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SUMVED
International

# Medical
## Oxygen Plant

## Medical Oxygen Plant


- Fully contained design for quick installation.
- PSA Technology delivers uninterrupted oxygen supply
- Built-in with safety automatic change over to backup system
- Meets ISO 7396 standards for use in hospitals
- ISO 13485-2016 Certified
- Easy to use and digital display at all critical parameter

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# ABOUT US


- Established in the the year 1988 - more than three decades of service to the industry.
- First to develop Auto drain valves in india.
- One of the leading Manufacturers of Compressed Air treatment products like:
  - Auto drain valves
  - Refrigeration / Desiccant Air dryer
  - Micro filters
  - Medical Breathing Air dryer
  - Nitrogen Generator
  - Oxygen Generator
- ISO 9001.2015 Certified company. ISO 9005, ASME, CE, UL & EN Standards are endorsements of our commitment to quality.
- Strong presence in the country with wide network of more than 100 dealers / associates for Customer support.
- Best practices like lean method, six sigma are followed in manufacturing.
- Supported by strong R&D team with qualified engineers.
- ISO 13485

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- Trident recently developed oxygen plant in technology collaboration with DRDO.
- Proud to be a part of PM Cares Initiatives for oxygen plant installations across the Country.

PMCARES
Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund

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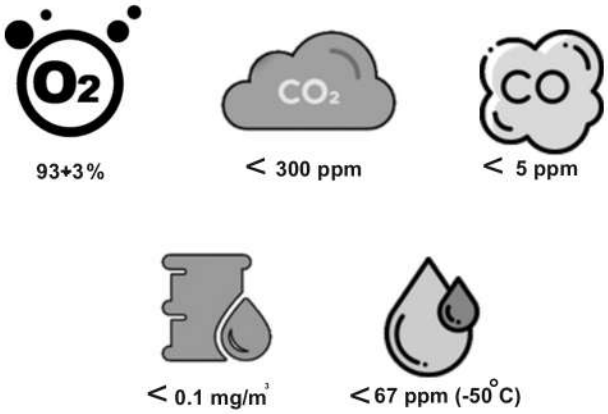
## Medical Grade Oxygen Quality




## Other Applications :

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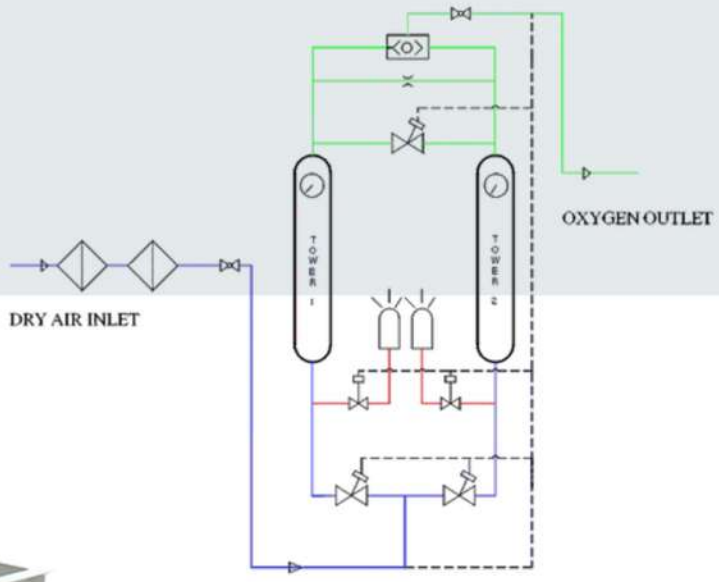


## Principle of Operation :

Oxygen plant works on the Pressure Swing Adsorption (PSA) technology. The moisture free air centers into the zeolite towers where the nitrogen and other gases are adsorbed and thus only oxygen at the desired purity level is delivered at the outlet.

**Generation Cycle:** Purified (Moisture and oil free) air from the compressed air system, passes through one of the tower filled with molecular sieves (Zeolite type). The sieves selectively adsorbs nitrogen, allowing oxygen to pass through at the desired purity level.

**Regeneration Cycle:** During regeneration cycle, the sudden depressurization brings out nitrogen molecules trapped in the sieves pores to the surface of the beads. Small portion of the oxygen from the drying tower is passed over the sieves through the regeneration orifice. This results in complete regeneration of molecular sieves and the trapped gases are completely exhausted.

The automatic cycling of the adsorption and desorption between the two beds enables the continues production of oxygen.

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**PLC BASED CONTROLLER WITH DIGITAL DISPLAY**

- Gas Purity
- Pressure
- Flow
- Operation hours
- Provides indication of plant maintenance schedule


## Automatic Alarm in case of :

- Low pressure (less than 4 bar)
- Low purity (less than 85 %)
- Low pressure and Low purity
- Power failure

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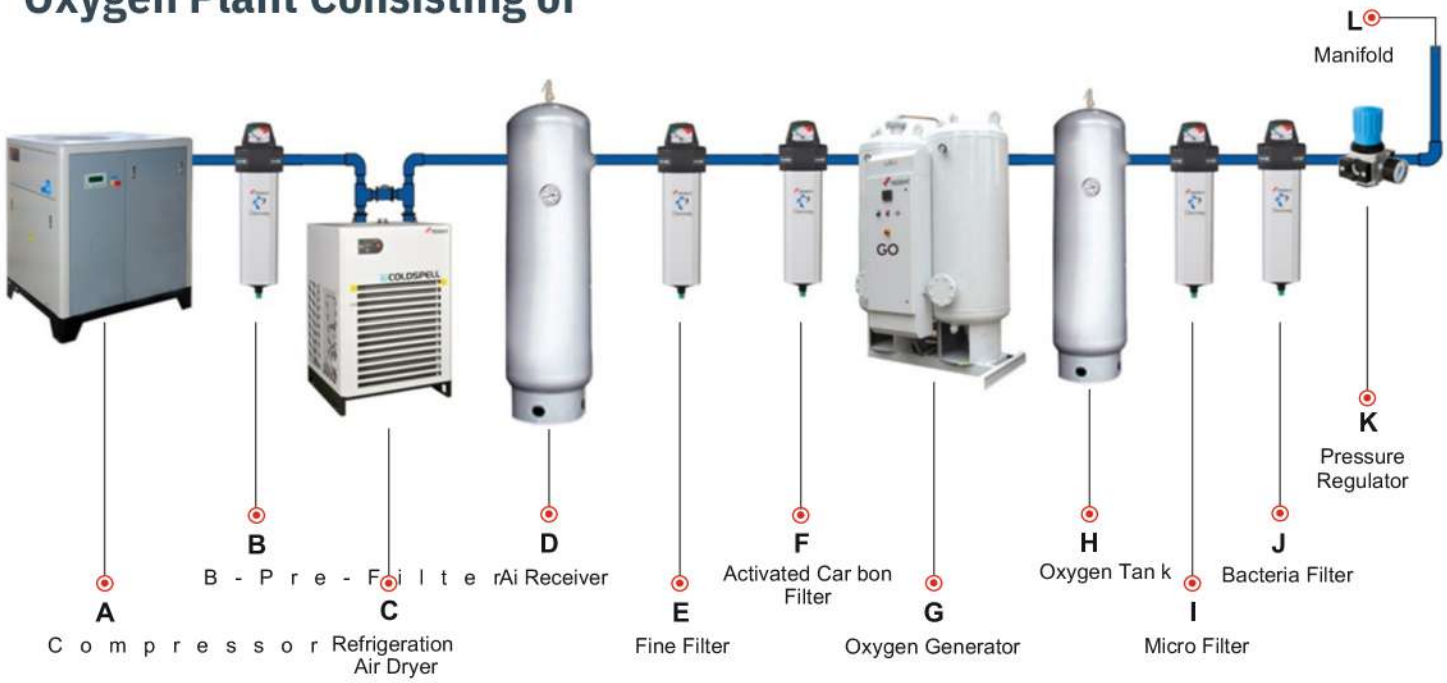
## Benefits:

- Produce as per demand
- Faster payback period
- No safety risks associated with handling high pressure cylinders
- Concentration up to 93±3%.
- Avoid oxygen cylinder availability, logistics and management problem
- Can be used as mobile application also
- Low operating cost
- Easy to install and maintain


ISO 7396-1

## Oxygen Plant Consisting of



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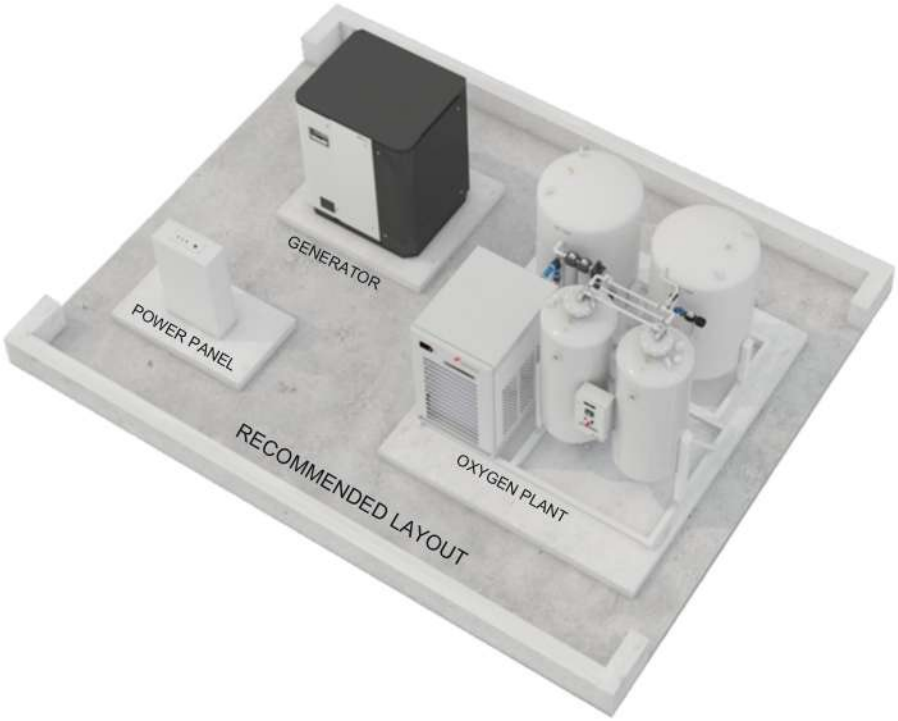


| Model | Room Layout (in mtrs) | | |
|---|---|---|---|
| GO x | L | B | H |
| GO 85 | 5.3 | 4.7 | 4.3 |
| GO 180 | 5.9 | 5.0 | 4.3 |
| GO 260 | 6.7 | 5.1 | 4.6 |
| GO 390 | 7.3 | 5.6 | 4.5 |
| GO 470 | 7.3 | 5.6 | 4.5 |
| GO 570 | 7.3 | 5.6 | 4.6 |
| GO 960 | 8.5 | 6.4 | 4.7 |

For higher model, contact factory

| Model | capacity | | Equivalent | | Air requirements (comp.power) | | | Dimensions (in meters) | | | Air/ oxygen Receiver Liters |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LPM | cu.m/hr | Liquid oxygen liters/day | No.of Cylinders /day | cfm | Pressure in kg/cm2 | Power in kw | L | B | H | |
| GO 85 | 85 | 5.1 | 153 | 15-18 | 44 | 7 | 7.5 | 1.3 | 1.7 | 2.5 | 300 |
| GO 180 | 180 | 10.8 | 324 | 35-80 | 100 | 7 | 15 | 1.8 | 1.9 | 2.5 | 500 |
| GO 260 | 260 | 15.6 | 468 | 50-60 | 144 | 7 | 22 | 2.1 | 2.1 | 2.8 | 1000 |
| GO 390 | 390 | 23.4 | 702 | 70-86 | 205 | 7 | 30 | 2.5 | 2.6 | 2.7 | 1500 |
| GO 470 | 470 | 28.2 | 846 | 90-105 | 250 | 7 | 37 | 2.5 | 2.6 | 2.8 | 1500 |
| GO 570 | 570 | 34.2 | 1026 | 110-126 | 310 | 7 | 45 | 3.9 | 3.4 | 2.8 | 1500 |
| GO 960 | 960 | 57.6 | 1728 | 170-220 | 525 | 7 | 75 | 3.9 | 3.4 | 2.9 | 2000 |

## Suggested Guidelines for Selection :

Capacity =(1 x No. of beds + No. of beds in ICU x 10 + No. of beds in operation theater x 10) (lpm)

**Compressor KW and related CFM would differ from make to make.**

**Kindly ensure the compressor with above mentioned CFM in installed.**

### Specification:

**Oxygen purity..... 93+_3%**

**Oxygen pressure..... 4-5 bar (g)**

**Air Pressure ..... 7 bar g**

**Air inlet temperature.....45 deg C max**

**Ambient temperature.....45 deg C max**

**Air Quality.....ISO 8573 - 2010 class 1-4-1**

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Trident's Medical Oxygen Plant are designed in such way, it will work at site 24 x7 without any trouble. All the components used in product are highly reliable and tested as per the Industrial standards. All the safety precautions have been addressed (stand by gas supply mode automatically in case of any failure mode like purity, power failure etc.) to give uninterrupted gas supply.

Trained service team are available across the country to attend the service calls for breakdown as well maintenance.
Necessary documents and training will be provided to users to handle minor breakdowns.

- 45 service outlets in India.
- Centralized service log system.
- Onsite training for the users.
- Genuine spares available at the nearest point.
- Competitive and effective annual maintenance contracts available at the end of warranty period.

## Comparison

| Factor | On-site oxygen production using PSA processes | Liquid oxygen supply systems | High-Pressure cylinder |
|---|---|---|---|
| Capital costs | Investments Required by; but pay-back period(compared with high-pressure cylinders)less than 15 months | Investment required | Investment not required |
| Recurring costs | Electricity | Cost of liquid oxygen and rent | Cost of oxygen |
| Space requirements | Medium | High | Least; but depends on number of cylinders |
| Administration | Easy | Difficult | Difficult |
| Safety | Safe | Risk of uncontrolled release of oxygen | Risk of explosion |
| Logistic management | One-time-installation of the plant | Issues might arise when a tanker needs access to bulk-storage tank to refill liquid ozygen | Issues might arise with the transport, storage and accessing of the cylinders |
| Evaporation loss | None | Up to 20% | 3% unusable |

## Recovery of investments

| | High-pressure Cylinders | On-site oxygen plant (Model : GO 180 Flow : 180 LPM) |
|---|---|---|
| Basis of estimates | Usage: 40 cylinders per day Cost of one cylinder:₹200 | Investment: 25,00,000 + taxes power requirement: 15 Kw |
| Total expenses per month (₹) | 40 cylinders per day x 30 days x 200 per cylinders = 2,40,000 | Monthly power bill: 15Kw x 75 % loading time x 24 hours x 30 days x ₹ 8 per Kw hour = 64,800 |
| Savings per month (₹) | —— | 2,40,000 - 64,800 = ₹1,75,200 |
| Payback Period | —— | 25,00,000/1,75,200 = 14.26 months |

Note: Plant price, Cylinder cost, Power cost mentioned above is tentative.

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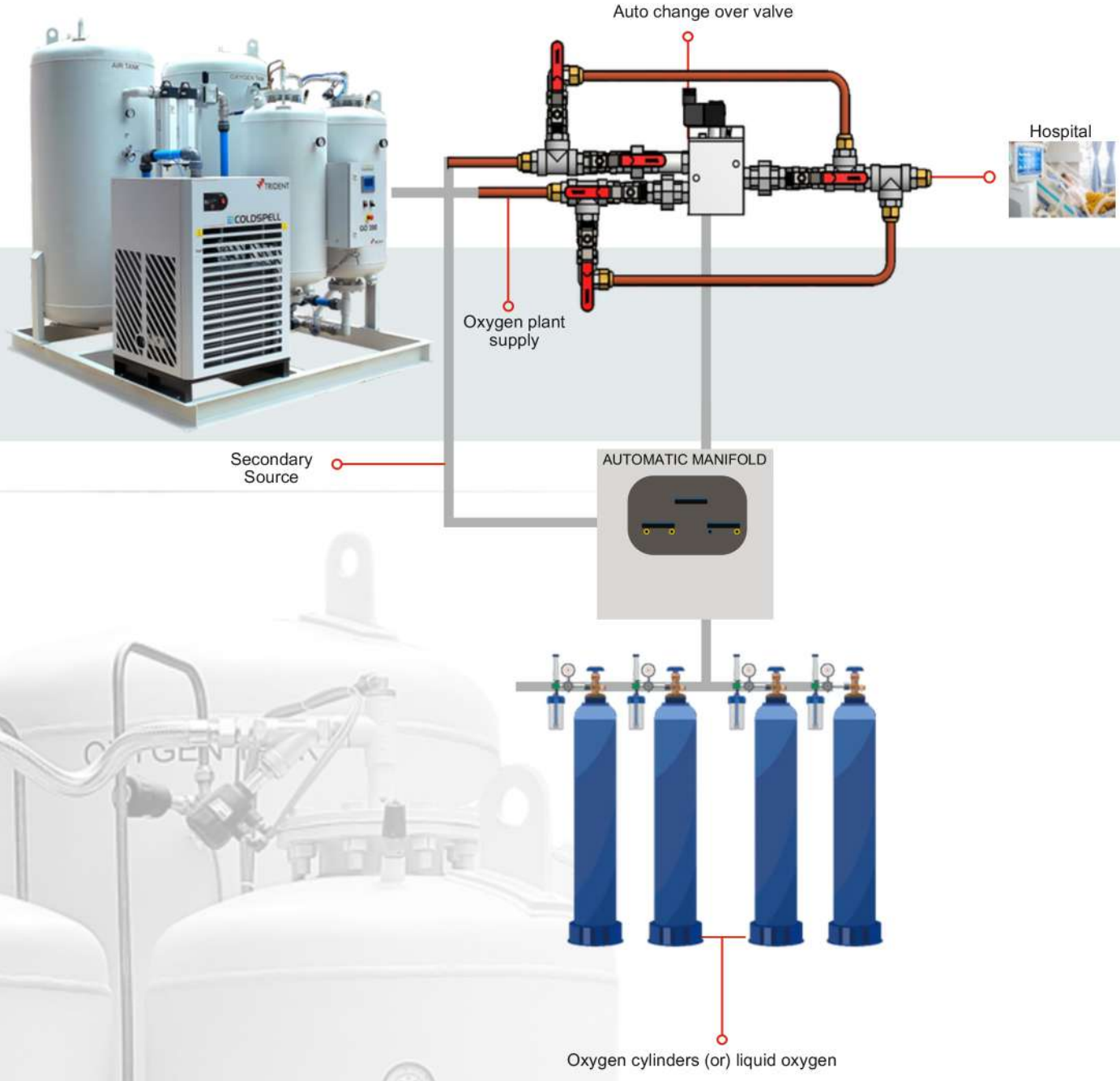
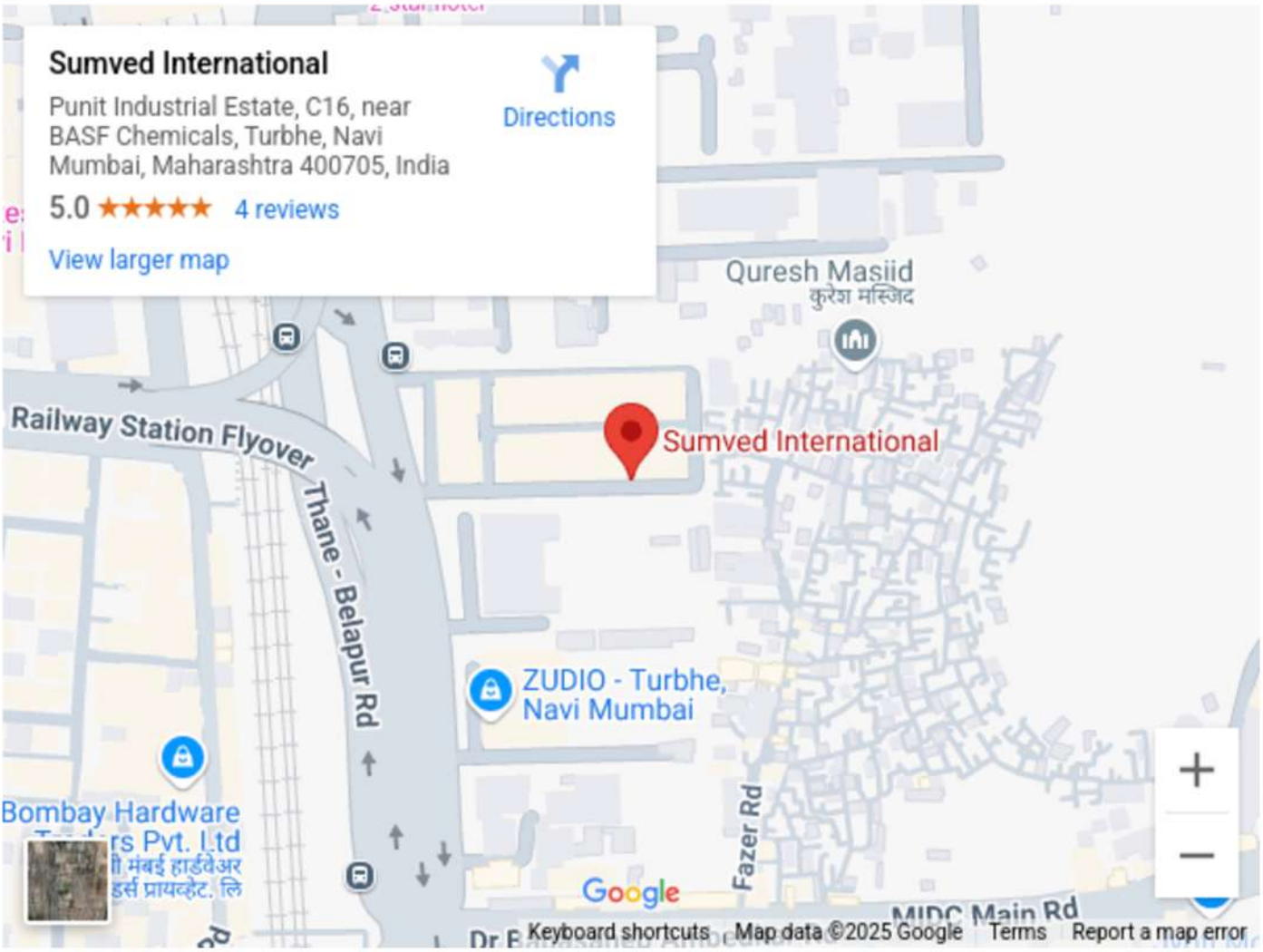
# RECOMMENDED OXYGEN SUPPLY CONNECTIONS

- Auto change over valve ensures the oxygen supply from the secondary source is triggered and continued incase of output set back from the oxygen plant.
- Installation of auto change over valve with secondary source connected is compulsory.



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