TP-P100



I. Overview

1、application

This high-voltage DC power supply is a specially customized unit featuring a compact size, lightweight construction, high efficiency, and built-in fan cooling; its maximum operating efficiency is ≥98%. The power module features an aluminum housing design that is lightweight and aesthetically pleasing, along with a waterproof construction – making it an ideal replacement for imported high-voltage DC module power supplies.

2、Product Features

- DC-DC isolated power converter: accepts 1600-2000 VDC input and provides 430 VDC rated output (400-440 VDC range), with 108 kW rated output and 120 kW maximum output.
- Characterized by high power density, compact size, and light weight.
- The design meets power supply reliability requirements: the input features overvoltage/undervoltage protection, while the output includes overvoltage protection, current limiting, short-circuit protection, and overtemperature protection functions.
- DSP digital design with strong scalability and support for CAN communication.
- Dynamic autonomous current balancing supports the parallel operation of multiple units to expand power capacity, supporting power extensions of up to 200 kW or higher.
- Key components are manufactured to automotive-grade standards, ensuring high reliability.

3、product photograph



4、Product Main Specifications

input voltage range	Rated output voltage	Rated output power	Efficiency	Voltage regulation accuracy	Output ripple and noise
1600 ~ 2000Vdc	430±4Vdc	108KW	≥98%	≤±1%	≤±1.5%Vo

II. Environmental Conditions

order number	project	qualification	unit	remarks

1	working temperature	-20℃ ~ +40℃	℃	Designed for long-term operation at 108 kW
2	storage temperature	-40℃ ~ +85℃	℃	/
3	relative humidity	≤95	%	No condensation (40°C ± 2°C)
4	above sea level	0-3000	m	
5	atmospheric pressure	76 ~ 106	Kpa	/
6	Heat dissipation method	Built-in air cooling	/	Fan speed regulation control
7	levels of protection	IP65	/	/

III. Electrical Characteristics

1	**input characteristics**			
order number	**project**	**technical requirement**	**unit**	**remarks**
1.1	Rated input voltage	1900	Vdc	
1.2	input voltage range	1600 ~ 2000	Vdc	
1.3	Maximum input current	65	A	Vin=1800Vdc，Po=108KW
2	**output characteristic**			
order number	**project**	**technical requirement**	**unit**	**remarks**
2.1	Output rated voltage	430	Vdc	/
2.2	Output voltage range	400 ~ 440	Vdc	
2.3	rated output current	251	A	/
2.4	Rated output power	108000	W	/
2.5	Maximum output power	120000	W	
2.6	Conversion efficiency	≥98	%	Vin = 1900 VDC, 50% load
2.7	Voltage regulation accuracy	±1	%	/
2.8	Line regulation	±1	%	/
2.9	load regulation	±1	%	/
2.10	Output ripple and noise	≤10000	mVp-p	Bandwidth limit: 20 MHz; test terminal equipped with a 10 μF electrolytic capacitor and a 0.1 μF film capacitor; rated load

2.11	temperature coefficient	±0.02	%/℃	/
2.12	Output rise time	≤1	S	/
2.13	Power-on output delay	≤5	S	Rated input
2.14	Power-on/off overshoot amplitude	△V：≤±5	%	/
2.15	Dynamic response overshoot	△V：≤±5	%	/
2.16	Dynamic response recovery time	≤2	ms	Load variation: 25%–50%–25% or 50%–75%–50%; Temperature: 25°C
3	**protection feature**			
order number	**project**	**technical requirement**	**unit**	**remarks**
3.1	Under-voltage protection input	1540～1570	Vdc	Hysteresis greater than 10 V
3.2	Input Under-Voltage Recovery	≤1600	Vdc	
3.3	Input Overvoltage Protection	2040～2070	Vdc	Hysteresis greater than 15 V
3.4	Input Overvoltage Recovery	≥2000	Vdc	
3.5	Overvoltage protection	450～458	Vdc	Self-recovering
3.7	Output Overcurrent Protection	280～300	A	Self-recovering
3.8	Output short-circuit protection	Long-term short circuit without damage		Self-recovering
3.9	Overtemperature protection	When the casing temperature exceeds 65°C, the current output begins to decrease; at 75°C, overtemperature protection is activated; at 60°C, normal operation resumes.	℃	Case temperature

IV. Safety Features

order number	**project**		**test condition**	**remarks**
1	dielectric strength	Input to Output	5000Vdc/10mA/1min	No flashover or breakdown
		Input to the housing	3000Vdc/10mA/1min	
		Output to the housing	2000Vdc/10mA/1min	

2	insulation resistance	Input to Output	≥10MΩ@ 500Vdc	Under normal atmospheric pressure and a relative humidity of 90%, with a test DC voltage of 500 V
		Input and Housing	≥10MΩ@ 500Vdc	
		Output to the housing	≥10MΩ@ 500Vdc	

V. Other Features

1. Flame retardancy requirements:

The flame retardancy rating of the PCBs used in the system shall comply with the V-0 requirement specified in GB 4943.1-2011; the flame retardancy rating of the insulated cables shall comply with the requirements specified in GB/T 18380.12-2008; and the flame retardancy rating of other insulating materials shall comply with the V-1 requirement specified in GB 4943.1-2011.

2. System noise

System noise should not exceed 60 dB(A).

3. System Reliability

MTBF≥100Khour ；

Test conditions: 25°C, rated input, full-load output (as per the MIL-HDBK-217F Notice 2 Stress Method);

4. Protection Rating

The protection rating shall meet the IP65 requirements. No water accumulation is permitted on the top surface of the power supply housing.

5. Three-Protection (Dampness Protection, Mold Prevention, and Salt Spray Protection)

The printed circuit boards, plug-in connectors, and other circuits within the product shall be treated for moisture resistance, mold prevention, and salt spray resistance; the salt spray resistance shall comply with the requirements specified in Table 9 of GB/T 4797.6, ensuring that the product can operate normally in outdoor environments with high humidity or salt spray conditions.

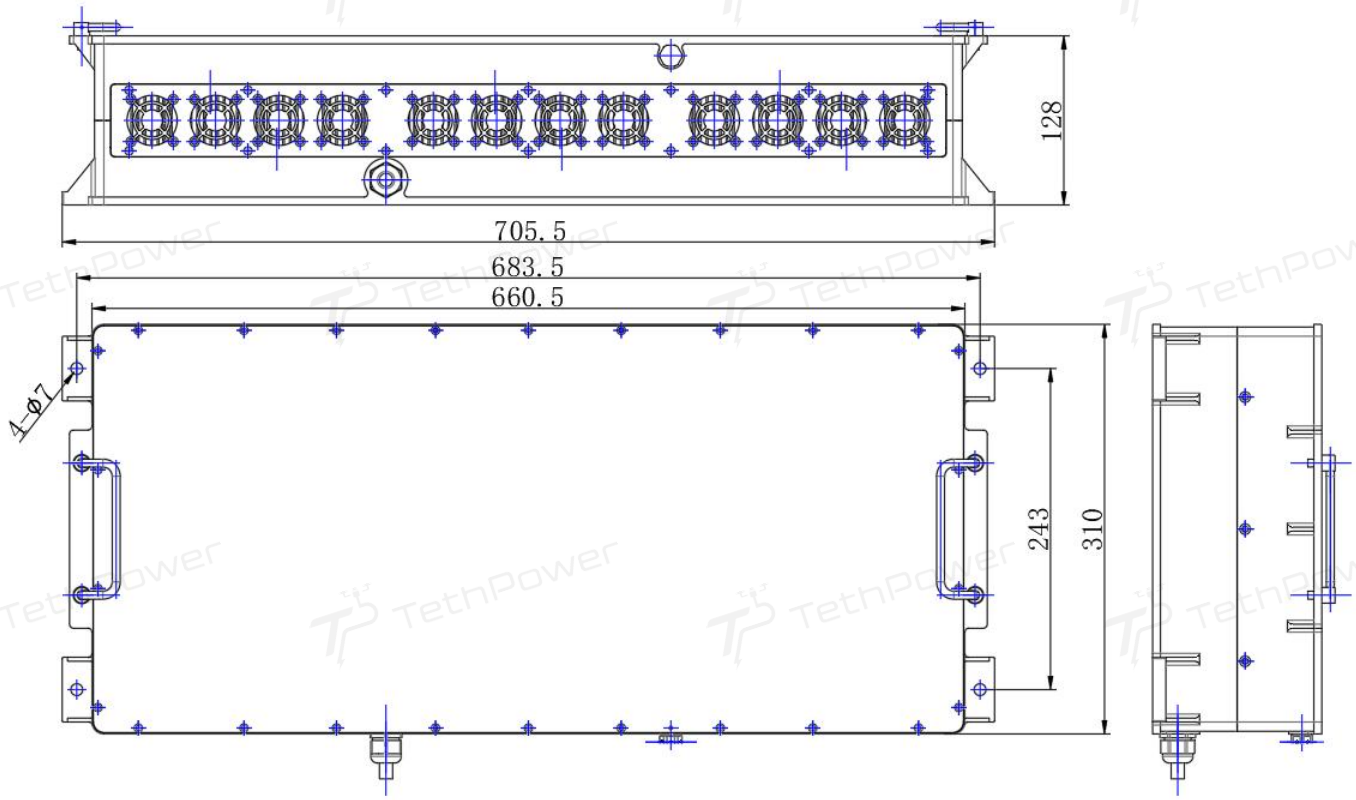
VI. Product Labeling

Made in-house or printed according to customer specifications.

VII. Mechanical Dimensions and Connector Definitions

1、 Product Installation Dimensional Diagram

parameter	metric
Maximum external dimensions	660mm*308mm*128±1mm



2、Connector Definition

Power Section Definition

definition table:

Function Name	definition	explanatory note
DC input	VIN+	High-voltage input positive terminal
	VIN-	High-voltage input negative terminal
DC output	OUT+	DC output positive
	OUT-	DC output negative

3、Quality (Net Weight):

Approx. 34 kg

VIII. Packaging, Transportation, and Storage

1. Packaging

The packaging box shall display the product name, model number, manufacturer's identification mark, the manufacturer's quality department inspection certificate, the manufacturing date, etc.; the interior of the packaging box shall contain an accessories list.

2. Transportation

Products shall be transported in securely sealed packaging boxes. The exterior of the boxes shall comply with relevant national standards and shall bear markings such as "Handle with care" or "Moisture proof." Packaging boxes containing products may be transported by any means of transport. During transportation, direct exposure to rain or snow, as well as mechanical impact, shall be avoided.

3. Storage

When not in use, the product shall be stored in its original packaging box under warehouse conditions where the ambient temperature ranges from –10°C to 40°C and the relative humidity does not exceed 80%. The warehouse shall be free of harmful gases, flammable or explosive materials, or corrosive chemicals; furthermore, the area shall be free from severe mechanical vibration, impact, or strong magnetic fields. The packaging box shall be placed at least 20 cm above the ground and at least 50 cm away from walls, heat sources, windows, or air inlets. The shelf life under these specified conditions is generally 2 years; after this period, the product shall be re-inspected.

IX. Safety Precautions

1. If the equipment's safety protection system is compromised, the equipment must be shut down immediately, and appropriate maintenance procedures should be followed.

2. When power supply equipment is moved from a cold environment to a warm environment, condensation may pose a risk of electrical leakage; therefore, grounding requirements must be strictly adhered to;

The equipment must be connected to the power supply only by a qualified personnel.

3. After disconnecting the power supply, the equipment must be shut down for five minutes to allow the capacitors sufficient time to discharge before performing any maintenance on the power supply equipment.

4. Pay attention to safety: In areas with safety warning signs or high-voltage warning signs, avoid touching them with your hands to prevent electric shock or burns.

X. Referenced Standards and Specifications

GB/T 2423.1-2001 Environmental testing of electrical and electronic products – Part 2: Test methods / Test A: Low temperature
GB/T 2423.2-2001 Environmental testing of electrical and electronic products – Part 2: Test methods / Test B: High temperature
GB/T 2423.3-1993 Basic Environmental Test Methods for Electrical and Electronic Products – Test Ca: Constant Humidity and Heat Test Method;
GB/T 2423.4-1993 Basic Environmental Test Methods for Electrical and Electronic Products – Test Db: Alternating Wet-Humid Heat Test Method
GB/T 2423.5-1995 – Environmental testing of electrical and electronic products – Part 2: Test methods / Test Ea and Guidelines: Impact
GB/T 2423.6-1995 – Environmental testing of electrical and electronic products – Part 2: Test methods / Test Ea and Guidelines: Impact

GB/T 2423.8-1995 – Environmental testing of electrical and electronic products – Part 2: Test methods / Test – Free fall
GB/T 2423.10-1995 – Environmental testing of electrical and electronic products – Part 2: Test methods / Test Fc and Guidelines: Vibration (Sine)
GB/T 2423.11-1997 – Environmental testing of electrical and electronic products – Part 2: Test methods / Test Fd: Wideband random vibration – General requirements
GB/T 2423.22-2002 – Environmental testing of electrical and electronic products – Part 2: Test N: Temperature variation
GB/T 14508-93 – Environmental conditions for freight transport machinery on graded highways
EN55022:1998 – Information technology equipment – Wireless interference characteristics – Limits and measurement methods;
EN55024:1998 – Information technology equipment – Electromagnetic compatibility – Limits and measurement methods;
CEI IEC 61000-4-2 (2001) – Electromagnetic compatibility – Test and measurement techniques – Electrostatic discharge immunity test
CEI IEC 61000-4-3: 2002 – Electromagnetic compatibility testing and measurement techniques – Test for immunity to radio frequency electromagnetic field radiation disturbance
CEI IEC 61000-4-4 (1998) – Electromagnetic compatibility testing and measurement techniques – Immunity test to electrical fast transient pulse trains
CEI IEC 61000-4-5 (1999) – Electromagnetic compatibility – Test and measurement techniques – Surge (impulse) immunity test
CEI IEC 61000-4-6: 2001 – Electromagnetic compatibility – Test 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 – Resistance to voltage sag, short-term interruption and voltage variation tests
CEI IEC 61000-4-29 (2000): Electromagnetic Compatibility Testing and Measurement Techniques – Immunity Test for Voltage Sags, Short-Term Interruptions and Voltage Transients at DC Input Ports
IEC 61000-3-2:2001 – Electromagnetic compatibility – Limits – Limits for harmonic current emission (for equipment with per-phase input current ≤ 16 A)
IEC 61000-3-3:1994 – Electromagnetic compatibility – Limits – Voltage fluctuations and flicker in low-voltage power supply systems (Equipment rated current ≤ 16 A)
GB4943-2001 – Safety of information technology equipment
YD/T 282-2000 – General Test Methods for Reliability of Communication Equipment
GB/T 13722-92 – Technical requirements and test methods for mobile communication power supplies
YD/T 732-95 – Testing Methods for DC–DC Converters for Telecommunications Applications
YD/T 731-2002 High-Frequency Switching Rectifier for Telecommunications
GB14287.1-2005 Electrical Fire Monitoring Systems – Part 1: Electrical Fire Monitoring Equipment