Robust Air™

PSA OXYGEN PLANT

MAKE IN INDIA

Robust Air™

INTRODUCTION

Since its establishment in 2012, Robust Air has been a prominent supplier of air and gas solutions throughout India. Specializing in turnkey supply of Air and Gas equipment, we are committed to engineering excellence and customer satisfaction. Our expertise lies in designing and implementing on-site systems for the continuous supply of high-purity gases and compressed air.

At Robust Air, quality is our top priority. We meticulously select the finest quality components for our products, ensuring superior performance and reliability. Leveraging our manufacturing facilities in India, we offer cost-effective solutions without compromising on quality.

Trusted by reputed companies nationwide, Robust Air has earned a reputation for reliability and innovation in the industry. Our focus on customer satisfaction and our track record of delivering innovative solutions have contributed to our success.

Moving forward, we remain dedicated to innovation and excellence, continuously striving to meet the evolving needs of our customers. With our unwavering commitment to quality and customer satisfaction, Robust Air is poised to maintain its position as a leader in the air and gas solutions industry.

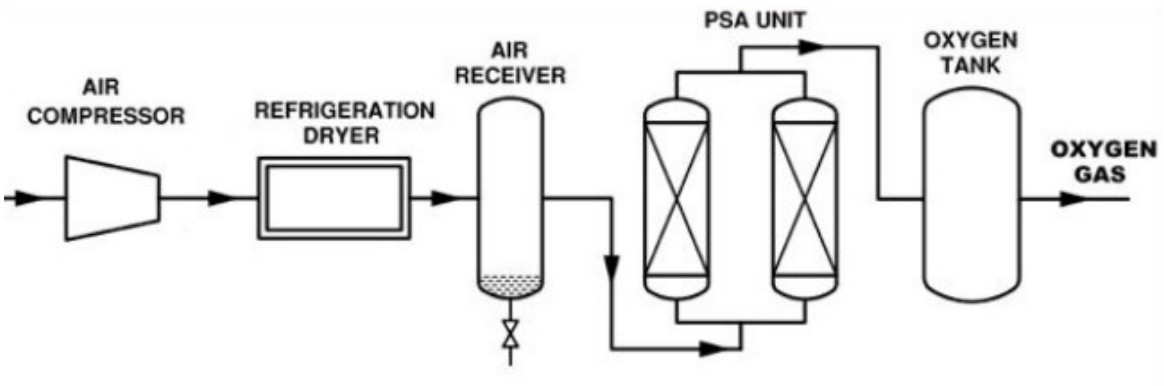
Robust Air™

PSA OXYGEN GENERATORS

About Us....

Experience excellence with **Robust Air**, a distinguished name in the industry as a leading Manufacturer, Distributor, and Supplier of **PSA Based Nitrogen and Oxygen generation plants**. Since our inception in 2008, we have established ourselves as a customer-centric organization, committed to meeting and exceeding the needs of every client. With our state-of-the-art in-house facility, we manufacture a diverse range of equipment including Columns, Heat Exchangers, Pressure Vessels, Reactors, and Tanks.

Our products boast a user-friendly interface, ensuring hassle-free operation for operators. Designed with a skid-mounted structure, our equipment features a robust structural design, guaranteeing durability and reliability in every application. Choose Robust Air for unparalleled quality and performance in nitrogen and oxygen generation technology.



ADVANTAGES OF OXYGEN GENERATORS

a) Cost of Oxygen: With electric power being the sole requirement for our gas generators, the production cost of oxygen ranges from Rs. 15 to Rs. 17 per cubic meter. In comparison, oxygen obtained from cylinders or bulk sources may cost around Rs. 50 per cubic meter. This significant cost difference translates into substantial savings for our customers.

b) On-Site Oxygen: Our oxygen generators ensure a constant and reliable supply of oxygen all year round, 365 days a year. This eliminates any potential interruptions in oxygen supply that may occur due to delays in cylinder deliveries or tanker shortages.

c) Convenience: Say goodbye to logistical hassles and the need to maintain cylinder stocks. With our oxygen generators, you'll never run short of oxygen, as you have a continuous and readily available supply right at your fingertips. Enjoy the convenience and peace of mind that comes with owning your own oxygen generator.

OXYGEN PURITY

Our medical oxygen generators are crafted in strict adherence to the ASME Code, ensuring the highest standards of safety and quality. Compliant with the Indian Pharmacopeia Oxygen 93% requirement, our generators utilize the Molecular Sieve process to extract oxygen from air. The term "Oxygen 93%" indicates a purity level ranging from not less than 90% to not more than 96%, with the remainder primarily comprising Argon and Nitrogen. With thousands of installations worldwide, these generators have been proven safe and reliable for medical use. Trust in our technology to deliver consistent and high-quality medical-grade oxygen for diverse healthcare applications.

OXYGEN PRESSURE

Our fully automatic units are designed to produce pure oxygen at a pressure of 4.8 bar, which is then collected in a storage tank. From there, the oxygen is delivered through a pressure regulator at 4 bar pressure and distributed through the hospital pipeline. Continuous monitoring of the pressure in the oxygen storage tank ensures safety, with an alarm sounding when pressure falls below 3.5 bar. In the event of a pressure drop, the reserve supply system is automatically activated via the switchover panel, ensuring uninterrupted oxygen supply to critical healthcare applications. Count on our advanced systems for reliable and efficient oxygen delivery in medical facilities.

1. **Onsite production of oxygen offers instantaneous access to oxygen derived from readily available ambient air.**
2. **This approach eliminates the need for cylinder deliveries and mitigates the risk of oxygen shortages.**
3. **Moreover, the absence of cylinder handling requirements reduces the need for manpower, offering significant safety benefits.**

PHARMACOPEIA	OXYGEN PURITY REQUIREMENT
India – IP 2010	Oxygen 93 per cent is composed of a minimum of 90.0 per cent and a maximum of 96.0 per cent oxygen, with the remaining composition primarily comprising argon and nitrogen. This oxygen variant is derived from air through the molecular sieve process.
USA– United States Pharmacopeia (USP) XXII oxygen 93% Monograph	Oxygen 93 Percent USP must be stored in cylinders or a low-pressure collecting tank to comply with USP requirements. Containers used for Oxygen 93 Percent must not be treated with any compounds that have toxic, sleep-inducing, or narcosis-producing properties, nor should they contain any substances irritating to the respiratory tract during use. Produced from air via the molecular sieve process, Oxygen 93 Percent may be piped directly from the collecting tank to the point of use, with each outlet labeled accordingly. This oxygen variant contains not less than 90.0% and not more than 96.0% oxygen by volume, with the remaining composition primarily comprising argon and nitrogen. It meets USP requirements for Identification, Odor, and ensures low levels of Carbon dioxide (not more than 0.03%) and Carbon monoxide (not more than 0.001%).
UK– HTM #02-01 Medical Gas Pipeline Systems	• Oxygen can also be supplied through an oxygen concentrator, utilizing a pressure-swing adsorber. These systems are typically installed in scenarios where liquid oxygen or cylinders are costly, inaccessible, or impractical. • The PSA process has achieved a high degree of technical advancement and can produce oxygen with a concentration of approximately 95%. (In the UK, the minimum threshold, triggering the emergency/reserve manifold, is set at 94%.)
ISO 10083 : 2006	• ISO 10083:2006 outlines the design and installation requirements for oxygen concentrator supply systems intended for use with medical gas pipeline distribution systems in accordance with ISO 7396-1. • This standard specifically pertains to oxygen concentrator supply systems that generate oxygen-enriched air with a minimum oxygen concentration of 90%.

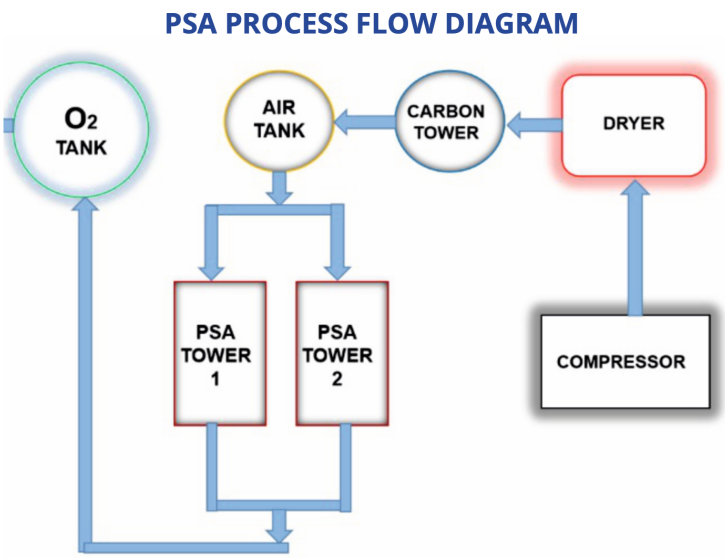
PSA ACCEPTANCE IN HOSPITALS

Traditionally, medical oxygen has been sourced from cylinders or liquid tanks. However, since the 1970s, the adoption of PSA oxygen generators for medical oxygen supply has become prevalent. These generators offer significant cost savings and increased flexibility, catering to the evolving needs of hospitals and the healthcare sector.

Historically, medical oxygen specifications mandated a purity greater than 99% due to its delivery from cryogenic sources. However, extensive clinical trials have demonstrated that oxygen with a purity of 93 ± 3% produced by PSA oxygen generators has no adverse physiological effects on patients. As a result, oxygen generated by PSA generators is now widely accepted and permitted by regulatory bodies such as the USA, European, and Indian Pharmacopeia.

The demand for onsite oxygen generation in hospitals worldwide has been steadily increasing over the years. Many hospitals have already transitioned to producing their own medical oxygen onsite. To ensure the quality of the generated oxygen, medical oxygen generators are equipped with oxygen purity monitoring devices. These devices continuously monitor the oxygen purity, and if it falls below 90%, the generator automatically stops, and the system switches to backup oxygen supply, ensuring uninterrupted medical oxygen supply for patient care.

PSA PRINCIPLE



PSA (Pressure Swing Adsorption) technology serves as a cost-effective solution for onsite oxygen production, catering to both medical and industrial applications for over 30 years. Ambient air, comprising 78% nitrogen, 21% oxygen, and less than 1% argon and other gases, enters the compressors. Through the PSA process, nitrogen is separated, resulting in a product gas with up to 95.5% oxygen purity.

The PSA process operates through zeolite-filled towers, exploiting the varying affinities of gases for solid surfaces. Nitrogen, with a higher affinity, is adsorbed by the zeolites, while oxygen is less adsorbed and conveyed to the end of the zeolite bed, ultimately being recovered in the oxygen buffer tank.

This process involves two zeolite beds working in tandem: One filters air under pressure, allowing oxygen to pass through while nitrogen is adsorbed. Simultaneously, the second bed begins filtering as the first becomes saturated. The saturated bed is then regenerated by releasing the pressure, expelling nitrogen (desorption), while the process repeats with the other bed. The oxygen produced is stored in a tank, ready for use.

MODELS

OXYGEN GENERATOR MODEL	PRODUCTION CAPACITY			Number of BEDS Oxygen plant can cater to when consuming at the rate in LPM below			
	Nm3/hr	Litre/min	Equivalent Cylinders per day	3 lpm	5 lpm	10 lpm	15 lpm
RA - O2 - 5	5	83	17	28	17	8	6
RA - O2 - 10	10	167	34	56	33	17	11
RA - O2 - 15	15	250	51	83	50	25	17
RA - O2 - 20	20	333	69	111	67	33	22
RA - O2 - 30	30	500	103	167	100	50	33
RA - O2 - 40	40	667	137	222	133	67	44
RA - O2 - 50	50	833	171	278	167	83	56
RA - O2 - 60	60	1000	206	333	200	100	67

OXYGEN PLANT ESSENTIALS

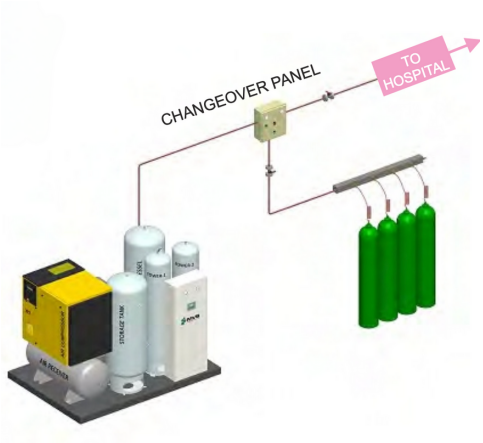
Experience seamless oxygen generation with our comprehensive system, featuring:

- High-performance Screw Type Air Compressor coupled with Refrigeration Dryer for optimal air quality.
- Multistage Coalescing Oil Filters ensuring air purity with oil content below 0.001 ppm.
- Reliable Air Receiver for efficient storage and distribution.
- Precision Oxygen Generator equipped with PLC Control and Oxygen Analyzer for seamless operation.
- Oxygen Surge Tank for consistent supply during peak demand.
- Microbial Filtration Unit ensuring purity and safety standards are met.

PIPELINE SYSTEM

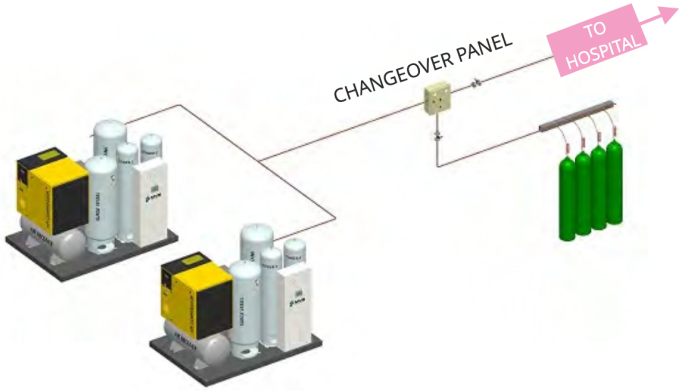
Experience seamless oxygen supply with our pipeline distribution system integration. When connected directly to the pipeline via the Oxygen Surge Tank, our Oxygen generator ensures continuous and reliable oxygen supply. Additionally, our system features a parallel connection to reserve Oxygen cylinders. In the event of pressure dropping below 3.5 Barg or a decrease in oxygen purity, these reserve cylinders ensure uninterrupted oxygen supply, providing peace of mind and safety assurance. Trust our integrated solutions for dependable oxygen delivery.

SUPPLY SCHEMES



SCHEME 1 - BASIC

For hospitals seeking uninterrupted oxygen supply, our basic supply scheme offers a straightforward and effective solution. With the installation of a single Oxygen generator and a switch-over panel, we ensure seamless operation. In the event of a drop in purity or pressure, or during maintenance of the Oxygen generator, the switch-over panel seamlessly transitions to the existing Oxygen cylinder manifold. This simple yet reliable setup provides peace of mind and ensures continuous oxygen availability, making it an ideal choice for hospitals prioritizing patient care. Trust our solution for dependable oxygen supply whenever you need it most.



SCHEME 2 - REDUNDANT

In remote areas where reliability is paramount, our extended scheme offers enhanced security. With a setup comprising one working (1W) and one standby (1S) Oxygen generator, operated alternately, uninterrupted oxygen supply is ensured even in challenging environments. Additionally, a tertiary backup from a cylinder manifold further enhances reliability. This comprehensive solution provides peace of mind, allowing healthcare facilities to focus on patient care without worrying about oxygen availability. Choose our extended scheme for dependable oxygen supply in remote areas, ensuring safety and continuity in critical situations.

SCHEME 3 - CYLINDER FILLING

Customers can opt to fill their own backup cylinders, ensuring uninterrupted oxygen supply and greater operational autonomy. This feature enhances readiness and eliminates reliance on external cylinder procurement.

TAILORED SOLUTIONS

With our extensive expertise and versatile engineering capabilities, we offer customized schemes tailored to meet the unique needs of our customers. From basic setups to complex configurations, we provide comprehensive solutions to ensure optimal performance and reliability in oxygen supply systems.

SAFETY INTERLOCKS

Oxygen Purity Assurance

Our oxygen generators are equipped with an online digital analyzer, ensuring consistent oxygen purity levels before distribution to the buffer tank. Should the purity drop below set parameters, the system automatically halts oxygen supply and triggers an alarm signal to alert of any generator malfunction. Additionally, a decrease in purity prompts the switchover panel to seamlessly divert gas supply to backup oxygen sources. This process involves closing the auto-shutoff valve in the oxygen supply line and activating reserve cylinder oxygen supply valves, ensuring uninterrupted oxygen availability.

Pressure Monitoring and Backup Activation

Our oxygen buffer tanks are equipped with pressure transmitters that continuously monitor vessel pressure. Should the pressure drop below the specified threshold of 3.5 bar, an alarm is triggered, alerting operators to the situation. Additionally, a decrease in buffer vessel pressure automatically activates the reserve supply system through the switchover panel. This seamless process ensures uninterrupted oxygen availability, maintaining critical operations even during fluctuations in pressure.

Backup Module

In healthcare settings where oxygen is consumed at 4-bar pressure, our onsite oxygen generators provide direct production. For backup purposes, hospitals have the option to connect market oxygen cylinders. Alternatively, our cylinder filling system is available, enabling the filling of oxygen cylinders up to 150-bar pressure. These filled cylinders serve as reliable backups, ensuring continuous oxygen supply, particularly in remote locations.

OUR PRESTIGIOUS CLIENTS

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GOLDEN Since 1950

ADITYA BIRLA GRASIM BHIWANI TEXTILES

delair® The Compressed Air Treatment System Company

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MITSUBISHI ELECTRIC Changes for the Better

APLAPOLLO

THANK YOU

At ROBUST AIR, a proud brand of K.B. Polytech Pvt. Ltd., we are dedicated to engineering excellence and customer satisfaction. As leading manufacturers, suppliers, and dealers, we specialize in providing premium quality products and comprehensive solutions for all your compressed air needs. From our industry-renowned Compressed Air Aluminium Piping to advanced Desiccants/Heatless Dryers, PSA Nitrogen/Oxygen Plants, and Reciprocating Compressors, each product embodies our commitment to innovation and quality. Additionally, our offerings include Air Receivers, Line Filters, PU Fittings, and Auto Drain Valves, meticulously designed to integrate seamlessly into your operations. Backed by a skilled team and a dedication to exceeding expectations, ROBUST AIR is poised to optimize system performance, enhance productivity, and improve operational efficiency. Experience the ROBUST AIR difference today and elevate your compressed air solutions to new heights of excellence.

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