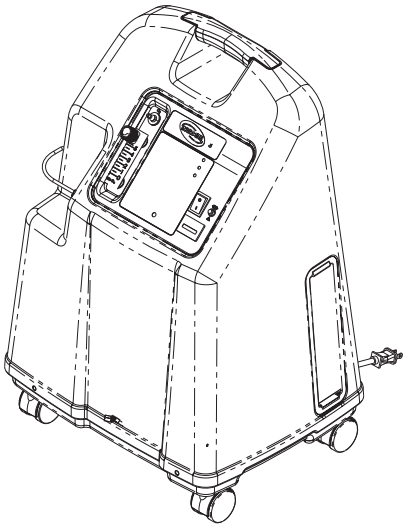
Service Manual

Platinum® Oxygen Concentrator



Model IRC5LXO2AW (With SensO$_2$ and HomeFill® Compatible)
Model IRC9LXO2AWQ (With SensO$_2$ and HomeFill Compatible)

DEALER: Keep this manual. The procedures in this manual **MUST** be performed by a qualified technician.

CE 0434

For more information regarding Invacare products, parts, and services, please visit www.invacare.eu.com

INVACARE®

Yes, you can.

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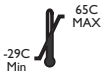
SPECIAL NOTES

Symbols

Signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage. Refer to the table below for definitions of the signal words.

Signal Word	meaning
⚠ 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 property damage or minor injury or both.
! IMPORTANT	Indicates a hazardous situation that could result in damage to property if it is not avoided.
NOTE:	Gives useful tips, recommendations and information for efficient, trouble-free use.

Symbols in the Documentation

	General Warning Sign *NOTE: The background color inside the triangle is yellow on product labels.*
	Read the Manual *NOTE: The color of the symbol background is blue on product labels.*
	No Smoking *NOTE: The color of the circle with the diagonal bar is red on product labels.*
	No Open Flame *NOTE: The color of the circle with the diagonal bar is red on product labels.*
	Class II, Double Insulation
IPX1	Protected against solid foreign objects of 12.5 mm diameter and greater. Protected against vertically falling water drops. This applies to units built after October 2016. Anything prior is IPX1 rated.
	Indoor Use Only
	Keep Dry
	Transport and Storage Temperature

	Transport and Storage Humidity
	Alternating Current
	Type BF equipment
	Recycle
	DO NOT dispose of in household waste
	Electrical Hazard
	Manufacturer
	European Representative
	This product complies with Directive 93/42/EEC concerning medical devices. The launch date of this product is stated in the CE declaration of conformity.

Symbols on Product

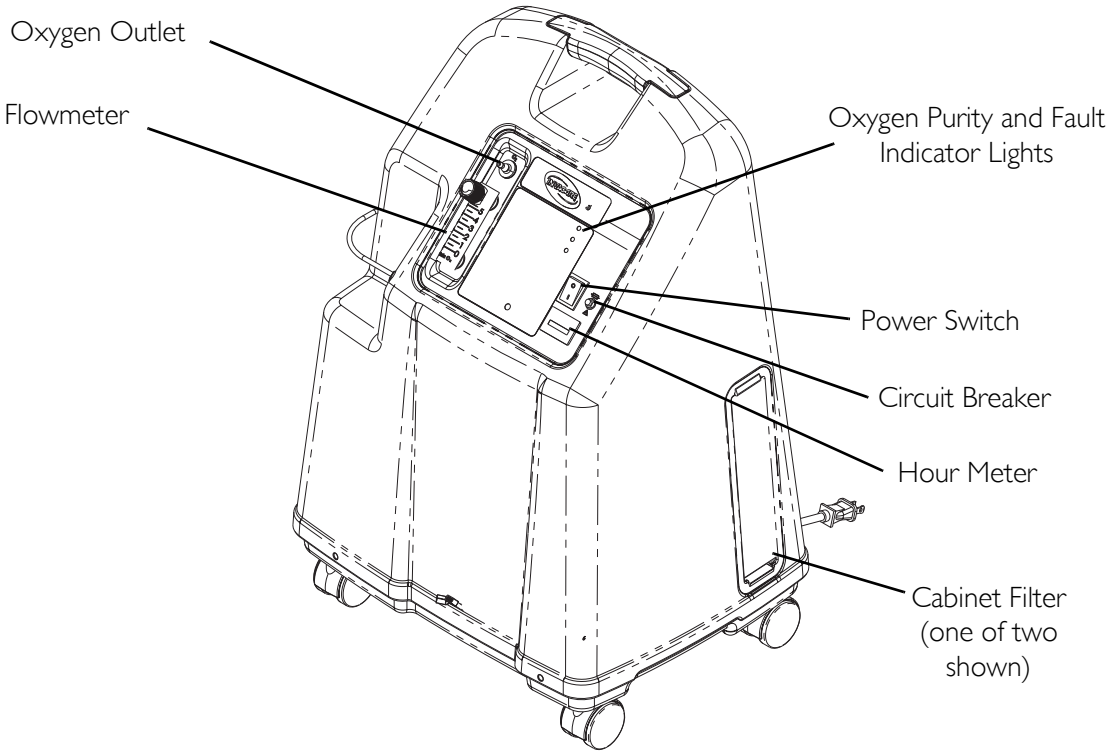
I	Power switch “ON”
O	Power switch “OFF”

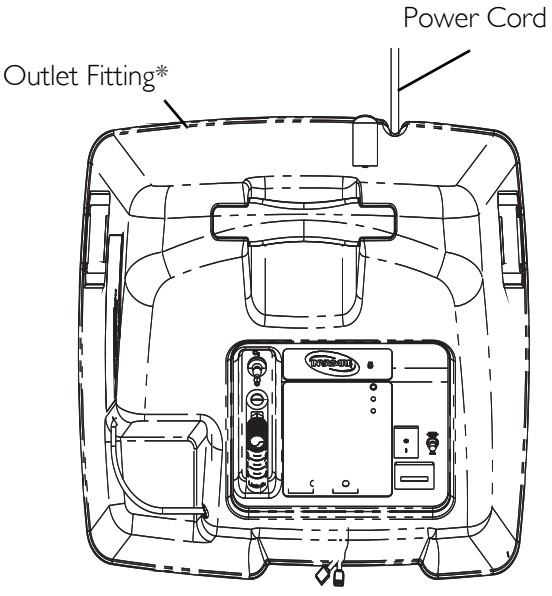
O_2 INDICATORS

LABEL SYMBOL	O_2 PURITY	INDICATOR LIGHTS (LED)
O_2	SYSTEM OKAY O_2 over 85%	GREEN Indicator Light
	O_2 Between 73% to 85%	YELLOW Indicator light A. YELLOW Solid B. YELLOW Flashing Sensor Failure Call a qualified technician.
	SYSTEM FAILURE O_2 Below 73%	RED Indicator Light Continuous Audible Alarm Sieve-GARD™ Compressor Shutdown.

FEATURES

FRONT VIEW - IRC5LXO2AW, IRC9LXO2AWQ





TOP VIEW

ACCESSORIES (NOT SHOWN):
HomeFill home oxygen compressor - IOH200AW

Contact your local Invacare representative for available accessory information.

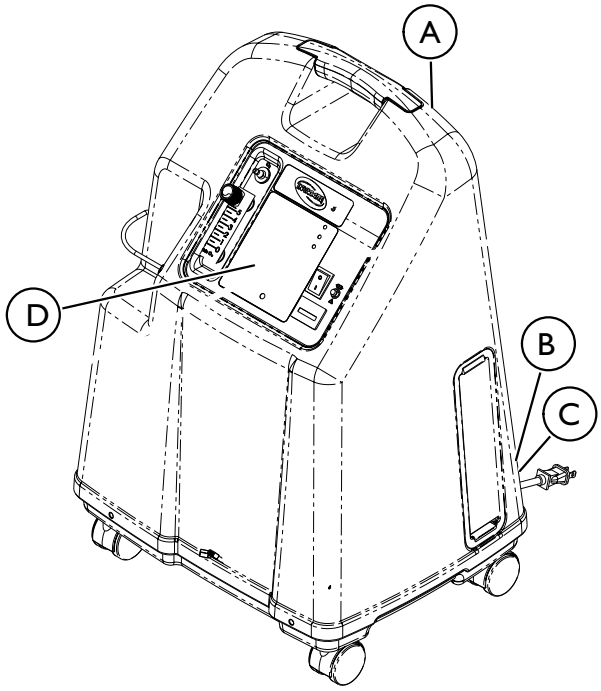
**NOTE: This outlet fitting is to be used only for filling oxygen cylinders with the HomeFill home oxygen compressor. The outlet fitting does not affect concentrator performance. Refer to the HomeFill user manual, part number 1116444, for connection and operating instructions. When not in use, the plug provided with the concentrator should be inserted into the outlet fitting. For more information about the HomeFill, contact Invacare.*

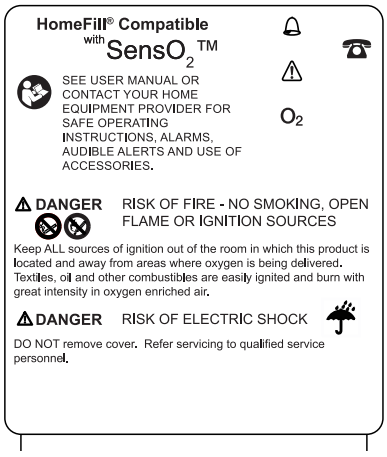
SPECIFICATIONS

Electrical Requirements:	230 VAC ± 10% (253 VAC/207 VAC), 50 Hz
Rated Current Input:	2.0 A (IRC5LXO2AW)
	2.5 A (IRC9LXO2AWQ)
Sound Level:	44 dB Average (IRC5LXO2AW)
Altitude:	For IRC5LXO2AW - Up to 1828 meters (6,000 ft.) above sea level without degradation of concentration levels. NOT RECOMMENDED FOR USE ABOVE 1828 M (6,000 ft).
	For IRC9LXO2AWQ - Up to 4,000 ft. (1230 meters) above sea level without degradation of concentration levels.
*Oxygen Output Concentration Levels: All 5LXO2AWQ/5LXAW/5LXO2AW models * (Stated concentration levels achieved after initial warm-up period (approximately 30 minutes).	For IRC5LXO2AW 93% minimum at 1 to 3 L/min. 91% minimum at 4 L/min. 87% minimum at 5 L/min (maximum recommended flow).
	For IRC9LXO2AWQ 93% minimum at 1 to 7 L/min; 91% minimum at 8 L/min; 87% minimum at 9 L/min.
Maximum Outlet Pressure:	5 Liter is 34.5 ± 3.45 kPa (5 ± 0.5 psi); 9 Liter is 62.05 kPa ± 3.45 kPa (9 ± 0.5 psi).
Flow Range:	For IRC5LXO2AW - 0.5 to 5 L/min. Flowrates less than 1 L/min. are not recommend
	For IRC9LXO2AWQ - 1 L/min. to 9 L/min. Flowrates less than1 L/min. are not recommended.
Potential Obstruction Alert:	The concentrator detects a condition that may indicate a potential obstruction of the output oxygen. Rapid audible beeping alert (this alert is deactivated when accessories are connected). May be associated with the following flow settings: IRC5LXO2AW - 0 L/min - 0.5 L/min IRC9LXO2AWQ - 0 L/min. to 1.0 L/min
Average Power Consumption:	395 W (IRC5LXO2AW)
	500 W (IRC9LXO2AWQ)
Pressure Relief Mechanism Operational at:	241 kPa ± 24.1 kPa (35 psi ± 3.5 psi)
Change in maximum recommended flow when back pressure of 7k Pa is applied:	0.7 L/min.
Filters:	Cabinet (2), Outlet HEPA and Compressor Inlet.
Safety System:	Current overload or line surge shutdown High temperature compressor shutdown High Pressure Alarm w/compressor shutdown Low Pressure Alarm w/compressor shutdown Battery Free Power Loss Alarm $SensO_2$ Oxygen System ($SensO_2$ Model) Possible Obstruction Alert
Width:	46.7 cm ± 1 cm (18 3/8 in ± 3/8 in)
Height:	67.0 cm ± 1 cm (26 3/8 in. ± 3/8 in)

Depth:	36.5 cm ± 1 cm (14 3/8 in. ± 3/8 in)
Weight:	For IRC5LXO2AW - 23.6 kg ± 1 kg (52 lbs ± 2 lbs)
	For IRC9LXO2AWQ - 24.0 kg ± 1 kg (53 lbs ± 2 lbs)
Shipping Weight:	For IRC5LXO2AW - 26.8 kg ± 1 kg (59 lbs ± 2 lbs)
	For IRC9LXO2AWQ - 27.2 kg ± 1 kg (60 lbs ± 2 lbs)
Operating Ambient Temperature:	10°C - 35°C (50°F - 95°F) at 20-60% relative humidity
Exhaust:	Less than Ambient +19°C (+ 35°F)
Oxygen Output:	Less than Ambient (+ 4°F) +2°C.
Cabinet:	Impact Resistant flame-retardant plastic cabinet that conforms to UL 94-V0.
CE marked models:	IRC5LXO2AW, IRC9LXO2AWQ
Electrical:	No extension cords.
Placement:	No closer than 7.5 cm (3 inches) from any wall, furniture, draperies, or similar surfaces.
Tubing:	For IRC5LXO2AW 2.1 m (7 ft) cannula with a maximum 15.2 m (50 ft) of Crush-Proof Tubing (DO NOT pinch).
	For IRC9LXO2AWQ - Recommended use up to 15.2 m (50 ft) high flow tubing with high flow cannula at all flow rates.
Relative Humidity:	20 to 60%
Time of Operation:	Up to 24 hours per day
Recommended Storage and Shipping Temperature:	-29°C to 65°C (-20°F to 150°F) at 15-95% relative humidity

SECTION 1— SAFETY



ITEM	DESCRIPTION
A	Serial number label is located on the resonator intake assembly.
B	Specification label is located on the back of the concentrator at the base.
C	Double Insulation label is located on the back of the concentrator at the base.
D	

General Guidelines

⚠ DANGER

Risk of Death, Injury or Damage

Improper use of the product may cause death, injury or damage. This section contains important information for the safe operation and use of this product.

DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manuals, service manuals or instruction sheets supplied with this product or optional equipment.

If you are unable to understand the warnings, cautions or instructions, contact a healthcare professional, dealer or technical personnel before attempting to use this equipment.

Check ALL external components and carton for damage. In case of damage, or if the product is not working correctly, contact a technician or Invacare for repair.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.

⚠ DANGER

Risk of Death, Injury or Damage From Fire

Textiles, oil or petroleum substances, grease, greasy substances and other combustibles are easily ignited and burn with great intensity in oxygen enriched air and when in contact with oxygen under pressure. To avoid fire, death, injury or damage:

DO NOT SMOKE while using this device.

DO NOT use near OPEN FLAME or IGNITION SOURCES.

DO NOT use any lubricants on concentrator unless recommended by Invacare.

NO SMOKING signs should be prominently displayed.

Avoid creation of any spark near oxygen equipment. This includes sparks from static electricity created by any type of friction.

Keep all matches, lighted cigarettes, electronic cigarettes or other sources of ignition out of the room in which this concentrator is located and away from where oxygen is being delivered.

Keep the oxygen tubing, cord, and concentrator out from under such items as blankets, bed coverings, chair cushions, clothing, and away from heated or hot surfaces including space heaters, stoves, and similar electrical appliances.

⚠ DANGER

To reduce the risk of burns, electrocution, death or injury to persons:

DO NOT disassemble. Refer servicing to qualified service personnel. There are no user serviceable parts.

Avoid using while bathing. If continuous usage is required by the physician's prescription, the concentrator must be located in another room at least 7ft (2.1m) from the bath.

DO NOT come in contact with the concentrator while wet.

DO NOT place or store concentrator where it can drop into water or other liquid.

DO NOT reach for concentrator that has fallen into water. Unplug IMMEDIATELY.

DO NOT use frayed or damaged AC power cords.

⚠ WARNING

Risk of Injury or Damage

Invacare products are specifically designed and manufactured for use in conjunction with Invacare accessories. Accessories designed by other manufacturers have not been tested by Invacare and are not recommended for use with Invacare products.

There are many different types of humidifiers, oxygen tubing, cannulas and masks that can be used with this device. You should contact your local home care supplier for recommendations on which of these devices will be best for you. They should also give you advice on the proper usage, maintenance, and cleaning.

⚠ DANGER

Risk of Injury or Death

To avoid choking or ingestion of chemicals from airway contamination:

DO NOT use the concentrator in the presence of pollutants, smoke, fumes, flammable anesthetics, cleaning agents, or chemical vapors.

⚠ WARNING

Risk of Injury or Death

To prevent injury or death from product misuse:

Closely supervise when this concentrator is used by or near children or impaired individuals.

Monitor patients using this device who are unable to hear or see alarms or communicate discomfort.

⚠ WARNING

Risk of Injury or Death

To avoid choking and/or strangulation from tubing entanglement:

Keep children and pets away from nasal cannula and tubing.

Close supervision is necessary when the nasal cannula is used by or near children and/or impaired persons.

⚠ WARNING

Risk of Injury or Death

To reduce the risk of injury or death from illness:

Replace the nasal cannula on a regular basis. Check with your equipment supplier or physician to determine how often the cannula should be replaced.

DO NOT share cannulas between patients.

⚠ WARNING

Risk of Injury

A change in altitude may affect total oxygen available to you. To prevent oxygen deprivation:

Consult your physician before traveling to higher or lower altitudes to determine if your flow settings should be changed.

⚠ WARNING

To prevent injury or damage from cord misuse:

DO NOT move or relocate concentrator by pulling on the cord.

DO NOT use extension cords with AC power cord provided.

Properly store and position electrical cords and/or tubing to prevent a tripping hazard.

⚠ WARNING

Risk of Injury or Damage

Invacare oxygen concentrators are specifically designed to minimize routine preventive maintenance. To prevent injury or damage:

Only professionals of the healthcare field or persons fully conversant with this process such as factory trained personnel should perform preventive maintenance or performance adjustments on the oxygen concentrator, except for tasks described in this manual.

Users should contact your dealer or Invacare for service.

⚠ CAUTION

Risk of Damage

To prevent damage from liquid ingress:

If the concentrator is not working properly, if it has been dropped or damaged, or dropped into water, call equipment supplier/qualified technician for examination and repair.

NEVER drop or insert any object or liquid into any opening.

For Indoor Use ONLY.

⚠ WARNING

Risk of Injury

It is very important to select the prescribed level of oxygen flow. To avoid injury from oxygen deprivation:

DO NOT increase or decrease the flow unless a change has been prescribed by your physician or therapist.

ALWAYS confirm prescribed dose before administering to patient and monitor on a frequent basis.

⚠ WARNING

Risk of damage

Shorter periods of operation may reduce maximum product life. For optimum performance:

The concentrator should be on and running for a minimum of 30 minutes at a time.

Radio Frequency Interference

⚠ WARNING

Risk of Injury or Damage

To reduce the risk of injury or product damage from interference with wireless equipment:

Keep concentrator at least 9.8 ft (3.0 m) away from wireless communication equipment such as wireless home network devices, mobile phones, cordless phones and base stations, walkie-talkies, etc.

This equipment has been tested and found to comply with EMC limits specified by IEC/EN 60601-1-2. These limits are designed to provide a reasonable protection against electromagnetic interference in a typical medical installation.

Other devices may experience interference from even the low levels of electromagnetic emissions permitted by the above standards. To determine if the emissions from the concentrator are causing the interference, turn the concentrator Off. If the interference with the other device(s) stops, then the concentrator is causing the interference. In such rare cases, interference may be reduced or corrected by one of the following measures:

- Reposition, relocate, or increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) is connected.

SECTION 2—INSTALLATION/ SEQUENCE OF OPERATION

Installation/Verification of Battery Free Power Loss Alarm

When your new Platinum concentrator arrives, it should be checked for proper operating conditions.

1. If the unit has been in below-freezing temperatures, allow it to warm up to room temperature before operating.
2. The concentrator may need to be turned on for 4 to 5 seconds to charge the Battery Free Power Loss Alarm. Connect power cord to outlet and turn the concentrator on. Turn flow control knob counterclockwise and flow will begin IMMEDIATELY. Set flow rate to five L/min. Let the unit run for 30 minutes, then turn unit off.
3. Unplug the power cord and press on/off **(I/O)** switch to the On (**I**) position. An intermittent audible alarm will sound. This confirms proper operation of the Battery Free Power Loss Alarm. Turn On/Off **(I/O)** switch Off (O).
4. Connect power cord to outlet and turn on concentrator. Unit will beep on start-up.
5. Check the oxygen concentration per specifications after 30-40 minutes running time.

Sequence of Operation

Turning on (**I**) the power switch applies 230 VAC to the compressor motor, hour meter, transformer, cooling fan and the printed circuit (P.C.) board.

Room air enters the compressor via the cabinet filter and the compressor inlet filter. The air is compressed by the wobble pistons in the compressor to a pressure of 144.79 kPa (21 psi) for 5 Liter model and 172.36 kpa (25 psi) for 9 Liter model.

As increased pressure creates increased temperature, a heat exchanger is used to lower the temperature before the air enters the 4-way valve. It is then channeled to a sieve bed containing the adsorption material. Restriction downstream of the sieve bed causes pressure to build up inside the sieve bed which is necessary for the adsorption process. A small amount of relatively pure oxygen enters the top of the second bed through a restrictive leak in the pressure equalization (PE) valve with the balance entering a storage tank. The nitrogen removed is exhausted back from the bed through the 4-way valve into room air. A muffler is located at the exhaust end of the valve to muffle the sound of the exhaust as it exits the concentrator.

The oxygen not being used to exhaust is channeled into the storage tank. The pressurized oxygen is regulated down to 34.5 ± 3.45 kPa (5 ± 0.5 psi) for 5 Liter; 62.05 kPa ± 3.45 kPa (9 ± 0.5 psi) for 9 Liter, enters an accurate flow-measuring device, flows through Outlet HEPA filter and check valve, then out to the patient.

The electrical activation of the 4-way Valve is accomplished every 8 to 15 seconds by the pressure sensor and P.C. Board electronics when the pressure reaches a set point of 144.79 kPa (21 psi) for 5 Liter and 172.36 kPa (25 psi) for 9 Liter. The time between cycles is dependent on altitude, flow rate and internal environmental factors.

A PE valve opens just prior to the shift of the 4-way valve. This allows highly concentrated oxygen to enter the just exhausted bed from the top. This additional pressure allows the bed to start its cycle at a higher pressure. The PE valve will close just after the shift of the 4-way valve.

If main power is lost, the Battery Free Power Loss Alarm will sound a short BEEP, with a long pause after. All units are equipped with a diagnostic alarm system that signals if the pneumatic pressure or electrical systems malfunction. The Troubleshooting Guide in this manual explains the alarm system signals and reasons, in detail, for your convenience.

SensO_2 Oxygen Sensor Technology - Ceramic Zirconia Sensor

Technical Description

The oxygen being produced by the concentrator flows out of the product tank and into the flowmeter. A small flow of oxygen produced by the unit is sent through a precision orifice to the oxygen sensor mounted on the printed circuit board.

As the oxygen enters the sensor, it passes through a screen and contacts the sensing disk.

Electric current flowing through a metal film resistor heats the disk in excess of 300°C. Oxygen molecules contact the electrode of the disk and pick-up extra electrons to become oxygen ions. These oxygen ions are attracted to the electrode on the bottom of the zirconia sensing disk. Because of the crystal structure of the zirconia, only oxygen ions can pass through. When the oxygen ions reach the bottom electrode, the extra electrons are released from the oxygen ions and oxygen molecules return to the air. The number of electrons is directly related to the oxygen concentration. The electrons travel to the P.C. board where they are counted and the oxygen concentration reading is calculated.

A microprocessor on the P.C. board contains software that interprets the signal being received from the sensor. It compares the signal to clinically acceptable limits. Signals outside of the clinically acceptable limits generate responses in the form of lights, audible indicators, and/or system shut-down.

Operating Sequence

Once the power switch has been turned on (**I**), the SensO_2 circuit will wait five minutes for the concentrator to begin producing clinically acceptable oxygen and the oxygen sensor to stabilize. The GREEN light will illuminate (indicating normal system operation) while the oxygen sensor is warming up.

After 5 minutes, if the oxygen purity exceeds 85% ± 2%, the GREEN light will continue to illuminate.

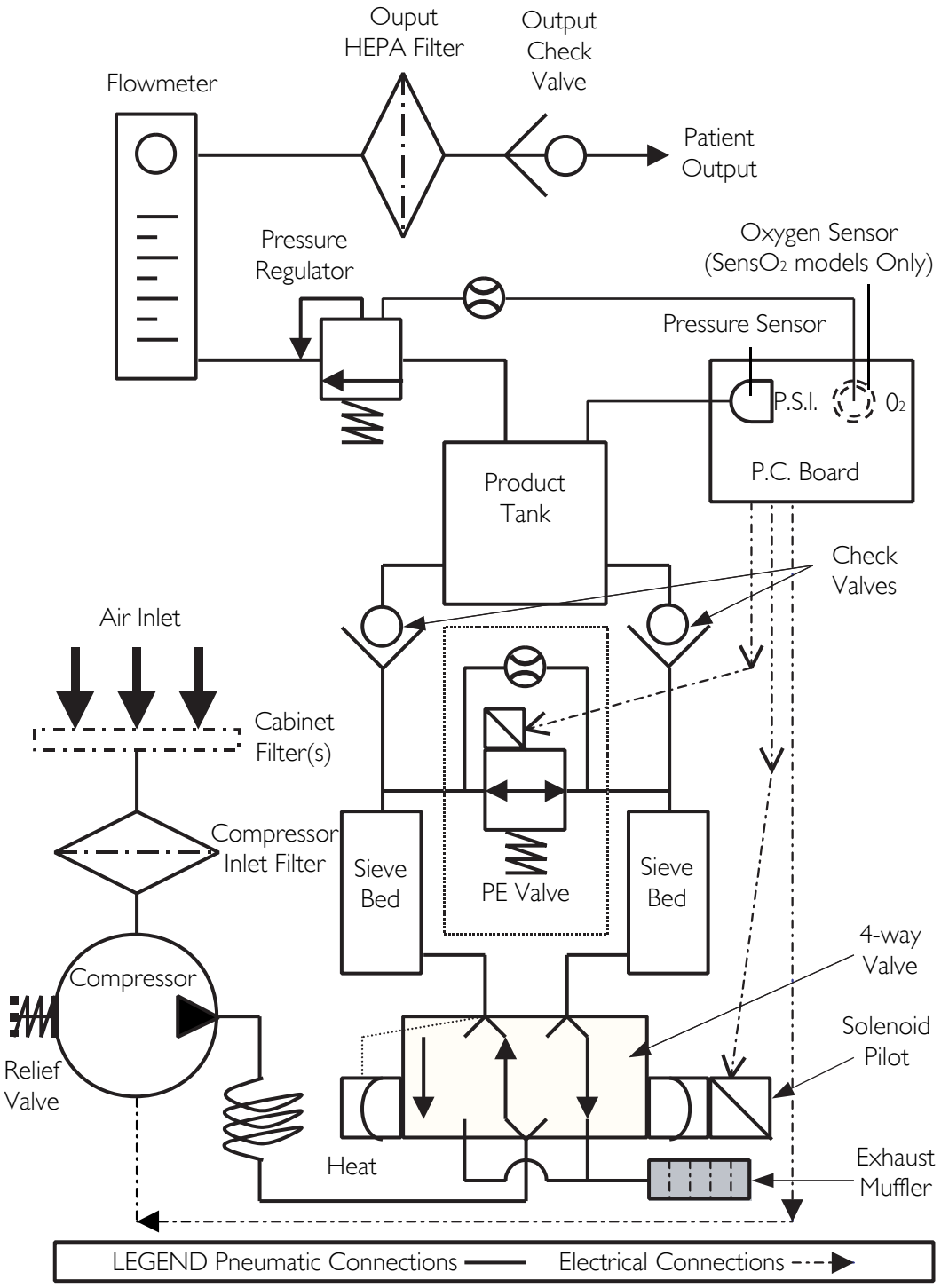
If the oxygen level is not above 85% ± 2% after the first five minutes, the system will continue to monitor the O_2 and wait for a maximum of 30 minutes from start-up to reach 85% ± 2% before activating an alarm. Environmental factors such as low voltage, high altitude, or age of the machine will affect the time required to reach 85% ± 2%.

If the oxygen level is not above 85% ± 2% within the first 30 minutes, the oxygen concentration alarm sequence will activate and the unit will shut down.

When oxygen concentration is above 85% ± 2%, the sensor measures oxygen purity every 10 minutes. If a reading falls below 85% ± 2%, a YELLOW light will illuminate. If the oxygen purity falls below 73% ± 3%, the RED light/Alarm/Shut-Down mode will activate.

SECTION 3—PNEUMATIC DIAGRAM

Plantinum Oxygen Concentrator



SECTION 4—TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	SOLUTION
Normal Operation Internal Status Indicators: RED: Off GREEN: Off Unit plugged in, power switch on. Single beep on start up.	No Problems	System Okay
Power Loss Internal Status Indicators: RED: Off GREEN: Off Unit unplugged, power switch on, alarm off.	No Problems	Battery Free Circuit drained. Plug in cord and turn power switch ON (**I**) to recharge.
Power Loss Internal Status Indicators: RED: Off GREEN: Off Unit plugged in, power switch, alarm off, battery Free circuit drained.	No power at outlet	Check electrical outlet with a table lamp or voltmeter set on the appropriate VAC scale. If outlet isn't working, check protective device in home's electrical panel or consult an electrician. Also ensure that unit is properly plugged in. DO NOT use extension cords. Move to another outlet or circuit.
	Power cord: a. Frayed b. Broken or damaged spade c. Spade connector from power cord loose or disconnected (inside back of unit)	a. Reattach cord. b. Replace power cord connectors on plug. c. Reattach connector.
	On/Off **(I/O)** switch a. Disconnected wire b. Faulty switch	Check all electrical connections to the On/Off **(I/O)** switch for any disconnected wires. If the concentrator does not come on at all and wiring is intact, color code and remove wires one at a time. Remove and replace with new one. Transfer wires from old switch to new switch one at a time to the matching contact.
	Circuit breaker tripped	Reset breaker NOTE: Breaker may trip to safeguard concentrator during a power surge. If breaker trips IMMEDIATELY, there is a probable short in the unit. Check for pinched or charred wires. If the breaker does not trip, run unit for approximately two hours. The circuit breaker should be less than ten ohms. If breaker trips again, there is an internal problem.
	P.C. board a. P.C. board damaged b. Loose or damaged connector	a. Replace P.C. Board. Refer to Replacing P.C. Board on page 54. b. Repair or replace connector. Refer to Replacing P.C. Board on page 54.
Internal Power Loss SensO_2 Internal Status Indicators: RED: Off GREEN: Off Alarm may or may not be on. Control Panel Indicators: RED: Off YELLOW: Off GREEN: Off Fan operates, Compressor not operating.	Transformer assembly a. Faulty b. Connector loose or disconnected c. Faulty wiring	a. Replace. Refer to Replacing Transformer Assembly on page 56. b. Reattach connector. c. Replace transformer assembly. Refer to Replacing Transformer Assembly on page 56.
	P.C. board faulty	Replace P.C. board. Refer to Replacing P.C. Board on page 54.

SYMPTOM	PROBABLE CAUSE	SOLUTION
High Pressure Internal Status Indicators: RED: One Flash GREEN: Two Flashes Unit plugged in, power switch on, continuous alarm. Compressor shut down.	P.C. board: a. Malfunction b. Disconnected wire c. Shifting valve at pressures greater than 25 psi	 a. Set flow to max L/min. for concentrator. Check voltage across Pilot Valve 2 on 200 volt scale. If meter reads 0 volts when unit is turned on, replace P.C. board. b. Check spade connectors on pilot valve 2 and connectors on P.C. board. c. Replace P.C. board. Refer to Replacing P.C. Board on page 54.
	4-way Valve: a. Not shifting. b. Defective coil.	 a. Check voltage. If voltage rises to approximately 24 volts D.C. when unit shuts down, P.C. board is functioning properly. Replace the valve if shorted or open. Refer to Replacing 4-Way Valve on page 60. b. Coil resistance should read 80 ohm ± 10. Replace 4-way valve. Refer to Replacing 4-Way Valve on page 60.
	Sieve Beds contaminated	a. Replace Sieve Beds. Refer to Replacing Sieve Beds on page 40.
Low Pressure Internal Status Indicators: RED: One Flash GREEN: One Flash Or RED: One Flash GREEN: Three Flashes Control Panel Indicators: RED: On YELLOW: Off GREEN: Off Unit plugged in, power switch on, continuous audible alarm. Compressor shut down (Failure to cycle due to low pressure).	Compressor inlet filter dirty or plugged	Replace compressor inlet filter. Refer to Replacing the Compressor Inlet Filter on page 28.
	Compressor: a. Leaks at fittings or tubing b. Leaking or defective relief valve c. Insufficient voltage at outlet d. Worn cup seals or gaskets	 a. Tighten fittings. Replace or repair. b. Repair leak or replace. c. DO NOT use extension cords. Use another outlet. d. Replace the compressor. Refer to Compressor on page 35.
	Heat exchanger: a. Leak at tubing or body chamber b. Inspect tubing and heat exchanger	 a. Replace or retighten. b. Replace or retighten tubing. Replace heat exchanger. Refer to Replacing Heat Exchanger on page 47.
	Regulator cracked or leaking	Replace regulator. Refer to Replacing Regulator on page 44.
	PE valve leaking	Replace PE Valve. Check voltage at PE valve connector on 24 volt D.C. scale. The PE Valve activates or energizes approximately one second prior to the activation of the 4 way valve with approximately 24 volts. If voltage is in excess of 24 volts consistently, replace the P.C. board. Refer to Replacing P.C. Board on page 54. If the P.C. board voltage acts normally, replace the PE valve. Refer to Replacing PE Valve on page 38. NOTE: Check for leaks starting at the compressor output through all the pneumatic connections. Major leaks will cause system pressures to remain below adequate shift (exhaust) pressures and will cause compressor shutdown.
Defective Parts Internal Status Indicators: RED: One Flash GREEN: Five Flashes Or RED: Two Flashes GREEN: Three Flashes Control Panel Indicators: RED: On YELLOW: Off GREEN: Off Unit plugged in, power switch on, continuous audible alarm. Compressor shut down.	Defective main valve coil	a. Replace main valve.Refer to Replacing 4-Way Valve on page 60. b. Replace main valve coil. Refer to Replacing 4-Way Valve on page 60.
	Connector loose	Reattach connector.
	Defective PE valve coil (Resistance 80 ohms ± 10) Defective PC Board	Replace PE coil if shorted or open on resistance check. Refer to Replacing PE Valve on page 38. Replace PC Board. Refer to Replacing P.C. Board on page 54.
	Defective PE valve coil (Resistance 80 ohms ± 10.)	Replace PE coil if shorted or open on resistance check. Refer to Replacing PE Valve on page 38.
	Connector loose	Reattach connector.
	Defective P.C. board	Replace P.C. board. Refer to Replacing P.C. Board on page 54.

SYMPTOM	PROBABLE CAUSE	SOLUTION
Unit Not Operating Alarm: On or Off Internal Status Indicators: RED: Two Flashes GREEN: Four Flashes Or RED: Two Flashes GREEN: Five Flashes	P.C. board Failure	Replace P.C. board.Refer to Replacing P.C. Board on page 54.
Low Concentration NOTE: Check for O_2 purity using a calibrated Oxygen Analyzer at Test Point 1 (Oxygen Outlet) of the concentrator. Internal Status Indicators: RED: Two Flashes GREEN: One Flash73% Shutdown Control Panel Indicators: SensO_2 ONLY: RED: On YELLOW: Off GREEN: Off For SensO_2 units, the RED indicator will signal extremely low purity and will be accompanied by a continuous audible alarm and a system shutdown. Repairs are required.	Cabinet filters dirty	Clean or replace. Refer to Cleaning the Cabinet Filter on page 26, Replacing the Outlet HEPA Filter on page 27, and Replacing the Compressor Inlet Filter on page 28.
	Compressor inlet filter dirty	Replace inlet filter. Refer to Replacing the Compressor Inlet Filter on page 28.
	Compressor: a. Defective b. Faulty capacitor c. Bad motor windings d. Worn seals e. Bad bearings f. Leak at fittings or tubing g. Leaky or defective relief valve h. Insufficient voltage (outlet)	a. Replace compressor. Refer to Compressor on page 35. b. Replace capacitor. Refer to Replacing Capacitor on page 37. c. Replace compressor. Refer to Compressor on page 35. d. Replace the compressor. Refer to Compressor on page 35. e. Replace compressor. Refer to Compressor on page 35. f. Replace fittings or tubing. g. Replace compressor. Refer to Compressor on page 35. h. DO NOT use extension cords.
	Heat exchanger: a. Leak at tubing or body chamber b. Inspect tubing and heat exchanger	a. Replace or retighten. b. Replace or retighten tubing. Replace heat exchanger. Refer to Replacing Heat Exchanger on page 47.
	Regulator cracked or leaking	Replace. Refer to Replacing Regulator on page 44.
	Exhaust/Throttle muffler dirty or plugged.	Replace. Refer to Inspecting/Replacing the Throttle Muffler on page 31.
	Fan: a. Not operating. Unit overheating. b. Faulty fan	a. Leads to fan disconnected. Reconnect. b. Replace.Refer to Replacing Cooling Fan on page 52.
	Sieve beds defective	Replace. Refer to Pressure Testing on page 80.
	Tubing kinked	Replace.
Potential Obstruction Alert does not activate on flows less than 0.5 L/min.	System leak	Repair leak in product tank, regulator, tubing, fittings, or flow meter.
	Defective check valves	Replace check valves. Refer to Replacing Check Valves on page 42.

SYMPTOM	PROBABLE CAUSE	SOLUTION
Low Concentration (Continued)	P.C. board: a. Shifts at wrong pressures	Check pressure at product tank. Pressure should rise to 144.79 kPa (21 psi) at shift point. If not, replace P.C. Board. Refer to Replacing P.C. Board on page 54.
	Flowmeter: a. Flowmeter opened beyond maximum flow rate b. Cracked or broken fitting c. Input tubing leaking or loose	a. Return flow to maximum setting. b. Replace fitting. c. Repair or replace. Refer to Replacing Flowmeter on page 58.
	Autotuning	To accommodate for varying tolerances when replacing components, autotuning is used to control the shifting of the Pressure Equalization (PE) valve. Refer to Autotuning on page 69.
	PE valve: a. Bad coil b. Restrictor blockage	a. Replace PE valve. Refer to Replacing PE Valve on page 38. b. Replace PE valve. Refer to Replacing PE Valve on page 38.
	Inspect P.C. board restrictor tubing for kinks or tears	Replace P.C. board. Refer to Replacing P.C. Board on page 54.
Fluctuating Flow	Regulator/Flowmeter: a. Incorrectly set regulator b. Flowmeter malfunction	a. Check pressure at oxygen outlet. Adjust regulator. b. If flow is still unstable, check for leaks starting at the compressor outlet fitting through all pneumatic connections. If no leaks are found and flow is still fluctuating, replace the regulator. If pressure at test point is within spec 34.5 ± 3.45 kPa (5 ± 0.5 psi) for 5 Liter; 62.05 kPa ± 3.45 kPa (9 ± 0.5 psi) for 9 Liter, replace flowmeter. Refer to Replacing Flowmeter on page 58.
	Outlet HEPA filter: a. Dirty or plugged	a. If low flow conditions persist, replace outlet HEPA filter. Refer to Replacing the Outlet HEPA Filter on page 27.
Unit Excessively Loud	Pneumatic exhaust: a. Muffler cracked, damaged or missing b. Muffler tubing disconnected or damaged	a. Replace. Refer to Inspecting/Replacing Throttling Muffler For Platinum 5 AW on page 30. b. Reconnect or replace tubing. Refer to Inspecting/Replacing Throttling Muffler For Platinum 5 AW on page 30.
	Compressor inlet filter missing and/or orange sticker removed	a. Replace compressor inlet filter. Refer to Replacing the Compressor Inlet Filter on page 28.
	Compressor noisy	a. Replace Compressor. Refer to Compressor on page 35.
	Incorrect style of inlet filter (aftermarket)	Replace with factory OEM sound reduced style inlet HEPA filter. Refer to Replacing the Outlet HEPA Filter on page 27.

SYMPTOM	PROBABLE CAUSE	SOLUTION
Unit Overheats	Base exhaust vent plugged or restricted	Place unit at least 7.5 cm (3-inches) from any wall. DO NOT place unit on pile or shag carpeting that may restrict air flow.
	Cabinet filters dirty or blocked	Clean or replace. Refer to Cleaning the Cabinet Filter on page 26.
	Fan: a. Leads to fan disconnected b. Defective fan c. Fan installed upside down	a. Reconnect leads. b. Replace fan. Refer to Replacing Cooling Fan on page 52. c. Install fan with air flow arrow pointing down.
	Heat exchanger: a. Dirty or plugged b. Damaged	a. Clean heat exchanger. b. Replace heat exchanger. Refer to Replacing Heat Exchanger on page 47.
	Compressor: a. Defective b. Faulty capacitor c. Bad motor windings d. Worn seals e. Bad bearings	a. Replace compressor. Refer to Compressor on page 35. b. Replace capacitor. Refer to Replacing Capacitor on page 37. c. Replace compressor. Refer to Compressor on page 35. d. Replace compressor.Refer to Compressor on page 35. e. Replace compressor.Refer to Compressor on page 35.
	Line voltage excessive (surge)	Have line voltage inspected by certified electrician. A voltage regulator may be required and is obtainable from your local electric company.
Oxygen Purity Internal Status Indicators: Control Panel Indicators: RED: Off YELLOW: On GREEN: On After 30 minutes of run time, unit operates normally, oxygen purity within normal range. GREEN or YELLOW panel indicator should illuminate.	P.C. board defective	Replace P.C. board. Refer to Replacing P.C. Board on page 54. Refer to Autotuning on page 69.
Unit Not Operating Internal Status Indicators: RED: Off GREEN: Off Control Panel Indicators: RED: Off YELLOW: Off GREEN: Off Power Switch ON. Continuous audible alarm.	Transformer assembly: a. Assembly connector disconnected b. Faulty transformer assembly	a. Reattach connector. b. Replace transformer assembly. Refer to Replacing Transformer Assembly on page 56.
Unit Operating Internal Status Indicators: RED: Three Flashes GREEN: One Flash CONTROL PANEL INDICATORS: RED: Off YELLOW: Flashing GREEN: On	Internal repairs required	Replace SensO_2 circuit board. Refer to Replacing P.C. Board on page 54.

NOTE: The error code must be cleared from the unit's memory after fixing the fault. The error code memory will be cleared after turning power on and off five times after the fault was detected.

SECTION 5—CABINET

Removing Cabinet

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove the four mounting screws that secure cabinet assembly to the base assembly.
3. Lift the cabinet straight up.

NOTE: When required, vacuum inside of the cabinet and exposed foam insulation.

4. To re-install cabinet, reverse STEPS 2-3.

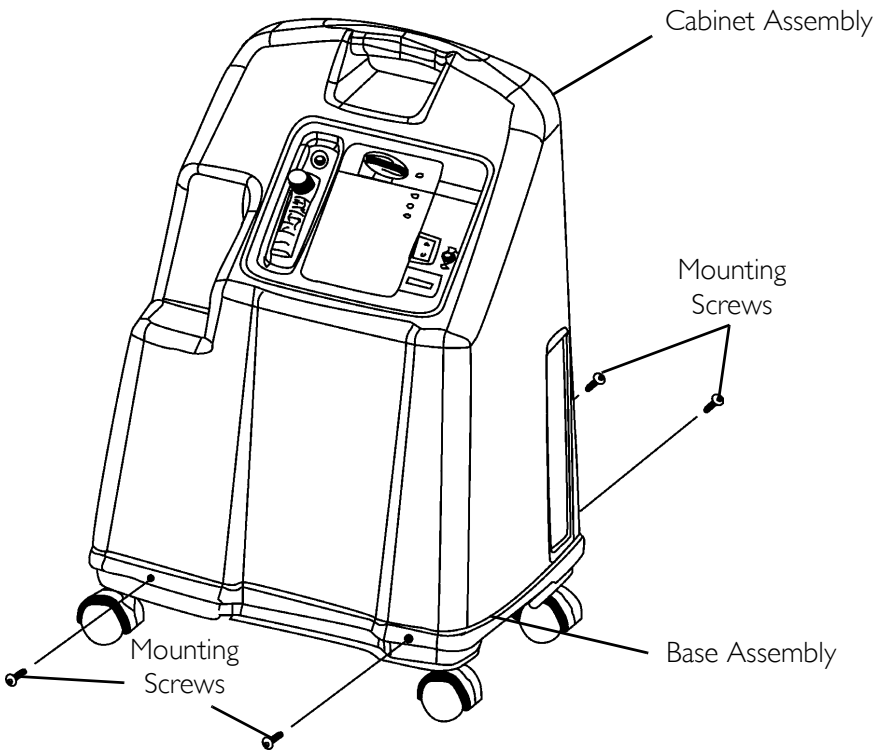


FIGURE 5.1 Removing Cabinet

SECTION 6—PREVENTIVE MAINTENANCE

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

⚠ WARNING

Risk of Injury or Damage

Invacare oxygen concentrators are specifically designed to minimize routine preventive maintenance. To prevent injury or damage:

Only professionals of the healthcare field or persons fully conversant with this process such as factory trained personnel should perform preventive maintenance or performance adjustments on the oxygen concentrator, except for tasks described in this manual.

Users should contact your dealer or Invacare for service.

NOTE: At a minimum, preventive maintenance MUST be performed according to the maintenance record guidelines. In places with high dust or soot levels, maintenance may need to be performed more often. Refer to Troubleshooting on page 20 for plugged filter symptoms and to Preventive Maintenance Record Invacare Platinum Oxygen Concentrator on page 34.

Cleaning the Cabinet Filter

NOTE: There are two cabinet filters, one located on each side of the cabinet.

1. Remove each filter and clean as needed.

NOTE: Environmental conditions that may require more frequent cleaning of the filters include but are not limited to: high dust, smoking, air pollutants, etc.

2. Clean the cabinet filters with a vacuum cleaner or wash in warm soapy water and rinse thoroughly.
3. Dry the filters thoroughly before reinstallation.

⚠ CAUTION

DO NOT operate the concentrator without the filters installed.

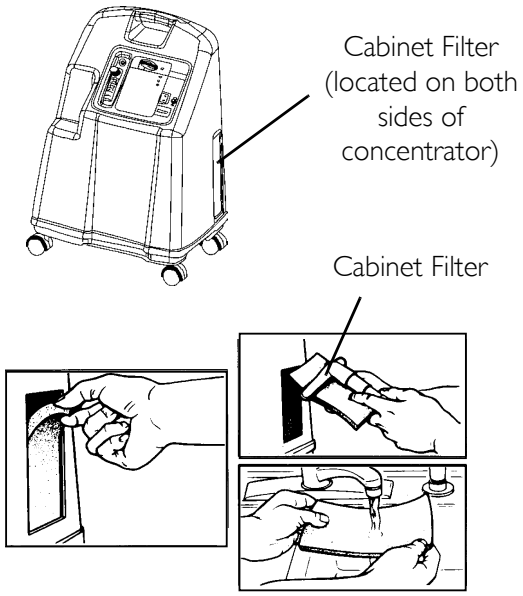


FIGURE 6.1 Cleaning the Cabinet Filter

Replacing the Outlet HEPA Filter

Check the Outlet HEPA Filter

NOTE: The outlet HEPA filter can be checked during preventive maintenance or between patients by performing the following procedure.

1. Turn the concentrator on and adjust the flowmeter to the maximum flow of the unit.
2. Observe the flowmeter's flow indicator while connecting a 50 foot (15.2 meters) cannula tube to the outlet barb of the concentrator (not shown).
3. If the flow indicator fluctuates, the outlet HEPA filter may need replacement. Refer to Troubleshooting on page 20.

NOTE: To replace the Outlet HEPA filter, perform this procedure as needed depending on the Outlet HEPA filter check results.

Replace the Outlet HEPA Filter

NOTE: Perform this procedure during preventive maintenance or between patients depending on the outlet HEPA filter check results.

1. Turn power Off (O) and unplug the unit.
2. Remove the cabinet. Refer to Removing Cabinet on page 25.
3. Remove the tubing from both sides of the existing HEPA filter and discard old filter.
4. Connect tubing to both sides of the new HEPA filter as shown below.
5. Install cabinet. Refer to Removing Cabinet on page 25.

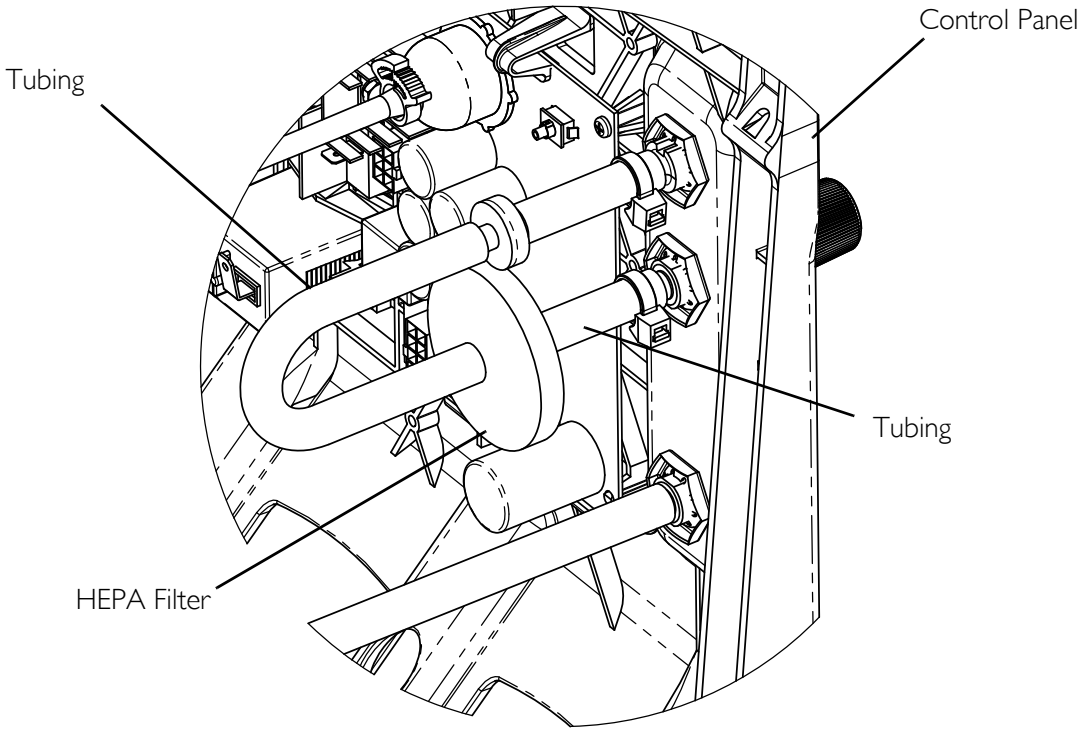
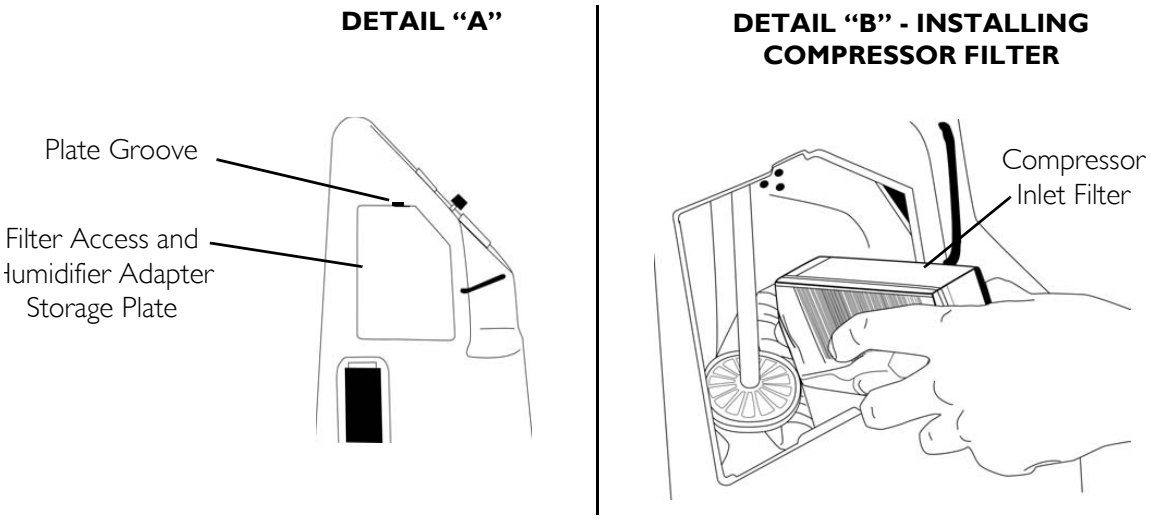


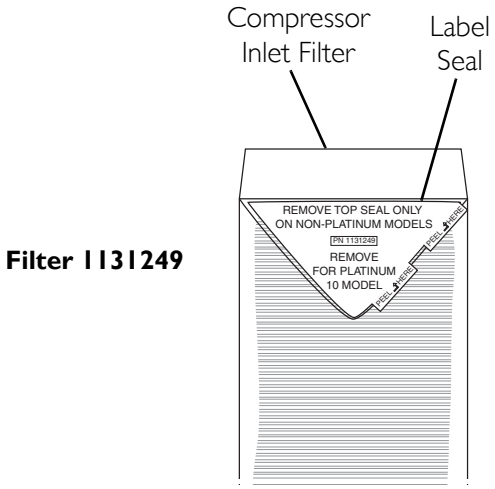
FIGURE 6.2 Replace the Outlet HEPA Filter

Replacing the Compressor Inlet Filter

NOTE: Perform this procedure as needed depending upon the environment the concentrator is used in.

1. Turn power Off (O) and unplug the unit.
2. Locate the filter access and humidifier adapter storage plate located on the side of the concentrator (Detail "A").
3. Insert a flathead screwdriver in the plate groove on the top edge of the plate and gently pry the humidifier adapter storage plate open to remove the plate. (Detail "A").
4. Grasp the compressor inlet filter and pull downward (Detail "B").
5. Discard the existing compressor inlet filter.
6. Install new compressor inlet filter by inserting the filter opening into the rubber base (Detail "B").
7. Push the filter down until the rubber base touches the edge of the filter.
8. Reinstall the filter access and humidifier adapter storage plate.





Filter 1131249

FIGURE 6.3 Replacing the Compressor Inlet Filter

Inspecting/Replacing Throttling Muffler For Platinum 5 AW

NOTE: Perform this procedure as needed depending upon the environment the concentrator is used in.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove the Y-tube from the manifold assembly.
4. Very carefully remove the blue tie wrap from the Y-tube. DO NOT sever the Y-tube.
5. Separate the throttle muffler from the Y-tube and inspect the muffler for residue build-up.
6. If excessive buildup, remove the throttle muffler and discard. Replace with a new muffler. If no buildup present, reattach the throttle muffler.
7. Place the new blue tie wrap onto the Y-tube.
8. Insert the new muffler approximately 1.27 cm (0.5 in.) into the Y-tube opening.
9. Adjust the tie wrap so it is resting just above the lip on the Y-tube and tighten.
10. Reattach Y-tube to the manifold assembly.
11. Run unit and inspect for leaks. Refer to Leak Test on page 71.
12. If no leaks detected, turn power Off (O) and unplug the unit.
13. Reinstall cabinet. Refer to Removing Cabinet on page 25.

5 Liter AW Models

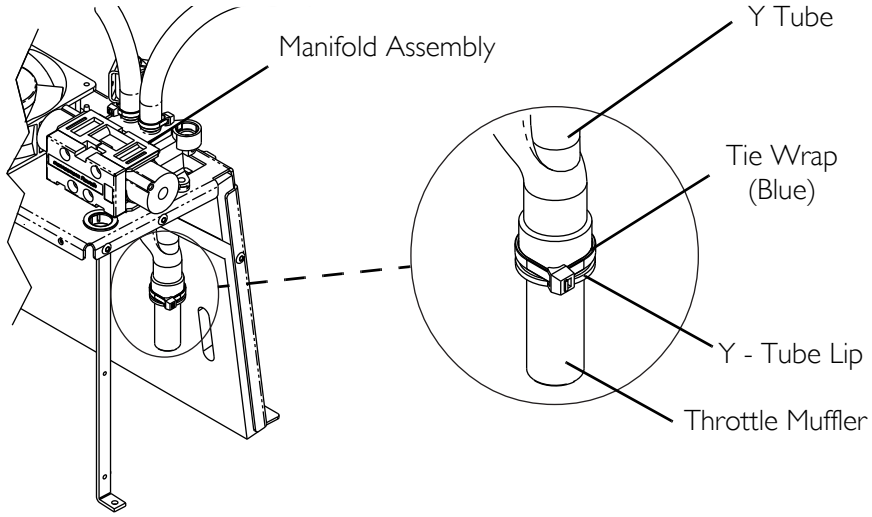


FIGURE 6.4 Inspecting/Replacing Throttling Muffler For Platinum 5 AW

Inspecting/Replacing the Throttle Muffler

For Platinum 9 AWQ

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove the throttle muffler from exhaust canister.
4. Cut the two tie wraps that secure the exhaust canister together.
5. Remove the exhaust canister from the Y-tube.
6. Separate the two halves of the exhaust canister (Detail "A").
7. Inspect the throttle muffler located inside the exhaust canister (Detail "A").
8. Perform one of the following:
   - If excessive buildup, remove the throttle muffler and discard. Replace with a new muffler. Proceed to STEP 9.
   - If no buildup present use existing throttle muffler and proceed to STEP 9.
9. Install throttle muffler into Y-tube (Detail "A").
10. Reconnect both halves of the exhaust canister (Detail "A").
11. Install exhaust canister over throttle muffler that is inserted into the Y-tube (Detail "A").
12. Run unit and inspect for leaks. Refer to Leak Test on page 71.
13. If no leaks detected, turn power Off (O) and unplug the unit.
14. Reinstall cabinet. Refer to Removing Cabinet on page 25.

For Platinum 5LXAW

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove the throttle muffler from the Y-tube.
4. Inspect the throttle muffler.
5. Perform one of the following:
   - If excessive buildup discard the throttle muffler and replace with a new muffler.
   - If no buildup present use existing throttle muffler and proceed.
6. Install throttle muffler into Y-tube.
7. Run unit and inspect for leaks. Refer to Leak Test on page 71.
8. If no leaks detected, turn power Off (O) and unplug the unit.
9. Reinstall cabinet. Refer to Removing Cabinet on page 25.

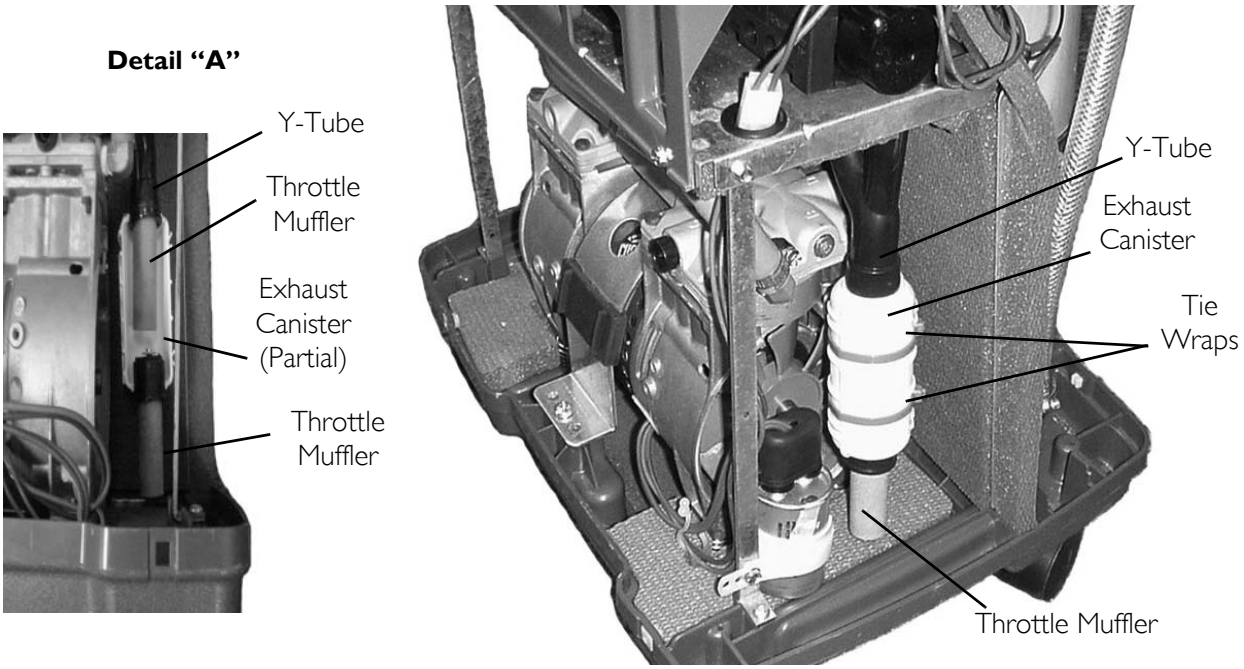


FIGURE 6.5 Inspecting/Replacing the Throttle Muffler For 9 AWQ and 5LXAW

Cleaning the Heat Exchanger

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit
2. Remove cabinet. Refer to Removing Cabinet on page 25.

⚠ CAUTION

Use care not to deform heat exchanger when installing, removing or cleaning.

3. Remove excess dirt using compressed air or vacuum.
4. Reinstall cabinet. Refer to Removing Cabinet on page 25.

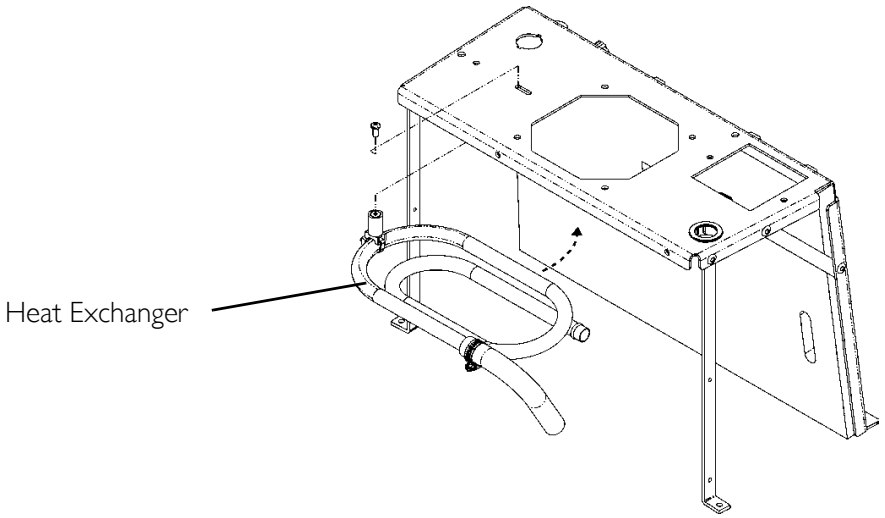


FIGURE 6.6 Cleaning the Heat Exchanger

MODEL NO. IRC ________ SERIAL NO. ________

Yes, you can:

PREVENTIVE MAINTENANCE RECORD

ON EACH INSPECTION																		
Record Date of Service																		
Record Elapsed Hours On Hour Meter																		
Clean Cabinet Filter(s)																		
Check Prescribed L/min. Flow Rate																		
DURING PREVENTIVE MAINTENANCE SCHEDULE, OR BETWEEN PATIENTS																		
UNITS WITHOUT SensO $_2$ **- EVERY 4,380 HOURS**																		
Check Oxygen Concentration																		
Clean/Replace Cabinet Filter(s)																		
Check Outlet HEPA Filter*																		
Check Compressor Inlet Filter*																		
Check Power Loss Alarm																		
UNITS WITH SensO $_2$ **- EVERY 26,280 HOURS OR 3 YEARS, WHICHEVER COMES FIRST**																		
Check Oxygen Concentration																		
Clean/Replace Cabinet Filter(s)																		
Check Outlet HEPA Filter*																		
Check Compressor Inlet Filter*																		
Check Power Loss Alarm																		

**NOTE: Refer to Preventive Maintenance section of Service Manual.*

NOTE:

4,380 hours are equivalent to usage 24 hours per day, 7 days per week, for 6 months.

26,280 hours are equivalent to usage 24 hours per day, 7 days per week, for 3 years.

FIGURE 6.7 Preventive Maintenance Record Invacare Platinum Oxygen Concentrator

SECTION 7—COMPRESSOR

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Replacing Compressor Assembly for 5 Liter Models

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Loosen clamp and disconnect intake hose and heat exchanger brass nut from compressor assembly.
4. Remove heat exchanger clamp screw from the compressor assembly.
5. Remove compressor wires from wire clamps and tie-wraps. Disconnect motor connector from the main harness connector.

NOTE: Motor connector goes through grommet before reaching the main harness connector.

6. Remove protective boot on capacitor.
7. Disconnect capacitor wires from the top of the capacitor.

NOTE: Re-use the protective boot if the replacement parts DO NOT provide one.

8. Remove mounting screws that secure the compressor restraint bracket and remove the bracket.
9. Lift heat exchanger, tilt compressor assembly toward front of unit and lift out.
10. Reverse STEPS 3-7 to install new compressor assembly.
11. Run unit and inspect for leaks. Refer to Leak Test on page 71.
12. If no leaks detected, turn power Off (O) and unplug the unit.
13. Reinstall cabinet. Refer to Removing Cabinet on page 25.

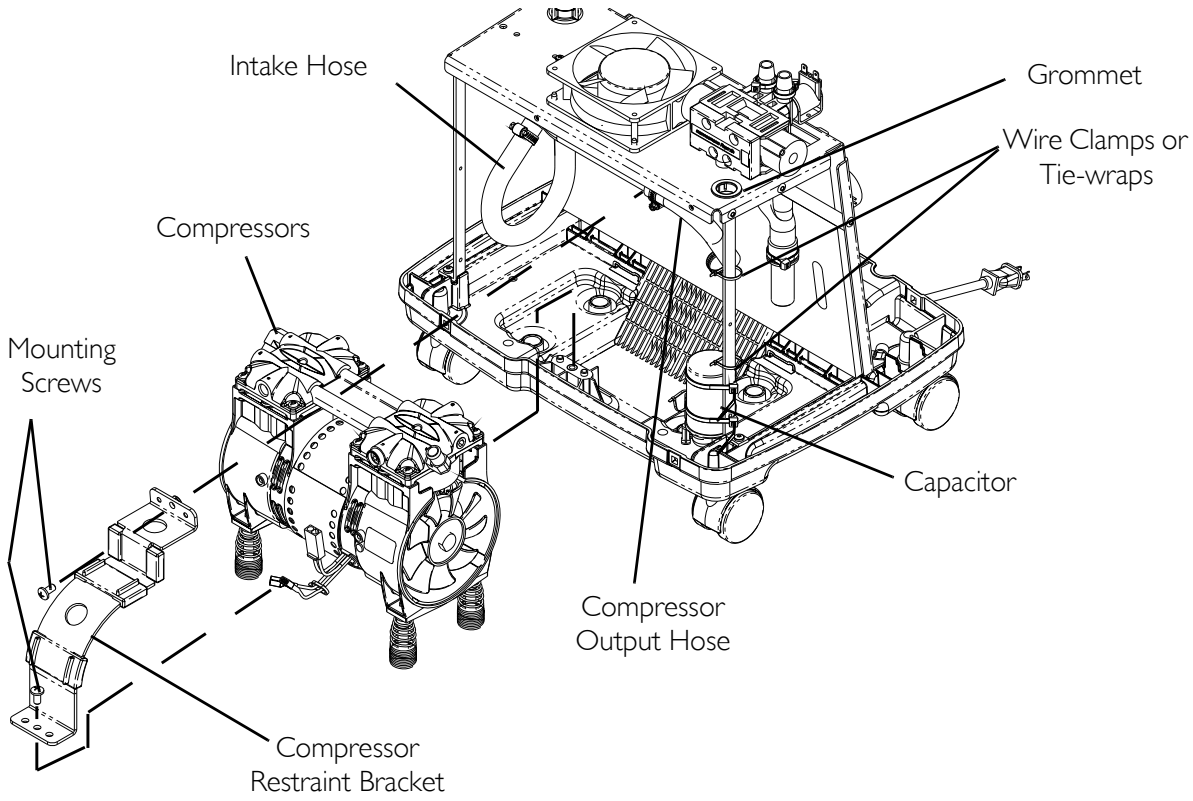


FIGURE 7.1 Replacing Compressor Assembly for 5 Liter Models

Replacing Compressor Assembly - 9 Liter Models

1. Turn power Off (O) and unplug the unit.
2. Remove the cabinet. Refer to Removing Cabinet on page 25.
3. Loosen clamps and disconnect intake hose and compressor output hose from compressor assembly.
4. Remove compressor wires from wire clamps and tie-wraps. Disconnect motor connector from the main harness connector.
5. Remove protective boot on capacitor.
6. Disconnect capacitor wires from the top of the capacitor.

NOTE: Re-use the protective boot if the replacement parts DO NOT provide one.

7. Remove the two mounting screws that secure the compressor restraint bracket and remove the bracket.
8. Tilt compressor assembly toward front of unit and lift out.
9. Reverse STEPS 3-8 to install new compressor assembly.
10. Run unit and inspect for leaks. Refer to Leak Test on page 71.
11. If no leaks detected, turn power Off (O) and unplug the unit.
12. Reinstall cabinet. Refer to Removing Cabinet on page 25.

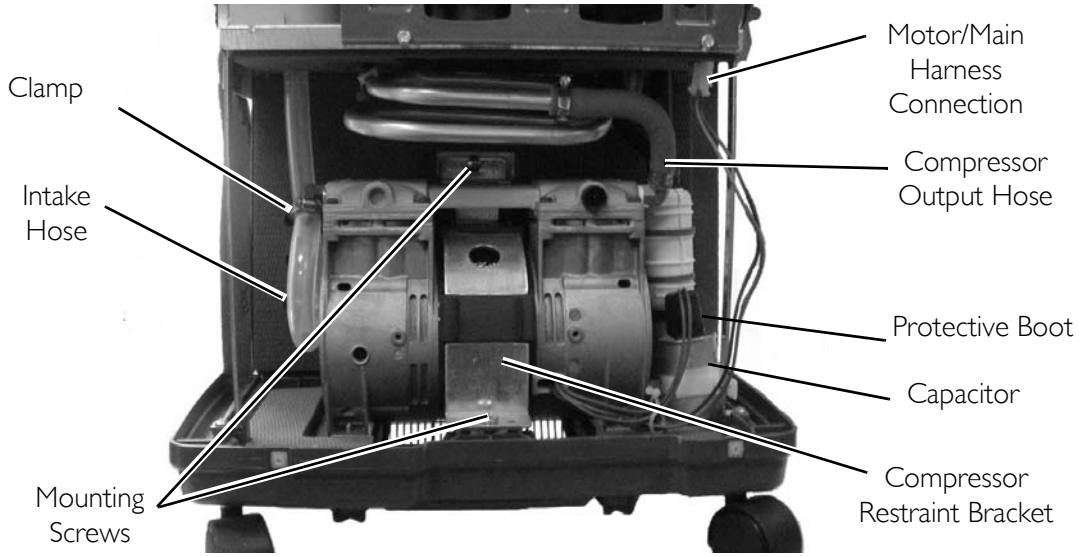


FIGURE 7.2 Replacing Compressor Assembly - 9 Liter Models

Replacing Capacitor

1. Turn power Off (O) and unplug the unit.
2. Remove the cabinet. Refer to Removing Cabinet on page 25.
3. Remove protective boot to reveal capacitor wires.
4. Disconnect the spade connectors from the capacitor terminals (not shown).
5. Remove the screw that secures the capacitor clamp to the soundbox brace.
6. Remove the capacitor from the concentrator base assembly.
7. Install new capacitor by reversing STEPS 3-6.
8. Run unit and inspect for leaks. Refer to Leak Test on page 71.
9. If no leaks detected, turn power Off (O) and unplug the unit.
10. Reinstall cabinet. Refer to Removing Cabinet on page 25.

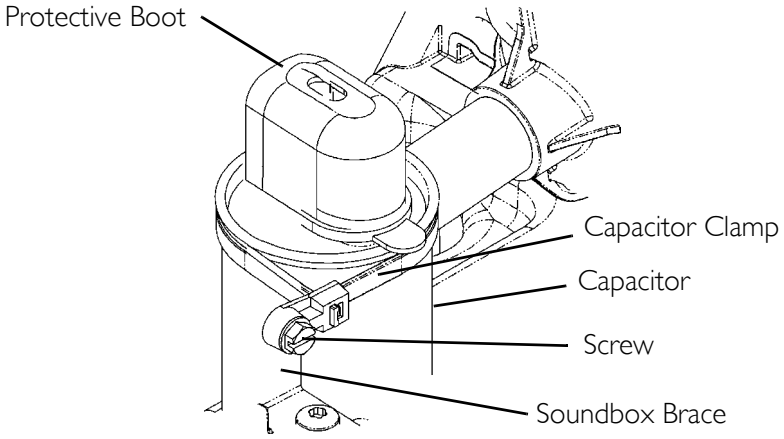


FIGURE 7.3 Replacing Capacitor

SECTION 8—PE VALVE

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing PE Valve

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove spade connectors from PE valve assembly.
4. Remove two tie-wraps that secure the sieve bed tubing to each side of the PE valve assembly.
5. Remove PE valve assembly from tubing.

⚠ CAUTION

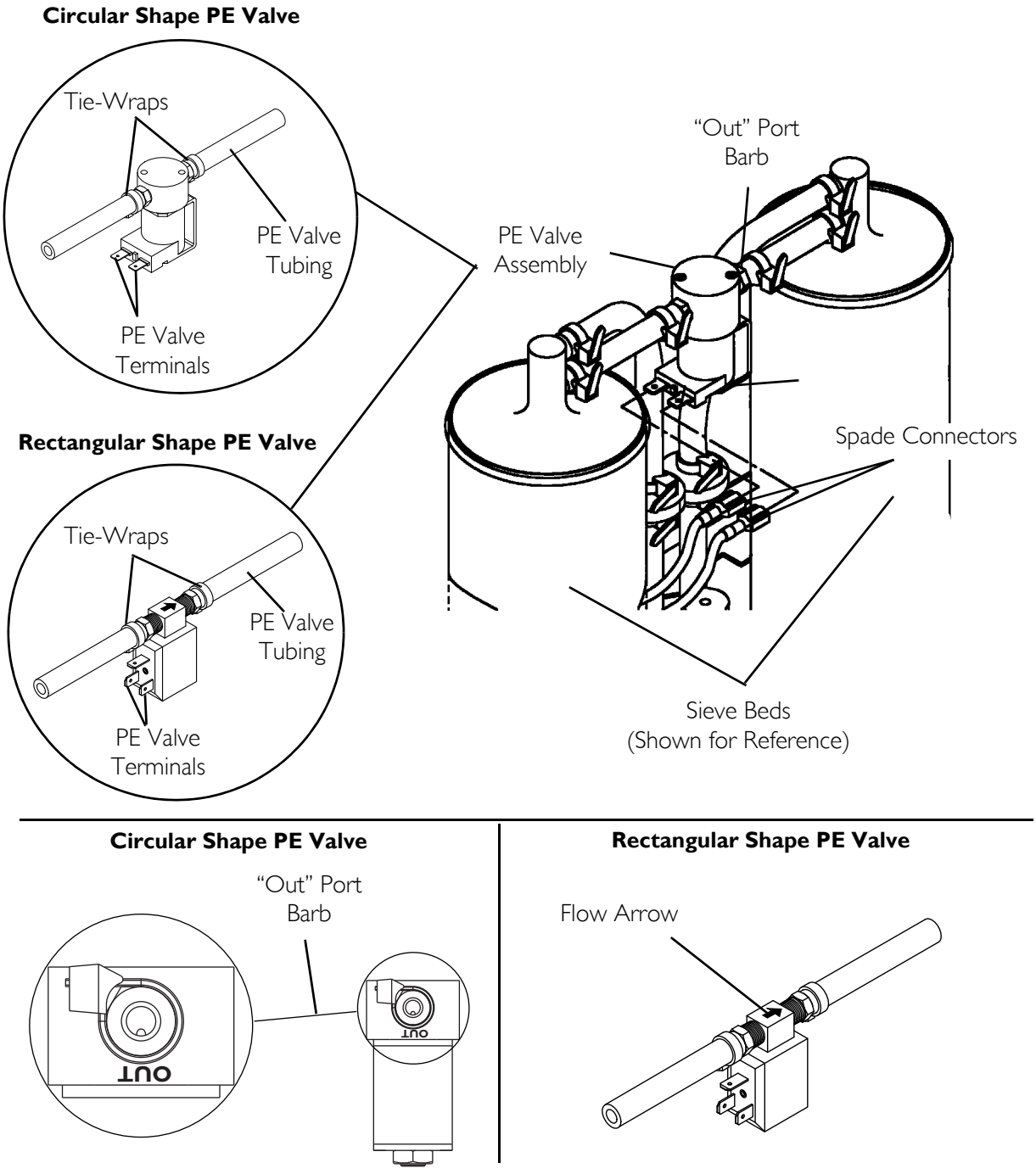
If PE valve is not to be installed IMMEDIATELY, plug the sieve bed fitting to prevent sieve bed contamination.

NOTE: To ensure proper orientation, the "Out" port barb should face to the right side of the sieve bed when viewing the back of the unit.

6. Install new PE Valve assembly IMMEDIATELY, by reversing STEPS 3-5.
7. Connect sieve bd tubing to each side of PE valve.
8. Secure sieve bed tubing with new tie wraps.
9. Connect spade connectors to PE valve assembly.

NOTE: After replacing PE valve, autotuning of the concentrator will be necessary. Refer to Autotuning on page 69.

10. Run unit and inspect for leaks. Refer to Leak Test on page 71.
11. If no leaks detected, turn power Off (O) and unplug the unit.
12. Reinstall cabinet. Refer to Removing Cabinet on page 25.



NOTE: Depending on the date of manufacture, the unit will be equipped with one of the two PE valve assemblies shown above, circular shape or rectangular shape.

FIGURE 8.1 Replacing PE Valve

SECTION 9—SIEVE BEDS

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Sieve Beds

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

NOTE: ALWAYS replace sieve beds in pairs to ensure that both beds are in optimum condition.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove tie-wraps and disconnect PE valve asm and sieve bed tubing from top of sieve beds.
4. Loosen adjustable clamps on sieve beds. Slide clamps down below the adjustable clamp hangers.
5. Lift sieve beds up and rest sieve beds on top rear of base.
6. Using a hose clamp tool, remove the clamp and reinforced tubing from bottom of both sieve beds and remove sieve beds.

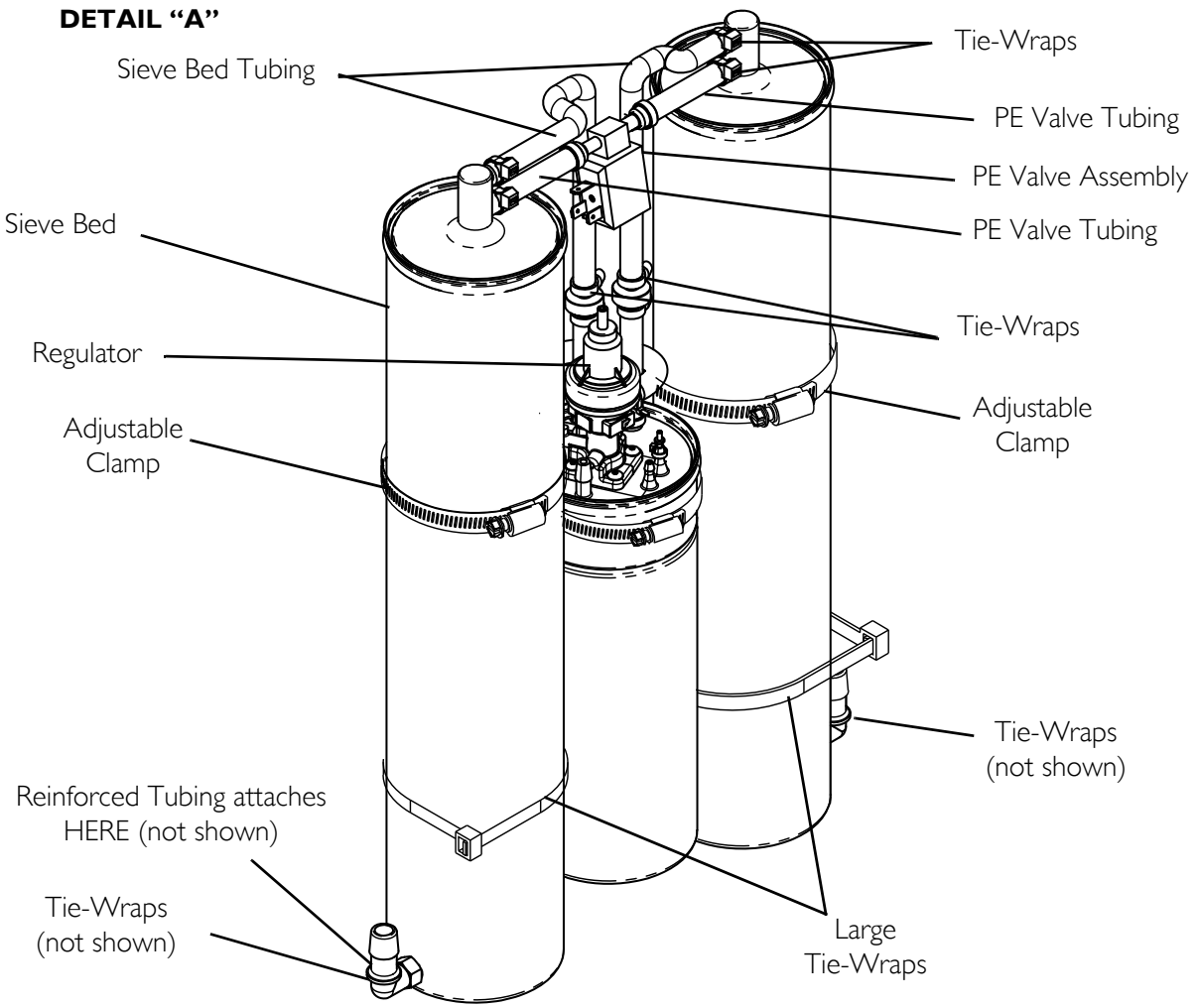
⚠ CAUTION

DO NOT remove plastic caps (not shown) from new sieve bed fittings until ready to install new sieve beds. Severe sieve contamination can occur if uncapped beds are exposed to air.

7. Remove plastic caps from the top and bottom fittings of the new sieve beds.
8. Install new sieve beds reversing STEPS 3-7.

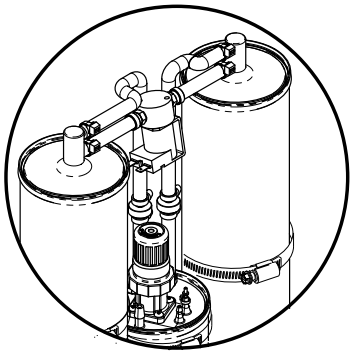
NOTE: After replacing sieve beds, autotuning is necessary. Refer to Autotuning on page 69.

9. Run unit and inspect for leaks. Refer to Leak Test on page 71.
10. If no leaks detected, turn power Off (O) and unplug the unit.
11. Reinstall cabinet. Refer to Removing Cabinet on page 25.

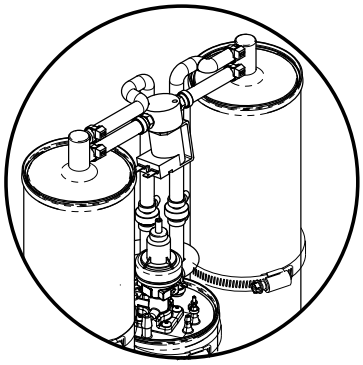


NOTE: The adjustable clamp hanger is not shown. It is located behind the product tank and is attached to the sound box.

DETAIL "B"



DETAIL "C"



NOTE: Depending on the date of manufacture, the unit will be equipped with one of three configurations:

- *Rectangular PE valve assembly and new regulator (Detail "A").*
- *Circular PE valve assembly and old regulator (Detail "B).*
- *Circular PE valve assembly and new regulator (Detail "C").*

FIGURE 9.1 Replacing Sieve Beds - 5 and 9 Liter models

SECTION 10—CHECK VALVES

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Check Valves

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

NOTE: Replace both check valves when performing this procedure. The check valves are one-way directional and can be checked by passing air through them. Air should flow in one direction only.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Loosen adjustable clamp on product tank, slide clamp down below the adjustable clamp hanger, and pull product tank forward to access check valve(s).
4. Remove tie-wrap securing lower ¼-inch tubing to the product tank.
5. Remove the tie-wrap (not shown) securing the upper ¼-inch tubing to the barb on the sieve bed (not shown).

⚠ WARNING

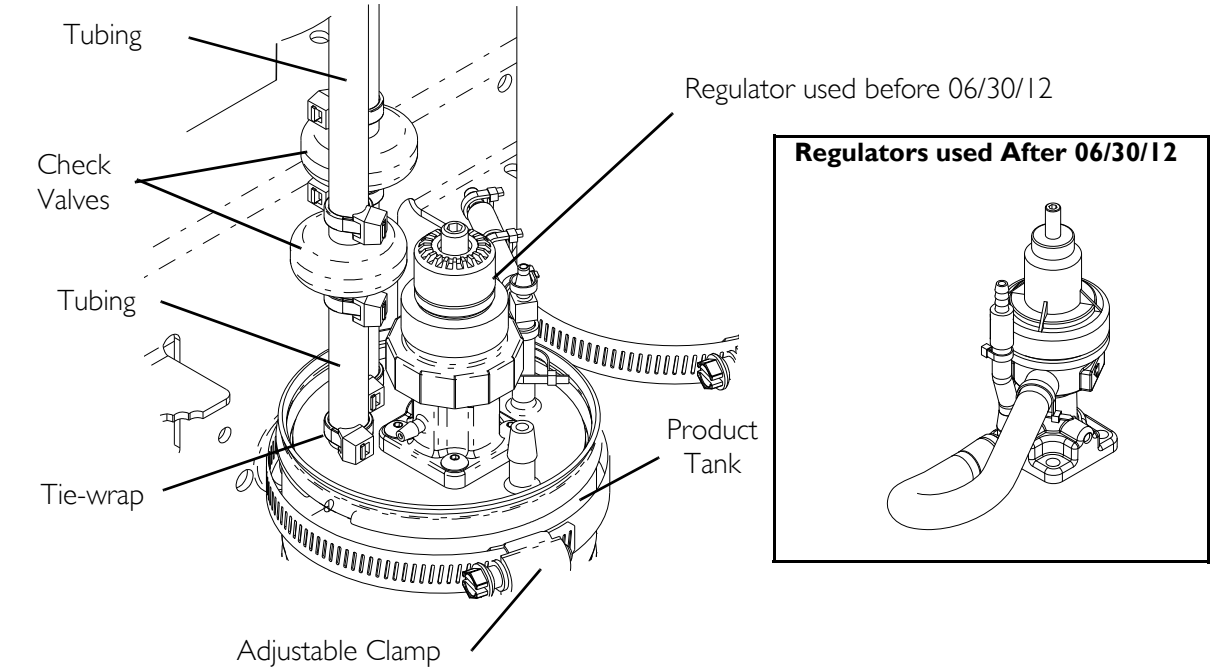
The check valves are one-way directional and MUST be installed correctly. Low system pressures and eventual bed contamination will result if check valves are not properly installed.

NOTE: To ensure proper orientation, the "Out" port barb should face to the right side of the sieve bed when viewing the back of the unit.

6. Position the check valve assembly so the black side to the product tank and the other end is attached to the sieve bed.
7. Secure the check valve(s) by installing new tie-wraps to the ¼- inch tubing where previously removed.

NOTE: Ensure check valves are not crossed. Left barb product tank check valve goes to left barb on sieve bed. Right barb product tank check valve to right barb on sieve bed.

8. Run unit and inspect for leaks. Refer to Leak Test on page 71.
9. If no leaks detected, turn power Off (O) and unplug the unit.
10. Reinstall cabinet. Refer to Removing Cabinet on page 25.



NOTE: Check valves replace in the same manner for both regulators.

FIGURE 10.1 Replacing Check Valves

SECTION 11—REGULATOR

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Regulator

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

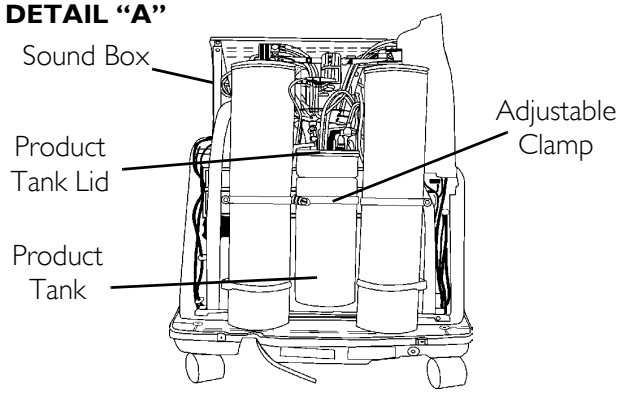
1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Loosen adjustable clamp on product tank and slide clamp down below the adjustable clamp hanger (Detail "A").
4. Pull product tank back and up to access regulator.
5. On SensO2 concentrator models only, remove the 1/8-inch tubing to the regulator assembly.
6. Remove the four mounting screws that secure regulator to product tank cap.
7. Remove regulator from product tank lid ensuring that the O-rings are removed.
8. Clean mounting surface of product tank cap.
9. Install the two O-rings for the NEW regulator onto the ports (underside) of the NEW regulator before installation.

⚠ WARNING

Ensure proper installation of regulator. Note flow arrow on regulator. This MUST face toward the front of unit or flow will be interrupted causing system shutdown.

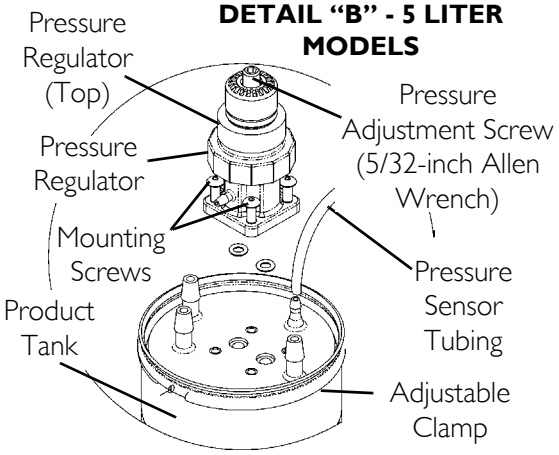
10. Install new regulator onto the product tank cap.
11. Use the four mounting screws to secure the new regulator onto the product tank cap.

DETAIL "A"



NOTE: The adjustable clamp hanger is not shown. It is located behind the product tank and is attached to the sound box.

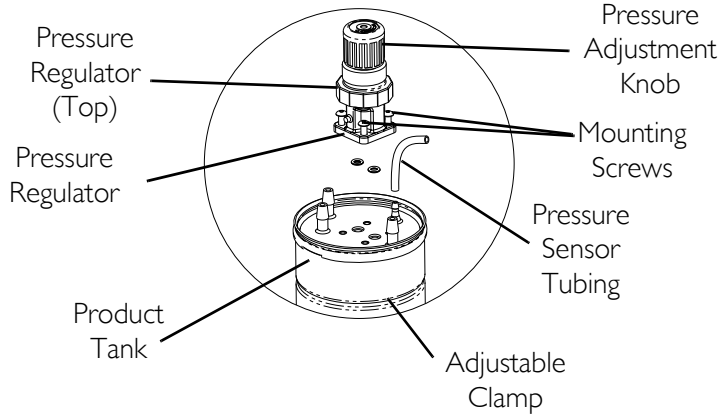
DETAIL "B" - 5 LITER MODELS



NOTE: Sieve Beds removed for clarity.

NOTE: Regulator shown was used before 07/01/12.

DETAIL "C" - 9 LITER MODELS



NOTE: Regulator shown was used before 07/01/12

DETAIL "D" - ALL MODELS - REGULATORS AFTER 06/30/12

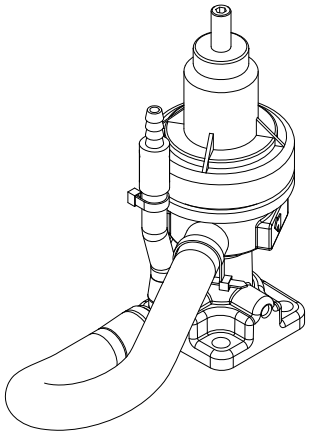


FIGURE 11.1 Replacing/Adjusting Regulator

12. Torque mounting screws to .56 N-M ±.11 N-M (5 ± 1 in-lbs).
13. Re-install product tank and secure with the adjustable clamp.
14. Reinstall 1/8-inch tubing to the regulator assembly.
15. Adjust regulator pressure if necessary. Refer to Adjusting Regulator on page 46.
16. Run unit and inspect for leaks. Refer to Leak Test on page 71.
17. If no leaks detected, turn power Off (O) and unplug the unit.
18. Reinstall cabinet. Refer to Removing Cabinet on page 25.

Adjusting Regulator

1. Turn unit on (I).
2. Install pressure gauge onto oxygen outlet.

NOTE: Check O_2 pressure at oxygen outlet. It should read a steady 34.5 ± 3.45 kPa (5 ± 0.5 psi) for 5 Liter; 62.05 kPa ± 3.45 kPa (9 ± 0.5 psi) for 9 Liter. If pressure is not in specification, proceed to STEP 3. If pressure falls within specification, no adjustment is needed.

3. Turn power Off (O) and unplug the unit.
4. Remove cabinet. Refer to Removing Cabinet on page 25.
5. Plug unit in and turn power switch on (I).
6. Examine the regulator and FIGURE 11.1 on page 45 to determine what type of regulator is installed.
7. Perform one of the following:
   A. 5 Liter models with Regulators before 07/01/12 - Insert a 5/32-inch Allen wrench into the pressure adjustment screw.
   B. 9 Liter models with Regulators before 07/01/12 - Locate the pressure adjustment knob.
   C. All models with Regulators after 06/30/12 - Insert a 3/32 (2.5 mm) Allen wrench into the pressure adjustment screw.
8. While reading pressure gauge, do one of the following:
   - Turn pressure adjustment screw or adjustment knob, clockwise to increase output pressure or,
   - Turn pressure adjustment screw or adjustment knob, counterclockwise to decrease output pressure.
9. Adjust until pressure reads:
   - For 5 Liter models: a steady 34.4 kPa ± 3.45 kPa (5 psi ± 0.5 psi).
   - For 9 Liter models: a steady 62.05 kPa ± 3.45 kPa (9 psi ± 0.5 psi)
10. Allow concentrator to run for ten minutes.
11. Retest the pressure by performing STEPS 8-10, to ensure proper operation.
12. Once required pressure is achieved, reinstall cabinet. Refer to Removing Cabinet on page 25.
13. Refer to Troubleshooting on page 20 if you are unable to adjust or maintain 34.4 kPa ± 3.5 kPa (5 psi ± 0.5 psi) for 5 Liter model and 62.05 kPa ± 3.45 kPa (9 psi ± 0.5 psi) for 9 Liter model.

SECTION 12—HEAT EXCHANGER

Replacing Heat Exchanger

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Platinum 5 Models

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.

⚠ CAUTION

Use care not to deform heat exchanger when installing, removing or cleaning.

3. Remove compressor assembly. Refer to Replacing Compressor Assembly for 5 Liter Models on page 35.
4. Loosen hose clamp and separate heat exchanger output fitting from hose elbow.
5. Remove heat exchanger from the soundbox assembly.
6. Reverse STEPS 3-6 to install new heat exchanger assembly.
7. Run unit and inspect for leaks. Refer to Leak Test on page 71.
8. If no leaks detected, turn power Off (O) and unplug the unit.
9. Reinstall cabinet. Refer to Removing Cabinet on page 25.

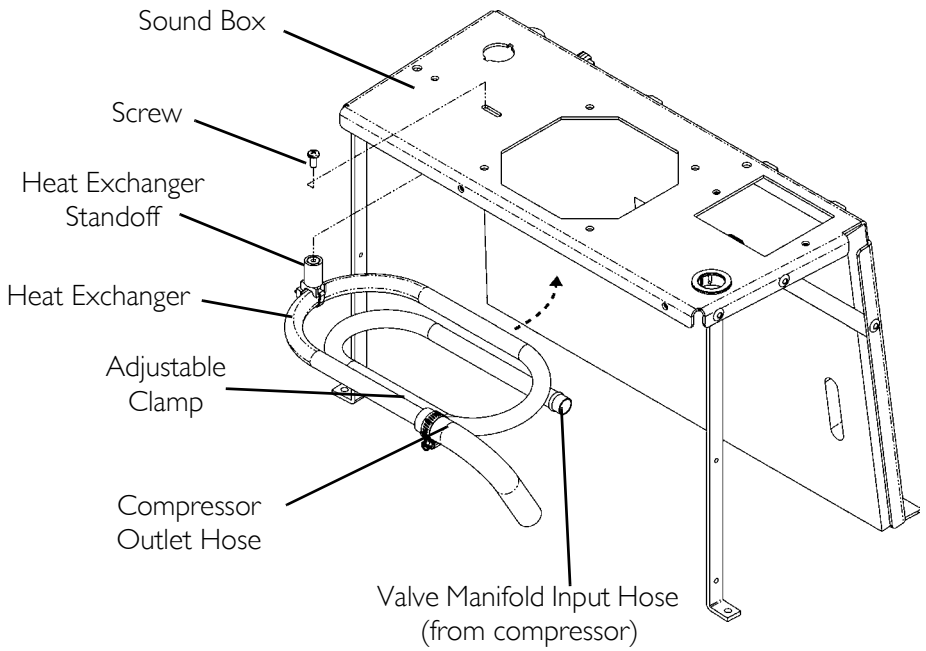


FIGURE 12.1 Replacing Heat Exchanger - Platinum 5 Models

Platinum 9 Models

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.

⚠ CAUTION

Use care not to deform heat exchanger when installing, removing or cleaning.

3. Loosen the adjustable clamps on the compressor output hose (BLUE) and valve manifold input hoses at the front and rear of the heat exchanger.
4. Remove screw securing heat exchanger standoff to the soundbox.
5. Move the heat exchanger out to access the hoses and remove them from the heat exchanger.
6. Remove heat exchanger.
7. Reverse STEPS 3-6 to install new heat exchanger.
8. Run unit and check for leaks. Refer to Leak Test on page 71.
9. Reinstall cabinet. Refer to Removing Cabinet on page 25.

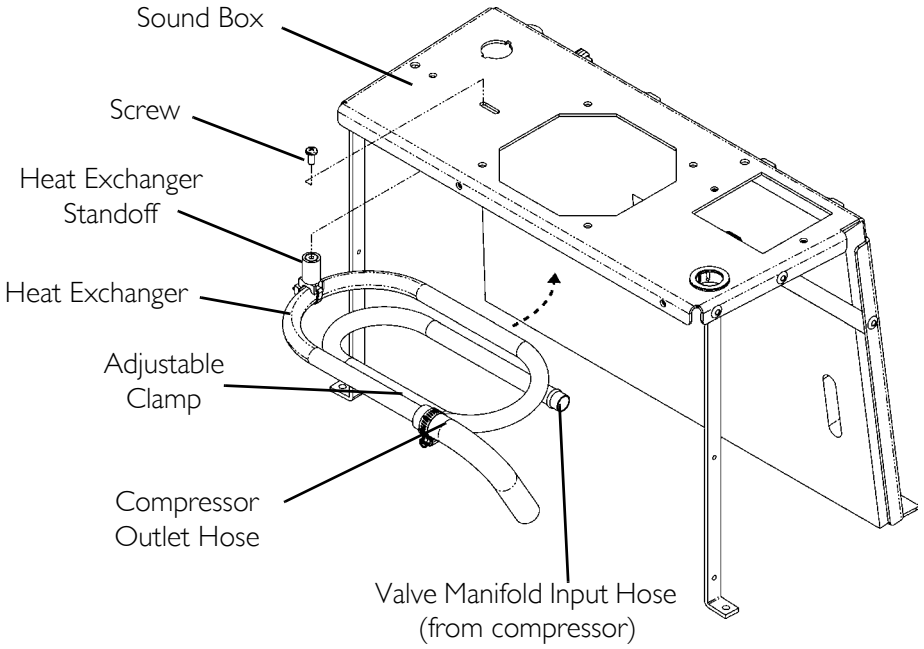


FIGURE 12.2 Replacing Heat Exchanger - Platinum 9 Models

SECTION 13—CONTROL PANEL

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Removing Control Panel

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Cabinet on page 25.
3. Remove the two upper mounting screws that secure the control panel.
4. Loosen the two lower mounting screws that secure the control panel.

⚠ WARNING

Use caution when removing the pressure sensor tubing from the product tank. Injury could result when tubing disconnects from product tank.

5. Cut the tie-wraps that secure the 1/8-inch I.D. pressure sensor tubing to the product tank connection and remove tubing.
6. Remove the ¼-inch I.D. tubing from the top and bottom barbed fittings of the flowmeter.
7. Cut tie wrap and remove ¼-inch I.D. tubing from the patient outlet barbed fitting behind the control panel.

NOTE: On SensO_2 models the oxygen sensor tube attached to the side of the regulator MUST also be released.

8. Disconnect the nine or ten pin connector from P.C. board.
9. Disconnect the eight pin connector from P.C. board.
10. Disconnect the transformer harness connector.

NOTE: Before performing STEP 11, label all wires to ensure correct reinstallation.

11. Remove spade connectors from circuit breaker, hour meter and On/Off (I/O) switch. (Jumper wire harness from On/Off switch to circuit breaker does not have to be removed).
12. Remove control panel.

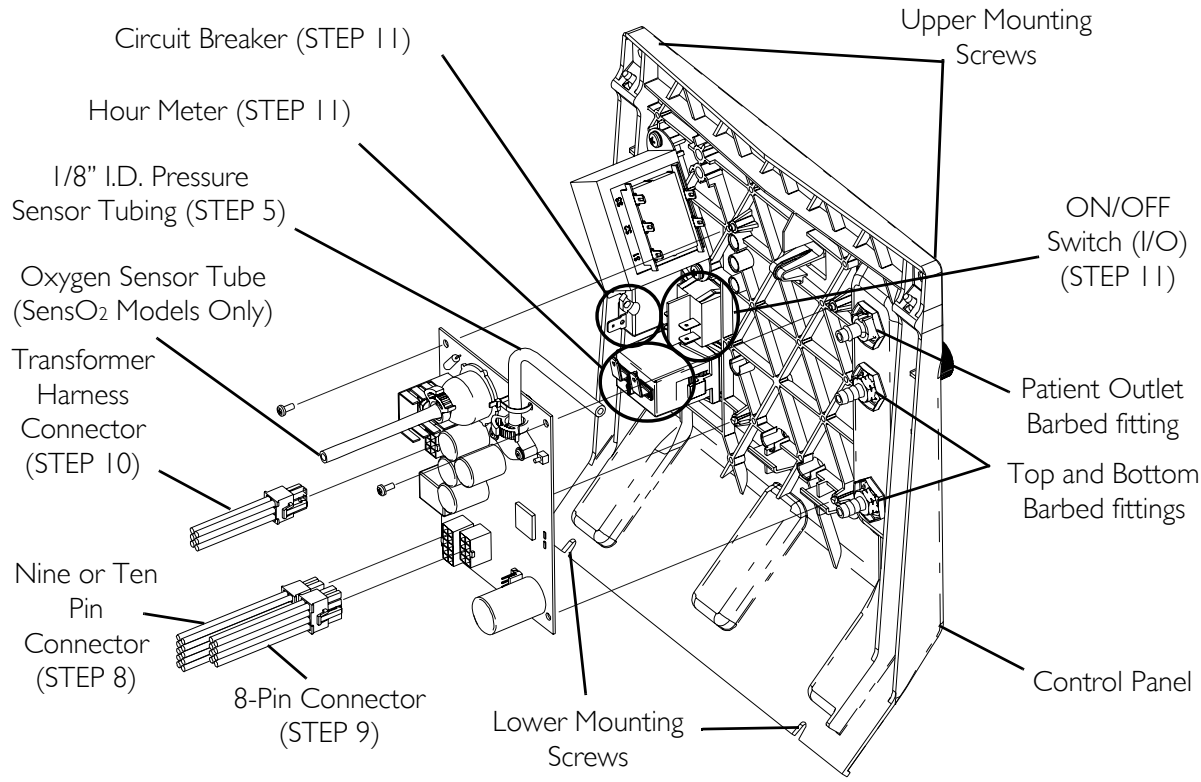


FIGURE 13.1 Removing Control Panel

Replacing Control Panel

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Remove the control panel. Refer to Removing Control Panel on page 50.
2. Remove the P.C. board. Refer to Replacing P.C. Board on page 54.
3. Remove the transformer. Refer to Replacing Transformer Assembly on page 56.
4. Remove the On/Off switch. Refer to Replacing On/Off Switch on page 57.
5. Remove the flow meter. Refer to Replacing Flowmeter on page 58.
6. Remove the hour meter. Refer to Replacing Hour Meter on page 59.
7. Remove horn and palnuts that hold the barbed outlet fitting.
8. Discard the existing control panel.
9. Install new control panel by reversing STEPS 1-7.
10. Run unit and inspect for leaks. Refer to Leak Test on page 71.
11. If no leaks detected, turn power Off (O) and unplug the unit.
12. Reinstall cabinet. Refer to Removing Cabinet on page 25

SECTION 14—COOLING FAN

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Cooling Fan

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Remove compressor assembly. Refer to Compressor on page 35.
5. Disconnect and remove spade connectors from fan terminals on back side of cooling fan (not shown).
6. Remove four mounting screws securing the cooling fan to the sound box.
7. Remove existing cooling fan.

⚠ CAUTION

Fan MUST be positioned properly so air from the fan blows down onto the compressor (see air flow arrow on back of fan and make sure the arrow is pointing down) or damage to the unit will occur.

8. Install new cooling fan.

NOTE: Run the self-threading mounting screws through the fan housing holes to cut the threads and remove them before mounting the fan for ease of installation.

9. Reinstall compressor. Refer to Compressor on page 35.
10. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.
11. Run unit and inspect for leaks. Refer to Leak Test on page 71.
12. If no leaks detected, turn power Off (O) and unplug the unit.
13. Reinstall cabinet. Refer to Removing Cabinet on page 25.

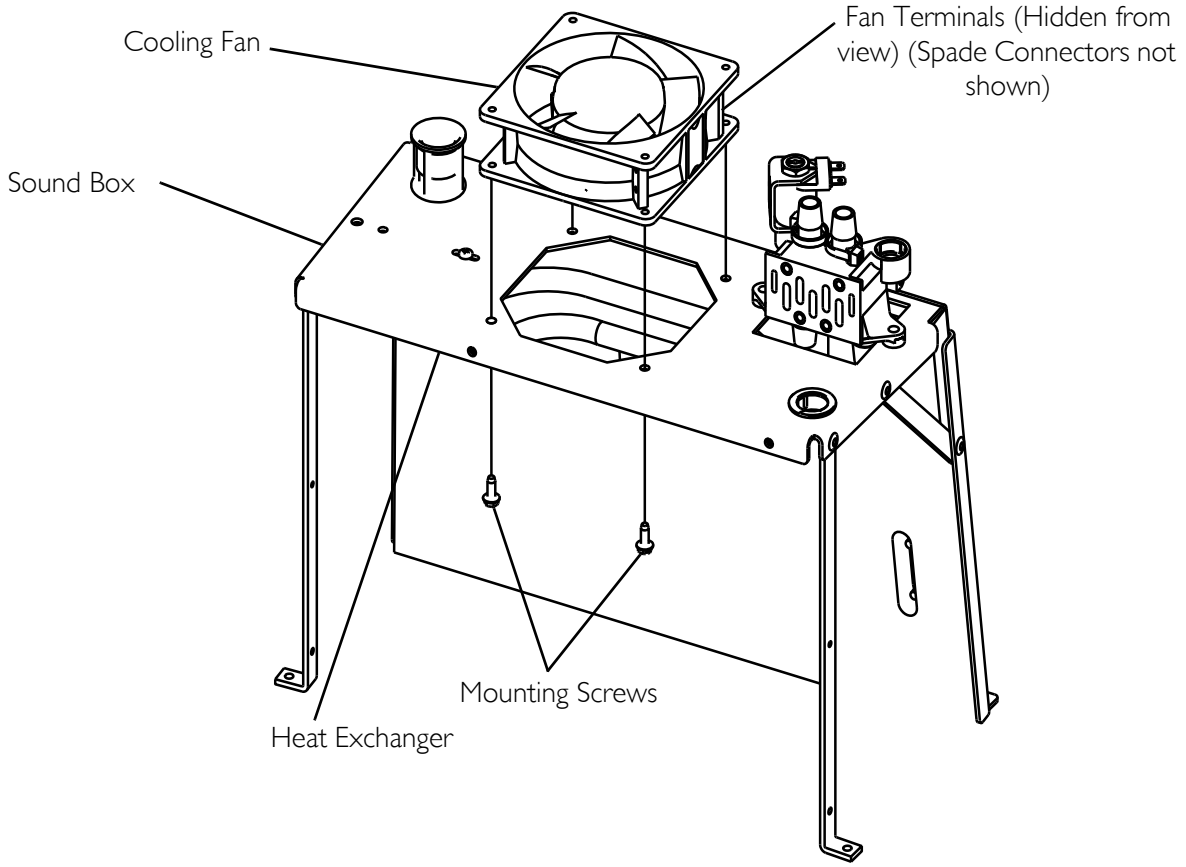


FIGURE 14.1 Replacing Cooling Fan

SECTION 15—P.C. BOARD

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing P.C. Board

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

⚠ CAUTION

Only qualified service technicians should make any changes to this equipment.

Follow these pre-cautions to prevent damage to the P.C. boards:

Before handling any P.C. boards, you need to be properly grounded to prevent static damage to the components of the board. A Static Cuff MUST be worn and properly grounded using an alligator clip. Electrical conduit or a water pipe is normally sufficient when a known good ground is not available. Care should be taken to ensure that the alligator clip contacts with bare metal surface.

When removing quick disconnects terminals, DO NOT pull on wire itself as damage to the connection may occur. Hold down the P.C. board with one hand and use an upward force with a slight rocking motion to remove the terminals.

Before installing any P.C. boards, ensure that all insulators are in place.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Disconnect the following:
   A. The three wire harnesses attached to the PC board.

⚠ WARNING

DO NOT remove sensor tubing from P.C. Board. Remove from tee fitting or regulator ONLY. Damage to sensor assembly could occur. A faulty sensor may result in improper oxygen delivery and harm to the user.

   B. Pressure sensor tubing from product tank, not P.C. Board.
   C. Oxygen Sensor tubing from Regulator Fitting. Refer to Replacing Regulator on page 44.
5. Remove the two mounting screws on top corners of P.C. board.
6. Position new P.C. board.

7. Reverse STEPS 4 and 5. Be sure all tie-wraps removed from tubing connections are replaced.
8. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.
9. Run concentrator to ensure unit operates to specifications.
10. After replacing P.C. board, autotuning will be necessary. Refer to Autotuning on page 69.
11. Run unit and inspect for leaks. Refer to Leak Test on page 71.
12. If no leaks detected, turn power Off (O) and unplug the unit.
13. Reinstall cabinet. Refer to Removing Cabinet on page 25.

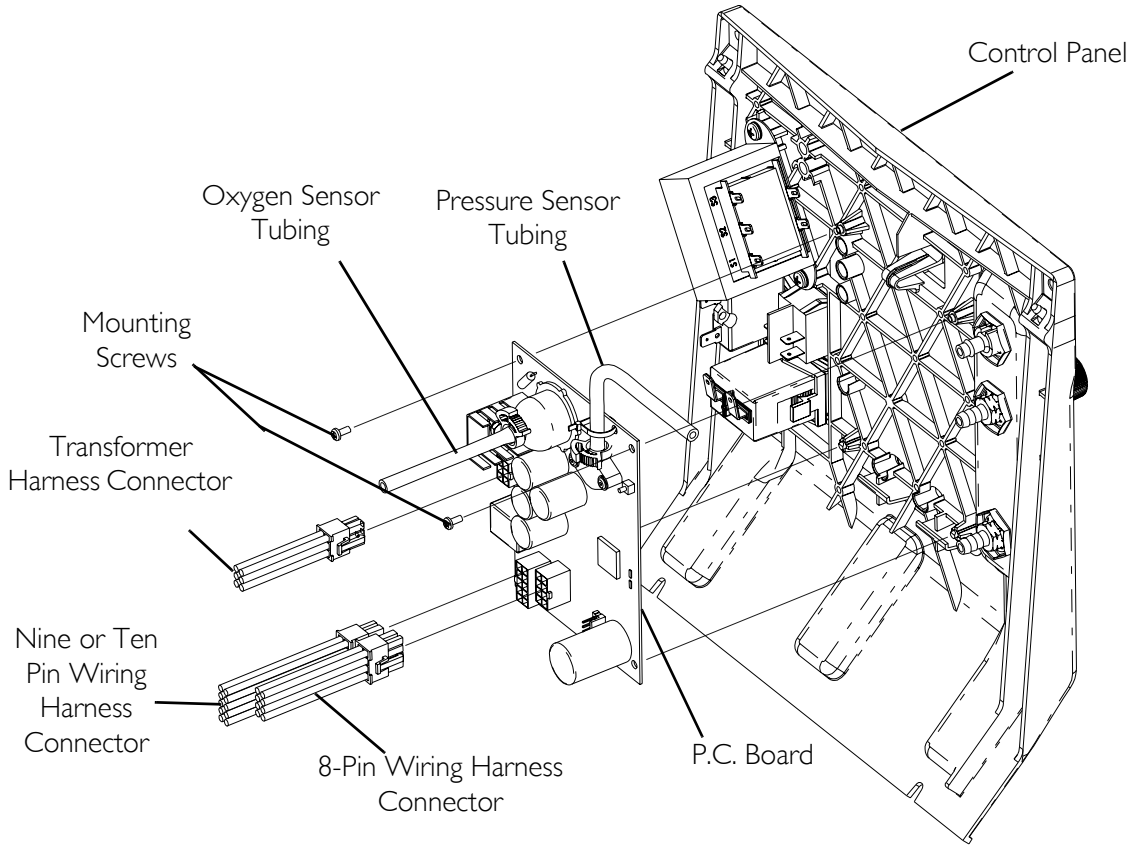


FIGURE 15.1 Replacing P.C. Board

SECTION 16—TRANSFORMER

Replacing Transformer Assembly

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Locate the transformer assembly in the upper left corner on the back of control panel.
5. Unplug the transformer connector from the P.C. board.
6. Remove the two screws that secure transformer to the back of the control panel.
7. Reverse STEPS 5-6 to install new transformer. Torque keps screw to 1.53 N-M ± 0.11 N-M (13.5 ± 1 inch-lbs).
8. Run unit and inspect for leaks. Refer to Leak Test on page 71.
9. If no leaks detected, turn power Off (O) and unplug the unit.
10. Reinstall cabinet. Refer to Removing Cabinet on page 25.

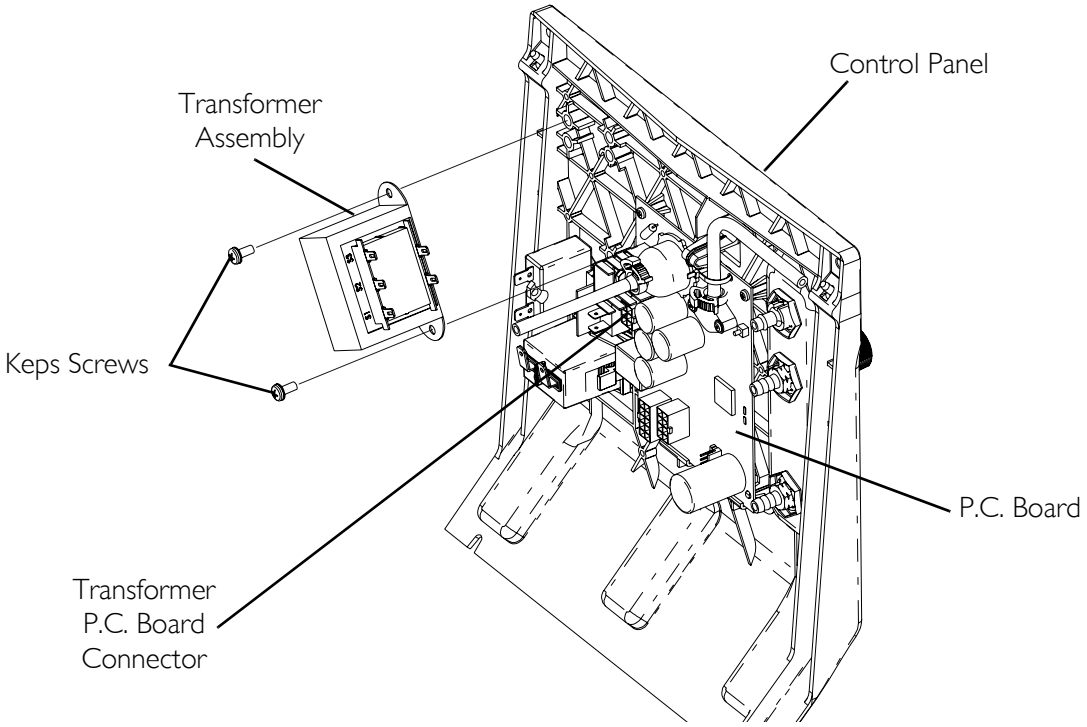


FIGURE 16.1 Replacing Transformer Assembly

SECTION 17—ON/OFF SWITCH

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing On/Off Switch

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Unplug unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Remove and label the four spade connectors from back of existing on/off switch.
5. Compress retaining grips on back of existing on/off switch and push switch out through front of control panel.

NOTE: Ensure proper orientation of the On/Off (I/O) switch and wiring connections before installation.

⚠ CAUTION

DO NOT install the On/Off (I/O) switch upside down. Universal Off (O) symbol should be at bottom and Universal On (I) symbol should be at the top. Possible damage to the concentrator may result if not properly installed.

6. Reverse STEP 4 and 5 to secure new On/Of *(I/O)* switch.
7. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.
8. Reinstall cabinet. Refer to Removing Cabinet on page 25.

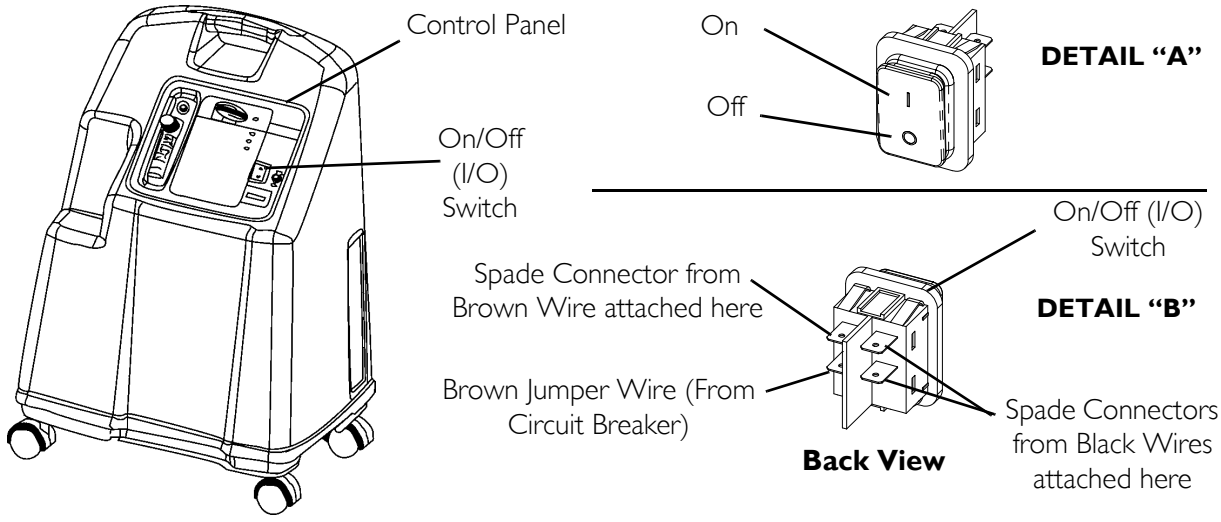


FIGURE 17.1 Replacing On/Off Switch

SECTION 18—FLOWMETER

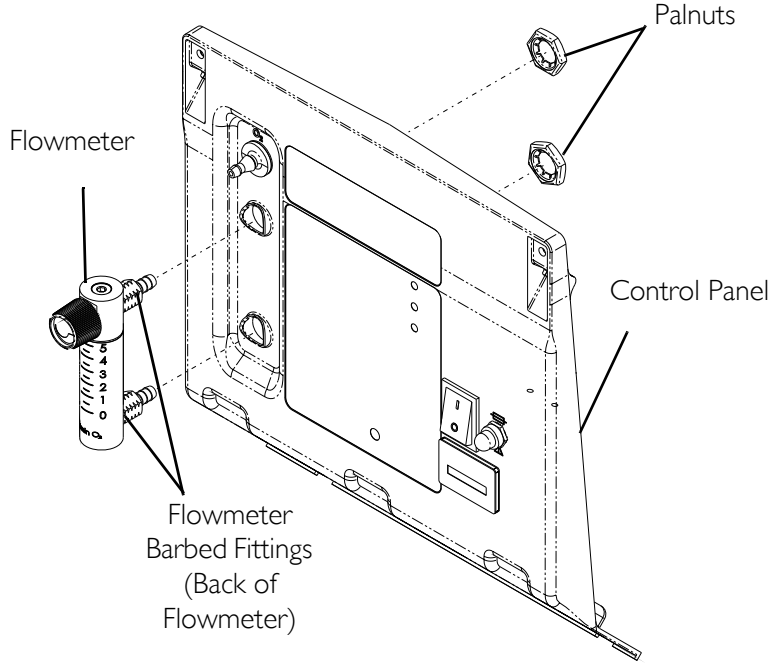
NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Flowmeter

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Label the location of the tubing for accurate replacement after new flowmeter is installed.
5. Remove palnuts that secure flowmeter to the control panel.
6. Remove flowmeter from front of control panel.
7. Install new flowmeter reversing steps 4-5.
8. Reinstall control panel. Refer to Removing Control Panel on page 50.
9. Run unit and inspect for leaks. Refer to Leak Test on page 71.
10. If no leaks detected, turn power Off (O) and unplug the unit.
11. Reinstall cabinet. Refer to Removing Cabinet on page 25.



NOTE: Both flowmeters for the 5 liter and 9 liter will replace in the same manner.

FIGURE 18.1 Replacing Flowmeter

SECTION 19—HOUR METER

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

Replacing Hour Meter

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Remove and label the two hour meter connectors and wires connected to back of hour meter.
5. Squeeze retaining clips on hour meter housing that secure hour meter to control panel.
6. Remove hour meter by pushing meter through front of control panel.
7. Install new hour meter reversing STEPS 4-6.
8. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.
9. Reinstall cabinet. Refer to Removing Cabinet on page 25.

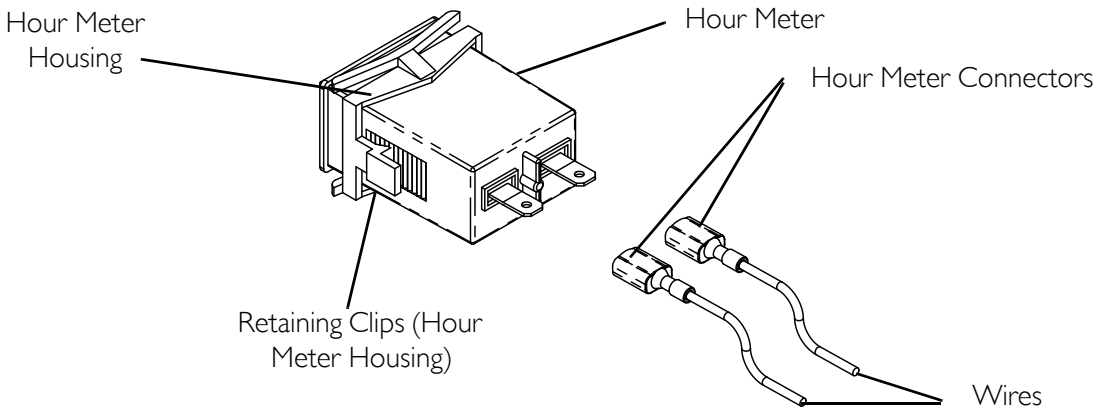


FIGURE 19.1 Replacing Hour Meter

SECTION 20— 4-WAY VALVE

NOTE: Refer to Recycling Information following local governing ordinances and recycling plans regarding disposal of the concentrator or components.

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Replacing 4-Way Valve

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Remove the four mounting screws that secure the 4-way valve to the manifold assembly.

NOTE: Ensure the manifold gasket is in place on 4-way valve before installing.

5. Position new 4-way valve onto manifold assembly and loosely install mounting screws through 4-way valve and into manifold assembly.

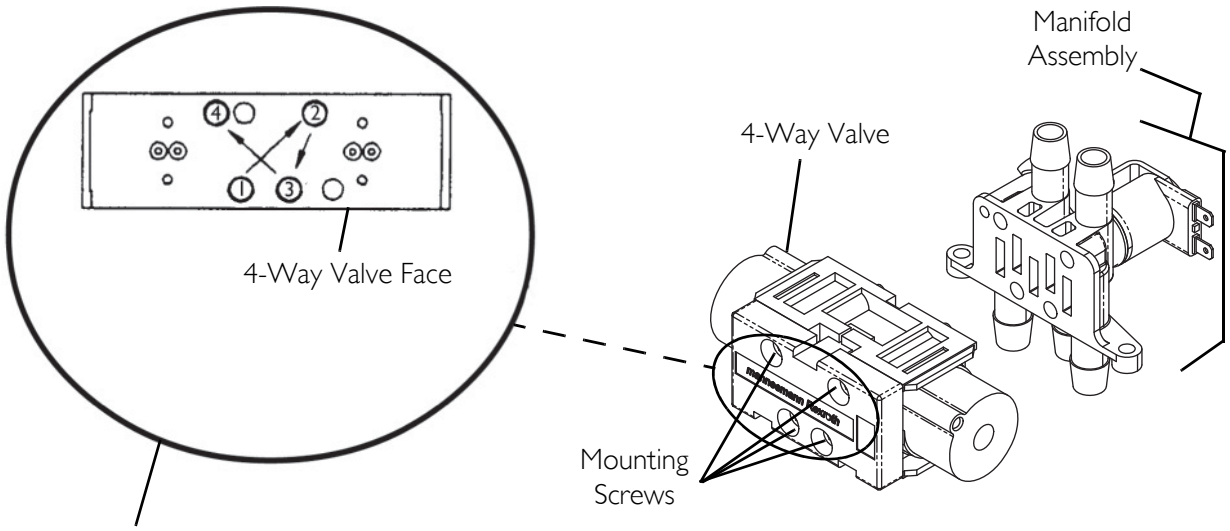
⚠ CAUTION

Torque sequence and specification MUST be adhered to or possible damage to the 4-way valve could result.

6. Tighten mounting screws in the sequence described below.
7. Pre-torque the mounting screws to 1.1 N-M ± 0.2 N-M (10 in-lbs ± 2 in-lbs) using the torque sequence.
8. The mounting screws can be now be torqued to 2.5 N-M ± 0.2 N-M (22 in-lbs ± 2 in-lbs) in the same sequence.

⚠ CAUTION

This is a maintenance free valve. Opening the valve will void any and all warranties applicable to the valve.



NOTE: The Numbers indicate the mounting screw torque sequence: pre-torque to 1.1 N-M ± 0.2 N-M (10 in-lbs ± 2 in-lbs), then *torque to* 2.5 N-M ± 0.2 N-M (22 in-lbs ± 2 in-lbs).

FIGURE 20.1 Replacing 4-Way Valve - 5 Liter Models

Replacing Manifold Assembly

5 and 9 Liter Models

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Remove the tie-wraps connecting the sieve bed hoses to top of manifold assembly.
5. Remove sieve bed hoses from manifold assembly.
6. Remove and label the two spade connectors from the valve pilot on top of the manifold assembly.
7. Loosen the adjustable clamp on the heat exchanger side that secures valve manifold input hose to heat exchanger.
8. Remove hose from end of heat exchanger.
9. Remove the two mounting screws, washers (1 per side) and bushings (2 per side) securing the 4-way valve/manifold assembly to top of sound box.
10. The 4-way valve/manifold assembly can be removed from the concentrator by lifting the assembly straight up through the cutout in the sound box.

11. Remove 4-way valve from manifold assembly. Refer to Replacing 4-Way Valve on page 60.
12. Remove Y tube and throttle muffler assembly from manifold.
13. Loosen the adjustable clamp on valve manifold input hose to bottom center port of manifold assembly.
14. Remove valve manifold input hose from bottom center port of manifold assembly.
15. Slide 4-way valve/manifold assembly complete through the cutout in top of sound box then install the two mounting screws, washer and bushings into the manifold to secure the 4-way valve assembly to the top of sound box.
16. Reverse STEPS 4-14.
17. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.
18. Run unit and inspect for leaks. Refer to Leak Test on page 71.
19. If no leaks detected, turn power Off (O) and unplug the unit.
20. Reinstall cabinet. Refer to Removing Cabinet on page 25.

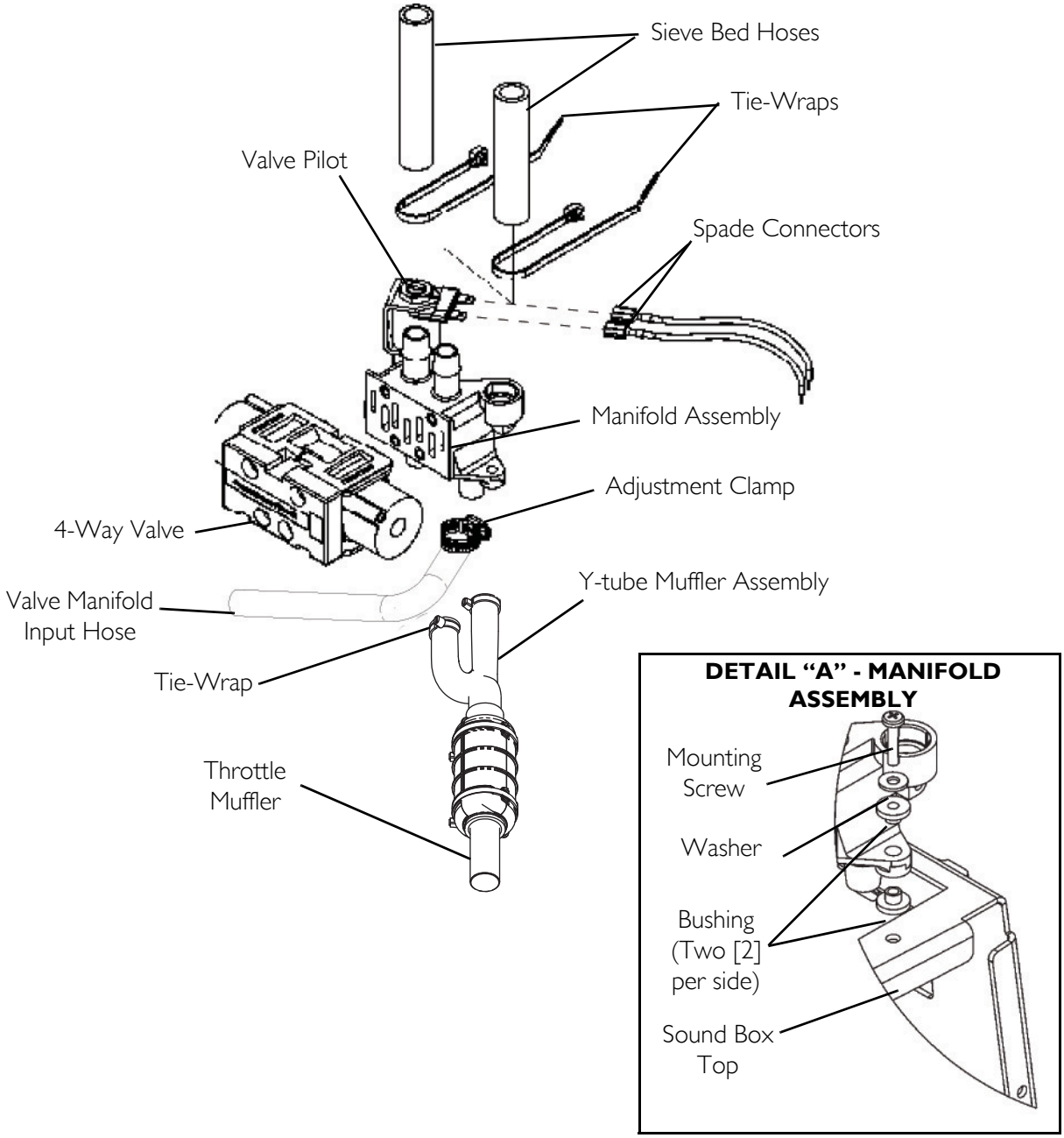


FIGURE 20.2 Replacing Manifold Assembly - 5 and 9 Liter Models

Replacing Pilot Valve Poppets and O-Rings

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Cabinet on page 25.
3. Remove control panel. Refer to Removing Control Panel on page 50.
4. Locate pilot valve on 4-way valve manifold assembly.

NOTE: Pilot valve can be accessed while the 4-way valve and sieve bed hoses are intact on the concentrator.

NOTE: DO NOT remove spade connectors from pilot valve coils. Simply lay coils with spade connectors aside while performing this installation.

5. Hold pilot valve stem with the flat blade screwdriver and turn the 9/16-inch locknut counterclockwise one complete turn.
6. Unscrew the pilot valve stem assembly from the manifold while leaving the coil with yoke and locknut intact on stem.
7. Remove pilot valve poppet from inside the pilot valve stem.

⚠ CAUTION

DO NOT remove the coil yoke from the coil. The washer between the bottom of the yoke and the bottom of the coil MUST not be removed. Otherwise, components may be damaged in reassembly.

8. Set aside the coil with yoke and pilot valve stem assembly with the wires still intact.

⚠ WARNING

DO NOT use sharp tools to remove O-ring from plastic manifold opening. Damage to the plastic manifold and/or plastic manifold airflow passage may occur. Damage to airflow may result in improper oxygen delivery and harm to the user. Refer to Detail "A" in FIGURE 20.3.

9. Remove poppet and O-ring from manifold opening (Detail "A").
10. Discard old poppet and O-ring.
11. Install new O-ring into the opening in the plastic manifold housing (Detail "A").

⚠ CAUTION

DO NOT overtighten pilot valve stem when installing it into plastic manifold. Damage to the rubber O ring and/or plastic manifold may occur.

12. Install new slotted poppet into the bottom of the pilot valve stem with tapered end facing to the bottom.
13. Install pilot valve stem and new slotted poppet with coil (with yoke and locknut intact) into manifold opening.
14. Use a flat blade screwdriver, and tighten pilot valve stem clockwise until snug. Torque to 2.8 N-M ± 0.5 N-M (25 inch-lbs. ± 5 in-lbs).

NOTE: DO NOT remove spade connectors from pilot valve coils. Simply lay coils with spade connectors aside while performing this installation.

15. Position pilot valve coil with yoke at an approximate 60° angle to the right (as viewed from the front of valve) to ensure spade connectors are not pulled or tensioned after reinstallation.
16. Use the flat blade screwdriver and hold the pilot valve-stem in place.
17. Tighten locknut clockwise with the 9/16-inch wrench until snug to secure the stem and coil with yoke. DO NOT overtighten. Torque to 2.3 N-M ± 0.3 N-M (20 inch-lbs ± 3 in-lbs).

⚠ CAUTION

DO NOT overtighten locknut when installing it onto pilot valve stem. Damage to the plastic manifold may occur.

18. Reinstall control panel. Refer to Removing Control Panel on page 50 and reverse all steps.

⚠ WARNING

Ensure that hoses behind control panel DO NOT contact cooling fan after control panel reinstallation.

19. Run unit and inspect for leaks. Refer to Leak Test on page 71.
20. If no leaks detected, turn power Off (O) and unplug the unit.
21. Reinstall cabinet. Refer to Removing Cabinet on page 25.

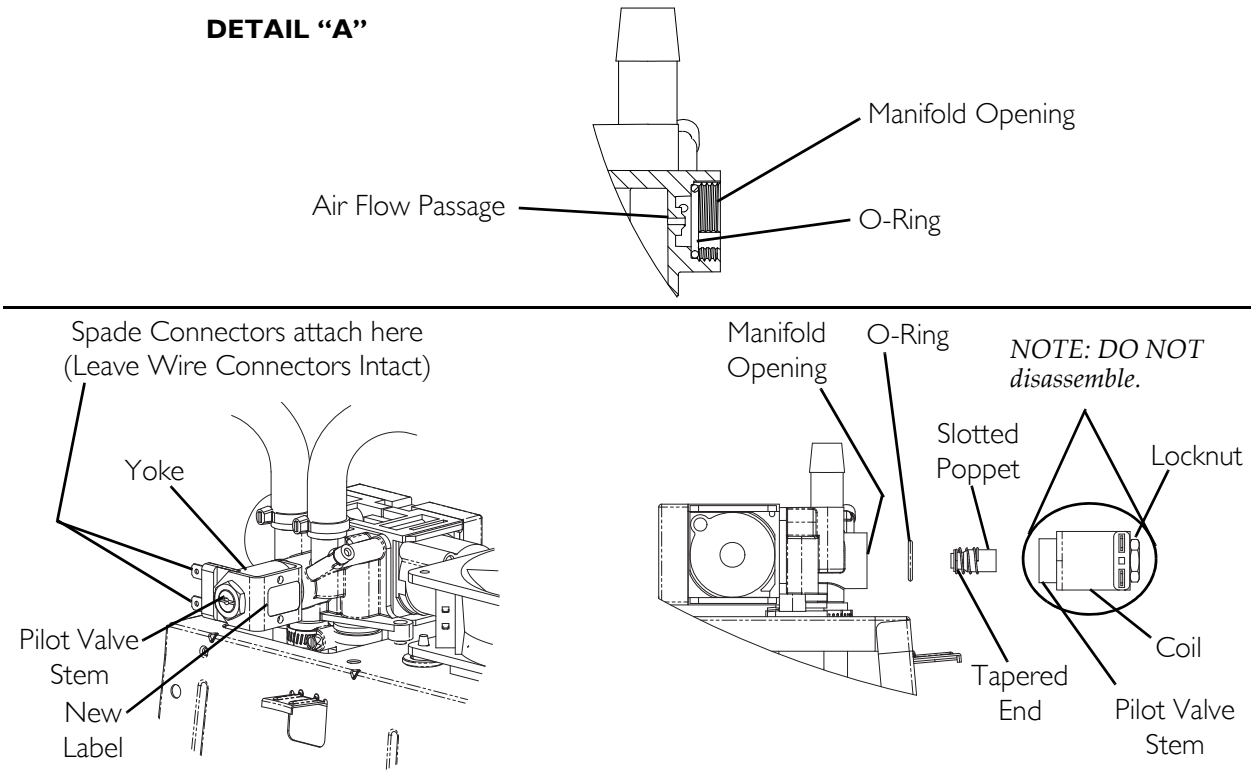


FIGURE 20.3 Replacing Pilot Valve Poppets and O-Rings - 5 and 9 Liter models

SECTION 21—PURITY INDICATORS

SensO$_2$ Alarm Indicators

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Operation

The Platinum with SensO$_2$ Concentrator is equipped with an oxygen purity indicator. This feature monitors the purity level of the oxygen generated by the concentrator. If purity falls below alarm thresholds, indicator lights on the control panel will illuminate.

NOTE: Concentrator may be used during the initial start warm-up time (approximately 30 minutes) while waiting for the O_2 purity to reach maximum.

When the unit is turned on, the GREEN light will come on (SYSTEM OK/O_2 greater than 85%). After five minutes, the oxygen sensor will be operating normally and will control the indicator lights depending on oxygen concentration values. The explanation of the indicator light functions are as follows:

Indicator Light Explanation

NOTE: Indicator lights are visible only when lit.

GREEN light (O_2) - Normal Operation.

YELLOW light **(⚠)** - Call supplier IMMEDIATELY. You may continue to use the concentrator unless instructed otherwise by your supplier. Be certain that backup oxygen is nearby.

RED light **(🔔)** - Total unit shutdown. Switch IMMEDIATELY to backup oxygen supply. Call supplier IMMEDIATELY.

GREEN light - with YELLOW light flashing - Call supplier IMMEDIATELY. Oxygen sensor malfunctioning; you may continue to use the concentrator.

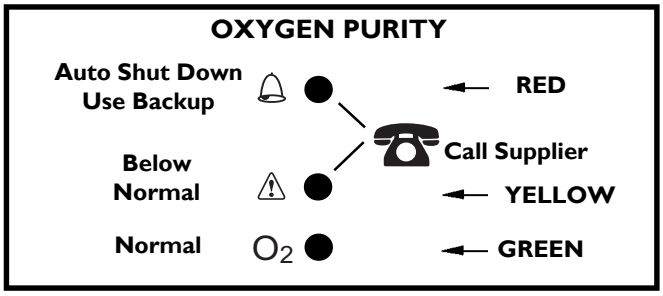


FIGURE 21.1 Indicator Light Explanation

SECTION 22—AUTOTUNING

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Use extreme care when making adjustments to the timing switch. DO NOT allow screwdriver or your hands to contact the P.C. Board when unit is plugged in and/or on. Turn unit off and unplug before adjusting timing switch. Electrical shock is possible.

To accommodate the varying tolerances when replacing components, an adjustable timer is used to control the shift time of the pressure equalization (PE) valve. The SensO_2 board allows for automatic (microprocessor controlled) adjustments of the PE shift times.

Autotuning

1. Turn power off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Plug the unit in and turn the power on (**I**).
4. Wait for the main valve shift to indicate one of the following:
   - If the board is new, the front panel RED indicator light will slowly blink, indicating autotune has initiated.
   - If the board is used and has performed autotuning before, press and release the small push button switch near the pressure sensor.
   - The front panel RED indicator light will slowly blink, indicating the unit is autotuning and automatically adjusting the PE valve timing.
5. Set the output flow to maximum flow rate during autotuning.

NOTE: The GREEN (onboard) diagnostic light will flash the current value of the PE valve timing number.

6. Place the cover back on the unit but DO NOT install the cover screws. Let the unit run until autotuning is completed.

NOTE: When autotuning is complete, the RED front panel indicator light will change from a slow blinking to a flashing of the final PE valve timing number.

7. Turn the unit off and then back on. The timing value is stored in memory for future use.

NOTE: If the unit is turned off before an autotune cycle is completed, the PE valve timing will not be stored or updated. If the board is new, autotuning MUST be successfully completed before the unit can be placed into service.

8. After a successful autotune, run the unit for 30 minutes and verify that the oxygen concentration output of the unit is within specification.
9. If the oxygen output concentration is not within specification, rerun the autotune again.
10. Turn power Off (O) and unplug the unit.
11. Reinstall cabinet. Refer to Removing Cabinet on page 25.

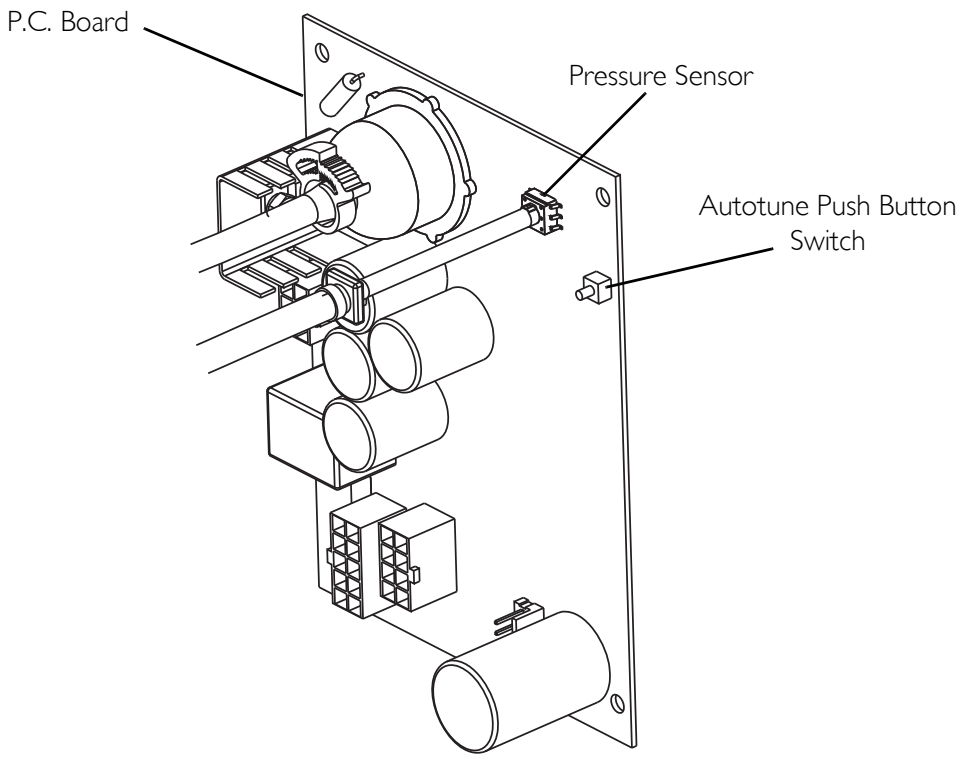


FIGURE 22.1 Autotuning

SECTION 23—LEAK TEST

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Leak Test

1. Turn power Off (O) and unplug the unit.
2. Remove cabinet. Refer to Removing Cabinet on page 25.
3. Plug in unit.
4. Turn the concentrator on (I).
5. Let concentrator run for 20 minutes.

⚠ DANGER

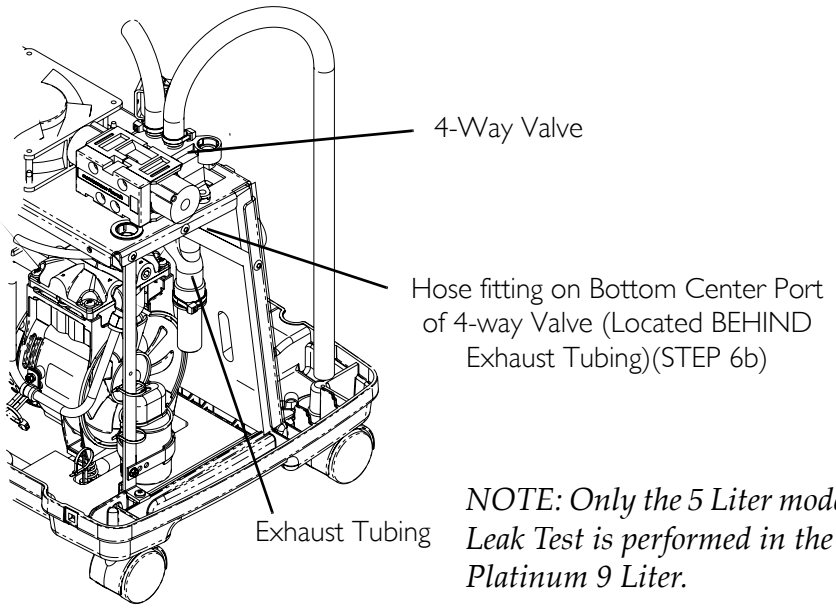
Apply small amount of leak test solution to fittings only. Avoid all other components. DO NOT leak test 4-way valve body. Carefully leak test for pressure leaks around sieve bed hoses at 4-way valve. DO NOT allow leak test solution to enter into 4-way valve and system.

6. With leak-test solution or equivalent soapy water, leak test the following:
   A. The two sieve bed hoses at the top of 4-way valve and hose to bottom center port on 4-way valve (FIGURE 23.1).

   NOTE: Refer to Preventive Maintenance on page 26 for maintenance of heat exchanger and filters.

   B. Hose connections to top and bottom fittings of sieve beds.
   C. PE valve hose connections on top of sieve beds (FIGURE 23.2).
   D. Hose fittings at product tank cap and check valves (FIGURE 23.2).
   E. The front and rear fittings on heat exchanger (FIGURE 23.2).
7. If no leaks are found, proceed to STEP 11. If leaks are found, proceed to STEP 8.
8. Turn power Off (O) and unplug the unit.
9. Replace any tubing that appears cracked, worn, etc.
10. Repeat STEPS 3-7.
11. Re-install cabinet. Refer to Removing Cabinet on page 25 and reverse all steps.

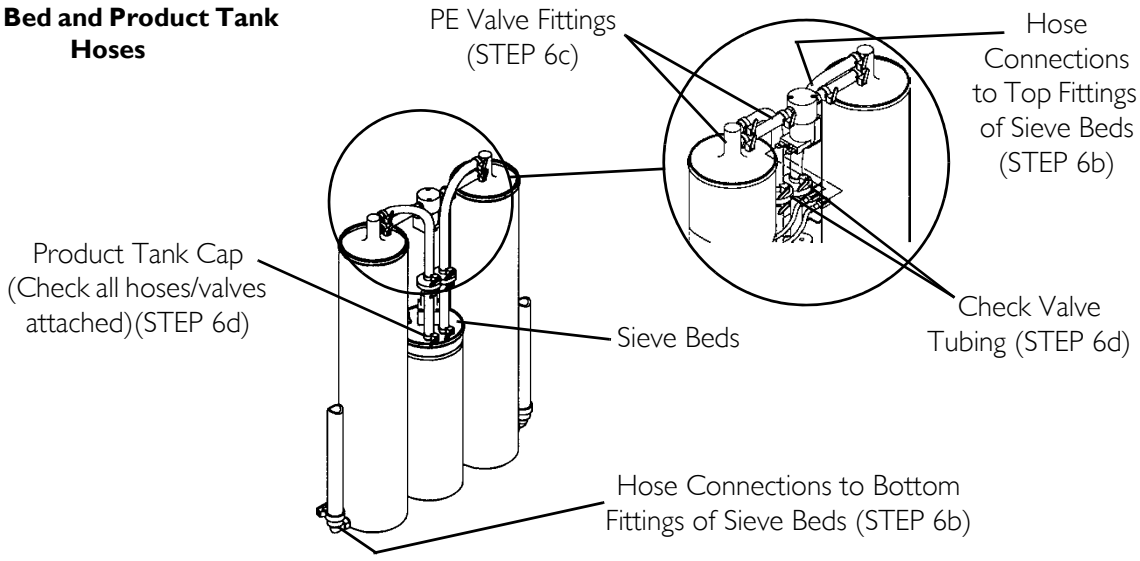
For 5 Liter Models with Throttle Muffler and 9 Liter Models



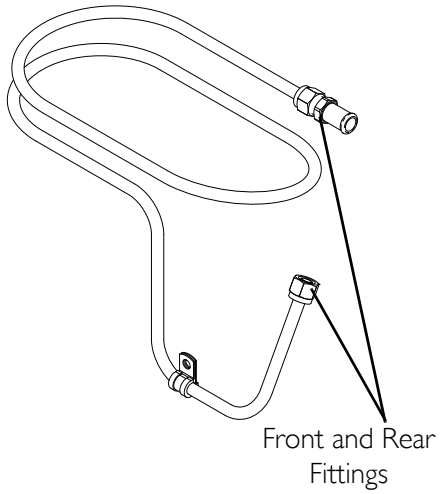
NOTE: Only the 5 Liter model shown for clarity. The Leak Test is performed in the same manner for the Platinum 9 Liter.

FIGURE 23.1 Leak Test

Sieve Bed and Product Tank Hoses



5 Liter Heat Exchanger Hose manufactured after 9-9-05



9 Liter Heat Exchanger Hose

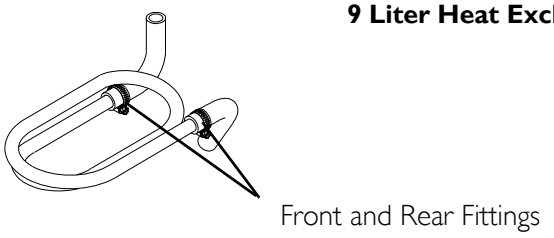


FIGURE 23.2 Leak Test

SECTION 24— ALARM TEST

Alarm and Sensor Tests

⚠ DANGER

To prevent electrical shock, ALWAYS disconnect concentrator from electrical outlet before servicing.

Check alarms periodically for proper function.

Power Loss Alarm

With the unit running, remove the line cord from power source. The power loss alarm mode should sound the audible alarm IMMEDIATELY or within 30 seconds.

NOTE: With the unit unplugged and inoperable for a short period of time, the battery free circuit will be drained. If power failure alarm does not sound with unit unplugged and power switch on, the battery free circuit is drained. It will recharge when unit is plugged in and switched on.

Low Pressure Test

1. There are two separate failure modes for Low Pressure:
   - Low product tank pressure. (Pressure in tank drops below a preset value, typically 48 kPa (7 psi).
   - Failure to reach the set point pressure within a prescribed time limit, or Timeout Failure.

Test One

1. With unit running, set flow at maximum rating.
2. When the main valve switches, pull the stem on the compressor relief valve out as far as it will go and hold it.
3. The low pressure alarm should activate within 30 seconds. Refer to SensO$_2$ Indicators on page 77 for shutdown mode.

Test Two

1. With unit running, set flow at maximum rating.
2. Remove the pressure sensor tubing (tie-wrap) from the top of the product tank (not shown).
3. The low pressure alarm should activate within 30 seconds. Refer to SensO$_2$ Indicators on page 77 for shutdown mode.
4. Replace tubing and tie wrap.

Time-Out Test

1. With unit off (O), disconnect the compressor connector from the main wiring harness.
2. Plug unit in and turn power on (I).
3. The Time-Out Failure alarm should activate within 40 seconds. Refer to SensO2 Indicators on page 77 for shutdown mode.
4. Replace tubing and tie wrap.

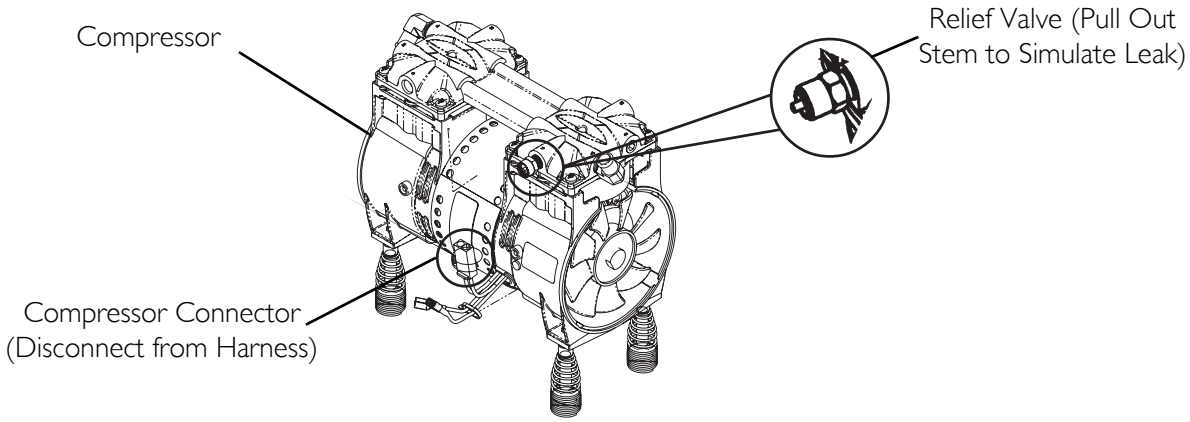


FIGURE 24.1 Low Pressure Test - Time-Out Test

High Pressure Test

- High Pressure - Occurs when pressure in product tank rises beyond a preset value, typically 158 kPa ± 7 kPa (23 psi ± 1 psi).
- Main Valve Coil - Alarm sequence occurs when the main valve coil, connection or P.C. board circuitry has failed.

1. With the unit running and flow set at 5 L/min for 5 liter models and 9 L/min for 9 liter models, remove one orange wire from the main valve coil.
2. The main valve coil alarm should activate within 40 seconds. Refer to SensO2 Indicators on page 77 for shutdown mode (FIGURE 24.3).
3. Replace tubing and tie wrap.

5 Liter models manufactured After 8/1/05 and 9 Liter models

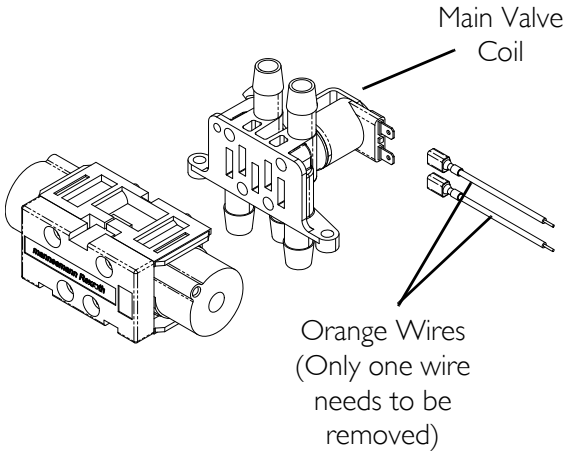


FIGURE 24.2 High Pressure Test

Oxygen Sensor

Alarm sequence occurs when concentration levels fall below a preset value, typically 73% ± 3% or 85% ± 2%. This failure indicates a catastrophic failure of any component mechanical or electrical.

Oxygen Sensor Test

1. Turn unit on (**I**). Set output flow at 5 L/min. for 5 Liter models and 9 L/min for 9 Liter models.
2. Monitor the O_2 level.
3. With the O_2 level greater than 85% after five minutes, the GREEN panel indicator light will remain illuminated.
4. Slowly adjust flow beyond maximum rated flow until you can achieve a concentration level greater than 75% but less than 84%. Within 30 minutes the YELLOW panel indicator light will illuminate and the unit will continue to run.
5. Clamp off the 1/8-inch oxygen sensor tubing between the oxygen sensor and the product tank regulator.

⚠ WARNING

Use care not to cut oxygen sensor tubing when clamping the oxygen sensor tubing.

6. Within 30 minutes, the Oxygen Sensor Alarm should activate and the RED panel light indicator will illuminate. The compressor will shut down with the alarm.

SENSO$_2$ INDICATORS

LABEL SYMBOL	STATUS	INDICATOR LIGHTS (LED)
O_2	SYSTEM OKAY O_2 over 85%	GREEN Indicator Light
⚠	O_2 Between 73% to 85%	YELLOW Indicator light A. YELLOW Solid B. YELLOW Flashing Sensor Failure Call a qualified technician.
🔔	SYSTEM FAILURE O_2 Below 73%	Continuous Audible Alarm Sieve-Gard™ Compressor shutdown. Call qualified technician.

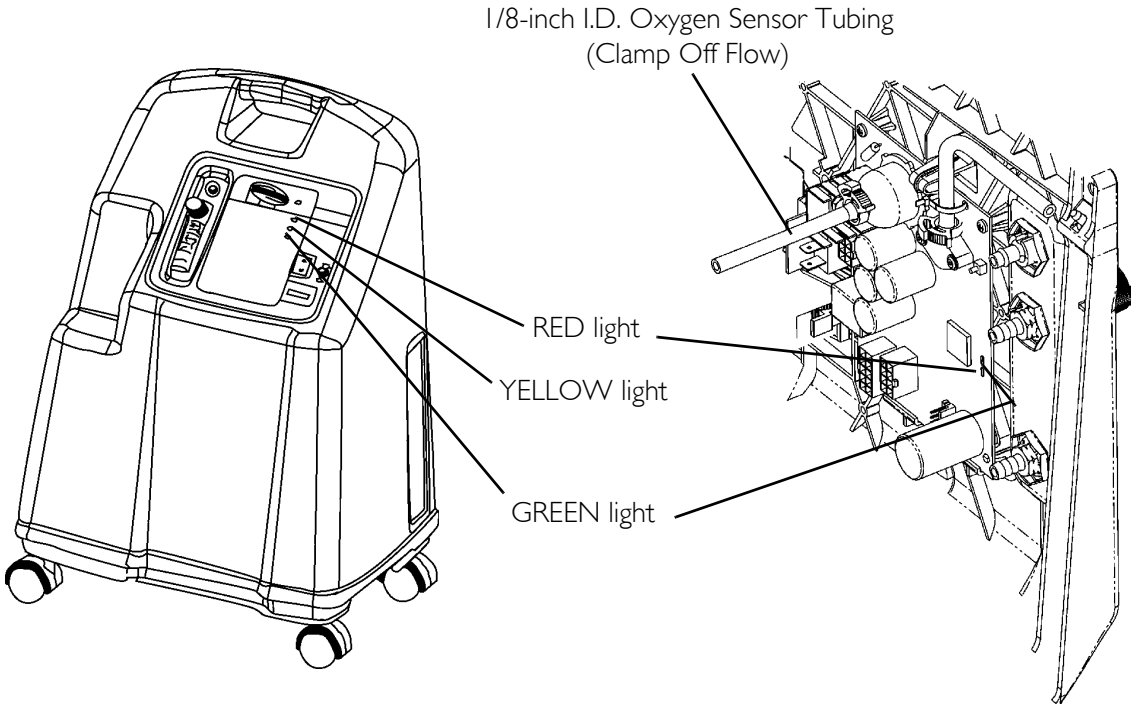


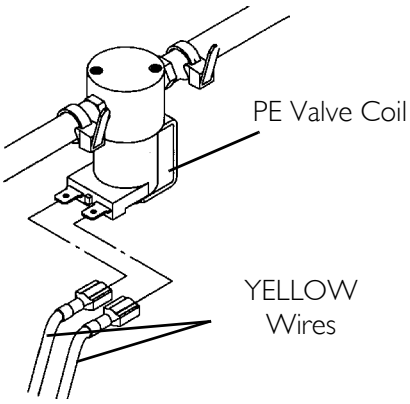
FIGURE 24.3 Oxygen Sensor

PE Valve Coil Test

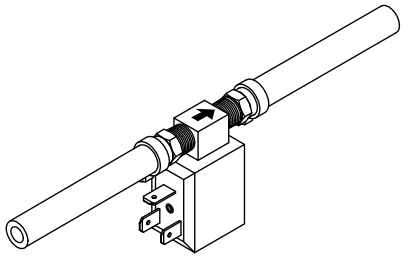
NOTE: PE Valve Coil - Alarm sequence occurs when the PE Valve Coil, connection or P.C. Board Circuitry has failed.

1. With the unit running and flow set at 5 L/min. for 5 Liter models and 9 L/min for 9 Liter models, remove one YELLOW wire from the PE valve coil. The PE valve coil alarm should activate within 10 seconds.
2. Reinstall cabinet. Refer to Removing Cabinet on page 25.

Circular P.E. Valve



Rectangular P.E. Valve



NOTE: Depending on the date of manufacture, the unit will be equipped with one of the two PE valve assemblies shown, circular shape or rectangular shape.

FIGURE 24.4 PE Valve Coil Test

3. Refer to Preventive Maintenance Record Invacare Platinum Oxygen Concentrator on page 34 to record date and number of hours when preventive maintenance was performed on the concentrator, or any repairs made.

OXYGEN CONCENTRATOR
Refer to Service Manual
DIAGNOSTIC ALARM SYSTEM

...ADJUSTMENTS BY UNAUTHORIZED PERSONNEL VOIDS WARRANTY...

ALARM	LED FLASHES RED	LED FLASHES GREEN	PROBABLE CAUSE
BEEP AT START UP	0	0	NO PROBLEM, SYSTEM OK
SHORT BEEP WITH LONG PAUSE	0	0	MAIN POWER LOSS
CONTINUOUS	1	1	LOW PRESSURE; MAJOR LEAK
CONTINUOUS	1	2	HIGH PRESSURE; NO SWITCHING
CONTINUOUS	1	3	TIME OUT FAILURE; COMPRESSOR
CONTINUOUS	1	5	PILOT VALVE CIRCUIT
CONTINUOUS	2	1	73% SHUTDOWN; LOW O2
CONTINUOUS	2	3	PE VALVE COIL
CONTINUOUS	2	4	EEPROM FAILURE
CONTINUOUS	3	1	OXYGEN SENSOR FAILURE

NOTE: CYCLE POWER ON AND OFF FIVE (5) TIMES TO CLEAR INTERNAL FAULT CODE.

PERFORMANCE SPECIFICATION

Flow: 0.5 to 5.0 L/min. Oxygen Concentration: 95.6% to 87%	Flow: 2.0 to 10.0 L/min. Oxygen Concentration: 94% to 87%

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SECTION 25—RECYCLING INFORMATION

This product may contain substances that could be harmful to the environment if disposed of in places (landfills) that are not appropriate according to legislation.

Follow local governing ordinances and recycling plans regarding disposal of the concentrator or components normally used in operation. The concentrator does not generate waste or residue in operation.

- DO NOT dispose of the concentrator in the normal waste stream.
- Any accessories not part of the concentrator MUST be handled in accordance with the individual product marking for disposal.

SECTION 26— SIEVE BED PRESSURE CHECK

Pressure Testing

NOTE: For this procedure, refer to FIGURE 26.1 on page 80.

1. Connect pressure gauge to the ¼ x 2-inch silicone tubing with connector (p/n 1131392).
2. Remove plug in HomeFill port in back of concentrator.
3. Connect ¼ x 2-inch silicone tubing with connector to HomeFill port.
4. Check each connection to make sure it is tight.
5. Turn the concentrator On (**I**).

NOTE: Adjust the concentrator to maximum rated Liter flow to 5 L/min. for 5 Liter and 9 L/min. for 9 Liter.

NOTE: Wait approximately five minutes to allow system pressures to achieve proper equilibrium before testing.

6. The pressure in the concentrator should rise within 20 seconds to 21 p.s.i.g. ± 0.3 and for 5 Liter and 9 Liter shift the 4-way valve to the opposite sieve bed.
7. After the 4-way valve shift, the pressure in the concentrator will drop to 12 p.s.i.g. ± 2 before rising within 20 seconds to 21 p.s.i.g. ± 0.3 for 5 Liter and 9 Liter and shift the 4-way valve to the opposite sieve bed.
8. If pressure reading is 21 p.s.i.g. ± 0.3 for 5 Liter and 9 Liter when both valve shifts are made, proceed to STEP 10.
9. If pressure in the concentrator does not fall into the specifications listed above, refer to Troubleshooting on page 16.
10. Turn the concentrator off (O).
11. Disconnect pressure gauge from the HomeFill port and reinstall plug.

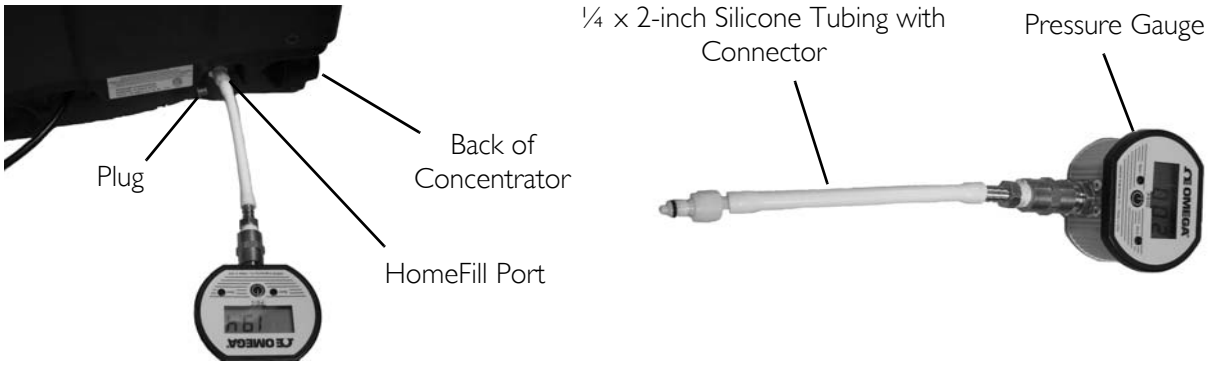

FIGURE 26.1 Pressure Testing

NOTES

CUSTOMER SERVICE AND WARRANTY INFORMATION

Terms and conditions of the warranty are part of the general terms and conditions particular to the individual countries in which this product is sold.

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