

## XAG P100 Pro

# Maintenance & Service Schedule

**T**he XAG P100 Pro is one of the most productive agricultural drones available. These drones are hard at work in many counties around the world and like all commercial vehicles they requires regular maintenance.

Every drone operates at height and maintains a delicate balance between gravity and thrust. While all XAG drones have an excellent safety record, even with the highest levels of preventative maintenance, failures will occur. Our aim is give you a guide that reduces those failures to a minimum.



Safety should be at the centre of every drone operation and a vital aspect of that is your maintenance of your UAV.

This Maintenance & Service Schedule is an evolving document that gives the best practice advice as it is today. As this new industry evolves and agricultural drone operations become more commonplace, this document will change to reflect our learnings.

## Lifed Items

Lifed items must be replaced as detailed below.

### 250 Flying Hours or Annual Service

Description	Unit Cost	Qty	Total
55" Propeller Blades Kit (CCW)	£195	2	£390
55" Propeller Blades Kit (CW)	£195	2	£390
Electronic Speed Controller ESC	£595	4	£2,380
<b>Total Cost</b>			<b>£3,160</b>

### 500 Flying Hours or 2 Yearly Service

Description	Unit Cost	Qty	Total
P100P Motor	£1,195	4	£4,780
Motor Bracket (A5)	£25	4	£100
55" Propeller Blades Kit (CCW)	£195	2	£390
55" Propeller Blades Kit (CW)	£195	2	£390
Electronic Speed Controller ESC	£595	4	£2,380
Peristaltic Pump (Type B)	£59	1	£59
Peristaltic Pump (Type A)	£59	1	£59
Service by service technician	£1,500	1	£1,500
<b>Total Cost</b>			<b>£9,658</b>

### Replace Batteries After 1,000 Cycles

P-Series Smart Battery are covered by the manufacturers warranty for 500 cycles and have an expected life of well over 1000 cycles. However, they need to be replaced in line with our OSC requirements.

Batteries with over 1000 cycles can be used in XAG's ground based robots.

Batteries should not be drained below 20% to maintain healthy operation.

After 500 cycles, make regular checks on the cell health within the XAG App during the planning of flights.

## Start of the day's operation – Pre-Flight Checks

Propellers – Ensure they are clean as you run fingers down the leading and trailing edge of each rotor. Looking for any nicks or dents that could affect their efficiency or strength. Damage can reduce lift which could then cause an imbalance of the drone on one or more propellers and ultimately to failure.

Motors – Rotate each rotor by hand to ensure they rotate freely. This check should be carried out by the same person so that any difference in resistance or unusual sound can be identified.

Arms – Physical check of the carbon fibre arms to ensure there is no damage and they are securely attached.

Check the 4G, Wi-Fi and RTK aerials on the drone to ensure they are securely fixed and no signs of damage.

Front red housing that protects the flight controller and electrical wiring should be pushed down to ensure closed correctly.

If the spray base is fitted, the spray arms situated on the rear arms should be positioned correctly from the stowed position to the spray position. To do this, the securing screw should be loosened (anti clockwise). This will allow the arm to be rotated down until slipping into the groove with the CDA (Controlled Droplet Applicator) close to the ground. Once in position, finger tighten (clockwise) the same screw to remain in position.

If the Granule tank is fitted, ensure the spray arms are stowed correctly.

Inspect Airframe, landing brace, arms and main beams checking there is no deformities, cracks or breaks. All hoses and connections appear intact and do not appear worn.

Ensure the two large clips either side of the drone, that secure the application platform are locked correctly securing the base to the drone. Also ensure the cable connector for the application platform is secure and stowed within its housing clip on the underside of the drone fuselage at the rear.

Check the battery connectors to ensure no damage is present and they are free from debris or dirt. Cotton Swabs are great for cleaning this area.

Any moving part should be free from obstruction.

Granular Container – remove lid and look in to check the augers are not obstructed in any way.

Always check any recent firmware updates have been uploaded in advance to any flight to avoid disruption whilst operating.

## Post-Flight Checks

Once the flight operation is completed, check the drone visually for any signs of damage. Propellers should be checked in the same way at the start of the day to identify any chips or dents that could lead to a failure.

**Granular Base:** If you have been spreading granules, ensure all granules are emptied. If necessary remove the augers by unclipping the two auger units (unclipping the power cable) and separate from the feed mechanism in order to thoroughly clean. Consider rinsing under a hose before drying. You can also use a soft brush to remove granular products inside the container.

Fertiliser will attract moisture and will corrode items if not thoroughly removed, which can lead to component failure.

**Spraying:** If spraying PPP chemicals, always adhere to your PA1 training when it comes to triple washing the inside of the container. When triple washing, ensure you either spray the chemical over the target area, without overdosing the crop, or dispose of the wash appropriately.

The same considerations and rules apply when rinsing the external part of the drone of any PPP chemical.

If the drone has been spraying none pesticide chemicals, use a hose (not a pressure washer) to rinse any residual fluid from the drone.

If you have been using an aggressive cleaning agent, ensure there is no residue left on any part of the drone or moving part. Each motor must be clean and free from any chemicals before storing.

Use a cloth to dry the drone and ensure the camera lens is wiped clean.

Fill the container tank with clean water and engage all nozzles to drain and clean out remaining residues within the spray system.

Repeat this process 2 more times to ensure the drone is clean and there is no danger of cross contamination on the next job.

Ensure that the tank is completely empty before packing the drone away to avoid any possible spillages during transport.

Once rinsed, use a dry cloth to dry the drone and ensure the camera lens is wiped clean.

Ensure the rotors, motor housings and terrain modules are free from dirt.

## 10 Flying Hours Check

This is an inspection of high use parts and critical systems as detailed below:

Inspect all wiring and screws to check for any looseness, breaks or wear. In particular, check the connection of motors to ESCs to ensure there are no loose connections. Check the ESC screws are secure.

Remove the cover of the electrical compartment on the drone's nose. Again, check all the wiring within for any sign of wear and tear. Ensure the flight controller is securely fixed.

Check the 4G, Wi-Fi and RTK aerials on the drone to ensure they are securely fixed and no signs of damage.

Check all rotors and fixings are secure. Ensure they all rotate with same degree of resistance without any unusual resistance or noise.

Ensure the battery and it's housing are free from any obvious signs of wear or damage.

Check the filters in the liquid container are undamaged and clean.

Ensure any firmware updates have been installed successfully.

Ensure the two large clips either side of the drone that secure the application platform are locked and secure.

Ensure the cable connector between the drone airframe and the application platform is free from damage and correctly stowed in its housing clip.

## 20 Hour GC4000+ Auto Super Charger Check

After 20 hours of use, give the GC4000+ a full visual check to ensure there is no obvious damage sustained to any part of the charging station. Check the charger has not experienced any collision and that the charging cable and connector are free from damage.

If necessary, refer to the Super Charger Station Maintenance Guide

A record of this check should be date stamped by whoever carried out the check. These records must be kept the record safe for any future audit.

## 50 Flying Hours or Monthly Check

After 50 flying hours or once a month, whichever comes first, all daily pre-flight checks are to be carried out and recorded.

You should also complete the 10 hour checks as shown above.

Inspect the GC4000+ Auto Super Charge Station.

## 100 Flying Hours Check or 6 Month Check

After 100 hours of flying, or after 6 months, whichever comes first, a thorough check for damage on both the drone airframe, batteries and Auto Super Charging Station must be made.

Remove propellers and ensure a detailed check of the propellers for any cracks, damage or deformities.

The aircraft structure. Ensure there is no deformities, cracks, or breaks to the arms, beams and carbon fibre frames. Replace any damaged or broken parts. Use a screwdriver/allen key to ensure each fixings are secure, replacing any damaged fixings.

ESC Wire Inspection – Check the wiring and terminals for any discolouration or obvious damage.

Motor Inspection- Remove the propeller and motor cover. Use a soft brush to clean any debris or dust from the motor. Any damage or discolouration should result in a motor replacement.

Battery – Ensure that the battery is not swollen or misshaped. The physical appearance should appear intact with no obvious damage to the body. Also ensure the batteries are charged and discharged at least once every 3 months to maintain good condition.

Batteries should not be drained below 20% to maintain healthy operation.

Make regular checks on the cell health within the XAG1 App during the planning of flights to ensure all cells are performing equally.

### GC4000+ Auto Super Charge Station

Full visual check to ensure there is no obvious damage sustained to any part of the charging station.