TP-P-FC200



I. Overview

1、application

The TP-P-FC200 high-voltage DC power supply is a custom airborne power unit designed specifically for the DJI FC200. Featuring a dual-unit design, it offers a compact size, lightweight construction, and high efficiency; it is directly compatible with the original factory battery compartment mounting position, allowing for non-destructive replacement of the original battery. It also includes built-in fan cooling and other advantages, with a maximum operating efficiency of ≥96%. The power module features an aluminum housing design that is lightweight and aesthetically pleasing, along with a waterproof design. It incorporates a flight-linked protection mechanism and is compatible with a wide range of high-power airborne operational loads, meeting the safe power supply requirements of the FC200 heavy-load operational platform. All electrical ratings, weight and dimensions in this manual are for one unit.

2、Product Features

- DC-DC isolated power converter: isolates and converts the input 1500 V DC power to 58 V DC, with a rated output power of 36 kW per unit.
- Features include high power density, compact size, and lightweight construction.
- The design complies with power supply reliability requirements: the input features overvoltage and undervoltage protection, while the output provides overvoltage protection, current limiting, short-circuit protection, and overtemperature protection.

3、product photograph



4、Key Product Specifications

Input voltage range	Rated output voltage	Rated output power per unit	Efficiency	Voltage regulation accuracy	Output ripple and noise
1200 ~ 1550Vdc	58Vdc	36KW	≥96%	≤±1%	≤±2%Vo

II. Environmental Conditions

order number	project	Technical requirement	unit	remarks
1	working temperature	-20℃ ~ +40℃	℃	36 kW for extended operation
2	storage temperature	-40℃ ~ +80℃	℃	/
3	relative humidity	≤95	%	No condensation (40 °C ± 2 °C)
4	Altitude	0-3000	m	
5	atmospheric pressure	76 ~ 106	Kpa	/
6	Heat dissipation method	Built-in air cooling	/	/

III. Electrical Characteristics

1	input characteristics			
order number	**project**	**technical requirement**	**unit**	**remarks**
1.1	Rated input voltage	1500	Vdc	
1.2	Input voltage range	1200 ~ 1550	Vdc	
2	**Output characteristics**			
order number	**project**	**technical requirement**	**unit**	**remarks**
2.1	Rated output voltage	58	Vdc	/
2.2	Output voltage range	52 ~ 59	Vdc	
2.3	Rated output current per unit	615	A	/
2.4	Rated output power per unit	36000	W	/
2.5	Peak output power per unit	40000	W	
2.6	Efficiency	≥96	%	Vin=1400Vdc， > 50%
2.7	Voltage regulation accuracy	±1	%	/
2.8	Line regulation	±1	%	/
2.9	load regulation	±1	%	/
2.10	Output ripple and noise	≤1000	mVp-p	Bandwidth limit: 20 MHz; the test end is 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 and power-off overshoot amplitude	△V：≤±5	%	/
2.15	Dynamic response overshoot	△V：≤±5	%	/
2.16	Dynamic response recovery time	≤2	ms	Load variation of 25%–50%–25% or 50%–75%–50%, at 25 °C
3	**protection feature**			
order number	**project**	**technical requirement**	**unit**	**remarks**
3.1	Input undervoltage protection	1140 ~ 1170	Vdc	Offset greater than 10 V
3.3	Input overvoltage protection	1570 ~ 1590	Vdc	Offset greater than 15 V
3.5	Output overvoltage protection	60 ~ 62	Vdc	Self-recoverable
3.7	Output overcurrent protection	685 ~ 720	A	Self-recoverable
3.8	Output short-circuit protection	Long-term short circuits cause no damage		Self-recoverable
3.9	Overtemperature protection	When the enclosure temperature exceeds 65°C, the current output begins to decrease.	℃	Shell temperature

IV. Safety Features

order number	project		test condition	remarks
1	dielectric strength	Input to output	3000Vdc/10mA/1min	No arc flash, no breakdown
		Input for outer shell	3000Vdc/10mA/1min	
		Output to the housing	1000Vdc/10mA/1min	
2	insulation resistance	Input to output	≥10MΩ@ 500Vdc	At normal atmospheric pressure, with a relative humidity of 90% and a test DC voltage of 500 V,
		Input and Housing	≥10MΩ@ 500Vdc	
		Output to the housing	≥10MΩ@ 500Vdc	

V. Other Characteristics

1. Flame retardancy requirements:

The flame retardancy rating of the PCB used in the system shall meet the V-0 requirement specified in

GB4943.1-2011; the flame retardancy rating of the insulated cable shall meet the requirements specified in GB/T 18380.12-2008; and the flame retardancy rating of other insulating materials shall meet the V-1 requirement specified in GB4943.1-2011.

2. System noise

System noise shall not exceed 60 dB(A).

3. System Reliability

MTBF≥100Khour ；

Test conditions: 25 °C, rated input, full-load output; MIL-HDBK-217F Notice 2 stress method prediction;

4. Protection Rating

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

5. Three Protections (against moisture, mold, and salt spray)

The printed circuit boards, connectors, and other circuit components within the product shall be treated for moisture resistance, mold resistance, and salt spray resistance; the salt spray resistance shall meet the requirements specified in Table 9 of GB/T 4797.6, enabling the product to operate normally in outdoor environments with high humidity and salt spray.

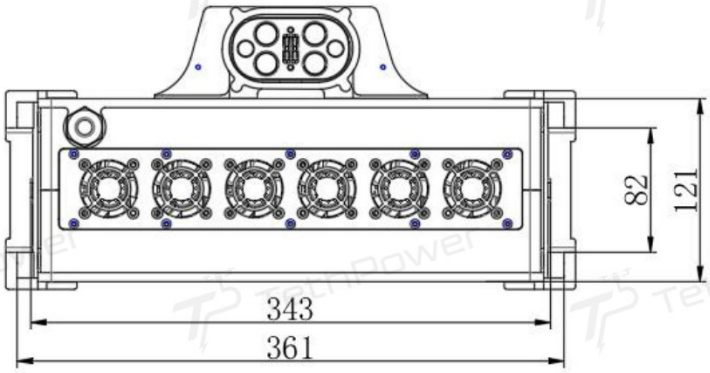
VI. Product Labeling

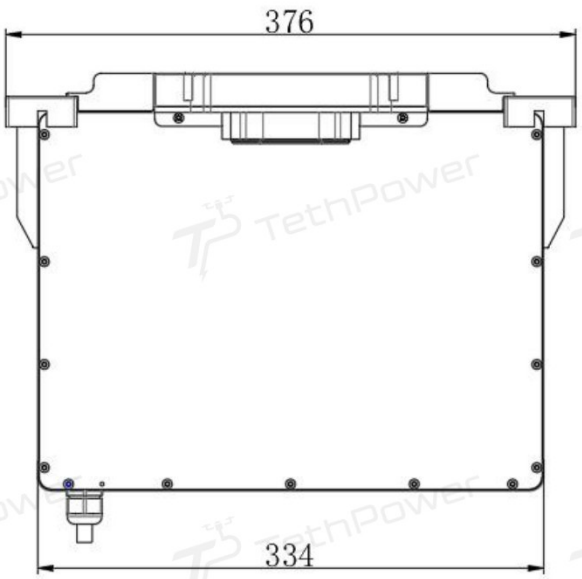
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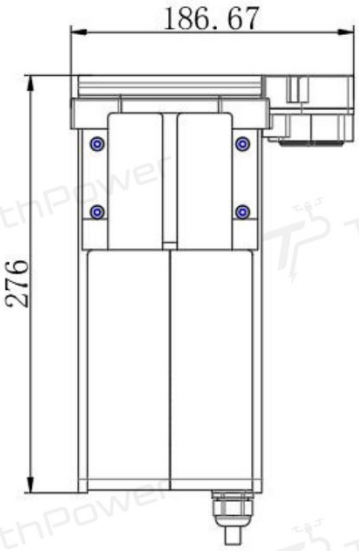
VII. Mechanical Dimensions and Connector Definitions

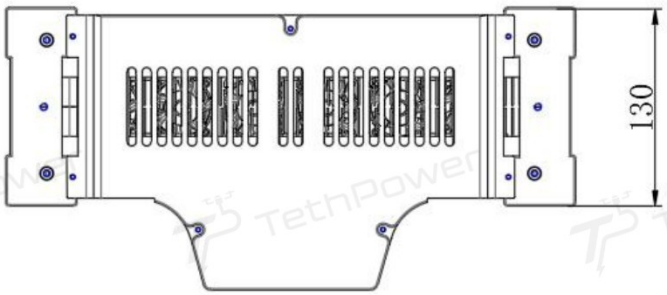
1、Product installation dimension diagram

parameter	metric
Maximum external dimensions	376 × 276 × 187 mm ±1 mm (per unit)









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+	58V output positive
	OUT-	58V output negative

3、Weight (net weight):

Approx. 14.5 kg per unit

8、Packaging, transportation, and storage

1. Packaging

The packaging box shall bear the product name, model, manufacturer's logo, inspection certificate issued by the manufacturer's quality department, manufacturing date, and other information; the interior of the packaging box shall contain an accessories list.

2. Transportation

Products should be transported in sturdy packaging boxes. The exterior of the boxes shall comply with the relevant national standards and shall bear markings such as "Handle with Care" and "Protect from Moisture." Packaging boxes containing products may be transported by any mode of transport. During transit, direct exposure to rain or snow and mechanical impact should be avoided.

3. Storage

When not in use, the product shall be stored in its packaging box. The warehouse temperature shall be-10–40 °C, and the relative humidity shall not exceed 80%. The warehouse must be free of harmful gases, flammable or explosive materials, and corrosive chemicals; it must also be free of intense mechanical vibration, impact, or strong magnetic field exposure. The packaging box shall be placed at least 20 cm above the floor and at least 50 cm away from walls, heat sources, windows, or air inlets. Under these specified conditions, the shelf life is generally 2 years; after this period, the product shall be retested.

9、Safety Precautions

1. Once the equipment's safety protection is compromised, the equipment must be shut down and handled in accordance with the relevant maintenance procedures.

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

Only qualified personnel may connect the equipment to the power supply.

3. The power supply must be disconnected and the equipment allowed to shut down for five minutes; only after the capacitors have had sufficient time to discharge should maintenance be performed on the power supply equipment.

4. Exercise caution when using the equipment: Avoid touching the equipment with your hands in areas where safety warning signs or high-voltage signs are displayed, 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 Regulations for Electrical and Electronic Products—Test Ca:

Constant Humidity and Temperature Test Method;
GB/T 2423.4, 1993—Basic Environmental Test Regulations for Electrical and Electronic Products—Test Db: Method for Alternating Moist Heat Testing
GB/T 2423.5-1995 Environmental testing of electrical and electronic products—Part 2: Test methods / Test Ea and guidelines: impulse
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/Tests—Ed: Free fall
GB/T 2423.10-1995 Environmental testing of electrical and electronic products — Part 2: Test methods / Test Fc and guidelines: vibration (sinusoidal)
GB/T 2423.11-1997 Environmental testing of electrical and electronic products—Part 2: Test methods / Test Fd: Broadband 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 Classified Highways
EN55022:1998 Information technology equipment — Wireless interference characteristics — Limits and measurement methods;
EN55024:1998 Information technology equipment — Immunity — 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 — Techniques for Electromagnetic Compatibility Testing and Measurement: Radio-Frequency Electromagnetic Field Radiation — Immunity Testing
CEI IEC 61000-4-4: 1998 — Techniques for Electromagnetic Compatibility Testing and Measurement — Immunity Testing for Electric Fast Transient Pulse Groups
CEI IEC 61000-4-5: 1999 – Techniques for Electromagnetic Compatibility Testing and Measurement – Surge (Impulse) Immunity Testing
CEI IEC 61000-4-6: 2001—Electromagnetic Compatibility—Test and Measurement Techniques—Immunity to Conducted Radiated Interference Induced by Radio Frequency Fields
CEI IEC 61000-4-8: 1993 – Electromagnetic Compatibility – Test and Measurement Techniques – Power Frequency Magnetic Field Immunity Test
CEI IEC 61000-4-11:1994 — Techniques for Electromagnetic Compatibility Testing and Measurement: Immunity Tests for Voltage Sag, Short-term Interruption, and Voltage Fluctuations
CEI IEC 61000-4-29:2000 — Electromagnetic Compatibility — Test and Measurement Techniques — Immunity Tests for Voltage Sag, Short-term Interruption, and Voltage Variation at DC Input Ports
IEC 61000-3-2: 2001 – Limits for electromagnetic compatibility – Limits for harmonic current emissions (for equipment with phase input current ≤ 16 A)
IEC 61000-3-3: 1994 – Limits for 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 the Reliability of Communication Equipment
GB/T 13722-92 Technical Requirements and Test Methods for Mobile Communication Power Supplies
YD/T 732-95 Test Method for Communication DC–DC Converters
YD/T 731-2002 High-frequency switching rectifier for communications
GB14287.1-2005 Electrical Fire Monitoring System – Part 1: Electrical Fire Monitoring System