Product Manual

TP-ST60

TethPower



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Introduction to the TP-ST60 Tethering System

When the tethering system's power output is sufficiently high—above 50 kW—its integrated design becomes impractical due to challenges such as high-voltage power supply, high power consumption, heat dissipation, and size/weight constraints. Consequently, this system adopts a modular design for high-power tethering systems, comprising a power supply unit and a tether winch unit, as illustrated below:



2 System Parameters and Description

2.1 Tethered Power Box

The high-power tethered power supply system primarily converts 380V three-phase mains electricity into high-voltage 1500V direct current, which is then delivered to the tethered winch box via industrial plugs.

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2.2 Main Technical Parameters

order number	project	technical parameter	
1	Box dimensions	740 mm × 630 mm × 498 mm (length, width, height)	
3	weight	80kg	
3	input voltage	Three-phase 380AC + neutral wire	
4	Output Voltage Setting	1500 VDC (standard maximum)	Default value: 1500 V
5	Output current setting range	30-40A	Default value: 40A
6	operating ambient temperature	-20-45℃	
7	output rating	60KW	normalcy

2.3 Power Box Usage Instructions

Main power circuit breaker: The primary power switch for the entire system, including the main power supply for both the tethered power enclosure and the tether winch enclosure.

Liquid Crystal Setting Button (SET): Used to configure the system output. The standard maximum voltage is 1500 VDC, the current setting range is 30–40 A, and the factory default is 1500 VDC / 40 A. Users should not modify protected settings; contact TethPower for project-specific adjustments.

Liquid Crystal Information Bar (Measure)

Liquid crystal display voltage value (Voltage): Displays the current power supply output voltage value

Liquid crystal display current value (Current): Shows the current power supply output current value

Liquid crystal display power value (Power): Displays the current power output value

Liquid crystal display temperature (Temperature): Shows the current internal power supply temperature. When this temperature exceeds 65°C, use with reduced capacity.

Liquid Crystal Information Bar (Set)

Liquid crystal display voltage value (Voltage): Shows the output voltage value of the tethering setting

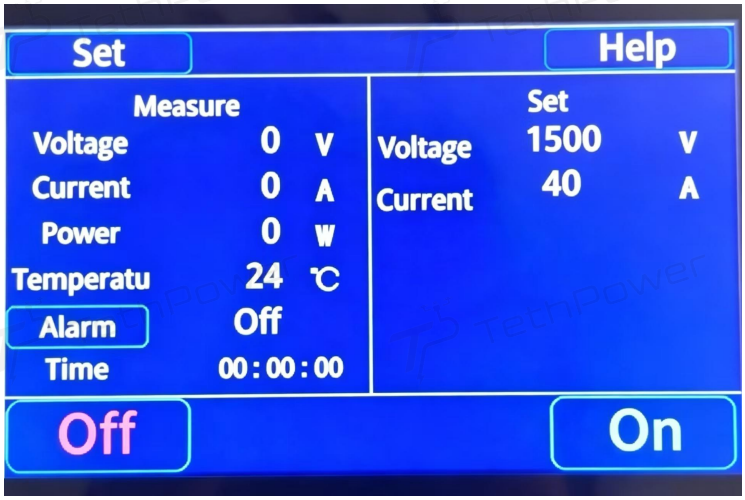
Liquid crystal display current value (Current): Shows the output current value of the tethering setting

Liquid Crystal Help Button

You can switch between Chinese and English. For details, contact the manufacturer.

The LCD power supply's On button, when pressed, activates the power box to deliver output at the set voltage value with a rated current not exceeding the specified current.

Liquid crystal power shutdown button (Off): Pressing it turns off the power supply, and no output is generated.



3 Series Tethered Winch Box

The winch box is primarily used for cable deployment, routing, and heat dissipation, with the deployment force adjustable via a torque knob.

3.1 Main Technical Parameters

order number	project	technical parameter
1	System box dimensions	740 mm × 620 mm × 568 mm (length, width, height)
2	Length of a single cable	120–200 m (depending on power availability)
3	weight	55-65kg 59 kg (based on a 40A cable of 140 m length)

4	Maximum winding speed	≤2 m/s
5	work pattern	Passive unwinding/Active winding
6	Cable electrical parameters	Operating voltage: 1500 VDC; rated current capacity: 25–50 A
7	Use ambient temperature	-20-45℃

Nominal input: 380 VAC, 50 Hz. 400 VAC, 50 Hz grids are within the normal input range. Standard maximum rewind speed is ≤2 m/s; faster rewind requires a custom configuration.

3.2 Instructions for Use

The hoist box panel primarily features a cable outlet, a transparent observation window, system switches, and a cable-reeling torque adjustment button, with the following main functions:

Outlet: Used for guiding the deployment and retraction of the tether cable, equipped with an integrated dust-proof brush.

Transparent observation window: apply for monitoring cable condition and cable length; it can be opened when necessary to facilitate better heat dissipation for the cables.

System Switch Button (System Switch): Used to power the control unit of the motor winding system

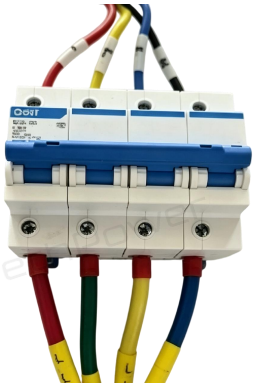
Torque adjustment knob: Used to regulate the torque during deploying and reeling the tether cable.



4. Wiring Instructions

Connect the power cord provided with the assembly to the tether box using the aviation plug: one end connects directly to the tether box's aviation socket, while the other end can be connected directly to the mains power or generator.





1）The industrial plug connecting the power supply box to the winch box is shown below.



The high-voltage cable output of the tether box features an AS150 connector, connecting the cable to the drone's onboard power supply as shown below, with the load-bearing hook securely fastened (receiving tension from its pull wire).



5 System Operation Instructions

1) During operation, first set the torque adjustment knob to the lowest position, then close the circuit breaker and power on the system; the display panel will light up at this point.

2) To power the drone, press the LCD "On" button. The tether box's cooling fan will then activate, and the display will show the current output voltage, current, and power of the main cable supply.

3) When preparing to take off, set the torque knob to the lowest position or apply slight torque (in windy conditions), then pull the cable out using the drone. During cable retraction, gradually increase the torque knob while adjusting the drone's descent speed accordingly; alternatively, set the torque to an appropriate level initially to maintain consistent cable tension throughout the process. When deploying the cable,

the drone pulls it forcibly and remains airborne; during landing, the cable automatically retracts due to its inherent tension.

4) After completing the task, first turn off the main power supply and press the LCD (Off) button to cut off the high-voltage DC power. Then proceed with the remaining cable winding operation to prevent electric shock. Finally, turn off the main power switch and unplug the power cord.

6 Precautions

Before use, ensure the device is placed flat and in a relatively balanced position.

2) Operators must wear insulating gloves to prevent accidental electric shock;

3) When adjusting the speed knob, turn it slowly from low to high; do not abruptly set it to the maximum position.

4) After completing the deployment, securely wind the power cord and store it inside the box; never drag it on the ground.

5) During use, the tether cable should not be dragged on the ground to prevent fiber shedding. Check for stones or other sharp objects on the ground to avoid cutting the cable.