

## Specification

### General

The Powerex Instrument Air System provides high pressure clean dry air for medical support purposes. The system is designed in accordance to NFPA99 section 5.1.3.8 Instrument Air Supply Systems.

### Instrument Air System

The package shall include multiple air compressors and associated equipment, one ASME tank, one medical desiccant air treatment center, and one medical control panel. The only field connections required will be system discharge, power connection at the control panel, and between-skid air and power connections. All interconnecting piping and wiring shall be included and operationally tested prior to shipment. Vibration isolation pads are included with the system.

### Compressor Pump

The compressor shall be belt-driven reciprocating, Two-Stage, single acting, air-cooled, oil pressure lubricated design. Each compressor shall be capable of compressing air to a maximum pressure of 250 psig. Crankshaft and connecting rod bearings are pressure lubricated for extended life. Piston rings shall include two compression rings, and one oil control ring to provide excellent oil control and high efficiency air delivery. Single-unit disc type valves provide low lift and long life. Discs are made of corrosion resistant Swedish steel. Intercoolers are provided between compression stages for maximum efficiency. Each compressor shall include a discharge check valve of brass construction, an ASME safety relief valve, discharge flexible connectors, a start-up unload system, an isolation valve, an air cooled aftercooler, and a moisture separator with automatic drain.

### Motors

Each compressor shall be belt driven by a 1750 RPM, ODP NEMA construction motor with a 1.15 service factor rating. OSHA approved belt guards shall be provided.

### Air Receiver

The system shall include a ASME rated air receiver rated for 250 PSI MAWP. The tank shall be equipped with a pressure gauge, safety relief valve, block and by-pass valves, and condensate sight gauge and automatic electronic tank drain with manual override. The receiver shall be internally lined with an FDA approved material for corrosion resistance.

### Control Panel

The NEMA 12 control panel complies with NFPA 99 requirements for Medical Air. The controls operate the duplex, triplex or quadplex, 250 psi capable air compressor modules as needed in response to a pressure signal from a pressure transducer located in main system pipeline near the air receiver.

The pressure signal is input to the programmable logic controller (PLC) and it is programmed to operate one, two or three compressor modules as needed to maintain the system minimum pressure

of 200 psig. A touch screen interface displays system status and alarm conditions. A reserve pump in use alarm circuit provides local indicator light and audible alarm along with remote indication if the air demand increases beyond the system rated capacity or the pressure drops for any other reason and the reserve compressor module is ever called for. An acknowledge function is provided for use during start up and maintenance. Pressure settings are factory set and are not user adjustable.

The PLC will alternate which compressor module is started each time a call for is generated. If a compressor is running longer than ten minutes continuously, the control will alternate to the next available compressor module to equalize run time and synchronize maintenance intervals. On initial start up or if air pressure drops rapidly, simultaneous motor starts are prevented by a programmed three second stagger. Two 110 v control circuit transformers with primary and secondary fuses are installed with a reserve transformer in use indicator light.

Motor circuit breakers with lockable disconnects and on/off/auto switches are provided for each compressor module. Operating in hand mode will bypass PLC controls. Operating hours, high temperature alarms, motor overload alarms and run indication for each compressor module is displayed on the screen. Easily navigated menus are provided to allow the user to select the display conditions and acknowledge the alarms. Remote alarm contacts are provided as shown on the system wiring diagram.

### Air Purification Package

The air purification package shall be sized in conformance with NFPA 99 specifications and consist of the following: Dual desiccant air dryers, dual filter and regulator bank with sample ports, Dew Point Monitor with alarm, and all bypass piping. All components shall be mounted piped and wired to the air receiver.

### Desiccant Air Dryers

Each twin-tower desiccant dryer shall be sized for the peak calculated system demand to provide a pressure dew point of -40 degrees F. 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 tower shall be on-line. Dryers that continue to operate the switching valves on a fixed cycle, while in purge control mode shall not be acceptable.

### Filtration and Pressure Reducing Station

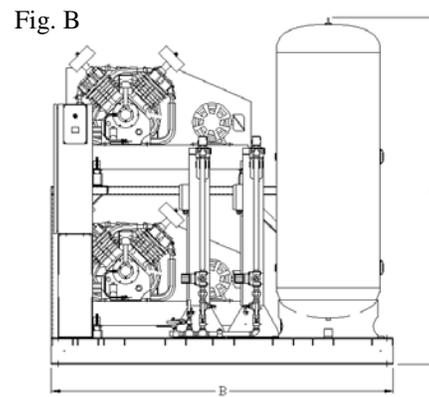
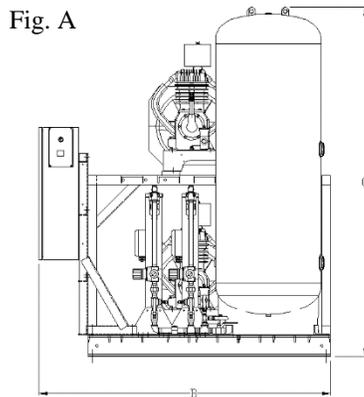
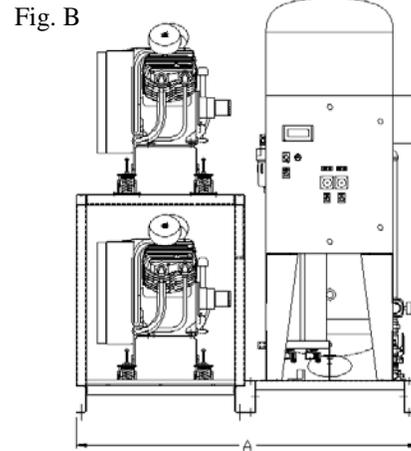
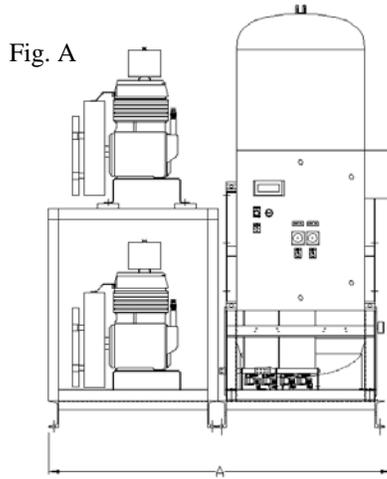
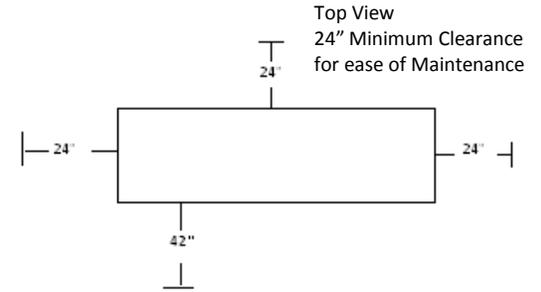
The filtration systems shall consist of 4 stages of filtration, two pressure reducing valves with pressure gauges, and a sample air port. The first stage of filtration shall include dual .01 micron coalescing pre-filters with element change indicators and automatic condensate drains and installed up-stream of the air dryers. The second stage shall include dual 1 micron particulate filters with element change indicators and installed downstream of the air dryers. The third stage shall include dual activated carbon filters. The fourth stage shall

include dual .01 micron final filters with pressure drop indicators. A dual set of pressure reducing valves with pressure gauges shall be installed downstream of the final filters. Each filter/dryer/regulator assembly shall be plumbed with bypass valves to enable service without disrupting air flow to the facility.

### **Dewpoint Monitor**

The system-integrated hygrometer shall be equipped with an LCD dew point display and high dew point alarm with dry contacts for remote monitoring. The dew point sensor (probe) shall be installed so that the monitored airflow is downstream of the pressure regulator assembly. The sensor shall include an auto calibration feature to ensure the accuracy of the dewpoint measurement without the need to return the sensor to the factory for calibration.

Dimensions					
Model	Dim. A	Dim. B	Dim. C	Outlet	Fig.
IPD0504	65"	66"	79"	¾"	A
IPD0754	65"	66"	79"	¾"	A
IPD1004	65"	79"	80"	¾"	B



Instrument Air Systems									
Model	HP	SCFM @ 200 PSIG <sup>(1)</sup>	Tank Size (gal)	BTU/Hr <sup>(2)</sup>	dB(A) Level <sup>(3)</sup>	System F.L.A.			System Weight (lbs)
						208V	230V	460V	
IPD0504	5 (2)	15.5	120	12,725	76	30	28.4	15.2	1,850
IPD0754	7.5 (2)	19.6	120	19,088	76	42.8	40.8	21.4	1,940
IPD1004	10 (2)	29	120	25,450	78	54	52	27	2,540

Notes:

- 1 – SCFM values @ 200 PSIG are shown with one compressor in reserve.
- 2 – BTU/Hr levels are shown with one compressor in reserve.
- 3 – dB(A) levels are shown with one compressor in reserve.
- 4 – 3 Year Limited Warranty.