Titan EZ series Electrolyzer Cell Instructions

1. Introduction

The Titan EZ series PEM Electrolyzer Stacks is an advanced patented product, which is lower voltage and higher efficiency, energy-saving and of environmental protection, producing hydrogen and oxygen through the electrolysis of pure water (without adding alkali).

The proton exchange membrane (PEM), which only allows water and positive ions to cross between compartments. The membrane also serves as the electrolyte in the cell, eliminating the need for hazardous liquid electrolytes such as concentrated potassium hydroxide. PEM water electrolysis simply splits pure deionized water (H_2O) into its constituent parts, hydrogen (H_2) and oxygen (O_2), on either side of this membrane. When a DC voltage is applied to the electrolyzer, water fed to the anode, or oxygen electrode, are oxidized to oxygen and protons, while electrons are released. The protons (H^+ ions) pass through the PEM to the cathode, or hydrogen electrode, where they meet electrons from the other side of the circuit, and are reduced to hydrogen gas. The two reactions that occur in the cell are as follows:

1. $2H_2O \rightarrow 4H^+ + 4e^- + O_2$
2. $4H^+ + 4e^- \rightarrow 2H_2$

2. Outlook and Structure

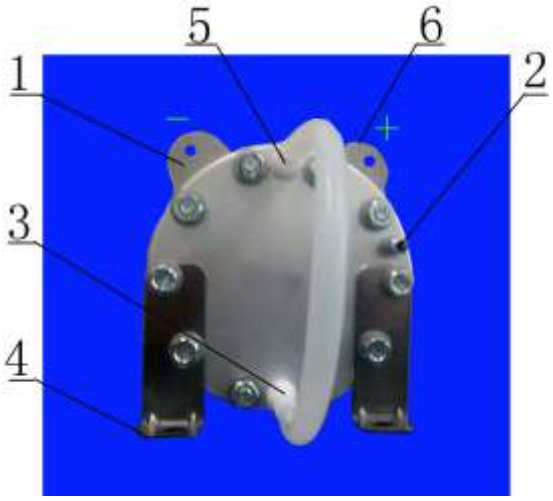

Fig. 1

1. Negative electrode
2. Hydrogen/water outlet
3. Water inlet
4. Support frame
5. Oxygen/water outlet
6. Positive electrode

Also needed: 3mm or 1/8" tubing for hydrogen/water outlet

3. Operating Instructions

1. Remove the sealing tube from the water inlet (3) and the oxygen/water outlet (5). When you stand the stack up, a small amount of deionized water may flow out.

2. Affix the electrolyzer stack in a suitable position using M5 bolts and the support frame (4).

3. Connect the water inlet (3) with the outlet of the water tank using silicone tubing with an ID of 6mm.

4. Connect oxygen/water outlet (5) with the inlet of the water tank using silicone tubing with an ID of 6mm. This will allow water from the stack to be reused. This stack is designed to be used with either a passive water supply, or a pump. If using passive water supply, please ensure the water supply is higher than the stack.

5. Connect positive electrode (6) with positive lead of power supply. Connect negative electrode (1) with negative lead of power supply and tighten the leads with an M6 bolt. Leaving the loose bolts can burn out the electrodes if they become heated.

6. Connect hydrogen/water outlet (2) with the inlet of a hydrogen/water separator using a 3mm or 1/8" tube. The connection should be sealed well with screw nuts to prevent gas leakage.

4. Product Specifications

Model	Titan EZ-60
Intended voltage and current	DC 2V, 9A
Power supply Current range (DC) (Using constant current power supply)	0 - 9A
Stack Diameter	12.6 mm
Working temperature range	5 - 45 °C
Water requirement	1. Deionized water, ultra-pure water or distilled water 2. Water Resistivity >1MΩ/cm 3. Water Conductivity <1us/cm

5. Notes

1. Water used should be deionized or distilled water. Water resistivity should be greater than 1MΩ/cm. Any other water will irreparably damage the stack.

2. Be sure to ensure correct polarity when connecting the stack to the power supply. Reversing the polarity could irreparably damage the stack.

3. Complete drying of the membrane can result in lower performance of the stack. When storing the stack, connect silicone tube between the oxygen inlet and outlet, and store in a zip-top bag, to keep water from evaporating.

4. Do not store below freezing temperature.