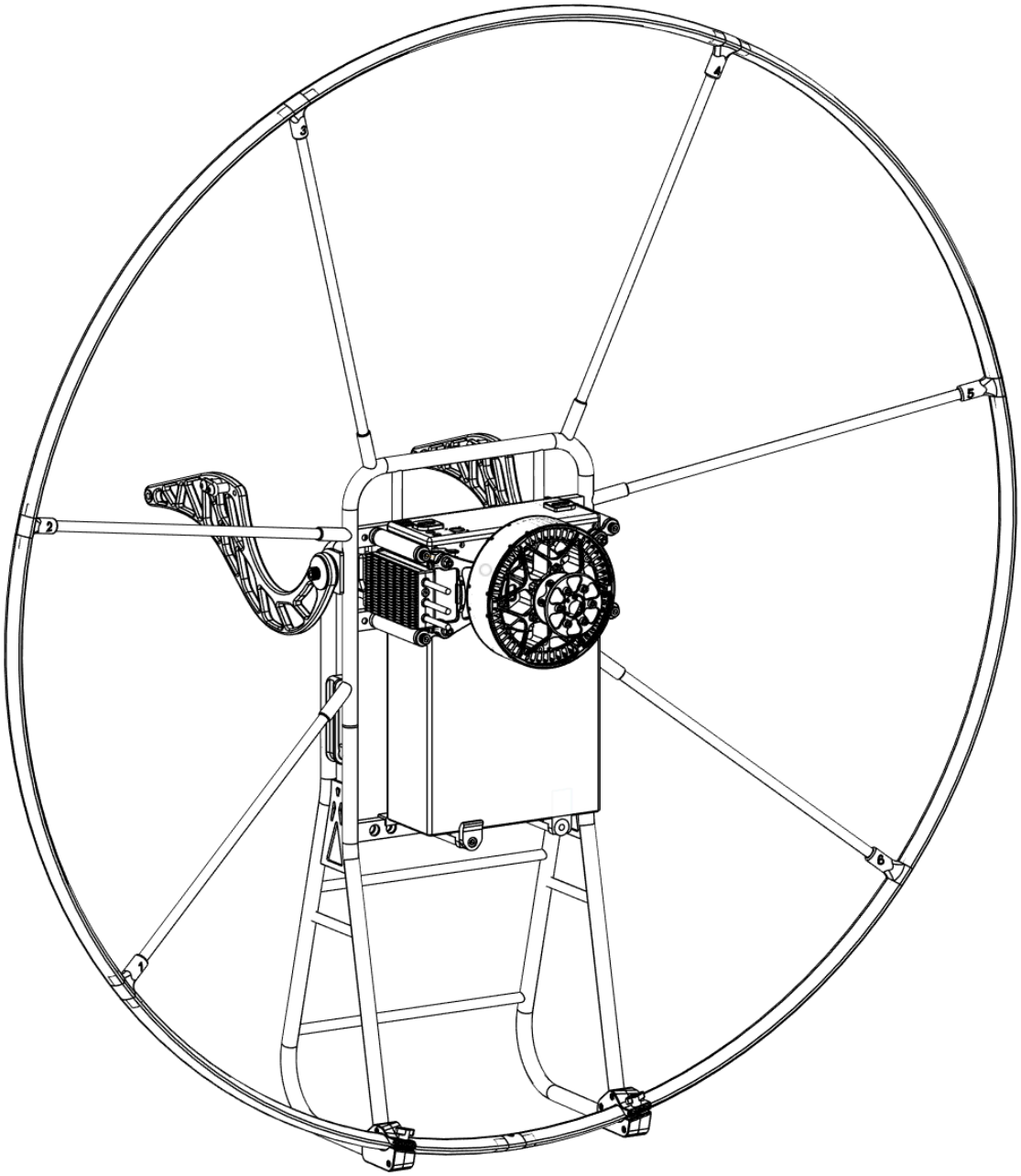
SP140 v2.5 Electric Paramotor

User Manual

V1.02 2026.01



Quick Start Video Tutorials

Go to the address below or scan the QR code to watch the tutorial videos, which demonstrate how to assemble and use the paramotor safely.

Frame assembly

https://www.youtube.com/watch?v=b3571IcFlRY

V2.5 Power Pack assembly

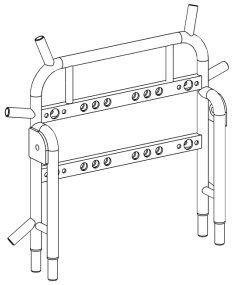
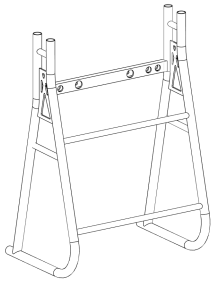
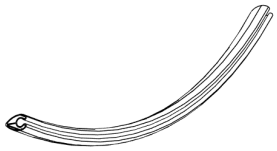
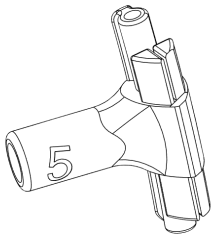
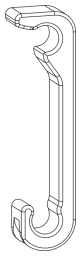
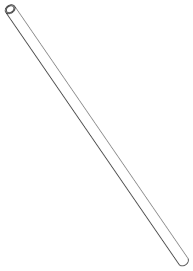
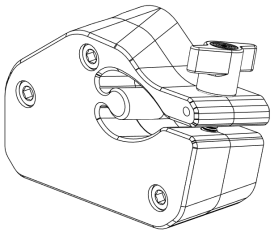
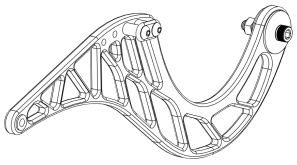
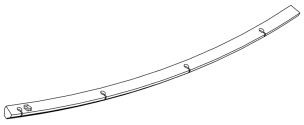
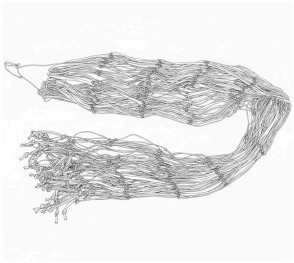
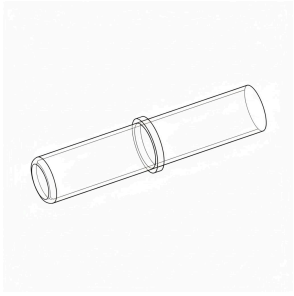
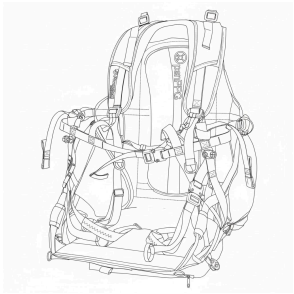
https://www.youtube.com/watch?v=PScYGVZks_c

1. Technical Specs Overview

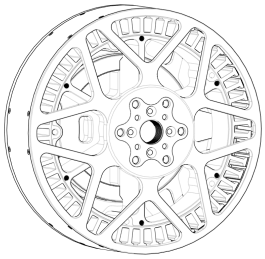
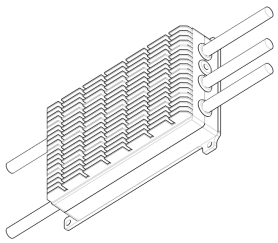
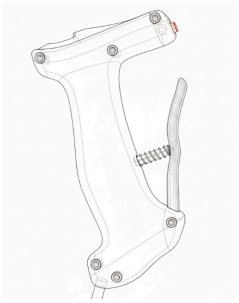
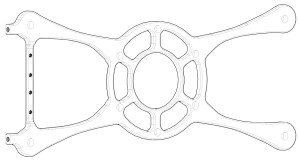
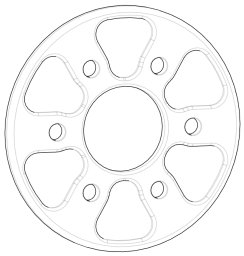
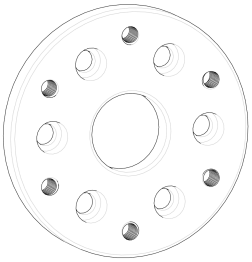
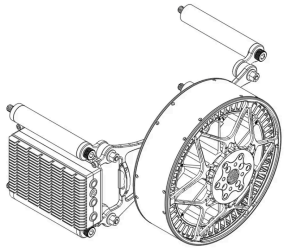
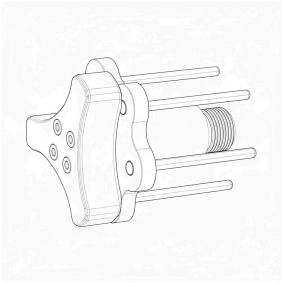
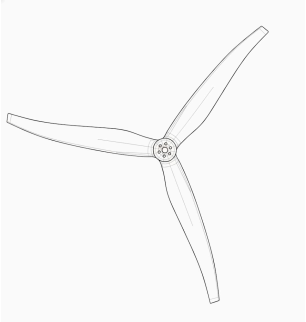
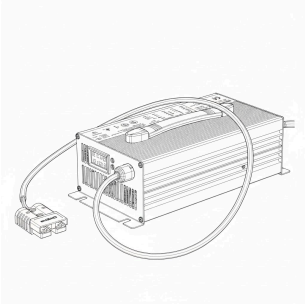
Category	Specification	Details
Performance	Thrust	160 lbs (Adjustable via controller)
	Maximum Power	20 kW
	Flight Time (2.6 kWh)	20 – 40 mins
	Flight Time (4.8 kWh)	55 – 80 mins
	Recharge Time	2.5 - 4.5hrs
	Stander Operating Temperature Range	-10 - 40c
Weight	Paramotor Unit	29 lbs
	Battery (2.6 kWh)	25.8 lbs
	Battery (4.8 kWh)	49.0 lbs
	Ready-to-Fly Total	54.1 – 78.4 lbs
Construction	Materials	6061 T6 / 7075 T6 Aluminum, Grade 5 Titanium, Carbon Fiber Spars
	Propeller	140 cm Carbon Fiber (Bi-blade or Tri-blade)
	Netting	Dyneema (5x stronger than steel)
Hardware	Motor	OpenPPG v2.5 25 kW high-efficiency brushless motor
	Motor Controller	Field-Oriented Control (FOC) High-powered, weatherproof, CAN bus controlled
	Throttle Controller	Built-in altimeter, haptic feedback, EICAS
	Battery Pack	Custom designed for paramotors with built-in Bluetooth BMS and CAN bus for communications. Using high energy density MNC cells.
Warranty	Coverage	12 months - 300 hours

2 Parts Identification Legend

Frame parts

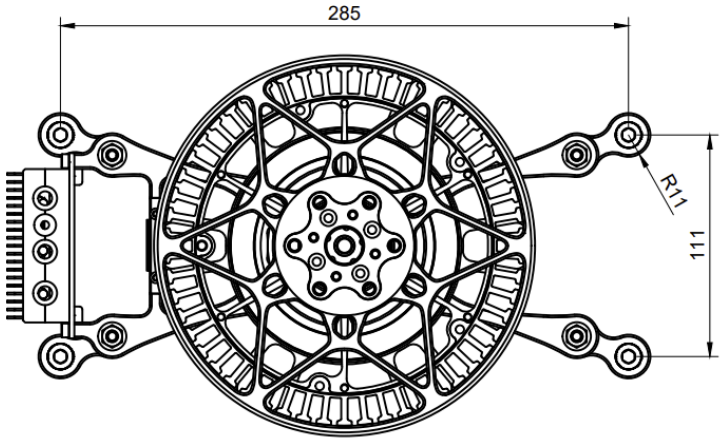
Center Frame 	Center Frame Legs 	Frame Hoop Section 	Hoop Connector 
Center Frame Clamp 	Carbon Fiber Spar 	Leg Clamp 	Goose Neck Bar 
Netting Rod 	Netting 	Center Frame connector 	Harness 

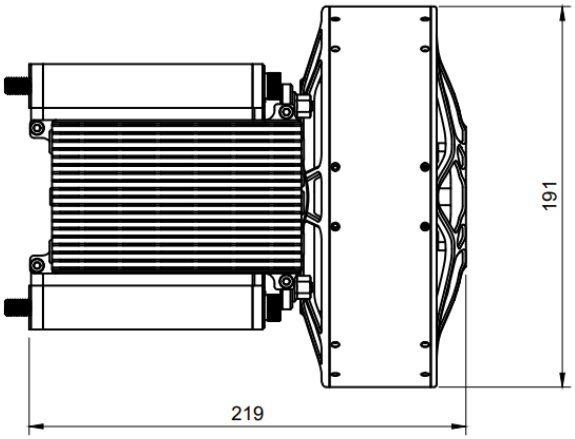
Power system

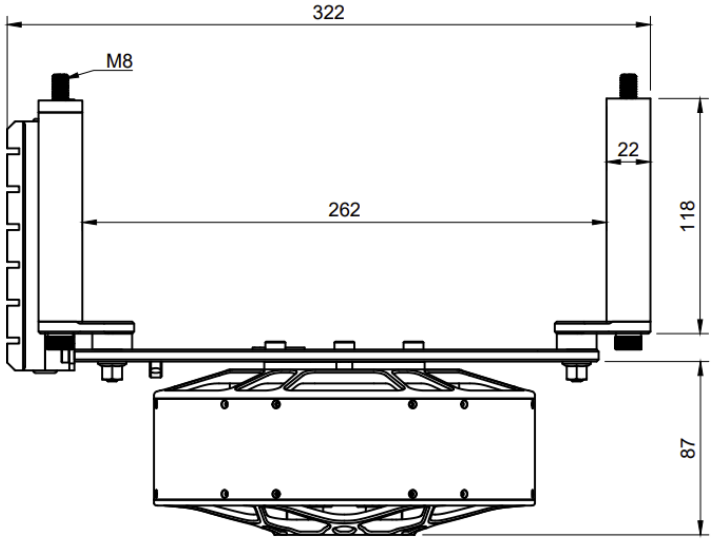
Motor 	Motor Controller 	Hand Controller 	Battery 
Motor Mount Plate 	Prop Plate 	Prop Adapter 	Power Pack 
Quick Release Prop Hub 	Prop 	Charger 	

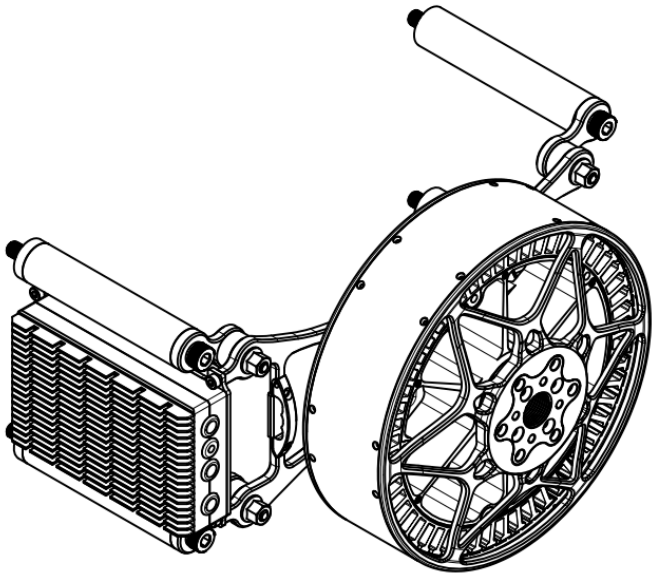
3 Engine & Frame Dimensions

Complete 3D files can be downloaded at the link
https://github.com/openppg/sp140-hardware/

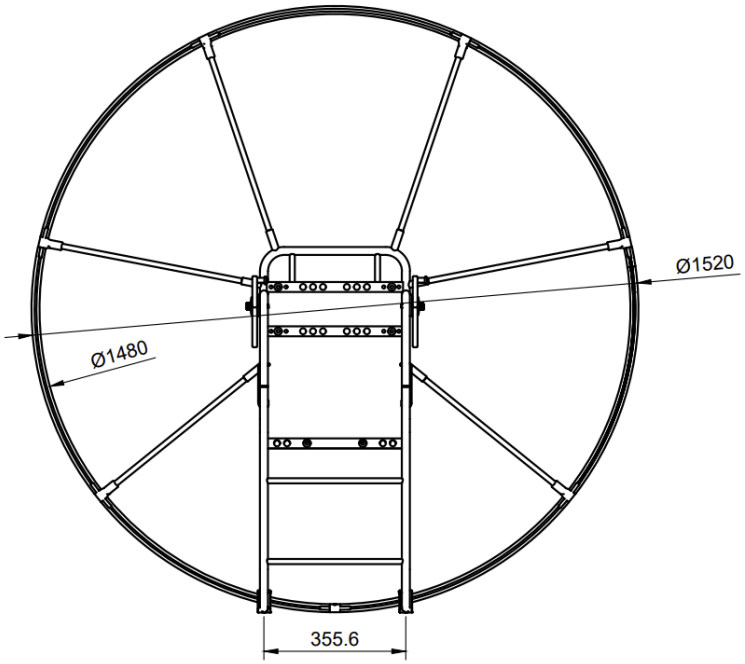


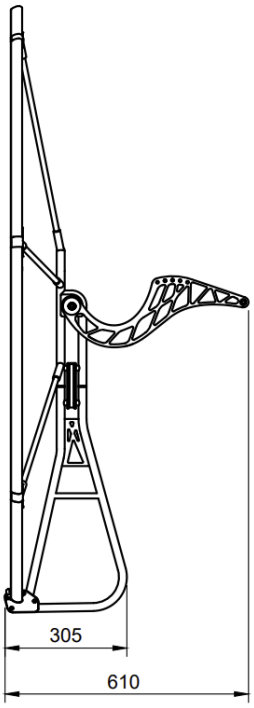


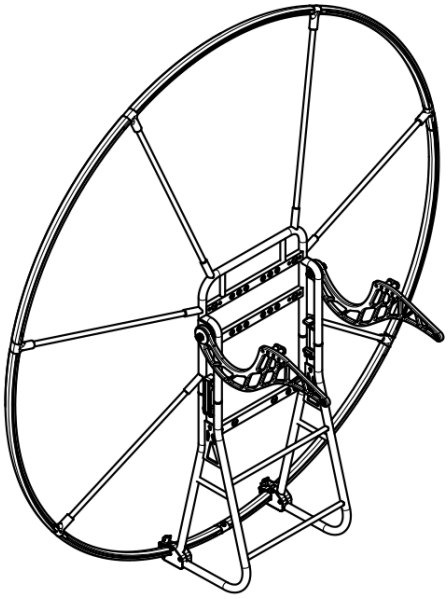


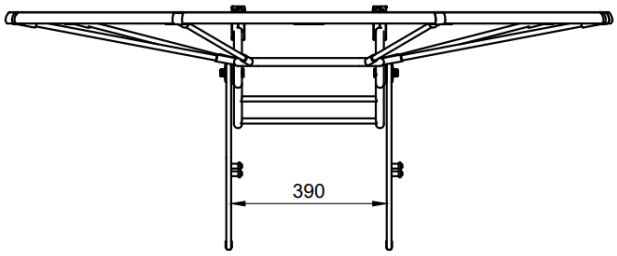


Size when assembled as ready to fly - **610x1520x1520mm**







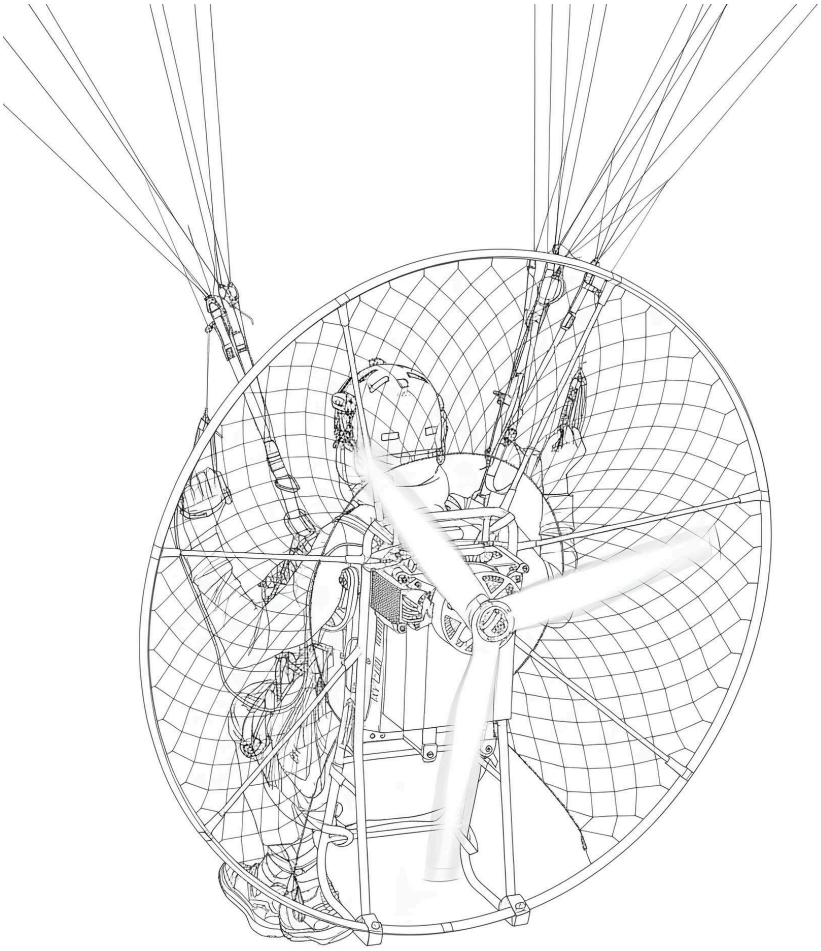


Shipping / Transport size: **580x400x420mm**

4 Assembly & Installation

Time to complete (30-60mins)

1. Unboxing
2. Center Frame assembly
3. CF Spars
4. Hoop connectors
5. Netting
6. Gooseneck bar assembly
7. Harness
8. Power Pack mounting
9. Hand Controller Connection
10. Battery installation

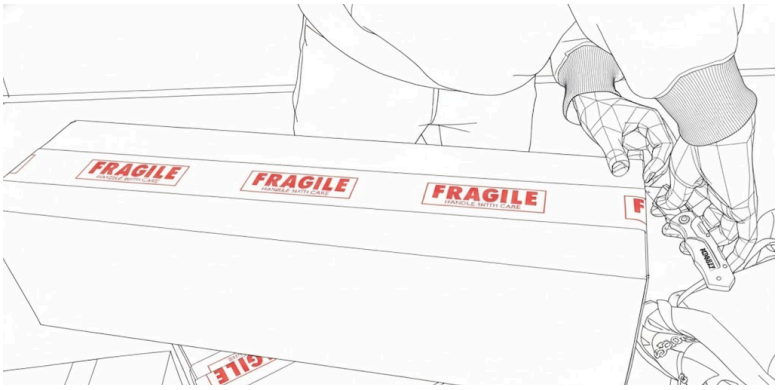


Assembly video can be found here for a more detailed view
https://www.youtube.com/watch?v=b3571IcFIRY

4.1 Unboxing

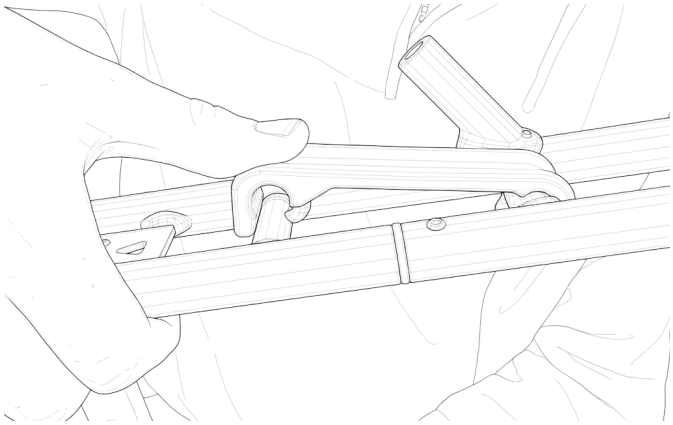
1. Check all parts are accounted for, and there is no physical or structural damage. If there is, please reach out to info@openppg.com with your order details and the part that needs inspection and solution will be provided or a replacement part will be sent.

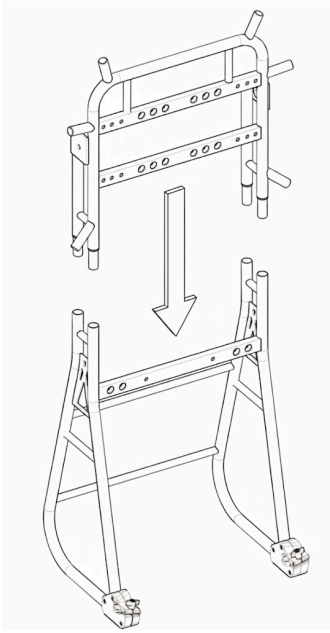
2. Set aside any tools that are needed (allen key and socket wrench)



4.2 Center Frame Assembly

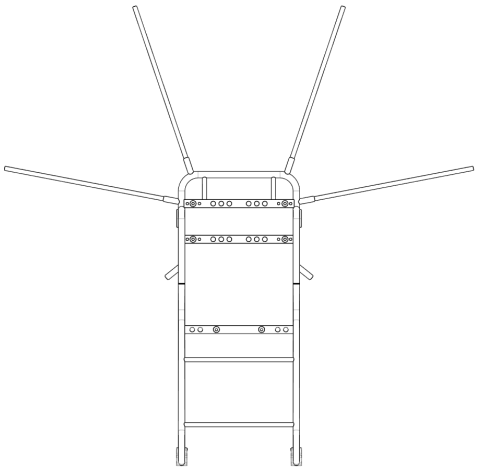
1. Place Center frame Legs on the ground and line up the four ABS connectors and press firmly in place.
2. Snap the center frame clamps in place



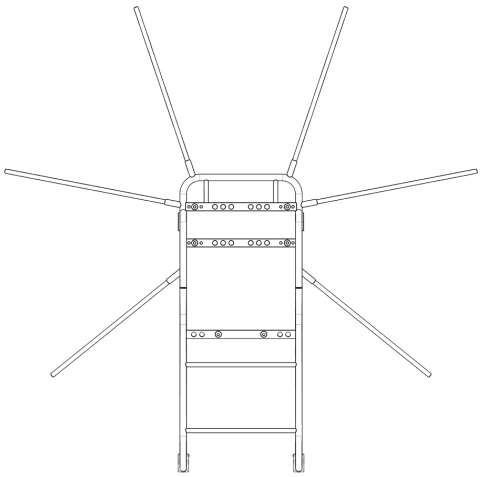


4.3 CF Spars

1. Take the 6 CF spars from the holder and slide the 4 longest in the top places in the center frame

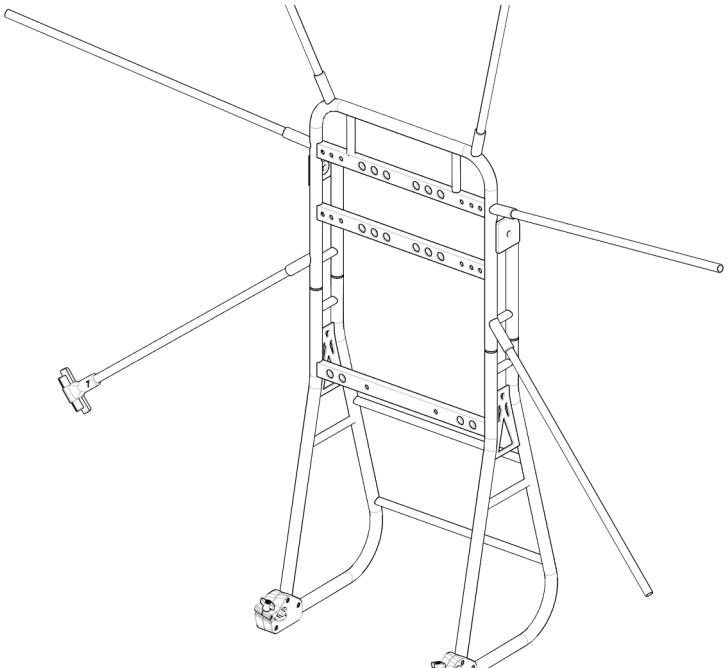


2. Finally take the remaining two shorter spars and place in the button two posts



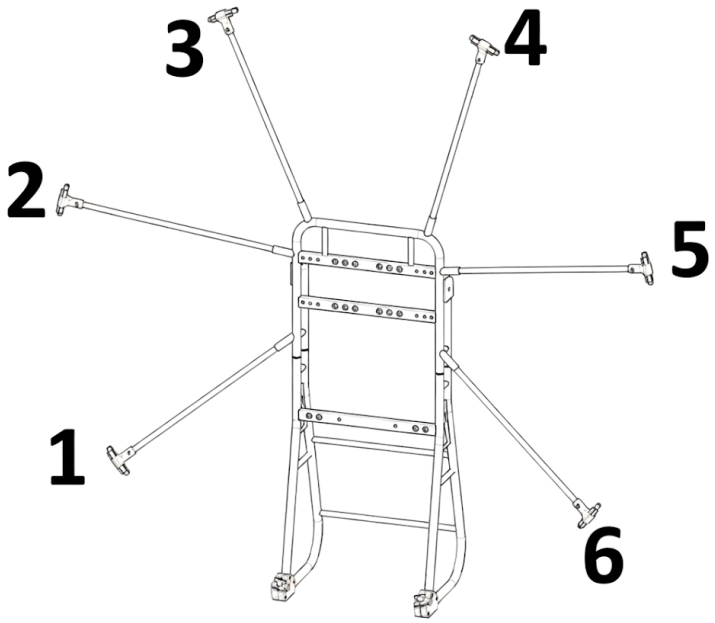
4.4 Hoop Connectors

1. There are 7 total hoop connectors 0-6. Start by looking at the motor side of the frame (backside) starting from the bottom left CF spar with the number 1 labeled connector.



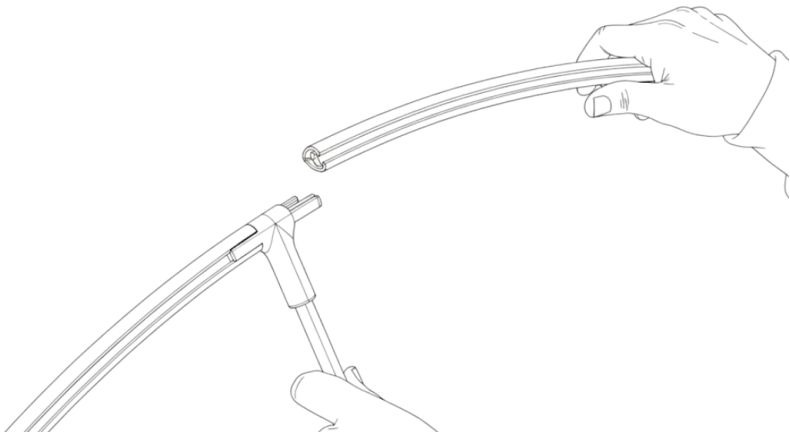
2. Slide firmly over the CF spar where you should feel it bottom out and not be able to slide on further. You can confirm this with a light tap of a rubber hammer, but please be careful not to hit the edges of the connector as they are more fragile.

3. Once the number one connector is in place you can now take the number 2 and work your way clockwise around the frame, placing a connector with the corresponding number on each spar.



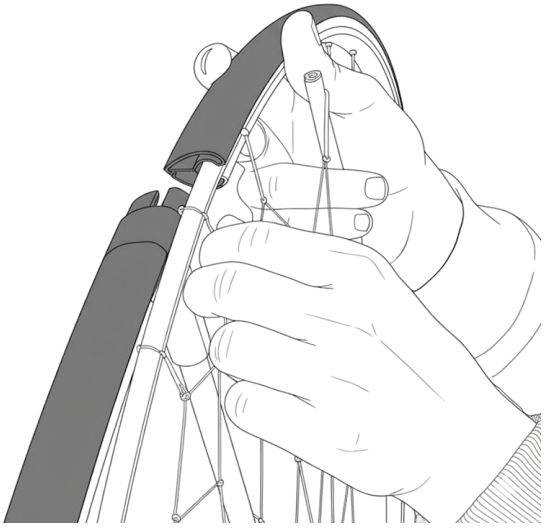
4.5 Netting

1. Start by taking the 7 hoop profiles out and sliding onto one section of the connectors, this will allow a simple structure for the netting to slide into place



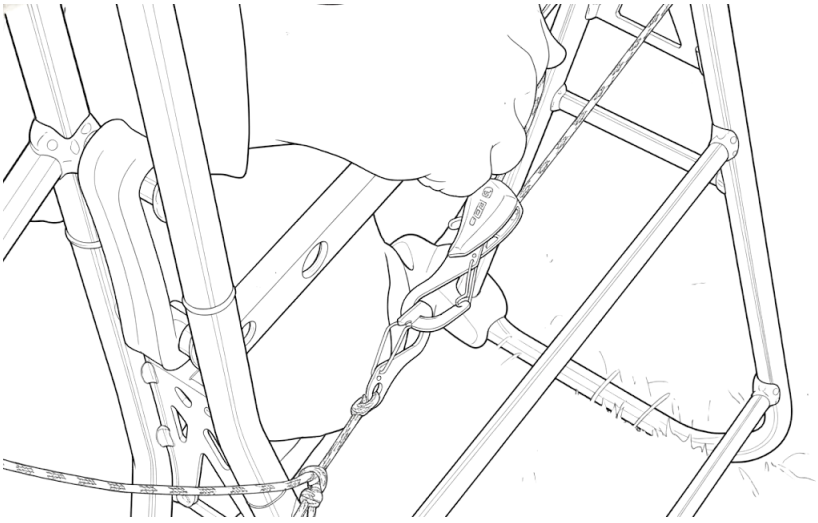
2. Now take the netting out of the bag and count over 6 sections of the netting rod

from an end point that will be the middle point to start from. There are 12 total netting rods



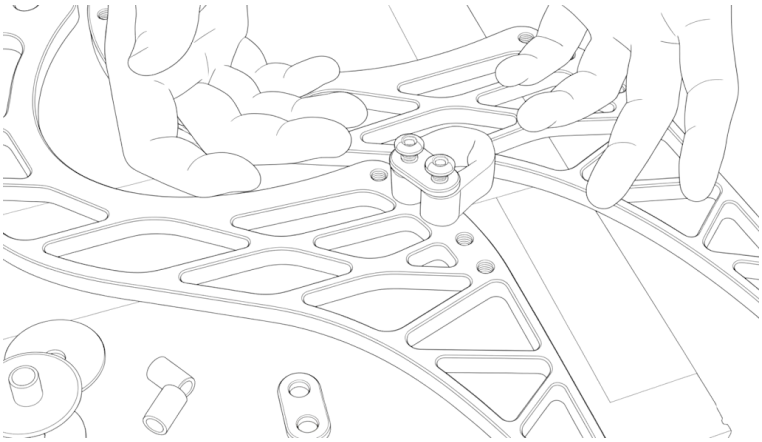
3. Slide the netting rods into the tubing and work your way down each size symmetrically. It can be done many ways but this is found to be the simplest.

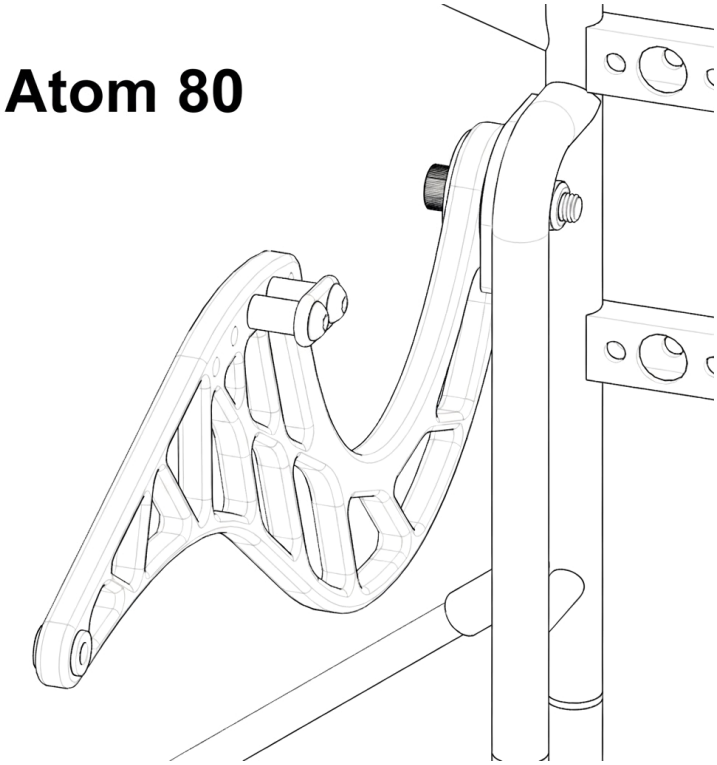
4. Finally connect the net tensioner and tighten the netting up as desired



4.6 Gooseneck bar assembly

1. Take your goose neck bars out of protective packaging and then decide which direction you want the torque compensation to be on. For the standard SP140 electric motor direction, it will be on the right side of the goose neck bars when in the flying position. *For the ICE Atom 80, it should be placed on the left side.



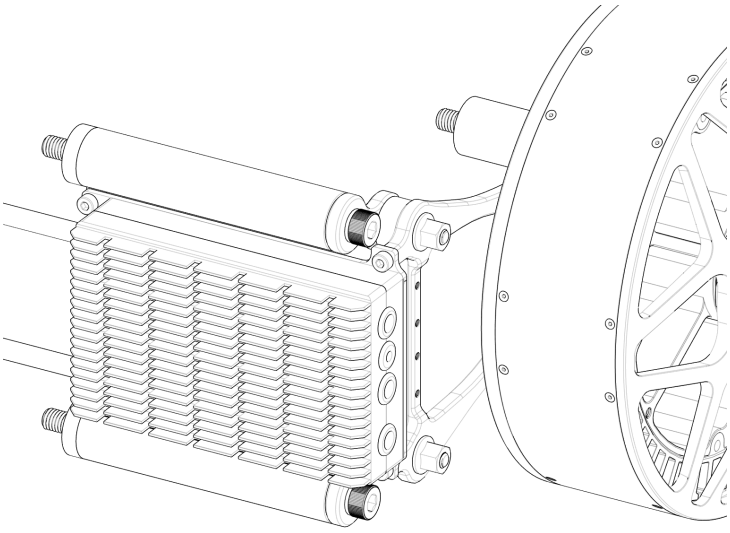


2. Place the soft links in place using the 2 aluminum standoffs.

3. Tighten up the bolts holding the soft links (LockTight can be applied). Tighten to 10nm

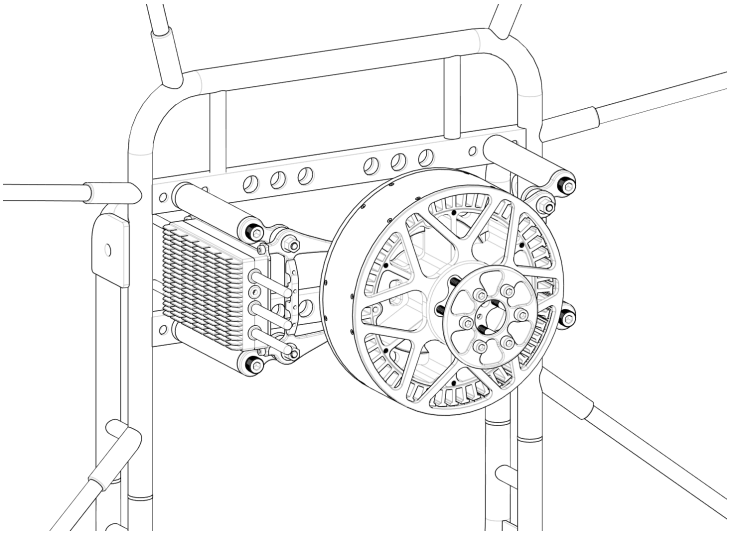
4. Using the plastic washers and 10mm bolt tighten up the goose neck bars to the frame leaving just enough play to move vertically with no wiggle.

4.7 Power pack mounting



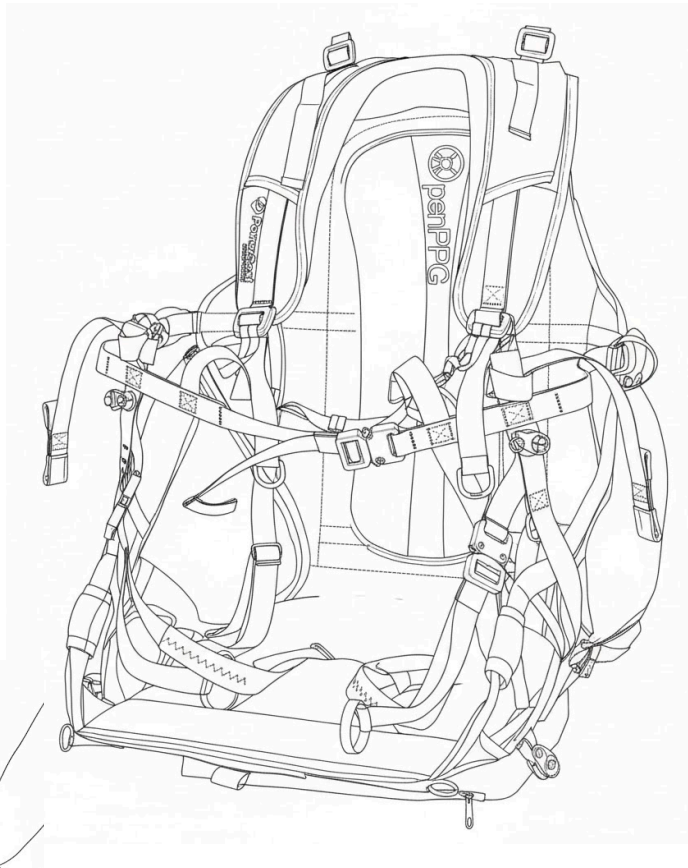
1. The power pack can now be mounted.
2. Start by bolting the ESC on and placing the supplied titanium bolts into the standoffs.
3. Then line up the four standoffs and bolts with the holes in the frame and tighten up with the supplied lock nuts.
4. Finally place the two battery standoffs on the legs for the frame that will hold the battery.

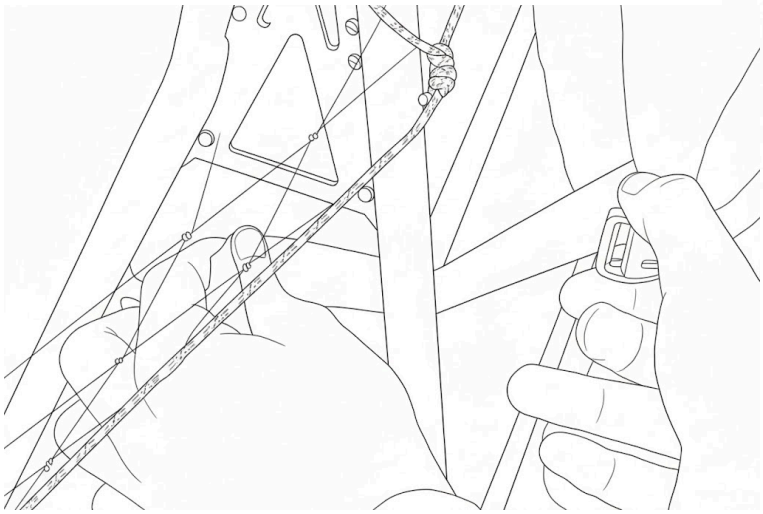
For detailed instructions on power pack assembly, please watch the video here:
https://www.youtube.com/watch?v=PScYGVZks_c



4.8 Harness

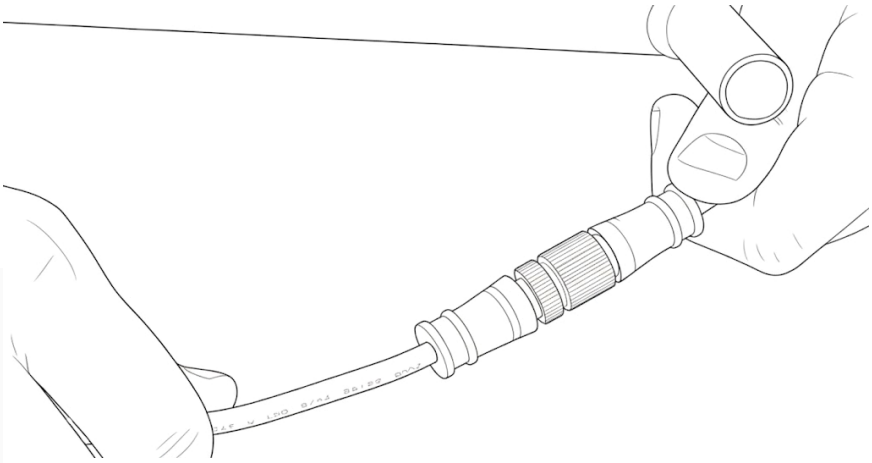
1. Take your harness and attach the two upper straps to the top of the frame.
2. Next take the long shoulder straps and loop around the bottom of the frame and adjust for comfort.
3. Then tighten the remaining two lower straps around the base of the frame
4. Now take your safety straps and clip them through the provided carabiners.
5. Finally you can attach the d-ring shackles to the tie-in points to the harness.

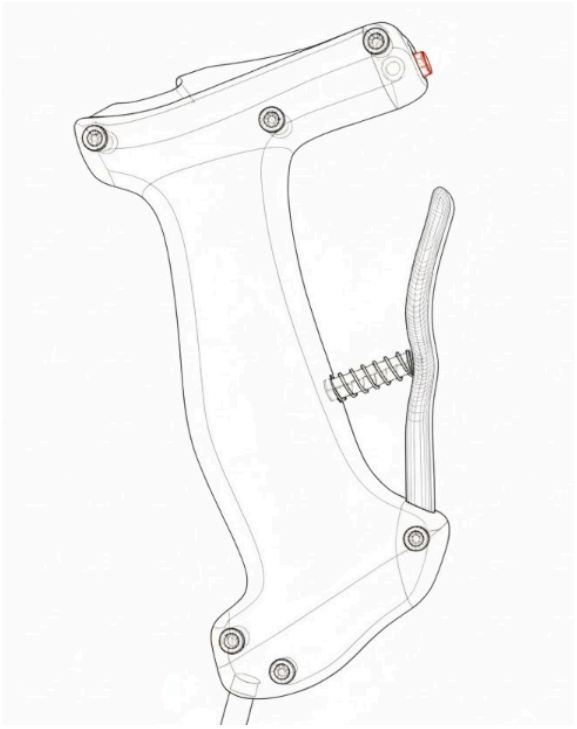




4.9 Hand Controller Connection

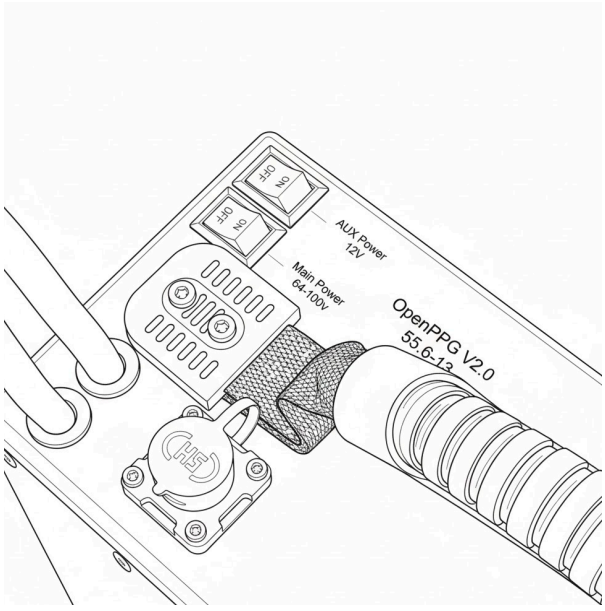
1. Remove the hand controller from its packaging.
2. Line up the pins to the connector coming from the Motor controller; it will only fit one way.
3. Press firmly in place and then use the threaded rings to tighten it down all the way to a tight and secure connection.





4.10 Battery installation

1. Take the battery pack out of its protective foam case.
2. Line up the battery pack with the slot and slide down into place.
3. With both switches off, connect the main power connector.
4. Then connect the BMS data plug to the top of the battery.
5. You can now turn on the main power switch. This will boot up the system and you will hear some beeps. The screen on the hand controller will show startup info and telemetry data.



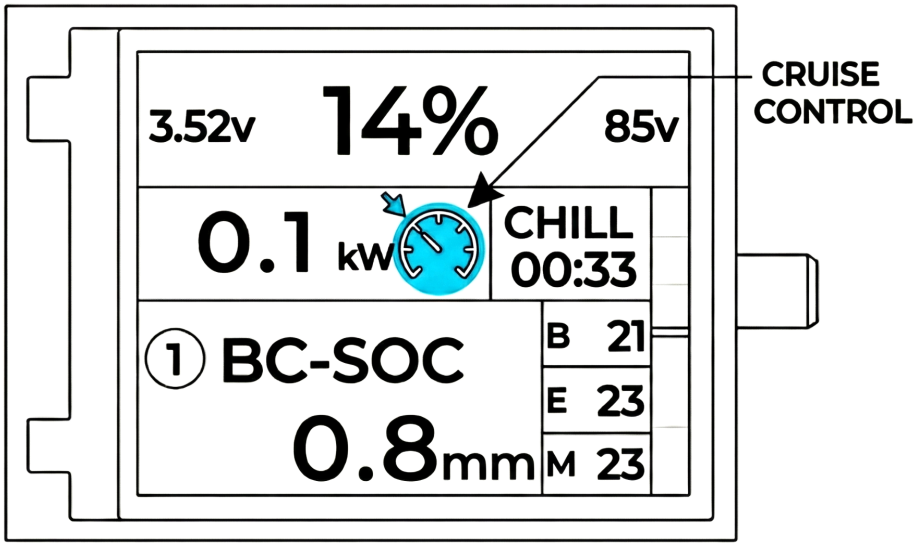
5 First Start-Up & Functional Checks

5.1 Motor runup (No Prop)

1. Start by having your battery plugged in followed by the main power switch turned on.
2. With your prop off the motor arming the motor can be done. Without arming the motor, the motor will not be able to spin. This is for safety so not to accidentally spin up the motor.
3. With all systems on and the main power switch in the on position, you can now arm the systems with the hand controller.
4. Arming is done with the little red button at the top of the hand controller.
5. To arm press and release the button once then press again and hold until the hand controller beeps and vibrates. (This should just take 1-2 seconds to arm or disarm and can be done at any state in flight)
6. With the system armed you can now press the throttle lever and the motor will spin up. The more the lever is depressed the faster the motor will spin.
7. You can then disarm with the same method of button presses (press and release then press and hold).

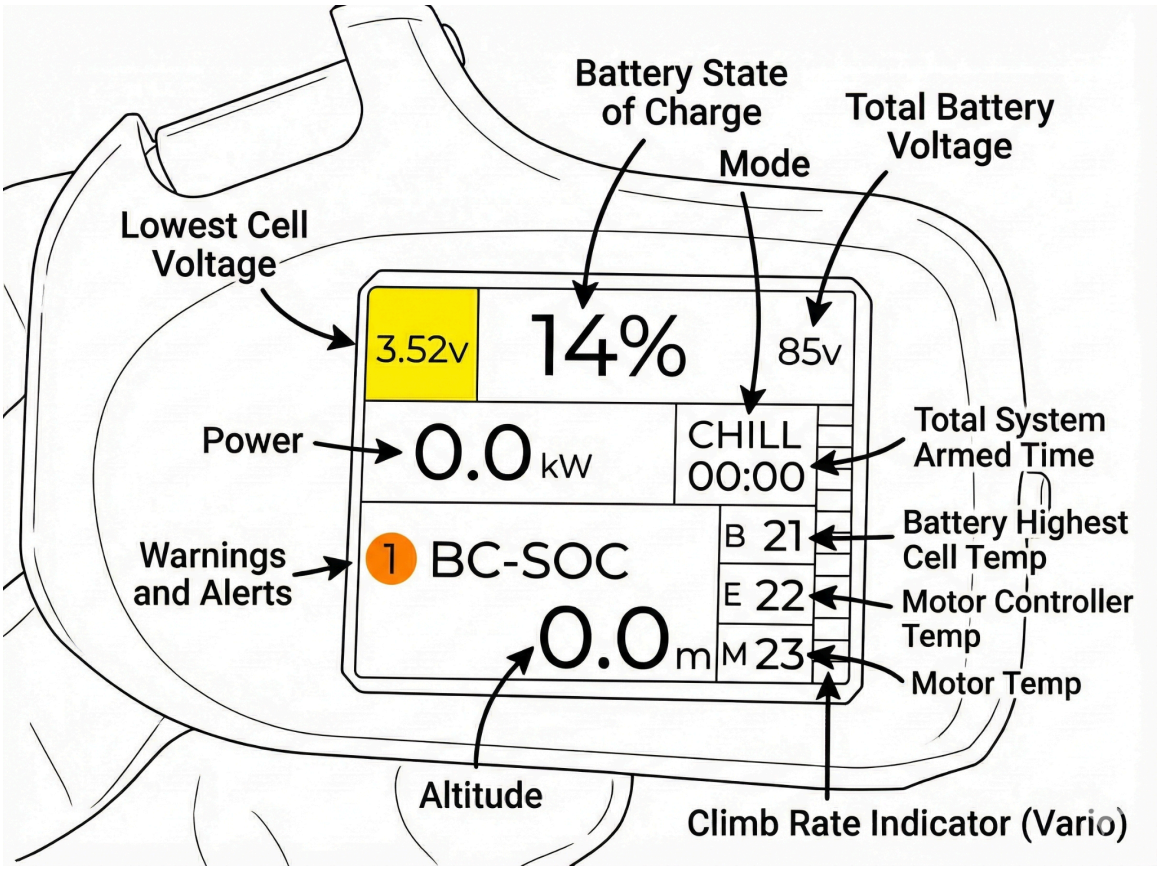
5.2 Cruise control test (No Prop)

1. This would also be a good time to test the cruise control function to get familiar with how it functions while the prop is off.
2. To enable cruise control you must be armed and have some power applied.
3. When at the designated power hold down the hand controller button for a second until you feel the vibration feedback from the hand controller and then you can let go of the throttle.
4. You will see on the screen the cruise control icon showing when enabled.
5. To leave cruise control, simply apply power to within 10% of the set power level and you will now have control over the throttle again manually.



5.3 Telemetry Link data (No Prop)

1. We can study the hand controller telemetry data displayed on the screen so you can get familiar with it.
2. The power is shown in the middle left side of the screen and you can see how it changes under different throttle levels it is shown in KW (kilowatts)
3. In the top is the SOC (state of charge) of the battery as a percentage. In the far left you will see a small number ranging from 2.5-4.2V. This is the lowest cell voltage in the battery pack. The top right corner shows the total system voltage. These voltages are mostly for advanced users who like to see this detailed info. For most users this is not relevant and they only need to notice the warning and alerts that appear automatically.
4. In the bottom right of the screen there are 3 temp boxes labeled M, B, E. This is the motor, battery, ESC (motor controller) temperatures. Again this is all handled automatically and will alert the pilot if they need to take and action but is for users who want to see some details.
5. In the middle left there is a timer that is started when the user arms the system and apply some throttle to start the stopwatch. Above the timer is the throttle mode (sport or chill).
6. In the bottom left is the altimeter, it can be set in FT or M above the ground and is reset to zero when the system is armed (your takeoff point).
7. On the far right of the screen there is a vario which shows climb/sink rate represented in colored bars.
8. Should any warnings or errors arise, they will be shown in the bottom left of the screen along with the number of errors or warnings.



6 Telemetry Codes

Alert Levels

- Warning: Yellow alerts indicate conditions approaching dangerous levels
- Critical: Red alerts indicate dangerous conditions requiring immediate attention

ESC (Motor Controller) Alerts

Temperature Alerts

Alert	Abbreviation	Warning Threshold	Critical Threshold	Meaning
ESC MOSFET Temperature	MC-F	>90°C / <-10°C	>110°C / <-20°C	High/low temperature on the ESC's power MOSFETs
ESC MCU Temperature	MC-C	>80°C / <-10°C	>95°C / <-20°C	High/low temperature on the ESC's microcontroller
ESC Capacitor Temperature	MC-P	>85°C / <-10°C	>100°C / <-20°C	High/low temperature on the ESC's capacitor
Motor Temperature	MC-M	>105°C / <-20°C	>115°C / <-25°C	High/low temperature on the motor

Alert	Abbreviation	Trigger Condition	Meaning
ESC Over Current	MC-RE-0	Active when true	ESC detected excessive current draw
ESC Locked Rotor	MC-RE-1	Active when true	Motor is locked or jammed
ESC Over Temperature	MC-RE-2	Active when true	ESC temperature protection triggered
ESC Over Voltage	MC-RE-6	Active when true	Input voltage too high
ESC Voltage Drop	MC-RE-7	Active when true	Input voltage dropped too low

Running Errors (Critical Only)

Self-Check Errors (Critical - Boot-time Hardware Faults)

Alert	Abbreviation	Meaning
Motor Current Output Bad	MC-SE-0	Motor current sensor malfunction
Total Current Output Bad	MC-SE-1	Total current sensor malfunction
Motor Voltage Output Bad	MC-SE-2	Motor voltage sensor malfunction

Capacitor NTC Bad	MC-SE-3	Capacitor temperature sensor malfunction
MOS NTC Bad	MC-SE-4	MOSFET temperature sensor malfunction
Bus Voltage Range Bad	MC-SE-5	Bus voltage sensor range error
Bus Voltage Sample Bad	MC-SE-6	Bus voltage sensor sampling error
Motor Z Too Low	MC-SE-7	Motor impedance too low
Motor Z Too High	MC-SE-8	Motor impedance too high
Motor Voltage Detect 1 Bad	MC-SE-9	Motor voltage detection 1 malfunction
Motor Voltage Detect 2 Bad	MC-SE-10	Motor voltage detection 2 malfunction
Motor Current Detect 2 Bad	MC-SE-11	Motor current detection 2 malfunction
Software/Hardware Incompatible	MC-SE-13	Firmware/hardware version mismatch
Bootloader Unsupported	MC-SE-14	Bootloader version not supported

BMS (Battery Management System) Alerts

BMS Temperature Alerts

Alert	Abbreviation	Warning Threshold	Critical Threshold	Meaning
BMS MOSFET Temperature	BC-F	>50°C / <-10°C	>60°C / <-15°C	High/low temperature on BMS power MOSFETs
BMS Balance Temperature	BC-B	>50°C / <-10°C	>60°C / <-15°C	High/low temperature on balance resistors
BMS Cell Temperatures	BC-T1/2/3/4	>50°C / <-10°C	>56°C / <-15°C	High/low temperature in battery cell group 1-4

Voltage and SOC AlertsMOSFET State Alerts

Alert	Abbreviation	Warning Threshold	Critical Threshold	Meaning
BMS High Cell Voltage	BC-CV-H	>4.19V	>4.20V	Individual cell voltage too high
BMS Low Cell Voltage	BC-CV-L	<3.2V	<3.0V	Individual cell voltage too low
BMS State of Charge	BC-SOC	<15%	<5%	Battery charge level too low

BMS Total Voltage	BC-Vtot	<79.2V or >100.4V	<69.6V or >100.8V	Total battery pack voltage out of range
BMS Voltage Differential	BC-dV	>0.2V	>0.4V	Voltage difference between cells too high

Alert	Abbreviation	Trigger Condition	Meaning
BMS Discharge MOS	BC-DSG	Active when false (MOS off)	Discharge MOSFET turned off

Internal System Alerts

Alert	Abbreviation	Warning Threshold	Critical Threshold	Meaning
CPU Temperature	CPU-T	>60°C / <0°C	>80°C / <-10°C	ESP32-S3 processor temperature too high/low
Baro initialized	Baro-I	Active when false		Barometer failed to initialize

Notes

- All temperature sensors use hysteresis to prevent alert bouncing (±1°C deadband).
- Voltage thresholds are absolute values without hysteresis.
- Boolean alerts (errors/faults) are either active (true) or inactive (false).
- Critical alerts trigger a red screen border and vibration.
- Warning alerts are displayed in yellow.

7 Flight Operations

7.1 Normal Flight Profile

The SP140 electric paramotor operates on the same principle as any other gas paramotor, spinning the propeller to produce thrust so it can be flown similarly to most other paramotors.

Takeoff: While no warm-up is needed, it's still a good idea to spin up the propeller and ensure there are no impediments to a smooth takeoff. Pilots tend to be focused on the takeoff once the wing is overhead, so it's best to confirm everything will operate as expected.

Climb-out: During climb-out and under full power, always ensure there's a safe landing area at any point in case of motor or wing problems. Also, check the hand controller's screen for system alerts before they reach a critical state. It's designed to give a heads-up well in advance to avoid surprises.

In flight: When settled into cruise flight, always be aware of your surroundings, watch out for other aircraft, and monitor any developing weather. Also, check the hand controller's screen to monitor the flight system's status and remaining energy. Your hand controller will vibrate to notify you of any warnings or alerts, along with displaying the information on the screen. Always fly in a manner that if a motor out occurred, you would always have a safe glide to a landing spot.

Landing: Many pilots choose to disarm the throttle on landing to prevent accidental activation when on the ground; this is a personal preference.

7.2 Post-Landing Shutdown

Post flight: After flight, turn off the main power switch located on the battery pack. Then, unplug the main power lead from the motor. Note the battery's SOC percentage. If landing with an SOC below 10%, it's best to charge the battery back to around 50% SOC before storing the system for longer than a week.

8 After-Flight Care

8.1 Transport

When transporting the motor and frame strap it securely in place from large movements. If traveling on bumpy roads, please store the battery upright or lay it flat on its side in its foam case. **Do not transport the battery upside down**.

8.2 Short- & Long-Term Storage

For long-term storage, store the entire paramotor in a cool, dry place. This helps prevent degradation of the fabrics in the harness and battery pack due to environmental factors. For optimal long-term storage (over one week), store the battery pack at 10-25°C, with a state of charge (SOC) between 30-50%, and away from high humidity.

Operating in very cold environments (sub-0°C temperatures) is not a problem for the SP140. However, avoid storing the battery pack outside in those temperatures, as the battery pack's maximum energy output will be reduced if cooled to those temperatures. Normal cold weather flying, even at -20°C, is fine, as the internal heating of the cells during use will protect the battery pack. The performance decrease only occurs during long-term storage in cold environments.

8.3 Scheduled Maintenance

There's little maintenance needed, as there are no motor rebuilds, oil changes, carburetor tuning, and essentially no moving parts, unlike a gasoline motor. There are a few things to keep an eye on below:

Interval	Task
Every flight	Inspect bolts, straps, and propeller for any marks or chip
Every 3 weeks	Inspect the battery pack using the app to connect to and ensure the cell voltages are not below 3.3v if they have dropped below that threshold please charge them until 3.8v for long-term storage.

9 Warranty

Electric SP140 OpenPPG Paramotor Warranty

At OpenPPG, we're passionate about building paramotors and want you to have the most fun possible without worrying about engine maintenance, repairs, or tuning the motor. This is why we are such big fans of electric systems. However, no system is perfect, so we also include a generous warranty on top of the highly reliable system.

We take pride in our work and want you to feel great about your purchase. That's why we offer this warranty to cover you for 12 months or 300 hours of operation, giving you a solid foundation for your adventures.

What is Covered:

This warranty covers any defects in materials or workmanship in all parts of your paramotor, including the motor power system and battery, under normal use and service. If something goes wrong due to an error on our part, we'll make it right.

Warranty Period:

The warranty lasts for 300 hours of operation or 12 months from the date of delivery, whichever comes first. We are able to provide this warranty because unlike internal combustion paramotors, which require regular maintenance and rebuilds, electric paramotors do not. That's why the SP140 comes with an industry-first 1-year/300-hour warranty, while many others offer little to no warranty.

What is Not Covered:

We want to be totally open about what this warranty doesn't cover, so there are no surprises:

- Damage caused by accidents, crashes, or collisions
- Damage from misuse, abuse, or neglect
- Damage due to major modifications or unauthorized repairs
- Normal wear and tear
- Damage from improper maintenance or not following our recommended maintenance steps
- Use of the paramotor in ways or conditions outside normal paramotor flying
- Any issues from not following safety guidelines or regulations

In short, if it's a defect from how we built it, we've got your back. But if it's from a crash, misuse, or big mods you've made, that's not part of this warranty.

Beyond the Warranty:

Here's the thing—we don't just stop caring once the warranty ends. For many of our customers, we're still supporting them even after the 300 hours or 12 months are up. We had to set a specific cutoff to give you something solid to rely on, but we're in this for the long haul. Plus, we take pride in keeping replacement parts affordable and in stock, so you can keep flying without breaking the bank.

Making a Warranty Claim:

If you run into a problem we've covered, just get in touch with us at **info@openppg.com**. Show us your proof of purchase and tell us what's going on. We'll check it out, and if it's under warranty, we'll repair or replace the defective part(s) at no cost to you—parts and labor included.

Limitations:

- This warranty is for you, the original purchaser—it's not transferable.
- Openppg.com decides if a part is defective and whether we'll repair or replace it.
- This warranty is not for the ICE SP140 as we do not manufacture the motor in that case, and that warranty is with the manufacturer Vittorazi.
- This warranty applies to the complete OpenPPG paramotors; it does not include standalone, individual parts procured separately for systems used outside compatible OpenPPG parts.
- Shipping cost not included, warranty covers all labor costs and replacement part costs; owners are responsible for getting warranty parts to the repair facility.
- This new warranty goes into effect for all paramotors received starting at the beginning of 2/2025 and onward.

10 Support & Contact Information OpenPPG

General inquiries	Questions	info@openppg.com
Orders & RMAs	Include order # in e-mail	info@openppg.com
Digital Guide	Online Manual	docs.openppg.com
Online resources	Youtube page	www.youtube.com/@openppg
Online resources	Config Tool	config.openppg.com
Online resources	Community Forum	community.openppg.com
Online resources	Software Docs	config.openppg.com/docs/controllers/sp140-v3/
Online resources	CAD files - Github	https://github.com/openppg/sp140-hardware/tree/main/Frame%20Parts

