

# QL HYDROGEN GENERATORS

Producing hydrogen by utilizing SPE technology to electrolyze pure water



## Typical Customer



### Shandong Saikesaisi Hydrogen Energy Co.,Ltd.

ADD: No. 51, Gongyenan Road, High-tech Development Zone, Jinan, China  
P.C. 250101

Tel: 86-531-58795166 ( International Sales Dept. )

86-531-58795198 ( Domestic Sales Dept. )

86-531-58795178 ( After-sales Service Dept. )

Fax: 86-531-58795199

Web: <http://www.ql-spe.com>

Email: [qlan@ql-spe.com](mailto:qlan@ql-spe.com)

[success9898@163.com](mailto:success9898@163.com)



## SHANDONG SAIKESAI HYDROGEN ENERGY CO.,LTD

Hotline: 400-0531-681



# Company Introduction

Shandong Saikesaisi Hydrogen energy Co., Ltd. is a member of Shandong Success Group. The company attracts many high-tech multi-disciplinary people to work together. This is an excellent team which has strong innovation capacity. The chief technical expert, who has over 20 years experience on relevant research, is the first one developing SPE technology in China. She has developed four generations of hydrogen generators adopting SPE technology. All have won the patents. This technology fills in the vacancy in Chinese technology field.

The company focuses on utilizing Solid Polymer Electrolyte (SPE) positive ion( proton) exchange membrane to electrolyze pure water, carrying on R&D, producing and selling hydrogen generator.

Our products have obtained many certificates and honors, such as Golden Prize of BCEIA, European CE certificate and Essential National New Products Certificate in the field. Products have been exported to over 20 countries such as USA, Britain, Korea and Japan. The brand, quality and performance of our products are all universally approved by foreign customers.

The SPE high pressure and large flow hydrogen generators have been put on the market, which fills in the vacancy of producing hydrogen with SPE technology. This type of products has gained favorable reputation from foreign customers.

Our staff will always adhere to strive for quality and innovation, regard "Sincerity, Carefulness, Loyalty and Perseverance" as our enterprise spirit and make this green energy product the famous brand at home and abroad.



# Certificates



- ★ National Patent achieved in 1999 ( ZL98222451.0 ) .
- ★ Selected as the recommend products of national scientific instruments in 2000.
- ★ Golden prize of BCEIA (Beijing Conference and Exhibition on Instrumental Analysis)--top prize of national analysis instruments awarded in 2001.
- ★ CE certificate achieved in 2005 ( No.E/EC1384051011537 ) .
- ★ Essential National New Product Certificate achieved in 2007.
- ★ Two National Patents achieved in 2008 ( ZL 200720159516.6,ZL 200720159515.1 ) .
- ★ Three National Patents achieved in 2009 ( ZL 200820026174.5,ZL 200820024098.4, ZL 200820024147.4 ) .
- ★ Two National Patents achieved in 2010 ( ZL 200920021315.9, ZL 200920021652.0 ) .
- ★ Enterprise Standards of Shandong Saikesaisi Hydrogen Energy Co., Ltd. carried out in 2010 with record number 370100N06275-2010.





## QL Type Portable Hydrogen Generator QL-100

### QL Type Double Displays Hydrogen Generator QL-150/300/500

#### QL-100 Features and Advantages

- ◆ Adopt the world's leading SPE/PEM technology to produce hydrogen by electrolyzing pure water;
- ◆ Output pressure and flow rate digital display, observe conveniently ;
- ◆ Easy and safe to operate, Various alarm devices;
- ◆ Small in size, light weight, Portable application ;
- ◆ High electrolysis efficiency, energy saving and environmental protection;
- ◆ Match with all kinds of GC; (Single set)



QL-100

#### QL-150/300/500 Features and Advantages

- ◆ Adopt the world's leading SPE/PEM technology to produce hydrogen by electrolyzing pure water;
- ◆ Output pressure and flow rate digital display, observe conveniently ;
- ◆ Output pressure can be adjusted, hydrogen gas production rate could track usage gas flow;
- ◆ High purity hydrogen gas 99.999%~99.9999%, Stable output flow;
- ◆ Easy and safe to operate, Various alarm devices;
- ◆ High electrolysis efficiency. Gas purity and output flow will stay regular under continual use;
- ◆ Match with all kinds of GC; ( one or several sets )
- ◆ No corrosion and pollution.



QL-300

#### Technical Parameters

Model	QL-100	QL-150	QL-300	QL-500
Output Flow (ml/min)	0 ~ 110	0 ~ 150	0 ~ 310	0 ~ 510
Output Pressure (MPa)	0.4	0.15 ~ 0.4 ( Conventional Type ) / 0.15 ~ 0.7 ( High Pressure Type )		
Hydrogen Purity (%)	> 99.999			
Power Consumption (W)	<50	<90	<150	<200
Power Voltage (V)	AC 220V 110V 50 ~ 60Hz			
Dimension (L*W*H)mm	270×175×255	420×227×352		
Water Requirement	Water resistivity>1MΩ·cm			
Weight (kg)	<5	<20		

## QL Series Hydrogen Generator-Conventional Type

### QL-150/QL-300/QL-500/QL-1000/QL-2000/QL-3000



QL-150/300/500



QL-1000



QL-2000/3000

#### Features and Advantages

- ★ Adopt the world's leading SPE/PEM technology to produce hydrogen by electrolyzing pure water.
- ★ No longer need to use dangerous and expensive hydrogen cylinders.
- ★ High purity hydrogen (99.999%~99.9999%), stable output flow, safe and convenient to operate, various alarm devices (overpressure alarm, water shortage alarm, water accumulated alarm).
- ★ Easy to operate, safe and reliable, generating hydrogen through electrolyzing pure water, switching power on to produce gas (available for several sets of gas chromatography).
- ★ High electrolysis efficiency. Gas purity and output flow will stay regular under continual use.
- ★ High reliability, easy to maintain.
- ★ High reliability, easy to maintain.
- ★ No corrosion and pollution.

#### Product Introduction/Application

- The series of products, producing highly pure pure water ( no adding alkali ) , are light, highly effective, energy-saving, and of environmental protection. They are advanced patented products.
- ★ Fuel gas and carrier gas for GC (Gas Chromatography).
  - ★ Reaction gas for ELCD (Electrolytic Conductivity Detector).
  - ★ Reaction gas for AED (Atomic emission detectors).

#### Technical Parameters

Model	QL-150	QL-300	QL-500	QL-1000	QL-2000	QL-3000
Output Flow (ml/min)	0 ~ 150	0 ~ 310	0 ~ 510	0 ~ 1020	0 ~ 2020	0 ~ 3050
Output Pressure (MPa)	0.02 ~ 0.4MPa/0.02 ~ 0.7MPa (under stable pressure)					
Hydrogen Purity (%)	> 99.999 / > 99.9999					
Power Consumption(W)	<90	<150	<200	<500	<1000	<1500
Power Voltage (V)	AC 220V/110V 50 ~ 60Hz					
Dimension(L × W × H)mm	420×227×352			455×365×352		500×450×800
Water Requirement	Water resistivity > 1MΩ·cm					
Weight (kg)	< 15		< 20		< 50	



## QL Series Hydrogen Generator-Large type

QL-5000/10000/17000/22000/34000

### Features and Advantages

- ◆ No longer need to use dangerous and expensive hydrogen cylinders.
- ◆ Generate 99.9999% ultra pure hydrogen continuously or on demand.
- ◆ High reliability, space saving.
- ◆ High purity hydrogen, stable output flow, safe and convenient to operate, various alarm devices (sensor alarm, overpressure alarm, hydrogen permeation alarm, hydrogen leak alarm, water accumulated alarm, water shortage alarm, oxygen permeation alarm, water over-temperature alarm, etc.).

### Application

- ★ Power station cooling systems.
- ★ Hydrogenation, restoring protection, metal smelting and heat treatment.
- ★ Under any circumstance that needing large and ultra pure hydrogen gas.
- ★ Hydrogen Stations.



QL-5000/10000



QL-17000/22000/34000

### Technical Parameters

Model	QL-5000	QL-10000	QL-17000	QL-22000	QL-34000
Output Flow (L/min)	0-5	0-10	0-17	0-22	0-34
Water Tank Volume (L)	15	30	60		
Output Pressure (MPa)	0.05-0.4(Conventional Type) Or 1-5(High Pressure Type)				
Hydrogen Purity (%)	>99.999				
Power Voltage (V)	AC 220V\380V	50-60HZ	AC 380V	50-60HZ	
Power Consumption (kw)	<2	<4	<7.2	<8.8	<14
Dimension of Main Machine(L×W×H) (mm)	1035×550×1100	1035×550×1500	1650×650×1900		

## SHC Series Hydrogen Generator SHC-300/SHC-500/SHC-1000

### QLB Series Air Generator QLB

### SHC Series Hydrogen Generator: SHC-300/SHC-500/SHC-1000

#### Features and Advantages

- ◆ Easy to operate, safe and reliable, adding lye only for one time, only replenishing distilled water, switching power on to produce gas(available for several sets of gas chromatography).
- ◆ Device for preventing backflow of lye.
- ◆ Cylinder-shaped electrolysis cell, high-grade stainless steel 316L used as material for electrolysis cell.
- ◆ High electrolysis efficiency. Gas purity and output flow will stay regular under continual use.



SHC-300/SHC-500

### QLB Air Generator

#### Features and Advantages

- ◆ Improve analysis accuracy, lower cleaning requirement on detector.
- ◆ Match with GC and analytical column.
- ◆ Work without noise.



QLB

### Technical Parameters

Model	SHC-300	SHC-500	SHC-1000	Model	QLB
Output Flow (ml/min)	0-300	0-500	0-1000	Output Flow (L/min)	0-3 0-5
Output Pressure (MPa)	0-0.4			Output Pressure (MPa)	0-0.4
Overpressure Protection (MPa)	0.45			Power Voltage (V)	AC 220 50-60Hz
Hydrogen Purity (%)	>99.999			Power Consumption (W)	<160 <180
Power Voltage (V)	AC 220 110 50-60Hz			Purity	Two-level Purification
Power Consumption (W)	<150	<300	<500	Dimension (L×W×H) (mm)	430×290×400
Dimension (L×W×H) (mm)	420×227×352	455×365×352		Weight (kg)	<24
Weight (Kg)	<15	<17	<30		



## QL Series Pure Air Generator

QL-3/QL-5/QL-10/QL-15/QL-40/QL-50

### Product Introduction

It's powered by whole sealing silent air compressor. After purification, water, oil, dust and impurities are removed. Through pressure stable system, pure and silent air is finally produced under stable pressure.

### Features and Advantages

- ◆ Improve analysis accuracy, lower cleaning requirement on detector.
- ◆ Match with GC and analytical column.
- ◆ Gas Purity: the amount of hydrocarbon is less than 0.5ppm (such as methane).
- ◆ Low noise, without blockage.
- ◆ Regular output flow and pressure.
- ◆ QL-10/15 adopts oil-free compressor. It's durable in use and produces high-purity air.
- ◆ QL-15 model uses PSA purification technology, no needing to replace desiccants, and lower dew point.

### Application

- ▲ Gas for flame ionization detector ( FID), flame photometry detector ( FPD), nitrogen phosphorous detector (NPD).
- ▲ Gas for hydrocarbon analyzer.
- ▲ Atomizing gas and vent gas for Liquid chromatography and Mass Spectrometer.
- ▲ Atomic adsorption and ELSD (Evaporative Light Scattering Detector).



QL-3/5

QL-10

QL-15

(Without maintenance)

QL-40/50

(for atomic adsorption)

### Technical Parameters

Model	QL-3	QL-5	QL-10	QL-15	QL-40	QL-50
Output Flow (L/min)	0-3	0-5	0-10	0-15	0-40	50-300
Output Pressure (MPa)	0-0.4			0-0.4		0-0.7
Power Consumption (W)	<160	<180	<500	<780	<380	<1000
Power Voltage (V)	220V±10%					
Dimension (L×W×H) (mm)	430×290×400	460×290×550	560×290×550	400×310×640		
Weight (Kg)	<26	<30	<55	<36	<50	

## QL Zero Air Purifier

QL-Z1500

### Product Introduction

QL zero air purifier uses advanced catalyst to remove hydro carbons. It's highly effective and quick speed. Usage temperature is at 400°C, and safe for operation.



### Working Principle

The compressed air is channeled into a heated catalyst bed where the hydrocarbons are converted to carbon dioxide and water vapor, producing zero-grade air with less than 0.1ppm hydrocarbon content (measured as methane). Then eliminate the carbon dioxide and water vapor to get zero-grade air.

### Application

GC-FID, GC-NPD, GC-FPD, GC-TCD, THC, TOC, COT, DSC, TGA, ELSD, which needs zero grade air equipment.

### Technical Parameters

Model	QL-Z1500
Input Hydrocarbon Concentration	<100ppm
Output Hydrocarbon Concentration	<0.1ppm
Input Gas Pressure	0-0.6MPa
Input Gas Flow	0-1500ml/min
Input Power	300W
Dimension	420×265×365 mm
Equipment Stable Time	< 1h
Using Temperature	0-40°C
Surrounding Humidity	< 85%
Power Voltage	220V/50-60Hz



## QL Series Nitrogen Generator, Nitrogen & Air Generator QL-N300/QL-N500/QL-NA300

### Product Introduction

QL Nitrogen generators adopt Pressure Swing Adsorption (PSA) technology to generate ultra pure nitrogen gas. Compressed air is dried and filtered through condenser tubes and filters. Lots of  $O_2$ ,  $CO_2$ , moisture, hydrocarbons will be removed after gas passes through CMS cylinder in purification model. Then clean, dry and ultra pure nitrogen will be generated.

### Features and Advantages

- ◆ Nitrogen generators supply ideal ultra pure nitrogen for GC (Gas Chromatography), LC/MS(Liquid Chromatograph/Mass Spectroscopy) and Thermal Analyzer.
- ◆ Continuously generate ultra pure nitrogen through Pressure Swing Adsorption (PSA) technology.
- ◆ No longer need to use inconvenient and dangerous high pressure nitrogen cylinders in laboratory.
- ◆ Compact structure. Take up very little laboratory space.

### Application

- ★ Carrier gas for various brands of GC and detectors.
- ★ Supplementary gas.
- ★ Gas for Gel Permeation Chromatograph.



### Technical Parameters

Type	Nitrogen Generator		Nitrogen & Air Generator	
Model	QL-N300	QL-N500	QL-NA300	
Output Flow (ml/min)	0-300	0-500	N <sub>2</sub> : 0-300	Air: 0-1000
Output Pressure (MPa)	0-0.4			
Purity (%)	99.999		99.99	Two-level Purification Moisture: 0.0204ppm CO <sub>2</sub> :0.039% Oil: 0.54ppm
Power Voltage (V)	AC 220 50-60Hz			
Surrounding Requirement	0-40°C, no dust, no corrosive gas			
Input Power (W)	<480	<500	<200	
Weight (Kg)	35		50	
Dimension (L×W×H) mm	520×286×700			

## QL Series Nitrogen & Hydrogen & Air Generator

### Product Introduction

QL N<sub>2</sub> & H<sub>2</sub> & Air generators achieve the perfect combination of nitrogen, hydrogen and Air. Compact structure and easy operation make it the ideal gas generator. This product can be applied to various gas chromatography and analysis instruments at home and abroad.



### Working Principle

- ① It can replace traditional high pressure cylinders. N<sub>2</sub>, H<sub>2</sub> and air are generated separately or together, intermittently or continuously. The purity of gas will not reduce for long time use.
- ② Easy to operate, switching power on to produce gas, regular output flow, completely automatic tracking equipment.
- ③ Generate nitrogen through world's leading Pressure Swing Adsorption (PSA) technology, which replaces the traditional electrolyte separation technology. It is safe and convenient to operate, has no corrosion toward instrument and supplies gas for 24 hours.
- ④ Generate hydrogen through world leading SPE (PEM) technology. No longer need to add lye. Without alkali reversion.
- ⑤ It's powered by whole sealing silent air compressor. After purification, water, oil, dust and impurities are removed. Through pressure stable system, pure and silent air is finally produced under stable pressure.

### Technical Parameters

Model	QL-NHA300		
Gas Type	N <sub>2</sub>	H <sub>2</sub>	Air
Output Flow (ml/min)	0-300	0-300	0-1000
Output Pressure (MPa)	0-0.4		
Purity (%)	99.99	99.999	
Input Power (W)	<350		
Power Voltage (V)	AC 220 50-60Hz		
Weight (Kg)	55		
Dimension(L×W×H)mm	460×440×460		



## Customized Product

### High Purity Hydrogen Generators

QL-150A QL-300A QL-500A

Generate ultra pure hydrogen generator through physical adsorption and chemical processing. The purity is more than 99.9999%.

### High Pressure and High Purity Hydrogen Generators

QL-150B QL-300B QL-500B

According to market research, in the analysis of gas chromatography, when hydrogen output pressure is over 0.4Mpa, it will provide more stable analysis data and greater reproducibility of results. Besides, it will demonstrate its advantages when applied to hydrogen absorbing device (such as metal hydride). We develop this kind of hydrogen generators to meet different demands of customers, and pressure could reach 0.7MPa.



前面板



后面板

### Hydrogen & Oxygen Generators

We launch this kind of equipment to meet demands of customers. The models are QL-150HO-QL-3400HO. It can collect both hydrogen and oxygen.

### HHO Generator

Adopt electrochemistry principle to turn alternating current into direct current and generate hydrogen and oxygen through electrolyzing pure water in electrolysis cell. Hydrogen is taken as fuel while oxygen is taken as combustion-supporting gas. Hydrogen oxygen fuel is a clean fuel with high temperature and high energy. It replaces traditional hydrocarbon fuel and is applied to every circumstance needing flame. This generator can both save energy saving and reduce emission. It's safer and more efficiency.

### Features and Advantages

1. Protect environment. Replace propane and acetylene. No pollution and No-toxic.
2. Safe. With various safety control devices: temperature controller, automatic power-off protection, automatic gas discharge device etc.
3. Save energy.
4. Easy to obtain raw materials. Material for this equipment is the inexhaustible water.
5. High practicability. Temperature will reach to 800°C-3000°C after igniting mixed hydrogen and oxygen.
6. Large gas output flow.

### Application

Steel welding and cutting, ship building and repair, boiler, glass polishing, etc.



## Hydrogen & oxygen Generator for Vehicle

### Product Instruction

Hydrogen & Oxygen Generator for Automobile is an energy generator supplying hydrogen and oxygen for cylinders of automobile engines. The instrument adopts SPE technology to electrolyze pure water, no corrosion to engine. Hydrogen and oxygen are provided for automobile engines as auxiliary energy. Oxygen can help fuels in the engine burns more fully, and improve the combustion efficiency. Hydrogen can reduce fuel consumption of vehicles, as the combustion value of hydrogen is three times than that of gasoline, and the efficiency on saving fuel is remarkable.

### Features and Advantages

- ◆ After testing, the efficiency on saving fuel is not less than 10%;
- ◆ It doesn't need to change any main structure of the automobile for equipment installation, and could be used directly.
- ◆ Various intelligent control systems are installed in the equipment, and it's safe and convenient for operation.



### Technical Parameters

Item	HOS-2000	Remark
Gas Flow for H <sub>2</sub> & O <sub>2</sub> (ml/min)	2000	
H <sub>2</sub> Production (ml/min)	1300	
Water Consumption (ml/h)	<250	
Power (W)	< 600	
Current	0~15A	Change with engine speed.
Referenced Dimension (mm)	430*200*340	
Referenced Weight	30	
Location of the Control Unit	Inside the equipment	
Displays on the Control Unit	Power Voltage, Gas Production, Current	
Safety Alarm	Over Current Alarm, Low Voltage Alarm, Water Lack Alarm, Pressure Alarm; Switch control while running, interlock with ignition.	
Switch Buttons on Control Panel	All Alarm indicators, Switch, Stop	
Material	Stainless Steel	



## Engine Cleaning Machine for Removing Carbon Deposition

### Product Introduction

Adopt the world's leading SPE/PEM technology to produce hydrogen by electrolyzing pure water. It's light, highly effective, energy-saving, and green to environment.

### Features and Advantages

- ★ High purity hydrogen (99.999%~99.9999%), stable output flow, safe and convenient to operate, various alarm devices (overpressure alarm, water shortage alarm, water accumulated alarm).
- ★ Easy to operate, safe and reliable, generating hydrogen through electrolyzing pure water, switching power on to produce gas (available for several sets of gas chromatography).
- ★ High electrolysis efficiency. Gas purity and output flow will stay regular under continual use.
- ★ High reliability, easy to maintain.
- ★ No corrosion, no pollution.



### Principle for QL Engine Cleaning Machine

It produces hydrogen gas and oxygen gas by electrolyzing pure water, no corrosion, no pollution. Hydrogen gas could promote burning well. When burning, it could burn completely the oil dirt on the engine inwall, and generate moisture after burning. It could burn the oil dirt while melting it. Finally all are discharged and flown out from the engine.

### Effects

- ★ Remove carbon deposition.
- ★ Increase horsepower
- ★ Reduce emission.
- ★ Lengthen engine life.

### Oxy-hydrogen Engine Cleaning Machine HO-1000C

Engine Cleaning Machine is a new carbon cleaning machine for automobile. This machine is developed for cleaning carbon based on our HHO generator. It produces hydrogen gas and oxygen gas by electrolyzing water. Gas mixture of hydrogen and oxygen could promote burning well, and it's also called Brown Gas. HHO Flame has some characteristics, like adhering to the inwall, catalysis, and high temperature. When it burning, it could burn completely the oil dirt on the engine inwall, and generate moisture after burning. It could burn the oil dirt while melting it. Finally all are discharged and flown out from the engine.

### Features and Advantages

- ★ Hydrogen and oxygen are burnt completely, and it's remarkable on cleaning carbon.
- ★ Reduce the air pollution and emission.
- ★ No chemicals. Don't damage the engine parts.
- ★ Cheap on material cost.
- ★ Easy operation.



### Technical Parameters

Model	HO-1000C Carbon Cleaning Machine
Input Voltage	220V 50/60Hz
Power Consumption	2.2 kw
Gas Production	1000L/h
Range of Application	Suitable for engine capacity lower than 3.0. (If larger than 3.0 engine capacity, please choose HO-3000C model)










## Accessory Product

### Gas Purification

QL gas purification has three-level purifications. It can be used in series or in parallel. Fill in many kinds of absorbing materials according to demands of customers. Meet the requirements of all kinds of ultra pure gases.



### Connector

	No.: 001	Name: Deoxidation tube	Specification: Deoxidation amount 5L
	No.: 002	Name: Ferrule Fitting Connection (Stainless Steel)	specification: G1/4-φ8
	No.: 003	Name: Quick Coupling (Stainless Steel)	specification: G1/4-8*6 G1/8-8*6
	No.: 004	Name: Copper Tee Joint	specification: M8*1-φ3.2
	No.: 005	Name: Quick Coupling Tee Joint (Plastic Steel)	specification: φ8*6
	No.: 006	Name: Ferrule Tee Joint (Stainless Steel)	specification: Connect with
	No.: 007	Name: Needle Valve	specification: M8*1-φ3.2 0-2000ml/min
	No.: 008	Name: Switch Valve	specification: M8*1-φ3.2
	No.: 009	Name: Ferrule Check Valve (Stainless Steel)	specification: φ4, φ6, φ8