

## Scroll Medical Air Package

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

### Description

The Powerex scroll medical air package is designed to provide medical breathing air for hospital and medical institutes. This system meets NFPA 99 requirements for Level 1 breathing air.

#### Oilless Scroll Air Compressor

The Powerex Oilless Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oilless unit.

The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll air compressor.

#### RECEIVER TANK

The ASME, National Board registered vertical air receiver is provided in sizes from 80 to 200 gallons. Each receiver is rated at 200 PSIG working pressure. Receivers are provided with sight glass and moisture drain (manual or automatic).

#### CONTROL PANEL

The NEMA 12 control panel is provided in all multiplex configurations and meets NFPA 99 requirements for medical air. Primary voltage is protected by fusing or circuit breaker. Control transformer power is 110 volts and protected by secondary fusing. Pressure switches/transducer control/s the compressors on and off cycle and signal lag compressor(s) to come on if air demand increases. A lag / lag pressure switch or transducer signals a light and audible alarm warning of a reserve compressor in use condition which is factory set at 85 PSIG. An acknowledge button is provided for start condition and maintenance. The adjustable timer alternator or the PLC cycles each compressor so equal run time is maintained. This alternator is

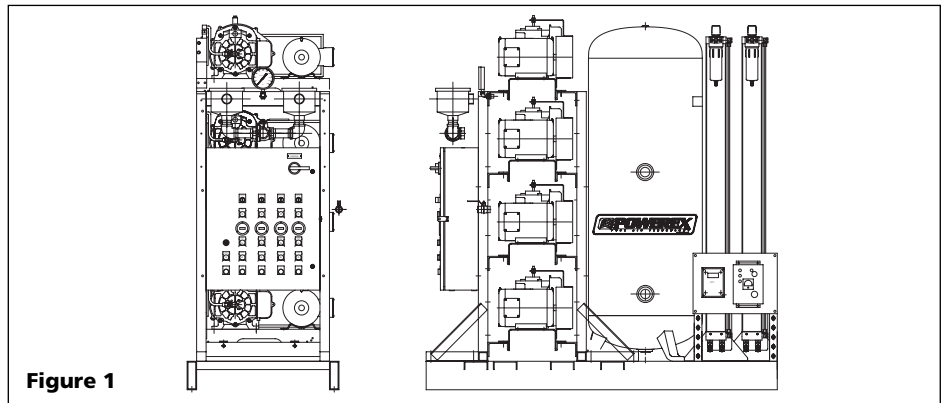


Figure 1

factory set to alternate the compressors every 10 minutes. The exterior of the control panel is provided with a main through door disconnect, on/off/ auto switches, run lights, power on lights, run hourmeters, reserve-pump-in-use light, high temperature light, overload light, horn with acknowledge button and reset button for high temperature condition. This control panel is UL listed.

#### DEW POINT MONITOR

The Powerex Dew Point Monitor provides indication of dew point temperature. It is microprocessor controlled with user programmable output range. Dew Point Monitor is equipped with adjustable alarm contacts. NEMA panel mount enclosure is protected by a polymer viewing cover.

#### CARBON MONOXIDE MONITOR/ALARM

The carbon monoxide monitor provides warning to the user by alarming and metering the presence of carbon monoxide. The monitor is provided in a NEMA 12 enclosure. In addition to audio/visual alarm, the meter displays the concentration of CO in the compressed air. The meter operates from a 110 VAC supply. Alarm points are set at 10 PPM (low) and 20 PPM (high).

#### AIR COOLED AFTERCOOLER

Aftercoolers are sized to provide an approach of 20°F. Each are constructed of copper tubing for rugged construction.

#### AIR DRYER DESICCANT

Powerex scroll medical air packages include desiccant dryer systems.

The Powerex Desiccant Drying System provides air at less than 32°F dew point at 100 PSIG. Each system is connected with bypass capability.

This system consists of two completely separate desiccant dryers. One is a complete backup of the other. Each of the desiccant dryers is a dual tower system. While one tower is on line removing the moisture from the air stream, the other is depressurized, reactivated using a dry purge air flow, and then repressurized for the next cycle. The purge saving feature on our system will suspend the purge cycle until the dew point detected by our hygrometer reaches -10°F.

#### MEDICAL FILTER SYSTEM

The medical filter system consists of a duplex series of filters and pressure regulators. Air enters the system and is directed to either bank of filters/dryer controlled by a ball valve. The first stage filter remove solids and liquid particles. The next stage of filters removes submicronic particles and

## Medical Package System

aerosols. The third and final after filter is carbon activated to remove unpleasant odors. Maximum operating temperature is 125°F and maximum pressure is 150 PSIG.

### CONDENSATE DRAIN VALVE

An automatic electric condensate drain valve is standard on all medical scroll systems. This valve removes liquid that collects in the tank during normal compressor operation. The electric drain valve has two built in timers. The first determines the amount of time that the valve is closed and the second determines how long the valve stays open. These timers are field adjustable and should be set to insure water does not build up in the tank and to minimize air loss. A sight glass showing liquid level in the tank is provided as standard to assist in the adjustment.

## Safety Guidelines

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.

**⚠ DANGER** *Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

**⚠ WARNING** *Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

**⚠ CAUTION** *Caution indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.*

**NOTICE** *Notice indicates important information that, if not followed, may cause damage to equipment.*

## Installation

### ⚠ WARNING

**Disconnect, tag and lock out power source then release all pressure from the system before attempting to install, service, relocate or perform any maintenance.**



**⚠ CAUTION** *Do not lift or move unit without appropriately rated equipment. Be sure the unit is securely attached to lifting device used. Do not lift unit by holding onto tubes or coolers. Do not use unit to lift other attached equipment.*

**⚠ WARNING** *Installation of inlet/outlet air plumbing from the compressor flange and electrical connection must be in accordance with National Fire Protection Association (NFPA99) Code Compliance for Medical Gas Breathing Air (Level 1).*

### INSTALLATION SITE

1. The oilless compressor must be located in a clean, well lit and **well ventilated** area.
2. The area should be free of excessive dust, toxic or flammable gases and moisture.
3. Never install the compressor where the surrounding temperature is higher than 105° F or where humidity is high.
4. Clearance must allow for safe, effective inspection and maintenance.

#### Minimum Clearances

Above	24"
Other sides	36"

5. If necessary, use metal shims or leveling pads to level the compressor. Never use wood to shim the compressor.

### VENTILATION

1. If the oilless compressor is located in a totally enclosed room, an exhaust fan with access to outside air must be installed.
2. Never restrict the cooling fan exhaust air. Maintain a minimum of 3 feet of clearance around entire unit.
3. Never locate the compressor where hot exhaust air from other heat generating units may be pulled into the unit.

### WIRING

All electrical hook-ups must be performed by a qualified electrician. Installations must be in accordance with local and national electrical codes.

Use solderless terminals to connect the electric power source.

### PIPING

Refer to the general product manual.

1. Make sure the piping is lined up

without being strained or twisted when assembling the piping for the compressor.

2. Appropriate expansion loops or bends should be installed at the compressor to avoid stresses caused by changes in hot and cold conditions.
3. Piping supports should be anchored separately from the compressor to reduce noise and vibration.
4. Never use any piping smaller than the compressor connection.
5. Use flexible hose to connect the outlet of the compressor to the piping so that the vibration of the compressor does not transfer to the piping.

### SAFETY VALVES

Our tanks are shipped from the factory with safety valves installed in the tank manifold. The flow capacity of the safety valve is equal to or greater than the capacity of the compressor.

1. The pressure setting of the safety valve must be no higher than the maximum working pressure of the tank.
2. Safety valves should be placed ahead of any possible blockage point in the system, i.e. shutoff valve.
3. Avoid connecting the safety valve with any tubing or piping.
4. Manually operate the safety valve every six months to avoid sticking or freezing.

## Assembling Modular Medical System (Unit With More Than 4 Air Ends)

### MODULAR PLACEMENT

1. Unpack each module and discard all wood shipping materials.
2. Locate frame assembly fasteners provided in parts pack [includes: fasteners, filter(s), isolation pads and inlet flex line].
3. Place modules at location designated (see picture on page 7 and 8 for proper arrangement of modules). Provide sufficient clearance around unit for servicing (see minimum clearance section).

4. Install frame assembly fasteners to each frame joining the frames together.
5. Lift corners of each frame assembly and install isolation pads provided.

## CONNECTING PIPING

1. Locate connection for piping at rear of unit for compressors module to receiver tank module.
2. Remove plastic caps that protect piping against contamination.
3. Connect flex joint to frame securely making sure flex line is not pinched or kinked.
4. Follow steps 1 to 3 for flex line from dryer package to outlet of receiver tank.

**NOTE:** All piping is provided and sealed for this portion of installation.

5. Locate and attach intake inline air filter to outside source air or header. Flex line is provided when attaching intake of compressors to rigid piping.
6. Connect outlet source from filter package located on dryer module to outlet source piping.

**WARNING** Attach all inlet and outlet source piping in accordance with NFPA 99 for Medical Gas.

## Electrical Wiring of Unit Shipped in Separate Modules (5 Plex or Bigger)

**CAUTION** Provide electrical power in accordance to NEC and local codes. Connection of wiring should be performed by a qualified electrician.

1. Connect wiring and flex conduit provided from each motor junction box to correct hole in bottom of control panel and starter.
2. Connect each temperature switch from the compressors to contacts located in control panel as marked for each temperature switch. Temperature switches shutdown the compressor when temperature is above 400°F. Connect dryer power cords, electric drain power cord, dew point and CO monitor power cords, and alarm wiring to the main control panel.

For questions concerning assembling and start-up, contact Powerex at 1-800-769-7979 for technical assistance.

## Operation

Scroll Medical Air Package from Powerex operates as an on/off control. The pressure cycle of the compressors

can be found on the electrical diagram. The Powerex Medical Package has load sharing capabilities that alternate the demand between compressors, maintaining equal operating hours of each compressor.

## BEFORE START UP

1. Make sure all safety warnings, labels and instructions have been read and understood before continuing.
2. Remove any shipping materials, brackets, etc.
3. Confirm that the electric power source and ground have been firmly connected.
4. Be sure all pressure connections are tight.
5. Check to be certain all safety relief valves, etc., are correctly installed.
6. Check that all fuses, circuit breakers, etc., are the proper size.
7. Make sure the inlet filter is properly installed.
8. Confirm that the drain valve is closed.
9. Visually check the rotation of the compressor pump. If the rotation is incorrect, have a qualified electrician correct the motor wiring.

## MEDICAL AIR SCHEMATIC (THIS IS A REPRESENTATIVE SCHEMATIC DIAGRAM FOR A MULTIPLE SCROLL MEDICAL SYSTEM)

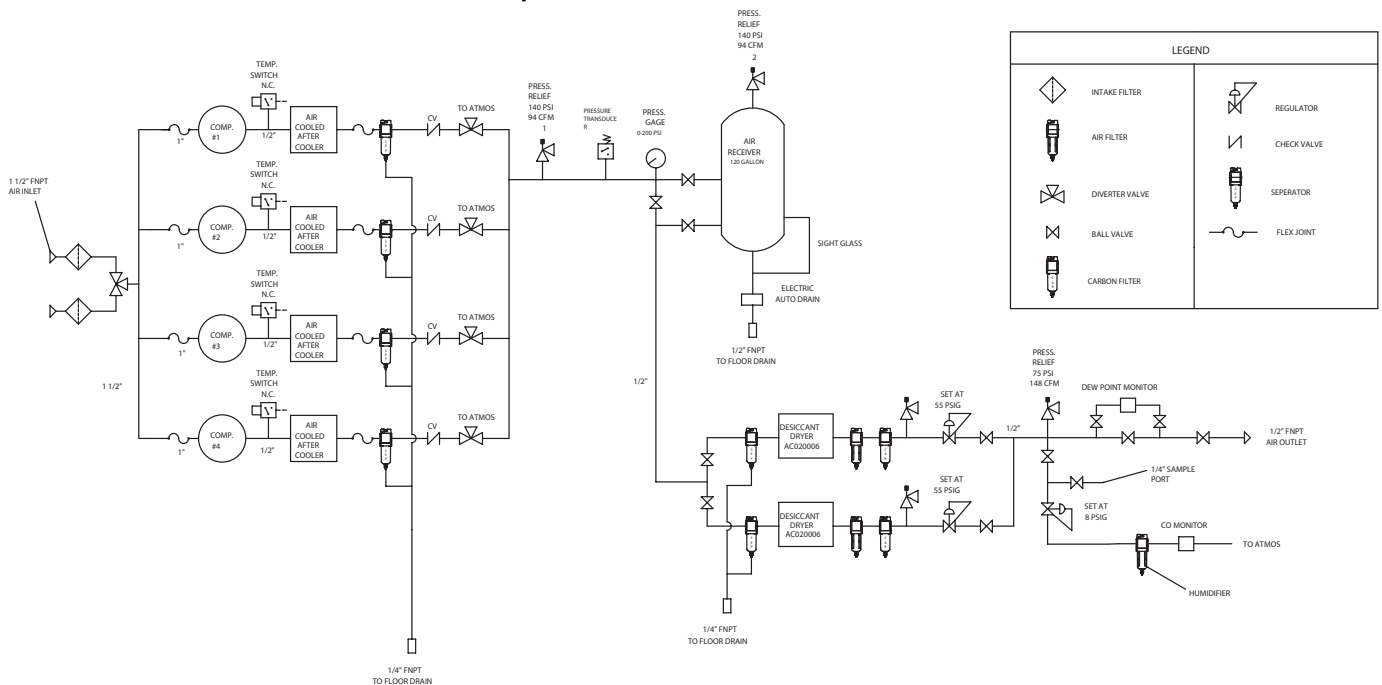


Figure 2

# Medical Package System

## MAINTENANCE SCHEDULE

Item	Action needed	Operating Hours				Remarks		
		500	2500	5000	10,000		15,000	20,000
<b>Compressor</b>								
Tank	Verify proper drain operation	Daily						
Inlet air filter	Replace	●	▲	(Every 2,500 hrs or less)				
Blower fan	Clean			●	●	●	●	
Fan Duct	Clean			●	●	●	●	
Compressor Fins	Clean		●	(Every 2,500 hrs or less)				
Bearings	Grease				▲	▲	▲	Service Center Only
Tip seal	Replace				▲		▲	
Dust seal	Replace				▲		▲	
V-belt	Inspect, replace	*Note 3	●	▲	▲	▲	▲	
Pressure Switch	Confirm operation				●		●	
Magnetic starter	Inspect				●		●	Replace if contact points deteriorated

<b>Piping System</b>								
Safety valve	Confirm operation		●	(Every 2,500 hrs or less)				
Pressure gauge	Inspect		●	(Every 2,500 hrs or less)				
Air leaks	Inspect		●		●		●	
Filters	Replace		▲	▲	▲	▲	▲	▲ (View delta pressure indication)
Moisture drains traps	Inspect	●		●		●		

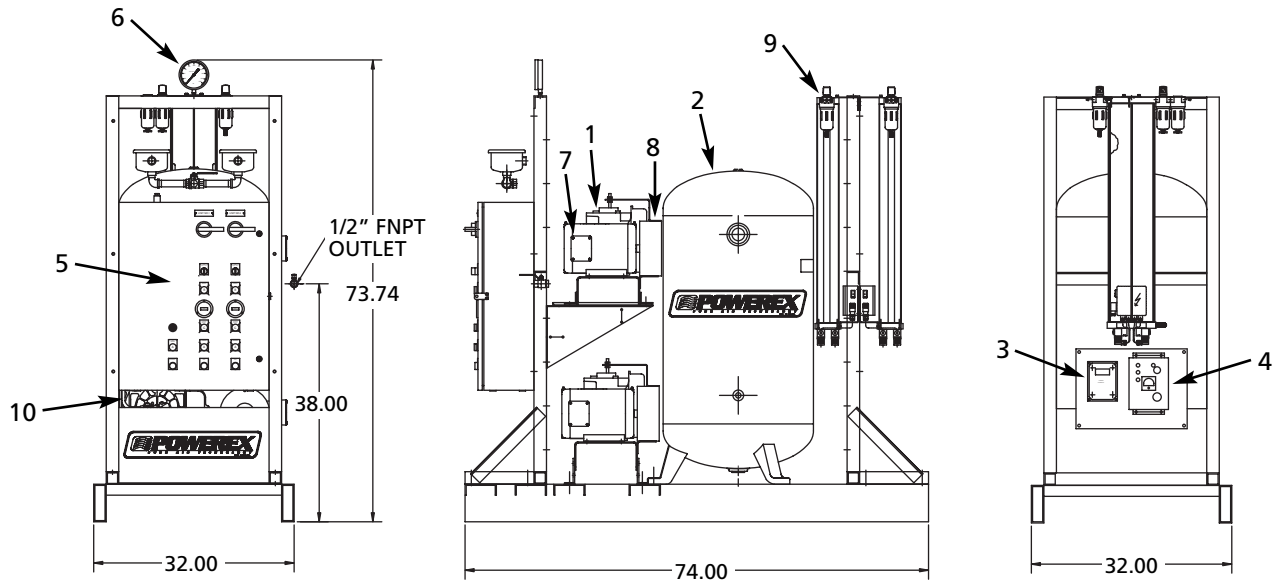
<b>Air Dryers</b>							
Suction pressure (refrigerated)		●	●	●	●	●	
Heat exchanger		●	●	●	●	●	

- Inspect
- ▲ Replace

### Notes:

1. Inspect and perform maintenance periodically according to maintenance schedule.
2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
3. \* The tension of the V-belt should be adjusted during the initial stage and inspected every 1,500 hours afterwards. Proper belt tension should be .25" deflection when 6 pounds of force is applied on the center of the belt span.

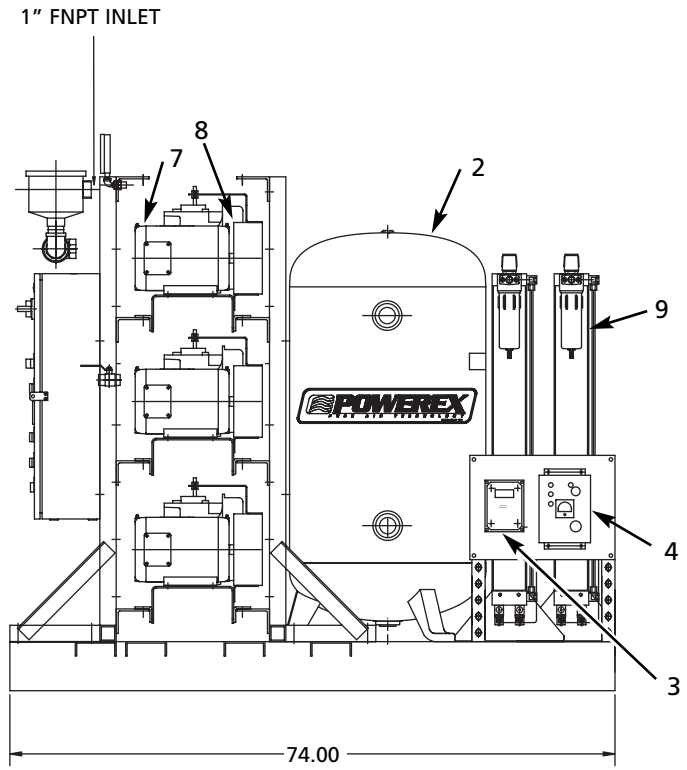
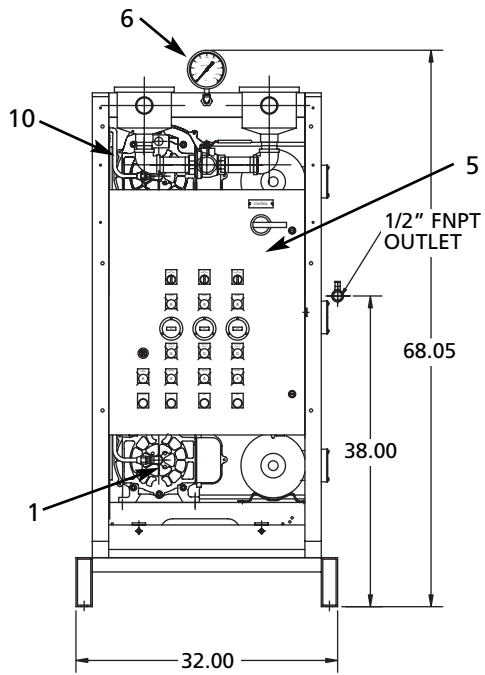
MSD0303 & MSD0503



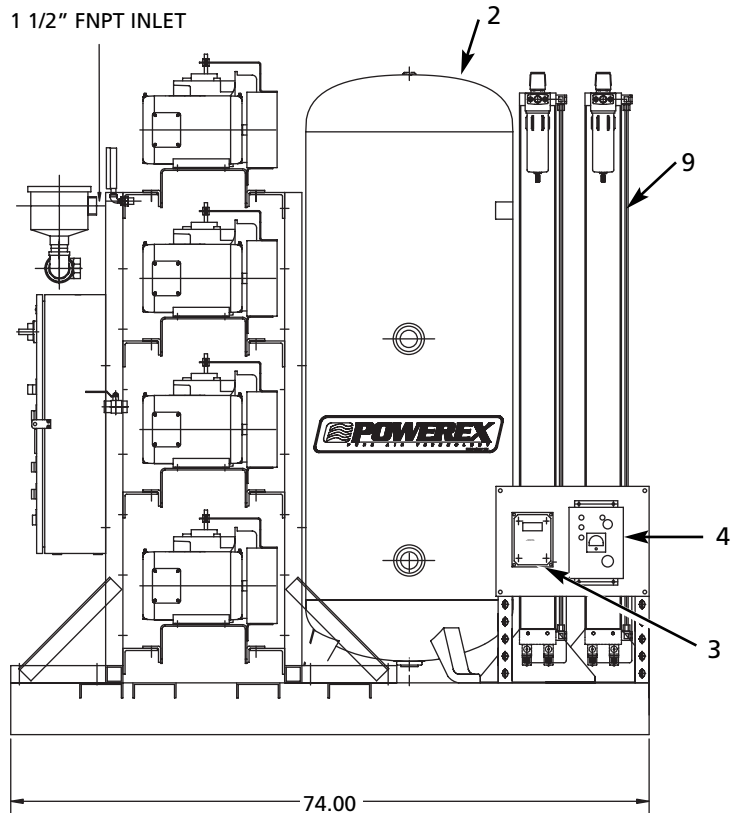
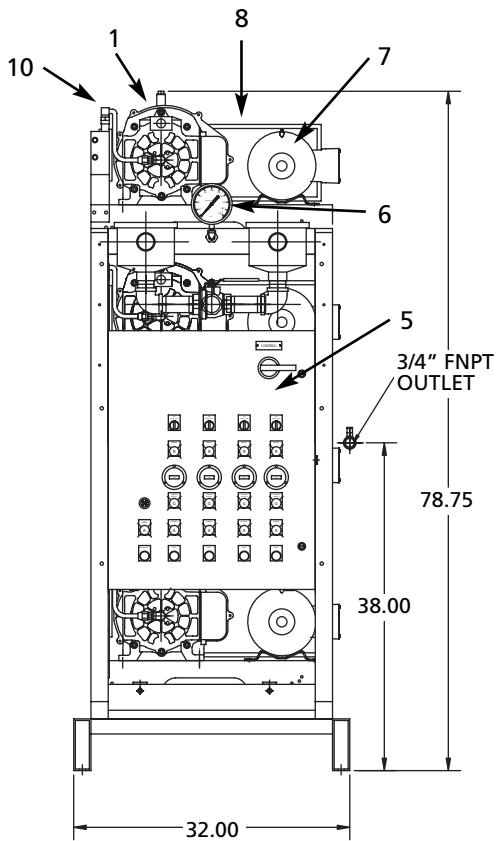
Ref. No.	Description	Part Number	Qty.
1	Scroll pump		
	3HP Scroll (MSD0303)	SLAE03	2
	5HP Scroll (MSD0503, MST0503, MSQ0504, MSS0504, MSN0505, MSW0505)	SLAE05	2/3/4/6/9/12
2	Vertical tank		
	80 Gallon	AR027300ST	1
	120 Gallon	AR027400ST	1
	200 Gallon	AR051200AV	1
3	Dew point monitor/probe dessicant	ACO500101	1
4	Carbon monoxide monitor/sensor	ACO600100	1
5	Control panel	Consult factory for parts and availability. Call 1-888-769-7979	1
6	Pressure gauge	GA031400AV	1
7	Motor (ODP)		
	3HP Motor (MSD0303)	MC022374AV	2
	5HP Motor (MSD0503, MST0503, MSQ0504, MSS0504, MSN0505, MSW0505)	MC022307AV	2/3/4/6/9/12
8	Belt guard		
	Front	BG303800AV	2/3/4/6/9/12
	Back	BG303900AV	2/3/4/6/9/12
9	Dryer		
	MSD0303	ACO20001AV	2
	MSD0503	ACO20003AV	2
	MSN0505	ACO20102AV	2
	MSQ0504	ACO20006AV	2
	MSS0504	ACO20100AV	2
	MST0503	ACO20004AV	2
MSW0505	ACO20103AV	2	
10	Aftercooler (not shown on all models)	SL0300100AV	2/3/4/6/9/12
Δ	Pulley		
	3HP Motor (MSD0303)	PU009753AV	2
	5HP Motor (MSD0503, MST0503, MSQ0504, MSS0504, MSN0505, MSW0505)	PU009754AV	2/3/4/6/9/12
Δ	Belt	BT010700AV	2/3/4/6/9/12

Δ Not Shown

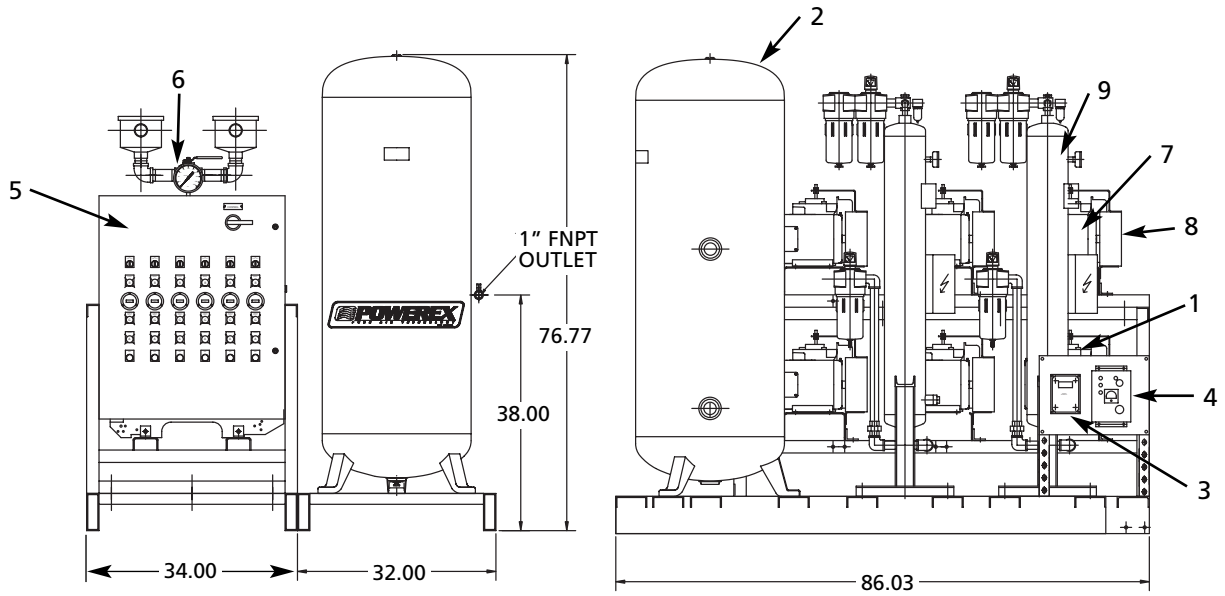
**MST0503**



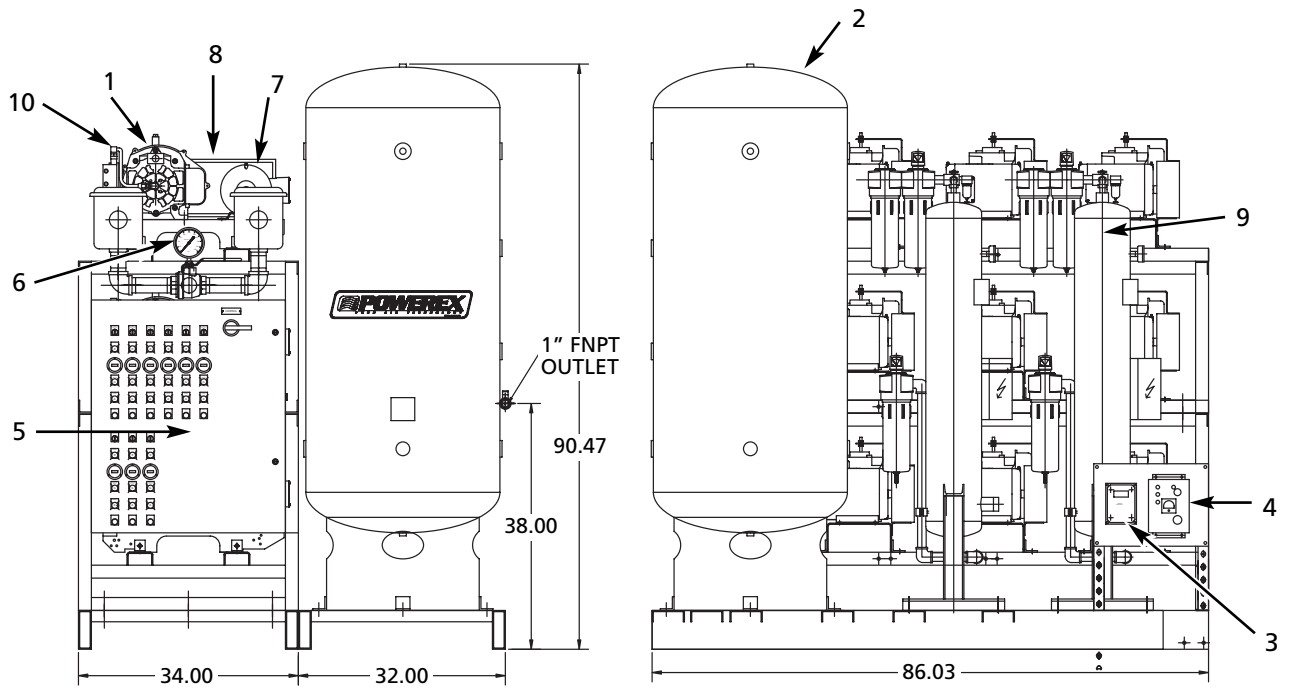
**MSQ0504**



MSS0504



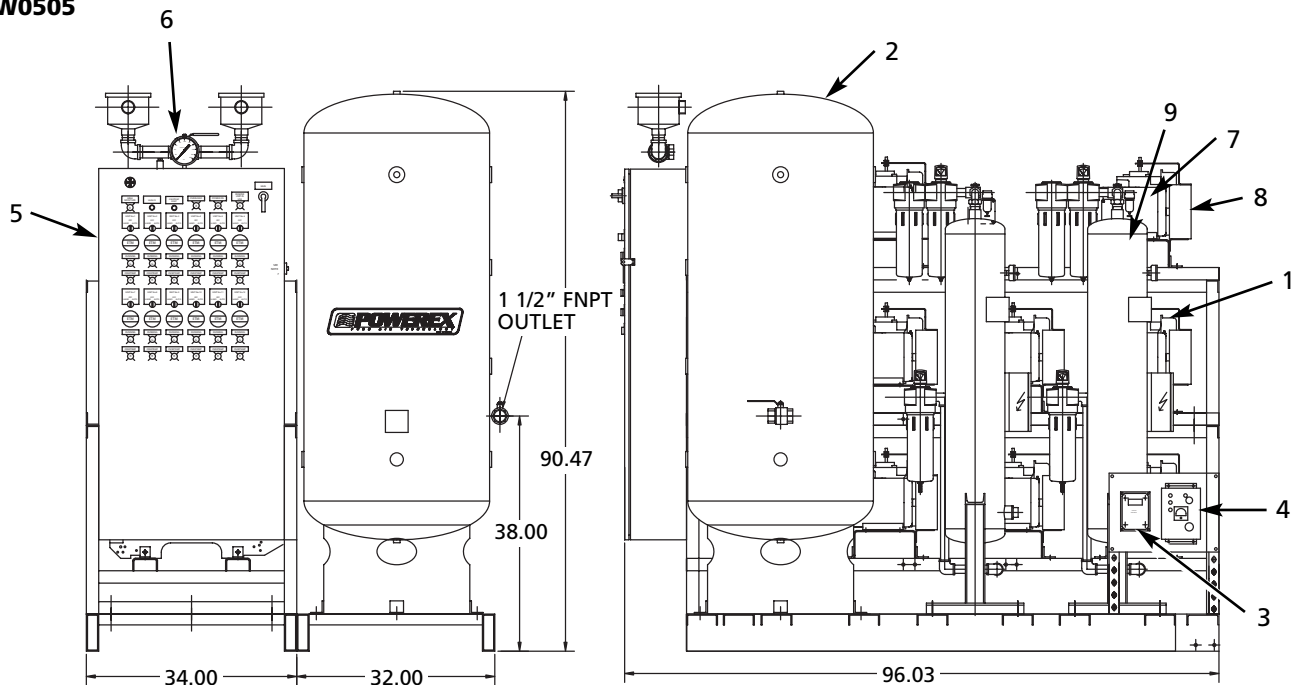
MSN0505





## Scroll Medical Package

MSW0505



### Powerex Limited Warranty

**Powerex 3 Year / 10,000 Hour Extended Parts Limited Warranty** - Powerex warrants each Compressor Pump or Scroll Air-End against defects in material or workmanship from the date of purchase for a period of **Three years or 10,000 hours**, whichever may occur first. This warranty applies to the exchange of part(s) of the compressor pump or air-end found to be defective by an Authorized Powerex Service Center.

**Powerex 1 Year / 5,000 Hour Inlet to Outlet Limited Warranty** - Powerex warrants each Compressor Unit, System, Pump, or Air-End against defects in material or workmanship from the date of purchase for a period of **One Year or 5,000 Hours**, whichever may occur first. This warranty applies to the exchange of defective component part(s) and labor performed by an Authorized Powerex Service Center.

The above mentioned warranty applies to POWEREX manufactured units or systems only.

Items listed in the operator's manual under routine maintenance are not covered by this or any other warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE: AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. THIS IS THE EXCLUSIVE REMEDY AND LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES IS EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

All claims pertaining to the merchandise in this schedule, with the exception of warranty claims, must be filed with POWEREX within 6 months of the invoice date, or they will not be honored. Prices, discounts and terms are subject to change without notice or as stipulated in specific product quotations. All agreements are contingent upon strikes, accidents, or other causes beyond our control. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of merchandise noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned merchandise will not be accepted without prior written authorization by POWEREX and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THESE TERMS AND CONDITIONS WILL CONTROL IN ANY TRANSACTION WITH POWEREX** any different or conflicting terms as may appear on any order form now or later submitted by the buyer. All orders are subject to acceptance by POWEREX.