

Tashka
HEALTHCARE

PSA Oxygen Generator



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Tashka Healthcare.Pvt.Ltd

About us

TASHKA HEALTHCARE PRIVATE LIMITED End to end solution including Software & Hardware for Hospital, Pharmaceutical, Lab, Radiology, Clinic and Tele-Clinic.

Tashka Healthcare Private Limited

THE COMPANY Tashka Healthcare Pvt. Ltd. is a healthcare solution provider, Headquartered at Bengaluru, India, having sales and support operations in United States, United Kingdom, Africa and Middle East for providing cost-effective End to end Software and Hardware solutions to the healthcare sector.

Tashka Healthcare Pvt. Ltd. had developed 'MedStar Application' - an industrial leading healthcare software that leverages AI, BI & DS to provide End to end fully integrated solution for efficiently running clinic to large multi chain - hospital. Tashka Healthcare Pvt. Ltd. is an ISO 9001:2015 and ISO 27001:2013 certified company.

VISION

To be the preferred, trusted technology partner to healthcare providers worldwide by delivering quality products and services that allow our customers to better serve their patients and communities.

MISSION

To provide quality healthcare products & services, which are innovative, comprehensive, fairly-priced for hospitals, physicians and other healthcare providers using the latest technologies and community engagement where our employees live and work.



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(THK-60 purity 93% Oxygen Generator model)

THK-60 Oxygen Generator (Pressurized) Technical Plan

1. Design requirements

1.1 Compressed Air required

Name	Data	Name	Data
Standard flow	≥10.5Nm ³ /min	Oxygen content	20.95%(V)
Inlet pressure	0.7-0.8MPa	Temp	≤45°C
Dust diameter	≤10μm	Oil content	≤5mg/m ³
No ammonia gas and other harmful gases that prevent the desorption of ZMS			

Air compressor selection recommendations: enlarge 15-20% margin according to the intake air 1.2

Product data

Model	Name	Data	Name	Data
THK-60	Oxygen flow	60Nm ³ /h	Oxygen purity	93-94%
	Oxygen pressure	0.4-15MPa	Oxygen dew point	≤-50°C

Flow unit "Nm³/h" is under 20°C, 0.101MPa standard flow

1.3 Project requirements

Name	Power Supply	Install power	Cooling type
screw air compressor	380V/50HZ	75KW	Air cool
Oxygen generator	380V/50HZ	2.8KW	Air cool
Oxygen booster	380V/50HZ	23KW	Water cool(3.0T/H)

1.4 Installation Condition

Item	Requirement	Item	Requirement
Ambient temp	0-38°C	Install place	Indoor, good ventilated
Relative Humidity	≤90%	Install requirement	Smooth concrete floor, without base
Altitude:	≤1000m		

2. System Process

System 1. Compressed air

First, the compressed air from the **75Kw screw air compressor** (Altitude: $\leq 1000\text{m}$) with outlet pressure $0.7\text{-}0.8\text{MPa}$, flow volume $13\text{m}^3/\text{min}$.

System 2. Purity system (Skid-mounted)

Compressed air into the **KAS-170 efficient gas-liquid separator** (with cyclone separation) to remove the most of liquid oil, water, dust, and then enter a **THK-170F refrigeration air dryer**, so that the compressed air dew point at atmospheric pressure dropped to about -20°C , to take off the most water, finally pass through 3 sets of **KAL-170 ultra filters** to make sure the oil content $\leq 0.001\text{ppm}$, dust content $\leq 0.01\text{ M}$.

System 3. Oxygen generator and buffer device (Skid-mounted)

Clean compressed air first enter to **buffer tank V-3**, and then into two PSA separation tower which filled with adsorbents (zeolite molecular sieve, composite structure) i.e. **KOB-60G**. Compressed air enter through the bottom of the adsorption tower, the air flow evenly spread after the special stainless steel multi-layer to adsorption tower to separate oxygen and nitrogen, finally oxygen flow out, this processed by pressure equalizing and pressure reducing (to atmospheric pressure). The adsorbent release the adsorbed impurities component (primarily nitrogen) to complete the regeneration of the adsorbent. The operating cycles between 2 adsorption towers, the air is continuously fed in, the oxygen continuously generated.

Oxygen generated from the oxygen generator first enter to **oxygen buffer tank V-1.0**, and then filtered by **KAF-026 dust filter.KAJ-026 Sterilization filter** to get the purity of 93% oxygen, the yield is $60\text{Nm}^3/\text{h}$, the output pressure is 0.4MPa , atmospheric dew point

$\leq -50^\circ\text{C}$, oil content $\leq 0.001\text{ppm}$, dust content $\leq 0.01\mu\text{m}$.

System 4. Booster and filling device

The pressure of the oxygen is compressed to 15MPa by **GOW-60/4-150 oxygen booster**, then get into the package device and the filling bottles.



3. Technical advantages

A. ZMS

High quality ZMS to make sure maximum energy saving, our company use the latest imported products which has the advantages of strong hardness, less powder, high oxygen recycling, long using life (up to 8 years) and so on.



B. Composite structure design for absorbing tower (showing in the fig)

Our new PSA oxygen generator adopt the new composite structure design for the absorbing tower, the top is cylinder and coconut auto compress device, the upper part is molecular sieve, the lower sieve is activate processed, compressed air through a special diffuser, firstly flow through to the activated molecular sieves to take off the most moisture to ensure the dew point under

-45°C for the air pass through the sieve.

C. Imported pneumatic angle seat valve

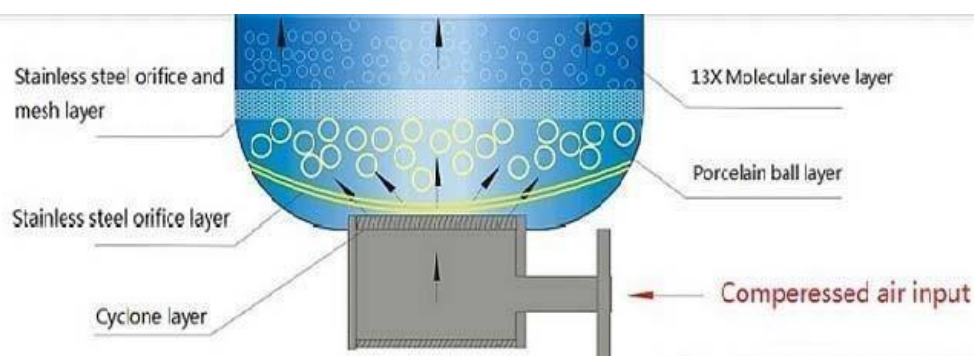
We corporate with the world famous Danish ESG stainless steel pneumatic angle seat valve, switching time 0.05 seconds, the normal using life is more than 3 million times, has advantages of simple structure, reliable sealing, close quickly, easy maintenance, reliable operation for protection of oxygen generator.



D. Special gas diffusion structure

The adsorption tower has a special internal air diffuser apparatus, first compressed air enter through the neck of the cyclone unit to contact with the special diffusion alumina balls (using a spherical shape and its hardness), the air flow as an "S" type. The gas then flow through the double stainless steel mesh sieve and activated processed sieve to finally contact with the carbon molecular sieve, which not only greatly reduce the impact to molecular sieve, but also make gas more evenly in the adsorption process, help to improve oxygen life efficiency and carbon molecular sieves.

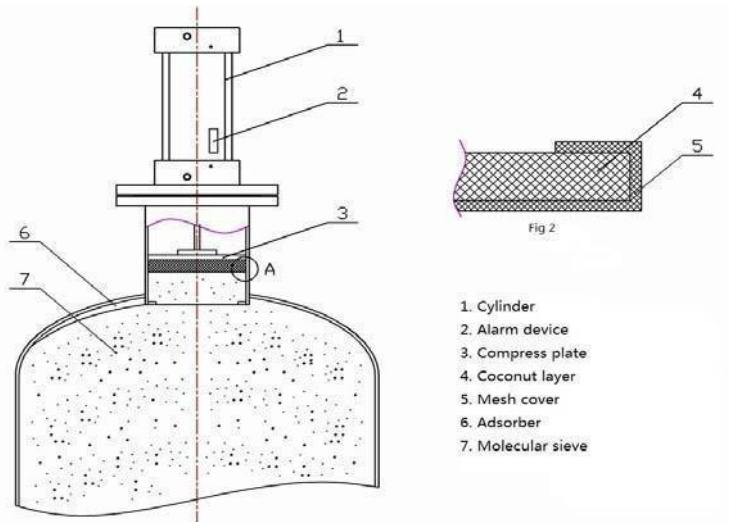
E. Cylinder Auto-compress device (Patent No.: ZL-300830168079.9)



Air Diffusion System Diagram

Adsorption tower uses advanced cylinder auto compress technology, the device has a molecular sieve automatic replenishment function control system can supervise the changes of the molecular sieve in adsorption tower.

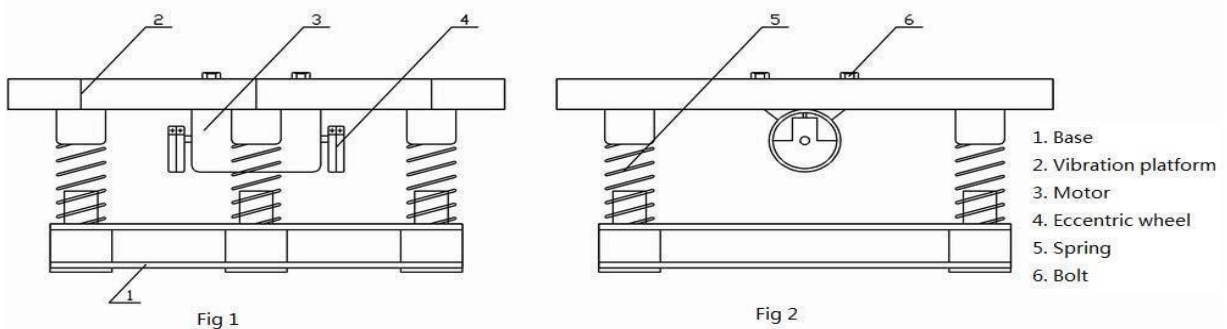
Auto-compress device uses operating pressure in adsorbing tower as its own working pressure, and begin work when the oxygen generator start working, its working pressure maintain a balance with the tower pressure, the pistons not influenced by alternating force, to make sure not crush the carbon molecular sieve. The pressing force always keep balance which does not change with the stroke, the pressing is provided in a decanter limit alarm system, when the stroke of the pressing exceeds its stroke, the automatic limit alarm system will list on panel photoelectric alarm, easier monitoring, stronger reliability and more efficiency.



- 1. Cylinder
- 2. Alarm device
- 3. Compress plate
- 4. Coconut layer
- 5. Mesh cover
- 6. Adsorber
- 7. Molecular sieve

F. Original high-efficiency filling (Patent No.: ZL-300830168078.4)

Our unique twist stretch vibration sieve filling method allows more uniform dense packing can get a minimum friction to ensure no phenomenon of powder for molecular sieve under long adsorption process.



G. Siemens PLC intelligent program controller

We configured the German company Siemens control systems for our oxygen generator, the unit has good control performance and reasonable running mode, can display various operating parameters, status and fault signal, automatically handle load changes in control system. The system is settings LCD control panel, not only display, but also set and control the parameter on the panel easily, the system can be interlocked start-stop control remotely with the air compressor, and feedback various status signal.



The main control functions as below

No	Item	Function	Remark
I	Important Alarm		
1	Oxygen unqualified	Sound and light, text display, English interface	
2	MS subsidence	Sound and light, text display, English interface	
3	Maintenance remind	Sound and light, text display, English interface	
II	Operating monitoring		
4	Process	Process chart display, operating display	operating fault alarm
5	Operating search	Text display, English interface	
6	Maintenance remind	Text display, English interface	
7	Fault analyze	Text display, English interface	
8	Fault alarm	Text display, English interface	

H. Advanced pressure swing adsorption process to maximum energy saving:

The new oxygen device uses upper pressure balance, which is improved according to the traditional equalizing process. upper pressure balance is let the gas flow out from the top of the adsorbing tower, and then into the regenerated adsorbing, which have the advantage of increasing the oxygen purity, because the upper in the absorbing tower, the higher oxygen purity, so the higher purity oxygen flow into the adsorbing tower can greatly improves the oxygen purity and the utilization of the sieve, i.e., increase the gas production of molecular sieve. Upper pressure balance is more rational, scientific, and directly increase the recovery rate of oxygen, saving the consumption of compressed air and energy.

In summary, our oxygen generator is better than other domestic manufacturers in design, manufacture, selection, etc. we have our unique features and advantages, its performance has reached a higher level among domestic similar products.

I. Features of Oxygen generator automatic control

- A. The switching valve of adsorbing tower is controlled by the German SIEMENS PLC programmable logic controller, safe and reliable, can complete DCS control of all oxygen generator devices, display various working state and the implementation of joint operating state control and remote control system ;
- B. When the oxygen purity is less than 90%, the system will sound and light alarm;
- C. Oxygen flow meter using rotor on-line display;
- D. Using German BF coconut layer, automatic compress technology.
- E. The whole unit are designed to be closed automatic feedback system, including the system operation and sewage, totally automatic unattended operation.

4. Main technical data

4.1 THK-60 Oxygen Generator

No	Name	Unit	Data
1	Oxygen output	Nm ³ /h	
	Oxygen Purity:	%	
	Oxygen Dew point	°C	60
	2		93±1
3			≤-50
4	Oxygen Generator compressed air consumption	Nm ³ /min	10.5(maximum flow before entering adsorbing tower)
5	Compressed air inlet meter power	MPa	
6			
7	Oxygen Output pressure:	MPa	
8			
9	Air inlet temper	°C	0.7-0.8
	Oxygen Generator power	V/HZ/KW	≤60
	Dust content	µm	220/50/0.1 ≤0.01 0.4(adjustable)
10	Operation :		automatic
11	Sewage :		automatic
12	Installation Environment :		Indoor (unit install)
13	Inlet/outlet flange size	DN	50/25



(THK-60 purity 93-94% Oxygen Generator model)

4.2. screw air compressor:

Model		Screw air compressor
Output capacity /pressure (m ³ /min/Mpa)		13/0.8
Motor	Power (KW)	75
	Speed (rpm)	1975
	V/ HZ	380/50
	Insulation grade	Y-Δ
Noise DB (A)		75±3
Outlet pipe diameter (DN)		50
Compressed gas		Air
Inlet gas pressure		Standard air pressure
Working ambient temp (°C)		-5°C—+45°C
Outlet air temp (°C)		Air cool < Ambient temp+8°C



(Screw air compressor)

4.3. THK-170F Air dryer unit

Name	Unit	Technical data
Model		THK-170F
Type		Combined (Refrigerated + 4 class filtering)
Nominal Capacity	Nm ³ /min	
Working pressure	Mpa	
Inlet gas temp	°C	
Pressure loss	Mpa	
Pressure dew point of final gas	°C	17
		1.0
		≤60
		0.03
		(standard pressure)
		2.8
		380/50
		Air cool
		≤-20
Installation Power	KW	
power input	V/HZ	
Cooling		
Ambient temperature	°C	
Installation		Skid without base
Inlet/outlet flange size	mm	DN65



(THK-170F Air dryer unit)

4.4 Oxygen booster

Name	Data
Model	GOW-60/3-150
Outlet capacity (Nm ³ /h)	60
Outlet pressure (Mpa)	15
Inlet pressure (Mpa)	0.3
Install power (KW)	380V/50HZ/23KW
Structure	Oil less vertical
Gas temper °C	≤50
Drive	Belt
Installation	With base
Cooling	Water cool (consumption 3T/h)
Inlet size mm	25
Outlet size mm	15
Compress gas	Oxygen
Working temp (°C)	-5°C—+45°C

(Oxygen Booster)



5 THK-60 Oxygen Generator equipment list

1. Air compress System				
screw air compressor	KCR-75	1Set	KSTK	screw air compressor
2. Purification system				
Gas liquid separator	KAS-170	1Set	Tashka	USA HV filter core, automatic sewage
Refrigeration dryer	THK-170F	1Set	Tashka	automatic sewage
Ultrafilter	KAL-170AO	1Set	Tashka	USA HV filter core, automatic sewage
Ultrafilter	KAL-170AA	1Set	Tashka	USA HV filter core, automatic sewage
Ultrafilter	KAL-170AX	1Set	Tashka	USA HV filter core, automatic sewage
3. Oxygen system skid				

Air buffer tank	V-3	1Set	Tashka	With related accessories
Oxygen generator	KOB-60G	1set	Tashka	Fully automatic
Oxygen buffer tank	V-1.0	1Set	Tashka	With related accessories
dust filter	KAF-026	1Set	Tashka	Aluminum alloy, USA HV filter core
Sterilization filter	KAJ-026	1Set	Tashka	Aluminum alloy, USA HV filter core

4. Booster and air package				
Oxygen booster	GOW-60/3-150	1Set	KSTK	Oilless
O ₂ Filling package	F-8*2	1Set	Tashka	Store the oxygen ready for use
cooling-water machine	THK-5HP	1Set	Tashka	Fully automatic

5. Configure list (composed of host devices)				
OG adsorbing tower	KOB-60	2	Pc	With pressure vessel certificate
ZMS	OX502	800	KG	Tashka
Muffler	KXS-60	1	Pc	Tashka
O ₂ analyzer	P950	1	Pc	Shanghai Changai
O ₂ flow meter	DN25	1	Pc	SMC
PLC	S7-200	1	Set	Germany's Siemens
Control System	KZK-60	1	Set	France Schneider
Pneumatic angle seat valve	DN65 DN50	8	pc	SS 304 Denmark ESG
Solenoid valve	4V210	7	Pc	Germany Nice coil
Check valve	DN15	2	Pc	SS504, 3 year warranty
Filter Regulator	GFR300	1	Pc	Airtac
Auto compress device	KQY-60	2	Set	Cylinder with subsidence alarm
Venting system	KFK-60	1	Set	Tashka
Vortex gas distributor	KCF-60	2	Set	Tashka
Joint Pipe & valves	KGF-60	1	Set	Tashka

6. THK-60 Oxygen Generator price list

No	System	Equipment	Spec	Qty. (Set)	Unit price	Total	Remark
1	Air compress system	Screw air compressor	KCR-75	1	10,000	10,000	Altitude \leq 1000m Kaishan
2	purification system	Gas liquid separator	KAS-170	1	35,800	35,800	Tashka
		Refrigeration dryer	THK-170F	1			Tashka
		Ultrafilter	KAL-170AO	1			Tashka
		Ultrafilter	KAL-170AA	1			Tashka
		Ultrafilter	KAL-170AX	1			Tashka
3	Oxygen system skid-mounted	Air buffer tank	V-3.0	1			Tashka
		Oxygen generator	KOB-60G	1			Tashka
		Oxygen buffer tank	V-1.0	1			Tashka
		dust filter	KAF-026	1			Tashka
		Sterilization filter	KAJ-026				Tashka
4	Booster and air package	Oxygen booster	GOW-60/3-150	1	28,000	28,000	oil less water cool
		O2 Filling package	F-8*2	1			pipes\valves, 8bottles of O2
		cooling-water machine	THK-5HP	1			
5	Package	include					
6	Freight	1*40HQ					