Product Manual

TP-T12



TP-T12 Tethered System Overview

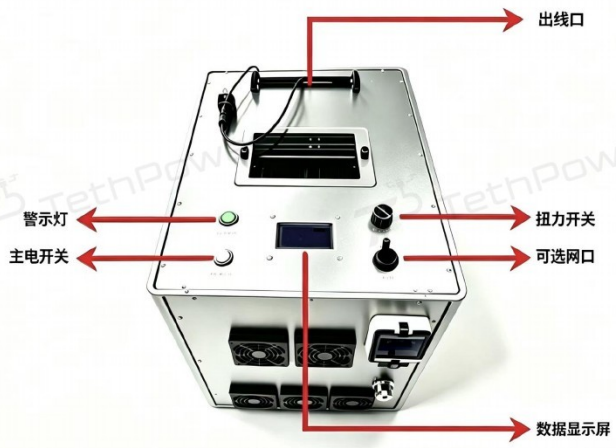
The TP-T12 tethered system primarily consists of a cable reel winch and a tether enclosure, integrating the tether cable and the tethered ground power supply. It is designed mainly to provide wired power supply, data transmission, and cable payout/retrieval functions for tethered unmanned aerial vehicles (UAVs).

The cable reel winch assembly mainly includes the system enclosure, main frame, cable storage drum, and control circuitry.

Key Technical Specifications

No.	Item	Technical Specifications
1	Main Enclosure Dimensions	472mm*377mm*453mm(L × W × H)
2	Enclosure with Handle & Control Panel Dimensions	500mm*410mm*470mm(L × W × H)
3	Single Cable Length	120m
4	Weight	39.5kg±0.5kg
5	Input voltage	AC380V
6	Maximum Cable Retrieval Speed	≤2 m/s
7	Operating Modes	Passive payout / Active retrieval
8	Power Output Voltage	DC800~1000V
9	Maximum Power Output	12kW
10	Recommended Onboard Power	≤12kW

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.



Button Descriptions	Main Power Switch / Torque Adjustment Knob — Start/stop high-voltage DC output/Start/stop cable retraction
System Operation Interface Description	After turning on the main circuit breaker (AC circuit breaker): 1. On the system operation interface, rotate the torque adjustment knob clockwise to start automatic cable retraction. To stop automatic retraction, rotate the torque knob counterclockwise. 2. Once the system is powered on, press the main power switch button to activate the high-voltage output. The warning indicator will turn green.

1. When using the TP-T12 tethered ground power box, it requires a three-phase AC power supply. During normal operation, the onboard power supply must be installed on the UAV.





2. Connect the tether cable output end to the UAV onboard power supply. Secure the load-bearing hook onto the load-bearing plate. The ground power box's high-voltage DC output uses an XT90 connector, which connects via the cable to the UAV onboard power module as shown below. Ensure the load-bearing hook is firmly fixed (the hook bears the mechanical tension of the cable).





Operation steps:

1) Before powering on, first turn the torque adjustment knob to the minimum, then close the circuit breaker to power up the system. At this point, the display panel will light up.
2) To power the UAV, press the "Main Power Switch" button. The cooling fans in the tether box will start running, the "Main Power Active" indicator will light up solid green, and the display shows the real-time output voltage, current, and power of the tether cable. Once the system detects load current, the indicator switches to a breathing flash, indicating power is being supplied to the UAV.
3) When the UAV is ready to take off, keep the torque knob at minimum or slightly increase torque (especially in windy conditions). The UAV will pull out the cable during ascent. During descent, gradually turn the torque knob up to synchronize with the UAV's descent speed. Alternatively, from the start you may set the torque knob to an appropriate value to keep constant cable tension: the UAV will then forcibly pull out and hover, and the winch will automatically retract cable when descending.
4) After the mission is complete, first turn off the main power switch to cut off the high-voltage DC output before retracting the remaining cable. This prevents accidental electric shock. Finally, turn off the main circuit breaker and unplug the AC power cable.

3. When launching the UAV to about 5 meters altitude, press the main power switch to energize the system. After the device powers up, press the main power button; the indicator turns green. The UAV ascends while you rotate the winch torque knob to keep the cable taut. If the UAV needs to descend, wait until it is around 5 meters above ground, then turn off the cable power. Retract the cable fully using the winch until zero, and let the UAV land safely.

Product Maintenance

1. Storage & Transport

1.1. Before transport or storage, always remove the airborne tether power module and UAV battery from the UAV and store them separately. Never store UAV batteries near heat sources or flammable/explosive materials.

1.2. Keep the storage environment dry; do not place UAV batteries in areas prone to water leakage or humidity.

1.3. If storing the tethered system for more than three months, recommended storage temperature is 22°C to 28°C. Never store the equipment or batteries below -10°C or above 45°C.

1.4. If the UAV battery is unused for more than 10 days, discharge it to 40%–65% for optimal storage. Never store it fully discharged to avoid over-discharge damage, which can make the battery unusable. It is recommended to cycle charge/discharge every 2–3 months to maintain battery activity.

1.5. When transporting the tethered power box, proper shock-proof measures must be applied. Slight loosening of internal screws due to vibration during transport is considered normal.

2. Maintenance

After every 50 takeoff-and-landing cycles or every 20 hours of operation, inspect and maintain the tether power system to ensure proper function.

- Check whether any part has suffered strong impact.
- Inspect whether moving parts still operate smoothly.