

# *Gas Generators*

Producing hydrogen by utilizing SPE  
technology to electrolyze pure water



## QL HYDROGEN GENERATORS



SHANDONG

HYDROGEN ENERGY CO.,LTD





# Gas Generators

## QL Series Hydrogen Generator-Conventional Type

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



QL-300

### 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.
- ★ Match with all kinds of GC.
- ★ No corrosion and pollution.

### Product Introduction

The series of products, producing highly pure hydrogen by utilizing SPE technology to electrolyze pure water (no adding alkali), are light, highly effective, energy-saving, and of environmental protection. They are advanced patented products.



QL-3000



QL-1000

### Application

- ★ 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 220 110 50~60Hz					
Dimension (L*W*H) mm	420×227×352			458×230×380	500×450×800	
Water Requirement	Water resistivity ≥1MΩ/cm					
Weight (kg)	<15			<20	<25	



## QL Series Hydrogen generator–Large type

QL-5000/QL-10000/QL-17000/QL-22000/QL-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 overfall alarm, water shortage alarm, oxygen permeation alarm, water over-temperature alarm ).
- ◆This product can be customized to be powered by solar/wind Generator.

### 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.



### 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 220/380 50~60Hz		AC 380 50~60Hz		
Power Consumption(kw)	<2	<4	<7.2	<8.8	<14
Dimension (L×W×H) (mm)	1035×550×1100	1035×550×1500	1650×650×1900		





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

## SHC Series Air Generator: SHC-3/SHC-5

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

#### 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.
- ◆ Drum-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

#### Technical Parameters

Model	SHC-300	SHC-500
Output Flow (ml/min)	0-300	0-500
Output Pressure (MPa)	0-0.4	
Overpressure Protection (MPa)	0.45	
Hydrogen Purity (%)	>99.999	
Power Voltage (V)	AC 220 110 50-60Hz	
Power Consumption (W)	<150	<300
Dimension (L×W×H) (mm)	420×227×352	
Weight (Kg)	<15	<17

### SHC Series Air Generator SHC-3/SHC-5

#### Features and Advantages

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



SHC-3

#### Technical Parameters

Model	SHC-3型	SHC-5型
Output Flow (L/min)	0-3	0-5
Output Pressure (MPa)	0-0.4	
Power Voltage (V)	AC 220 110 50-60Hz	
Power Consumption (W)	<150	<300
Purity	Two-level Purification	
Dimension (L×W×H) (mm)	420×227×352	
Weight (Kg)	<20	<23



## QL Series Pure Air Generator: QL-3/QL-5/QL-10/QL-20/QL-40/QL-50



QL-3

### 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 adopts oilless compressor. It's durable in use and produces high-purity air.

### 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-10



QL-20



QL-50

### Technical Parameters

Model	QL-3	QL-5	QL-10	QL-20	QL-40	QL-50
Output Flow (L/min)	0-3	0-5	0-10	0-20	0-40	50-300
Output Pressure (MPa)	0-0.4					0-0.7
Power Consumption(W)	<160	<180	<200	<350	<380	<1000
Power Voltage (V)	AC 220 50-60Hz					
Dimension (L×W×H) (mm)	430×290×400		500×270×420		400×310×640	
Weight (Kg)	<26		<30		<50	





# Gas Generators

## 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<sub>2</sub>, CO<sub>2</sub>, moisture, hydrocarbon 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 (L/min)	0-300	0-500	N <sub>2</sub> : 0-300	Air: 0-1000
Output Pressure (MPa)	0-0.4			
Purity (%)	99.99			Three-level Purification CO <sub>2</sub> :0.039% Oil: 0.54ppm
Power Voltage(V)	AC 220 50-60Hz			
Surrounding Requirement	0-40℃, no dust and corrosive gas			
Power Consumption (W)	<180		<200	
Weight (Kg)	35		50	
Dimension (L×W×H) mm	460×290×760 (L×W×H)			



QL-N300



## QL Series Nitrogen & Hydrogen & Air Generator: QL-NHA300

### Characteristics ▼

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 chromatographies and analysis instruments at home and abroad.

### Features ▼

- ①It 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 decay for long time use.
- ②Easy to operate, switching power on to produce gas, regular output flow, completely automatic tracking equipment.
- ③Generate 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.
- ④Generate hydrogen through world leading SPE (PEM) technology. No longer need to add lye. Without alkali reversion.
- ⑤It'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.



QL-NHA300

### 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	Three-level Purification CO <sub>2</sub> :0.039% Oil: 0.54ppm
Power Consumption (W)	<350		
Power Voltage(V)	AC 220 50-60Hz		
Weight (Kg)	55		
Dimension (L×W×H) mm	460×440×460 (L×W×H)		





# Gas Generators

## Customized Product

### 1.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%

### 2.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 launch this kind of hydrogen generators to meet different demands of customers.

### 3.Hydrogen & Oxygen Generators

We launch this kind of equipment to meet demands of customers. The models are QL-150HO~QL-34000HO. It can collect both hydrogen and oxygen.

### 4.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 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.

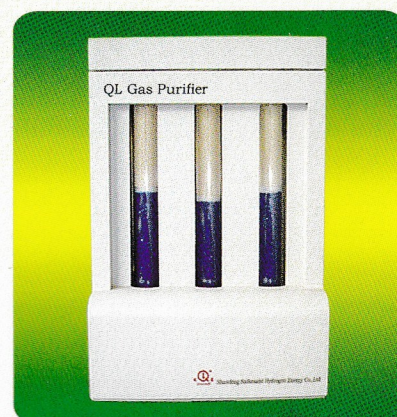












## Accessory Product

### 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: Ferrule Fitting Connection (Stainless Steel)	specification: G1/4-Φ8
	No.: 002	Name: Quick Coupling (Stainless Steel)	specification: G1/4-8*6 G1/8-8*6
	No.: 003	Name: Copper Tee Joint	specification: M8*1-Φ3.2
	No.: 004	Name: Quick Coupling Tee Joint (Plastic Steel)	specification: Φ8*6
	No.: 005	Name: Ferrule Tee Joint (Stainless Steel)	specification: Connect with 3mm stainless steel pipe
	No.: 006	Name: Needle Valve	specification: M8*1-Φ3.2 0~2000ml/min
	No.: 007	Name: Switch Valve	specification: M8*1-Φ3.2
	No.: 008	Name: Ferrule Check Valve (Stainless Steel)	specification: Φ4, Φ6, Φ8



Product Catalogs

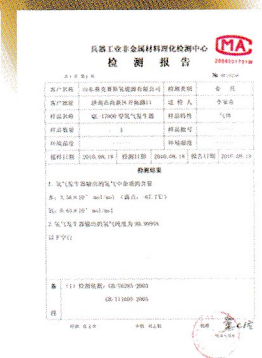
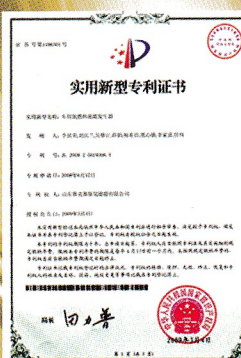
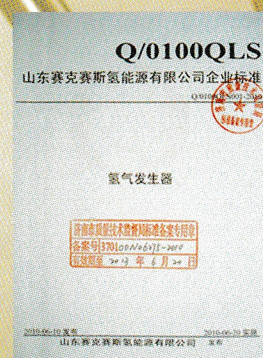
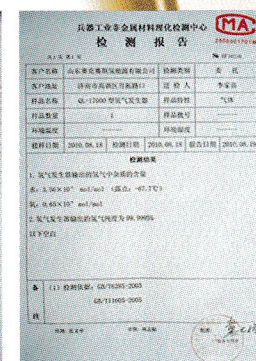


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# Gas Generators Certificates



- ★ 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 200920021752.0)
- ★ Enterprise Standards of Shandong Saikesaisi Hydrogen Energy Co.,Ltd carried out in 2010, with record number 370100N06275—2010.