

HOSPITAL OXYGEN PLANT SPECIFICATION

Central Medical Oxygen Plant or Supply System

Capacity: 56.2 Nm³/hour (937 Liter/min) PSA Technology

General Information

- The Central Medical Oxygen, Medical Air and Suction System for 200 Beds Hospitals Central Supply & 100 Cylinders/day filling (Cylinder Size 42Liters)

Contents of the plant:

Model: Oxygen Generator

PSA specification Oxygen Generator Details Specs

Capacity 56.2 Nm³/hour

Purity 95% ± 1%

Min inlet pressure 7 bar(g)

Outlet pressure 5 bar(g)

Max. operating pressure 10 bar(g)

Air consumption 12.94 m³/min FAD

Hose connection: 2" hose
Colour: RAL7012 Grey

Climatic conditions
Ambient temperature 10°C to 40°C
Altitude less than 3050 meters a.s.l.

Compressed air spec.
Air delivery: 5.53 m³/min FAD
Air quality spec. ISO 8573.1:2010.2.4.1
Dew point +3°C
Filtration 0.01 micron

6

Set

1

grade:

Intellicontrol Siemens
Touch Screen 7" Colour Wide screen. Alarm indication, trends

Oxygen monitor for oxygen generators (standard)
Range 0,1-100% Includes alarm function (through control)

External audio / visual alarm
Audio and visual alarm in one unit. Can be placed
anywhere. Visual alarm is active whenever an alarm is
present in the system. Audio will turn on when an alarm
appears but can be turned off from for control panel

UPS module for Only Display Screen & control box
Uninterrupted power supply up to 30 mins for controls only
Alarm pack

Relay digital outputs 24 VDC for following alarms: Purity
alarm, Purity stop, Low pressure product, Quick stop/
E-Stop, Low pressure columns, Alarm on air compressor,
Alarm on air dryer
Purity control excl. valvekit

Purges product outside valid purity range. Placed after product tank.

Includes Valve kit 3

Utility Monitoring excl. sensors
Monitoring and alarm levels for 8 parameters:
Airpressure, Airtemperature, Dewpoint Air, Dewpoint
product, Product temperature, CO, CO2, Flow

Remote view and logging for intelli Control
Logging of all measured values to SD card / USB. Remote
access for view and control.

Valve kit 2

Air pressure sensor for Utility Monitoring
Pressure dew point sensor for Air for Utility Monitoring

Product temperature sensor for Utility Monitoring
Temperature Sensor 0-100°C, 4-20mA output MBT 3560

Emergency STOP

Consists of safety relay and E-Stop button (mushroom
type) placed on the main control cabinet below HMI.

Air pack alarm handling

Alarm on air compressor, Alarm on air dryer

Air Screw Compressor For Oxygen Plant

Air Compressor

5.5 - 8.5 barG screw compressor 400V / 3Ph / 50Hz (75 kW) SIGMA CONTROL 2

Dryer Machine for Oxygen Plant

		<p>Refrigeration dryer Donaldson Buran DC0650AB; Flow 750 m3/h</p> <p>Filter Package 110S 1micron and 0,01 micron filter with drain valve</p> <p>Coal CARBON Tower Coal tower 150</p> <p>Filter 0750SS, 0.01 micron</p> <p>Production & Air Tanks 2000 L Air Tank; 11 bar, PED, with handhole</p> <p>2" hose, Generator and Other Outlet Connections</p> <p>2000 L Oxygen Tank; 11 bar, PED, with handhold</p> <p>Carbon Filter, Filter 0120SSA</p> <p>Bacterial Filter A30</p> <p>1. Standard should comply as follows: a. Terminal unit shall comply with ISO 9170-1 b. Gas-specific connector shall comply with the body of a NIST or DISS connector complying with ISO 5359. c. Pendants, bed head units, booms shall comply with EN ISO 11197. d. Manifold and line pressure regulator shall comply with ISO 10524-2. e. Pressure gauges shall comply with the requirement given in ISO 10524-2</p> <p>2. Only one standard system to be adhere of any international standards BS.</p> <p>Note: 1. One Year Maintenance kit with cooling oil & Compressor belt should provide together with Machines 2. Operation training should provide for the hospital Technical staff</p>	
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6	Set	<p>Filling Station for 60 Oxygen Cylinders</p> <p>High pressure O2 compressor flow 29 to 34 Nm3/h, discharge pressure 200bar</p> <p>High pressure O2 compressor flow 1.7 to 3.2 Nm3/h, discharge pressure 152 bar</p> <p>Current Filling Cap. Calculated flow: 34 m3/h + 3.2 m3/h = 19.2 m3/h Cylinder size: 40 L (water volume) End pressure: 152 bar Cylinders filled/day: 100 cylinders /Day Filling Capacity</p> <p>Filling ramp IV incl. system buildup Filling ramp for 10 cylinders One Year Maintenance kit with cooling oil & Compressor Machines</p>	Cylinders Filling Station RIX USA or Equivalent	2
Set	high 3/8" automatically supply by the with	<p>Oxygen Auto Manifold System for Oxygen Supply Backup 20 Cylinders 2 x 10 cylinders (bulk cylinder of D type) Cylinders Having top frame</p> <p>comprising of high pressure copper pipe of size 5/8" ID x 7/8" OD with high pressure brass fitting made of high tensile brass, NRV and pressure copper tailpiece made of high pressure copper size 3/16" x OD. This will be a secondary source of oxygen supply, shall supply the pipeline when primary source (Oxygen Generator) of become exhausted or fails. Reserve source of supply will be provided 20 cylinders' Automatic manifold system with high flow regulator gauges and safety valves.</p>	Oxygen Manifold System for Oxygen Backup BS Standard	3
6	Set	<p>Central Medical Air Supply System:</p> <p>MEDICAL AIR PLANT</p> <ul style="list-style-type: none"> • Med Air Plant 580l/min Duplex – • 2x 5.5kw Oil Lubricated Screw Compressors • 1 x 350ltr Vessel • 4 bar outlet, 50hz 	Medical Air Centrals Supply System PRECISION CPX UK or Equivalent	4

Specification

- Fully complies to HTM 02-01, HTM 2022, C11, BS EN 7396, CE0086 Class Iib
- CPX® branded solid British design
- Control and highly visible indication panel
- All interconnecting pipework is included
- Outlet pipework for connecting to the pipeline
- Anti-vibration mounts on all pumps
- Isolator to each pump unit as standard
- Alarm and BMS outputs for remote status indication
- Digital display available on request
- 400Kpa, 700Kpa and 1000Kpa output versions available
- All settings are factory set and verified with certificates of inspection

The air compressor will have Air-cooled, oil free, at least three-air compressor source for continuous duty application. Air compressors should be critical maintenance free (CMF) and seizure free technology, which ensures that the compressors can with, stands continuous use under high temperature and possess high resistance to extreme environments.

Type of compressor: oil scroll technology

Capacity: 1500-2000 liters per minute and maximum pressure 121 psi.

Following should be provided with compressors:

Inlet filter o Check valve delivery pipe of Two Conditioning systems of Two compressed air receiver of One dew point alarm sensor shall be fitted to the pipeline system down stream of all conditioning system. One dryer with shut-off valve and automatic drains. An absorber, a catalyst and filter as required removing contaminants. Supply system of medical grade air with compressor should comply with the following:

- Oxygen $\geq 20.4\%$ and $\leq 21.4\%$
- Total oil concentration V/V $\leq 0.1\text{mg}/\text{m}^3$ measured at ambient pressure
- Carbon monoxide conc. $\leq 5\text{ml}/\text{m}^3$
- Carbon dioxide conc. $\leq 500\text{ml}/\text{m}^3$
- Water vapour content $\leq 67\text{ml}/\text{m}^3$
- Sulfur dioxide $\leq 1\text{ml}/\text{m}^3$
- NO+NO₂ $\leq 2\text{ml}/\text{m}^3$

Note: all the Medical Grade copper Pipe Distributions /Installation and related material from Mechanical room up to OT/ICU/WARDS in the hospital and it is functionalization is included

1. One Year Maintenance kit with cooling oil & Compressor belt should provide together with Machines
2. Operation training should provide for the hospital Technical staff

6	Set	<p>Central Vacuum Central Supply System: PUMP VACUUM PLANT</p> <ul style="list-style-type: none"> • Best Zone Receiver System • Med Vac. Plant 675l/min • Duplex 2 x 2.2kw Vacuum Pumps 1 x 675ltr Vessel Packaged, 50hz • Standard Vacuum Suction Regulator with 2liters Jar Washable 29 Sets <p>Specification</p> <ul style="list-style-type: none"> • Fully complies to HTM 02-01, HTM 2022, C11, BS EN 7396, CE0086 Class Iib • CPX® branded solid British design • Control and highly visible indication panel • All interconnecting pipework is included • Outlet pipework for connecting to the pipeline • Anti-vibration mounts on all pumps • Isolator to each pump unit as standard • Alarm and BMS outputs for remote status indication • All settings are factory set and verified with certificates of inspection <p>a. Supply system for vacuum shall comprise at least three sources of supply, one reservoir, two parallel bacterial filter and one drainage trap, to suitably ensure flow rate of vacuum as per the international norms at each outlet.</p> <p>The system should be fully compliant with NFPA latest recommendation.</p> <p>Three oil sealed rotary vane vacuum pumps; a control panel and a receiver mounted on a common base frame should comprise the package. Out of three, each vacuum pump shall be capable of supplying the system design flow to ensure continuity of supply.</p> <p>Each pump shall be oil lubricated, dynamically balanced multi-vane design with heavy- duty aluminum alloy vanes. The vane housing shall be a double walled construction. The oil lubrication system shall be a pressure differential design with full re-circulation and multi-stage exhaust oil separation rated at minimum 99.99% efficiency.</p> <p>Water vapor condensation in the cylinder shall be prevented by means of an automatic gas ballast valve. A non-return valve to prevent oil migration upon shutdown. Each pump should have a 5-micron inlet filter. Each reservoir shall be fitted with shut-off valve(s), a drain valve, and a vacuum gauge.</p> <p>Exhaust from vacuum pump shall be piped outside and shall be provided with the means of to prevent insect, debris & water. Exhaust shall be located remote from any air intake, doors, window and other</p>	Medical Vacuum Suction Plant	5
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		<p>opening in the building.</p> <p>The exhaust shall be provided with a drain at its lowest point. Means shall be provided to prevent transmission vibrations to the pipeline.</p> <p>All sources of electrical supply should be connected to the emergency supply. The control system should provide automatic lead / lag sequencing with circuit breaker disconnects for each vacuum pump visual and audible reserve unit alarm, with isolated contacts for remote alarm, manual-off-auto lighted selector switches and runtime hour</p> <p>A programmable logic controller should control the automatic alteration of the vacuum pumps with provisions for simultaneous operation if required and automatic activation of reserve unit if required. The control system shall include an automatic minimum run time adjustment to control run time based on demand.</p> <p>b. AGSS (an aesthetic gas scavenging system): AGS system shall have two oil less rotary compressor and other associated accessories to provide service to all the operation theatre.</p> <p>c. Electrical Control Panel (For Compressor & Vacuum Pump): The complete system should work on duplex sequencing and cascading system. The panel should be floor mounted enclosed type. Panel must have one common electrical control panel for both vacuum pumps and both air compressors with automatic switch gear system, for motors, two vacuum switches, two Air pressure switches, complete with wiring & cabling, electrical contractors with single phase preventing units, and Main voltmeter, Ampere meters-4, hour meters-4, duplex system, sequencing & cascade system for vacuum pumps and air compressors. The electrical control panel shall be of cubical type made of CRCA sheet of 16 g with epoxy power coating. The panel shall offer the following facilities.</p> <p>Note: All Medical Grade copper Pipe Distributions /Installation and related material from Mechanical room up to OT/ICU/WARDS in the hospital and its functionalization is included.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. One Year Maintenance kit with cooling oil & Compressor belt should provide together with Machines 2. Operation training should provide for the hospital Technical staff 		
300	Set	<p>Ward wall panel / Bed Head Units: (5 OT Points+ 10 Beds recovery + 15 ICU Beds + 20 Beds Emergency)</p> <p>will have wall mounted Bed head panels with the provision of the followings: Oxygen outlet-2, MA4-1 (4bar), vacuum-1. Electric Socket, lights & Copper pipe from plant to beds with all standard accessories. Each of the bed head unit should furnish with Sluice valves or Control valves</p>	<p>Pendant System Wall type for Patient Wards & Hemodialysis Unit Standard Quality</p>	6

		the flowmeters for Oxygen, Medical Air, Vacuum with 2-liter Washable jar should supply together with Pendants		
900	Each	Wall Oxygen Outlets BS Standard for Wards with Installation & copper pipe from plant to beds with all standard accessories Each room should have separate Sluice valves or Control valves	Wall Outlets BS Standard	7
1200	Each	Oxygen Flow Meters BS Standard	Oxygen Flow Meters BS Standard	8
300	Each	Medical Air Flow meters BS Standard	Medical Air flow Meters BS Standard	9
300	Each	Suction Flow meters BS Standard with 1 liter Bottle	Suction Flow Meters BS Standard	10
6	Each	Medical Gas Alarm System for 3 Gas Alarm Switch for control room	Alarm System	11
6	Set	Electric Power Stabilizer 200KVA (SVC) 3Phase, 50/60MHz 1. With Electric Wiring and others from source to Oxygen Room 2. With Electric Control Box & with all the Electric fuses and others 3. Service & Installation	Electric Power Stabilizer	12
6	LS	Safe Room /Mechanical room for the Central Supply Oxygen Plant, Medical Air Plant, Suction Vacuum Plant, Manifold System, Oxygen filling station & Nitrous Oxide supply. <ul style="list-style-type: none"> • Size of Room: 50 Square Meters. • Height of room: 3.5 Meters • 15cm doubly reinforced floor slab • Room Should Cover with MS Sheets with Proper Ceiling System and room lights • Main Entrance Door Size: 190cm wide, 250cm High Made of PVC Materials • 4 Windows Each Windows Size 100cm x 60cm Made of PVC with double Glass • Fully ventilated with 30 x 40cm Wintilation Fan 2sets. • HEPA Filters for the Mechanical room 30 X 40cm HEPA Filters should installed in the Mechanical room with all the wiring system 2sets. • A/C unit for 24000BTU should install to control the ambient temperature as per Machines requirement. • Room thermometer with Humidity detector should instatalled. • Medical Gas Alarm System should install for all the Gases with Digital display. • Gas Control box should install for each site Medical Gas Control Box (3Gases) with Alarm 1.the box is stainless steel 	Mechanical Room Standard Quality	13

- 2.the the hose is brass
- 3.With alarm
- 4.In the wall
- 5.GAS: Oxygen & Medical Air
- 6.hose size:15mm

Note: wiring system for all electrical equipment's and should be completely installed according to the requirement. 50mm Electric wire from Source to The mechanical room and 16mm wire for Machines with power control boxes and circuits and fuses

		5. The hose is brass 3. With alarm 4. In the wall 2. GAS: Oxygen & Medical Air 6. hose size: 12mm	
		Note: wiring system for all electrical equipment's and should be completely installed according to the requirement. 50mm Electric wire from source to the mechanical room and 10mm wire for machines with power control boxes and circuits and fuses	