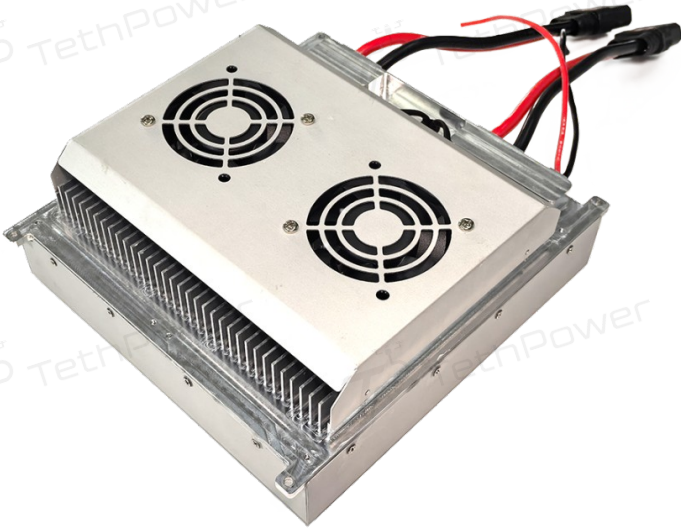
Product Manual

TP-P8-80050



1. Overview

1、 Application Scenarios

This high-voltage DC power supply is a specially customized power supply, featuring advantages such as small size, light weight, high efficiency, and built-in fan for heat dissipation. Its maximum working efficiency is ≥97%. The power module adopts an aluminum shell design, which is lightweight and aesthetically pleasing. With IP54 protection, it can serve as a substitute for imported high-voltage DC modular power supplies.

2、 Product Features

- DC-DC isolated power supply converter: It isolates and converts the input 800V direct current (DC) into 50V DC, with a total output power of 8KW.
- It has the characteristics of high power density, small size, and light weight.
- The design meets the requirements for power supply reliability: The input is equipped with over/under-voltage protection, and the output has functions such as over-voltage protection, current limiting, short-circuit protection, and over-temperature protection.

3、 Main Specifications of the Product

Input voltage range	Rated output voltage	Rated output power	Efficiency	Voltage regulation accuracy	Output ripple and noise
680～800Vdc	50±0.5Vdc	8KW	≥97%	±1%	≤±2%Vo

2. Environmental conditions

NO.	Program	Technical indicators	Unit	Remark
1	Operating temperature	-40℃～+50℃	℃	
2	Storage temperature	-40℃～+80℃	℃	/
3	Relative humidity	≤95	%	No condensation（40℃ ±2℃）
4	Altitude	0-2000	m	
5	Atmospheric pressure	76～106	K pa	/
6	Heat dissipation method	Self-contained air cooling	/	/

3. Electrical characteristics

1	Input characteristics			
NO.	Program	Technical requirements	Unit	Remarks
1.1	Rated input voltage	750	Vdc	
1.2	Input voltage range	680～800	Vdc	
1.3	Maximum input current	14	A	In=680Vdc，Po=8KW
2	Output characteristics			
NO.	Program	Technical requirements	Unit	Remarks
2.1	Output rated voltage	50	Vdc	/
2.2	Output voltage range	47～50.5	Vdc	
2.3	Rated output current	160	A	/
2.4	Maximum output current	175	A	/
2.5	Rated output power	8	KW	/
2.6	Output efficiency	≥97	%	In=750Vdc，Half load
2.7	Voltage regulation accuracy	±1	%	/
2.8	Source regulation rate	±1	%	/
2.9	Load regulation rate	±1	%	/
2.10	Output ripple and noise	±2	%/Vo	Bandwidth limitation: 20MHz. Connect a 10μF electrolytic capacitor and a 0.1μF film capacitor in parallel at the test end; 750V input, rated load

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2.11	Temperature coefficient	±0.02	%/℃	/
2.12	Output rise time	≤200	ms	/
2.13	Output delay at power-on	≤5	S	Rated input
2.14	Overshoot amplitude during power-on and power-off	△V：≤±5	%	/
2.15	Dynamic response overshoot	△V：≤±5	%	/
2.16	Dynamic response recovery time	≤2	ms	25%～50%～25% or 50%～75%～50% Load variation，25℃
3	**Protection Characteristics**			
NO.	**Program**	**Technical requirements**	**Unit**	**Remarks**
3.1	Input under-voltage protection	620～640	Vdc	The hysteresis is greater than 10V
3.2	Input under-voltage recovery	≦650	Vdc	
3.3	Input over-voltage protection	820～840	Vdc	The hysteresis is greater than 10V
3.4	Input over-voltage recovery	≧800	Vdc	
3.5	Input reverse connection protection	No damage will occur in case of reverse connection		Reverse connection of 800Vdc input
3.6	Output over-voltage protection	54～56	Vdc	It can recover automatically
3.7	Output over-current protection	180～190	A	It can recover automatically
3.8	Output short-circuit protection	Available		It can recover automatically
3.9	Over-temperature protection	80	℃	Shell temperature
3.10	Over-temperature recovery	65	℃	

4. Safety Characteristics

NO.	Program		Test conditions	Remarks
1	Withstand voltage strength	Input to output	2500Vdc/2mA/1min	There is no arcing and no breakdown.
		Input to enclosure	2000Vdc/2mA/1min	
		Output to enclosure	500Vdc/2mA/1min	
2	Insulation resistance	Input to output	≥10MΩ@ 500Vdc	Under normal atmospheric pressure, when the relative humidity is 90% and the test DC voltage is 500V.
		Input and enclosure	≥10MΩ@ 500Vdc	
		Output to enclosure	≥10MΩ@ 500Vdc	

5. Other Characteristics

1. Flammability requirements：

The flame-retardant grade of the PCBs used in the system should meet the V-0 requirements specified in GB4943.1-2011. The flame-retardant grade of the insulated cables should meet the requirements specified in GB/T 18380.12-2008. The flame-retardant grade of other insulating materials should meet the V-1 requirements specified in GB4943.1-2011.

2. System noise

The system noise shall not exceed 55dB(A).

3. System reliability

MTBF≥100Khour；

Test conditions: At 25℃, with rated input and full-load output, predicted by the stress method in MIL-HDBK-217F Notice2.

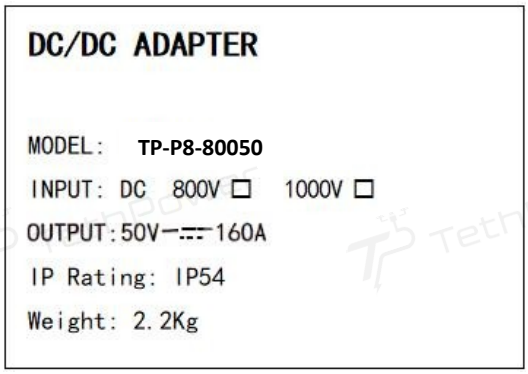
4. Protection Level

The protection level should meet the requirements of IP54 grade. Water accumulation on the top of the power supply housing is not allowed.

5. Three Protections (Moisture-proof, Mildew-proof, Salt Fog-proof)

The printed circuit boards, plug-in components and other circuits inside the product should be treated with anti-humidity, anti-mildew and anti-salt spray measures. Among them, the anti-salt spray ability should meet the requirements of Table 9 in GB/T 4797.6, so that the product can operate normally in outdoor humid and salt spray environments.

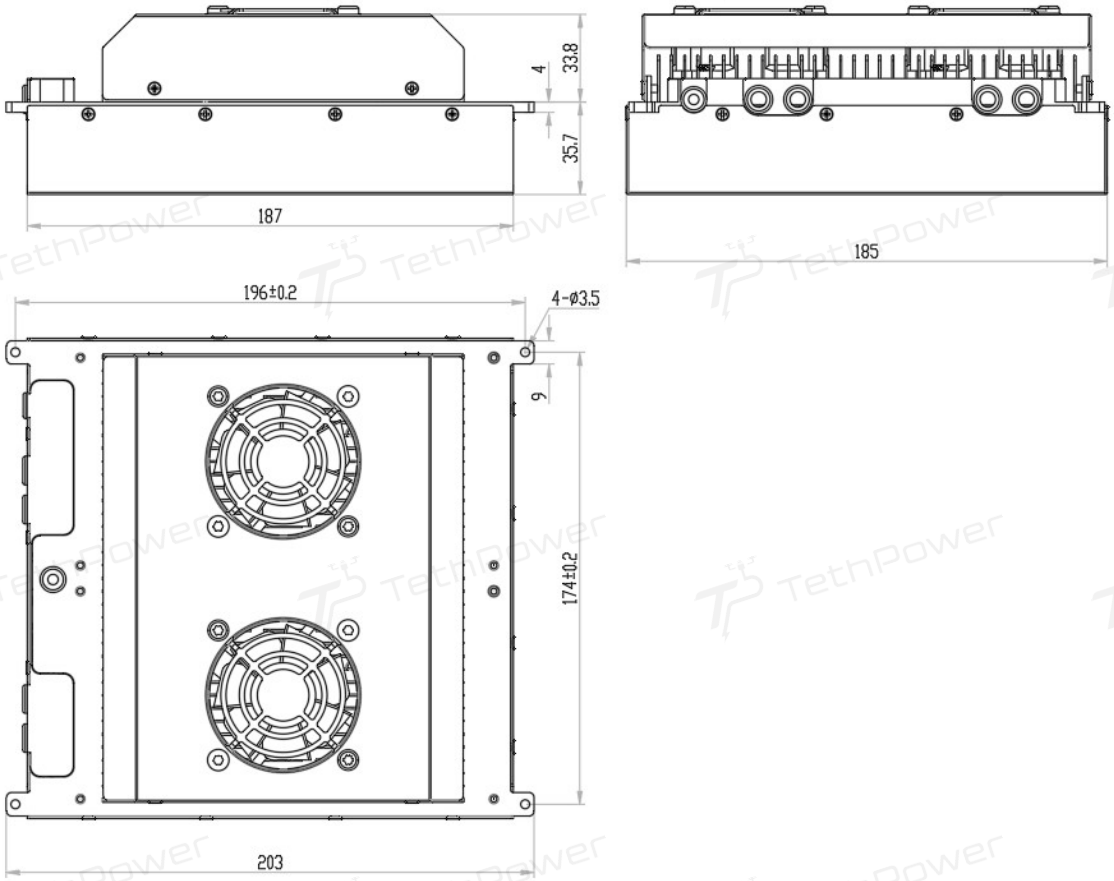
6. Product Label



7. Mechanical dimensions and definitions of connectors

1、 Schematic diagram of the product installation dimensions

Parameters	Indicator
Shell dimensions	187mm*185mm*70mm±1mm



2、 Product weight：

About 2.2KG

8. Packaging, Transportation, and Storage

1. Packaging
   The product name, model, manufacturer's logo, the inspection certificate of the manufacturer's quality department, the manufacturing date, etc. shall be marked on the packaging box; an accessory list shall be included in the packaging box.

2. Transportation
   The product shall be packed in a firm packaging box during transportation. The outside of the box shall comply with the relevant national standards and shall be marked with signs such as "Handle with Care" and "Keep Away from Moisture". The packaging box containing the product is allowed to be transported by any means of transportation. During transportation, direct exposure to rain and snow as well as mechanical impacts shall be avoided.
3. Storage
   When the product is not in use, it should be stored in the packaging box. The ambient temperature of the warehouse should be between -10℃ and 40℃, and the relative humidity should not exceed 80%. There should be no harmful gases, flammable and explosive products, or corrosive chemical substances in the warehouse. Also, there should be no strong mechanical vibration, impact, or strong magnetic field. The packaging box should be placed on a cushion at least 20 cm above the ground, and at least 50 cm away from the walls, heat sources, windows, or air inlets. Under the conditions specified herein, the general storage period is 2 years. After more than 2 years, re-inspection should be carried out.

9. Safety Precautions

1. Once the safety protection of the equipment is damaged, the equipment must stop operating and be dealt with in accordance with the relevant maintenance regulations.
2. When the power supply equipment is transferred from a cold environment to a warm one, condensation may pose a risk of electric leakage. Therefore, the grounding requirements must be strictly implemented; Only qualified personnel are allowed to connect the equipment to the power supply.
3. After cutting off the power supply, the equipment must be shut down for five minutes to allow sufficient time for the capacitors to discharge before any maintenance work on the power supply equipment can be carried out.
4. Pay attention to safety during use: Avoid touching the areas with safety warning signs and high-voltage signs by hand to prevent electric shock and scalding.

10. Referenced Standards and Specifications

GB/T 2423.1-2001 Environmental testing for electrical and electronic products - Part 2: Test methods/Test A: Low temperature
GB/T 2423.2-2001 Environmental testing for electrical and electronic products - Part 2: Test methods/Test B: High temperature
GB/T 2423.3-1993 Basic environmental test procedures for electrical and electronic products - Test Ca: Method for test of constant damp heat
GB/T 2423.4-1993 Basic environmental test procedures for electrical and electronic products - Test Db: Method for test of cyclic damp heat
GB/T 2423.5-1995 Environmental testing for electrical and electronic products - Part 2: Test methods/Test Ea and guidance: Shock
GB/T 2423.6-1995 Environmental testing for electrical and electronic products - Part 2: Test methods/Test Eb and guidance: Collision
GB/T 2423.8-1995 Environmental testing for electrical and electronic products - Part 2: Test methods/Test Ed: Free fall
GB/T 2423.10-1995 Environmental testing for electrical and electronic products - Part 2: Test

methods/Test Fc and guidance: Vibration (sinusoidal)
GB/T 2423.11-1997 Environmental testing for electrical and electronic products - Part 2: Test methods/Test Fd: Broadband random vibration - General requirements
GB/T 2423.22-2002 Environmental testing for electrical and electronic products - Part 2: Test N: Temperature change
GB/T 14508-93 Mechanical environmental conditions for the freight transportation on classed highways
EN55022: 1998 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
EN55024: 1998 Information technology equipment - Immunity characteristics - Limits and methods of measurement
CEI IEC 61000-4-2 2001 Electromagnetic compatibility - Testing and measurement techniques - Electrostatic discharge immunity test
CEI IEC 61000-4-3 2002 Electromagnetic compatibility - Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
CEI IEC 61000-4-4 1998 Electromagnetic compatibility - Testing and measurement techniques - Electrical fast transient/burst immunity test
CEI IEC 61000-4-5 1999 Electromagnetic compatibility - Testing and measurement techniques - Surge (impact) immunity test
CEI IEC 61000-4-6 2001 Electromagnetic compatibility - Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
CEI IEC 61000-4-8 1993 Electromagnetic compatibility - Testing and measurement techniques - Power frequency magnetic field immunity test
CEI IEC 61000-4-11 1994 Electromagnetic compatibility - Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity test
CEI IEC 61000-4-29 2000 Electromagnetic compatibility - Testing and measurement techniques - Immunity to voltage dips, short interruptions and voltage variations on DC input ports
IEC 61000-3-2 2001 Electromagnetic compatibility - Limits - Limits for harmonic current emissions (equipment input current per phase ≤ 16 A)
IEC 61000-3-3 1994 Electromagnetic compatibility - Limits - Voltage fluctuations and flicker in low-voltage supply systems (equipment rated current ≤ 16 A)
GB4943-2001 Safety of information technology equipment
YD/T 282-2000 General test methods for the reliability of communication equipment
GB/T 13722-92 Technical requirements and test methods for mobile communication power supplies
YD/T 732-95 Test methods for DC-DC converters for telecommunication
YD/T 731-2002 High-frequency switching rectifiers for telecommunication
GB14287.1-2005 Electrical fire monitoring system - Part 1: Electrical fire monitoring equipment