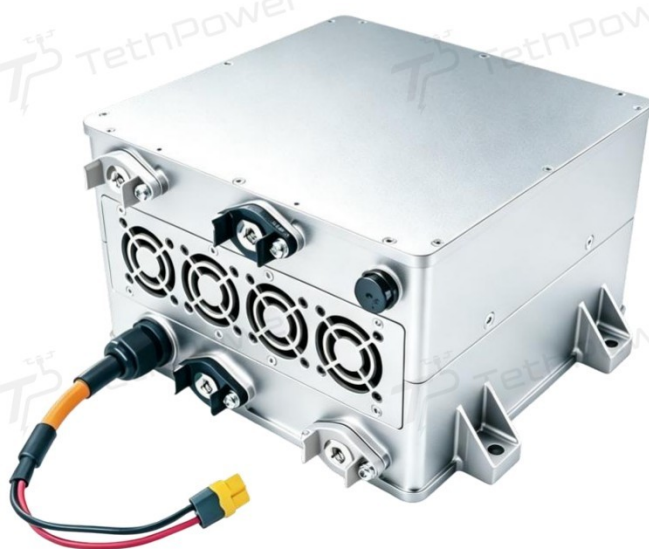


Product Manual

TP-P16-100050



1. Overview

1、 Application Scenarios

This high-voltage DC power supply is a specially customized power supply, which has the advantages of small size, light weight, high efficiency, and built-in fan for heat dissipation. Its maximum working efficiency is $\geq 97\%$. The power supply module is designed with an aluminum shell, which is light, beautiful, and has a waterproof design. It can be used as a substitute for imported high-voltage DC module power supplies.

2、 Product Features

- DC-DC isolated power converter: It isolates and converts the input 1KV direct current (DC) into 50V DC, with a total output power of 16KW.
- It features high power density, small size, light weight, etc.
- The design meets the reliability requirements of the power supply: There is over/under voltage protection for the input, and the output has the functions of overvoltage protection, current limiting, short-circuit protection, and overtemperature protection.

3、 Product Photos

4、 Main Specifications of the Product

Input voltage range	Rated output voltage	Rated output power	Efficiency	Voltage regulation accuracy	Output ripple and noise
850~1000Vdc	50±0.5Vdc	16KW	$\geq 97\%$	$\leq \pm 1\%$	$\leq \pm 2\%V_o$

2. Environmental conditions

NO.	Program	Technical indicator	Unit	Remark
1	Operating temperature	-40°C~+50°C	°C	
2	Storage temperature	-40°C~+80°C	°C	/
3	Relative humidity	≤ 95	%	No condensation (40°C±2°C)

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	950	Vdc	
1.2	Input voltage range	850~1000	Vdc	
1.3	Maximum input current	21	A	In=850Vdc, Po=16KW
2	Output characteristics			
NO.	Program	Technical requirements	Unit	Remarks
2.1	Output rated voltage	50	Vdc	/
2.2	Output voltage range	49.7~50.3	Vdc	
2.3	Rated output current	320	A	/
2.4	Maximum output current	340	A	/
2.5	Rated output power	16	KW	/
2.6	Output efficiency	≥97	%	In=950Vdc, 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 at the test end; Rated load
2.11	Temperature coefficient	±0.02	%/°C	/
2.12	Output rise time	≤200	ms	/
2.13	Output delay at startup	≤5	S	Rated input
2.14	Over - shoot amplitude during startup and shutdown	ΔV: ≤±5	%	/
2.15	Dynamic response over - shoot	ΔV: ≤±5	%	/

2.16	Dynamic response recovery time	≤ 2	ms	25%~50%~25% or 50%~75%~50% load change, 25°C
3 Protection Characteristics				
NO.	Program	Technical requirements	Unit	Remarks
3.1	Input under - voltage protection	730~770	Vdc	The hysteresis is greater than 10V
3.2	Input under - voltage recovery	≤ 800	Vdc	
3.3	Input over - voltage protection	1030~1070	Vdc	The hysteresis is greater than 10V
3.4	Input over - voltage recovery	≥ 1000	Vdc	
3.5	Input reverse connection protection	There will be no damage in case of reverse connection		When the input of 750V DC is reverse-connected
3.6	Output over - voltage protection	54~59	Vdc	it can self-recover
3.7	Output over - current protection	340~360	A	it can self-recover
3.8	Output short - circuit protection	It can be short-circuited for a long time		it can self-recover
3.9	Over-temperature protection	75	°C	Shell temperature
3.10	Over-temperature recovery	65	°C	

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	$\geq 10M\Omega @ 500Vdc$	At normal atmospheric pressure, when the relative humidity is 90% and the test direct current voltage is 500V
		Input and enclosure	$\geq 10M\Omega @ 500Vdc$	
		Output to enclosure	$\geq 10M\Omega @ 500Vdc$	

5. Other Characteristics

1. Flammability requirements:

The flame-retardant grade of the PCB used in the system should meet the V-0 requirements specified in GB4943.1-2011. The flame-retardant grade of the insulated cable 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 be greater than 45 decibels (A) (dB(A)).

3. System reliability

MTBF≥100Khour ;

Test conditions: At 25°C, with rated input and full-load output. Predicted by the stress method in MIL - HDBK - 217F Notice 2 ;

4. Protection Level

The protection level should meet the requirements of IP54. 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 for protection against moisture, mildew and salt spray. Among them, the salt spray resistance should meet the requirements of Table 9 in GB/T 4797.6, enabling the product to operate normally in outdoor environments with humidity and salt spray.

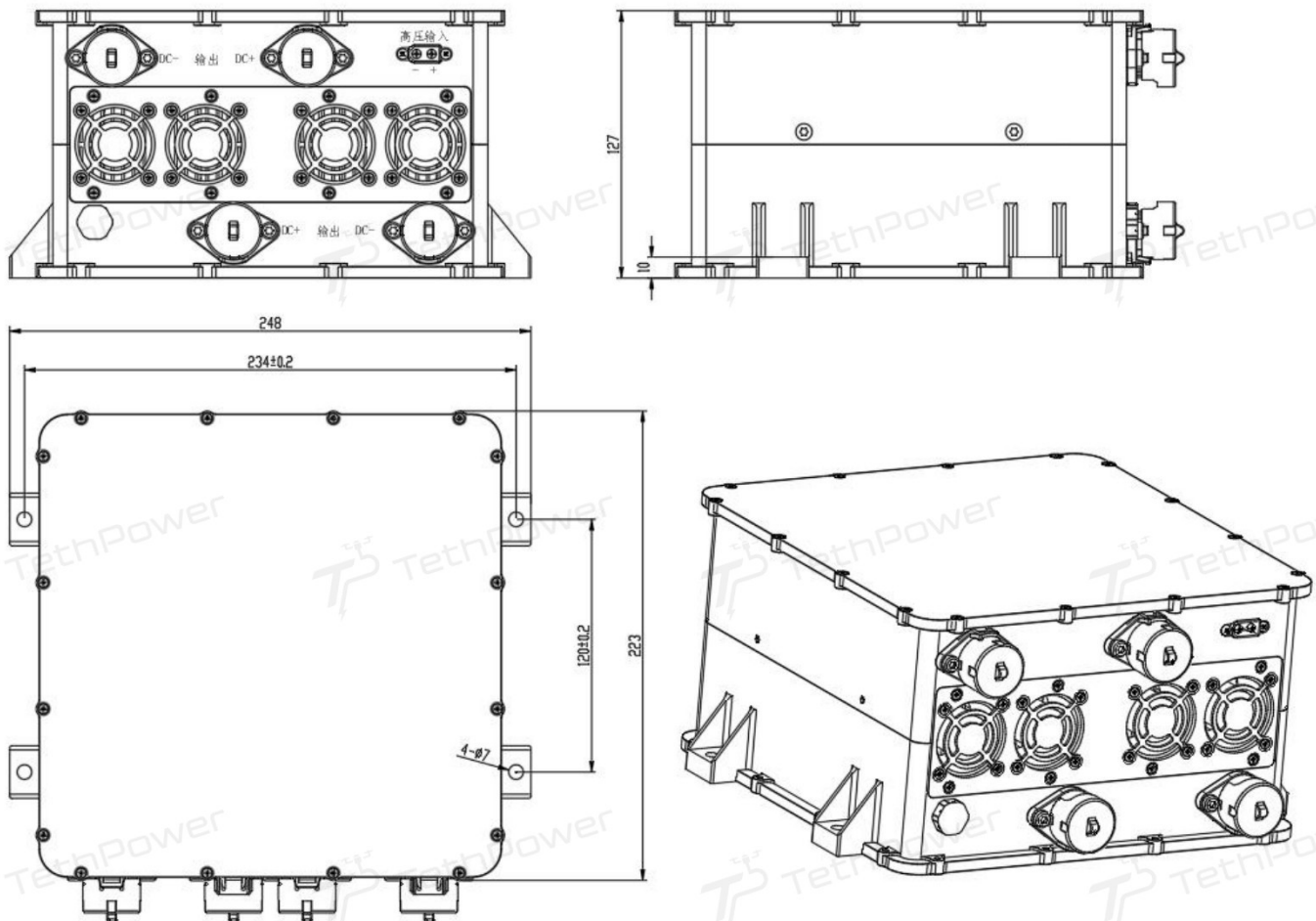
6. Product Label

DC/DC ADAPTER
MODEL: TP-P16-100050
INPUT: DC 750V ☐ 1000V ☒ 1400V ☐
OUTPUT: 50V ☒ 320A
IP Rating: IP54
Weight: 6500g

7. Mechanical dimensions and definitions of connectors

1、 Schematic diagram of the product installation dimensions

Parameters	Indicator
External dimensions	206mm*201mm*127mm±1mm



2、Product weight

About 6.5KG

8. Packaging, Transportation, and Storage

1. Packaging

The product name, model, manufacturer's logo, the inspection certificate issued by the manufacturer's quality department, the manufacturing date, etc. shall be marked on the packaging box. There is an accessory list inside the packaging box.

2. Transportation

When transporting the product, there should be a sturdy packaging box. The outside of the box should comply with the provisions of relevant national standards and should have marks 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 should be avoided.

3. Storage

When the product is not in use, it should be stored in the packaging box. The ambient

temperature in the warehouse should be between -10°C and 40°C, and the relative humidity should not exceed 80%. There are not allowed to have harmful gases, flammable and explosive products, and corrosive chemical substances in the warehouse. Also, there should be no strong mechanical vibrations, impacts, or strong magnetic fields. The packaging box should be placed on a cushion at least 20 cm above the ground, and at least 50 cm away from walls, heat sources, windows, or air inlets. Under the conditions specified herein, the general storage period is 2 years. After exceeding 2 years, the product should be reinspected.

9. Safety Precautions

1. Once the safety protection of the equipment is damaged, the equipment must stop operating and be handled in accordance with the relevant maintenance regulations.
2. When the power supply equipment is moved from a cold environment to a warm environment, 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 capacitor to discharge before any maintenance work can be carried out on the power supply equipment.
4. Pay attention to safety in 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 tests for electrical and electronic products - Part 2: Test methods/Test A: Low temperature

GB/T 2423.2-2001 Environmental tests 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 tests for electrical and electronic products - Part 2: Test methods/Test Ea and guidance: Shock

GB/T 2423.6-1995 Environmental tests for electrical and electronic products - Part 2: Test methods/Test Ea and guidance: Collision

GB/T 2423.8-1995 Environmental tests for electrical and electronic products - Part 2: Test methods/Test Ed: Free fall

GB/T 2423.10-1995 Environmental tests for electrical and electronic products - Part 2: Test methods/Test Fc and guidance: Vibration (sinusoidal)

GB/T 2423.11-1997 Environmental tests for electrical and electronic products - Part 2: Test methods/Test Fd: Broadband random vibration - General requirements

GB/T 2423.22-2002 Environmental tests 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 test 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 $\leq 16\text{A}$)

IEC 61000-3-3 1994 Electromagnetic compatibility - Limits - Voltage fluctuations and flicker in low-voltage supply systems (equipment rated current $\leq 16\text{A}$)

GB4943-2001 Safety of information technology equipment

YD/T 282-2000 General test methods for the reliability of telecommunication 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 used in telecommunication

YD/T 731-2002 High-frequency switching rectifiers for telecommunication

GB14287.1-2005 Electrical fire monitoring system - Part 1: Electrical fire monitoring equipment