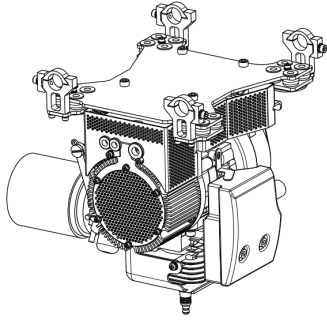


Richen Power

H2 ISG UAV Generator Remote Starting

Read This First



H2

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www.richenpower.com

English

This manual can be downloaded from the following website:

<https://www.richenpower.com/download>

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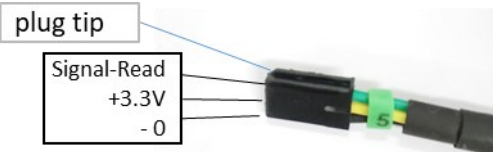
Share information with Flight Controller

H2 can share running status and errors information with Flight Controller via #5 wire. The transmission protocol is TTL. Please require protocol from us. For Ardupilot APM autopilot, enable the display on Mission Planner. Docs:

<https://ardupilot.org/copter/docs/common-richenpower-generator.html>

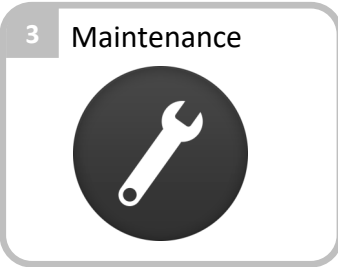
Connect the Signal pin of #5 to one of the autopilot serial ports (e.g. Telem2).

Connect #6 to one of the autopilot's servo outputs and set a 2pos or 3 pos switch on RC to start/stop the engine.



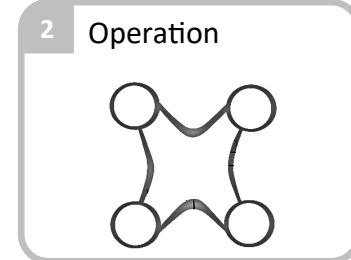
Read This First

Apply H2 Hybrid UAV Generator for extremely long endurance as following steps:



Checking the bundled items

- H2 (1)
- LiPo Battery 6S (2)
- Manual (this)



Complimentary Accessories

- Fuel Mixer (1) *
 - Oil (1) *
 - Fuel Tank (1) *
 - Fuel Level Sensor (1) *
- *Accessories are consumable items, available at <https://www.richenpower.com/shop>

Specification

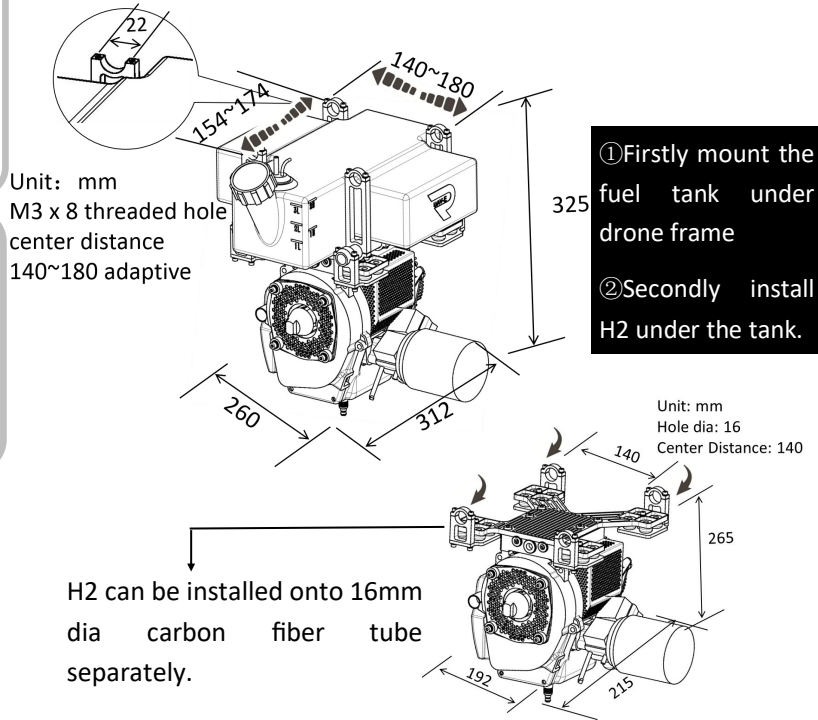
	H2 ISG
Weight	4.0kg(8.8lbs) w/o Accessories / 5.2kg(11.5lbs) Total
Power	1.8kW(2.4hp) Continuous / 2.0kW(2.6hp) Max. Power
Dimension (L x W x H)	215 x 192 x 265 mm/8 x 7 x 10in
Applicable UAV Types	Multicopters & VTOL Fix-wings
Max. Take-off Weight	18kg (39.7lbs) or UAV suggested
Output Voltage	12 S (49V)
Fuel consumption	750 g/kw • h (hovering 1.5 L/h)
Service Temperature	-20 ~ 40 °C / -4 ~ 104 °F
Ceiling (above the sea)	1000 m / 3280 ft
Rotating direction	Clock wise (view from starter)
Fuel	Automotive #95 or above + 2T oil

LED	2/3 positions switch	Instruction
Red flashing	No signal	#6 wire not connected or wrong parameters
Green flashing	Stop <1600μs	#5 outputs LOW voltage messages when lower than 46 V
Solid green	Start/Run>1700μs	
Red & green	Stop & Run	Maintenace required. Automatic Off in 4 hours
Green flashing	Servo calibration	#6 output = 1650μs

Getting Started

1 INSTALLING TO UAV

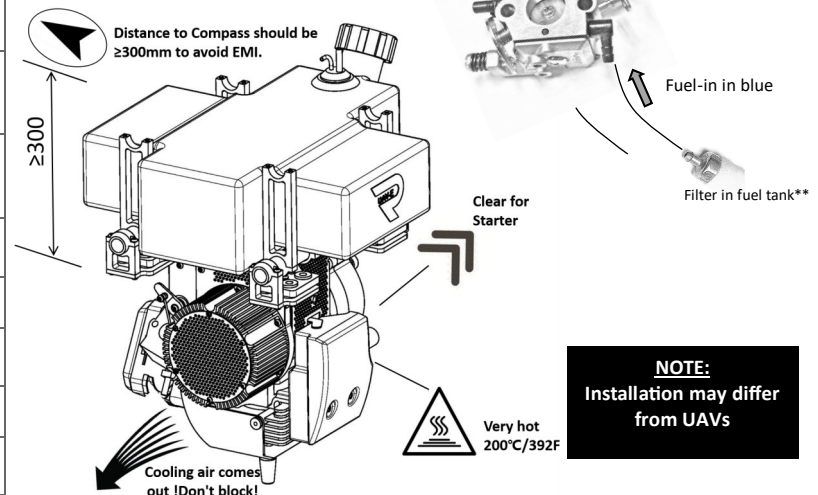
Installing H2 to UAV, default is suspended



NOTES: default mount is suspended. Other modes may lead to damper failure

Fuel supply

**Tank fuel filter must have 85μm or equivalent mesh



2 FUEL

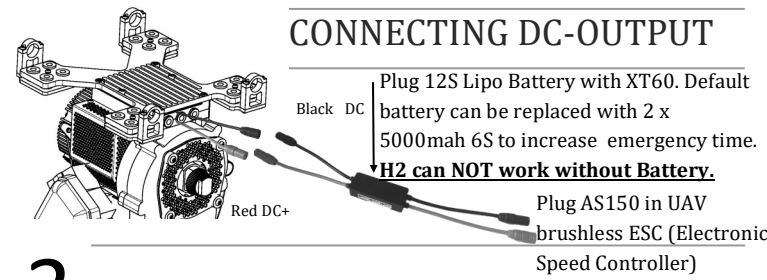
Using Fuel Mixer to mix gasoline and oil

- ①Filling gasoline (octane over 95) until Mixer mark.
- ②Filling oil *** until Mixer mark
- ③up-side down to mix the fuel

gasoline/oil at 25: 1

***Using recommended 2 cycle engine oil or JASO FC/FD ISO-L-EGD grade oil

CONNECTING DC-OUTPUT

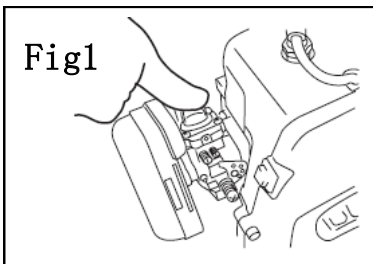


3 ENGINE RUNNING-IN

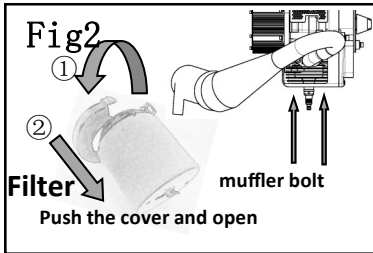
Engine Running-in is completed. Plug-in and go

Operation

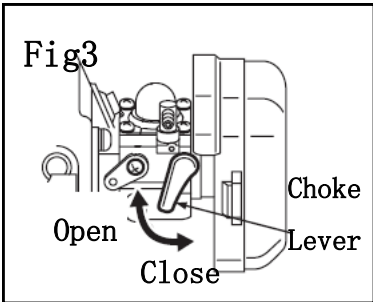
1 STARTING



1. Before every start, push the primer pump several times until overflow fuel flows out from yellow pipe. (Fig.1) Check if the filter is clogged. Check muffler bolt. (Fig.2)



2. Power on and make sure the status LED on H2 is "green flashing". Close the Choke Lever (Fig.3) Switch the 3pos/2pos to HIGH (start) (In case of engine warm condition, choking may not be necessary)



The engine stats by itself. If it fails to start, switch the 3pos/2pos back to LOW and up to HIGH again.

Messages in Mission planner:

Generator HIGH

Warming up (80%)

3. Open the Choke (Fig.3).

! NOTES: H2 is able to start, when LED is "green flashing". If the LED is "green & red flashing", maintenance is required. H2 is still able to start. H2 is unable to start when LED is "red flashing" See Trouble Shooting

Important

Over choking may cause starting difficulty due to wet spark plug.

In this case change spark plug or dry it, and try to start again.

2 RUN

- After auto started, the generator LED is solid green. And no Prearm fail messages. The drone is ready to disarm.
- monitoring the power voltage.

Voltage should be at 49 ± 1V

- Voltage may drop 2~3 V when encounters air turbulence or maneuver. If the voltage drop rapidly to under 46 V

Please pay attention. Generator related warning messages will prompt. Land and inspect when necessary.

⚠ Important

- H2 has LiPo Battery with capacity of 90-second emergency landing. Contact us for bigger capacity.

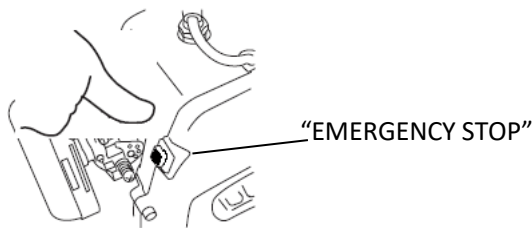
3 STOP

- Switch the 3-pos/2-pos switch to LOW/Stop.** H2 will stop. LED is green flashing.
- During the flight or RC signal lost, the generator will be still in HIGH/Run due to fail avoidance.

📖 NOTES

- Fuel ran out may completely damage H2. Monitor fuel level with given sensor and land before fuel ran out. DISPLAY is optional for fuel level sensor incompatible flight controllers like DJIA3

- H2 has “EMERGENCY STOP” bottom.



Gasoline is flammable! At the end of the day or during long-distance transport, the fuel tank should be emptied. Fuel shall be properly stored .

Maintenance

- Correct maintenance is necessary to keep H2 high performance
- H2 controller LED blinks “green and red” for 4 hours. H2 is reaching the maintenance cycle (75 hours). H2 is still able to start . Please follow the MAINTENANCE in separate manual.

⚠ Important

Balance charge Li-batteries every 75 hrs

- If H2 is NOT maintained at every 75 hours cycle, it will lead to performance degradation.
- The controller LED stops to blink “green and red” 2 hours after every 75 hours cycle.
- Spark plug and air filter are required to replace every 75 hours cycle.

Trouble Shooting

1) unable to start

	LED	Possible Cause	Solution
3-Pos/2-pos Switch	Off	PCB failure	ECU replacement
	Red flashing	#6 wire is not connected	Check wiring, parameters and RC receiver channel
	Green flashing	EMERGENCY STOP switch failure	Exchange
Filter overflow or clogged		Carburetor overflow	Repair carburetor or exchange
		Bad environmental air condition	Wash the filter with mixed gasoline
Maintenance cycle exceeded	green and red flashing	Engine failure because of short of maintenance	Operate maintenance

2) lack of power or unstable running

	LED	Possible Cause	Solution
Unstable running or unstable voltage	Solid green	Spark plug loose	Tight the spark plug
		Water in fuel, wrong, poor fuel quality or mixed longer than 2 months	Change with proper fuel
		Poor oil quality	FD/ISO-EGD 2T oil
		Air in blue fuel-in pipe or in tank wool fuel filter over 75 hours	Press primer pump. Make sure tank is connected to the air or change the fuel filter
Lack of power	LED off	ECU or sensor failure	Contact us
	“green & red flashing ”	Maintenance required	Operate maintenance
		Filter clogged	Wash the filter with mixed gasoline
		Carburetor clogged	Clean (as below)
Spark plug		Remove spark plug and connect red plug cap, connect spark tip to cylinder and rotate the engine starter. If spark is yellow, discontinuous or weak, change the spark plug.	
Voltage drops rapidly		Battery Voltage is too low	Run 1 minute until “solid green” before take-off

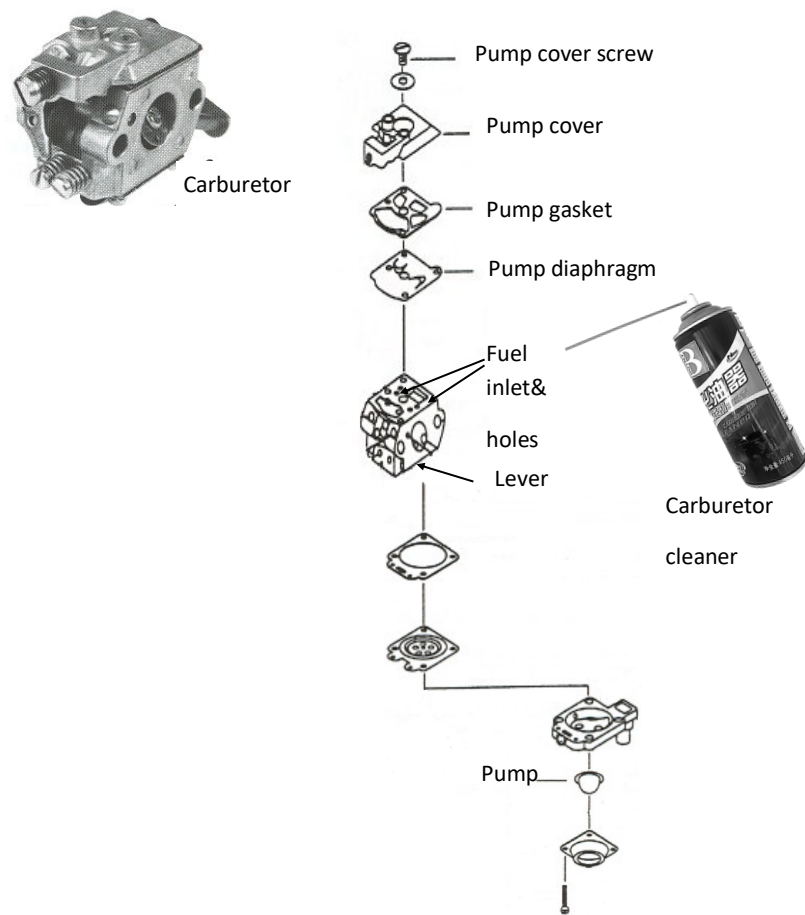
Carburetor Cleaning

Dirty operating environment (dusty) or unfiltered fuel can lead to clogging of carburetor and lack of power. It can be solved by simple carburetor cleaning.

- Remove fuel pump cover screw and pump cover. Clean diaphragm and fuel inlet using carburetor cleaner.
- Remove pump. Press and Clean Lever using Carburetor cleaner.
- Reassemble the pump cover and make sure gasket and diaphragm direction is correct.

📖 NOTES

Do NOT disassemble carburetor from H2. Only remove pump cover and clean diaphragm and fuel inlet.



Multirotor Propeller configuration

H2 UAV Engine Hybrid Multirotor Power Configuration					
Motor	Propeller	Prop. Number	Voltage V	Max. Takeoff Weight KG	Norm Takeoff Weight KG
Dji E2000Pro 6010kv130	21x7 Plastic	6	48	14.5	13.5
TmotorU8kv135	Tmotor22x6.6Pro CF	6		15.8	14.2
TmotorU10kv100	JXF/Tmotor24x9 CF	6		16.5	14.8
TmotorU10kv100	JXF/Tmotor26x8.5/26x9.2 CF	6		18.3	15.5
TmotorU10kv80 or TmotorU811kv85	Tmotor28x9.2 CF	6		19.5	16.5
TmotorU10kv100	JXF29x9.5 CF or Tmotor29x9.5 CF	4		18.0	16.2
Dji E5000 M10kv120	Dji 28x8	4		20.0	18.0

Accessories

Number	Items
422014	Starter Rubber
421013	Starter Battery
522012	Starter
422011	Oil
422006	Spark Plug
422007	Spark Plug screwer
422008	3.5 Liter default fuel tank
422010	Fuel Filter
422009a	Fuel Pipe (Fuel in in blue)
422009b	Fuel Pipe (Fuel out in yellow)
422015	Fuel Mixer
421002	LiPo Battery 6S 1800mah 75C
421017	Fuel Level Sensor
421019	Air Filter
422018	4.3 Liter square fuel tank (optional)