Product Manual

TP-P1.5



Overview

1.The power supply features a small size, light weight, and a high waterproof rating.
2.It has a long service life, a fast dynamic response, and high efficiency.
3.It can seamlessly switch to the battery without any voltage transient drop.
4.The power supply adopts a highly reliable modular design.
5.It is widely used as the power supply for tethered lighting drones.

Function Description

The input range is 360-400Vdc, and the output is 24Vdc/62.5A. Rated power is up to 1400 W. Recommended output for long-term continuous operation is 1200 W. Peak output is 1500 W for less than 30 seconds. Adequate heat dissipation is required. The power supply has the functions of output overcurrent protection, output short-circuit protection, output overvoltage protection, and overtemperature protection.

Operating Environment

Program	Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Operating temperature	-40	-	+55	℃	Forced air cooling
Storage temperature	-55	25	+105	℃	
Relative humidity	5	-	95	%	Without condensation
Storage humidity	5	-	95	%	Without condensation
Atmospheric pressure	54	-	106	kPa	
Altitude	-	-	5000	m	
IP rate	IP55				

Basic input characteristics

Program	Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Input voltage range	360	390	400	Vdc	
Maximum limit input voltage	410	415	420	Vdc	The power supply will not be damaged under this condition
Maximum input current	-	-	4.3	A	Vin=360Vdc，Output rated load

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Program	Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Input inrush current	-	-	50	A	Vin=410Vdc，Output at full load
Power-on startup	360	390	400	V	Start with rated power

Basic output characteristics

Program		Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Output voltage range		22.5	24	25.5	Vdc	
OUT Load regulation rate		-	-	±3	%	
OUT Load regulation rate		-	-	±5	%	
Efficiency		95	97	97.5	%	Input 380-400Vdc,Output at full load
Ripple and noise		-	110	280	mVp-p	20MHz Bandwidth limitation
OUT current		-	58	62.5	A	
The amplitude of the output voltage overshoot		-	-	±5	%	
Transient response	The amplitude of overshoot	-	-	±5	%	Ta=25℃，50%-75%-50%，di/dt=0.1A/μs Load step change
	Recovery time	-	-	200	μs	
Temperature coefficient		-	-	±0.02	%/℃	

Protection characteristics

Program	Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Input overvoltage protection	435	440	445	V	
Input undervoltage protection	290	300	305	V	

Program	Minimum value	Typical value	Maximum value	Unit	Remark/Condition
Output overcurrent protection		63		A	Protection activates immediately at 63 A.
Output short-circuit protection	Available				It gets locked up, but it can operate normally after restarting.
Over-temperature protection function	Available				Self-recovery is available
Parallel connection of power supplies	Passive current sharing in parallel operation				

Other specifications

Program	Requirement	Remark
Three-proof design	Apply three-proof coating on the PCB	
Heat dissipation	Forced air-cooling heat dissipation	
MTBF	≥100K H	
Total weight of the machine	≤380g	
Power indication	One green light stays on steadily when it is working; otherwise, it goes out.	

Safety regulation characteristics

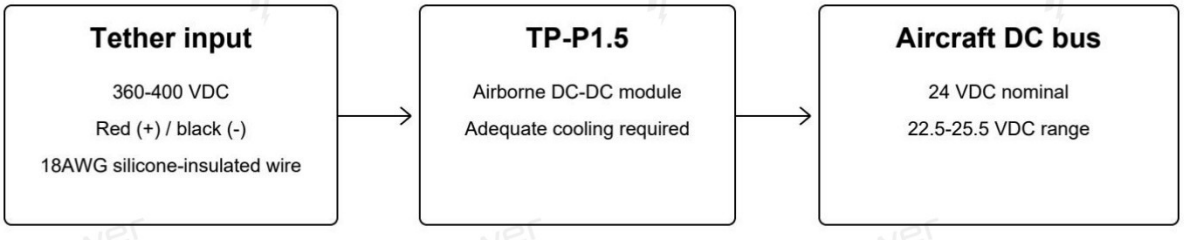
Program	Level			Standard (or testing conditions)
Insulation voltage withstand	Input to output	3000	Vdc	No breakdown and no arcing Testing conditions: 5mA /min, rising rate 500V/s
	Input to ground	1500	Vdc	
	Output to ground	500	Vdc	
Insulation resistance	Input to output	≥50	MΩ	Under normal atmospheric pressure and with a relative humidity of 90%, the test voltage is 500V direct current (500Vdc).
	Input to the chassis	≥50	MΩ	
	Output to the chassis	≥50	MΩ	

EMC characteristics

Program	Grade (Standard)	Remarks (Index Requirements)
Surge	IEC61000-4-5，LEVEL 3	The criteria are shown in Remark 1) A. For the input, the differential mode is ±1kV, and the common mode is ±2kV. An additional filtering circuit is required.
EFT	IEC61000-4-4 LEVEL 3	The voltage between wires is ±1KV, and the voltage between wire and ground is ±2KV. The criteria are shown in Remark B, and both the input and output need to meet these requirements.
ESD	GB/T 17626.2-2006	Contact discharge: ±6KV. The criteria are shown in Remark B.
		Air discharge: ±8KV. The criteria are shown in Remark B.
Conducted interference （CE）	EN55022	Add an EMC (Electromagnetic Compatibility) filter Class A
Radiated interference （RE）	EN55022	Add an EMC (Electromagnetic Compatibility) filter Class A

Usage wiring diagram

Power conversion overview. Confirm the project wiring harness and battery connections with TethPower.



Functional overview only. Confirm the approved wiring harness and battery connections before installation.



Definition of input and output wire materials：

1、The positive input wire: red, 18AWG soft silicone-insulated model-aircraft wire, 7 A, -20–80°C, 600 VDC insulation withstand;

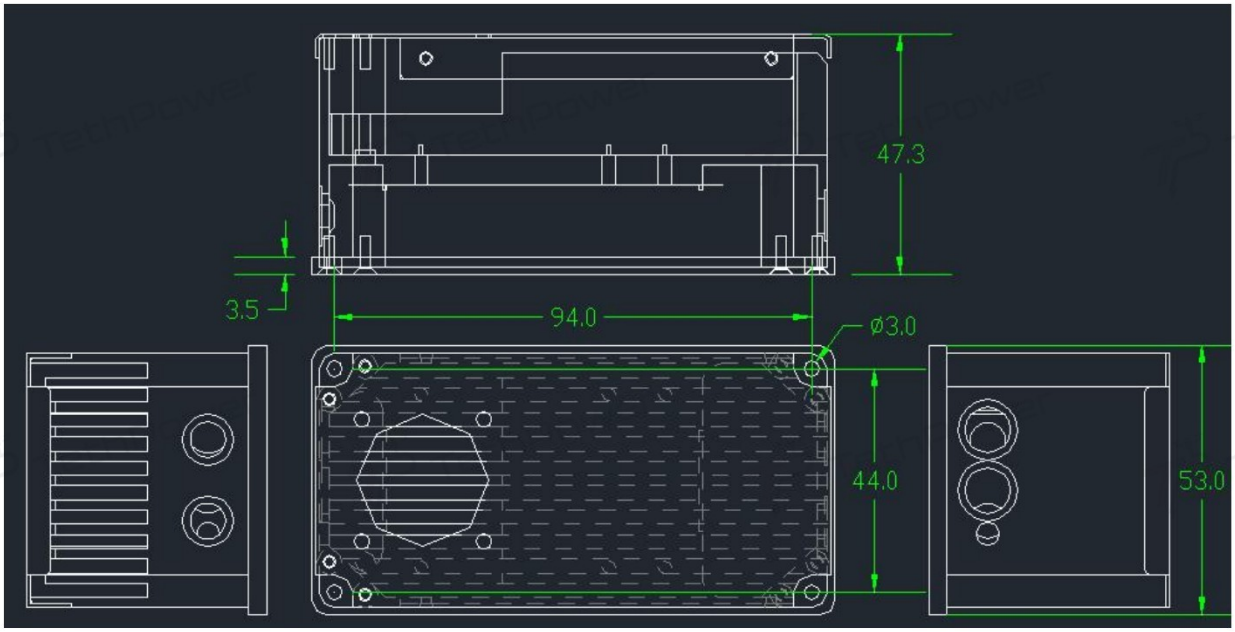
The negative input wire: black, 18AWG soft silicone-insulated model-aircraft wire, 7 A, -20–80°C, 600 VDC insulation withstand

2、The positive output wire: Brown，10AWG，105℃,300V；

The negative output wire: Orange，10AWG，105℃,300V；

Structural and installation dimensions：

103mm*53mm*50mm(The outgoing wires are not included)





Dimensional tolerances not specified：±0.3mm

User Instructions

Please make sure to read the Warning and Precautions sections before using the product.
Incorrect operation may cause damage to the power supply or lead to accidents.

Warning

When the product is powered on, keep your hands and face away from it to avoid accidental injury.

Do not modify or disassemble the product by yourself, as it may damage the product or cause accidents.

There are high - voltage and high - temperature areas inside the product. Do not touch the internal components to avoid electric shock or burns.

Precautions

Ensure that the input/output terminals and signal terminals of the product are correctly connected according to the product manual. Cut off the input power when wiring.

Use the power supply within the specified technical parameters. Using it beyond the specified range may cause damage to the product.

The potential electric shock hazard at the output terminals during product use must be considered. Ensure that end - users do not come into contact with the product. Terminal equipment manufacturers must design corresponding protection measures to ensure that engineers or tools do not accidentally touch the power supply terminals during operation, thus preventing potential dangers.