

GENERAL

The Powerex Skid Mount Scroll Medical Air System is designed to provide medical breathing air for hospital and medical institutions. This system meets NFPA 99 requirements for Risk Category 1 systems. Each system is completely tested before shipment and includes:

- Multiple oil-less scroll air compressors and associated equipment
- Corrosion resistant air receiver
- Redundant medical desiccant air dryers with purge control
- Medical control panel
- Dew point and CO monitors

The only field connections required will be system intake, exhaust, and power connection at the control panel. All interconnecting piping, wiring, and vibration isolation pads are included with the system.

OILLESS SCROLL COMPRESSOR PUMP

Each compressor shall be belt driven oil-less rotary scroll single stage, air-cooled construction with absolutely no oil needed for operation. Direct drive compressors shall not be used.

- The rotary design shall not require any inlet or exhaust valves and shall be rated for 100% continuous duty
- Tip seals shall be of a composite PTFE material and be rated for 10,000 hours operation.
- Compressor bearings shall be external to the air compression chamber and shall all be serviceable for extended compressor life. Bearing maintenance shall not be required until 10,000 run hours. Compressors with bearings that are not accessible for service have a limited life span and shall not be accepted. Compressors shall have an integral radial flow fan for cooling and shall not require any additional electric cooling fans.
- Each compressor shall have flexible connectors on intake and discharge, an electric drive motor, a discharge check valve, an air-cooled aftercooler and a high discharge temperature shut down switch.
- Each compressor module shall have an isolation valve and a moisture separator with automatic drain.

MOTORS

Each compressor shall be belt driven by an ODP, NEMA construction motor. Belt guards that meet OSHA requirements shall be provided.

AIR RECEIVER

The system shall include an ASME air receiver rated for 200 PSI MAWP. The tank shall be equipped with:

- A pressure gauge and a safety relief valve
- A sight gauge
- By-pass valves to allow tank isolation without system shutdown
- An automatic electronic tank drain with manual override

The receiver shall be internally lined with an FDA approved material for corrosion resistance.

INTAKE FILTERS

Duplex systems of 5 HP or below have individual pump filters. Otherwise, the medical air system shall include a dual inlet filter system with one filter on-line and one filter in reserve to enable servicing of the filter elements without shutting down any of the air compressors units or disrupting service to the facility. The inlet filter system shall be located on the compressor package and plumbed up-stream of the compressor pumps.

DESICCANT AIR DRYERS

Each desiccant dryer shall be sized for the peak calculated system demand to provide a pressure dew point to meet NFPA 99 standards.

- Dryer controls shall include a re-pressurization cycle to prevent shocking of the desiccant bed prior to switching towers.
- An integral purge saving control system shall be provided and shall suspend the purge air loss during periods of low demand. When the dryer is in purge control mode, the tower switching valves shall not operate, and only one desiccant bank shall be on-line. Dryers continue to operate the switching valves in the fixed cycle.

FILTRATION AND PRESSURE REDUCING STATION

Each filter/dryer/regulator assembly shall be plumbed with bypass valves to enable service without disrupting air flow to the facility. Each assembly also includes a sample air port. The filtration systems consist of two stages of filtration.

- The first stage of filtration shall include dual pre-filters with element change indicators and automatic condensate drains, installed up-stream of the air dryers.
- The second stage shall include dual particulate filters with element change indicators installed downstream of the air dryers.
- A dual set of pressure reducing valves with pressure gauges shall be installed downstream of the final filters and shall be adjusted to an outlet pressure of 55 psig.

STANDARD HMI CONTROL PANEL

The control system provides automatic lead/lag sequencing and automatic alternation of all compressors in order to equalize the amount of usage among the available compressors. The HMI control system shall include:

- UL508A listed control panel in a NEMA 12 enclosure with the following accessories for each pump: a HOA switch, a magnetic starter with 3 leg overload protection, a high temperature shutdown with audible and visual alarm, an hour meter and a compressor run light. Standard features also include:
 - A color touch screen HMI (Human Machine Interface)

panel which displays the operating status of the unit. The HMI touch screen will display pump status, pump faults, pump run hours, system pressure, system alarms and service alert notifications for the pumps, dryers, dew point and CO monitors.

- PLC controller with control logic to start the lag compressor automatically if the lead compressor fails to operate, a reserve compressor in-use alarm with visual and audible alarms, and redundant control circuit transformers with visual indication of a main transformer failure.
- Dry contacts on a labeled terminal strip for remote alarm monitoring and an acknowledge pushbutton for horn silencing.
- Control logic to start the lag compressor automatically if the lead compressor fails to operate.
- Integrated dew point and carbon monoxide monitors. The touch screen will display dew point and CO readings and provide audible and visual high dew point and CO alarms.
- Dryer maintenance notifications and service alerts at set run-hour intervals

OPTIONAL PBMI CONTROL SYSTEM

The PBMI control system shall include all features of the standard HMI control panel with the addition of a gateway server card. The PBMI control system shall include:

- Building automation communication gateway with BacNet[®] protocol and Web server features. Web server features include email notifications in case the system is in alarm or has achieved one of its maintenance intervals and requires service.
- Ethernet port for connection to BacNet[®] server or direct connection to facility Ethernet for viewing of system operations and status via device IP-address

OPTIONAL BASIC CONTROLS

The control system provides automatic lead/lag sequencing and automatic alternation of all compressors in order to equalize the amount of usage among the available compressors. The Basic control system shall include:

- UL508A listed control panel in a NEMA 12 enclosure with the following accessories for each pump: H-O-A switch, a magnetic starter with 3 leg overload protection, a high temperature shutdown with audible and visual alarm, an hour meter and a compressor run light. Standard features also include:
 - PLC controller or a timing alternator with control logic to start the lag compressor automatically if the lead compressor fails to operate, a reserve compressor in-use alarm with visual and audible alarms, and redundant control circuit transformers with visual indication of a main transformer failure.
 - Dry contacts on a labeled terminal strip for remote alarm monitoring and an acknowledge pushbutton for horn silencing.
 - Control logic to start the lag compressor automatically if the lead compressor fails to operate.

- Dew point monitor equipped with an LCD dew point display and high dew point alarm with dry contacts for remote monitoring.
- Carbon monoxide (CO) monitor in an enclosure with LCD display of CO concentrations. Dry contacts are provided for remote monitoring of the high CO alarm.