

## Technical Specifications for Medical Oxygen Generator

1. The non-cryogenic, O<sub>2</sub> generations system for hospitals should be mobile and easy to move around with the design such that total weight is less than 300kg
2. The O<sub>2</sub> generations system for hospitals should be capable of producing oxygen of purity 90-96% at the specified flow rates.
3. The O<sub>2</sub> generation system for field hospitals should be designed and built to international standards with CE, FDA, GMP or ISO 13485 accreditations/certifications
4. The O<sub>2</sub> generation system for hospitals should be able to work efficiently in the environmental extremes encountered in deployable areas:
  - (a) At altitudes from sea level (0 m) to up to 5000 m above sea level
  - (b) Operating Temperature 5-45°C
  - (c) Storage temperatures +70- -20°C
  - (d) Dusty environment with up to 25% dust
5. Operational Timings:
  - (a) The set up time should be of less than 60 min after arrival in the operational site.
  - (b) The ramp up time should be of less than 10 min after the start.
6. The O<sub>2</sub> generation system for hospitals should have the following power ratings:
  - (a) Capable of running on single phase with voltage: 220-230V +/- 10%/ 50-60 Hz
  - (b) Should be able to run on diesel generator power
  - (c) Total power consumption should be equal or less than 4.0 KW/h
  - (d) Amperage of individual components should be <18 Amp
7. The O<sub>2</sub> generation system for hospitals should contain the following components:
  - (a) Modular unit consisting of
    - i. Integrated Feed Air Equipment (air compressor, dryer and feed air filter set)
    - ii. Microprocessor based, Pressure Swing Absorber (PSA) oxygen concentrator plant at 1.2-2 Bar pressures
    - iii. Booster pumps to bring pressure of medical grade oxygen to 5 Bar
    - iv. Set of oxygen Bacterial Filters
  - (b) Booster compressor to maintain a pressure of Max 5 Bar for running ventilators.
8. The modular units should have the following specifications:
  - (a) Independently operated production units of 5-10 Liters per minute (LPM) operating in synchronization yet running independently.

- ▼ (b) Able to function independently of each other and in case any component like compressor or instrumentation system fails, it should not affect the other operating modules.
  - (c) Any component can be maintained without interrupting the gas supply to the pipeline distribution system.
  - (d) No interruption of oxygen supply upto 5 Bars in the normal condition or in a single fault condition of any component.
  - (e) In case of power cut, there must be an automatic back up system to maintain oxygen supply.
9. The air compressors in the system shall have the following specifications:
- a) Oil-free design to prevent any possible oil vapor in the oxygen.
  - b) Noise at 2 bar less than 85 dB
  - c) To achieve air of filtration grade of 0.05 Micron Dust particle
10. Pressure Swing Adsorber (PSA) Oxygen concentrator plant should have the following specifications:
- (a) Twin-bed Pressure Swing Adsorber (PSA) system
  - (b) Only standard ISO approved PSA zeolites (5-A, CAS 1318-02-1, lithium based X-13 or X-15) molecular sieve should be used
  - (c) No desiccant moisture remover like activated alumina should be present.
  - (e) Oxygen should be continuous and supplied with pressures up to (1-5 bar)
11. A sterile medical grade oxygen filtration unit with the following specifications:
- (a) Absolute filtration rating of <0.01 microns
  - (b) Bacterial retention > 110 CFU/cm<sup>2</sup>.
  - (c) Bacterial Filtration Efficiency: 99.99%
12. Pressure booster compressor for oxygen generator shall be from reputed makers with the following specifications:
- (a) Oil-free design
  - (b) Capable of compressing 20-120 Liters per minute (t PM) oxygen to a pressure of 5 bar
  - (c) Capable of being hooked up to 20-120 Liters per minute (LPM) Oxygen generation packages
13. The following safety features should be present:
- (a) Auto switch-off function when the unbearable temperature is reached by the system due to possible circumstances.
  - (b) Automatic drain of moisture or water from the compressed air
  - (c) Vents for the waste gases generated during production of oxygen enriched air with means to prevent the ingress of insects, debris and precipitation.