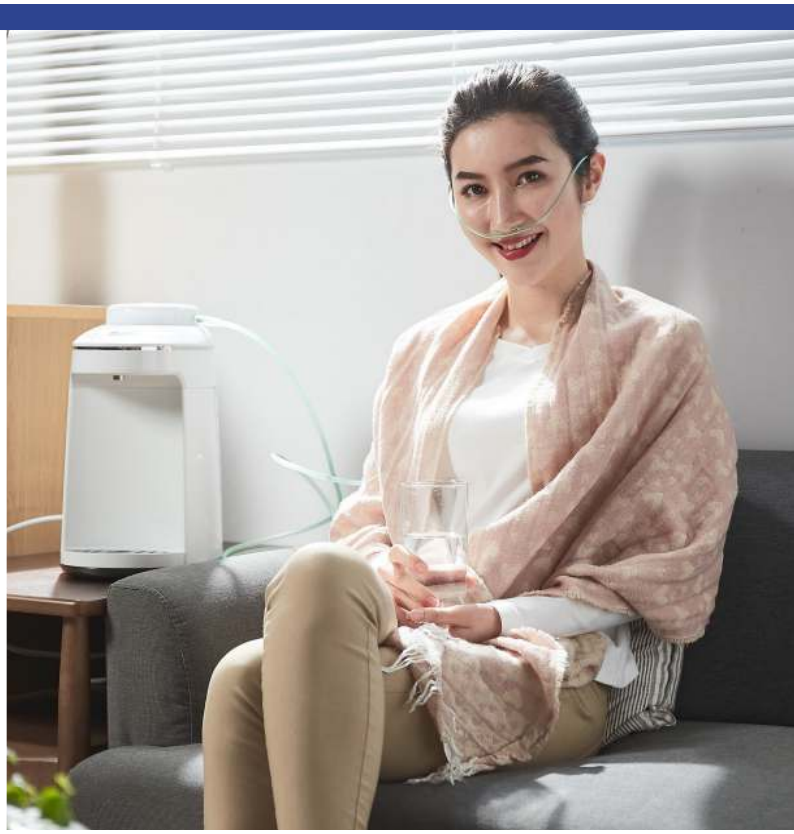


Membrane electrode assembly

Pure Water Electrolysis EHG

Electrolytic Hydrogen Generator

- Invention patented in multi-countries
- > 99.999% Ultra-high purity hydrogen output
- 30,000 hour working life

Power by BES

Fully customized service based on market requirements

NOVEL ELECTROLYTIC HYDROGEN TECHNOLOGY

Membrane electrode assembly (MEA) pure water electrolysis EHG (Electrolytic Hydrogen Generator) is a novel technology which produces pure hydrogen from water directly. It is available for in-production use, consuming low power, producing only oxygen and water as by-products without other impurities. Generating hydrogen electrolytically is a straight-forward and effective method to produce ultra-highly pure hydrogen (greater than 99.999%).

Technical Benefits

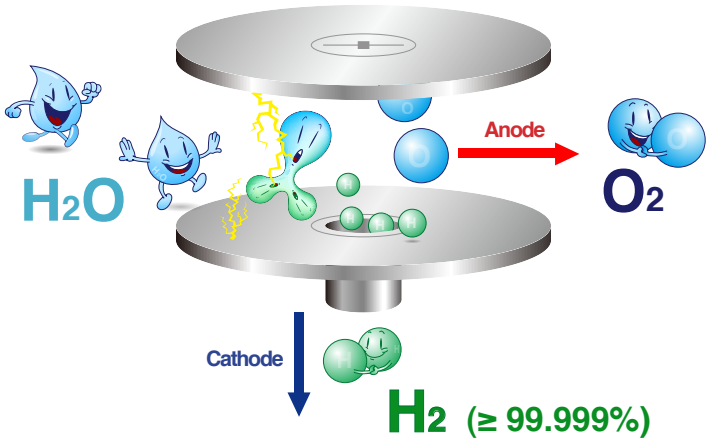
- **Hydrogen purity ≥ 99.999%**
- **Instant production without waiting**
- **Reduce equipment size & maintenance**
- **Without liquid electrolyte addition**
- **Consistent production**
- **Without Hypochlorous Acid (HClO) & Ozone (O_3)**

FULL RANGE SUPPLY

BES Group is the world leading developer and supplier of electrolytic hydrogen generators, offering a broad range of hydrogen production capacity with modular and scalable design for extensions to match various application demands (12 - 500 ml.H_2/min).

HOW IT WORKS

The electrolytic cell splits water into its basic elements including hydrogen (H_2) and oxygen (O_2). Oxygen is discharged at anode, whereas highly purified hydrogen is produced at cathode (purity ≥ 99.999%).



PRODUCT HIGHLIGHTS

- PEM #1 technology
- Instant start-up performance
- Consistent high purity hydrogen output
- Clean, without ionic contamination & smell
- No change to water pH
- Patented structure with long working life

#1: Proton Exchange Membrane (PEM) Electrolysis is the electrolysis of water in a cell equipped with a solid polymer electrolyte (SPE) that is responsible for the conduction of protons, separation of products gases, and electrical insulation of the electrodes. The PEM electrolyzer has been proven to overcome the issues of partial load, low current density, and low pressure operation currently plaguing the conventional liquid alkaline electrolyzer.

[-] Cathode:

$$2H^+ + 2e^- \longrightarrow H_2$$

[+] Anode:

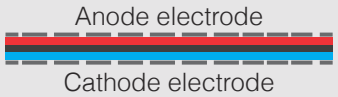
$$H_2O \xrightarrow{Electrolysis} 1/2O_2 \uparrow + 2H^+ + 2e^-$$

STABLE PERFORMANCE AND LONG WORKING LIFE

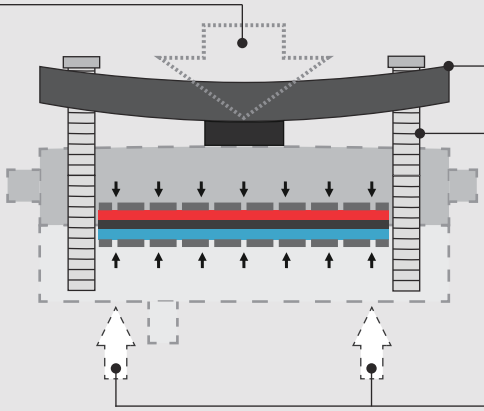
The durability of an EHG cell is greatly associated with the compaction degree of the electrocatalyst within the cell engineering structure.

A patented, innovative and discreet anodic spring compressing fixture structure is used to assure a constant compaction degree of the electrocatalyst laying and its attachment on the PEM, which in turn secures our steady performance and solid long service life.

Attributed to even bolt fixtures, the Spring Compressing Plate supplies a constant compression through the surface vertex contact to enable an inward compression on to the anode electrode surface.



Anode electrocatalyst layer
Proton exchange membrane
Cathode electrocatalyst layer



Spring Compressing Plate

Fixture Bolt

Contributed by the Spring Compressing Plate, reaction forces act on the bolt fixtures simultaneously, creating a constant opposite inward compression on to the cathode electrode surface for a evenly distributed compaction to occur and sustain.

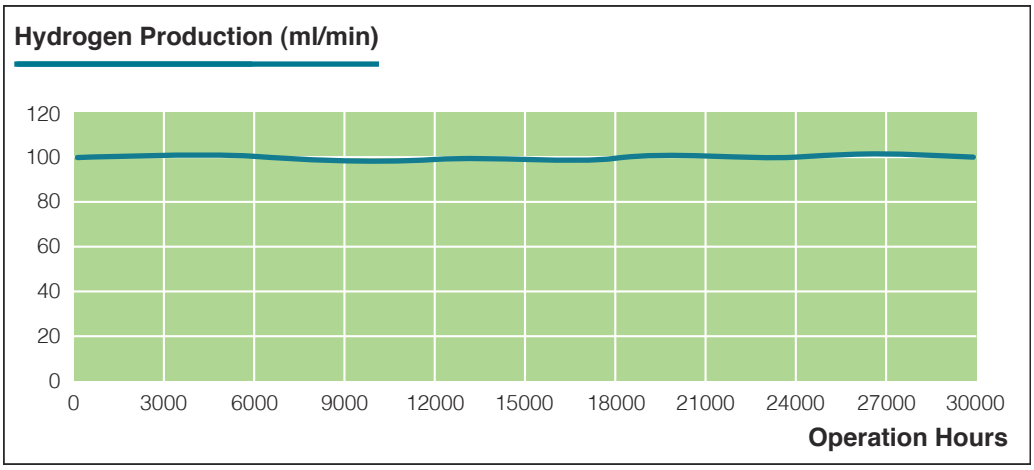


Figure: EH100 service life with performance profile at natural room temperatures

※ Comprehensive data for other cells is available from BES Group upon request.

Measured conditions:

- 1 atm;
- Natural room temperature;
- Natural water temperature;
- Water quality: ≤ 1μs/cm
- Working pressure: 0.08 Mpa

KEY ADVANTAGES

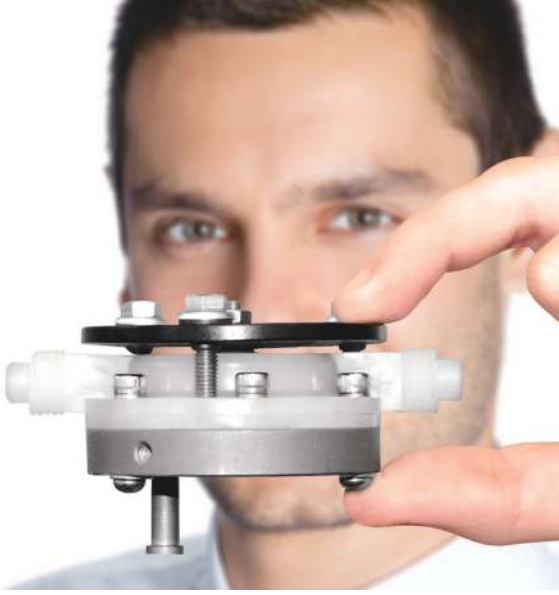
- 30,000 working lifetime supported by patented engineering design and electrolytic coating-placing technology.
- Industry leader in quality and reliability, upgrading your product value to enhance the competitiveness.
- The hydrogen purity in gas and the concentration in water will not change due to continuous use or its operation time.
- Never produces black water that contaminates water during process.
- Simple configuration, suitable for hydrogen gas and hydrogen water product applications.

SPECIFICATIONS

EHG EH series

Hydrogen Production

12 - 500 ml/min

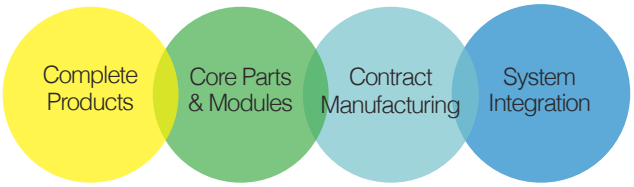


Model [#1]	EH15	EH30	EH60	EH100	EH250	EH500
Production (ml.H_2/min) [#2]	12	30	60	100	250	500
Hydrogen Purity	≥ 99.999%					
Output Pressure	-	0.5 Mpa				
Working Life [#3]	3,000 hr	10,000 hr				
Power Supply	DC 4 - 12V	DC 1.9 - 4V				
Rated Power	18W	16W	32W	54W	134W	268W
Water Quality	≤ 10 μs/cm	≤ 5 μs/cm				
Frame Materials	PA6	Titanium, PVDF				
Dimensions (mm)	W58 x D58 x H22	Ø44 x H23	Ø55 x H33	Ø59 x H33	Ø85 x H39	Ø115 x H55

#1 Process control modules provided for EH series is optional and available upon request.
#2 Hydrogen output may be configurated as necessary. Please contact BES Group for more information.
#3 Working Life means the actual operation life of generator. lifetimes quoted are as determined for the periods during which the production performance of cell remains 70% above. Intermittent use is available for some models. Contact BES Group for more information.

About Us

Since 1988, BES Group has been the global leader of electrolytic technology that converts water to ultra-pure ozone and hydrogen. Products applications include Food Safety, Ice & Beverage, Dentistry, Healthcare, Professional Laundry, Professional Cleaning, Maritime, and Home Sanitation & Wellness. All products and components are tested for high performance, safety, efficacy and reliability with certifications from government agencies and leading 3rd party labs.



BES GROUP

Technologies applied are protected by one or more of the following patents: US 8,308,914 B2, US 9,757,697 B2, US 9,248,208 B2

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