AC/DC Converter

FA30-380SXXH2N4(-T)(-TS) Series

Typical Features

- ◆Wide input voltage range 176-528VAC/248-745VDC
- ◆No-load power consumption ≤0.55W
- ◆Efficiency 82% Typ.
- ◆Operating Temperature -40℃~105℃
- ◆Switching frequency 65KHz
- ◆Output Short Circuit, Over Current, Over Voltage Protections
- ◆Isolation voltage 4000Vac
- ◆Altitude during operation 4000m Max
- ◆Compliant with IEC/EN62368/UL62368
- ◆Conform to CE & RoHS regulation
- ◆Plastic case, flame class UL94 V-0
- ◆PCB mounting

Application Field

FA30-380SXXH2N4(-T) (-TS) Series**-----** *a compact size, high efficiency module power supply provided by Aipu. It has the advantages of universal input voltage both DC & AC available, low ripple, low temperature rise, low standby power consumption, high efficiency & reliability, safety isolated and good EMC performance. EMC conforms to EN55032, IEC/EN61000. It can be widely used for electric power, industrial, instrument and smart home applications. The additional circuit for EMC is recommended in this data sheet for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No	Output Specification			Max. Capacitive Load	Ripple& Noise 20MHz (Max)	Efficiency @Full Load 230Vac (Typical)
		Power	Voltage	Current			
		(W)	(V)	(mA)	uF	mVp-p	%
-	FA30-380S05H2N4	30	5	6000	7000	100	78
	FA30-380S12H2N4	30	12	2500	5000	120	82
	FA30-380S15H2N4	30	15	2000	5000	120	82
	FA30-380S24H2N4	30	24	1250	800	150	85

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2: The full load efficiency should be in ±2% of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.

Note 3: The ripple and noise are tested by the twisted pair method (please refer to the following Ripple & Noise Test Instructions).

Note 4: The suffix -T indicates a kind of chassis package, -TS indicates a kind of packaging with DIN Rail.

Note 5: Please contact with Aipu sales for other output voltages requirement in this series but not in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	176	230	528	VAC
	DC Input	248	325	745	VDC

Input Frequency Range	-	47	50	63	Hz
Input Current	176VAC	-	-	0.40	A
	230VAC	-	-	0.32	
Surge Current	176VAC	-	35	-	
	230VAC	-	60	-	
No Load Power Consumption	Input 176VAC	-	-	0.55	W
	Input 230VAC	-	-		
Leakage Current	230VAC/50Hz	0.5mA RMS TYP			
Recommended External fuse	-	2.0-3.15A/500VAC Time-delay fuse, necessary			
Hot plug	-	Unavailable			
Remote control terminal	-	Unavailable			

Output Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full input voltage Range, Any load	-	±2.0	±3.0	%
Line Regulation	Rated Load	-	-	±0.5	%
Load Regulation	Rated input Voltage, 20%~100% load	-	-	±1.0	%
Minimum load	Single isolated output	0	-	-	%
Turn-on Delay Time	Input 230Vac	-	2000	-	mS
	Input 400Vac	-		-	
Power-off Hold up Time	Input 230VAC	-	35	-	mS
	Input 400VAC	-	100	-	
Dynamic Response	25%~50%~25% 50%~75%~50%	Overshoot range ≤ ±10			%
		Recovery time ≤ 5.0			mS
Output Overshooting	Full input voltage range	≤10%Vo			%
Short Circuit Protection		Continuous, Self-recovery			Hiccup
Drift Coefficient	-	-	±0.02%	-	%/℃
Over Current Protection	Input 230VAC	⩾120% Io, Self-recovery			Hiccup
Over Voltage Protection	5VDC Output	⩽7.5			VDC
	12VDC Output	⩽20			
	15VDC Output	⩽20			
	24VDC Output	⩽30			

General Specifications

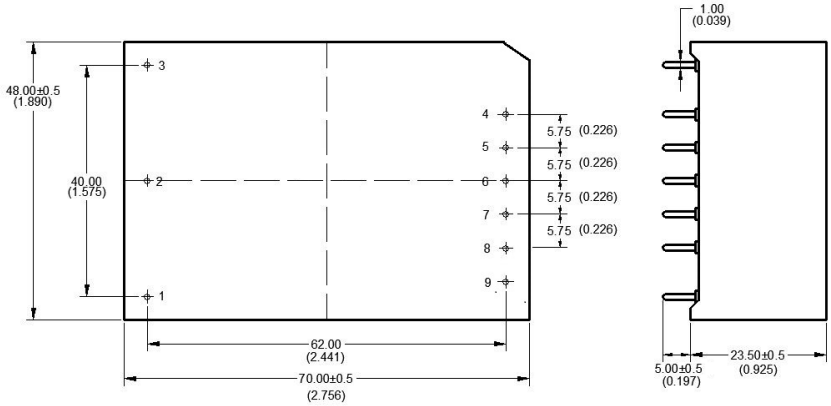
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the temperature derating curve	-40	-	+105	℃

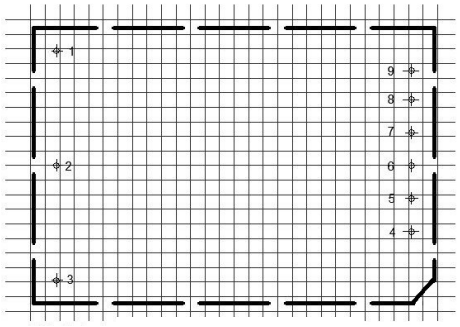
Storage Temperature	-	-40	-	+110	
Soldering Temperature	Wave-soldering	260±4℃, timing 5-10S			
	Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	I/P-O/P test 1min, leakage current≤5mA	4000	-	-	VAC
	I/P-O/P @DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368/UL62368			
Vibration	-	10-55Hz,10G, 30 Min, along X,Y,Z			
Safety Class	-	CLASS Ⅰ			
Flame Class of Case	-	UL94 V-0			
MTBF	MIL-HDBK-217F@25℃	＞300,000H			
Product Weight	Part No.	Weight (Typ.)			
	FA30-380SXXH2N4	122g			
	FA30-380SXXH2N4-T	165g			
	FA30-380SXXH2N4-TS	205g			

EMC Performance

Total Item		Sub Item	Standard	Performance/Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B
		RE	CISPR22/EN55032	CLASS B
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria A
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±2KV Perf.Criteria B
				Line to line ±4KV Perf.Criteria B (with the Recommended Circuit 2, 3&4)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
				±4KV Perf.Criteria B (with the Recommended Circuit 2, 3&4)
		Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%~70% Perf.Criteria B

H2 Packaging Dimension





PCB Vertical View

Pin	Function
1	NP
2	AC(N)
3	AC(L)
4	+Vo
5	NP
6	NP
7	NP
8	-Vo
9	NP

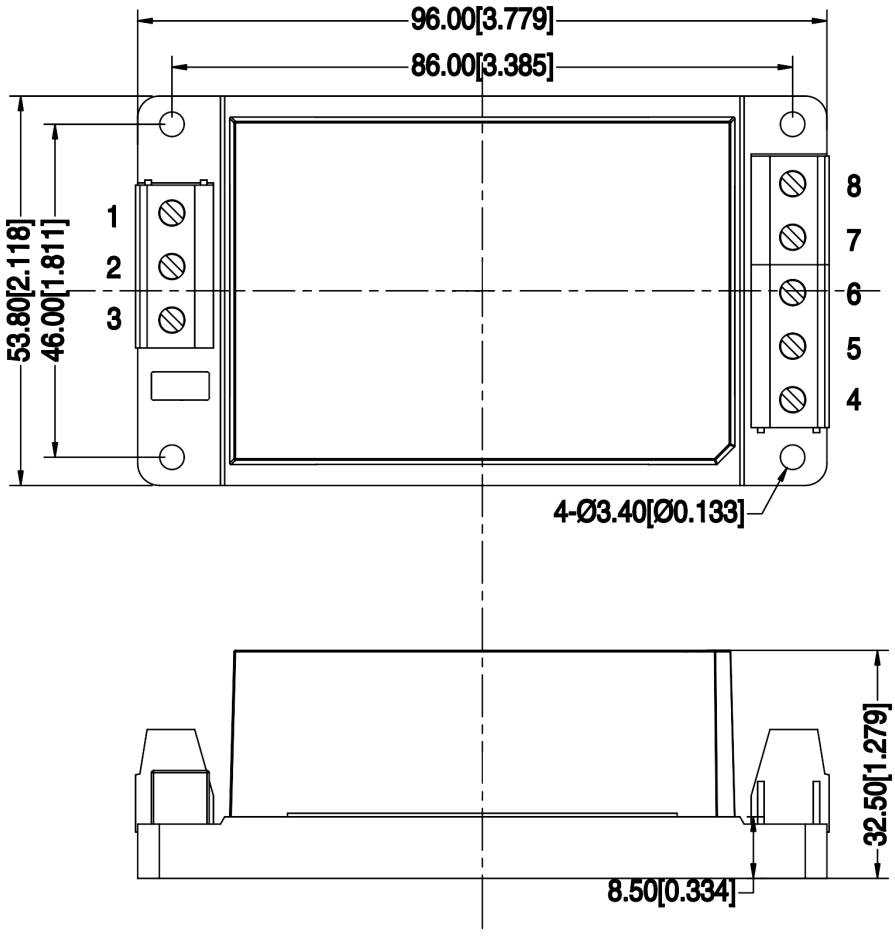
Unit: mm(inch)

Grid: 2.54x2.54(0.10x0.10)

General tolerance: ±0.25(0.010)

Pin diameter tolerance: ±0.10(0.004)

H2-T Packaging Dimension



Pin	Function
1	NP
2	AC(N)
3	AC(L)
4	+Vo
5	NP
6	NP
7	NP
8	-Vo

Note:

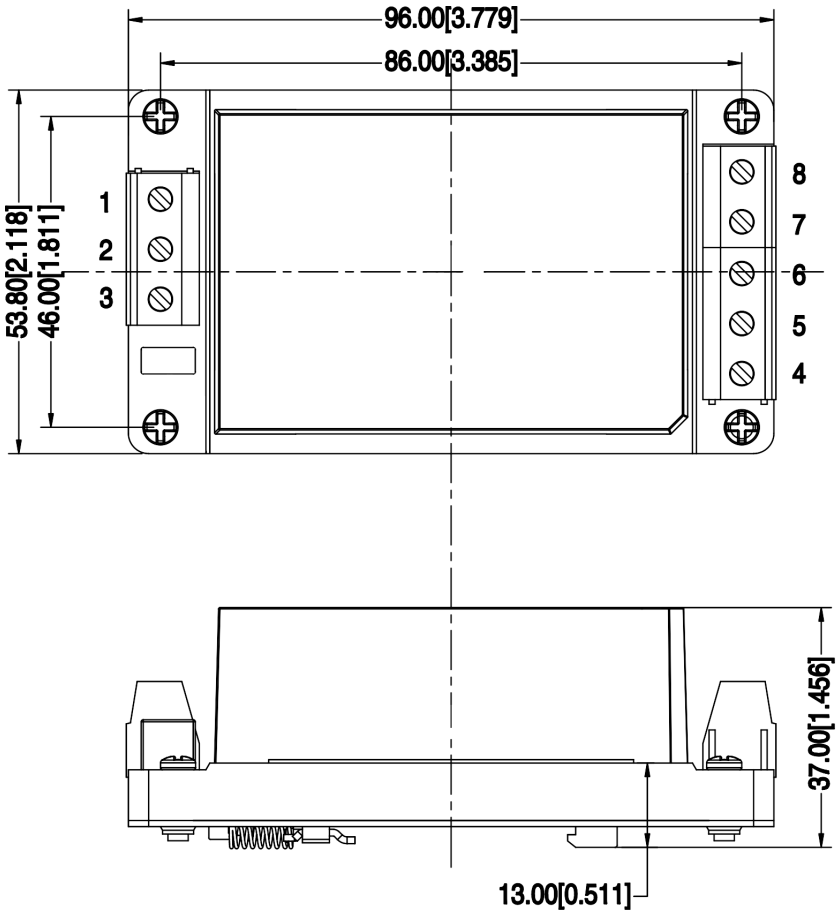
Unit: mm[inch]

Lead Wire size: 24-12AWG

Screwing torque: Max 0.4N.m

General tolerance: ±1.00[±0.039]

H2-TS Packaging Dimension



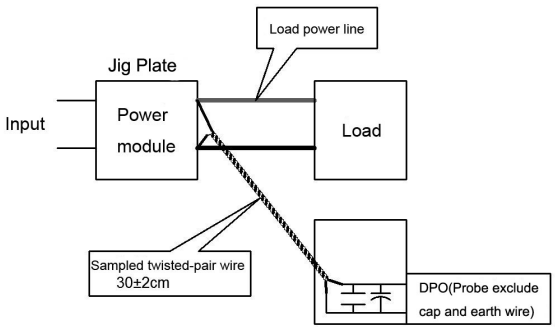
Pin	Function
1	NP
2	AC(N)
3	AC(L)
4	+Vo
5	NP
6	NP
7	NP
8	-Vo

Note:
Unit: mm[inch]
Lead Wire size: 24-12AWG
Screwing torque: Max 0.4 N.m
General tolerance: ±1.00[±0.039]

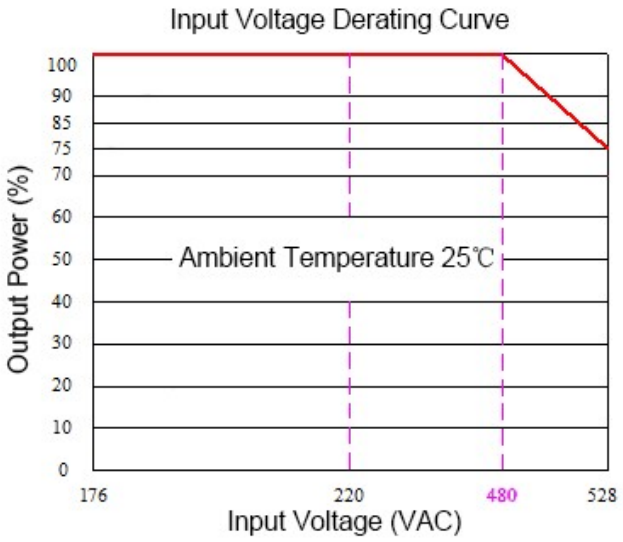
Packaging Code	L x W x H	
H2	70.0X48.0X23.5 mm	2.756X1.890X0.925 inch
H2-T	96.0X53.8X32.5 mm	3.779X2.118X1.279 inch
H2-TS	96.0X53.8X37.0 mm	3.779X2.118X1.456 inch

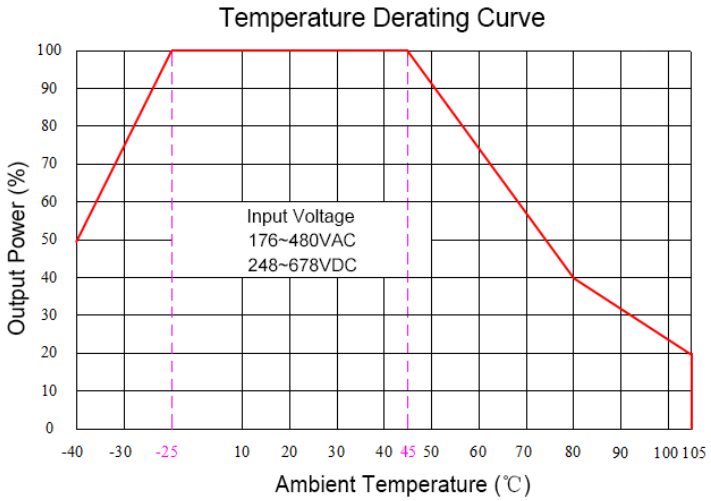
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

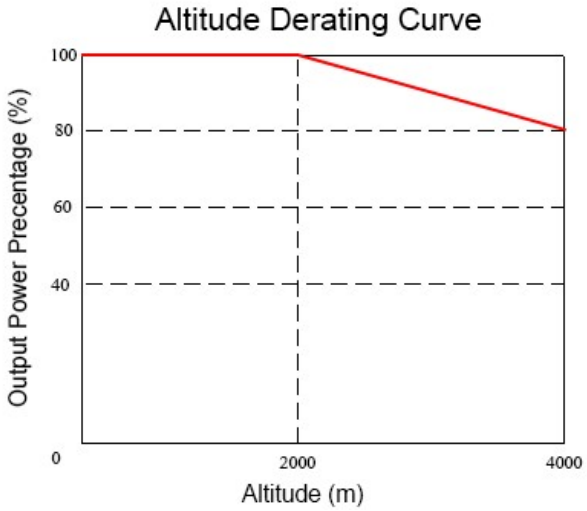
1) Ripple noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.
2) The output ripple noise test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curve





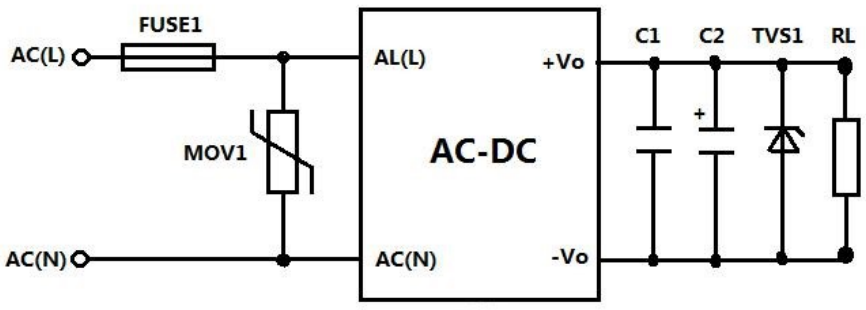


Note 1: The output power should be derated based on the input voltage derating curve at 480~528VAC/678~745VDC.

Note 2: This product should operate at a natural air condition, please contact us if it need be used at a closed space.

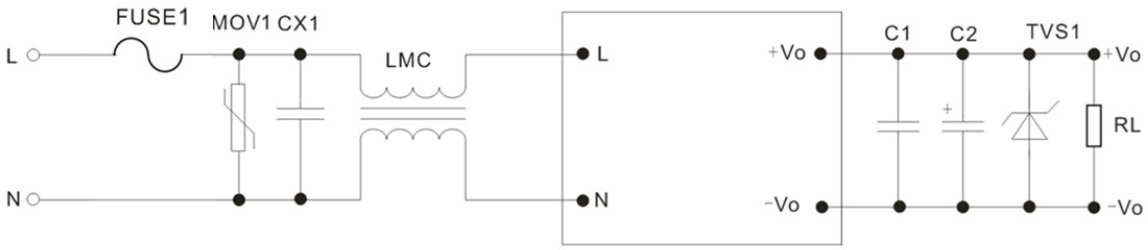
Recommended Circuits for Application

1. Typical Application Circuit



Circuit 1

2. Recommended EMC Circuit



Circuit 2

Model	FUSE1	MOV1	C1	C2	TVS1
FA30-380S05H2N4	2.5A/500VAC/Time-delay fuse, necessary	14D911K/ 4500A	1uF/50V	330uF/10V	SMBJ7.0A
FA30-380S12H2N4				220uF/16V	SMBJ20A
FA30-380S15H2N4				220uF/25V	SMBJ30A
FA30-380S24H2N4				220uF/35V	SMBJ30A

Note:

1.CX1, CX2 are X capacitors, X2/334K/300Vac is recommended.

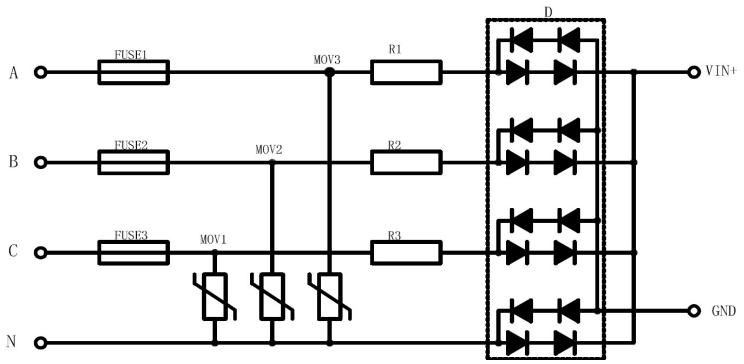
2.LMC is a CMC(common mode choke), 25mH/0.6A is recommended.

3. High-frequency low-resistance electrolytic capacitor is recommended for C2 as the output filter capacitor, please refer to the technical specification provided by its manufacturer for the capacitance and current values. C2 withstand voltage can be decreased at least 80% of rated. C1 is a ceramic capacitor to suppress high-frequency noise.

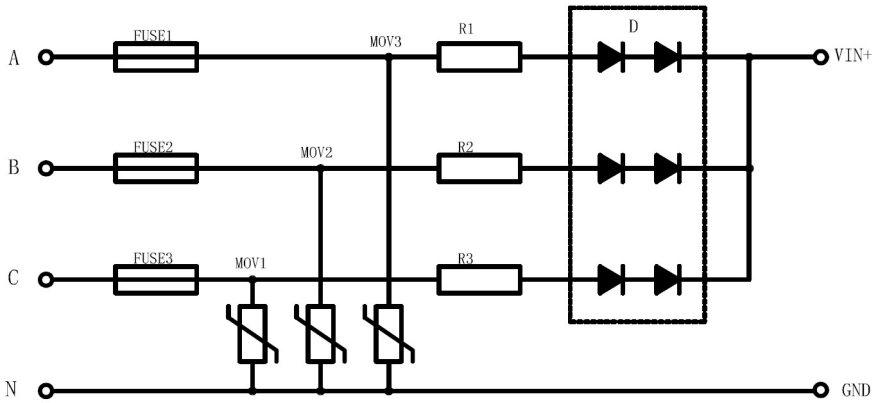
4.CY1, CY2 are Y capacitors, 102M/400Vac is recommended.

5. TVS is recommended to protect the output circuit when the module operates at abnormal condition.

3. Recommended circuit for strong Lightning surge situation



Circuit 3 (4KV Differential mode surge – Full-wave rectification circuit)



Circuit 4 (4KV Differential mode surge – Half-wave rectification circuit)

Recommended Circuits Components Parameters	
Component No.	**Parameter**
MOV1, MOV2, MOV3	20D911K/4500A
D	2A/1000V
R1, R2, R3	10Ω/5W (Linear resistor)
FUSE1, FUSE2, FUSE3	2.5A/500VAC Time-delay fuse, necessary

Application Notice:

1.The products should be used according to the specifications in this manual, otherwise it could be permanently damaged.

2. The product performance in this manual cannot be guaranteed if it works at a lower load than the minimum load defined.

3. The product performance in this manual cannot be guaranteed if it works at over-load condition.

4. Unless otherwise specified, all values or indicators in this manual are tested at Ta=25℃, humidity<75%RH, rated input voltage and rated load (pure resistance load).

5. All values or indicators in this manual had been tested based on Aipupower test specifications.

6.The specifications are specially for the parts listed in this manual, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.

7. Aipupower can provide customization service.

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