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Medical
**OXYGEN
GENERATOR**

www.airshuddhi.com

ABOUT COMPANY

Airshuddhi Engineers Is One Of The Leading Company Focused On Transforming Organic Waste Into Green Energy Along With Manufacturing And Designing High Quality Psa Oxygen Generators Plants. The global demand for Oxygen generators in the medical field is growing rapidly and to us, this is a great challenge!

We can provide the state-of-the-art Oxygen supply you need meet your day-to-day requirements and demands. We offer a modular design, which is easily installed with any existing oxygen supply, it be cylinders, cryogenic or other PSA systems. Our highly advanced central control system carefully operates the system making sure your desired oxygen quantity and quality is supplied always.

Medical Oxygen Generator Salient Features

- ⇒ Full Independency
- ⇒ Full Automation
- ⇒ 24/7 – 365 Days Operation
- ⇒ Full Compliance With European Pharmacopoeia
- ⇒ And Iso 10083
- ⇒ Full Compliance With Mdd (medical Device Directive), Ped (pressure Equipment Directive) And Ce Medical

Our Extensive Standard Product Range Includes Models Supplying From 0,7 To 484.8 M3/h.

Salient Features:

- ⇒ Low Energy Consumption (1,0 KW/M3)
- ⇒ Low Co2 Emission
- ⇒ Heavy Duty Construction Designed For Rough Conditions
- ⇒ High Quality & Durable Components
- ⇒ Container Installed Systems
- ⇒ Frame-built Design
- ⇒ Plug And Play Installation
- ⇒ High Quality Touch Screen Control Unit
- ⇒ Remote Control Access



OXYGEN PURITY

Oxygen Generators Are Manufactured In Accordance With ASME Code & It Meets Indian Pharmacopoeia Oxygen 93% Requirement. It Is Oxygen From Air By Molecular Sieve Process. "oxygen 93%" Contains Not Less Than 90% Oxygen & Not More Than 96%, Remainder Consisting Mostly Of Argon And Oxygen And Thousands Of Such Installations Have Proven These Are Safe For Medical Use.

CHECK O₂ PLUS



PHARMACOPEIA

India - IP 2010

OXYGEN PURITY REQUIREMENT

Oxygen 93 percent contains not less than 90.0 percent and not more than 96.0 percent of Oxygen, the remainder consisting mostly of argon and nitrogen. It is produced from air by the molecular sieve process.

USA - United states PHARMACOPEIA (USP) XXII Oxygen 93% Monograph

USP Requirements: **Oxygen 93 percent USP**-Peserve in cylinders or in a low pressure collecting tank. Containers used for Oxygen 93 percent must not be treated with any toxic, sleep-inducing, or narcosis-producing compounds, and must not be treated with any compound that will be irritating to the respiratory tract when the Oxygen 93 percent used. It is Oxygen produced from air by the molecular sieve process. Where it is piped directly from the collecting tank to the point of use, Label each outlet "Oxygen 93 Percent" **Contains not less than 90.0% and not more than 96.0% by volume, of oxygen**, the remainder consisting mostly of argon and nitrogen. Meets the requirements for Identification, Odor, Carbon dioxide (not more than 0.03%), and Carbon monoxide (not more than 0.001%).

UK-HTM #02-01 Medical Gas Pipeline System

- Oxygen can also be Supplied from an Oxygen concentrator (Pressure-swing adsorber). Such systems are usually installed where liquid or cylinders are expensive, unavailable or impracticable.
- The PSA Process has reached a high level of technical sophistication and is **capable of producing oxygen with a concentration of about 95%**. (For the UK the minimum level, below which the emergency/reserve manifold will come into operation, is 94%).

ISO 10083:2006

Europe

- ISO 10083:2006 specifies requirements for the design and installation of an oxygen concentrator supply system for use with a medical gas pipeline distribution system that complies with ISO 7396-1.
- The standard applies only to oxygen concentrator supply system that produce Oxygen-enriched air with an oxygen concentration not less than 90%.
- European Pharmacopoeia Supplement 7.1.
- **Oxygen (93 percent) 7.1-3445**

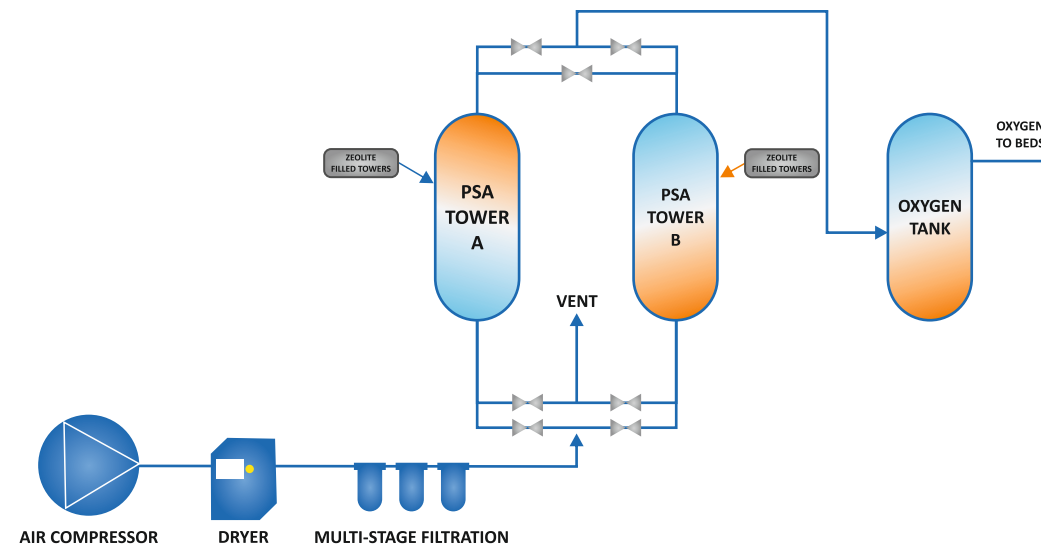
Sweden- Svensk lakemedelsstanderd 2012.2

- **90.0 percent to 96.0 percent of oxygen**, the remainder mainly consisting of argon and nitrogen.
- Oxygen (93 percent) is produced in single-stage concentrators by adsorption purification of

FLOW DIAGRAM

A PSA PROCESS FOR AN OXYGEN CONCENTRATOR

Oxygen is used in a variety of chemical processes and for medical purposes throughout the world. Pressure swing adsorption (PSA) has become a viable alternative to cryogenic distillation for the separation of oxygen from air with the development of advanced adsorbents like zeolites. PSA processes are inherently complex because it is a dynamic process. Efficient operation of a PSA process is necessary in order to utilize the capacity of the adsorbent as much as possible and reduce the power requirements of the process.



OXYGEN PRESSURE

These Fully Automatic Units Produce Pure Oxygen At 4.8 Bar Pressure And Is Collected In A Buffer Tank And Then Used Through A Pressure Regulator At 4 Bar Pressure Through Pipeline.

Pressure In Oxygen Buffer Tank Is Continuously Monitored By Pressure Transmitter. Whenever Oxygen Buffer Vessel Pressure Falls Below 3.5 Bar, An Alarm Is Sounded.

Drop In Buffer Vessel Pressure Also Activates The Reserve Supply System To Be Activated Automatically Through The Switchover Panel.

BACKUP AND HIGH PRESSURE FILLING SYSTEM

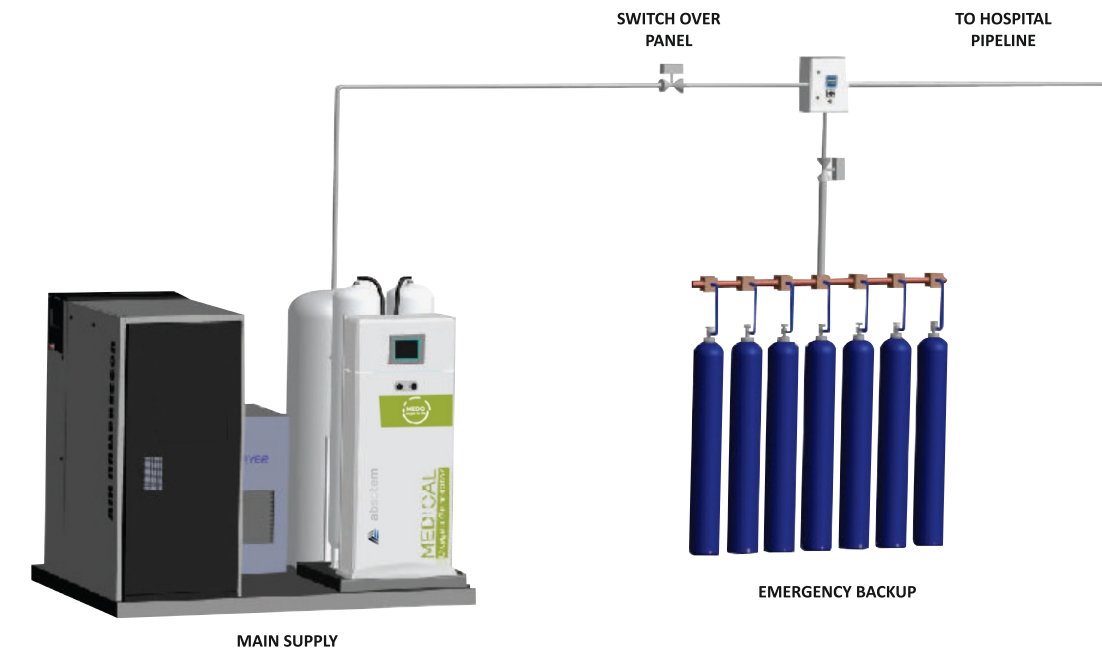
- Rack For Filling Of Small Cylinders For Internal Use In Hospitals Or Used For Homecare Filling And Rescue Services.
- Normal Cylinder Size Would Be From 1 To 4 Liters Cylinders.



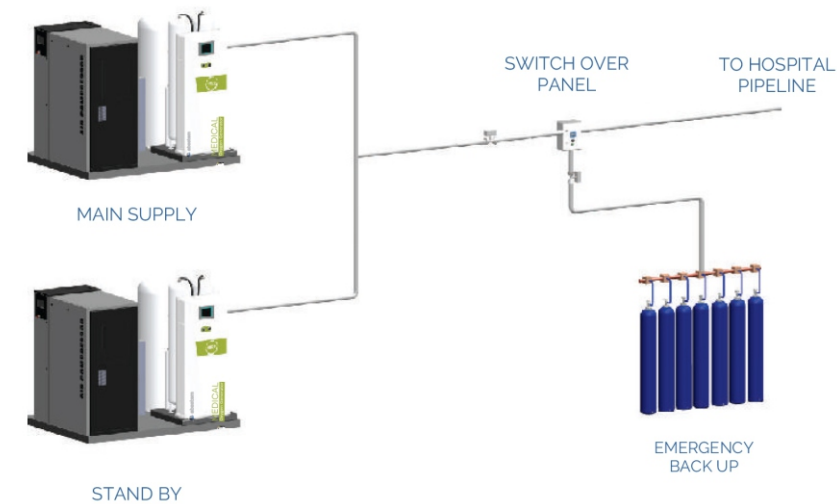
SUPPLY SCHEMES

SCHEME 1 : BASIC

This is the most basic supply scheme and the simplest implementation for any hospital thinking about installing an online oxygen generator for non-interrupted supply. we install one Oxygen Generator and provide a switchover panel. The switchover panel will switch to the existing Oxygen cylinder manifold in case of drop in purity or pressure or any maintenance for the Oxygen generator.



SCHEME 2: REDUNDANT



This scheme is an extension of the basic. for remote areas, customers may consider having a 1W+1S (one working, one standby) Oxygen generator and operate them alternately. The tertiary backup can still be provided from a cylinder manifold.

BENEFITS of Cylinder Filling Stations

- ☑ Hospitals do not need to take off the cylinders for refilling the batch
- ☑ Hospitals do not need operators to carry, handle or change cylinders
- ☑ Hospitals do not need any daily/periodic transportation of cylinders
- ☑ Hospitals do not need to pay any rent for cylinders
- ☑ Hospitals do not need to make bulk storage of cylinders
- ☑ Hospitals do not need to add-on additional cylinders

INDUSTRIAL OXYGEN GENERATORS

The steel industry is the largest user of oxygen. INDUSTRIAL OXYGEN GENERATORS are also used in the Manufacture of other metals, such as copper and lead.



Applications Using Oxygen Generation

- steel making
- Lead and copper smelting
- Oxygen lancing
- Oxy-acetylene cutting, welding and brazing
- Oxygen-enriched combustion
- Oxy-fuel burners

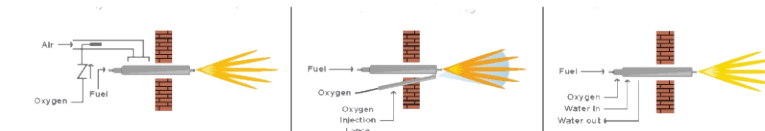
An industrial oxygen generator is used in the production of both ferrous and nonferrous metals for two main purposes:

- Enhanced Productivity
- Reduced Fuel Consumption

By replacing some or all of the combustion air in the burners that are used in melting furnaces, flame temperature and heat transfer are increased while there is a significant reduction in exhaust gas volume and content (e.g. Nox, voc's). the combustion reaction of methane (natural gas) is shown below:

The nitrogen in the air does not enter into the combustion reaction and actually contributes to the energy losses due to the hot exhaust gases leaving the furnace by as much as 40-50%. By adding oxygen to the combustion air, the concentration of nitrogen is significantly reduced depending on the percentage of oxygen enrichment. The major benefits of oxygen combustion are:

IN GENERAL, THERE ARE THREE TYPES OF OXYGEN COMBUSTION PROCESS:



Oxy-fuel burners have been developed for a wide range of metal production furnaces, including:

- Electric Arc Furnaces (EAF's) for steel scrap melting
- Rotary and reverberatory furnace for aluminum production
- Cupola furnaces for cast iron production
- Rotary and blast furnaces for lead manufacture
- Rotary furnaces for copper and its alloys melting
- Crucible furnaces for gold and silver scrap processing

The substitution of conventional air-fuel burners with oxy-fuel burners positively affects furnace operation by:

- Reduced melting costs
- Higher operating flexibility
- Reduced melting times
- Higher slag/metal separation
- Decreased off-gas volume
- Reduced metal oxidation and loss

