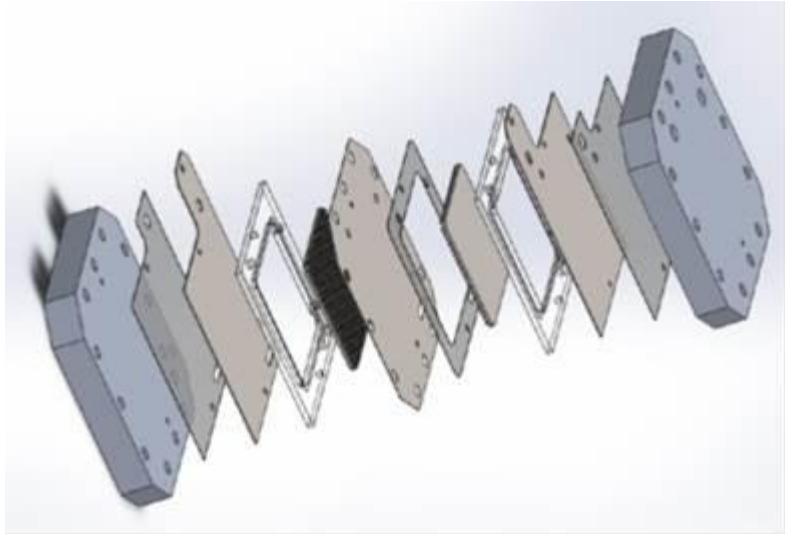


Set Up and Operation Instructions for Electrolyzer Hardware



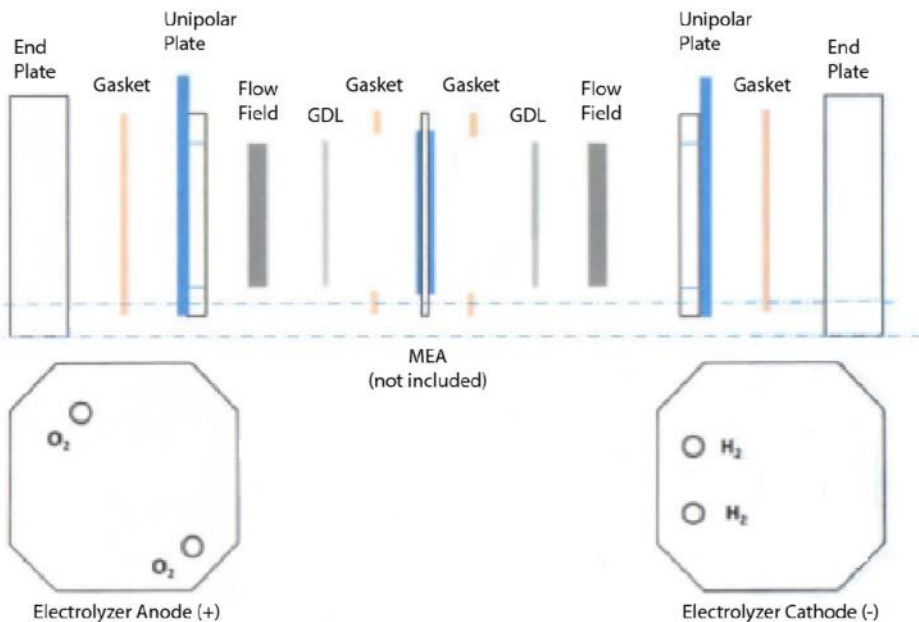
WARNING

This product is intended for laboratory use only by qualified personnel. Use of Oxygen and Hydrogen gases can result in an extreme hazard of fire and explosion. Use of these or other gases can lead to injury or death to the operator and severe property damage. All responsibility for the tightness and correctness or connections is assumed by the user. The Fuel Cell Store makes no representations or warranty, express or implied, regarding the use of fitness for use of this equipment for any purpose. **The Fuel Cell Store specifically disclaims any and all responsibility and/or liability for injury, death or property damage associated with the use of this device. This disclaimer applies to both direct and consequential damages.**

The EC-EL is a laboratory electrolyzer hardware designed for assembly and dis-assembly. The hardware allows the fundamental study of membrane electrode assembly (MEA) and electrolyzer operation. The EC-EL hardware does not generate gases by itself.

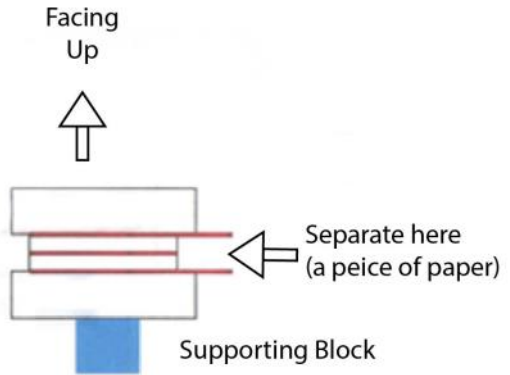
An MEA is required to generate gases.

EC-EL Electrolyzer Hardware

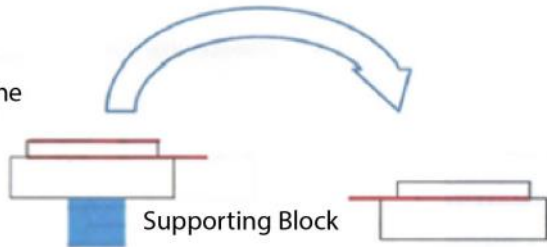


Disassembly and Reassembly

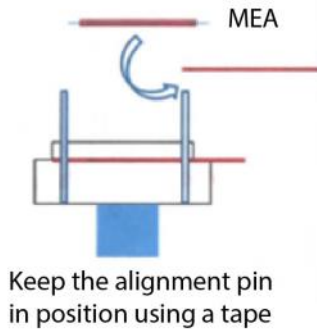
- Loosen the 12 nuts
- Remove the 12 bolts
- Place the EC-EL electrolyzer **facing up** on a supporting block



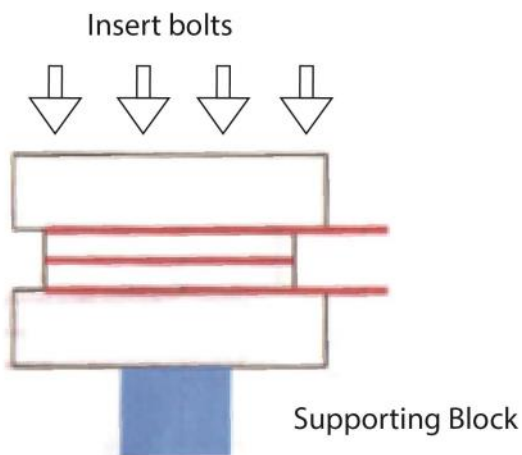
- Separate the hardware at the center of the cell (a piece of paper)



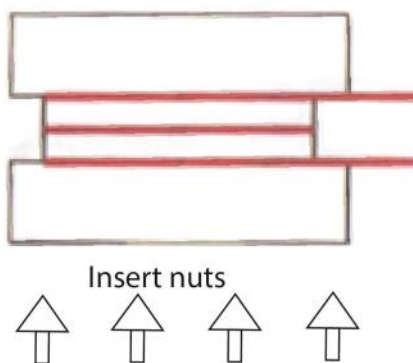
- Replace the piece of paper with an MEA



- Reassemble the cell - insert bolts



- Reassemble the cell - insert nuts

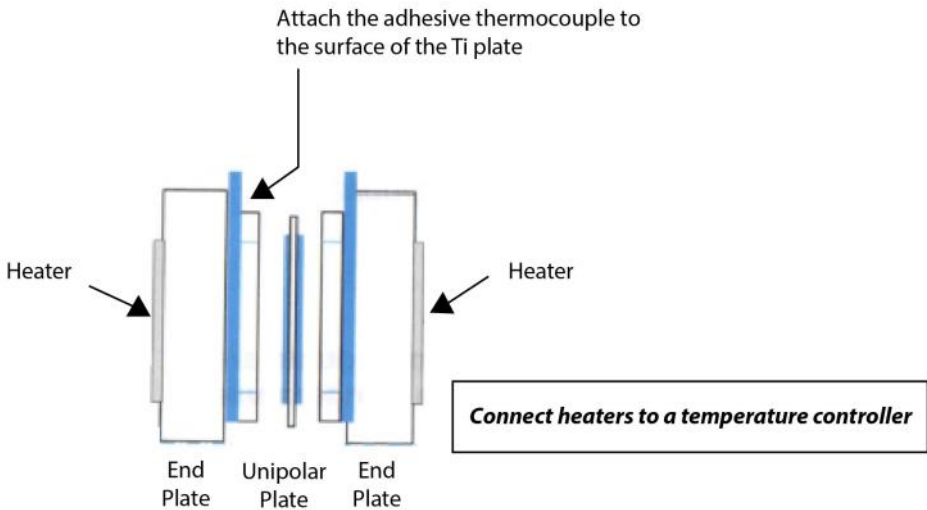


Tighten the nuts using a torque wrench - at 40in-lb



Heater

The EC-EL has attached heaters on end plate and an adhesive thermocouple (K-type) on titanium plate. The EC-EL attaches heaters and an adhesive thermocouple (K-type). To provide heat to the EC-EL, the **heaters and thermocouple must be connected and controlled by a temperature controller**. A temperature controller must be used to control the power to the heater for generating heat which is required to maintain the EC-EL cell temperature.



Electrolyzer Testing Operation

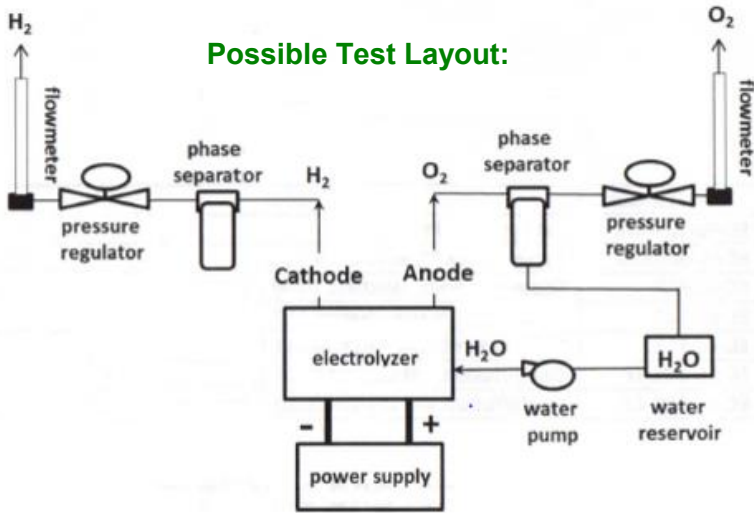
To set up electrolyzer testing, the following items are recommended:

- Water pump
- Water reservoir
- Hydrogen phase separator
- Hydrogen flow meter
- Oxygen phase separator
- Oxygen flow meter
- Temperature controller
- Backpressure regulators (optional)

Make sure that heaters and thermocouple are connected and controlled by the temperature controller.



The EC-EL electrolyzer test hardware uses titanium material for the unipolar plate, flow field and gas diffusion layer (GDL) design. Titanium is specifically selected in the EC-EL due to its high resistance to corrosion in regards to electrolysis conditions.



In water electrolysis reaction, oxygen is generated at the anode and hydrogen is generated at the cathode.

For making the connection:

The reactant, DI or distilled water, is connected to the anode with a water pump for circulation.

Anode (O_2) exit is connected to a phase separator to separate the product gas from water before the flowmeter that measures the flow rate.

Cathode (H_2) exit is connected to a phase separator to separate the product gas from water before the flowmeter that measures the flow rate.

Pressure regulator (*optional*) can be used to control the pressure at the anode and cathode compartment of the electrolyzer.

Operating Conditions

H ₂ Pressure:	50 psi Max
O ₂ Pressure:	50 psi Max
Differential Pressure:	5 psi Max
Temperature:	65° C Max





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