

# PSA Medical Oxygen Generating System

ZOY Medical Technology Co., Ltd.

Changsha, Hunan, China



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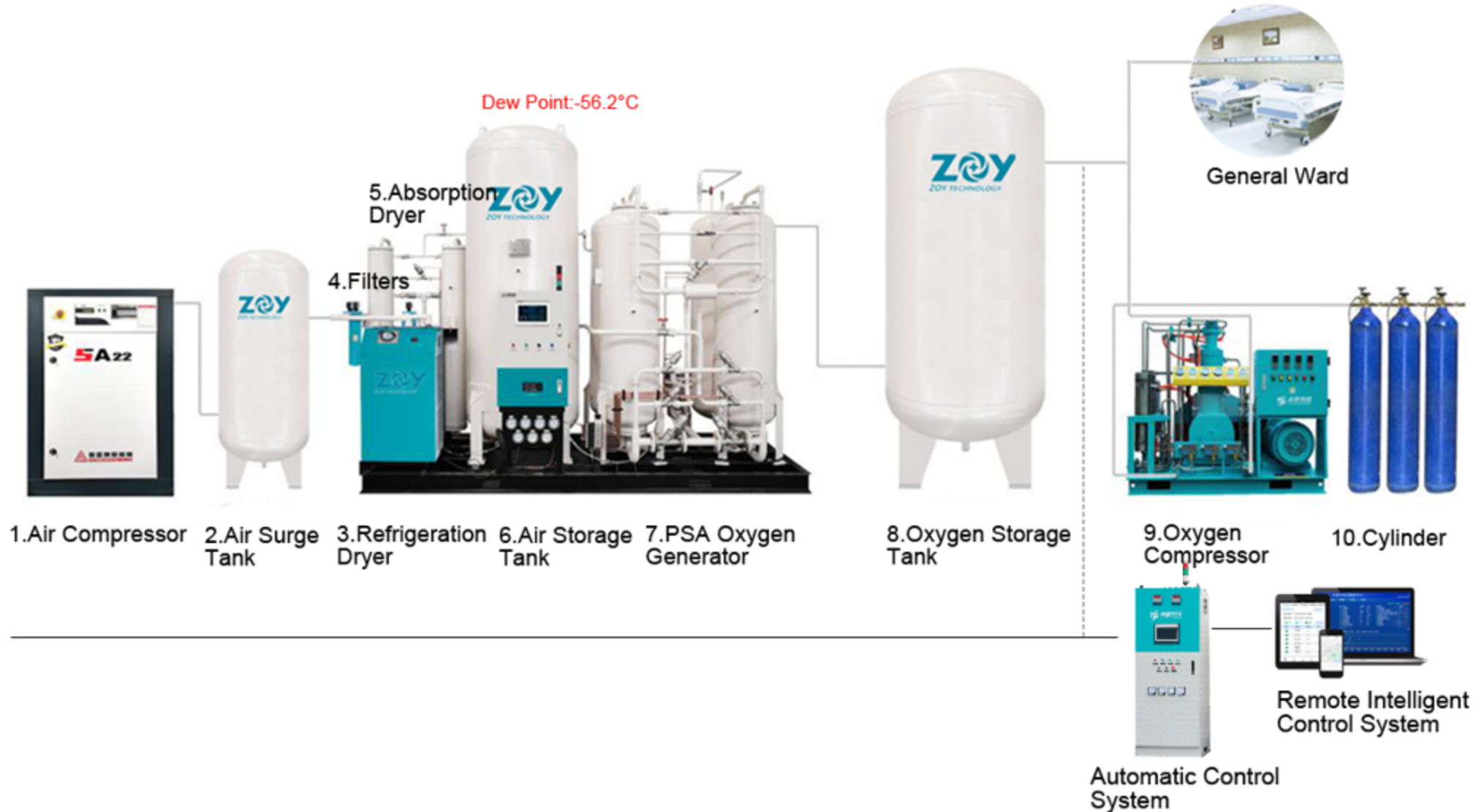
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# Part 1

## Product Introduction



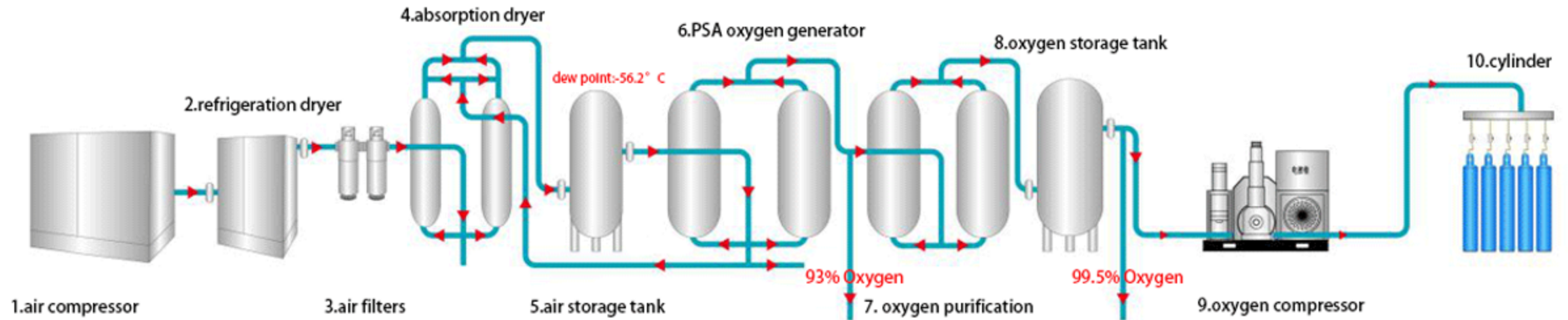
# PSA Oxygen Generating System







# PSA Oxygen Generating System—Working Principle



general ward



ICU



## Model and Parameter Table

### Model and Parameter Table

Model	Flow Nm <sup>3</sup> /h	O <sub>2</sub> purity	Installed power kw	Size mm ( L * W* H )
ZY/MO-01	1.0	93±3%	2.5	1470×850×1800
ZY/MO-02	2.0	93±3%	4.0	1470×850×1800
ZY/MO-05	5.0	93±3%	6.0	2800×1000×1900
ZY/MO-6.5	6.5	93±3%	8.5	3000×1000×2100
ZY/MO-10	10.0	93±3%	12.0	3200×1400×2300
ZY/MO-15	15.0	93±3%	16.5	3300×1450×2400
ZY/MO-20	20.0	93±3%	23.5	3300×1500×2600
ZY/MO-30	30.0	93±3%	31.5	4500×1800×2700
ZY/MO-35	35.0	93±3%	39.0	5000×2000×2700
ZY/MO-40	40.0	93±3%	39.0	5500×2000×2800
ZY/MO-50	50.0	93±3%	47.0	6000×2100×2800

Integrated PSA Oxygen  
Generating System

PSA Oxygen  
Generating System

- 1.The size of Type ZY/MO-01 and ZY/MO-02 include air compressor, the size of other models does not include air compressor.  
2.220V/50HZ and 380V/50HZ are optional for ZY/MO-01, other models use 380V/50HZ by default.

# Part 2

## Product Components



## Product Components





# Product Components

NO.	Component		Model	Size（mm）	Weight(kg)
Part A	Air Compressor		SA-45A	1280*1180*1680	1080
Part B	Storage Tank	Air Surge Tank	0.6m3/0.8MPa	Φ700*1900	162
		Oxygen Storage Tank	4.0m3/0.8MPa	Φ1400*3030	645
Part C	Combined Air Dryer	Filter Units	TWS,AO TWS,AA,AAR,ACS,FCJ Series	2000*1620*2870	1500
		Refrigeration Dryer	KDH-75F		
		Zero Gas Consumption Adsorption Dryer	XG-40		
Part D	Controlling System	PLC Controlling System	ZOY RIC Series	550*260*900	30
		Remote Monitoring System	ZOY RIC Series	/	/
Part E	PSA Oxygen Generator		MO-40	1810*1800*2800	2800





## Product Component—Part A: Air Compressor

Our air compressor has an advanced and scientific design. The control system has real-time data monitoring, and communicating with the oxygen generator at the same time.

Energy-efficient engine adopts the axial air intake design to make the performance more excellent. The high-efficiency oil filter can filter out impurities and degraded substances more effectively in the lubricating oil, ensuring the service life of the main engine to the maximum extent. Large-scale oil coolers and air coolers have a unique structure and reasonable layout. It conforms to principle of airflow and forms a powerful cooling wind field.



Name	Air Compressor
Model	SA-45A
Quantity	1 Set
Gas displacement	7.6m <sup>3</sup> /min
Discharge pressure	0.8MPa
Drive Method	Belt drive
Power	45KW
Nominal voltage	380V
Lubricating oil	35L
Oil Content	3ppm
Full-Load current	78±3dB(A)
Environment Temperature (Minimum/Maximum)	3/45°C
Outlet dimensions of compressed air	2 inches
Size	1280*1180*1680mm
Weight	1080kg



## Product Component—Part B: Air Surge Tank & Oxygen Storage Tank

Air surge tanks and oxygen storage tanks are professional unit of manufacturing D1, D2 (Class I, II) pressure vessels, and their designs are approved by State General Administration of Quality Supervision and ,Inspection Quarantine. And these products obtain the honor of Shanghai well-known brands for four consecutive times, there are more than 300 thousand storage tanks operating stably in various industries around the word.



Model	Air Surge Tank	Oxygen Storage Tank
Volume	0.6m <sup>3</sup>	4.0m <sup>3</sup>
Pressure	0.8MPa	0.8MPa
Quantity	1 piece	1 piece
Height	1900mm	3030mm
Inner Diameter	Φ700mm	Φ1400mm
Inlet and outlet diameter	Rp1-1/2	DN100Flange
Inlet Height	680mm	910mm
Outlet Height	1550mm	2470mm
Relief valve connector	Rp1/2	Rp1-1/2
Pressure gauge connection	Rp1/2	Rp1/2
Blow down interface	R1/2	R3/4
Weight	162kg	645kg



## Product Component—Part C: Combined Air Dryer

Combined Air Dryer includes Filters, Refrigeration Dryer, Adsorption Dryer, Air Surge Tank, Nitrogen recovery tank, and Electronic control system.



Name		Combined Air Dryer
Quantity		1set
Handling capacity		8.5m <sup>3</sup> /min
Normal Pressure Dew Point		-61.5℃
Size		2000*1620*2870mm
Weight		1500kg



## Part C: Combined Air Dryer — Filter Units

There is a guarantee that under normal working conditions, filter's case can be used for 15 years, and filter element can be used for 6000-8000 hours. Pressure-bearing capacity (0~1.6MPa) of filter case, heat resistance and cold resistance of accessories, corrosion resistance have passed the relevant national institutions and departments. It obtained the production license for pipeline components.





## Part C: Combined Air Dryer — Filter Units

**TWS series gas-water separator.** It can remove 99% liquid water in the compressed air, to improve air quality, and reduce the load of subsequent processing work effectively.

**AO series precision filter.** It has high effectiveness in general protection. It removes the dust particles whose size is larger than  $0.01\mu\text{m}$ , water and oil mist, and the residual content of oil mist does not exceed  $0.6\text{mg}/\text{m}^3$  ( $21^\circ\text{C}$ ), 1ppm (w).

**AA series advanced filter.** It is highly effective on oil removal filtration, it removes dust particles whose size is larger than  $0.01\mu\text{m}$ , water and oil mist, and the residual content of oil mist does not exceed  $0.01\text{mg}/\text{m}^3$  ( $21^\circ\text{C}$ ), 0.01ppm (w).

**AAR series super filter.** It completely removes dust particles whose sizes are larger than  $0.01\mu\text{m}$ .

**ACS series activated carbon filter.** It can remove dust particles whose size is larger than  $0.01\mu\text{m}$ , oil vapor and odor, and the residual content of oil vapor does not exceed  $0.003\text{mg}/\text{m}^3$  ( $21^\circ\text{C}$ ), 0.003ppm (w).

**FCJ series Sterilization filter.** Its design conforms to German product standard. The material of filter's case adopts 304 or 316 stainless steel, and inner and outer diameter surface are high-precision mechanical polishing with double O-ring sealing, and the filter element adopts heat resistant PTFE membrane with built-in stainless-steel frame. The filtration accuracy is  $0.01\mu\text{m}$ . It completely removes bacteria and viruses from the gas in the pipe.

Name	Filter Units		
Model	Series	Quantity	Brand
Gas-Water Separator	TWS Series	1 piece	ZOY
Precision filter	AO TWS Series	1piece	
Senior Grade Filter	AA Series	1 piece	
Super Grade	AAR Series	1 piece	
Carbon Filter	ACS Series	1 piece	
Sterile Filter	FCJ Series	1 piece	



## Part C: Combined Air Dryer — Refrigeration Dryer

Our refrigeration dryer is with compact structure and small size which can save installation space. There are a lot of advantages, such as good heat exchange efficiency, low pressure loss, high utilization rate of compressed air, energy saving and environmental protection. The refrigeration dryer adopts heat exchanger with aluminum alloy steel plate which combines the pre-cooling regenerator, evaporator, gas water separator into one integrated design, and it saves more than 20% energy than the traditional tube-fin heat exchanger under the same flow resistance and pump power consumption, so it can reach the dew point pressure of 2-10°C with less energy consumption.



Name	Refrigeration Dryer
Model	KDH-75F
Quantity	1 Set
Inlet Temperature	$\leq 80^{\circ}\text{C}$
Capacity	8.5m <sup>3</sup> /min
Pressure Dew Point	2-10°C
Voltage	220V
Power	1.8kW
Interface Size	1-1/2"
Size	870*580*1180mm
Weight	110kg



## Part C: Combined Air Dryer — Zero Gas Consumption Adsorption Dryer

The adsorption dryer adopts the principle of pressure swing adsorption (PSA), which uses the difference in the amount of moisture adsorbed by the adsorbent under different pressures. The adsorbents adsorb under working pressure but regenerate and desorb with near-normal pressure. Through periodic circulation, the adsorption and regeneration process of two absorbers will work alternately, which removes the moisture from compressed air. The dew point of compressed air can easily reach  $-40^{\circ}\text{C}$ .

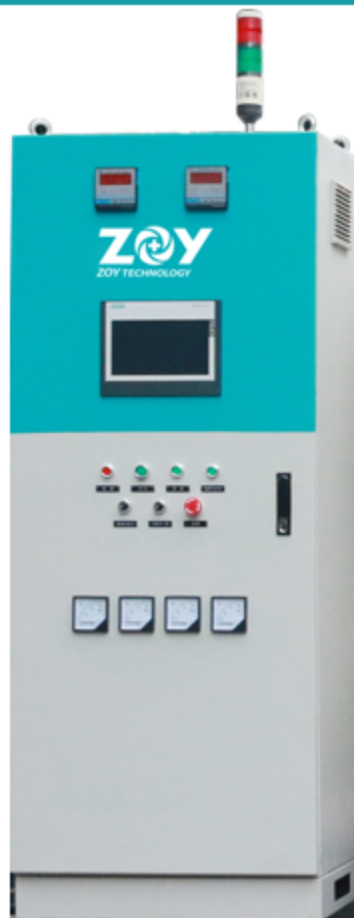
Our company's zero gas consumption adsorption dryer uses the exhaust gas produced by PSA oxygen generator for water removal. This process is without the consumption of compressed air. It is also high efficiency, and energy-saving. The dew point of compressed air can be blow  $-61.5^{\circ}\text{C}$ .

Zero Gas Consumption Adsorption Dryer	
Name	
Brand	ZOY
Model	XG-40
Quantity	1Set
Handling capacity	8.5m <sup>3</sup> /min
Dew Point With Normal Pressure	$-61.5^{\circ}\text{C}$
Weight	900kg



## Part D: Controlling System — PLC Controlling System

The control system uses Siemens S7-200 PLC for millisecond-level control of oxygen system valves, 10-inch LCD screen for human-computer interaction, ZOY RIC series remote intelligent controller for remote control, and multiple sensors for control and detection. The equipment is with a series of advantages such as one-key start and stop, stable control, reasonable interface design and simple operation.



Name	Control System
Quantity	1 Set
Touch Screen	ZYTS10N
Remote intelligent controller	ZOY RIC Series
Sensor	Temperature sensor, pressure sensor, flow meter, oxygen analyzer
Size	550*260*900mm
Weight	30kg





## Part D: Controlling System — Remote Monitoring System

The remote monitoring system makes the upload and download of data through the remote controller come true. Users can log in to the cloud platform on their mobile phones and computers to search real-time data and historical data; equipment administrators can also send instructions to the equipment through the cloud platform and control the operation of the equipment through the remote controller. Through real-time monitoring of the operating conditions of equipment, faults and other abnormal conditions can be discovered and even predicted in time. There is no need to arrange personnel to guard equipment, which not only reduces management costs and labor cost, but also increases the reliability of oxygen supply.





## Product Component—Part E: PSA Oxygen Generator

Equipped with Zeolite molecular sieve as the adsorbent, PSA Oxygen Generator can separate oxygen from the surrounding air by adsorption and release of nitrogen. Oxygen concentrations can be 93%(±3%)and over 99.5%. Zeolite is with three-dimensional structure which forms uniformly sized pores. As the pores preferentially absorb small molecules and exclude large molecules, Zeolite acts as molecular sieves. Zeolite molecular sieve will absorb nitrogen and separate high purity oxygen under high pressure; it will release nitrogen at low pressure. There are two adsorption towers for nitrogen adsorption and release. Once Zeolite molecular sieve in tower A absorbs enough nitrogen, tower A will stop the separation process and begin to release nitrogen into the nitrogen storage tank. Tower B will begin to separate the oxygen. Two towers will separate oxygen alternately.



PSA Oxygen Generator	
Name	
Oxygen Output	40m <sup>3</sup> /h
Pressure	0.2-0.5MPa
Oxygen Purity	93±3%
Oxygen Surge Tank	1.0m <sup>3</sup>
Oxygen Analyzer	BEE-M Series
Oxygen Flow Meter	PFM711 Series
Size	1810*1800*2800mm
Quantity	1Set
Weight	2800kg

# Part 3

## Optional Components





# Optional Components

## Remove Argon Device: 99.5% High Purity Oxygen System ( Sold Separately)

检测报告编号: 2019030-30-1999202001  
Test report number: 2019030-30-1999202001

**上海市计量测试技术研究院**  
SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY  
**华东国家计量测试中心**  
NATIONAL CENTER OF MEASUREMENT AND TESTING FOR EAST CHINA  
**中国上海测试中心**  
NATIONAL CENTER OF TESTING TECHNOLOGY SHANGHAI

### 检测报告

Test Report

委托者: 湖南卓普科技有限公司  
联系人: 长沙经济技术开发区湘江大道1号湖南卓普科技集团A2-C栋  
样品名称: 航空呼吸用氧  
制造厂: 湖南卓普科技有限公司  
型号/规格: 医用分子筛中心制氧系统  
样品编号: ZYMO-20

批准人: 郭玉红  
检测员: 姜翔  
检测员: 于瑞祥

发布日期: 2019 年 09 月 05 日

地址: 上海市张江高科1500号1002室 电话: 021-38856600 内线: 021-60796390 邮编: 201203  
客户咨询电话: 800-620-6172 投诉电话: 021-60796392

本检测中心检测, 部分检测项目受限于检测能力, 恕不检测。  
This laboratory report is not valid for the detection items that are not within the detection capability of this laboratory.

第 1 页 共 4 页  
Page 1 of 4

检测结果/说明: Test result and additional explanation  
Results of test and additional explanation

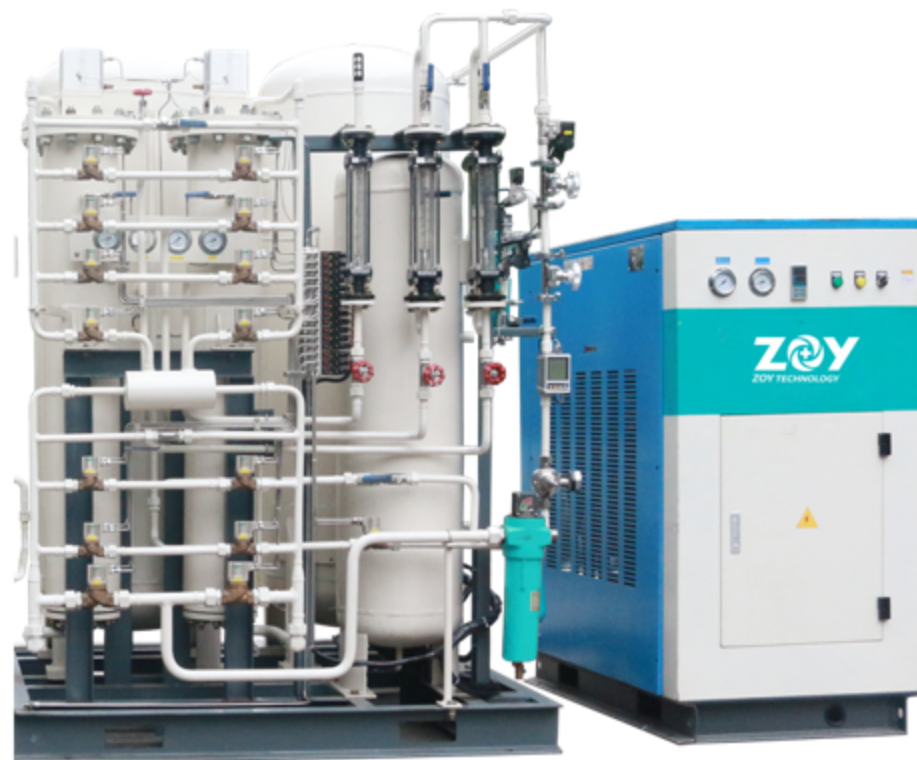
检测项目	标准要求	检测结果
O <sub>2</sub>	≥99.5×10 <sup>-2</sup> (v/v)	99.6×10 <sup>-2</sup> (v/v)
H <sub>2</sub> O	≤-65℃	-66.2℃
CO <sub>2</sub>	≤100×10 <sup>-6</sup> (v/v)	0.7×10 <sup>-6</sup> (v/v)
CO	≤5×10 <sup>-6</sup> (v/v)	<0.1×10 <sup>-6</sup> (v/v)
气味	无异味	无异味
总粒	≤50×10 <sup>-6</sup> (v/v)	0.3×10 <sup>-6</sup> (v/v)
颗粒	≤100μm	<1.0μm
固体物质	含量	≤1 mg/m <sup>3</sup> 0.002mg/m <sup>3</sup>

检测结果内容结束

Test Result

99.6×10<sup>-2</sup>(v/v)

Authoritative Test Report  
for Zero Particle by  
National Metrology  
and Testing Center(SIMT)





## Optional Components

### Filling System of Oxygen Cylinder (Sold Separately)

The high purity oxygen produced by the PSA Oxygen Generating System can also be filled with oxygen cylinders by using oxygen compressor. Our equipment adopts WWZ-30/4-150 oil-free high-pressure oxygen compressor.

ZY/MO-40 Medical PSA Oxygen Generating System can fill about 120 bottles of oxygen cylinders(40L) per day (24H)



Model	WWZ-30/4-150
Inlet/Outlet Size	External Diameter $\Phi$ 32/External Diameter $\Phi$ 16
Inlet/Outlet Pressure	0.4MPa/15.0MPa
Exhaust Range	30m <sup>3</sup> /h
Inlet Temperature	$\leq 35^{\circ}\text{C}$
Outlet Temperature	$\leq 80^{\circ}\text{C}$
Cooling Mode	Air Cooling
Size	1700X1200X1200 mm
Power	15Kw, 220V, 50HZ
Weight	500kg

# Part 4

## Product Advantages



## Advantages of PSA Oxygen Generating System

1. FS-Curtis air compressor
2. Dew point is below  $-56.2^{\circ}\text{C}$



3. Ability to produce 99.5% high purity oxygen
4. With Noise eliminator, below 80db

5. Built-in nitrogen reuse system
6. Environment friendly

7. Remote intelligent monitor system in real time
8. Zero Particle for 99.5% high purity oxygen

part 5

Comparison



	Oxygen Cylinder	Liquid Oxygen	PSA Oxygen Generaing System
Cost	\$2.3 / m <sup>3</sup>	\$0.5 / m <sup>3</sup>	\$0.15 / m <sup>3</sup>
Operation	Complicated	Complicated	Simple
Stability	Unstable	Unstable	Stable
Convenience	Unconvenient	Unconvenient	Convenient
Safety	Potential risks	Potential risks	Safe





## Oxygen Cylinder & Liquid Oxygen

1. Potential safety hazards;
2. Investment of a lot of labour and material resources for transportation and storage;
3. Hard to count oxygen reserves and easy to cause the waste of oxygen;
4. Strict environmental requirement of storage;
5. Frequent installation and replacement.



## Our Medical PSA Oxygen Generating System

1. Remote Intelligent Control System in Real time:
  - (1). Online monitoring of data in real-time: oxygen concentration, oxygen flow, oxygen pressure, etc;
  - (2). Monitor via mobile and computer;
  - (3). Remote Control and Maintenance: pre-warning of abnormal data and machine error;
  - (4). Simple operation: one button to start and stop;
  - (5). PLC : S7-200 PLC of SIEMENS brand.
2. Optional installation scenarios: basement, courtyard, etc.
3. No need to transfer oxygen cylinders and continuous supply of high purity oxygen.



# Part 6

## Certificates & Patents





Business License



Manufacture License of Medical Devices



Business License of Medical Devices



Manufacture License of Air Compressor



CE Certificate



ISO9001



ISO13485



Business Registration Certificate



Product Quality and Security Certificate



Product Registration Form



# 1 Invention Patents and 9 Innovation Patents



**Invention Patents: PSA Oxygen Generating System**



**Innovation Patents: Oxygen Storage Tank**



**Innovation Patents: Automatic Compaction Device for Solid Particle Filler**



**Innovation Patents: Adsorber**



**Innovation Patents: Device for Preventing to the Efflorescence of Molecular Sieves**



**Innovation Patents: PSA Oxygen Generating Equipment**



**Innovation Patents: Liquid Electronic Drain Valve with Zero Gas Consumption**



**Innovation Patents: Intelligent Conveying Management System for Pneumatic Conveying**



**Innovation Patents: Device for Gas Refrigeration and Drying**



**Innovation Patents: Pneumatic Conveying for Bulk Cement**

**Leader of PSA Oxygen Generating System**

# Part 7

## Workshop





# Part 8

## Application



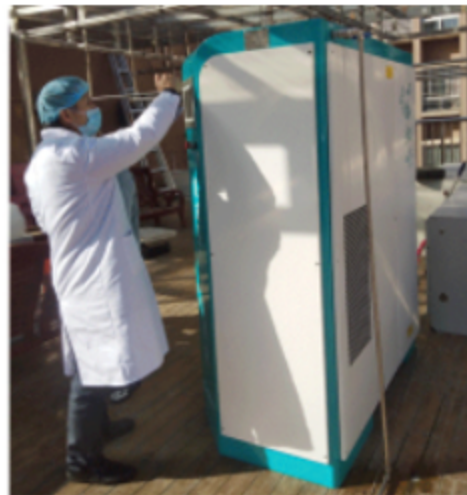
# Application



Bangladesh



Thailand



Singapore



The Republic of Suriname



Uganda



Congo



Malaysia



Australia

Leader of PSA Oxygen Generating System



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E-mail : [andrew@zoy-tech.com](mailto:andrew@zoy-tech.com)