

前 言

Introduction

请让我们带您快速了解“金星 150”高效农用无人植保喷雾机的优越性能。

Let's take a quick overview of the superior performance of "VENUS-150" High Efficiency Agricultural Aerial Sprayer.

“金星 150”高效农用无人植保喷雾机，用于作物的农药喷洒作业。由于其极高的灵活性和极强的适应性，广泛用于各种粮食、经济作物、果树等产区。为了广大用户能正确使用好该机器，特汇编了这本内容丰富，兼具知识性、技术性，又通俗易懂的使用说明书。希望大家能认真阅读。

Hanhe "VENUS 150" High Efficiency Agriculture Sprayer is used for spraying operation of crops. Due to the extreme flexibility and adaptability, it is widely applied in various areas including grain, economic crops, orchards etc. For the proper use, this easy-to-understand user manual, which covers extensive technical and informative instructions, is hereby compiled. Please read it carefully.

使用说明书系统介绍了“金星 150”高效农用无人植保喷雾机的安全使用要求、技术规格、基本结构、操作使用、维护保养、润滑及易损件明细表、周期检查和调整表等内容。购机用户务必在使用前充分阅读并经常参照使用，充分发挥该设备的优越性能。

The user manual covers requirements of safe use, technical specifications, basic structure, operation, maintenance, lubrication, the list of quick-wear parts, and the periodic check and adjustment table, etc. After purchasing the sprayer, users must thoroughly read the manual before the sprayer can be used, and frequently refer to it as needed, to unleash the superior performance of the equipment.

说明书是机器的组成部分，务必随机携带、妥善保管，保证内容完整。请认真阅读，否则极有可能造成安全事故和机器故障。如将机器转借或转让于他人，请把使用说明书同时交付，务必确保其在操作前认真阅读使用说明书。

The user manual is part of the sprayer, and shall be kept intact and stored carefully along with the sprayer. It shall be read through carefully. Otherwise, it is quite likely to create safety accidents and failures. If the sprayer is borrowed or transferred to someone else, please also deliver the user manual and do notify him to read it thoroughly before operation.

本机操作者必须接受专业培训，熟练掌握操控技术，认真学习使用说明书中各项条款，熟悉机器特性与相关安全操作知识、掌握维修保养技能。

The operator shall be trained systematically to become proficient with manipulation techniques, and learn all the items in the user manual carefully to get familiar with aircraft characteristics and relevant safety practices, and possess maintenance

skills.

严禁任何擅自改装机器的行为、严禁使用非原厂配件，应使用本说明书列明的附件辅料，以免导致作业性能下降、可靠性降低、机器损坏或人员伤害的情况发生，如不遵守，后果自负。Any unauthorized modification to the sprayer and use of non-original accessories are all specifically prohibited. Always use those accessories and auxiliary materials listed in this manual to prevent reduced operation performance and reliability, sprayer damage and personal injury. Hanhe assumes no liability for the customer's failure to comply with these requirements.

我们致力于产品的不断改进和完善，不断提高机器设备的质量、性能，使用说明书与零件图册所述的内容与实物可能存在差异和不同，若遇说明书、零件图册与产品实物有所不符时，以产品实物为准，这些更改恕不另行通知，敬请谅解。

We are committed to constant improvement of products, to continuously enhance the quality and performance of equipment. The content in the user manual may differ from actual product. If there is any mismatch between actual product and the user manual, the actual product shall prevail. The products are subject to change without notice. Thanks for understanding.

重要声明: Important Notes:

1. 飞机必须由经过无人机专业训练的飞行人员进行安装、维护、操作、保养！
“金星 150” 高效农用无人植保喷雾机具有功率大、机动性高等作业特性，因此对操作人员操作熟练程度和心理素质具有较高要求，必须由专业且熟悉本机的飞行人员进行操作，使用者须承担法定的安全责任。
1. The sprayer has to be installed, maintained and operated by pilots with professional training of this sprayer! Hanhe VENUS 150 Sprayer has operation characteristics of high power and maneuverability, which requires a high level of operational proficiency and psychological quality of operators. The sprayer has to be operated by professional pilots. Users shall take legal safety responsibility.
2. 安装、操作或保养不当都可能造成严重的安全事故，对周边人员的生命和财产损失造成潜在的威胁和严重损害！
2. Improper installation, operation or maintenance may cause serious safety accidents, leading to potential threats to property and people around or actual damages and injuries!
3. 飞机质量、作业前检查、例行维护和保养才构成无人机设备的作业性能！
3. Stable product quality, preflight check and routine maintenance contributes to high

performance of product!

4. 无人机低空作业过程务必遵守当地法律法规、遵循所有手册中的无人机安全规范及保养程序。生产商和经销商对由于组装、操作、保养不当所造成的意外损失不承担任何责任。
4. Low-altitude flight operations shall be conducted in strict accordance with local laws and regulations, as well as the safety specifications and maintenance procedures in the manuals. Manufactures and distributors assume no liability for unexpected loss caused by improper assembly, operation and maintenance.

注：在中华人民共和国范围（不包括港澳台地区）实施无人机飞行活动时，须遵守《民用无人机空中交通管理办法》及其他相关法律法规。《办法》中明确了无人机飞行活动安全责任由操作者或组织者承担。世界其他国家地区应依照当地法律法规规定。

Note: when carrying out UAV flight activities in the territory of the People's Republic of China (excluding Hong Kong, Macao and Taiwan), comply with the "Air Traffic Management Regulations for Civil Unmanned Aerial Vehicles" and other relevant laws and regulations. "Air Traffic Management Regulations for Civil Unmanned Aerial Vehicles" clearly stipulates that safety responsibilities of UAV flight activities shall be borne by the operator or the organizer. In other parts of the world, conform to local laws and regulations.

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第一章 “金星 150” 型高效农用无人植保喷雾机出厂信息

Chapter 1 Manufacturing Information



Model type	VENUS 150
Manufacturer	Foxtech Trade Co., Ltd
Telephone	8602227989688

Chapter 2 Safety Precautions

2.1 安全操作Safety Practices

1. 操作者须经过无人机专业培训，并获得相关机构核发的有效证照后方可上机操作。本机系远程控制无人机，供操作者在可视范围内遥控使用，属高危险性设备，作业时务必远离人群，操作者维护维修不当、电子控制设备不良、以及操控上的不熟悉都有可能造成失控损伤等不可预期的意外。作业者务必注意作业安全，并需了解疏忽可能带来的严重危险情况。

1. The operator of this equipment must receive professional trainings and obtain valid certificate before hands-on operation.

As an unmanned product with remote control, this equipment can be operated through remote control within line of sight. The equipment is highly dangerous and must be kept away from crowds when in use. Improper maintenance and repair, poor electronic control equipment or any inexperience in manipulation may cause unexpected accidents such as out of control, damages or injuries. The operator must guarantee operation safety and understand those serious dangers which may result from negligence.

2. “金星 150”型农用植保机销售时不包含电池与充电器，用户需自行购买推荐型号 电池与充电器。请严格遵守电池与充电器本身的说明使用电池及充电器，锂聚合物电池充电及使用存在失火风险，用户使用时需提前做好防火措施，用户因电池或充电器的不当使用而造成的任何损失或伤害，汉和不予负责。

2. Hanhe “VENUS 150” Sprayer does not come with battery and charger. Users need to purchase the recommended model of battery and charger by themselves.

Please

use the battery and charger in strict accordance with corresponding instructions. Charging and using the lithium polymer battery involves the risk of catching fire, so users shall take measures of fire prevention in advance. Hanhe assumes no liability for any loss, damage or injury incurred from user's improper use of battery or charger.

3. 避免在极端气候环境中进行作业；雨雪天应停止作业；5 级以上风力和高温曝晒天气会严重降低农药喷洒效果应停止作业；能见度不足 200 米距离时无法识别设备姿态，应停止作业。

3. Do not operate under extreme environmental conditions, such as rainy or snowy days,

wind force above 5-grade or high temperature exposure which will greatly weaken pesticide spraying effects, and the visibility of less than 200 meters where equipment attitude cannot be recognized.

4. 避免独自作业，操作员应配备至少一名助手进行作业。助手在作业过程中进行地面保障工作：帮助识别飞行距离和位置、读取作业轨迹记录数据、确保无关人员保持安全观看距离，是在紧急情况下实施救援措施必不可少安全保障人员。同时操作手应避免疲劳作业、超技术能力作业。

4. The operator shall perform spray operation with the help of at least one assistant.

During spraying, the assistant performs the following ground security work: help to

identify flight distance and location, read record data of flight tracks and keep irrelevant out of the operation zone.

personnel at safe viewing distance. The assistants are necessary security personnel to

execute rescue in case of emergency. Operators shall not operate in fatigue or beyond

technical competence.

5. 本型号设备仅适用于在人员稀少的农田、果园、森林上进行可视范围内的作业。应绝对避免在人群密集处、机场附近、低空管制区域、军事管理区域和其他法律法规禁止的区域作业。

5 This equipment only applies to spraying operations within line of sight over sparsely populated farmlands, orchards etc. The equipment must not be operated in crowded places, near the airport, at low-altitude control area, in the military administrative region or other areas prohibited by laws and regulations.

6. 农用植保机每次工作前应按照标准流程进行作业前检查，并确保机身各部位机械件、螺丝等正常后才能进行作业。准备时要严格确保动力电池未连接，设备周围五米内不得有操作手和助手外的任何人员。

6. Before each flight operation, follow the standard process of preflight check and

ensure that each airframe part and screws are all firmly tightened. When preparing, absolutely ensure that power battery is not connected and there is no personnel other than the operator and assistant within 5 meters around the equipment.

7. 务必保证动力电源接通前进行农药加注、检查、维护、保养等所有作业前准备工作。动力电源接通后，应迅速远离飞机，确保飞机 50 米范围内不得有操作手和助手外的任何人员。如遇任何问题需要检修，第一时间切断动力电源后方可进行。

7. Be sure to complete all the preflight preparation work such as pesticide filling, inspection, maintenance before power battery is connected. Once the power battery is connected, quickly leave the operation zone. And ensure there are no personnel other than the operator and assistant within 50 meters around the drone. If the equipment requires troubleshooting, first disconnect the power battery before doing so.

8. 启动前保证设备安放在坚实平整的开阔地面上，启动过程中任何人员严禁接触或进入旋翼组等部件的旋转 50 米范围内，严防发生意外伤害。

8. Before startup, place the equipment on flat, sturdy and open ground. During startup, any person is prohibited to touch or access the area within a distance of 50 meters around rotating parts such as rotor set and to prevent accidental injuries.

9. 农药配置、加注、喷洒过程中应注意做好人员防护，农药和用水的配置、使用注意事项请咨询农药提供商。为避免吸入农药，喷洒过程中操作手应处于上风处，并确保无关人员在操作手身后一米距离以上，禁止与操作者说话，设备作业过程中机器周边 50 米范围不得有人员。

9. During the processes of pesticide preparation, filling and spraying, be sure to take

proper personnel protection measures. Please consult the pesticide supplier for the

ratio of pesticide to water and considerations on pesticide use. To avoid inhalation of

pesticide, operator shall stand windward while irrelevant personnel shall be kept one

meter or more behind the operator and prohibited to talk with the operator. During spraying operation, no personnel are allowed within 50 meters around the equipment.

10. 作业过程中如遇任何意外情况应立即降落，排除故障后方可重新投入作业。作业中农药箱放空后应关闭水泵开关，防止空转损坏设备。作业完成后，将设备降落在平整坚实的开阔空地。将油门摇杆放到最低、必须待主旋翼尾旋翼彻底停止转动后才能靠近，第一时间切断动力电源插头。

10. Land the sprayer at once in case of any accident during operation, and the operation can only be resumed after problems have been solved. Switch off the delivery pump after the liquid tank is emptied, to prevent equipment damage due to running dry. After operation, land the sprayer on flat, sturdy and open ground. Push the throttle stick to the lowest location, and do not approach the equipment until the main rotor blades and tail rotor blades stop rotation completely. Keep in mind that the power battery shall be disconnected in the first place.

11. 在没有切断动力电源插头前不可关闭遥控器，防止意外电磁干扰导致动力重启！因此降落后首先第一时间切断动力电源，必须记住最后关闭遥控器电源。

11. Do not turn off transmitter before power battery is disconnected, to prevent

motor restart caused by unexpected electromagnetic interference! Therefore, after landing, keep in mind that the power battery must be disconnected in the first place and transmitter be powered off at last.

12. 作业完成后, 须按飞行后检查要求认真检查, 方可重新投入作业。按原厂维护保养要求进行定期保养维护, 可使设备保持良好的工作状态。

12. When spraying operation is complete, inspect the equipment carefully as per post-flight check before operate again. Perform periodic maintenance to keep the equipment in optimal working state.

2.2 安全标志 Safety Sign

为了安全使用本机, 避免人身伤害事故, 务必请用户仔细了解本机各处所粘贴的各种安全标志, 切实遵守规定。

To safely operate this equipment and avoid personal injury, be sure to understand all the safety signs pasted on each location of the airframe and strictly comply with relevant rules.

安全标志应保持完整、清洁和清晰, 如有损坏, 请及时更换。新的安全标志可向经销商或本公司索取。

The safe signs shall be kept intact, clean and clear, and be replaced timely if damaged. New safety signs can be obtained from the manufacturer and its distributors.

1. 危险标志 Danger Sign

标志底色为红色, 危险程度标志图形带底色为白色。图形为红色或黑色, 文字为黑色。表示在设备工作时所贴危险标志的部位必须严格遵守所示内容, 否则可能造成重大人身伤亡事故。

The bottom color of this kind of sign is red, and the background color of the graph area is white. The graphics are red or black and the text is black. For the parts pasted with the danger sign, the indicated content on the sign must be strictly obeyed during operation. Otherwise, major accidents of personal injury or death may occur.



2. 警告标志 Warning Sign

警告标志底色为橙色，警告程度标志图形带底色为白色，图形与文字为黑色，提醒人们在进行操作时必须按使用说明书要求进行操作，否则会有人身伤害或机器损坏事故。

The bottom color of this kind of sign is orange, and the background color of the graph area is white. The graphics and text are black. The sign is to remind that the user manual must be observed during operation. Otherwise, accidents of personal injury or product damage may take place.



3. 注意标志 Caution Sign

注意标志底色为白色，注意程度标志图形带的底色为黄色，图形与文字为黑色。提醒人们在进行操作时必须注意有关事项，在维修保养时按使用说明书所规定的方法进行。

The bottom color of this kind of sign is yellow, and the background color of the graph area is yellow. The graphics and text are black. The sign is to remind that relevant precautions shall be taken during operation, and that maintenance shall be conducted according to prescribed methods in the user manual.



第三章 产品主要性能指标和技术规格

Chapter 3 Main Performance and Technical Specifications

3.1 概述 Overview

金星 150 是经过多年的市场应用经验，结合用户需求精心打造的电动多旋翼植保机，配合最新科技的飞行控制系统，让植保作业变的更轻松， 更高效率。

“VENUS 150” Agricultural Sprayer is an electric multi rotor sprayer developed based on user needs and years of application experience. Equipped with the state-of-the-art flight control system, the product enables more efficient and easier operations for agricultural care.

该产品具有 4 种飞行模式：

It has four flight modes:

1. 姿态模式:用于起飞降落，以及异常处理。

Attitude Mode: It is used for takeoff, landing and exception handling.

2. GPS 模式:适合复杂、高低不平的作业环境。

GPS mode: it is used for complex and uneven operation areas.

3. AB 点模式:适合地形空旷，规则整齐的大面积地块。

A-B Route Mode: it' s ideal for open, big and regularly shaped areas.

4. 智能航线模式: 用户通过 APP 智能规划作业系统进行农田测量、障碍物测量、航点设置等，APP 将根据这些数据计算并生成最佳航线，实现作业的智能规划。

After the operation area and obstacles have been measured and setting have been configured, APP uses built-in intelligent operation planning system to produce a flight route.

该产品同时具备断点续航功能：在作业过程中，若中断作业，飞行器可记录中断坐标点，用户可进行换药、换电池或手动避障等操作，再次作业时自动返回该点继续作业。

The sprayer has operation resumption function. When exiting Route or A-B Route operation, the aircraft records a breakpoint. The Operation Resumption Function allows you to pause the operation temporarily to refill the spray tank, change the battery, or avoid the obstacles manually. Afterwards, resume the operation from the breakpoint.

配备完整的喷洒系统，包含作业箱、喷头、水泵等，精准计算喷洒量，喷洒均匀、覆盖范围大。

The sprayer is equipped with a complete spraying system which includes spray tanks, nozzles and pressure gauge, etc. Spray volume can be calculated accurately, providing well-distributed spraying and great coverage.

本机单个起落作业 15 分钟，可喷洒面积 20 至 25 亩。根据作业高度喷幅可调整为 6 至 7 米，标准作业高度距作物表面 1 至 2 米，标准作业航速 5 米/秒。

This sprayer can fly for 15 minutes in a single flight which covers an area of 2 hectares. Depending on operating height, spray width can be adjusted to 6-7 meters. The standard operating height is 1-2 meters above the surface of crops and standard flight speed is 5 meters per second.

本机结构可靠、外形优雅、对田块适应性强、大幅提高喷洒作业效率、性能稳定，是全新的革命性农药喷洒作业设备。

As a new revolutionary spraying equipment for agriculture, the sprayer can significantly improve spraying efficiency with reliable structure, elegant profile and strong adaptability to fields.

3.2 主要性能测试条件Main Conditions for Performance Test

在海拔零点、气温 20 摄氏度、三级以下风力的情况下，距作物表面 1.5 米高度，本机作业性能符合下表（表 2）的规定。

At sea level, with wind force below 3-grade and temperature at 20 °C, the operating performance of equipment which is 1.5 meters above the surface of crops, meets the requirements described in the following table (Table 2).

金星 150 无人植保喷雾机 “VENUS 150” Sprayer	作业性能 Operating Performance
项目 Items	小麦 Wheat
总效率 Overall Efficiency	3.2 亩/分钟 0.22 ha/min
喷洒覆盖率 Spray Coverage Ratio	88.3% 88.3%
药剂损失率 Pesticide Loss Ratio	9.1% 9.1%

表 2
Table 2

3.3 主要技术规格 Main Technical Specifications

分 类 Items	项 目	参 数 Parameters
植保参数	喷洒离作物冠层高度	1 ~ 3m

Spraying Parameters	The distance between the surface of the crop and the drone	
	喷头数量 Nozzle Quantity	4pcs
	泵数 Pump Quantity	2pcs
	喷洒流速 Flow Rate	2.4 ~ 5.2L/Min
	作业速度 Flight Speed	1.0 ~ 7m/s
整机参数 Fuselage Parameters	整机质量 Empty Weight	14.5
	螺旋桨直径 Rotor Diameter	838mm
	螺旋桨材料 Blade Material	Carbon Fiber
	螺旋桨数量 Propeller Numbers	12pcs
	整机尺寸(长 X 宽 X 高) Fuselage Size	1250*1250*650mm
	使用温度范围 Working Temperature	-5 ~ 40℃
遥控发射器 Remote Controller	无线发射频率 Transmitting Frequency	2.4GHz
遥控接收机	频率	2.4GHz

Receiver	Frequency	
	通道 Channels	9
动力系统 Power System		
	满载消耗电流 Full Load Consumption Current	120A
	电动机 持续输出功率 Motor Continuous Output Frequency	2.2Kw*4
	电调工作电压 ESC Working Voltage	51.8V
	电调最大持续电流 ESC Max Continuous Current	150A*4
	推荐电池 容量 Battery Capacity	≥20000mAh
	电池仓总容积 Battery Compartment	247*191*138
飞行模式 Flight modes	(1) 姿态模式 Attitude Mode (2) GPS 模式 GPS Mode (3) AB 点作业模式 A-B Route Mode (4) 航线作业模式 Route Mode	

表 3
Table 3

第四章 产品构造和工作原理

Chapter 4 Construction and Operation Theory

本植保机由机身部件、喷洒部件、飞行操纵部件、遥控器等共四大部件组成。机体结构部件是喷洒部件的基础安装平台，由旋翼组、动力系统、机身等组合而成。喷洒部件安装在桨叶

下方，由农药箱、农药泵、喷洒架等组成。飞行操纵部件由锂电池组、螺旋桨组、飞行控制系统等组成。遥控器可以在地面通过无线电遥控植保机飞行。

The sprayer mainly consists of four parts that are the main mechanical frame, spraying system, flight manipulation system and remote controller. The spraying system consists of liquid tank, delivery pump and spraying arms etc. The flight manipulation system is composed of Li-Po battery pack, rotors set and flight control system, etc. The flight operation of sprayer can be remotely controlled by the remote controller.

工作时操作手在地面通过遥控器控制设备运行。设备上旋翼组顺时针/逆时针旋转使气流往下运动产生升力使整机悬停于作物上方；

During operation, the operator uses the RC controller (Figure 2) to control the equipment. The rotors on the equipment rotates to make airflow move downwards, resulting in lift force which enables the sprayer to hover above crops;

液态农药储存在农药箱中, 经农药泵驱动从机身两边喷洒架上喷嘴雾化后喷出。工作中主旋翼的高速下降气流吹开作物表面枝叶并加速药雾的下行，在风力作用下使得农药均匀附着在植株表面、叶背面和根茎上，由于下降气流单一可使药液均匀分布于风场之下，从而达到农药均匀喷洒的目的。

Liquid pesticide stored in liquid tank is driven by the delivery pump to be atomized and then sprayed by nozzles of the spraying arms on both sides of the airframe. During operation, the high-speed downward airflow generated by the main rotor blows apart the surface branches and leaves of crops and accelerates the downward movement of atomized pesticide, making pesticide evenly attached to the plant surface, and the abaxial leaf surface, root and stem of plant under wind force. The sole downward airflow drives pesticide to be evenly-distributed under wind field, realizing uniform spray.

第五章 “金星 150” 型农用无人植保喷雾机装箱情况
Chapter 5 Package

5.1 装箱情况 Package

产品模块 Module	名称 Items	数量 Quantity
机身结构 Airframe	机体、脚架、外壳组件、药箱、桨托等 Main body, landing gear, Shell, Spraying tank etc.	1 set
动力系统	桨 3-Blade Propeller	12pcs

Power System	电机 Motor	4pcs
	电调及配套线路 ESC	4pcs
控制/航电系统 Controlling System	飞控主机、FPV 模块、GPS 模块、避障模块等 FC, FPV module, GPS, Radar,	1set
喷洒系统 Spraying System	喷头组件、管路、压力泵、药箱、过滤网等 Nozzles, Pump, Tank, filter etc.	1set
遥控器 Remote Controller	遥控器及打点设备 Transmitter, Receiver	1set

具体请以销售协议或发货单为准。

For detailed configuration, please refer to the sales agreement.

5.2 初次使用前准备 Preparation before First Use

5.2.1 动力电池准备 Power Battery Preparation

“金星 150”无人植保喷雾机采用大容量电池，为了满足作业需求，需提前将电池充满备用，请勿快速充电，影响作业效率与电池循环寿命。

“VENUS 150” sprayer uses large capacity battery. Fully charge the battery in advance for use. Do not execute quick charge, which will reduce spraying efficiency and battery cycle life.

检查电池金属接头是否因长期使用导致严重磨损、氧化，若出现请及时更换。

Check whether the metal terminal of battery is seriously worn or oxidized due to long-term use. If so, replace it timely.

电池出现鼓胀、变形、漏液、低电压为不可修复的损伤，应立即更换！

If the battery has bulge, deformation, leakage or undervoltage condition which are irreparable damages, replace it immediately!

充电注意事项：充电区域请选择空旷、防火、干燥清洁的通风环境，附近无贵重物品，充电过程请时刻保持有人监视，充电区域须常备可靠的二氧化碳灭火器或大量沙土。

Attention: for charging, choose open, fireproof, dry, clean and ventilated areas without valuables nearby. Always keep someone on guard during charging. Ensure that reliable carbon dioxide extinguishers and a large amount of sand are always available in the charging area.

电池使用后须待冷却（自然冷却）至常温方可再次充电。

After use, do not charge the battery until it is natural cooled to the normal temperature

注意：请反复确认充电使用的插座及线路是否能满足 2400W 供电需求！以免造成短路或线路燃烧等事故发生。

Note: please carefully verify if the socket and lines used for charging can meet

the needs of 2400W power supply, to prevent accidents such as short-circuit or burning lines!

5.2.2 外场作业准备 Preparation for Outfield Operation

携带好常用工具，石棉毯、沙子、二氧化碳灭火器。电池使用专用防爆箱装载，在前往外场进行试验或作业前，请准备好合适的装载交通工具。

Bring common tools, asbestos blankets, sand and carbon dioxide extinguisher. Ship the batteries with dedicated explosion-proof tank.

注意

作业过程中严禁超载，若有超载可能

对电池或其他设备造成不可逆的损伤；

Note:

Overload is strictly prohibited during the operation; it may cause irreversible damage to the battery or other equipment;

Suggestion: For new users, it is advisable to carry liquid at 10Kg in the early stage of the operation, and increase to 20Kg after being proficient.

第六章 遥控器的使用

Chapter 6 Remote Controller Usage

6.1 远程控制器的使用 Using Remote Controller

Start: long press the power button to turn on the radio controller.

Turn-off: long press the power button to pop up "turn-off" and restart ", click on" turn-off ".

A: return-to-launch B: pump switch C: Fan switch

D: Obstacle avoidance switch

E: Flight Mode Auto-position-Auto F: AB points, points removing



Note: 1. This description is for reference only:

2. With its own device Assistant Controller tuning software, you can modify the settings related to the Controller Channel:

3. Directly pointing "unconnected" to connect to the aircraft in the ground station . There is no need to select the aircraft number, H30 is selected in the system setting.

4. The receiver is plugged on and out more than five times by counterfrequency operation, and the interval is more than 2 seconds (different from the previous fast plug and unplug).

5. Be sure to confirm the functional channel corresponding to the rocker switch before unlocking the aircraft.

6.2 设备使用前的准备 Preparation Before Using Equipment



图4 旋翼的安装
Figure 4 Installation of Blades

旋翼组件如图进行顺时针/逆时针安装，安装时确保安装到位，须由经过培训的操作人员安装。

The blades are installed clockwise / counterclockwise. Make sure the installation is in place, and it must be installed by a trained operator.



电池的安装，严格按照培训要求将电池置于水桶上的电池卡槽内，用电池挡块限位并固定住，并按照规定接插好电源插头。

For battery installation, place the battery in the battery slot above the tank according to the training requirements, block and fix it with the battery stopper, and plug in the power plug as required.

使用漏斗或自备农药泵，将预先配置好的药剂注入药箱内。加药过程中请注意药水，勿淋湿机上电子设备，以防受潮影响飞机的稳定性与可靠性。

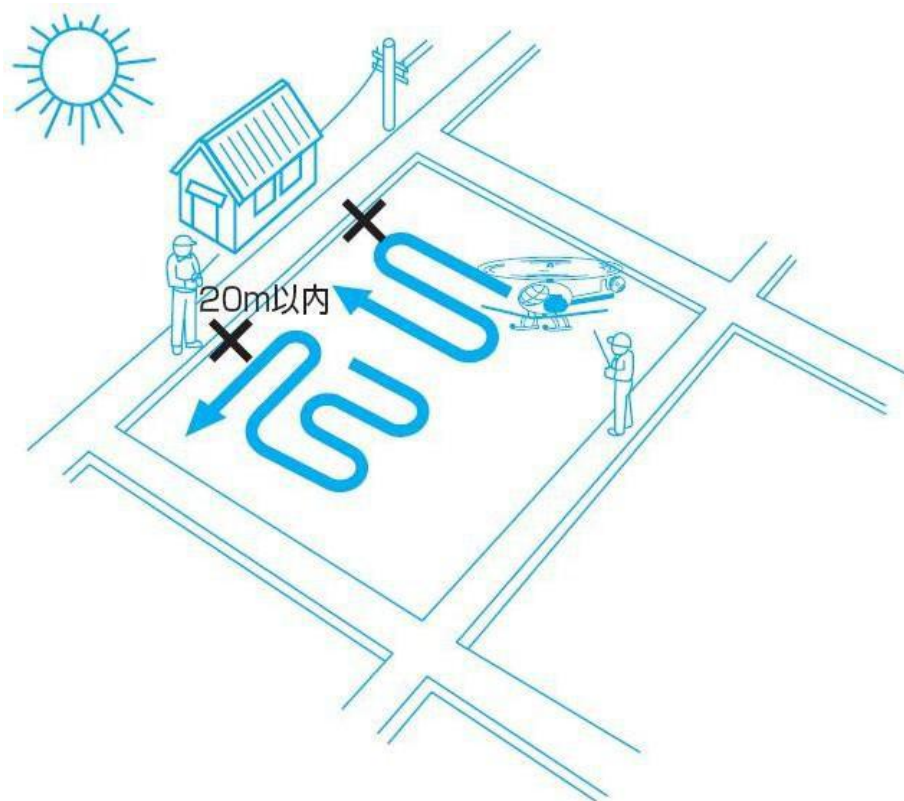
Use a funnel or self-equipped delivery pump to inject the prepared pesticide into the liquid tanks. The maximum dosing amount of pesticide is 20L. During dosing, prevent pesticide from splashing onto the electronic devices of the helicopter, which will impact the stability and reliability of the helicopter due to damp.

6.3 作业区域 Operation Area

1. 充分确认喷洒区域、预定喷洒面积，全面把握喷洒作业场地中阻挡物的位置。严格确保设备作业过程中周边 20 米没有人员和障碍物。
1. Accurately determine the spray range and pre-planned spray area. Get a comprehensive understanding of the locations of obstacles in the site of spraying operation. Strictly confirm that there are no personnel or obstacles within 20 meters around during equipment operation.
2. 根据作物、病虫害、喷洒量等的不同确认作业速度和高度。
2. Determine the spraying speed and height according to different crops, pests and spraying amount.
3. 根据风向、风速判断是否会把农药漂移到附近的物体上或对附近的物体造成危害。特别应当重视可能对人类造成的危害，并采取严格预防措施。通过使用风向、风速仪器确切把握其状况。
3. Judge whether pesticide will drift onto or cause damage to nearby objects according to wind speed and direction. Pay special attention to potential hazards to human and take strict preventive measures. Know the exact situation using anemoscope.
4. 防止对家畜、桑蚕、蜂类、鱼类等造成影响。
4. Prevent impacts on livestock, silkworm, bees and fish.
5. 防止农药对车辆房屋等造成污染。
5. Prevent pesticide pollution on vehicles and houses.
6. 防止对喷洒对象外的作物造成影响。
6. Prevent impacts on crops other than the spray objects.
7. 充分注意避开周边的幼儿园、学校、医院等公共设施相关地带。
7. Keep away from areas of surrounding public utilities such as kindergartens, schools and hospitals.
8. 充分注意避开水源地、河流、水库等。
8. Keep away from water source, river and reservoir, etc.
9. 充分注意避开机场铁路道路住宅区等。
9. Keep away from airports, railways, roads and residential areas, etc.
10. 确保设备有充足的起飞降落空间。
10. Ensure there is enough takeoff and landing space for the helicopter.

6.4 作业条件 Operation Conditions

- 1 气流稳定的时间段进行喷洒飞行，地面以上 1.5 米风速超过 3 米/秒时终止飞行。
1. Perform spraying operation when airflow is stable and stop spraying when wind speed exceeds 3 m/s at a distance of 1.5 meters above the ground.
2. 注意风向风速尽量控制农药飞溅到喷洒区域外，根据实际情况更改飞行轨迹、飞行高度、飞行速度等参数，制定防止飞溅措施。
2. Pay attention to wind speed and direction, to minimize pesticide splash beyond the spray area. Change parameters such as flight track, height and speed as needed and establish measures to prevent splash.
3. 作业人员务必置身于上风处。
3. Operators must stand windward.
4. 禁止在大风、下雨、霾雾、雷电、能见度低等气象条件下作业。
4. Operation is prohibited in adverse weather conditions such as strong wind, rain, haze, thunder and low visibility.
5. 禁止 20 米以上高空飞行。
5. High-altitude flight of above 20 meters is prohibited.
6. 所有人员和机体保持 20 米以上距离，机体和操控员的最大距离限度为 200 米。严禁飞机在头顶飞行。面对面飞行时会对操控人员造成心理上的恐慌，所以应尽量避免。
6. All personnel shall stay at least 20 meters away from the aircraft body. The maximum distance limit between the aircraft body and the operator is 200 meters. Do not fly the aircraft over head. Flying the aircraft face-to-face will cause psychological tension to the operator, so try to avoid doing so.
7. 禁止面向人、房屋、河流、障碍物、太阳、高压线架、电线杆等飞行。
7. Do not fly against human, houses, river, obstacles, sunlight, overhead power lines and telegraph poles, etc.



8. 平坦地带的喷洒飞行应遵从横风喷洒原则，喷洒顺序由下风处向上风处进行飞行。
8. On flat terrain, follow the crosswind spraying principles and spray from the downwind side to the upwind side.
9. 在倾斜地带进行喷洒飞行时，沿等高线，由下而上进行喷洒飞行。
9. On sloped terrain, spray upper to lower along the contour lines.
10. 障碍物比较多的区域进行喷洒飞行时，让飞机的载重量保持有盈余。
10. When spraying in areas with many obstacles, do not fly the helicopter under full load.
11. 严禁增加喷洒装置的喷出量、禁止不按喷洒守则高速喷洒。
11. Do not increase the spraying flow of the spraying unit. High-speed spraying against practices is prohibited.
12. 操控员必须在自己的飞行操控能力范围内操控喷洒飞行。气象条件比较稳定的时间段，每小时必须至少进行一次休息调整。
12. Operators must fly the sprayer within their ability of flight manipulation. When the weather condition is stable, have a rest and make adjustment once per hour.

6.5 标准作业流程 Standard Operation Procedures

6.5.1 作业前检查 Preflight Check

每次作业前操作员均须进行作业前检查。

Preflight check must be conducted by operator prior to each spraying operation.

1. 机械: 桨座螺丝、机架螺丝有否松动, 桨叶运转是否顺滑, 电池是否安装到位。
1. Mechanical parts: check whether the screws are loosened; whether the blades can move freely. Check if the battery mount is installed in place.
2. 螺旋桨: 仔细查看螺旋桨是否存在破损、裂纹、变形。
2. Blades: check whether the blades are broken, cracked or deformed.
3. 电池: 使用专用测电表对设备电动力电进行电压检测, 确保电池满电, 检查电池插头金属端子, 是否严重磨损、氧化或松动。
3. Battery: detect the voltage of equipment power batteries using dedicated electric meter. Ensure the battery is fully charged and the metal terminal of battery connector is not seriously worn, oxidized or loosened.
4. 喷洒系统: 农药箱及管路无漏液情况。
4. Spraying system: check whether the liquid tank and plumbing has leakage.

作业前检查完毕一切正常的情况下进入开机流程; 如发现问题, 务必进行妥善处置才可作业。

After confirming everything is normal through preflight check, proceed to the startup procedure. If any problem exists, solve it properly before operation.

6.5.2 开机 Startup

1. 遥控器检查: 确认遥控器摇杆及各功能拨杆正常无损害, 天线摆放正确
2. 遥控器通道开关: 摇杆自然回中, 开关全部处于高位。
3. 打开遥控器电源: 应无报警声, 检查遥控器电池电压。
4. 连接动力电池: 航灯颜色变化 (按照培训说明要求观察) 即自检完成。
5. 飞控数据: 查看地面站的回传显示, 各项数据显示正确。
6. 工作模式: 确认地面站显示: 位置保持模式。
7. 测试喷洒器: 喷洒管系统是否正常, 有无泄漏堵塞等。
1. Transmitter check: verify that the control sticks and each function switch are normal and not damaged. Ensure the antenna is correctly located.
2. Switches of the transmitter: The stick returns to the center naturally, the switches are all in high position.
3. Power on the transmitter: there should not be alerts. Check the transmitter battery voltage.
4. Connect the power battery: Watch carefully the state of navigation LED till the self-checking process completed.
5. Flight control data: Check the return display of the ground station, and assure

them correct.

6. Controlling mode: Position mode.

7. Spraying system test: Ensure there is no leak or block in the spraying system.

6.5.3 起飞流程 Takeoff Procedure

启动前务必保证无关人员距离设备 50 米，操作员和助手也应远离设备 20 米以上。Before startup, keep irrelevant personnel 50 meters away from the equipment, and the operator and assistant at a distance of above 20 meters away.

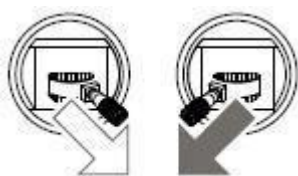
1. 内八动力解锁, 各摇杆自然回中。

2. 慢推油门摇杆，飞机起飞。

3. 悬停高度 2 米，姿态模式下观察飞机悬停状态，观察航灯闪烁情况，根据航灯变化确认。

4. 定点悬停：5 秒钟，观察飞机悬停状态，各项正常。

1 Starting the motors: The Combination Stick Command listed below is used to start motors. Make sure you perform it in one continuous motion.



2 Push the throttle stick slowly, the drone takes off.

3 Hover at the height of 2 meters: under the attitude mode, observe the hovering state and navigation LED, verify everything is OK.

4 Hover at fixed point for 5 seconds: observe the hovering state and verify everything is OK.

6.5.4 飞行模式的使用 Use of Flight modes

提供 4 种飞行模式，姿态模式、GPS 作业模式、AB 作业模式和航线作业模式，且各种模式作业过程随心切换，满足各种地形。

There are four kinds of flight modes: Attitude, GPS, A-B Route & Semi-autonomous modes.

姿态模式 Attitude Mode

- 在姿态模式下，飞控才能解锁，其他模式下不能解锁，需在姿态解锁起飞后切换到其他模式。

In Attitude mode, the flight control can be unlocked only under this mode. It can be switched to other modes after the drone takes off.

- 姿态模式下，仿地雷达不起作用。

In Attitude mode, the terrain-following radar doesn't work.

- 姿态模式下，定高与定点根据搜星状态自主切换，没有 GPS 或 GPS 信号不好时定高，GPS

信号良好时可定高定点飞行。

In Attitude mode, the fixed altitude and fixed points can be switched automatically according to the stars searched. If GPS signal is weak, the fixed altitude will be used, and if the GPS signal is strong, the fixed altitude will be used.

GPS 作业模式 GPS Operation Mode

- 该模式下，不能解锁起飞，需在姿态模式下解锁起飞后切入该模式。

In this mode, takeoff cannot be unlocked, you need to switch to this mode after unlocked in attitude mode.

- 该模式下水泵开关通过遥控器开关控制。

In this mode, the pump switch is controlled by RC controller.

- 该模式下仿地功能，需通过 APP 设置后使用，遥控器可临时控制高度，回中后高度延续之前 APP 设定高度飞行。

In this mode, the terrain-following function needs to be used after setting through the APP. The remote controller can temporarily control the altitude. After the controlling stick returning to the middle position, the altitude maintains the altitude set by the APP before.

AB 作业模式 A-B Route Mode

- AB 点必须在 GPS 作业模式下记录，不能在姿态模式下记录，否则无法使用 AB 作业。

AB points must be recorded in GPS operation mode, it can't record in attitude mode, otherwise A-B route mode can't be used.

- 飞机起到 A 点先将 SA 开关拨到最左边，飞到 B 点后再将开关拨到中间位置，记录下 B 点后再拨到 AB 点作业模式向左或向右飞即可 AB 点模式作业。

When the aircraft flies to point A, toggle the SA switch to the left to record it as Point A, and toggle the switch to the middle to record as Point B after the aircraft flies to point B. Select the A-B Route mode, and move to left or right side, then A-B Route Mode will begin.

- 快速来回拨动 A 点和 B 点，等到遥控器提示 AB 点清除可重新设置 AB 点。

Quickly toggle point A and point B, and wait until the remote controller marks the A/B points has been erased, then can reset A/B points.

- 该模式下，水泵自动开启，可通过 APP 调节水泵控制模式。

In this mode, the pump is automatically turned on, and the pump control mode can be adjusted through the APP.

- 该模式下，仿地雷达自动开启，可通过 APP 设置关闭等操作，遥控器可临时控制高度，回中后高度延续之前 APP 设定高度飞行。

In this mode, the terrain-following radar is automatically turned on, and can be turned off through the APP. The remote controller can temporarily control the altitude. After the controlling stick returning to the middle position, the altitude maintains the altitude set by the APP before.

- 该模式可通过遥控器解锁起飞后再通过 APP 航线作业，也可直接在 APP 先规划地块、发布任务，在任务列表选中规划好的地块任务，进行航线调整，设置参数再执行任务即可自动从地面起飞执行作业任务。

This mode can be applied after the aircraft takes off. You also can plan the field on APP, publish the task, select the planned task, adjust the route, set the parameters and then execute the task Automatically after takeoff.

- 该模式下，水泵自动开启，可通过 APP 调试水泵控制模式。

In this mode, the pump is automatically turned on, and the pump control mode can be adjusted through the APP.

- 该模式下，仿地雷达自动开启，可通过 APP 设置关闭等操作，遥控器可临时控制高度，回中后高度延续之前 APP 设定的高度飞行。

In this mode, the terrain-following radar is automatically turned on, and can be turned off through the APP. The remote controller can temporarily control the altitude. After the controlling stick returning to the middle position, the altitude maintains the altitude set by the APP before.

6.5.5 降落 Landing

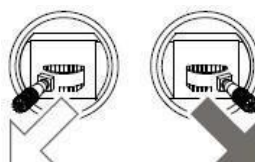
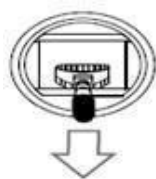
再次确认无关人员与设备距离 50 米以上，操作人员距离设备 20 米以上。

Confirm again that irrelevant personnel are above 50 meters away from the equipment, and the operators at a distance of above 20 meters away.

完成预定喷洒作业后，设备进入降落流程。

The equipment begins the landing procedure upon completion of prescheduled spraying operations.

1. 降落区域安全:助手确保预定降落区域周边 20 米内没有人员。
2. 进场:设备低速移动到降落区域上空 1.5-3 米上空。
3. 切位置模式:拨回模式开关至位置模式或利用一键起降（条件允许情况下）。
4. 降落:垂直降落预定区域
5. 关闭动力:油门摇放置最低位，外八加锁（或保持油门低位 5 秒，系统自动加锁）
6. 看回传电压:记录飞行后的电压。
7. 断开主电源:待螺旋桨完全停止后第一时间先断开动力电源。
8. 关闭遥控电源:待确认飞机上所有电源全部断开后再关闭遥控电源
1. Landing area security: the assistant shall confirm that there are no personnel within 20 meters around the prescheduled landing area.
2. Enter the site: move the equipment at low speed to 1.5-3 meters above the landing area.
3. Switch to Position Mode: toggle the mode switch back to Position mode or use the ONE-KEY takeoff & landing (if the condition permits)
4. Landing: land on the prescheduled area vertically.
5. Turn off the power: Push the throttle stick down, and perform the Combination Stick Command as below (or push and hold the throttle stick down, the motors will stop after 5 seconds).



6. Check the

voltage feedback: record the post-flight voltage.

7. Cut off main power: after the blades stop completely, first disconnect the power battery.
8. Power off the transmitter: confirm that all power supply on the aircraft is disconnected before powering off the transmitter.

6.5.6 飞行后检查 Post-flight Check

1. 电调温度 $\leq 70^{\circ}\text{C}$
 2. 电机温度 $\leq 85^{\circ}\text{C}$
 3. 电池插头温度 $\leq 50^{\circ}\text{C}$
1. ESC temperature: $\leq 70^{\circ}\text{C}$
 2. Rotor temperature: $\leq 85^{\circ}\text{C}$
 3. Battery connector temperature: $\leq 50^{\circ}\text{C}$

第七章 电池的维护保养 Chapter 7 Maintenance of Battery

电池作为能源消耗品，如正确合理的使用及保养将大大降低农业生产成本，节能环保。
As energy consumable, batteries can greatly reduce agricultural production cost if used and maintained properly, thus contributing to energy conservation and

environmental protection.

一、使用范围 I. Operating Range

电池类型：锂聚合物电池。 Battery Type: Lithium Polymer Battery.

	过放（终止电压） Over Discharge (Cut-off Voltage)	过充(最高电压) Over Charge (Maximum Voltage)	正常使用电压范围 Operating Voltage Range
锂电池单节电压 Voltage of Each Li-Po battery Cell	$\leq 2.8V$	$\geq 4.22V$	3.50—4.20V

二、电池危险人为原因II. Dangers Caused by Human Errors

- a) 电池环境温度过高，电池碰撞，电池外壳破损，电池线破损→(过放/短路及着火)
- a) Battery ambient temperature is too high; battery is collided; battery external casing or cable is broken (over discharge, short-circuit or catching fire).
- b) 拆解电池，过度使用电池→(过放/短路及着火)
- b) Disassemble or overuse the battery (over discharge, short-circuit or catching fire).
- c) 错误使用充电器→(过充，过放，短路及着火)
- c) Use the battery incorrectly (over discharge, short-circuit or catching fire).

三、电池正确使用方式 III. Correct Use of Battery

1、电池充电：Charging Battery:

- a) 使用充电器前清晰电池类型/性能参数，使用正确的充电器，对充电器进行正确的设置。
- a) Identify battery type and performance parameters before using the charger. Use correct charger and set the charger correctly.
- b) 使用前及使用过程中及时检查电池的电压/外形情况；存在鼓胀、变形、泄漏或电压低于 2.6V 现象的电池不可进行充电；室温下充电前电芯的温度不得超过 40℃；充电的上限电压不得超过 4.22V，充电后的温度不应高于 45℃。
- b) Check the voltage/appearance of battery timely before and during use; do not charge the batteries which have bulge, deformation, leakage or voltage less than 2.6V; when charging in ambient environment, the temperature of battery cell must not exceed 40℃; the upper limit of charging voltage must not exceed 4.22V and the temperature after charging shall not exceed 45℃.
- c) 充电电流不得超过规格书标示最大电流，一般不得超过 2C。
- c) The charging current must not exceed the maximum current indicated in the specifications, usually not more than 2C.
- d) 充电时电池发热属正常现象，如过热（即烫手）/鼓胀/漏液/起火，立即终止充电（使用石棉手套取下电池/石棉毯盖住危险区域）。
- d) Battery heating-up when charging is a normal phenomenon. If there is overheat (very hot when touching)/bulge/leakage/fire, stop charging immediately (remove

battery using asbestos gloves and cover the dangerous area using asbestos blanket).

e) 充电时充电室内必须有人，无人时将所有电池取下，停止充电。

e) When charging, someone must be present in the charging room. Remove all the batteries and stop charging if no one is present.

2、使用电池：Using Battery:

a) 使用前及使用过程中及时检查电池的电压/外形情况（单节电池电压 $<2.6V$ 时必须停止充电）。

a) Check the voltage/appearance of battery timely before and during use (stop charging when voltage of a single battery cell is less than $2.6V$).

b) 电池能承受的最高极限电压为 $4.22V$ ，最低极限电压为 $2.60V$ ，当电池电压高于 $4.22V$ 或低于 $2.60V$ 时，将可能造成电芯的充放电性能、机械性能和安全性能受损，可能会导致发热或泄漏。

b) The maximum and minimum voltage limit of battery is $4.22V$ and $2.60V$ respectively. When the battery voltage is above $4.22V$ or below $2.60V$, the charge and discharge performance, safety and mechanical performance of battery cells will be degraded, probably causing heating or leakage.

c) 勿长期将电池接在耗电设备上。

c) Do not connect the battery to power consumption devices for long time.

d) 勿将电池短路，勿拆解电池，勿将电池靠近明火，发热源；

d) Do not disassemble the battery, cause short-circuit or place it close to naked flame or heating source.

e) 电池过热（烫手），勿继续使用，等待电池冷却后确认正常才可继续使用。

e) Stop using the battery which is overheated (very hot when touching). Wait until the battery is cooled and normal after confirmation before continuing to use it.

3、电池储存：Battery Storage

a) 长期保存（时间 >15 天）不使用时将所有电池放电至 $3.7-3.9V$ 保存，不可高电压保存 $>4.0V$ 。

a) Discharge all the batteries to $3.7-3.9V$ for long-term storage (not using for more than 15 days). The voltage must not exceed $4.0V$ for storage.

b) 在电芯长期未使用期间（2个月以上），它可能会因其它自放电特性而处于某种过放电状态。为防止过放电的发生，电芯应定期充电，将其电压维持在 $3.6-3.9V$ 之间；需使用 $0.5C$ 电流充放一次（活化作用）；电池长期不使用，请保证 2-3 个月内进行一次放电激活，以维持电池的稳定性。

b) When the battery cell are left unused for long time (more than 2 months), it may be in an over-discharge state due to other self-discharge characteristics. To prevent over discharge, charge the battery cell periodically to maintain its voltage between $3.6V$ and $3.9V$. Charge cycle the battery with current of $0.5C$ (activation); apply discharge activation once per 2-3 months when the battery

is not in use for long time, to ensure stable performance of battery.

- c) 电芯储存温度必须在 $-10^{\circ}\text{C}\sim 45^{\circ}\text{C}$ 的范围内;
- c) Storage temperature of battery cells must be between -10°C and 45°C .
- d) 长期贮存电池 (超过 3 个月) 须置于温度为 $23\pm 5^{\circ}\text{C}$ 、湿度为 $65\pm 20\%\text{RH}$ 的环境中;
- d) For long-term battery storage (more than 3 months), the environment temperature and humidity shall be $23\pm 5^{\circ}\text{C}$ and $65\pm 20\%\text{RH}$ respectively.
- e) 仓库常年准备好石棉毯跟沙子, 泡沫及二氧化碳灭火器
- e) Ensure that asbestos blankets, sand, foam and carbon dioxide extinguishers are always available in the warehouse.

四、聚合物电池燃烧正确灭火方法及注意事项

IV. Proper Extinguishing Method and Precautions of Burning Polymer Battery

- a) 充电柜架上首先关闭充电电源开关; 迅速观察附近石棉手套石棉毯存放位置, 迅速取石棉手套摘下充电柜架上燃烧的锂电池, 隔置于地面。
- a) First turn off the charge power switch on the charge rack; quickly identify the storage location of nearby asbestos gloves and asbestos blankets, remove the burning Li-Po batteries from the charge rack using asbestos gloves and put them aside on the ground.
- b) 用石棉毯盖住地面上锂电池燃烧的火苗。
- b) Cover the burning flame of Li-Po battery on the ground with asbestos blanket.
- c) 消防沙掩埋石棉毯上隔绝空气将其窒息。
- c) Bury the asbestos blanket with sand to smother fire by isolating air.
- d) 切忌: 不可用干粉灭火器扑灭, 效果较差, 因为对固体金属化学火灾需要大量粉尘覆盖, 且对设备有腐蚀作用, 污染空间。
- d) Do not use dry powder extinguisher which has poor effect, as a large amount of dust is needed to extinguish the chemical fire of solid metal, which will erode the equipment and lead to space contamination.
- e) 二氧化碳灭火器不污染空间和腐蚀机器, 但只能达到对火苗瞬间抑制作用, 而后仍然继续燃烧。
- e) Carbon dioxide extinguisher will not cause space contamination or machine corrosion, but it can only temporarily suppress flames which will continue to burn afterwards.
- f) 泡沫、二氧化碳有效, 其他灭火器无效。
- f) Foam extinguisher and carbon dioxide extinguisher are effective. Do not use other types of extinguishers which are ineffective.

第八章 “金星 150” 型无人植保喷雾机的贮存

Chapter 8 Storage

8.1 贮存前的准备Preparation before Storage

1. “金星 150” 型农用植保机为高精度运转设备，贮存前请按照培训保养要求保养 清洁，确保一切运转正常，贮存前将桨叶拆下擦洗干净，喷洒系统清洗干净。
- 1 VENUS 150 Sprayer is high-precision equipment. Perform maintenance and cleaning as per trained daily maintenance before storage, ensuring everything works properly, cleaning the spraying system.
- 2 遥控器清洁，遥控电池充电至 11.4-11.5V 后拔下电池单独存放。
2. Clean the transmitter. Remove the battery from transmitter after charging it to 11.4-11.5V and store the battery separately.
3. 动力电池请充电至 3.8~3.9V(单片电压)，检查外观有无破损、鼓胀、漏液、变形。
3. Charge the power battery to 3.8-3.9V per chip, and check battery appearance for any bulge, breakage, leakage or deformation.

8.2 贮存环境Storage Environment

存放区域洁净、干燥，无淋雨日晒风险，空气无腐蚀性气体，区域附近无大型钢厂、刚材、变电站、高压塔等强磁性建筑。

Store the equipment in clean and dry area which is not exposed to rain and sunlight. The storage area shall have no corrosive gas in air and stay away from steels and ferromagnetic buildings such as large steel mills, substations and high-voltage towers.

电池贮存环境需干燥、阴凉、通风，采用防火材料进行隔绝，单独划分，周围无贵重物品及人员生畜。仓库常备石棉毯、沙子及灭火器。

The battery storage environment should be dry, cool and ventilated and separated with fireproof materials, with no valuables, human or livestock around. Ensure that asbestos blankets, sand and fire extinguishers are always available in the warehouse.

8.3 贮存 Storage

机体：平地或箱体安放，盖一层防尘布，周边安放防潮材料，桨叶垂直悬挂，遥控器装于包装盒或者橱柜防潮防尘。

Aircraft Body: Place the aircraft body on flat ground or in a box. Cover it with a layer of dust cloth and place moisture barrier materials around. Vertically hang

the blades. Place the transmitter in a packing box or cabinet to guard against moisture and dust.

电池：将异常电池与正常电池分类存放，之间使用防火材料隔开。

Battery: store the batteries by category. Separate the abnormal batteries from normal batteries with fireproof materials.

第九章 使用注意事项 Chapter 9 Precautions

金星 150 农用无人植保喷雾机在使用过程中若不按照操作要求或盲目操作会存在危险隐患，具体危险情况及应对措施如下：

序号 No.	危险产生部位 Parts	应对措施 Measures	备注
1	螺旋桨 Blades	螺旋桨转动时保持安全距离（20 米以上） Maintain a safe distance (more than 20 m) when the propeller rotates	
2	电机 Rotors	未安装桨叶电机转动时保持安全距离（0.5 米以上）； Maintain a safe distance (more than 0.5m) when the motor is not installed;	
3	农药箱 Tank	使用过的药箱有农药残留，不可用其盛装饮用水或内部的水不能用于梳洗 The used tank has pesticide residues, it is not allowed to contain drinking water or the water inside can't be used for washing.	
4	使用的农药 Pesticide	农药使用要按照农药使用说明或植保部技师指导使用 Pesticides should be used in accordance with the instructions of technicians.	
5	电池 Battery	电池必须严格按照使用规程进行操作，不能过冲和过放 The battery must be used strictly in accordance with instructions, and cannot be over-charged or over-discharged	
6	充电器使用 Charger	充电器必须严格按照使用规程进行操作，且使用过程中远离易燃易爆物品，同时旁边须准备消防沙或灭火器 The charger must be used in strict accordance with the rules of use, and it should be kept away from flammable and explosive materials during use, and fire sand or fire extinguishers must be prepared in advance.	

7	作业飞行 Working	禁止在闹市区飞行操作；田间作业时远离人群，保持安全距离（10 米以上） It is forbidden to fly in the downtown area; stay away from the crowd and maintain a safe distance (more than 10 m) during field operations	
8	农药喷洒作业 Spraying Area	作业区域远离鱼塘、蜜蜂养殖区，最少保持 20 米以上 The working area should be far away from fish ponds and bee breeding areas, and should be kept at least 20 m.	

第十章 飞行状态指示灯的含义 Aircraft Status Indicator Description

	描述 Description	指示灯状态 LED Blinking Pattern	优先级 Priority
飞行模式状态 Flight Mode	姿态模式 Attitude Mode	绿灯单闪 Blink green	低 Low
	GPS 作业模式 GPS Mode	绿灯双闪 Blink green two times	低 Low
	AB 作业/航线作业 A-B Route/Route Mode	绿灯三闪 Blink green three times	低 Low
	保护模式 Safe Mode (返航/降落/悬停) RTH/Landing/Hovering	绿灯快闪 Blink green rapidly	中 Medium
GPS 状态 GPS status	GPS 未连接/GPS 未搜到星 No GPS reception	红灯三闪 Blink red three times	低 Low
	GPS 信号较差 Weak GPS reception	红灯双闪 Blink red two times	低 Low
	GPS 信号一般 Normal GPS reception	红灯单闪 Blink red	低 Low
	RTK 定位 RTK positioning	黄灯单闪 Blink yellow	低 Low
AB 功能状态 A-B function statue	记录 A 点 Point A recorded	黄灯长亮 Solid yellow	高 High
	记录 B 点 Point B recorded	绿灯长亮 Solid green	高 High
	清除 AB 点 AB points erased	红绿黄交替闪 Red,Green,Yellow alternately	高 High
	AB 点长度加长修正 Lengthen the AB points distance	绿灯长亮 Solid green	高 High
	AB 点长度减短修正 Shorten the AB points distance	红灯长亮 Solid red	高 High
	到达断药点 Arriving at the breakpoint	红绿黄交替闪 Red,Green,Yellow alternately	高 High

	记录断药点 Recording the breakpoint	红绿黄交替闪 Red,Green,Yellow alternately	高 High
电压报警 Voltage Alert	一级报警 1 st level alert	黄灯三闪 Blink yellow three times	低 Low
	二级报警 2 nd level alert	黄灯快闪 Blink yellow rapidly	高 High
药量报警 Pesticide Capacity Alert	一级报警 1 st level alert	黄灯双闪 Blink yellow two times	低 Low
	二级报警 2 nd level alert	黄灯四闪 Blink yellow 4 times	低 Low
两面校磁 Magnetic Compass Calibration	水平校准 Horizontal calibration	黄灯长亮 Solid yellow	中 Medium
	垂直校准 Vertical calibration	绿灯长亮 Solid green	中 Medium
	校准成功 Calibration successful	红绿黄交替闪 Red,Green,Yellow alternately	中 Medium
	校准失败 Calibration failed	红灯长亮 Solid red	中 Medium
加速度计校准 状 态 Accelerometer Calibration	正在校准 In calibrating	红绿黄交替闪 Red,Green,Yellow alternately	中 Medium
	校准失败 Calibration failed	红灯长亮 Solid red	中 Medium
	校准成功 Calibration successful	绿灯长亮 Solid green	中 Medium
异常状态 Abnormal status	遥控器失控 Remote controller signal lost	红灯快闪 Blink red rapidly	高 High
	磁罗盘干扰/异常 Magnetic compass interference/abnormal	黄绿交替闪 Yellow,Green alternately	高 High
	GPS 丢星/异常 No GPS reception/abnormal	红绿交替闪 Red,Green alternately	高 High
	IMU 震动过大/异常 IMU large vibration	红黄交替闪 Red,Yellow alternately	高 High
其他状态 Others	禁飞区域 Flight forbidden area	红灯慢闪 Blink red slowly	高 High
	飞控自检 FCS self-checking	红绿黄交替闪 Red,Green,Yellow alternately	高 High
	解锁表示 Unlocking	红绿黄交替闪 Red,Green,Yellow alternately	高 High
	解锁失败	红灯长亮	高

	Unlocking failed	Solid red	High
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