Top Gun

3WWDZ-35B
Agriculture Drone

User Manual V0.1

Usage Recommendation

Topxgun provides user with the following documents:

1. "Packing List"
2. "User Manual of Plant Protection UAV FP150"
3. "Usage Guidelines of Agriculture Assistant APP"

For detailed usage and functions, please refer to "User Manual of Plant Protection UAV FP300" and "Usage Guidelines of Agriculture Assistant APP". You can also follow us on YouTube Channel for tutorials and tips in the operation.

* To keep you updated, some documents may be taken as E-documents.

User Manual of Plant Protection UAV

Usage Guidelines of Agriculture Assistant APP

Agriculture Assistant APP

Preface

The plant protection UAV 3WWDZ-35B is a mature multi-rotor aircraft, leading the industry in terms of function, appearance, control, safety and other aspects. There are certain usage risks of multi-rotor drones due to the mechanism and structure. Please strictly follow the safety tips and user manual during the operation. Violation of regulations when using this drone may result in direct or indirect loss and damage.

Disclaimer

Please read the manual carefully before using the aircraft. Once the drone is used, it is deemed to be an acknowledgement and acceptance of all the content of this user manual. This drone is suitable for people 18 years of age and older. Topxgun is not responsible for the loss of personal or property due to the following problems:

1. The user does not assemble or use the drone as required by this manual.
2. The user operates the drone in poor physical or mental conditions such as drinking, drug abuse, fatigue, etc.
3. The user actively or intentionally operates the drone to create damage.
4. The user modifies the drone without using the accessories from Topxgun, which causes malfunction of the drone.
5. Injury caused by the user's misoperation or subjective misjudgment.
6. Damage caused by natural causes, such as aging of the circuit and so on that affects the aircraft.
7. Damage caused by the user's operation of the drone while knowing that it is in an abnormal working condition.
8. The user still operates the drone under severe weather conditions such as typhoons, hail and fog.
9. The user operates the drone in the magnetic interference area, radio interference area and government no-fly area.
10. The user operates the drone in case of poor visibility and occlusion of the line of sight.
11. The user operates the drone to cause the infringements by obtaining any data, image data and other infringement behaviors.
12. Other losses that are not within the scope of the company's liability.

Safety operation instructions

1. Pesticide Usage

➢ Wear protective clothing to prevent direct body contact with the pesticide while operating.

➢ Avoid the use of powder pesticides as much as possible or else they may reduce the service life of the spraying system.

➢ Use clean water to prepare the pesticide to avoid blocking the strainer. Do not remove any filter and clear any blockages before using the equipment.

➢ After using the pesticide, please clean up the residual liquid in time. It is strictly forbidden to pollute the river and drinking water source and ensure that it will not cause harm or impact on people, animals and the environment in the surroundings.

➢ The effect of the pesticide is closely related to the concentration of the pesticide, the spraying rate, the altitude of the drone from crops, the wind direction, the wind speed, etc. The above factors should be taken into account comprehensively when using the pesticide in order to achieve the best effect.

➢ Strictly follow the safety instructions of the pesticide production company.

➢ Particular working fluids are prohibited.

2. Usage Environment

➢ Always fly in an open space, away from the crowd.

➢ It is recommended to fly below 2000 meters.

➢ It should fly in an environment with a temperature between 0□ and 40□.

➢ It is recommended to fly in an environment with a wind speed below level 4.

➢ It is strictly forbidden to fly in rain, fog, snow or other extreme weather.

➢ It is strictly forbidden to fly indoors.

➢ It must fly in a legal area. Before flying in the legal area, please consult your local flight management department to comply with local laws and regulations.

3. Pre-flight Inspection

➢ Make sure that every device is fully charged.

➢ Make sure that all parts are in good condition. If there are some parts worn or damaged, please replace them before the flight. Make sure that the landing gear and the tank are tightly mounted and all the screws are firmly tightened.

➢ Make sure that the propellers are intact and firmly mounted, the propellers and arms are fully extended, and the screws are tightened.

➢ Make sure the motors are clean and free of damage.

➢ Make sure the spraying system is free of blockage and works properly.

➢ Please calibrate the compass before the flight.

4. Operation

➢ Keep away from the rotating propellers and motors.

- When folding the drone, avoid crushing and damaging the drone parts.
- Do not exceed the take-off weight of 82.7 Kg to avoid danger.
- Pilots must be professionally trained and pass the assessment, and the untrained personnel must not fly the drone.
- Make sure that the propellers are removed before calibrating the drone and upgrading the firmware.
- When the drone and the remote controller are in the frequency-connecting process, make sure that the propellers are removed and that people and animals are far away from the motor.
- A pilot should not operate this product under the influence of alcohol, fatigue, illness, etc.
- If the operating environment does not meet the working condition of the module, the drone will not avoid obstacles when it returns automatically. If the remote-control signal is normal, the flight speed and altitude can be controlled using the remote controller.
- When working, be sure to turn on the remote controller first, and then turn on the power supply. After landing, turn off the power supply first and then turn off the remote controller.
- Please maintain control of the drone throughout the process and do not rely entirely on the information provided by the hand-held ground station(remote controller).
- Obstacle avoidance and terrain following functions will not be available in the specific flight mode or environment. Please observe the attitude of the drone at all times and judge the flight condition reasonably to avoid obstacles in time.

5. Flight Restrictions and Local Laws

- Browse the official website of the Aviation Authority of your location for the latest list of restricted flight areas.
- The maximum control flight altitude is 20 meters. Please consult the local flight management department before taking off, to comply with local laws and regulations.

Special precautions: Safety operating instruction notes include but are not limited to the above items.

Intellectual Property Rights

The intellectual property rights of this product and its manual belong to Topxgun Robotics Co., Ltd. Without written permission, any organization or individual may not copy, reproduce or distribute them in any form. If the quotation is required, the source should be indicated and the manual should not be modified, deleted or quoted contrary to its original intention.

About this manual

This manual is used as a user's guide. Photos, graphics, charts and illustrations in the manual are only for explanatory and illustrative purposes and may differ from the actual product. Please refer to the actual product.

Due to product upgrades or other reasons, the content of this document will be updated from time to time. Unless otherwise agreed, it is without further notice.

Before using this product, please read this manual carefully.

Execution standard of this product: Q/TG 002-2022

All rights reserved by Topxgun Robotics Co., Ltd.

Content

1. Product Overview

The agricultural drone 3WWDZ-35B Agricultural plant protection UAV has undergone several iterations of upgrades, and now reaches the leading level in practicability, reliability and safety. The drone is full-body waterproof, dust-proof and anti-corrosion. Some key modules, such as spraying system, system and power system, are IP67 rated ensuring easy cleaning and maintenance. The RTK positioning system can achieve centimeter-level high precision positioning, and also supports dual antenna anti-magnetic interference direction-finding technology. The drone is equipped with wide-angle FPV camera and high-definition digital image transmission system. Users can observe the environment in real time.

1.1. Smart Battery Introduction

TB1430 battery is a polymer lithium power battery, featuring a compact size, light weight and large capacity.
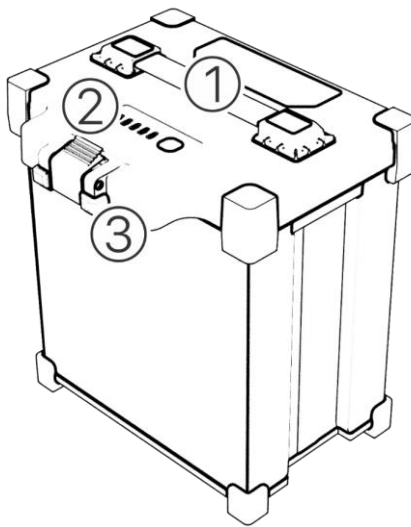
1.1.1. Component Definition

Figure 1-1 Battery Component
1. Handle 2. Indicator 3. Charging port

1.1.2. Specification Parameters

Subject	Parameter
Typical Capacity	30000mAh
Nominal Voltage	51.8V
Standard Charging Current	150A (Environment Temperature 25±5□)

Maximum Charging Current	15A, cell temperature: 0~10□ 30A, cell temperature: 10~15□ 150A, cell temperature: 15~70□
Limited Charging Voltage	58.8V
Maximum Discharging Current	240A, Environment Temperature: -5~45□
Operating Temperature	0~45□ (Charge) -10~60□ (Discharge)
Storage Temperature	-20~25□ (1 year)
Weight	11.0Kg

1.1.3. LED Indicator Status

1.1.3.1. Battery Status Display

Function	Precondition	Operation	LED Indicator	Note
Battery Level Checking	Sleep/Power off	0 (Short Press)	Display the current battery level for 3s	The battery level will be displayed for 5s after a short press
Power On	Sleep/Power off	0-1 (Short Press+Long Press >1s)	0, display the current battery level; 0-1, turn off the display. The LED indicators will light up one by one, then display the current battery level	0-1 MOS has been activated after power on
Power Off	Power On	0-1 (Short Press+Long Press)	0, display the current battery level; 0-1, turn off the display. The LED indicators will go off one by one	0-1 MOS has been deactivated after power off
RC Pairing	Battery is activated and RC is on the pairing interface	In the power on status 2 (Long Press>5s)	The LED 3 and 4 will flash while pairing. After the pairing is completed, LED indicators will revert to	

			the original status	
Disconnect UPS	Battery is activated	Short press for 5 times, 0-0-0-0-0	0, display the current battery level	1. UPS is deactivated

1.1.3.2. 电量显示

When the battery is in standby mode, short press the power button once to display the current battery level, and it will turn off after 3s.

Battery Level	LED1	LED2	LED3	LED4	LED5
91%~100%	ON	ON	ON	ON	ON
81%~90%	ON	ON	ON	ON	FLASH
71%~80%	ON	ON	ON	ON	OFF
61%~70%	ON	ON	ON	FLASH	OFF
51%~60%	ON	ON	ON	OFF	OFF
41%~50%	ON	ON	FLASH	OFF	OFF
31%~40%	ON	ON	OFF	OFF	OFF
21%~30%	ON	FLASH	OFF	OFF	OFF
11%~20%	ON	OFF	OFF	OFF	OFF
0%~10%	FLASH	OFF	OFF	OFF	OFF

1.1.3.3. Charging Status

The battery displays the charging status while charging: in the off state, press

the power display button once, and then long-press. LED1~LED5 will turn on one by one, and the battery charging status display function is activated.

Battery Level	LED1	LED2	LED3	LED4	LED5
0%~40%	Flash	Flash	OFF	OFF	OFF
41%~60%	Flash	Flash	Flash	OFF	OFF
61%~80%	Flash	Flash	Flash	Flash	OFF
81%~99%	Flash	Flash	Flash	Flash	Flash
100%	ON	ON	ON	ON	ON

1.1.3.4. Error and Other Indications

The abnormal charging status will trigger the battery protection function and the battery LED light will display as follow.

Error Info	LED1	LED2	LED3	LED4	LED5
Excessive Charging Current	OFF	FLASH	FLASH	OFF	OFF
Excessive Battery Voltage	OFF	ON	ON	OFF	OFF
Charge Overcurrent/Discharge Overcurrent	OFF	OFF	OFF	FLASH	OFF
Low Charging Temperature	OFF	OFF	ON	OFF	OFF
High Charging Temperature	OFF	OFF	FLASH	OFF	OFF
Pre-discharge Failed	OFF	OFF	OFF	FLASH	FLASH
Battery Cell Pressure Difference exceeds limit	FLASH	OFF	OFF	OFF	FLASH
MOS Overheat	OFF	OFF	FLASH	OFF	FLASH
MOS Error	OFF	OFF	ON	OFF	ON
NTC Open Circuit/Short Circuit	OFF	FLASH	FLASH	FLASH	OFF
Connector Overheat	OFF	FLASH	OFF	FLASH	OFF
Collection Line Open Circuit	OFF	ON	ON	ON	OFF
Battery Updating	FLASH	FLASH	FLASH	FLASH	FLASH
AFE Communication Failure	OFF	FLASH	OFF	FLASH	FLASH
0V Disabled Charging	OFF	ON	FLASH	FLASH	ON
Short Circuit Protection	ON	FLASH	FLASH	FLASH	ON
CAN Communication Failure	ON	FLASH	ON	FLASH	ON

Notes:
1. Activate the battery only after it is well connected to the drone.
2. Disconnect the battery after it is turned off.
3. Charge the battery to 60% every 3 months to ensure a longer service lifetime.
4. Before using, ensure sufficient battery level. When the battery has not been used for a long time, please use the dedicated charger to discharge the

battery to the storage voltage, and then store it in a dry and ventilated environment.

5. This battery needs to be charged with a dedicated charger (TC7202, TC7201, TC7201P). In order to avoid accidents, please do not change the charger in any condition.

6. Do not use batteries if they emit odors or heat, or they are in an abnormal shape/color or has any other problems. If the battery is in use or charging, it should be immediately removed from the drone or charger. Stop using this kind of battery.

7. It is normal that the flight time will be shortened when the ambient temperature is lower than 10□.

8. The battery surface should be cleaned in time after the operation, in order to avoid agrochemical corrosion.

9. The drone is strictly forbidden to be used in the environment of strong static electricity, magnetic field or high voltage power line.

10. It is strictly prohibited to pierce the battery case with nails or other sharp objects, or to hammer or step on the battery.

11. If the electrolyte enters eyes after the battery leaks, rinse the electrolyte out instead of rubbing the eye. Seek medical help immediately. Eyes will be injured if not treated in time.

1.2. Charger Introduction (TC7201P)

TC7201P charger is a one-channel lithium-polymer battery charger with a maximum charging current of 150A.

1.2.1. Components

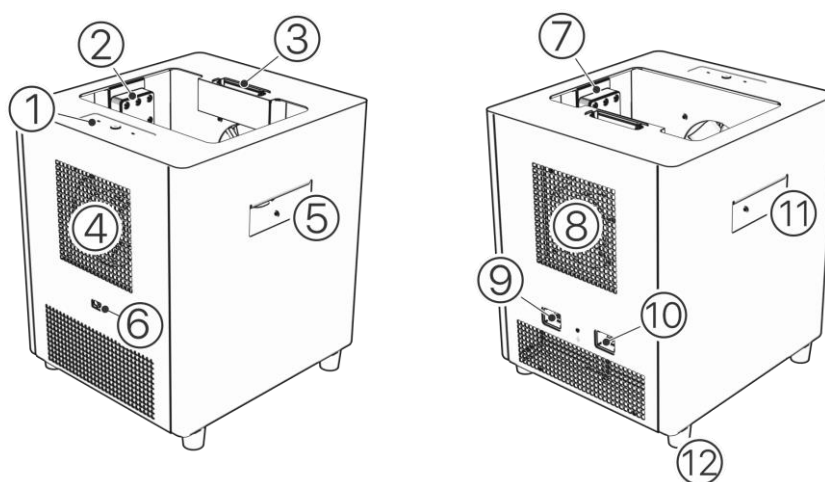The definition of the charger components is shown in Figure 1-11.

Figure 1-2 Charger Components

1. Operation interface	2. Battery supporting frame 1	3. Battery charging port	4. Air inlet

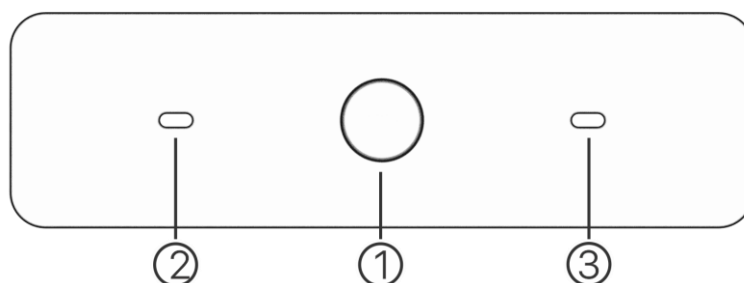| 5. Handle 1	6. USB port	7. Battery supporting frame 2	8. Air outlet
9. AC input port 1	10. AC input port 2	11. Handle 2	12. Base

Figure 1-3 Charger Operation Panel

1. Power on/off button＆
Operating indicator

2. Charge status indicator

3. Alarm indicator

1.2.2. Function Description

1.2.2.1. Status Indicator LED Description

1) Activation Indicator Description

The charger needs to be activated at the first usage. After the charger is connected to the drone via Wifi, please activate it according to the APP guidance.

Status	Prompt	Battery channel status indicator	Alarm indicator	Operating indicator
Deactivated	/	Solid White	Solid White	FLASH
Activated	/	OFF	OFF	FLASH

Self-check: First, make sure that all the terminals are correctly connected, then press the "start/stop" button on the operational panel. The battery charging status indicator and alarm indicator will turn white. The charger will complete the self-check with a beep sound at the end.

2) Description of the Battery Charging Status Indicator

LED flash	Warning	Description	Notes

rules			
OFF	/	No battery connected to the corresponding port	
Yellow Solid On	/	The battery is connected to the corresponding port, waiting for charging	
Green Breathing	/	The corresponding port is in slow charging mode	
Green Fast Flash	/	The corresponding port is in fast charging mode	
Green Solid On	/	The battery connected to the corresponding port is fully charged	
Yellow Continuous Single Flash	/	Battery temperature is too low. The charging current is limited	0≤Cell temperature<10□
Yellow Continuous Double Flash	/	Battery temperature is too low. Charging is prohibited.	Cell temperature<0□
Yellow Continuous Triple Flash	/	Battery temperature is too high. Charging is prohibited。	Cell temperature>65□
Red Single Flash	D.D.D…	The battery is not plugged in/unofficial battery/communication error	
Red Double Flash	D.D.D…	Batteries of different voltages are mixed charged	
Red Triple Flash	D.D.D…	BMS error	For troubleshooting, check the charging permission conditions
Red Solid On	D.D.D…	Output over-voltage. other	

		hardware error	

LED Flash Rules	Warning	Description	Action
All On, Then All Off	D	Self-check is completed	
Yellow Single Flash	/	Charger temperature is too high	Self-directed derating
Yellow Double Flash	/	Input voltage is under voltage	Self-directed derating
Yellow Triple Flash	/	Input voltage is high	Charge normally
Red Signal Flash	D.D.D…	Ambient temperature is too high or fan malfunction	Stop charging
Red Double Flash	D.D.D…	Fault in charger input voltage (Under-voltage protection)	Stop charging
Red Triple Flash	D.D.D…	Fault in charger input voltage (Over-voltage protection)	Stop charging
Blue Solid On	/	Only one power module is working	/

1.2.3. Charge Steps

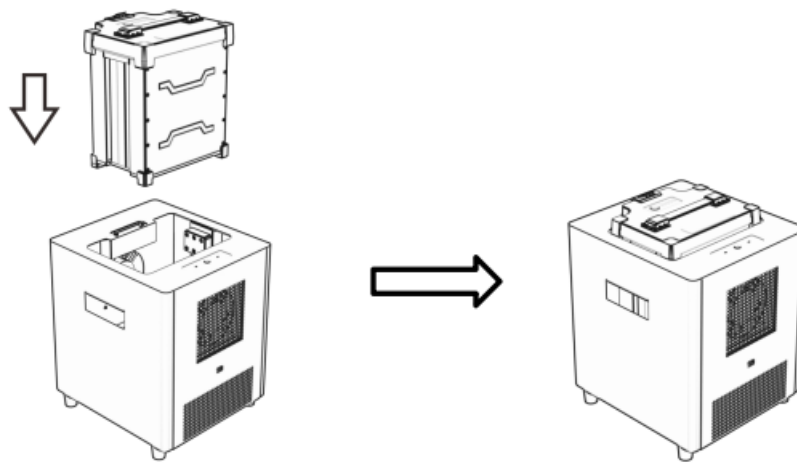**Step 1:** Insert the battery to the charger. Please pay attention to the direction of the connector.

Figure 1-4

Step 2: Insert the power cable to the charger's power port, and insert the other connector to the AC power supply (200-240V, 50/60Hz). If only one power cable is connected, the maximum charging power will be limited to 3600W.
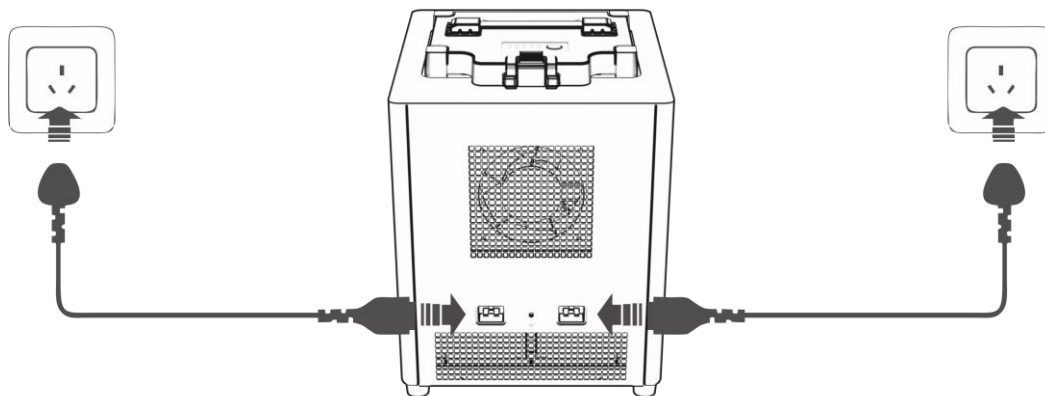

Figure 1-5   Charger Power Cable Connect

Step 3: After making sure that all wires are connected correctly, press the "Start/Stop" button in the operation panel, and the charger will start self-check. The channel indicator will be solid white, and will off if no error occurs. If some error occurs during the self-test process, please refer to the indicator status chapter.

Step 4: Press the "Start/Stop" button in the operation panel to turn off the battery after charging, unplug the AC power cable, and unplug the battery. Please follow the rules below.

Charging Mode	Battery State	Channel Indicator State	Plug or Unplug Battery Instruction
	Fully charged	Solid Green	Unplug battery directly
	Waiting for charging	Solid Yellow	Unplug battery directly

	Charging	Solid Green	If plugging or unplugging is needed, please press the start/stop button first. Plugging or unplugging directly is prohibited

Notes:

1. Make sure the charger is grounded before use.
2. Do not use the product in direct sunlight, high humidity, high temperature, dust, vibration or thunder/lightening.
3. Products should be kept away from dangerous substances such as high pressure, heat source, corrosive agent, flammable gas, etc., and must be used at appropriate ambient temperature (5-45□ is recommended).
4. Products should be placed in a stable horizontal position, and good ventilation and heat dissipation conditions should be ensured when working.
5. When charging, please strictly follow the battery safety instructions and cautions.
6. Before connection, please ensure that all ports and input lines of modules and batteries have no obvious defects such as blockage, damage, breakage or short circuit.
7. Before use, please ensure that the power supply line has enough capacity to avoid overheating or even fire caused by insufficient capacity, especially when two or more pieces of equipment are used at the same time.
8. Do not pull out the input wire when the charger is working. Pull out the battery in time after charging.
9. Make sure the battery is well connected before charging.
10. This charger is only applicable to the battery of this drone. If the user uses the charger for purposes other than those listed in the manual, the Company shall not assume any responsibility.
11. Do not leave the charger unattended when it's working. If any function is not normal, please stop charging immediately.
12. In case of fire, do not use liquid extinguisher to avoid electric shock. Use dry powder extinguisher correctly.

1.2.1. Specification Parameters

Subject	Parameter
Input	AC 220-240V 50/60Hz
Rated Input Voltage	AC 220V/ 50~60Hz
Output Power	max 7200W
Output Voltage	max 58.8V
Charging Current	max 150A (Adjustable)
Operating Temperature	5□~45□
Operating Humidity	0%~75%

Storage Temperature	-10□ ~ 70□
Storage Humidity	0%~75%
Voltage Detection	Support
Protection	Over-current protection
	Over-temperature protection
	Over-voltage protection
	Short circuit protection
	Reverse connection protection
Weight	18.7kg
Dimension	300*330*375

1.3. Spreading System (Optional)

1.3.1. Introduction

Spreader is one of the most important functional parts of agricultural drones. Compared with traditional manual spreading operation (low efficiency, high cost and poor uniformity), the spreader can greatly improve the efficiency, reduce the cost and improve the quality at the same time.

Air Jet Spreading System: The FP spreading system adopts a air duct sinking diversion design and uses high-speed air flow to blow out granule evenly, which can prevent damage to seed and drone body.

Precision Spreading: The special designed rolling feeder can adjust the discharging rate in real time and precisely control the discharging quantity according to the dosage and flight speed.

Scenario: Seeding of rice, wheat; Second Seeding in Grassland; Fertilizer spreading; Fish food feeding, etc.

1.3.2. Spreading System Installation

1.3.2.1. Preparation

Since the spraying system and the spreading system share the FP400 platform, the components of the spraying system need to be removed before the spreading system is installed. The replacement process takes less than 10 minutes.

Notes: During the replacement, the battery must be removed from the drone!

1.3.2.2. Spraying System Removal

1. Remove the two plugs of the spray/spread on the HUB module and pull the wire out of the cabling holder on the tank.

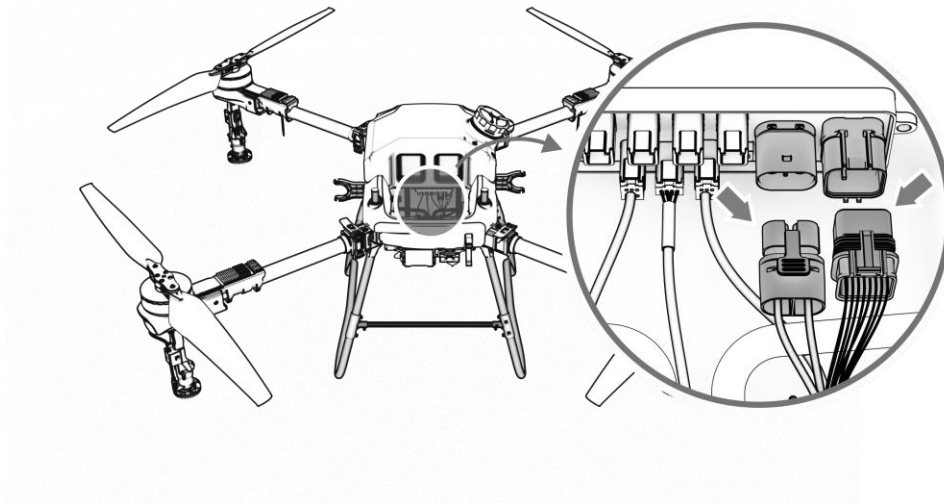**Notes: Prevent agrochemical (neither liquid nor solid) from the port during the removal.**

Figure 1-6

1. Unplug the quick disconnect connector of the pipe on both sides of the drone to remove the pipe between the pump and the nozzle.

Notes: If you need to switch the spraying system to spreading system, it is recommended to apply some liquid on the head of the pipe for lubrication.
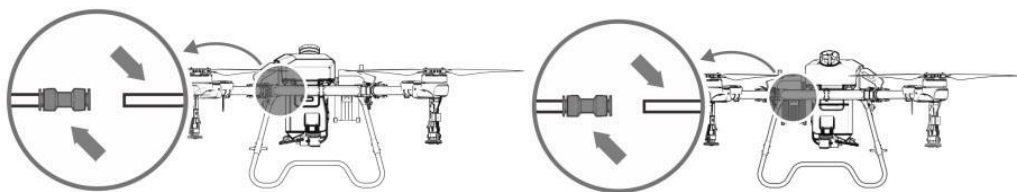
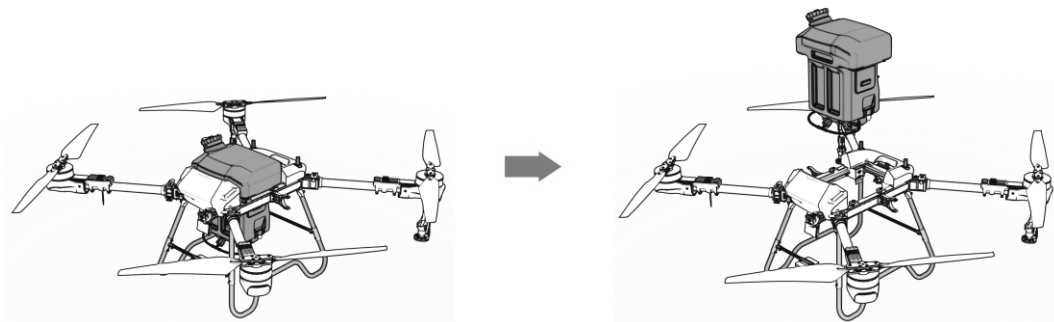Figure 1-7

2. Remove the tank up straight from the drone.

Figure 1-8

Notes: Do not scratch the surrounding wire during the tank removal.

1.3.2.3. Spreading System Installation

1. Tilt the spreader into the body frame as shown in the figure. Do not scratch the surrounding wiring. Adjust the tank to make sure its supported by four weight sensors. Prevent agrochemical (neither liquid nor solid) from the port during the installation.
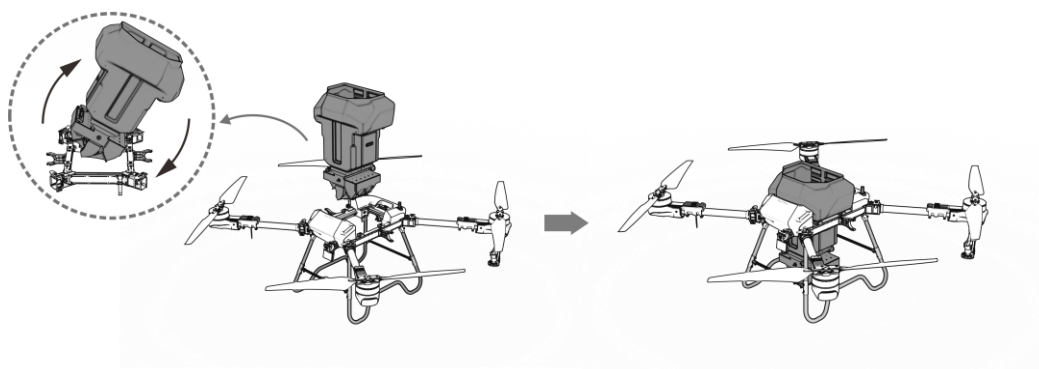

Figure 1-9

2. Insert the two plugs of the spray/spread outgoing line into the two reserved interfaces on the HUB module of the spreader respectively. Fix the wire on the clamp on the container.
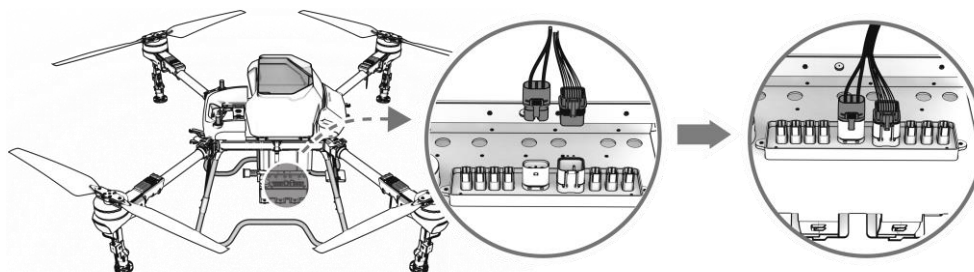

Figure 1-10

1.3.3. Basic Operation

1.3.3.1. Usage

1. Boot up the RC and drone according to the instruction.

2. Enter the Agri Assistant APP after Step 1 finished.

3. For the first time users of spreading system, please enter the Setting interface.

Choose Air Jet Spreader in the operation mode list.

4. Choose the roller type and granule type in the setting interface according to the actual situation.

Figure 1-11

5. Set the dosage, line spacing and operating height in the parameter setting interface. The parameter will be different in different scenario. Please calibrate the actual granule before operation.

Figure 1-12

Notes:

1. Please keep the granule for operation dry.

2. If you change the granule or rolling feeder, please operate the calibration.

1.3.3.2. Spreading System Calibration

Preparation:

1. Please prepare the granule before the calibration. Place the drone on the plain surface, and completely empty the container.

2. Select the type of rolling feeder and granule type. If the granule is used for the first time, click "Management" for naming.

Figure 1-13

3. Click the Calibration to enter the calibration interface. Please operate according to the guidance on the APP. Here are the steps:

Step 1: Place the drone on a plain surface and make sure the container is empty.

> **Notes:** If the drone is not placed on a plain surface and the offset angle is large, the next steps of calibration cannot be operate. Please adjust the drone, then click the "Finish" button.
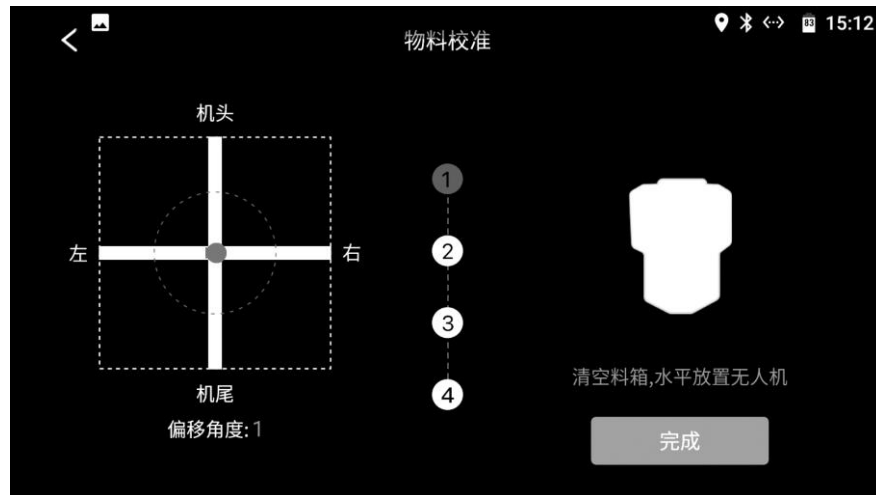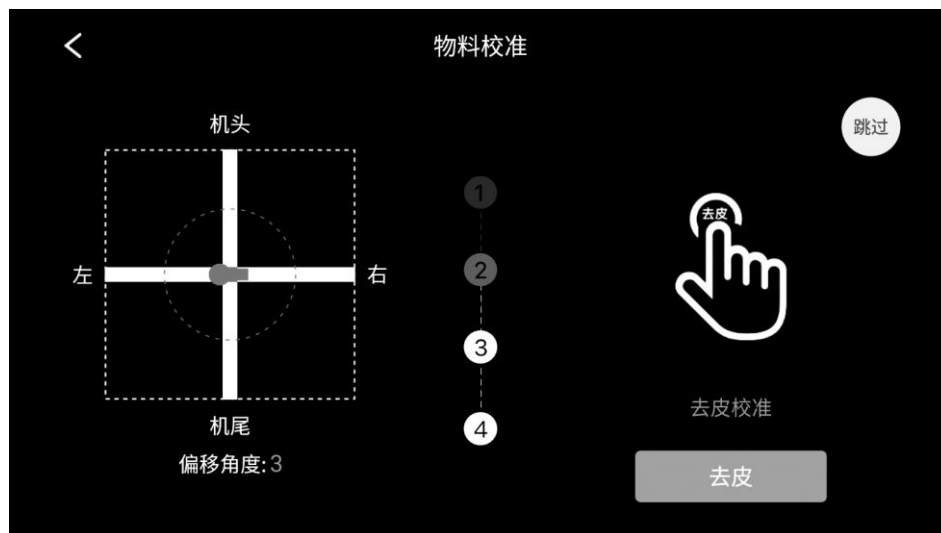

Figure 1-14

Step 2: Click Peel

Figure 1-15

> **Notes:** If the tare calibration has been completed before, click "Skip".

Step 3: Fill the container. Click "Finish". Click "Complete", the calibration will start automatically.
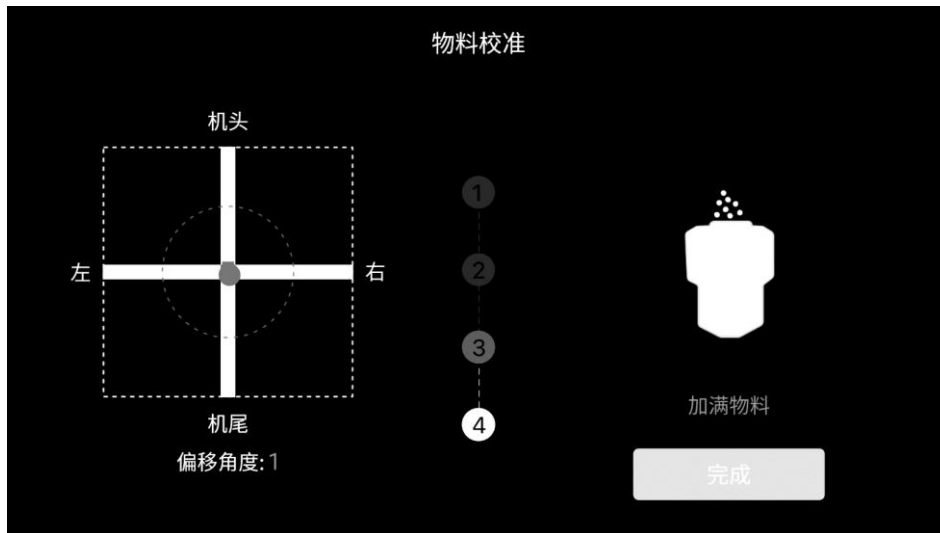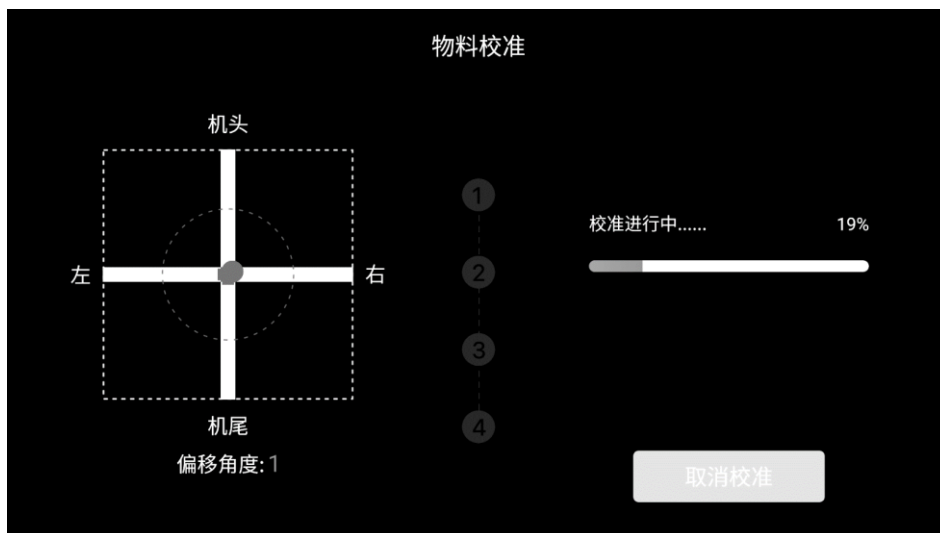
Figure 1-16

Figure 1-17

Notes: Do not touch the drone during the calibration.

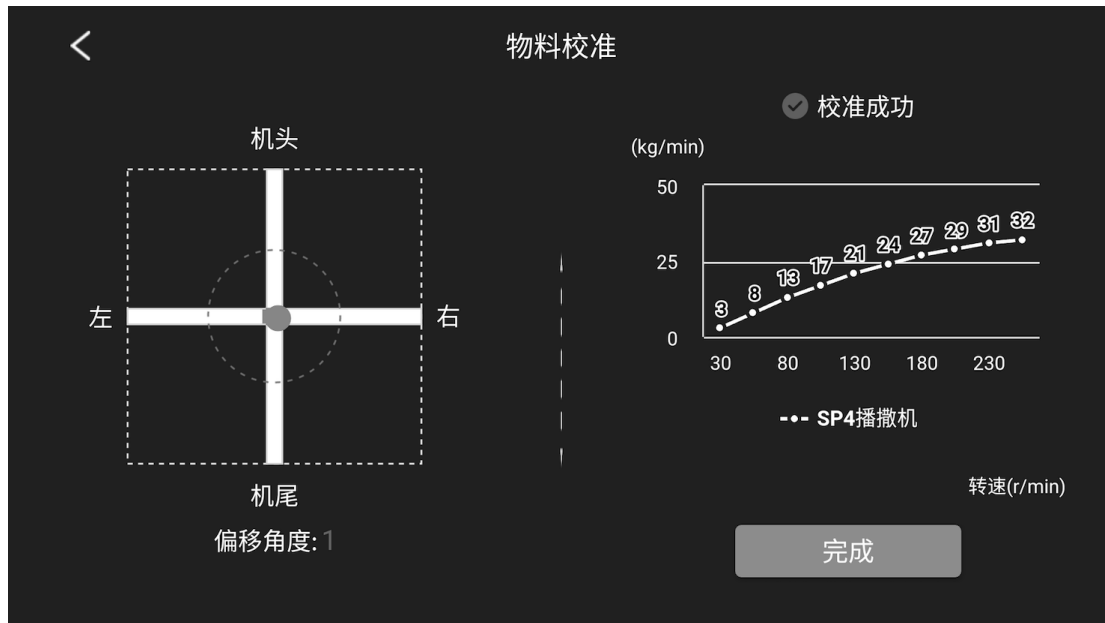**Step 4:** The calibration coefficient will pop up when the calibration is completed.

Figure 1-18

Notes: If the calibration fails, please repeat the calibration according to the above steps.

1.3.3.3. Spreading Test

There is a spreading test function in the setting interface. Users can click the Start button before operation to make sure the rolling feeder and the fan work properly.

Figure 1-19

1.3.4. Specification Parameters

Mechanical Specifications	
Spreader Size	526*399*750mm
Spreader Weight	5.8Kg (include the container and spreader)
Container Capacity	55L
Electrical parameters	
Supply Voltage	14S（48V-58V）
Rated Power	600W
Environmental parameters	
Working temperature	0℃-40℃
Storage temperature	0℃-40℃
Protection level	IP67 (exclude the fan)
Performance parameters	
Spreading Material Range	1-10mm (Granule)
Effective spreading range	5-7m (Depending on operation height, seed weight, shape, wind speed and dosage)
Rolling feeder speed	300r/min（max）

1.4. Drone Introduction

1.4.1. Functional Features

3WWDZ-35B Agricultural plant protection drone has the following features:

1. Made of professional carbon fibers with lighter weight and higher strength. Foldable arms are designed for easy transportation.

2. Swappable tank and battery make mode changing easier, and also improve

the efficiency.

3. With a high-precision   navigation system and IMU sensor, the drone has an accurate positioning function to ensure safety and reliability.

4. Dual water pumps are equipped and each has an independent control spraying system. Flowmeter is provided to ensure high precision of spraying and good atomization effect.

5. The Agriculture Assistant APP supports smart route planning so that the drone can operate autonomously. It helps to make the pilot's work easier.

6. No waste gas emits so the drone is environmentally friendly and meets the government's requirements for energy conservation, environmental protection and the development of a "green agriculture". It is also easy to maintain, and cost-effective.

1.4.2. Drone Components
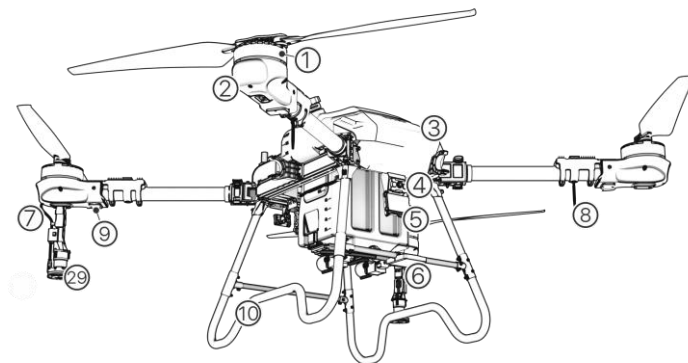
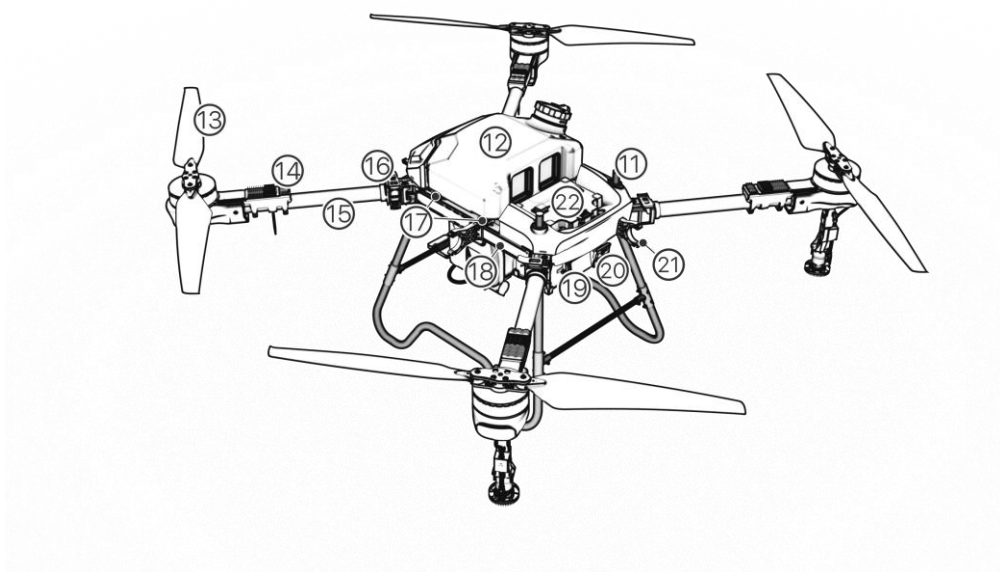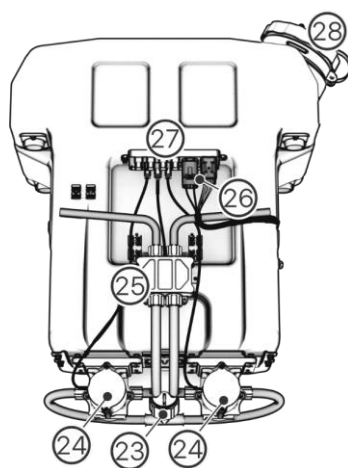Drone components are shown in the figure below.

图 1-20

图 1-21

图 1-22

1. Motor	2. Motor Cover	3. Front Housing	4. Front FPV Camera	5. Front Obstacle Avoidance	6. Terrain Following
7. Nozzle Holder	8. Antenna	9. Status Indicator	10. Landing Gear	11. RTK Antenna	12. Tank
13. Propeller	14. ESC	15. Arm	16. Clamping Unit	17. Weight Sensor	18. Drone Body
19. Rear Obstacle Avoidance	20. Rear FPV Camera	21. Arm Clamp	22. Smart Battery	23. Tank Outlet	24. Pump
25. Flowmeter	26. Spray/Spread Connecting Cable	27. Tank HUB Module	28. Tank Inlet	29. Centrifugal Nozzle Component	
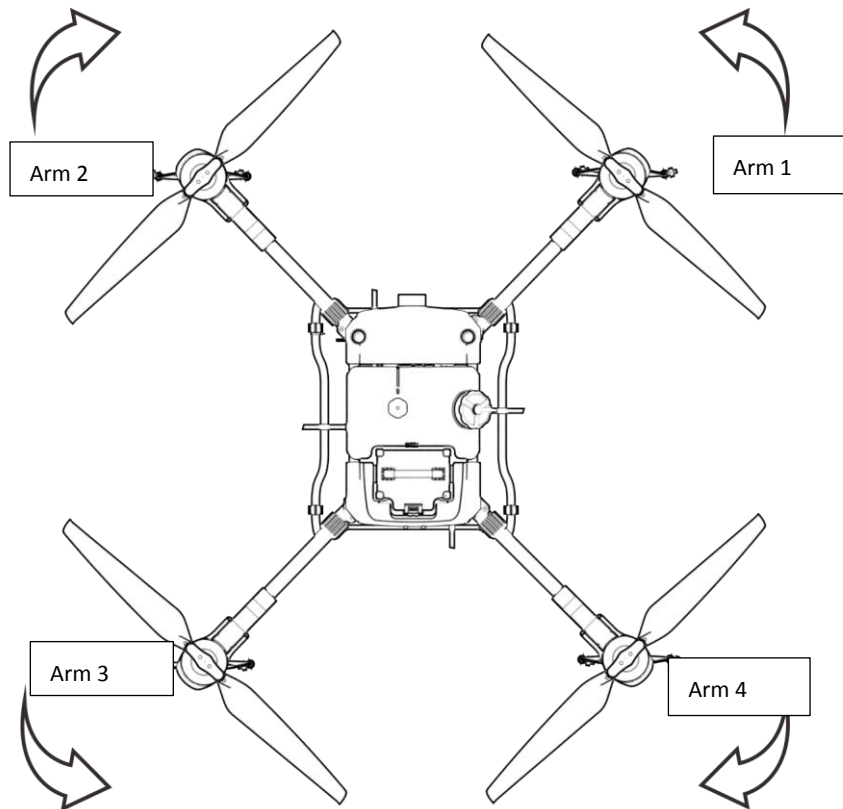
Figure 1-23

Notes:
The propellers on arm 1 and arm 3 rotate counterclockwise, while on arm 2 and arm 4 rotate clockwise. See Figure 1-32.

1.4.3. Preparation

1.4.3.1. Unfold Arms

Step 1: Take 3WWDZ-35B plant protection drone out of the box.
Step 2: Horizontally rotate the propellers to remove them from the holder.
Step 3: Unfold the arms. See Figure 1-33.

Figure 1-24 Arm Unfolding

Step 4: Make sure the clamping component is tightened, as shown in Figure 1-34.
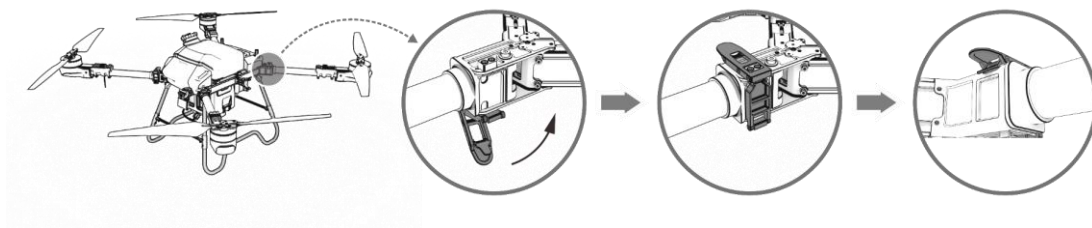
Figure 1-25 Arm Clamp

Step 5: Unfold the propellers to 180°, as shown in Figure 1-35.

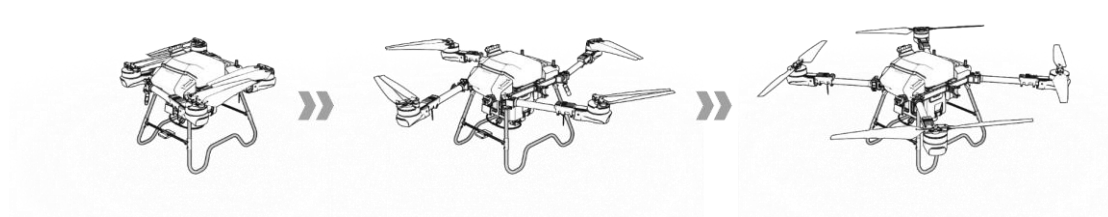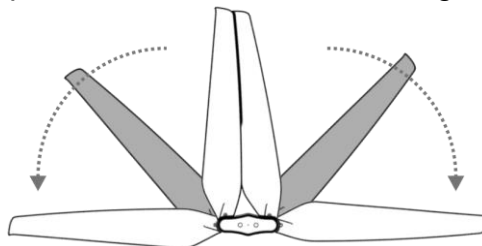
Figure 1-26 Unfold the Propellers

Notes:

Be careful with your hands during the above process.

1.4.4. Install Battery

Be sure to use the official battery and check the battery level before flying.

Step 1: Place the battery vertically down in the battery rail on the rear side of the drone body.

Step 2: Connect the battery output port to the body, and the battery is locked in when you hear a "click". See Figure 1-36.

Figure 1-27 Insert the battery

1.4.5. Equipment Calibration

1.4.5.1. Compass Calibration

Method 1: Access the calibration function via APP installed on the RC:

Step 1: Pull down the throttle.

Step 2: Quickly toggle down "Flight Mode Switch" to the down position ("S")

and toggle it up to the up position ("G") for about 6-10 cycles until the status indicator light flashes blue.

Step 3: Place the drone head forward and keep the drone level with the ground. Slowly rotate the drone clockwise for at least one circle. If the status indicator flashes green, process to step 4. If the status indicator is solid green, the calibration is completed.
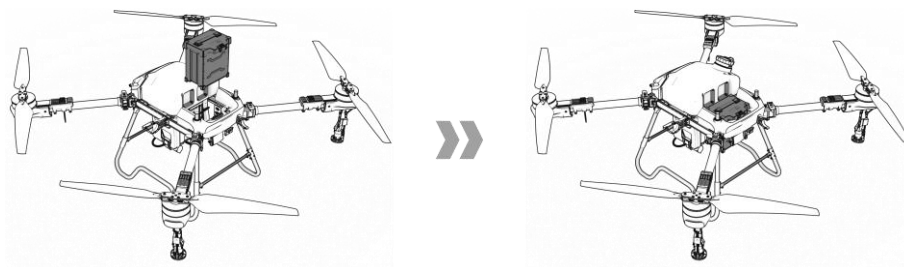
Step 4: Lift the drone horizontally for more than 45° to the ground. Slowly rotate the drone clockwise for at least one circle until the status indicator shows solid green for 4s. The calibration is completed.

Step 5: Calibration fails if the status indicator shows solid red for 4s. Repeat Step 2-4 until the operation succeeds. See Figure 1-37.
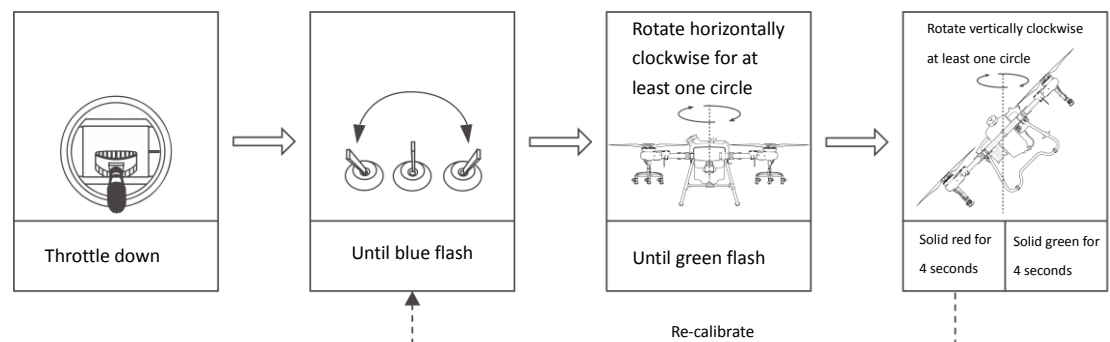
Figure 1-28 Compass Calibration

Method 2: Enter the calibration function via APP:

Step 1: Click [icon] on the right top in the APP to enter the Setting interface, and

click [icon] into Flight Setting.

Step 2: Click [Magnetic Compass Calibration] to enter the magnetic compass calibration interface. Click to start the calibration, and the drone navigation light flashes blue.

Step 3: Repeat the Step 3-5 in Method 1.

Notes:
1. Before calibration, the propellers on the drone should be removed.
2. Do not calibrate it in areas with strong magnetic fields, such as magnetic mines, parking lots, building areas with underground steel reinforcement, etc.
3. During the calibration, do not carry ferromagnetic materials, such as keys, mobile phones, etc.
4. Do not calibrate the compass indoors.

1.4.5.2. **Flowmeter Calibration**

Flowmeter calibration must be performed when the drone is used for spraying for the first time, otherwise, the operation effect will be affected.

Preparation before calibration : Press "⬚" button to start the pump when the drone is on the ground to discharge the air from the pipeline.

Enter Setting ==> Spraying interface. Click "Flowmeter Calibration".

Notes:
1. Re-calibrate after replacing with different nozzles.
2. Re-calibrate after replacing agrochemical with different viscosity.
3. Re-calibrate if the error between the actual operation area and theoretical operation area is more than 10%.

2. **Flight**

2.1. **Flight Instructions**

According to the regulations of the International Civil Aviation Organization (ICAO) and national air traffic control on airspace control and the regulation of drones, drones must fly in the prescribed airspace. For flight safety, the flight restriction function (including altitude and distance restrictions and no-fly area) is enabled by default to help users to use the product safely and legally.

When   is available, the no-fly area affects the flight together with altitude and distance restriction. The drone flyable airspace is the intersection of restricted airspace. Without , the drone flight height is not limited by Agriculture Assistant APP.

2.1.1. **Altitude and Distance Restriction**

Height limit is used to limit the flight height of a drone and maximum radius is used to limit the flight distance of an aircraft. The maximum flying altitude of the drone on delivery is 20 meters. See Figure 2-1.

Maximum Altitude

Maximum Radius

Return Point

The altitude of the flight at startup or the distance from the drone to the surface below it
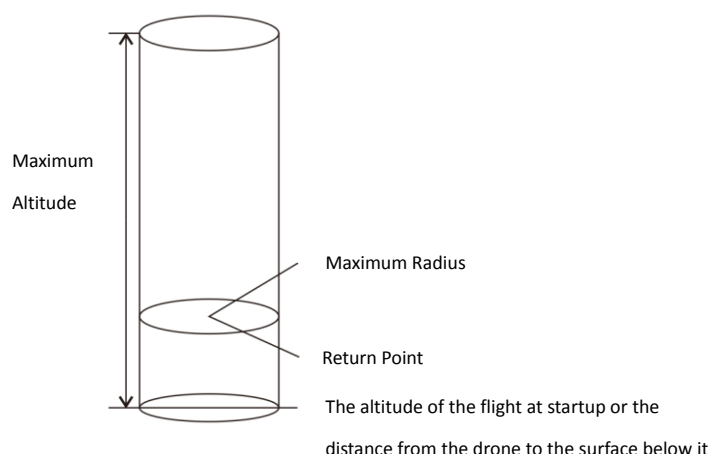
Figure 2-1 Altitude and Distance Restriction

State	Flight Mode	Flight Limit		Notification
With	POSION mode and autonomous mode	Max Altitude	20m	Warning
		Max Radius	9999m	Warning
	Attitude mode	Max Altitude	20m	Automatically switch to POSION mode with warning
		Max Radius	9999m	Automatically switch to POSION mode with warning
Without	Attitude mode	Max Altitude	No limit	No warning
		Max Radius	No limit	No warning

2.1.2. No-Fly Zone and Restricted Area

2.1.2.1. No-Fly Zone

The area includes airport restricted flight areas and special flight restricted areas. For more details, please refer to special flight restricted areas defined by local authorities.

2.1.2.2. Restricted Area (when   is available)

Areas are temporary restricted for flying due to emergencies (such as forest fires, large-scale events, etc.). The restricted area can be a circle or a polygon. The drone is not allowed to fly within the no-fly zone. See Figure 2-2.
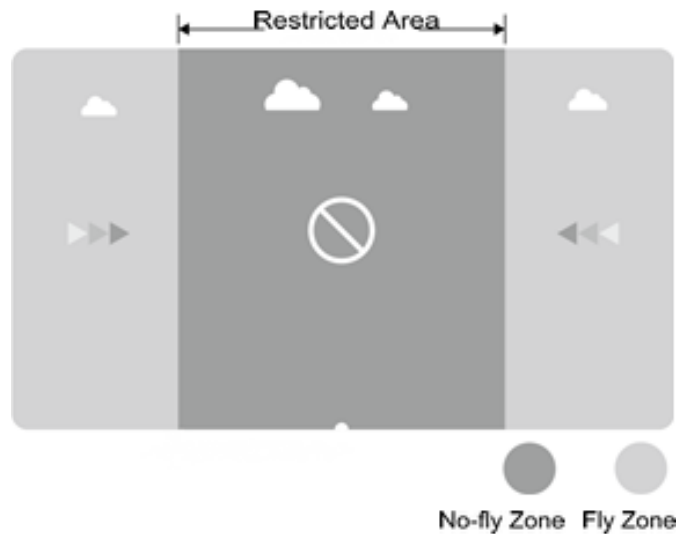
Figure 2-2 No-fly zone and restricted area

signal is normal		
Area	**Special Area with Flight Restriction**	**Status Indicator Light for the Drone**
No-fly Zone	The motors can not be activated.	Red light solid on for 5s and off in 1s
	If the drone flies without , it will land automatically immediately after is available, and the motor stops automatically after landing.	
Close to No-fly Zone	Distance to the no-fly zone <120m. The drone flight speed will slow down with flashing lights and alarming.	Red light solid on for 5s and off in 1s
Fly Zone	The drone can fly normally. No flight restrictions.	No Warning

Notes:

For flight safety, please try to avoid airports, highways, railway stations, subway stations or urban areas. If users need to fly in such areas, prepare relevant materials and apply for temporary airspace to local authorities. Then contact the after-sales service to release the restriction.

2.2. Indicator Description

On the first test flight, it is recommended to understand the meaning of the flight status indicators to ensure a safe flight.

No.	Status	Content	Indicator Display
1	Normal	Power on Self-check is completed POSION satellite searching	Flash yellow for twice
2		Preparation is completed;	Solid yellow

		waiting for take-off	
3		Taking-off and flying	Head direction, solid red; Opposite head direction, solid green
4		Mode switch	Flash green for 5s
5		Magnetic compass calibration (Horizontal)	The indicator flashes yellow twice per second
6		Magnetic compass calibration (Vertical)	The indicator flashes green twice per second
7		Magnetic compass calibration succeeds	Solid green for 4s
8	Abnormal	Magnetic compass calibration failure	Solid red for 4s
9		Self-check Failed	Solid red
10		Low Voltage/Volume Level I	Flash red slowly
11		Low Voltage/Volume Level II	Solid red
12		IMU failure	Solid red
13		Barometer failure	Solid red
14		POSION failure	Solid red
15		Independent magnetic compass failure	Solid red
16		Motor failure	Solid red
17		RC lose control	Solid red

2.3. Operation Description

2.3.1. Pre-flight Inspection

Please check the following points to avoid flight accidents.
1. Place the drone in the open operation area and the user should face the tail.
2. Make sure that the battery of the drone is installed properly.
3. Before flying, it is necessary to turn on the remote controller before plugging in the battery of the drone.
4. Ensure the battery of the drone and the remote controller are adequately charged, also the agrochemical required for spraying is sufficient.
5. Make sure that the motors and propellers rotate in the correct direction and the structure is stable. All arms and propellers of the drone have been fully extended, and the arm sleeves have been tightened.
6. Make sure that the spraying pipes are free of blockage and leakage, and the nozzles can spray water normally. If there is no liquid sprayed out during spraying test, please turn on the pressure relief valve on the side of the

nozzles manually. After discharging the air, turn off the pressure relief valve, and the nozzles can be used for operation.

2.3.1. Lock and Unlock

2.3.1.1. Unlock

The unlocking operation is shown in Figure 2-3. When you unlock the drone, the motors rotate in the sequence of No. 1, No. 2, No. 3 and No. 4. When motor No. 1 starts, push the throttle slightly up and all the motors will start at the same time.

Figure 2-3 Unlock

2.3.1.2. Lock

The drone supports two active locking methods:
➢ Perform the operation shown in Figure 2-4 to lock.
➢ After the drone lands, the throttle stick should be kept at the down position for at least 3s, and then the drone will be locked automatically.
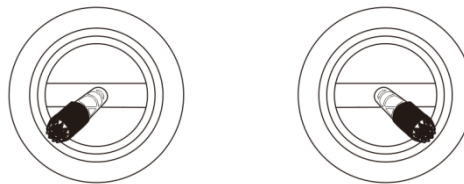
Figure 2-4 Lock

2.3.2. Take Off and Land

2.3.2.1. Take Off

Step 1: Click on " ⏻ " and then long press " ⏻ " for 2s to turn on the remote controller.
Step 2: Turn on the power supply of the drone.

Step 3: The pilot should keep a distance from the drone of more than 10m. Enter the operation interface of the Agriculture Assistant APP to ensure that the signal of   is good, and the status indicator light of the drone is not showing red, which means there's no warning.

Step 4: Perform the unlock action, the drone motors will start one by one, then slowly push up the throttle stick to take off.

Step 5: The drone remains at its current altitude and hovers after the throttle lever is centered, as shown in Figure 2-5.
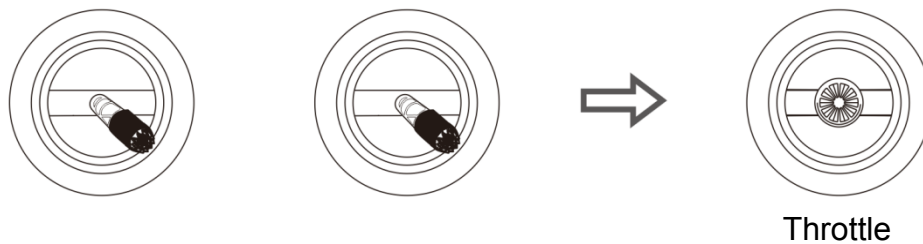
Throttle

Figure 2-5 Unlock and Hover

2.3.2.2. Land

Step 1: Slowly pull down the throttle stick, and the drone lands on the ground.

Step 2: After the drone lands, place the throttle stick to the down position, and then perform the locking action as shown in Figure 2-6.

Throttle
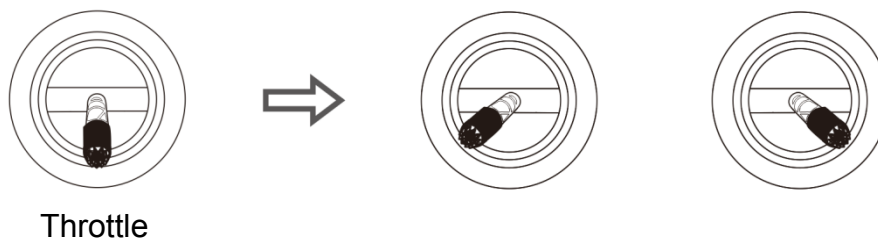
Figure 2-6 Land and Lock

Notes:
1. For the first test flight, the flight altitude shall not exceed 4m.
2. Do not fly beyond the visual range for the first test flight.
3. If there is light flashing showing an alert or there is a warning on the interface of the Agriculture Assistant APP during the flight, please land immediately and check the drone according to the plant protection assistant warning information.

2.3.3. POSION Operating Mode

2.3.3.1. Mode Introduction

POSION operation mode has the features of being easy-to-use and quick-to-start, which is suitable for the operation in small, irregular and complex fields. In POSION mode, the maximum flying speed of the drone is 10m/s. The

spraying speed of the liquid is related to the flying speed. The faster the drone flies, the greater the flow rate is. When the drone hovers, the flow shuts down automatically.

2.3.3.2. Operating Procedure

Step 1: Before taking off, click " ![icon] " button to start the testing spray, to check if there is air in the pipeline.
Step 2: The drone takes off and flies to the field for operation.

Step 3: Press the spray button " ![icon] ", and fly the drone to the field and start the operation.

Notes:
During the operation, make sure that the drone is in the visual range.

2.3.4. AB Point Mode

2.3.4.1. Mode Introduction

AB point operation mode is suitable for use in the regular area. It has fewer operation steps. In the AB point operation mode, the drone can operate automatically after Point A and Point B are recorded. The spray will turn off automatically when the drone changes lines.

The flight route for AB point operation mode is shown in Figure 2-7. The dotted line length is the line spacing, which can be set in Agriculture Assistant APP according to the working conditions.

Figure 2-7　AB Point Operation Route

2.3.4.2. Operating Procedure

Step 1: After the drone taking off, fly the drone to point A of the operating field, and click the "A" Button. The Agriculture Assistant APP will send a voice notification of "Point A is recorded successfully".

Step 2: Fly the drone to the B point of the operating field, and click the "B" Button. The Agriculture Assistant APP will send a voice notification of "Point B is recorded successfully".

Step 3: Click the "AB" Button. The Agriculture Assistant APP will send a voice notification of "AB Point Mode".
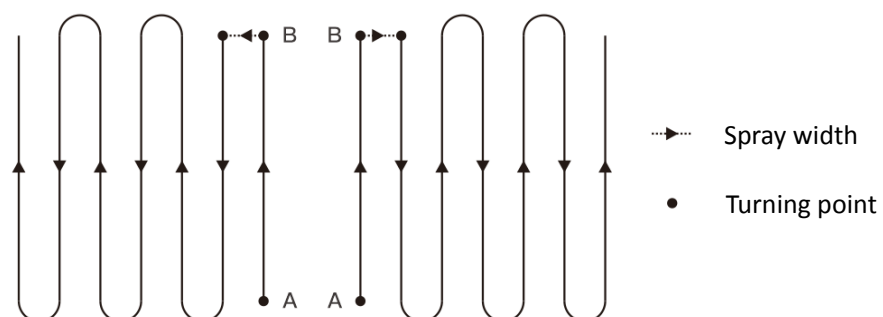
Step 4: Toggle the RC stick to the left/right to fly the drone in the direction of the next line and then the drone will perform according to the planned route.

2.3.4.3. Exit AB Point Mode

The drone can exit AB point by the following methods:
1. No liquid is remained, and breakpoint has been generated.
2. Enter Automatic Obstacle Avoidance Hover Mode.
3. Manual emergency brake the drone. The drone will record the breakpoint and hover.
4. During the operation in AB Point Mode, click the "AB" button on the RC (blue light is off) and the drone will exit the AB point operation mode and hover. If the user clicks the "AB" button on the RC again, the drone will fly directly to the breakpoint or projection point and continue the operation. (Returning to the breakpoint or projection point can be set in the Agriculture Assistant APP).

Notes:
1. During the operation, it is necessary to ensure that the drone is within the visual range.
2. AB points can be recorded when the signal is strong and there is no breakpoint.
3. The distance between "A" and "B" point should be no less than 10m.
4. During operation, the flight altitude can be adjusted by the RC to meet the actual need. When the throttle is in the central position, the drone will maintain its current altitude.

2.3.5. Autonomous Mode

2.3.5.1. Introduction

Users can survey the field and mark the obstacle, and set the border point using the field surveying function of the Agriculture Assistant APP. The Agriculture

Assistant APP will calculate and generate the best route. This mode is suitable for large or irregular fields. The operation route of fully autonomous operation mode is shown in Figure 2-8. The dotted line shows the line spacing. It can be set in the Agriculture Assistant APP.
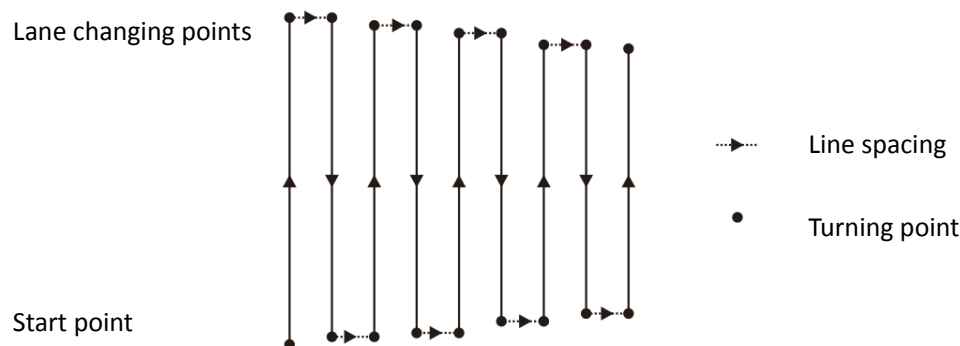
Figure 2-8 Auto Operation Route

2.3.5.2. Field Surveying Steps

Step 1: Run the Agriculture Assistant APP and there will be three options (POSION mapping mode, drone mapping mode and RTK hand-held marker mapping mode), you can choose according to the actual situation.

Step 2: Set a name for the field.

Step 3: Mark the border points: select the points at each corner of the borderline.

Step 4: Mark the obstacle: if there are obstacles in the field, click the obstacle point and select the shape. Click on the turning points of the obstacle shape to set it as an obstacle point, and then click "OK" after the obstacle points setting is completed.

Step 5: Calibration point settings: after editing the operation area, calibration points need to be added. Calibration points are used for map rectification. When setting calibration points, make sure the reference object is easy to identify; the surrounding area is clear and suitable for the drone to take off. The operation area setting is completed when the calibration point is set.

2.3.5.3. Autonomous Operation Steps

Step 1: After the Agriculture Assistant APP is connected to the drone, click to expand the land/task list in the main interface.
Step 2: Select a field (or a field in the task list) and click to use the field.
Step 3: Place the drone at the calibration point of the operation area, click on "Calibrate", then click "Calibrate Drone Position".
Step 4: After the field is chosen, set the following parameters one by one: route angle, turning mode, route inner contraction, obstacle point spacing, altitude,

usage per mu, ways of bypassing obstacle area.

Step 5: According to the route condition, select the routes ready to be sprayed (all routes are selected by default).

Step 6: Click "Start Operation" on the operation interface.

Step 7: Slide to unlock (please set the RTH height and take off height), and the drone will take off automatically and execute the planned route.

Step 8: Complete the operation (also can be finished manually during operation) and then generate the operation report.

Notes:

1. During the operation, it is necessary to ensure that the drone is in the visual range.

2. During the operation, the throttle stick of the RC can be toggled to adjust the flight altitude according to the plant condition. When the throttle stick is in the central position, the drone will resume its setting altitude.

3. For more detailed operation, please refer to the " User Manual of the Agriculture Assistant APP ".

2.4. Function Introduction

2.4.1. Remaining Liquid

2.4.1.1. Introduction

3WWDZ-35B is equipped with a real-time level meter, which can detect the remaining liquid in real-time and display it in percentage to the users, as shown in the figure below. During operation, breakpoints can be selected by combining the remaining liquid and route length. This can reduce the time when drone is flying to the breakpoint and not operating, which will improve the operation efficiency.
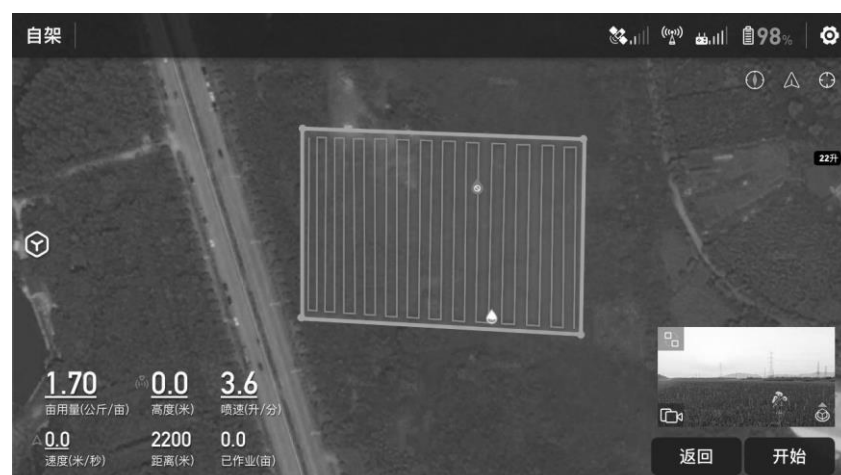
Figure 2-8

2.4.2. Resume at the breakpoint

2.4.2.1. Introduction

If the breakpoint is recorded during the operation due to running out of agrochemical, low battery, manual braking, obstacle avoidance, etc., the drone can be set to resume operation at the breakpoint following the established route.

2.4.2.2. Record the breakpoint

During the operation, the drone will record the breakpoint and resume the operation at the breakpoint in the following situations:
1. Insufficient liquid in the tank.
2. When the low voltage protection function is enabled and the Level II warning is triggered.
3. Pitch or roll stick on the RC is pulled/pushed.
4. When the drone enters the RTH mode.
5. When the drone has obstacle avoidance   and has detected the obstacle, which leads to an automatic brake.
6. When the location signal or heading signal is weak, the drone will automatically exit the operation mode and enter the protection mode, and record the current coordinate as the breakpoint.

Notes:
1. Any condition above is met, the drone will update the breakpoint.
2. The following actions can be set for the drone according to the operating environment after no remaining liquid: hover, raise 2m and hover, RTH and no action.

2.4.2.3. Return to the breakpoint

The steps for returning to the breakpoint are as follows:
Step 1: Hover the drone manually in any open place and ensure there is no obstacle between this position and the breakpoint.
Step 2: Click "Return to the breakpoint " (click the AB Button or return to the Projection Point) in the Agriculture Assistant APP.
Step 3: The drone automatically rises or descends to the operating altitude and returns to the breakpoint.
Step 4: Resume the set route and continue the operation.

Notes:

For more detailed operation, please refer to the " User Manual of Agriculture Assistant APP".

2.4.2.4. **Return to the Projection Point**

If there is any obstacle on the way back to the breakpoint, you can choose "Projection Point" to return to avoid the obstacle.

Step 1: After the operation is paused, you can fly the drone manually to bypass the obstacle.

Step 2: Click "Continue" on the bottom right corner and select "Return to the Projection Point". Three options corresponding to No. 1, 2, and 3 points are marked in the route.

图 2-9

Step 3: Click on one of the points, and the drone will fly to the point to continue the operation.

2.4.3. **Low Battery Level Protection**

The drone has a low battery level protection function. The user can set the warning threshold, which is the battery level in percentage in the Agriculture Assistant APP. When the value is reached, the drone will act according to the setting. The action can be set as: hover, land, return, no action (warning prompt only).

2.4.3.1. Level I Protection

As the Level I protection, the drone indicators flash red. The protection will be triggered after the indicators flash for 10s. The factory default Level I low power threshold is 30%, and the protective action is "no action". At the same time, the Agriculture Assistant APP sends voice notification "Level I Low Battery".

2.4.3.2. Level II Protection

As the Level II protection, the drone indicators flash red. The protection will be triggered after the indicators flash for 10s. The factory default Level II low power threshold is 10%, and the protective action is "auto-landing". At the same time, the Agriculture Assistant APP sends voice notification "Level II Low Battery".
Notes:
1. When Level I warning occurs, fly the drone to the safe area and land as soon as possible.
2. It is necessary to avoid the Level II warning as much as possible to avoid accidents.
3. After the low battery protection action is triggered, the drone can only be switched to attitude mode or RTH mode.
4. When the drone lands automatically, the protection mode can be quit by switching to attitude mode.

2.4.4. Lost Control Protection

2.4.4.1. Overview of Return to Home (RTH) Mode

When the POSION signal reaches the seven satellites for the first time during taking-off or flight and the signal quality is good, the drone will record the current location as the RTH point. The process of the drone returning automatically to the RTH point is called RTH.

2.4.4.2. Protection Logic

When the drone is in good   signal, the compass work normally, and the RTH point has been successfully recorded. If the RC signal is lost for any reason during the operation, the protection action will be triggered. The protection actions include landing, hovering and RTH.
Notes:
1. When the RC is well connected, RTH can be canceled by toggling the RC switch to "S", and the drone can be controlled manually.
2. When the RC is well connected, RTH can be canceled by long-pressing the

"⊙" button for 2s.

3. Maintenance and Common Troubleshooting

3.1. Drone Maintenance & Precaution

1. Delicate electronic components are inside the drone. Do not soak the drone in water when cleaning.
2. Regular inspection of components is required. Make sure the screws are fastened at all the joints.
3. During transportation, make sure to properly fold the arms so that the motor base is placed on the folding structure.
4. If the structural parts (such as frames, arms, landing gears) are damaged, please contact the after-sales service for replacement.

3.2. Motor Maintenance & Precaution

The working environment of agricultural plant protection drones' motor is harsh. Water mist, liquid and agrochemical residue are the main factors causing damage. Therefore, it is necessary to:
1. Clean the housing of the motor with a warm cloth after the operation. Remove the residue on the surface, and do not flush the inside of the motor with high-pressure water. Prevent water from leaking into the motor, which will shorten the service life.
2. Check the motor regularly. When the resistance of the motor is high, the sound is abnormal or the gap between the motor and the motor base becomes large, please contact after-sales immediately and maintain according to the instructions by the after-sales.

3.3. Propeller Maintenance & Precaution

1. If the propeller cracks or is damaged, please replace it in time. Otherwise, it will not have enough lifting power and the drone will be unstable, which will cause safety problems.
2. Pay attention to the marking on the propellers when installing them. Motor No.1 and No.3 should match "CCW" propellers, and motor No.2 and No.4 should match "CW" propellers.
3. Clean up agrochemical residues after finishing the operation.
4. Insert the propeller into the propeller holder during transportation.

3.4. Battery Maintenance & Precaution

3.4.1. UPS

3.4.1.1. Specification Parameters

No.	Project	Specification Parameters
1	Cell Type	Rechargeable Lithium-Ion Battery
2	Individual Cell Voltage	3.7V
3	Capacity	2500mAh
4	Discharge	-20□~55□
5	Charge	0□~45□
6	Storage (Within 3 Months)	-5□~35□

3.4.1.2. Notes

1. When the agricultural drone is not used for a period of time, please connect the drone to the battery once a month for no less than 20min, in order to prevent the battery from discharging.
2. Do not disassemble the battery.
3. It is strictly forbidden to throw the battery into the fire, otherwise, it may explode.
4. Batteries should not be immersed in liquids such as freshwater, seawater, beverages, etc.
5. Using damaged batteries are prohibited.

3.4.2. Battery

1. Charge in the slow charging mode regularly to balance the battery voltage.
2. Avoid charging at a temperature of above 45 □.
3. If the battery falls from height, it might cause a short circuit or even combustion.
4. Make sure the battery is firmly connected to the drone, otherwise it may affect the performance of the drone.
5. If corrosion or discoloration is found in the battery plug of the drone, wipe it with absolute alcohol in time and contact the after-sales department and follow the instructions.
6. Do not use batteries which have dents, scratches and deformation on the surface. Serious mechanical damage may lead to the risk of short circuits or combustion.
7. Make sure all wires are not damaged. Severely damaged wires may cause

short circuits or combustion.

Storage Instructions:

1. For storage of a large number of batteries, it is recommended to keep 30cm between each storage unit.
2. Please avoid direct sunlight for more than 10min under any storage condition.
3. Battery storage environment should be maintained at room temperature (15℃ ~35℃). Long-term storage above 35℃ will accelerate the aging of the battery. Long-term storage at 0℃~15℃ may shorten the service time, but after several times of use at room temperature, the normal condition can be restored.
4. Battery storage should avoid a humid environment. Keep storage environment dry and not ventilated.
5. Battery storage locations should not be places where large items are often moved in and out to prevent accidental collisions.

Transportation Instruction:

1. It is recommended to use a temperature-resistant or flame-retardant box with a cover to store batteries. It is recommended to use the shockproof and tilt-proof sponge in the original box in other packages.
2. Avoid putting the charging and discharging cables on the edge of the box to prevent accidentally being crushed, otherwise, it will lead to a short circuit when being used.
3. During the operation, if the batteries are placed in a vehicle, ventilation should be guaranteed and avoid direct sunlight. The place exposed to direct sunlight in a sealed vehicle may have a temperature of above 80□, which may cause the battery to burn.

Emergency Instructions:

Adequate sand, fire extinguishers, and heat-insulating gloves should be provided in places where batteries are stored, transported, or used.

When smoking and burning of batteries are found, the following measures should be taken immediately:

1. Battery is just starting to smoke (or has a burnt odor): Determine the part where a short circuit happens immediately. Lift the battery handle or charge-discharge cable (with heat-insulating gloves if necessary) and quickly drag the battery into the open room or outdoor. Completely bury the whole battery with sand (the charge-discharge cable needs to be buried in if there is smoking). Be careful to wait until the battery has completely cooled down before taking it out (otherwise the battery may continue to smoke).

2. Batteries emit heavy smoke: immediately use sand and fire extinguishers to extinguish or bury the burning batteries while relocate the surrounding batteries and other flammable objects. If the surrounding flammable and explosive objects (liquids) cannot be removed, immediately use large quantities of water for rapid fire extinguishing and cooling.
3. Batteries are on fire: immediately use a large amount of water, fire extinguishers and sands to extinguish the fire (disconnect the power supply of surrounding electrical equipment first) while removing the surrounding batteries and other flammable material.

Notes:
When using fire fighting equipment to extinguish fire, strictly follow the requirements and specifications of the local Fire Fighting authorities.

3.5. Plug Maintenance & Considerations

1. The plug must be inserted completely when it is connected, otherwise, it will heat the plug and affect flight.
2. The power plug and battery plug should be replaced if they have turned black or sparked.

3.6. Spray System Maintenance & Considerations

1. Fill the water tank, pipe and nozzle with clean water to clean them when the operation is finished.
2. Avoid mixing herbicides and pesticides, otherwise, it will be harmful to plants.
3. In the case of long-term storage or transportation of the drone, always empty the tank.
4. It is forbidden to run the water pump at high speed on an empty tank for long time.
5. Avoid using powders and high-concentration emulsifiers to avoid blocking the spray pipe.

4. Transportation Instructions

Packaging method:
The drone will be placed in the package box with flexible supporting material embedded in the package box while shipping.
Package size: 1083mm*1083mm*905mm as shown below.
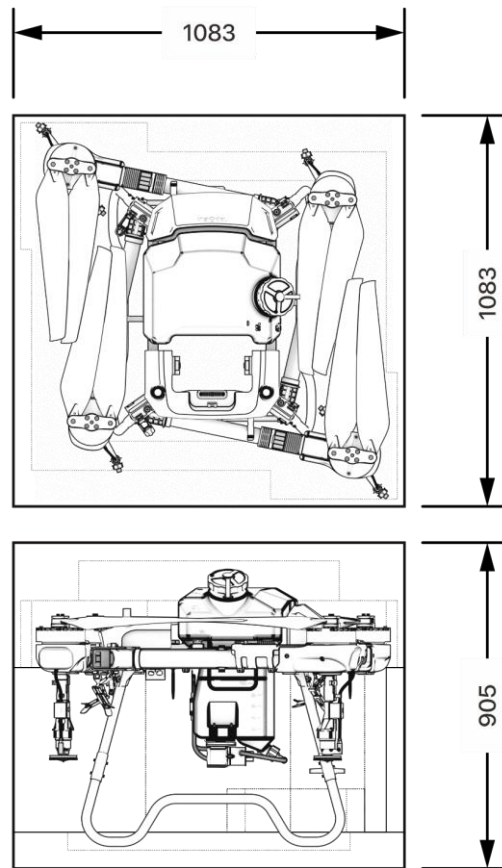
Figure 4-1

5. Hazards and Safety Checklist and Countermeasures

No.	Hazard	Countermeasures
1	Foldable Structure	When folding or unfolding the drone, be aware of the hand pinch hazard sign and keep your fingers away from the folding structure.
2	High-speed Rotating Propeller	Keep a safe distance from the drone and keep it away from people, animals or other obstacles during operation.
3	Charger While Being Charged	Place in a dedicated charging area and environment. Ensure good ventilation. When the charger is connected to power, make sure the charger is grounded.
4	Tank	Flush it with clean water after use and cover it with the lid, and store in a safe place.
5	Battery	The maximum voltage is up to 51.8V. Please use in strict accordance with the relevant safety regulations and the instructions of the battery, and pay attention to safety.
6	Agrochemical	When handling agrochemical, pay attention to the risk of different kinds of agrochemical. Fully understand the

		using methods in advance.
7	During the Operation	Do not operate in bad weather, such as strong wind (wind speed 8m/s or above), heavy rain (rainfall 25 mm/12 hours or above), snow, fog, etc.

6. Manufacturer Information

Manufacturer: Topxgun (Nanjing) Robotics Co., Ltd.
Add.: No.8 Building, Jiyun Building, Jiangsu Software Park, No.1 Dongji Avenue, Jiangning District, Nanjing, China
Tel.: 025-83798727
Website: en.topxgun.com

7. Appendix

7.1. Specification Parameters

Specification	Parameter
Package	
Package Size	1083*1083*905mm
Net Weight	32kg
Gross Weight	47.6kg
Body Frame	
Symmetrical Motor Wheelbase	1970mm
Arm Length	740mm
Spraying Mode	
Dimension (Folded State)	1045*1020*815mm
Dimension (Unfolded State)	2684*1496*815mm (With unfolded propellers)
Dimension (Unfolded State)	1653*1496*815mm (Without propellers and nozzle, antenna included)
Spreading Mode	
Dimension (Folded State)	1045*1024*836mm
Dimension (Unfolded State)	2684*1496*836mm (With unfolded propellers)
Dimension (Unfolded State)	1653*1496*836mm (Without propellers and nozzle, antenna included)

Power Motor	
Model	T136
Stator Dimensions	136x27mm
KV	66rpm/V
Power	8000W (1 motor)
Maximum Thrust	41kg (1 motor)
Weight	1830g
Number of motors	4
Power ESC	
Rated Working Current	60A
Operating Voltage	51.8V (14S LiPo)
Maximum Signal Frequency	500Hz
Drive PWM Frequency	20kHz
Foldable Propeller	
Pitch	聚合物+碳纤
Pitch	47 inch，1210 mm
Pitch	18 inch
Pitch	820g
Spraying System	
Tank	
Maximum Capacity	36L
Rated Capacity	35L
Weight	4.5kg (Including liquid level sensor and other accessories)
Pump	
Pump Type	Diaphragm pump
Max Flow Rate	8.0L (1 pump)
Operating Pressure	0.2~0.4Mpa
Centrifugal Nozzle	
Rated Voltage	51.8V

Protection Level	IP67 (exclude the valve structure)
Maximum speed of centrifugal disc	10000rpm
Maximum Atomization capacity	5L/min (1 nozzle)
Spray Range	6.0~10.0m
Recommended Spray Range	8m
Atomization	80μm~300μm
Spreading System (Optional)	
Container Capacity	55L
Maximum Capacity	40Kg
Weight	5.8Kg (include the container, spreader and other components)
Feeding Mode	Ration by rolling feeder
Spreading Mode	Adjustable air jet
Spread Range	5~7m
Operating Temperature	0□~40□
Size	526*399*750mm
System	
FPV Camera	
FOV	Horizontal 140°, vertical 87°
Resolution Ratio	720P
Auxiliary Light Brightness	15lux@5m Directly
Flight Parameter	
Drone Weight (With Battery)	42.6kg (Spraying mode) 42.7kg (Spreading mode)
Rated Take Off Weight	77.6kg (Spraying mode) 82.7kg(Spreading mode)
Maximum Take Off Weight	91kg
Hover Precision (signal properly)	Horizontal ±1.0m, vertical ±0.5 m
	Horizontal ±10 cm, vertical ± 10cm (RTK enabled)
	Vertical ±0.1m (enabled)
Hover Time*	≥7min (Take-off weight 77.8kg & 30Ah battery) ≥15min (Take-off weight 42.8kg & 30Ahbattery)
* The hover time is measured near sea level, when the wind speed is less than 3m/s, and the ambient temperature is 25℃.	

Maximum Flight Speed	10m/s
Distance Limit	1000m
Maximum Take-off Altitude	2000m
Recommended Operating Ambient Temperature	0~40□
Flight Control System	
Model	TIA2023
Input Voltage	30~60.9V
Rated Power	20W
Working Temperature	-10□~60□
Interface Type	CANBus, RS485, PWM, USB, etc.
Supported Multi-rotor Aircraft Types	Four rotors, six rotors, eight rotors (configurable)
Protective Function	Low voltage protection, lost control protection, no-fly zone protection, etc.
Supported Languages	Simplified Chinese/English
System	
Frequency	BDS: B1/B2; POSION: L1/L2; GLONASS: L1/L2;
Hover Accuracy (RMS)	RTK not enabled: horizontal: ±0.6m, vertical ±0.3 m
	RTK enabled (fixed solution): horizontal: ±0.1m, vertical: ±0.1m
Orientation Accuracy (RMS)	0.4°
Handhold RTK Mapping Kit (Optional)	
Measurement Accuracy	Point positioning: 2.0m CEP D: 0.5m CEP RTK: 2cm+1ppm (horizontal) CEP
Charge Time	≤4h
Duration	Work individually: 8h Work with data transmission: 4h
Battery Capacity	3000mAh
Waterproof Level	IP65
Size	70*70*50mm
Weight	300g
Charger (TC7201P)	
Input Power	AC 220V~240V
Input Voltage Frequency	50/60Hz

Output Power	DC 58.8V (Max)
Output Current	150A (Max)
Output Power	7200W (Max)
Channel	1 Channel
Supported Language	Simplified Chinese
Net Weight	18.7kg
Gross Weight	12.2kg
Size	300*330*375mm
Package Size	440*300*365mm
Battery (TB1430)	
Voltage	51.8V
Capacity	30000mAh
Discharge Rate	8C
Charge Rate	5C
Waterproof Level	IP56 (when is is installed on the drone)
Battery Life Time	1000 cycles (Capacity will be attenuated, no limit to use)
Weight	11.1Kg
Size	226*199*269mm
Package Size	500*300*320mm

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different   from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.