



MEDICAL OXYGEN GENERATOR



Air-N-Gas Process Technologies

ISO 9001 : 2008 CERTIFIED COMPANY



INTRODUCTION

Air-N-Gas Process Technologies AN ISO 9001 CERTIFIED COMPANY was established in the year 2007, with an aim to boost the technical advances in the field of Adsorption based Gas Separation Systems, Air Filters and Air Dryers. In this short span of time, we have earned ourselves a niche in the air dryers industry and have established a great rapport amongst the leading manufacturers, exporters, traders and suppliers.

Supported by a group of efficient technocrats, we are headed by Mr. Shailesh Verma (B.Tech-Mech, DMM), who has accumulated a rich experience of more than 19 years in the respective field. Today, we have emerged as a specialized concern in designing, manufacturing, exporting, site installation and commissioning of a varied range of products like Nitrogen/Oxygen Gas Generators, Compressed Air Drying Units, High/Low Pressure Dryers, Air Filters, After Coolers, Auto Drain Valves, Air Receivers, Pressure Vessels, Air & Water Chillers, etc.

Delivering a high on performance range of products and services, we aim to be a leading name as a manufacturer, exporter and service provider in the concerned field. Experimental outlook and innovative designing power have enabled us to established a firm base, and we are sure that the same will take us ahead as well.



Certificate of Registration

*This is to certify that
The Quality Management Systems*

of

AIR-N-GAS PROCESS TECHNOLOGIES

at

**B - 8, MARUTI INDUSTRIAL ESTATE, NEAR KIRAN INDUSTRIES,
PHASE - 1, G.I.D.C. VATVA, AHMEDABAD - 382 445
(GUJARAT) (INDIA)**

Has been found to conform to the Quality Management System Standard:

ISO 9001:2008

This certificate is valid for the following Product or Service ranges:

**MANUFACTURING OF GAS GENERATION PLANTS,
BIO-GAS PLANTS AND AIR & GAS DRYERS**

CERTIFICATE NO. : PCMS/QMS/1799-2014
ISSUED ON : 26/04/2014

VALIDITY DATE : 25/04/2017

1ST SURVEILLANCE DUE ON: 26/03/2015

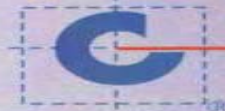
2ND SURVEILLANCE DUE ON: 26/03/2016

THE VALIDITY OF CERTIFICATE IS SUBJECT TO REGULAR SURVEILLANCE AUDIT ON OR BEFORE ABOVE MENTIONED DATES AND IT'S ONLY VALID AFTER SUCCESSFUL SURVEILLANCE WITH CONTINUATION LETTER ISSUED BY PCMS

AUTHORISED BY
CHAIRMAN / DIRECTOR



JAS-ANZ



Acc.No. :- M3111204IN
www.jas-anz.org/register

P.C MANAGEMENT SYSTEM PVT. LTD.

134-A, IIIND FLOOR, TAIMOOR NAGAR,
NEW FRIENDS COLONY, NEW DELHI - 110 065 (INDIA)

THIS IS SINGLE-SITE CERTIFICATION
WEBSITE - WWW.PCMSINDIA.COM
E-MAIL - PCMS@PCMSINDIA.COM

THE CERTIFICATE REMAINS THE PROPERTY OF PCMS AS PER CERTIFICATION AUDIT CONTRACT

Our Group Companies

- (1) Maas Engineering, Ahmedabad – Was established in the year 2009. Company is offering services & spares parts for Nitrogen Plant, Oxygen Plant, Various Air Dryers, Air & Water Chiller..etc.
- (2) W2E Engineering, Delhi – Was established in the year 2011. Company is offering various range customized equipments especially in the field of Bio Gas, Gas drying Systems & Projects.

Key Personalities

- (1) Mr. Shailesh Verma (CEO & Group Head) – Graduate in Mechanical Engineering with MBA in Marketing. More than 23 years of vast experience in Gas Separation technology
- (2) Mr. Sanjay Sharma (Director - Techno Commercial) – Graduate in Mechanical Engineering. More than 25 Years of wide experience at various levels.
- (3) Mrs. Mani Verma (Director – Finance & Admin) - Post Graduate in Labour & Social Welfare. More than 15 Years of vast experience in Admin & Finance.

Our Product Range

We specialize in designing, manufacturing, site installation and commissioning of the following products:



SANATHAN TEXTILES

PSA Nitrogen Gas Generators

PSA/VSA/VPSA Oxygen Gas Generators



BEWL

Ammonia Cracking Units for Hydrogen Generation



SANATHAN TEXTILES



RELIANCE

Refrigerated Air Dryer

Heatless Desiccant
Air Dryer



ISRO

Heat Of Compression Air Dryer



SUMIT INDUSTRIES

Split Flow No Purge Loss Air Dryer



SHREE DURGA SYNTAX PVT LTD

Low Pressure Air Dryer



GUJRAT POLUFILS



Air Chillers

GSP CROP SCIENCE

Water Chillers



GSP CROP SCIENCE

Refrigerated Based Bio Gas Dryer



PRAJ



Desiccant Based Bio Gas Dryer

VATECH WABAG LTD

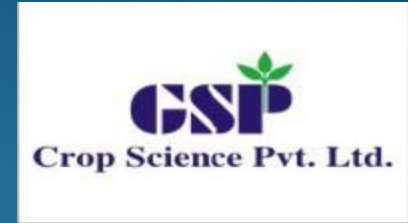
Manufacturing Facilities

We have State of art manufacturing units, which are locate at Ahmedabad. The unit is spread across a sprawling area with an appreciable installed capacity and latest equipments to meet the bulk requirements of our clients. We are facilitated machines and equipments, which enables us to fabricate our range of Industrial Gas Generators, Compressed Air Dryers and Ammonia Cracker as per the set industry standards.

Our sophisticated machines ensure effective and fast production of our range with ease. Further, our team of experts develops these products as per the specifications provided by our clients. We have installed, which has helped us to preserve a good hold in the market of nitrogen gas plants.



SOME OF OUR VALUABLE CLIENT





This is to certify that
Air-N-Gas Process Technologies
*B-8, Maruti Industrial Estate, Near Choksi Tube, Phase -1, GIDC Vatva,
Ahmedabad - 382 445, Gujarat, India*
is now part of the
Dun & Bradstreet Global Database
and has been assigned the
D&B D-U-N-S® Number: 67-693-9111

For Dun & Bradstreet Information Services India Private Limited


Authorized Signatory

February 29, 2012

"The fact that this business is registered in the D&B database should not be construed as suggesting that credit or any other financial or business transaction should be approved, denied, restricted or delayed. It only signifies that there is sufficient information in the database to assign a D&B D-U-N-S® Number."

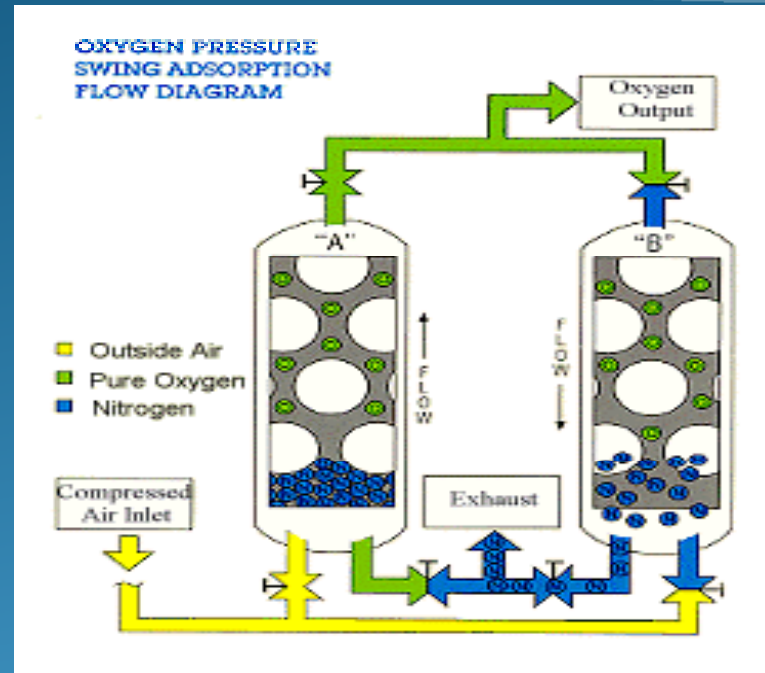
D&B D-U-N-S® Number is a registered number of Dun & Bradstreet Corporation, USA.

93% Oxygen Safe for Medical use....Oxygen Produced meet the United States Pharmacopeia (USP) XXII oxygen 93% Monograph.

OXYGEN 93 PERCENT

USP requirements: Oxygen 93 Percent USP—Preserve 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 is 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%).

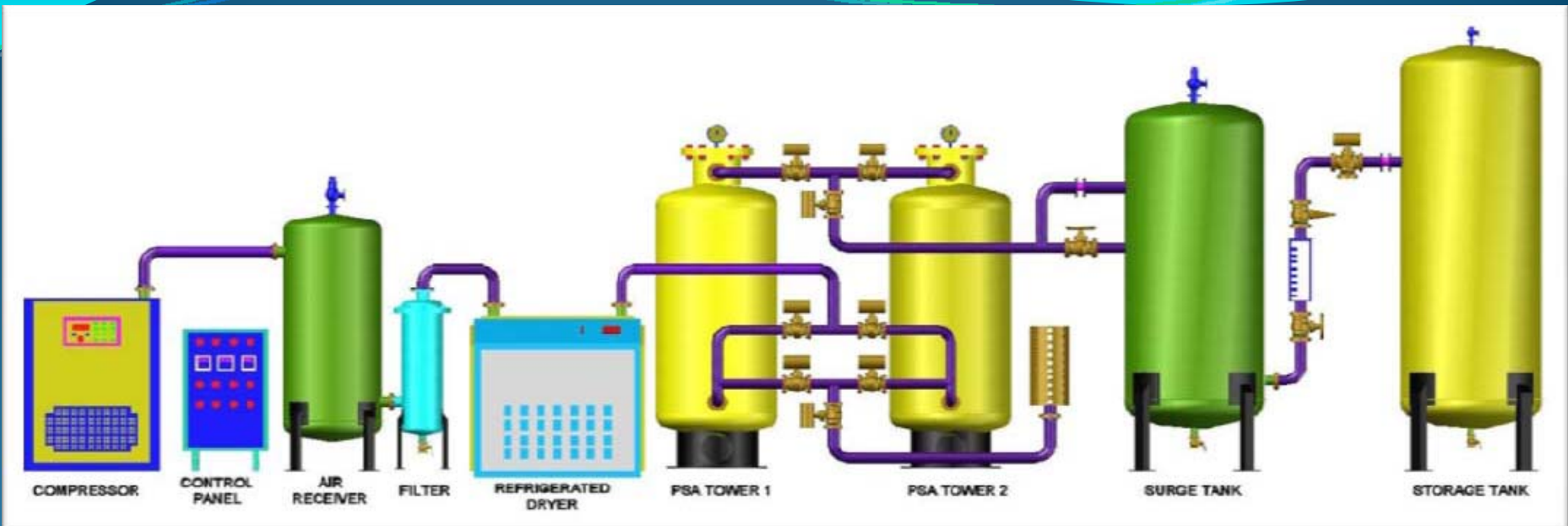
PSA OXYGEN GAS GENERATOR



TECHNOLOGY:- PRESSURE SWING ADSORPTION (PSA)

In this system, when compressed air is passed through an adsorption tower field with Z.M.S, the molecules of nitrogen, moisture & other unwanted gases are adsorbed on the surface of Z.M.S and oxygen which is not adsorbed by Z.M.S comes out of the adsorption tower. This oxygen is collected in a surge vessel. Two adsorption towers are used for continuous generation of oxygen gas, which are interconnected with auto-change over valves controlled by Programmable Control Panel (PLC) in the control panel. After saturation of one tower with oxygen, the process automatically changes over to another tower resulting in the continuous production of oxygen gas for long.

Scope of supply of the Oxygen Gas Generator



- 1)Compressor
- 2)Filtration System
- 3)Air Receiver
- 4)Refrigerated Air Dryer
- 5)PSA Tower
- 6)Surge Tank
- 7)Storage Tank

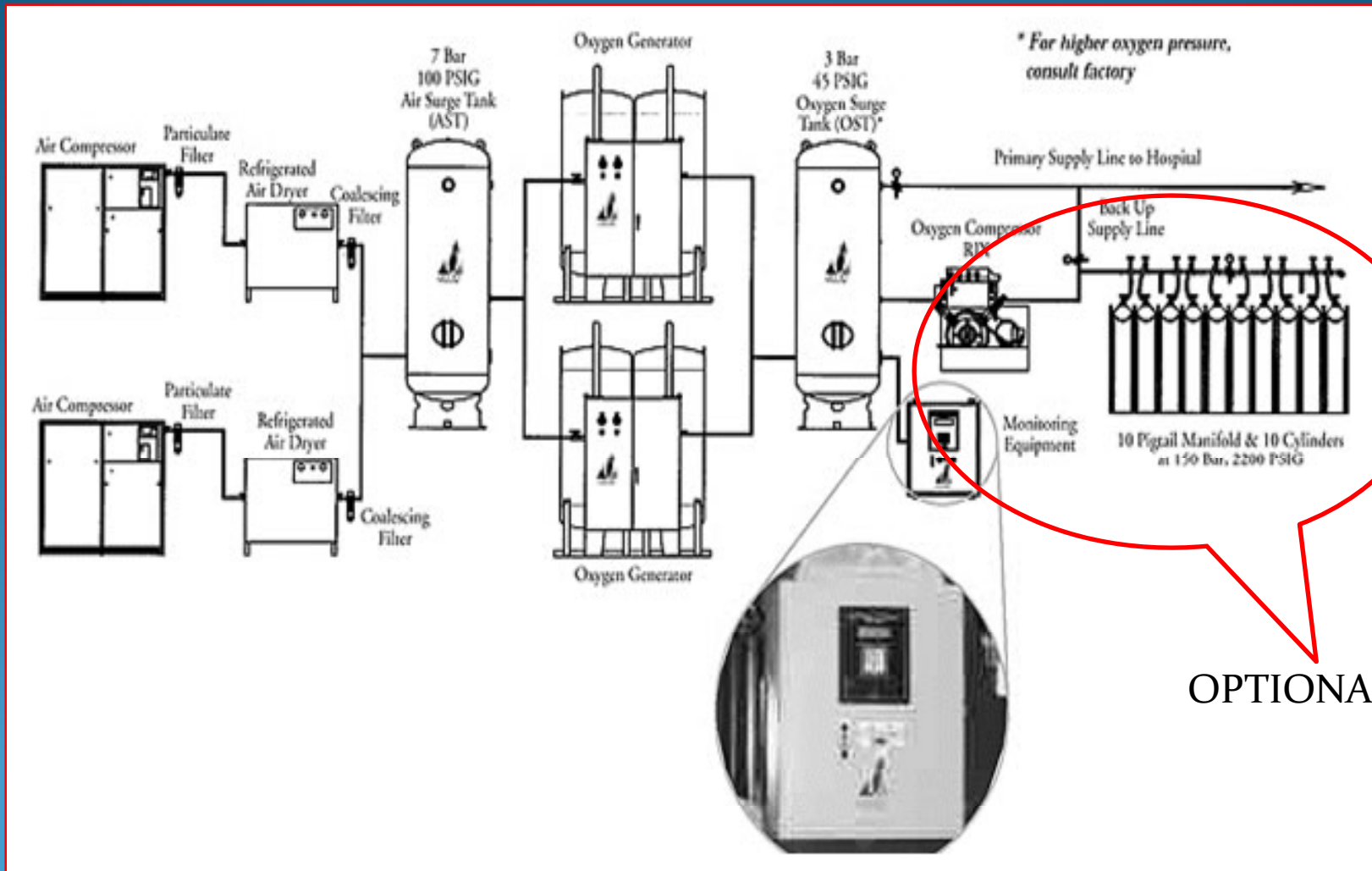
With All Necessity Instruments As Per Medical Norms.

Features

- 1) Based On Well Proven PSA Technology. More Than 10000 PSA Plants Working in India.
- 2) Fully Automatic Operation requiring no special attention- Man less Operation
- 3) Generates Oxygen as and when required – Plug It, Switch on & forget
- 4) Lower your Facility's Operation Cost – Take it directly from Air
- 5) Continuously monitored purity and pressure.
- 6) Low Temperature Adsorption Technologies For Batter Life of ZMS
- 7) Economic, payback within 15 months.
- 8) Energy saving – depends on the consumption.
- 9) Easy to install and maintain – Skid Mounted & pre-commissioned.

- 10) Eliminate the hassles of Purchasing, Receiving & Monitoring Your Hospital's Oxygen Supply
- 11) Failure Indication .
- 12) Automatic switch to secondary Oxygen supply while system failure and power shutdown.
- 13) Free from bacteria.
- 14) Effective filtration system.
- 15) System guidelines as per IS 10083.
- 16) Oxygen safe for medical use as per USP Requirements.
- 17) **PURITY OF OXYGEN UP TO 93-95% CAN BE ACHIEVED (APPROVED BY US PHARMACOPEIA)**

SCHEMATIC DIAGRAM OF O2 PLANT



MODEL SELECTION

<u>MODEL</u>	<u>GEN CAP O2</u>		<u>Air Demand</u>			<u>Area Reqd (LXWXH) In mm</u>			<u>EQUIVALENT NOS.</u> <u>OF CYLINDERS/DAY</u> BASED ON 20 HRS	<u>EQUIVALENT NOS.</u> <u>OF CYLINDERS/DAY</u> BASED ON 16 HRS
	<u>NM3/Hr</u>	<u>LPM</u>	<u>LPM</u>	<u>NM3/Hr</u>	<u>KW</u>				<u>GENERATION PER DAY</u>	<u>GENERATION PER DAY</u>
AGOG 03S	0.3	5	64	4	0.42	450	300	450	0.9	0.7
AGOG 05S	0.6	10.00	128	8	0.84	450	300	450	1.7	1.4
AGOG 10S	1	16.67	213	13	1.4	450	300	450	2.9	2.3
AGOG 20M	2	33.33	425	26	2.8	900	550	1200	5.7	4.6
AGOG 50M	5	83.33	1063	64	7	900	550	1200	14.3	11.4
AGOG 75M	7.5	125.00	1594	96	10.5	900	550	1200	21.4	17.1
AGOG 100M	10	166.67	2125	128	14	900	550	1200	28.6	22.9
AGOG 150L	15	250.00	3188	191	18	1800	1500	1800	42.9	34.3
AGOG 200L	20	333.33	4250	255	24	1800	1500	1800	57.1	45.7
AGOG 300L	30	500.00	6375	383	36	2100	2000	2200	85.7	68.6
AGOG 400L	40	666.67	8500	510	48	2100	2000	2200	114.3	91.4
AGOG 500L	50	833.33	10625	638	60	2100	2000	2200	142.9	114.3
AGOG 750L	75	1250.00	15938	900	82.5	3000	2000	3500	214.3	171.4
AGOG 1000	100	1666.67	21250	1200	110	4000	2000	4500	285.7	228.6
AGOG 1250	125	2083.33	26563	1500	137.5	4500	2000	4500	357.1	285.7
AGOG 1500	150	2500.00	31875	1800	165	5500	2000	4500	428.6	342.9
AGOG 2000	200	3333.33	42500	2400	220	7000	3000	6000	571.4	457.1

COMPARISON



Parameters	ANG Onsite PSA O ₂ Generator	Existing Cylinders
Autonomy	Our System gives you full autonomy. No more gas supply Constraint.	There are constraints of Suppliers. Logistic dependency. Local Turmoil dependency. etc
Handling	Easy to handle. Fully Automatic.	Tough to carry. Unloading and loading is tough job
Cost	Cost involves only in Electricity. As Raw Air is free. 1 Cu. M cost approx. 7.5-9.9/-	Heavy costs involve. 1 Cu. M cost approx. 20-22/-
Safety	Secure and safe in operation.	Not Safe. As, Cylinders are at 150 Bar Pressure. May Explode and cause serious injury.

Why our quality is better than cryogenic oxygen?

- ANG Oxygen Generator use molecular sieves as adsorbent to separate oxygen from air. Like Magnets Molecular sieves strongly attracts certain type of molecules such as those of nitrogen, CO₂, CO, Hydrocarbons, water etc. have positive and negative electrical poles.
- These polar molecules are strongly attracted to Molecular Sieves. For this reason the CO₂ & CO in the PSA generated can not exceed 1 PPM. This is far less than 5 to 50 PPM that you find in cryogenic oxygen.

Why better than liquid oxygen?

- **Space:** Does not consume bigger space like Liquid oxygen which requires at least 225 Sq. Ft. to 3000 Sq.Ft. or more at ground floor.

Our system can be installed at terrace.

- **N.O.C.:** You need to take NOC of Chief controller of explosive, Nagpur to install this system as it is highly hazardous & inflammable as liquid oxygen need to be maintained at (-200 degree Celsius), also need to renew it every year. Our system is non hazardous.
- **COST:** You need to Pay one time installation cost ,per month rent & per liter cost for liquid oxygen tank which increases with transportation cost.
- **LOSSESS:** Heating transmission, evaporation & leakage is additional loss in Liquid gas. Truck entering in hospital premises raises issue of safety.
- **Low Temperature:** The low temperatures of oxygen can produce cryogenic burns and frostbite to the oxygen delivery system within the lungs, which will lead to asphyxiation
- **Hazardous:** High working pressure condition, explosive, high requirements for transportation and worksite. Only one mistake, Consequences are severe.

HOW TO CALCULATE CAPACITY OF THE PLANT?

Capacity = (no. of bEds * 0.75 lpm) + (other outlet x 10 lpm)

(other outlet = icu bEd + operation theatres etc.)

capacity in cfm = lpm x 0.0357

as per cylinder

1 cylinder = 6.5 nm³ = 6500 liter

50 cylinders = 325 nm³ = 3,25,000 liter

working hour = 24 hour ,

so the plant capacity = 3,25,000 / 24

= 13541.6 liter/hour

= 13542 liters/hour

1 nm³ = 1000 liter

so 13542 liters = 13.541 nm³

there for you will purchase the 15 nm³/hr o₂ generation plant

ECONOMY COMPARISION OF ANG PLANT VS CYLINDER

ECONOMY OF PSA OXYGEN PLANT VS CYLINDER OXYGEN

Assuming you are using	50 cylinders per day	(cap 6.5 M3)
Total daily consumption	325 M3	
Each cylinder costs around	190	(cost of refilling, transportation, handling, procurement)
Total cost of OXYGEN per day	9500	
A) Cost of Oxygen per annum	<u>3467500</u>	(considering 365 working days per annum)

FROM PSA OXYGEN GENERATOR

OPERATIONAL COST

Kindly note that the major consumable for oxygen generation is the power consumed by Air Compressor

Power Consumed	22 KWH	
Cost of O2 generation per hr	154	(considering power tarrif @ 7 Rs./KWH)
Cost of O2 generation per day	3696	(considering 24 Hrs generation per day)
B) Cost of O2 generation per annum	1349040	(considering 365 working days per annum)

Savings per annum (A-B)

2118460 i.e.

O2 Cost from cylinder	<u>3467500</u>	
O2 Cost from generator	1349040	
saving per annum	2118460	
payback period	<u>0.708</u> yrs	Considering O2 Plant cost 1500000

It is evident that Oxygen produced from PSA OXYGEN GENERATOR is much much cheaper than cylinder oxygen

Apart from huge economical benefit you are also saved from regularly procuring & changing of cylinders

Our PSA Oxygen Gas Generator is completely automatic requiring no operator's attention

Also it is onsite gas generator which is not affected by bad weather, bad roads & strike in factory

ECONOMY COMPARISON OF ANG PLANT VS LIQUID OXYGEN

ECONOMY OF PSA OXYGEN PLANT VS LIQUID OXYGEN

Assuming you are using	325	M3 Liquid Oxygen per day (13.54 cub.m/hr	1 nm3 in gas form =	1.25	Litres in Liquid form
Total daily consumption	406.25	Litre/Day			
Costs of Liquid Oxygen/Litre	19	(cost of transportation,procurement)			
Total cost of OXYGEN per day	7718.75				
Liquid Oxygen Rent/Month Rs 15000	180000	Liquid oxygen Per Annum			
A) Cost of Oxygen per annum	<u>2997344</u>	(considering 365 working days per annum)			

FROM PSA OXYGEN GENERATOR

OPERATIONAL COST

Kindly note that the major consumable for oxygen generation is the power consumed by Air Compressor

Power Consumed	22	KWH			
Cost of O2 generation per hr	154	(considering power tariff @	7	Rs./KWH)	
Cost of O2 generation per day	3696	(considering	24	Hrs generation per day)	
B) Cost of O2 generation per annum	1349040	(considering	365	working days per annum)	

Savings per annum (A-B)

1648304 i.e.

O2 Cost from cylinder	<u>2997344</u>		
O2 Cost from generator	1349040		
saving per annum	1648303.75		
payback period	<u>0.910</u>	yrns	Considering O2 Plant cost 1500000

It is evident that Oxygen produced from PSA OXYGEN GENERATOR is much much cheaper than cylinder oxygen

Apart from huge economical benefit you are also saved from regularly procuring & changing of cylinders

Our PSA Oxygen Gas Generator is completely automatic requiring no operator's attention

Also it is onsite gas generator which is not affected by bad weather, bad roads & strike in factory

Indian Central Drug Standard control Organization Amendment and approval

Drugs and Cosmetics Rules, 1945

GSR 735 (E) Dated 21.12.2005-Drugs and Cosmetics (8th Amendment) Rules,2005 published to substitute Part I in the Schedule O of the Drugs and Cosmetics Rules, 1945 with a new entry.GSR 734 (E) Dated 21.12.2005-Drugs and Cosmetics (7th Amendment) Rules,2005 published to insert in the Drugs and Cosmetics Rules, 1945, in ScheduleK, after Serial Number 33 and the entries relating thereto, a new entry No (34)shall be inserted relating to Exemption for Production of Oxygen 93 % USP.

Air-N-Gas Process Technologies

OXYGEN
PLANT

OXYGEN
PLANT

THANK YOU

NITROGEN
PLANT

AIR & GAS
DRYER

