mm	
	Connecting terminal	Input: 9.525 terminal block /3Pin, Output: 9.525 terminal block /4Pin (VOUT+,VOUT- 2PIN each) Battery: M4 single-port copper terminal (BAT+,BAT-, 1 PIN each)	
	Cooling mode	Forced air cooling 80 x 80 x 25 fan The 12V air volume is greater than 70CFM	
	communication	Support RS232 or TTL communication (optional), detect the main input voltage, output voltage and current, backup battery voltage (including single battery voltage), battery temperature	
	Compulsory	The emergency can be forced through software commands to change the battery overdischarge protection voltage point to	

		After the battery overdischarge protection, if the battery is powered back, it can be forced to switch on the control circuit power supply by short-circuiting the CON4 terminal. When the battery voltage meets the working conditions, the MCU will start the backup power, and turn off the output after the battery voltage drops and triggers the overdischarge protection again. The user can connect a resettable trigger switch on CON4 to the panel to enable this function.
	Start the backup power	You can manually start the backup power by using software commands or hardware switches
	Backup switch	After the battery is connected, press the backup switch to start the backup power only after the internal indicator lights up for 15 seconds. To remove the battery, turn off the switch first. (Do not press this switch before the battery is connected or the system is not sure to enable it, otherwise it will cause battery leakage)
	The software reports the AC voltage range	150-280V±5%(under voltage protection below 150V±10V, over voltage protection above 280V±10V)
	Battery temperature detection	For battery temperature detection, use a temperature sensor (matching a 10 Kω 3950 curve) to connect one end to the battery temperature 1/2/3 Single battery needs to be connected to bit 1, and the other end to the Vout-(negative output pole of the main circuit).
	Single battery voltage detection	To detect the voltage of a single battery, the user needs to connect the lead from the single power-saving pool to the battery voltage 1/2. 1 battery does not need to be connected, (2 24V or 3 36V battery pack reference: 2 batteries only need to connect the first to the 1 position, 3 batteries only need to connect the first position。
Software detection accuracy	Battery voltage	±0.2V
	Output voltage	±3%
	Charging current	±10% when normal charging, ±0.2A when floating charging
	Output current	The minimum detectable current is 0.2A, the detection error is ±10% when VO > 2A, ±0.2A when VO < 2A
	Output power	The detection error is ±10% when PO > 72W, and ±7.2W when PO < 72W
	Input voltage	±10%
Pilot lamp	External indicator light	If the external indicator is on, the main power supply is normal
	Internal indicator light	If one indicator is steady on, the backup is ready. If the other indicator blinks, the MCU is running.
Reliability	Design MTBF	200,000Hrs AT 25℃, MIL-217 Method 2 Components Stress Method
	Designed electrolytic	3 years@ 40℃ FULL Load and Units Continuously Working
Remark	Note 1: Unless otherwise specified, all parameters are tested after 15min in the oven at room temperature. Note 2: Ripple noise is the use of 12# twisted pair connection length 20mm, and at 20MHz bandwidth, parallel 0.1uF and 10uF capacitors, ripple and dynamic ripple are not required under the condition of -10 ~ 0℃. Note 3: In actual application, see the derating curve, positioning diagram, and installation mode description for details.	

■ Model Code Description:



■ Mechanical:



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■ Product installation and instruction：

1. Refer to the mechanical to select the appropriate installation. If necessary， the diameter of the kelly wire is no less than AWG #1.
2. Make the electrical connection is correct, to avoid damage to the SPS or equipment : Input & Output, Ac & DC, Positive & negative, Input Voltage Range.
3. Do not touch circuit board to avoid electric shock when SPS is working. Do not touch to avoid heat in three minutes after working. Do not touch the soldering side.
4. Let it work at ventilated conditions to improve reliability. Do not make it ON/OFF too quickly . Any condition is out of the rated range, please contact FAE for suggestion.
5. If the SPS works abnormally, do not open to repair except professional, contact FAE for support.

■ Packaging, transportation, storage：

1. **Package**:Unless customer's special demand, Product name, model, manufacturer logo in the box; Date of production can be traced back.
2. **Transport:** Product packaging is suitable for road, railway, air shipping and sea shipping, etc. Be to civilized handling, waterproof, anti-fall, and to avoid severe impact.
3. **Storage**: Do not disassemble or take off the packing box when the product is not in use. Keep 20cm away from ground, and 50cm away from Wall, heat source and air inlet. The storage temperature and relative humidity shall be in accordance with the specifications， and Avoid strong mechanical vibration, shock and strong magnetic field. If the storage period is more than two years, it should be tested again before use.

■ Reference standard：

1. **GB4943/EN60950/ EN62368：** Safety of Information Technology Equipment.
2. **GB2324：** Basic environmental testing procedures for electric and electronic products.
3. **EN55022/EN55032/EN55024：** Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement
4. **IEC61000-4：** Electromagnetic compatibility (EMC) test and measurement techniques.
5. **IEC 61000-6-1 :** Standard and measurement of electromagnetic immunity for residential, commercial and light industrial environments.
6. **IEC 61000-6-2 ：** Standard and measurement of electromagnetic immunity for products used in industrial environment.
7. **GB17625.1-2022：** The limits for the harmonic current from low-voltage electrical and electronic equipment (equipment input current≤16A per phase).
8. **GB/T 17626：** Electromagnetic compatibility testing and measurement techniques.
9. **GB/T14714：** General specification for switching power supply of micro computer system equipment.
10. **GB/T9254.1-2021:** Radio disturbance limits and methods of measurement for information technology equipment.
11. DONGGUAN PYW ELECTRONICS TECH. CO.,LTD. Enterprise standard.

■ Statement

Class A statement

Warning

In a residential environment, running this device may cause radio interference.