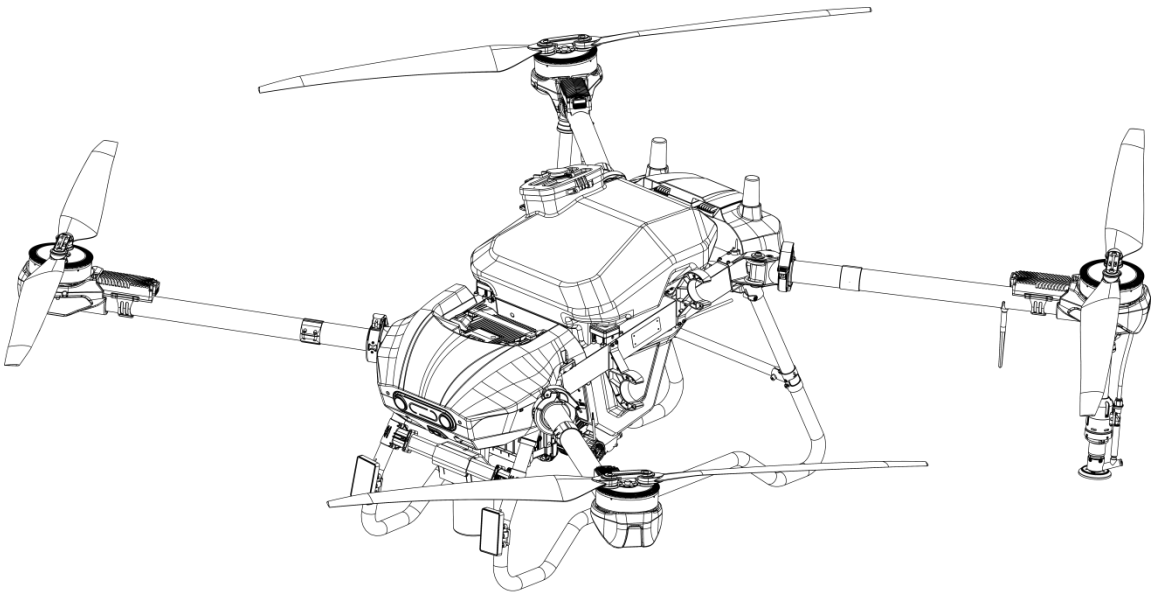
Agricultural Drone Instruction Manual

HD580 Drone Maintenance

Version 1.0



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After the operation, the relevant spraying accessories and drone surface should be cleaned in time, and regular maintenance should be carried out.

Daily Maintenance	Check Items	Handling Methods
Airframe and Appearance	1.Arm Module 2.Integrated Agrochemical Container Module 3.Nose Module 4.Tail Module 5.Landing Gear Module 6.Centrifugal Nozzles 7.Seed Box 8.Spreader	After operation, fill the seed box with soapy water and activate manual spraying to drain all the liquid. Then rinse the spraying system with clean water and repeat the flushing until all water is discharged. This prevents residual liquid from leaking and damaging other items during transportation or storage. Wipe the drone body with a soft damp cloth to remove dust, dirt, and chemical residue. For stubborn stains, use a mild detergent, but avoid contact with electronic components. Check all parts for cracks, deformation, or damage, especially the propellers, landing gear, and arms.
Propeller Assemblies	1.Normal (Clockwise) Propeller Assembly 2.Reverse (Counterclockwise) Propeller Assembly	Check for cracks, deformation, wear, or looseness in the propellers. Replace or tighten if necessary. Use a soft brush to clean dirt from the propeller surfaces to ensure smoothness.
Motors and ESCs	1.Motor 2.ESC	Use an air pump or a hair dryer on cool setting to remove dust from the surfaces. Check whether the motor rotates smoothly and whether there are signs of overheating, noise, or vibration. Check ESC connections for looseness or heat damage.

Battery	1.Battery	Before flight, check for any damage, deformation, or leakage on the battery. Also check the connectors for damage or looseness. After flight, disconnect the battery promptly to avoid leaving it on the drone for a long time.
Liquid System	1.Integrated agrochemical container 2.Centrifugal Nozzles 3.Vane Pump 4.Tubing 5.Flowmeter	After operation, immediately rinse the agrochemical container, nozzles, pumps, and tubings with clean water to remove pesticide residue and prevent clogging. Check for nozzle blockages or damage. Use a cleaning needle for clogs or replace if damaged. Check tubing for damage or leaks, and ensure all connections are secure.

Periodic Maintenance	Check Items	Handling Method
Fastener Check	1.Arm Module 2.Integrated Agrochemical Container Module 3.Nose Module 4.Tail Module Landing Gear Module Centrifugal Nozzle Seed Box Spreader	Perform a comprehensive check of screws and other fasteners every week to ensure they are not loose. Apply threadlocker to easily-loosened parts if necessary.
Power System	1.Motor 2.ESC	Periodically check the lubrication condition of motor bearings and listen for abnormal

Check	3.Propeller 4.Propeller Clamp	noises. Check the propellers for any cracks or damage.
Battery Maintenance	1.Battery	For batteries not in use for a long time, charge to 50–60% every two months for storage. Recharge and discharge smart batteries every three months to maintain activity. Check the storage environment (weekly), ensuring it is dry, ventilated, and at an appropriate temperature.
Spraying System Maintenance	1.Centrifugal Nozzle 2.Impeller Pump 3.Tubing 4.Flowmeter	Regularly check the working status of the pump for wear or leakage. Test the nozzle for flow rate and atomization performance; adjust or replace the nozzle if abnormalities are found.
Full Airframe Check	1.Arm Module 2.Integrated Agrochemical Container 3.Nose Module 4.Tail Module 5.Landing Gear Module 6.Centrifugal Nozzle 7.Seed Box 8.Spreader	Check for any deformation in the frame structure and ensure all component connections are secure. Check the landing gear for proper function and shock absorption performance.

Special Maintenance	Check Items	Handing Method
After Operation in Harsh Environments	Entire Drone	After operating in environments with heavy dust, high humidity, or corrosive substances, the drone must be thoroughly cleaned and checked. Rinse the drone body, propellers, and other components with clean water, wipe them dry with a soft cloth, and place the drone in a well-ventilated area to air dry. If necessary, use a hair dryer in cool mode to speed up drying.
After Collision or Malfunction		If the drone has been involved in a collision or experiences a malfunction, a full check is required even if no obvious damage is visible. Check the airframe, arms, and landing gear for potential hidden damage such as cracks or deformation. Perform functionality tests on electronic components including motors, ESCs, and the flight control to ensure everything is working properly.

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
Frame Module	Front/Rear /Left/Right Main Beam	Check for damage or deformation of the structure; check if screws are loose	Frame becomes loose, unstable structure	Tighten or replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
	Left/Right Inner Liner	Check for damage or deformation of the structure; check if screws are loose	Frame becomes loose, unstable structure	Tighten or replace	Regular
	Inner Joint 1/2/3/4	Check for damage or deformation of the structure; check if screws are loose	Frame becomes loose, unstable structure	Tighten or replace	Regular
	Left/Right Tube Clamp	Check for damage or deformation of the structure; check if screws are loose	Frame becomes loose, unstable structure	Tighten or replace	Regular
	Landing Gear Connector 1/2/3/4	Check for damage or deformation of the structure;	Frame becomes loose, unstable structure	Tighten or replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
		check if screws are loose			
	Battery Bracket Assembly - Left/Right	Check for damage or deformation of the structure; check if screws are loose	Frame becomes loose, unstable structure	Tighten or replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
Arm Module	Propeller	Check if the surface is clean	Increased air resistance, higher power consumption	Clean	Daily
		Check if the propeller is intact	Power abnormalities, unstable lift	Replace	Daily/Regular
	Propeller Clamp	Check if the propeller is	Cannot securely	Replace	Daily/Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
		intact	hold the propeller, risk of detachment		
		Check if screws are loose or overtightened	Cannot securely hold the propeller, risk of detachment	Adjust tightness	Daily
		Check if the surface is clean, and for any liquid or dust buildup	Poor heat dissipation	Clean	Daily
	Motor	Check if wiring is intact and functioning	Short circuit, power failure	Replace	Regular
		Check if screws are tight and intact	Motor or propeller may detach	Tighten or replace screws	Regular
		Check if the motor cap (outer rotor)	Propeller and rotor may	Replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
		is firmly connected to the shaft	detach		
		Check if motor rotates smoothly, and for foreign objects	Abnormal power output	Replace or clean	Daily
		Check for motor displacement, tilt, or deflection	Abnormal power output	Replace or clean	Regular
		Check if the surface is clean, and for any liquid or dust buildup	Poor heat dissipation	Clean	Daily
	ESC (Electronic Speed Controller)	Check for deformation or damage from impacts or other reasons	Power failure	Replace	Daily
		Check if	Short	Replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handling Method	Maintenance Type
		wiring is intact and functioning	circuit, power failure		
		Check if screws are tight and intact	ESC may detach, power loss	Tighten or replace screws	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handing Method	Maintennance Type
Nose Module	Connection Mounts	Check for deformation, cracks, or loose screws	Not securely fastened	Tighten or replace	Regular
	Battery Mount Assembly - Left/Right	Check for deformation, cracks, or loose screws	Battery not securely fixed	Replace	Regular
	Power Distribution Board	Check for deformation, cracks, or loose screws	Abnormal battery connection	Replace	Regular
	Wire Harness	Check for firm connection, damage, or corrosion	Abnormal drone functions	Reconnect or replace	Regular
	Front Interface Board Assembly –	Check for deformation, cracks, or loose	Abnormal connection	Reconnect or tighten the screws	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handing Method	Maintennance Type
	Self-Developed ESC	screws			
	Binocular Camera Module Fisheye Camera Module	Check for dirt, corrosion, or image abnormality	Unable to recognize image	Clean or replace	Daily
	Avionics Module Assembly	Check for damage or functional issues	Function loss	Replace	Regular
	Connection Mounts	Check for deformation, cracks, or loose screws	Not securely fastened	Tighten or replace	Regular
Tail Module		Check for deformation, cracks, or loose screws	Abnormal connection	Reconnect or tighten the screws	Regular
	Wiring Harness	Check for secure connection, apparent damage, or corrosion	Drone malfunction	Reconnect or replace	Regular
	RTK Antenna	Check for damage and proper functionality	Positioning status abnormal	Replace	Regular
Landing Gear Module	Landing Gear Bent Tube	Check for deformation	Unstable landing	Replace	Regular
	Landing Gear T-joint	Check for deformation,	Radar insecurely	Tighten or replace	Regular

System Classification	Maintenance Section	Check Items	Potential Hazards	Handing Method	Maintennance Type
		cracks, or loose screws	mounted; landing gear easily deforms		
	Landing Gear Crossbeam - Front/Rear	Check for deformation, cracks, or loose screws	Landing gear detached; unstable landing	Tighten or replace	Regular
	Rotary Radar	Check for damage and proper functionality	Radar failure or loss	Replace	Regular

Maintenance interval

Component Group	Module	Maintenance Check Recommendation	Suggested Replacement Interval
Power System-Motor, ESC	Motor & ESC	1. Check after 100 flights for new aircraft. 2. Then check every 100 flight hours. 3. Check if ESC stalls or abnormal motor/ESC temperature. 4. Check if motor is damaged by	Replace after 1000 flight hours.

Component Group	Module	Maintenance Check Recommendation	Suggested Replacement Interval
		external force.	
Frame Module	Propeller	1. Check after 100 flights for new aircraft. 2. Then check every 100 flight hours or monthly. 3. Check if ESC stalls or abnormal motor/ESC temperature.	Replace after 700 flight hours.
	Propeller Clamp	Check before each operation.	Replace after 1000 flight hours.
	Frame Arm Mounting Screws	Check every 1 month.	Replace after 1000 flight hours.
	Frame-to-Arm Connectors	Check every 1 month.	Replace after 1000 flight hours.
	Arm Lock Screws	Check every 1 month.	Replace after 1000 flight hours.
	Frame Beam Connectors	Check every 1 month.	Replace after 1000 flight hours.
	Battery Slider	Check every 1 month.	Replace after

Component Group	Module	Maintenance Check Recommendation	Suggested Replacement Interval
			2000 battery insertion cycles
	Weighing Sensor	Check every 100 flight hours or 1 month	Replace after 1000 flight hours.
	Avionics System-Avionics Module	Avionics Module	Check every 6 months
	Avionics System-Front Interface Board	Front Interface Board	Check every 6 months
	Avionics System-Rear Interface Board	Rear Interface Board	Check every 6 months
Avionics System	Avionics System-Power Distribution Board	Power Distribution Board	Check before each operation
	Avionics System-RTK Antenna	RTK Antenna	Check every 6 months
	Avionics System-Transmission Antenna	Transmission Antenna	Check every 6 months
Spraying System	Water Pump	Check every 100 flight hours or 1 month	Replace after 1000 flight hours
	Nozzle	Check every 100 flight hours or 1 month	Replace after 1000 flight

Component Group	Module	Maintenance Check Recommendation	Suggested Replacement Interval
			hours.
	Tubing & Connectors	Check before each operation	Replace after 1000 flight hours.
	Agrochemical Container	Check every 6 months	Replace after 1000 flight hours.
	Flowmeter	Check every 1 month.	Replace after 1000 flight hours or 24 months
	Spraying Control Board	Check every 6 months	Replace after 24 months
Radar System-Radar Module	Radar Module	Check every 6 months	Replace after 36 months
Remote Control	Remote Control	Check every 1 month.	Replace after 36 months
Battery	Drone Battery	Check every 200 charge cycles or 1 month	Replace after 1000 flight hours.
Charger	Charger	Check every 400 charge cycles or 1 month	Replace after 1000 flight hours.

Emergency Safety Handling for Lithium Batteries

1. If the battery electrolyte comes into contact with skin, eyes, or other parts of the body, rinse the affected area immediately with clean water and seek medical attention promptly.
2. Firefighting equipment: Asbestos gloves, crucible tongs, asbestos blanket, fire extinguisher, fire sand, fire bucket, fire shovel, etc.;
3. If the battery suddenly explodes, catches fire, or ignites spontaneously, immediately turn off the charging power switch if it is being charged. Move to a safe area located behind the battery or in the downwind direction. Quickly use asbestos gloves or crucible tongs to remove the burning battery and place it on the ground. Cover the battery flames with an asbestos blanket, then bury the blanket with fire sand to isolate the battery from air and suffocate the fire. Alternatively, the battery can be directly submerged in a saltwater bucket. If the fire is severe, it can also be extinguished directly with fresh water.