

Nomenclature

- 1 Air Compression
- 2 Air Purification
- 3 Air Expander
- 4 Cold Box with internal Compression
- 5 Cylinder Filling Ramp

Oxygen (O ₂)	Info
Molar Mass	32 g/mol
Density	1.14 kg/dm ³
Covalent Radius	66 pm
Number of Electrons	16
Vapor Pressure	1.52 mbar
Melting Point	54.4 K
Boiling Point	90.2 K

THE EXPERIENCE

Hi-Tech Engineered Solutions, one of the World's leader in Installing, manufacturing turn key based Cryogenic Oxygen / Nitrogen Cylinder filling plants, also offers custom engineered cryogenic gas plants for Bulk Industrial or Medical Grade Oxygen, Industrial cylinder filled nitrogen up-to parts per million (ppm) grade that are designed to Specific Requirements of Installation with Capacities ranging from 30 Nm³ per Hour to 500 Nm³ per hour.

Hi-Tech's high-efficiency, rugged Medium pressure cold box design offers extremely low energy consumption with easy operation, and long term Plant life of 50 years or more under standard tests. Hi-Tech Engineered Solutions has designed and supplied more than 100 Cryogenic Cylinder filling plants, Plants are currently in use all over the world in remote, harsh, and demanding environments throughout globe.

THE PROCESS

Free atmospheric air is sucked in by a multi stage air compressor through a filter and compressed to working pressure. The compressed air is then passed through a purification skid for pre-cooling, removal of dust, hydrocarbon, moisture and carbon dioxide. This purified air then enters to cold box and passes through first Heat Exchanger, where it is cooled by the outgoing Nitrogen and Oxygen. Part of this cooled air then passes through an air expander and other part through the second heat exchanger. Both Air Expander & second heat exchanger help in cooling down the air further, which is finally released to the bottom of the rectification column for fractional distillation.

The rectification column is divided into two parts Lower column and Upper column. In between lower and upper columns there is a condenser which acts as a reflux for the lower column and as re-boiler for the upper column. Both Oxygen & Nitrogen are removed by separate pipelines, compressed and passed through heat exchangers for cooling the incoming air direct to filling manifolds.

THE SCOPE OF SUPPLY

The cryogenic oxygen plant mainly comprises of following-

- ✓ Cyclone Air Filter
- ✓ Air Compressor
- ✓ Process Skid
- ✓ Specially selected adsorbent materials
- ✓ Cold Box Assembly
- ✓ Air Expander
- ✓ Liquid Oxygen Compression
- ✓ Oxygen & Nitrogen Cylinder filling ramp
- ✓ Oxygen & Nitrogen Product Analyzer
- ✓ Electrical Panel
- ✓ Electric Induction Motors
- ✓ Interconnecting pipelines
- ✓ Set of insulation materials
- ✓ Set of installation spare-parts

Optional-

- ✓ Re-Circulated Cooling water system
- ✓ Liquid Nitrogen withdrawal
- ✓ Liquid Oxygen withdrawal
- ✓ Nitrogen cylinder charging upto 415 Bar

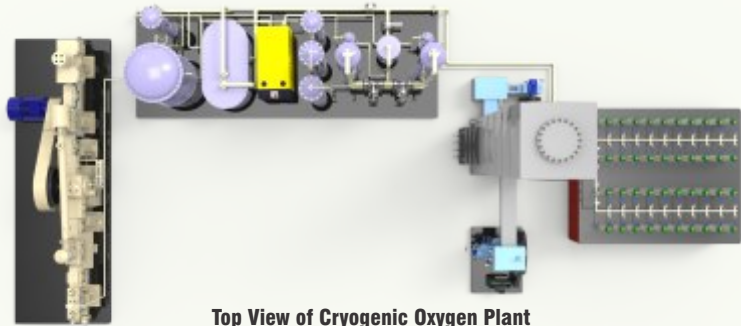
ADVANTAGES

General Features of Oxygen Plant Available-

- ✓ CE compliance
- ✓ Efficient, reliable oil-flooded compressor
- ✓ High-performance oil free Air Expander
- ✓ Cost Saving of up-to 50% from Cryogenic liquid supply
- ✓ Proven air pre-purification clean up system
- ✓ Choice of 50 or 60 Hz power systems
- ✓ Choice of 220 to 440 V Electrical power systems
- ✓ Ships as standard ISO containers to minimize transportation expense
- ✓ Complete with all interconnecting piping & electrical systems, ready for installation
- ✓ Dependable Highest Reliability with Energy Efficiency
- ✓ Compact design with Easy and Simple controls
- ✓ State-of-the-art analytical instrumentation package
- ✓ Easy to maintain with continuously monitored Purity & Flow
- ✓ Integrated cylinder filling system for oxygen & nitrogen
- ✓ Optional product storage tank
- ✓ Optional Fully Automatic touch screen control

Services-

- ✓ On-site or in-factory operator training
- ✓ Installation and commissioning assistance
- ✓ Extended warranty packaging
- ✓ AMC / Service package



Top View of Cryogenic Oxygen Plant

Hi-Tech Engineered Solutions Equipment Operating in over 50 Countries

With our Worldwide base of installed equipment, Hi-Tech Engineered Solutions has the engineering and manufacturing experience to integrate successfully into Plants for Ozone, Oxygen, Nitrogen, Argon, Acetylene, Nitrous Oxide & Carbon-dioxide. Our sales and service Network is dedicated to keeping your Oxygen Plant in top condition throughout year.



Ingersoll Rand Make Air Compressor

PLANT UNIQUE FEATURES

- ✓ FEA Validated design.
- ✓ Completely Pre-Piped & Skid Mounted.
- ✓ Full containerized shipments right from factory.
- ✓ All Steel design suitable for Medical grade oxygen as per US or EN Pharmacopeia.
- ✓ Automatic shutdown for in case of high Temperature, High Pressure
- ✓ Designed in accordance with local standards.
- ✓ On-site start-up Training and assistance by Hi-Tech's technicians anywhere in the World.



Rectification Column

A Full Line of Oxygen/Nitrogen Cylinder Filling plant available

Our Plant Provides from 30 to 500 Nm³/hr of Oxygen Gas. Use the following Table to determine which model is most suitable to your application.

Model		HTO-30	HTO-50	HTO-80	HTO-100	HTO-150	HTO-200	HTO-300	HTO-500
Production									
Gas Oxygen	Nm ³ /hr	30	50	80	100	150	200	300	500
Gas Nitrogen	Nm ³ /hr	8	18	29	40	65	85	135	235
Purity									
Oxygen	%O ₂ , min	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Nitrogen	ppm O ₂	2	2	2	2	2	2	2	2
Product Pressure									
Oxygen	Bar max	220	220	220	220	220	220	220	220
Nitrogen	Bar max	415	415	415	415	415	415	415	415
Utilities									
Power	KW	55	85	125	150	225	290	425	700
Specific Power	KW/hr/Nm ³	1.25	1.2	1.1	1.0	1.0	0.85	0.8	0.75
Cooling Water									
Makeup	lpm	4	8	12	14	18	18	20	20
Temperature	Deg C	25	25	25	25	25	25	25	25

-Plant performance is based on standard atmospheric conditions (ambient temperature 20° C, relative humidity 50%, cooling water temperature 19°C, 1.0 atm. barometric pressure)
 -Higher Capacity / Custom Built units also available, makeup with recirculated cooling water system, Specific power excludes cooling water system.

WORLDWIDE LOCATION

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YOUR LOCAL CONTACT

