Walnut Medical™

Portable Oxygen Concentrator 5L

Walnut Medical Oxygen concentrator works on the principle of '**Rapid Pressure Swing Adsorption'** which is where the Nitrogen is removed from the air using zeolite minerals which adsorb the Nitrogen, leaving the other gases to pass through and leaving oxygen as the primary gas.

The composition of air (78% Nitrogen, 21% Oxygen and 1% other gases like Carbon Dioxide, Argon, etc.) clearly shows that air is mainly comprised of two gases: Nitrogen and Oxygen [together 99%]. If Nitrogen is removed from air, the primary gas remaining would be Oxygen with purity of about 90-95%.

Working Principle:

An oxygen concentrator has an air compressor, two cylinders filled with zeolite pellets, a pressure equalizing reservoir and valves and tubes. During the first half-cycle the first cylinder receives air from the compressor, which lasts about 3 seconds. During that time the pressure in the first cylinder rises from atmospheric to a few times normal atmospheric pressure (about 20 psi) and the zeolite becomes saturated with nitrogen.

As the first cylinder reaches near pure oxygen (there are small amounts of argon, CO2, water vapour, radon and other minor atmospheric components) a valve opens and the oxygen enriched gas flows to the pressure equalizing reservoir, which connects to the patient's oxygen hose. At the end of the first half of the cycle, the air from the compressor is directed to the 2nd cylinder. Pressure in the first cylinder drops as the enriched oxygen moves into the reservoir, allowing the nitrogen to be desorbed back into gas. Part way through the second half of the cycle there is another valve position change to vent the gas in the first cylinder back into the ambient atmosphere, keeping the concentration of oxygen in the pressure equalizing reservoir from falling below about 90%. The pressure in the hose delivering oxygen from the equalizing reservoir is kept steady by a pressure reducing valve.

CAWACH DST Fund: Walnut Medical Private Limited has designed and developed Oxygen Concentrator in India by grant from Department of Science and Technology, Government of India. Walnut Medical Oxygen Concentrator is a truly Made in India product.

Technical Specifications:

Model	MS-OC-05
Power (W)	450
Power efficiency (W/LPM)	90
Min O2 output (LPM)	0.5
Max O2 output (LPM)	5
Flow outlet	Single/Double
Outlet pressure (kPa)	50-75
Power input options (VAC /Hz)	180–240/50Hz
Operating conditions:	10–42 °C;
Max. Rel. Humidity	10–95% RH;
Max. Altitude	8000 m
Capacity	5L
Sound	< 48 db
Weight	22 kg
Alarms	Power Failure, Pressure, Voltage, Purity
Oxygen Purity	93% +/- 3%
Test Standards/Approval Compliance/	IEC 60601-1-2, IEC-61000-4-2, IEC-61000-4-4, IEC-61000-4-5, Purity Test

Testing and Validation: Walnut Medical Oxygen Concentrator is tested and validated as per National/International Standards for oxygen purity, EMI/EMC, Electrical Safety for patients. All tests are done at AIC Medi-Valley Andhra Pradesh Medtech Zone (AMTZ), Asia's largest Medical Technology Manufacturing Zone based in Visakhapatnam Andhra Pradesh.

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