OxyPure

Oxygen Concentrator ZY-5AC/BA

Service Manual

Content

Introduction

This service manual is provided to medical device technicians and after sales service providers for providing maintenance and repairing the OxyPure. Please read this manual thoroughly before repairing the concentrator.

The air that we breathe consists of about 78% nitrogen and 21% oxygen with the remaining 1% being trace gases such as argon. The concentrator works by removing the nitrogen from the air using a process known as Pressure Swing Adsorption or PSA. The air is first compressed and then passed through a zeolite tower which adsorbs the nitrogen so that the resulting gas flowing out of the tower contains about 93% oxygen.

SANRAI reserves the right to change this document and product design. Therefore, there may be some difference between the manual and the machine.

The following terms are used throughout this manual to highlight important information.

DANGER Urgent safety information for hazards that will cause serious injury or death.

WARNING Important safety information for hazards that might cause serious injury.

CAUTION Information for preventing damage to the product

NOTE Information to which you should pay special attention.

The reliability and performance of this unit is dependent on the quality of parts and accessories. Please use SANRAI's parts and accessories for maintenance and repairing.

Overview

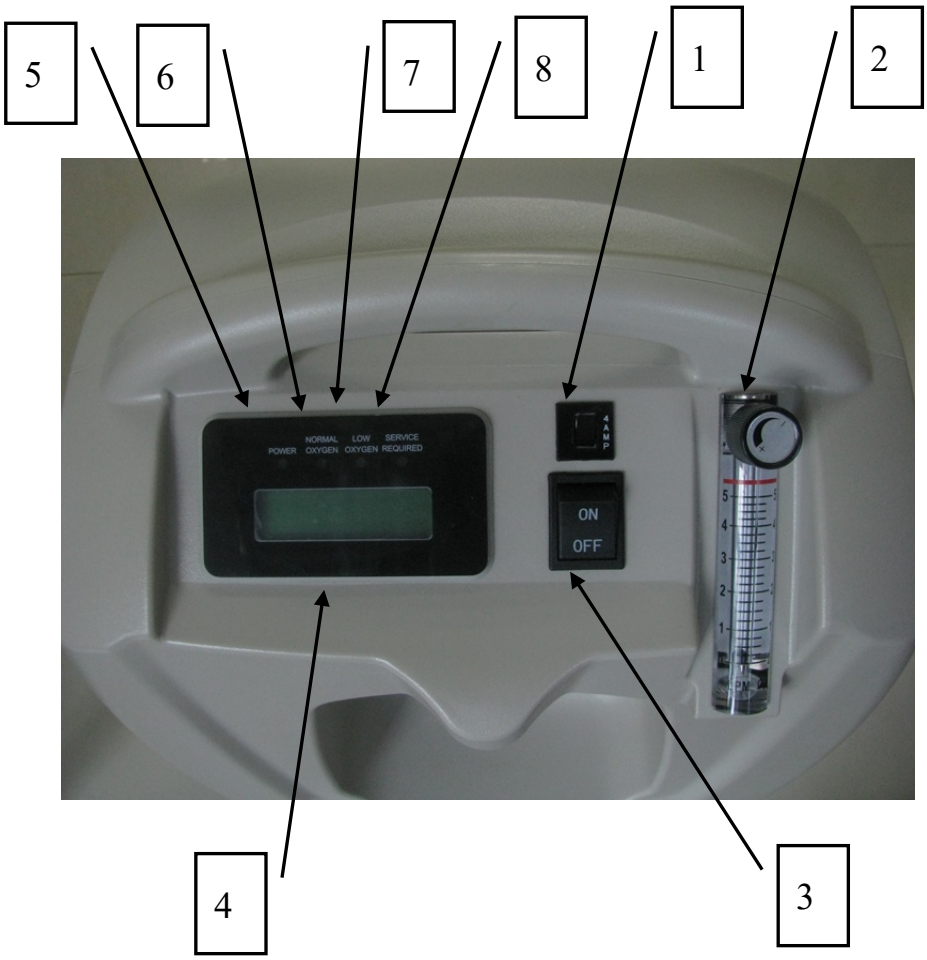


Figure 1: Control Panel

Figure 2: Front View

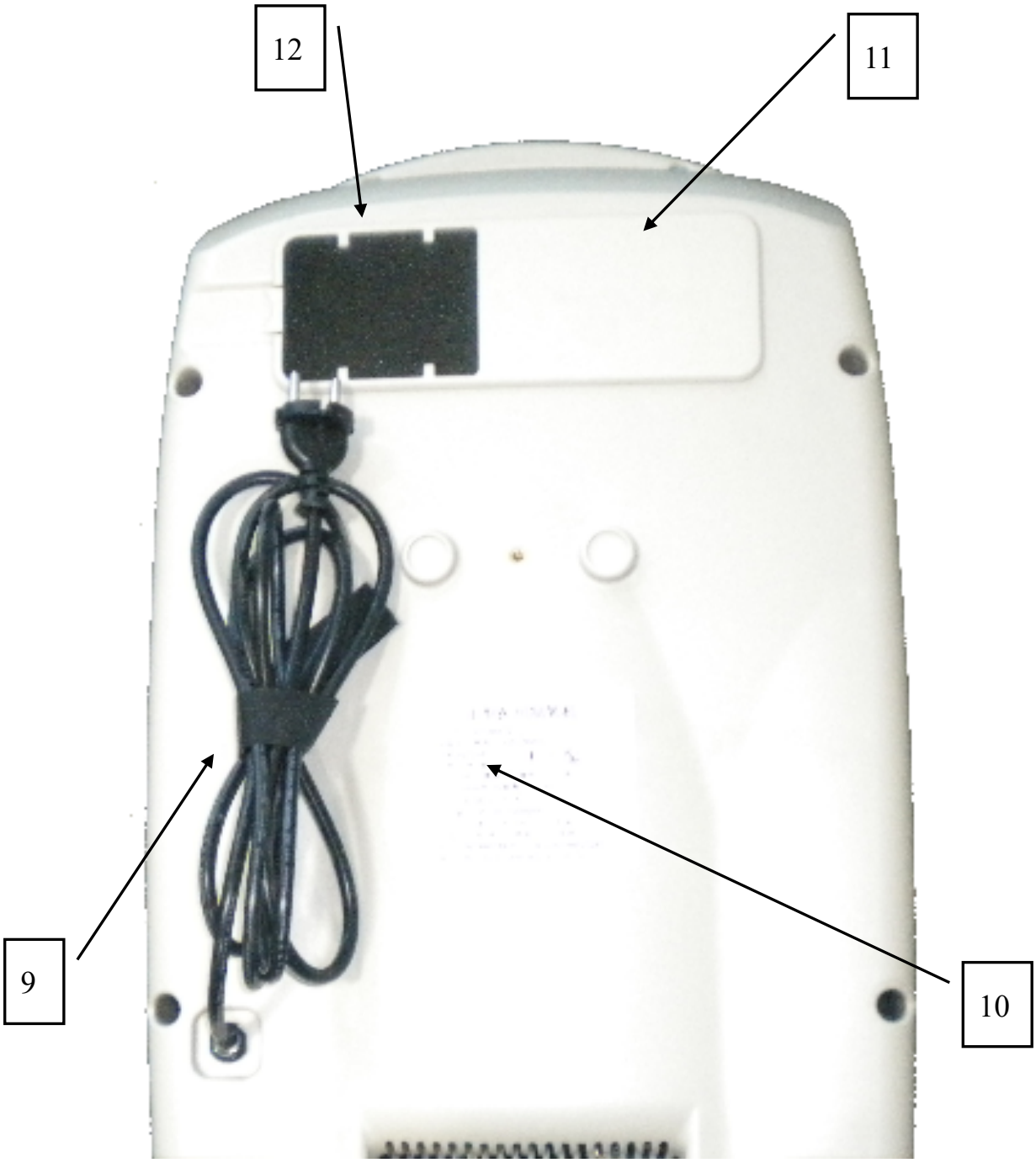


Figure 3: Rear View

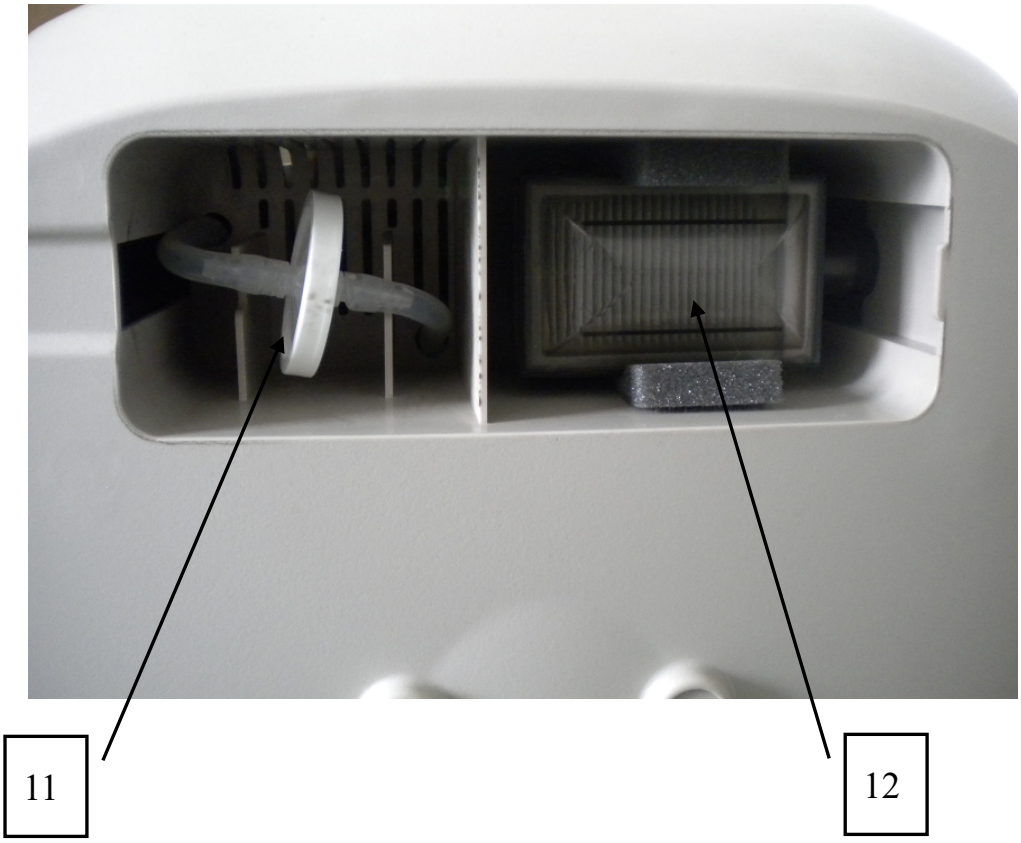


Figure 4: Filter Chamber

1·····Overload Protect Switch

2·····Flow Meter

3·····Power Switch

4·····LCD Display

5·····Power On Indicator

6·····Normal Oxygen Purity Indicator

7·····Low Oxygen Purity Indicator

8·····Service Required Indicator

9·····AC Power Cord

10·····Product Label

11·····Filter Cover

12·····Intake Filter Cotton

13·····Bacteria Filter

14·····Intake Filter

SPECIFICATIONS

No.	Item	Rating
1.	Delivery Rate	1 to 5 LPM
2.	Outlet Pressure	8.5 ± 0.5 psi (58.6 kpa)
3.	Electrical Rating	110-120V/60Hz/2.6A (Max.) 340W 220-240V/50Hz/1.4A (Max.) 340W
4.	Oxygen Percentage	1~5 LPM 93%±2%
5.	Operating Environment Range	Temperature 10℃ to 40℃, Humidity 30% to 80% Atmospheric pressure 50~106 kpa (7.3~15.4 psi)
6.	Operating Altitude (tested at 21°C) 0-2000 M (0-6561 ft) 2000-4000 M (6561-13123 ft)	Across the voltage range: 93% ± 3% Not recommended/efficiency less than 85%
7.	The visible "low oxygen" indicator will activate at the following level (only available with ZY5AC-O and ZY5BA-O)	82%±2%will activate at the following level (the red "service required" light will activate if purity dropped to 75%±3%
8.	Pressure Relief Valve	40 psig±5psig (276 kPa±34.5 kPa)
9.	Weight	35.3 lbs. (16 kilograms)
10.	Sound Level (ISO 8359:1996 from front)	45dbA
11.	Dimensions	23" H x 14.2" W x 11.4" D (58 x 36 x 29 cm)
12.	Operating System	Time Cycle / Pressure Swing
13.	Storage Conditions	Temperature -40℃ to 70℃ Humidity 10% t0 100% Atmospheric pressure 50~106 kpa (7.3~15.4 psi)
14.	Equipment Class and Type	Class II TYPE BF

Important Safety Items

To reduce the risk of burns, electrical shock, and fire:

⚠ DANGER

1. **Keep the oxygen concentrator at Least 5 feet (1.6 m) away from hot, sparking objects or naked sources of flame.**

   NOTE—Do not connect to an electrical outlet controlled by a wall switch. NO other appliances should be plugged into the wall outlet

2. Position your unit at least 6 inches (16 cm) away from walls, draperies, or any other objects that might prevent the proper flow of air in and out of your oxygen concentrator. The oxygen concentrator should be located so as to avoid pollutants or fumes.

Installation and Operation

Verify the power disconnect alarm

1. Confirm the Power Switch is “OFF”
2. Insert the AC plug to a suitable AC socket
3. Turn the Power Switch to “ON”
4. Run the machine for 3 minutes
5. Unplug the AC plug, you should hear a “3-2 beep” alarm for around one minute

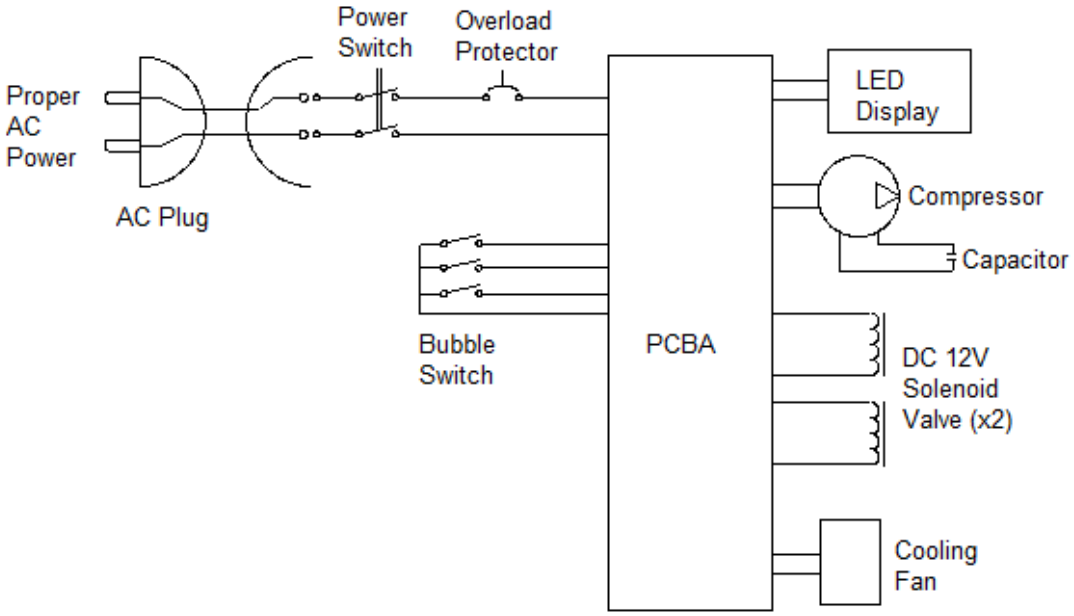
Operation Procedure

1. Confirm the Power Switch is “OFF”
2. Insert the AC Plug to a suitable AC socket
3. Screw the Connector into the Oxygen Exhaust Outlet
4. Connect the Cannula to the Connector
5. Turn the Power Switch to “ON”
6. Tune the flow rate to 5LPM
7. The LCD Display should show the run time of the machine

Verify the low oxygen purity alarm function

1. Connect the Oxygen Exhaust Outlet to an oxygen purity meter and flow meter with 8LPM measure range or above
2. Tune the flow range up to 7.5LPM or above
3. The oxygen purity should drop slowly
4. “LOW OXYGEN” LED should be lit up when oxygen purity drops below 81%, with “beep” sounds and the LED display should show “oxygen low”.
5. “SERVICE REQUIRED” LED should be lit up when oxygen purity drops below 73%, with shorter “beep” sounds and the LED display should show “oxygen too low”

Schematic Diagram



Failure Mode

Item	Symptom	Cause	Action
1	Low oxygen purity	1. Internal leakage	Find out and repair the leak point
		2. Low air flow from compressor	Inspect the compressor and replace it if necessary
		3. Low Voltage	Verify the voltage
		4. Sieve bed failure	Replace the oxygen system
		5. Intake filter failure	Replace the filter
		6. Oxygen flow over 5LPM	Adjust it to lower than 5LPM
		7. External oxygen purity meter shows a good reading, i.e. Sensor failure	Replace the Oxygen Purity Sensor
		8. Solenoid valve failure	Replace the solenoid valve or the whole oxygen system

2	Machine is not turning on	1.The overload protector switch is “OFF”	Reset the overload protector
		2. Improper voltage input	Provide proper voltage
		3. Power disconnect	Check the power socket, wire and internal connection
3	Overload protector	1. Voltage fluctuation	Verify the voltage and reset the protector switch
		2. AC plug has poor contact with AC socket	Fix the socket and plug
		3. The capacitor for compressor failed	Replace the capacitor
4	Low oxygen flow rate	1. Floater ball failure	Replace the flow meter
		2. Cannula is bent or kinked	Stretch it out or replace it
		3. Oxygen exhaust pressure too low	Adjust the Relief Regulator
		4. Intake Filter Failure	Replace the Intake Filter
5	Compressor is not running	1. Compressor failure	Replace the Compressor
		2. Capacitor for Compressor failed	Replace the Capacitor
		3. Compressor connector loose	Reconnect the connector or replace it
6	Compressor is running, but no air is coming from the exhaust	1. Control Board failure	Replace the Control Board
		2. Internal Hose loose	Reconnect the Hose
		3. Solenoid Valve failure	Replace the Solenoid Valve

Cabinet

Take off Rear Cabinet [Part 3.01.0538]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Filter Cover [3.01.0552]
4. Take off Intake Filter [3.07.0012]
5. Take off Bacteria Filter [3.07.0009]
6. Unscrew the 7 screws on Rear Cabinet
7. Separate Front Cabinet and Rear Cabinet
8. Disconnect the wire and cable between Front and Rear Cabinet, take a photo for record if necessary
9. Take off Rear Cabinet

Put on Rear Cabinet

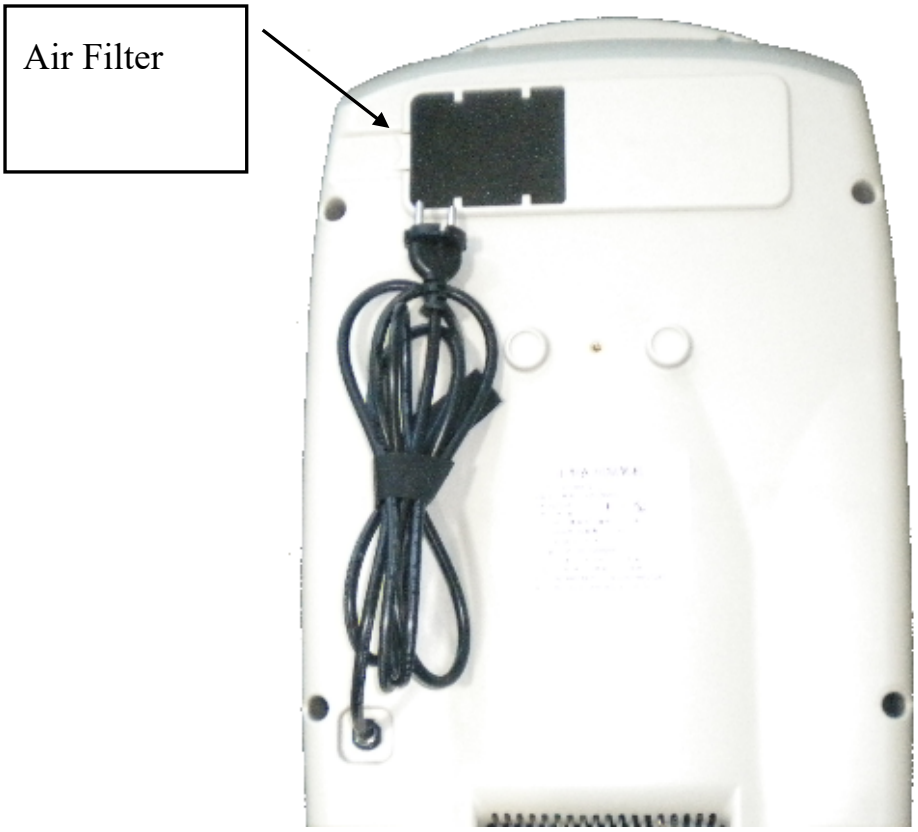
1. Connect the wire and cable inside the Cabinet
2. Put Oxygen Tube through the chamber for Bacteria Filter
3. Close Rear Cabinet
4. Connect Bacteria Filter
5. Screw the 7 screws for Rear Cabinet
6. Install Intake Filter
7. Shut Filter Cover

Routine Maintenance

Clean Air Filter [Part 3.05.0017]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Air Filter and wash it with fresh water
4. Dry Air Filter
5. Put Air Filter back

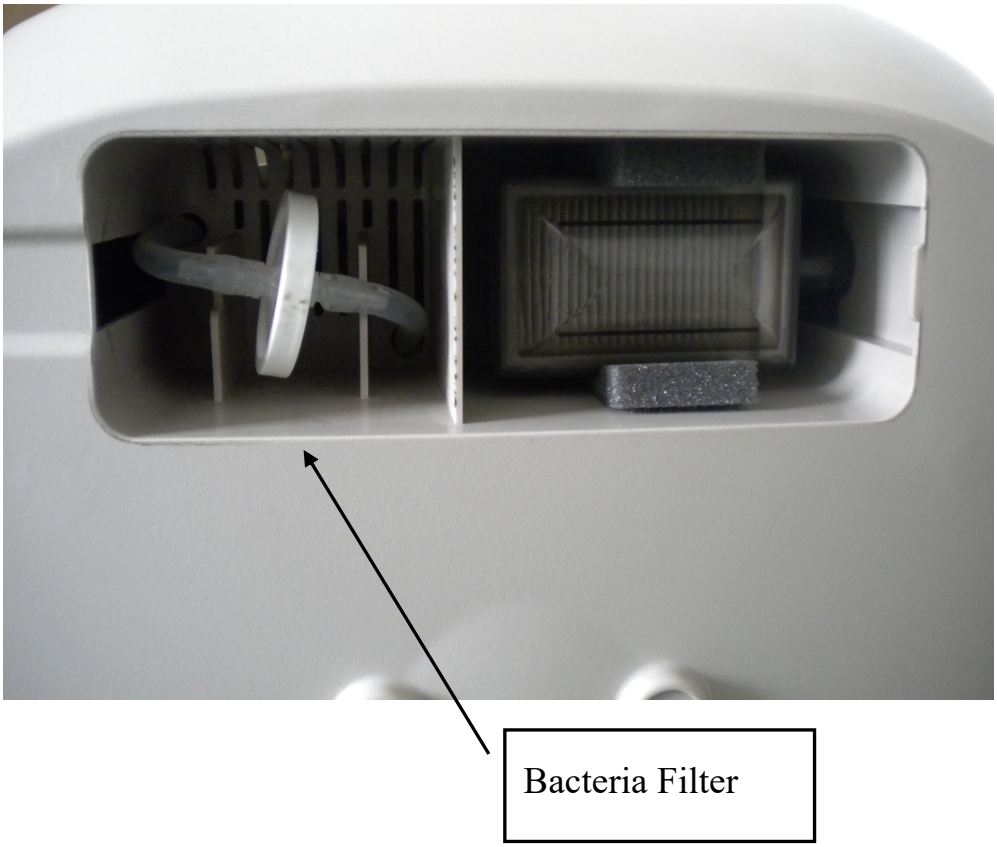
⚠ Caution, please clean the Air Filter at least every week and more in dusty climates



Replace Bacteria Filter [Part 3.07.0009]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Filter Cover [3.01.0552]
4. Take off the used Bacteria Filter
5. Put a new Bacteria Filter back
6. Shut Filter Cover

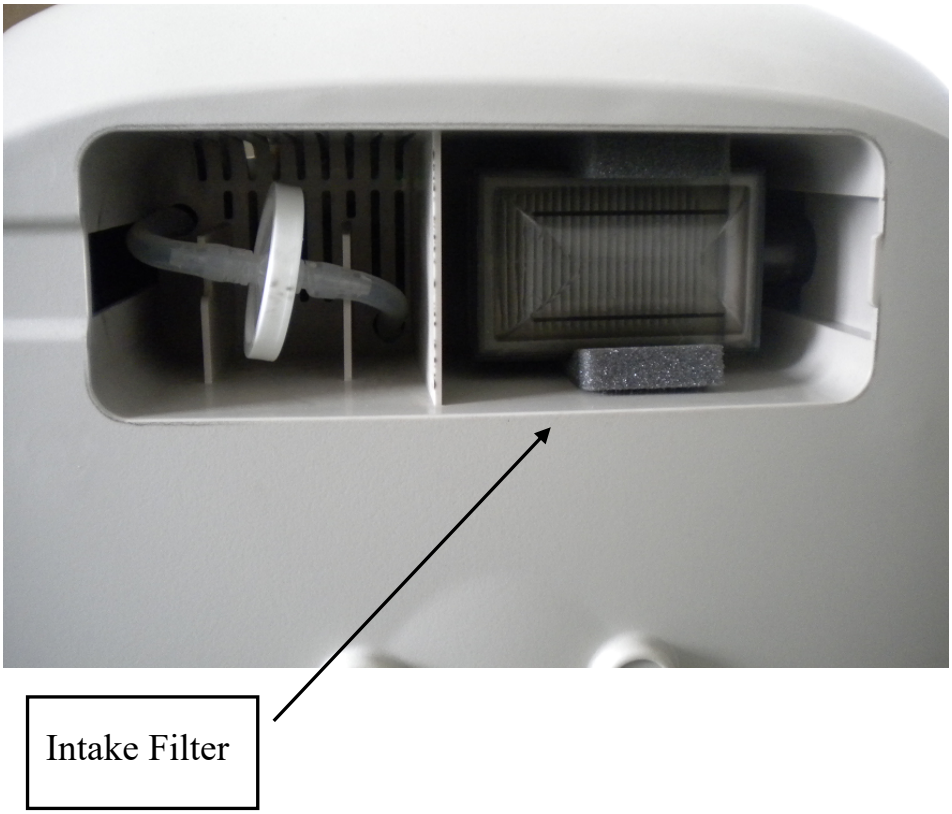
⚠ Caution, please replace the Bacteria Filter every 5 years or between patients.



Replace Intake Filter [Part 3.07.0012]

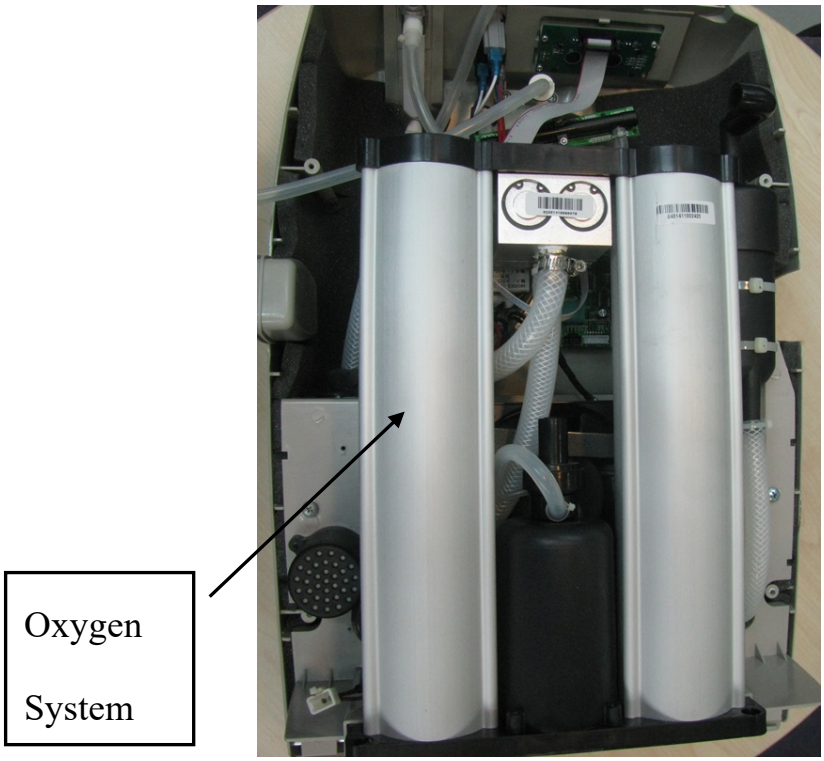
1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Filter Cover [3.01.0552]
4. Take out the used Intake Filter
5. Put a new Intake Filter back
6. Shut Filter Cover

⚠ Caution: it is recommended to replace the intake filter every 500 hours depending on the ambient conditions.



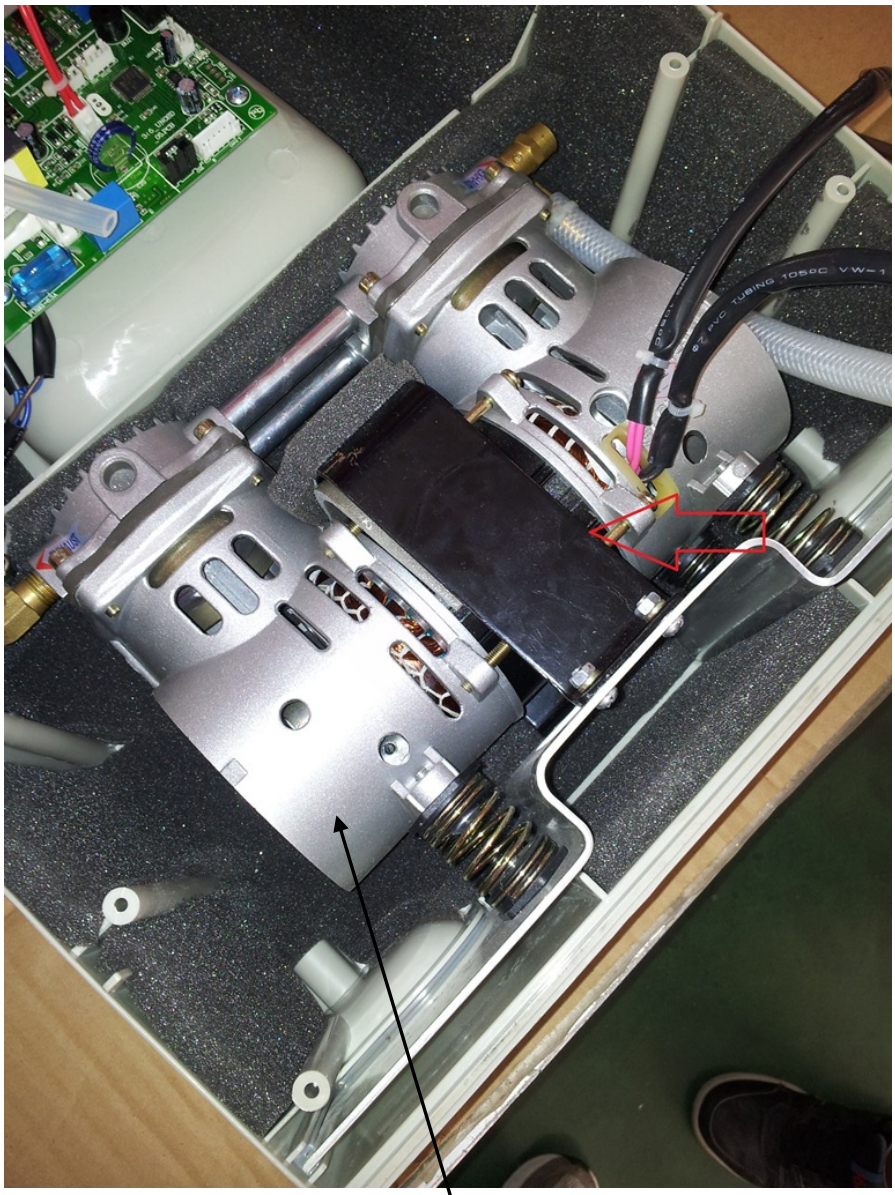
Replace Oxygen System (Sieve Beds) [Part 1.01.058]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Unplug the connector for the Solenoid Valve [3.02.0176]
5. Unscrew the clip for the silicon braided tube
6. Take off the silicon braided tube
7. Cut off the cable tie for the Oxygen Tube
8. Take off Oxygen System (Sieve Bed)
9. Put a new Oxygen System on the Compressor Frame
10. Connect all the wires and tubes for Oxygen System
11. Put on the Rear Cabinet (refer to “put on Rear Cabinet”)



Replace Compressor [Part 3.02.0023]

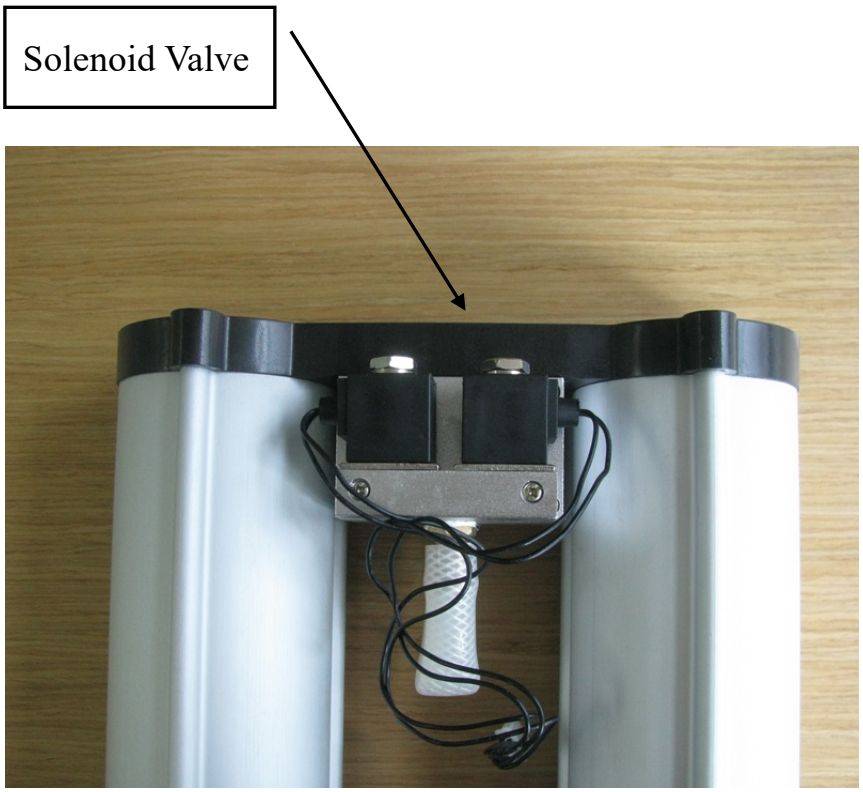
1. After step 8 of “Replace Oxygen System”
2. Disconnect the Compressor [3.02.0023] and Capacitor [3.02.0024]
3. Disconnect the Compressor and Control Board [3.02.0404]
4. Take off the Inlet Tube from Muffler
5. Unscrew Compressor Frame
6. Take out Compressor Bracket Assembly
7. Unscrew the used Compressor from Compressor Bracket Assembly
8. Screw a new Compressor on Compressor Bracket
9. Install the new Compressor Bracket Assembly into Front Cabinet
10. Connect all wire connector for Compressor
11. Put Compressor Frame on
12. Put Oxygen System (Sieve Bed) on Compressor Frame
13. Connect all the wire and tube for Oxygen System
14. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



Compressor

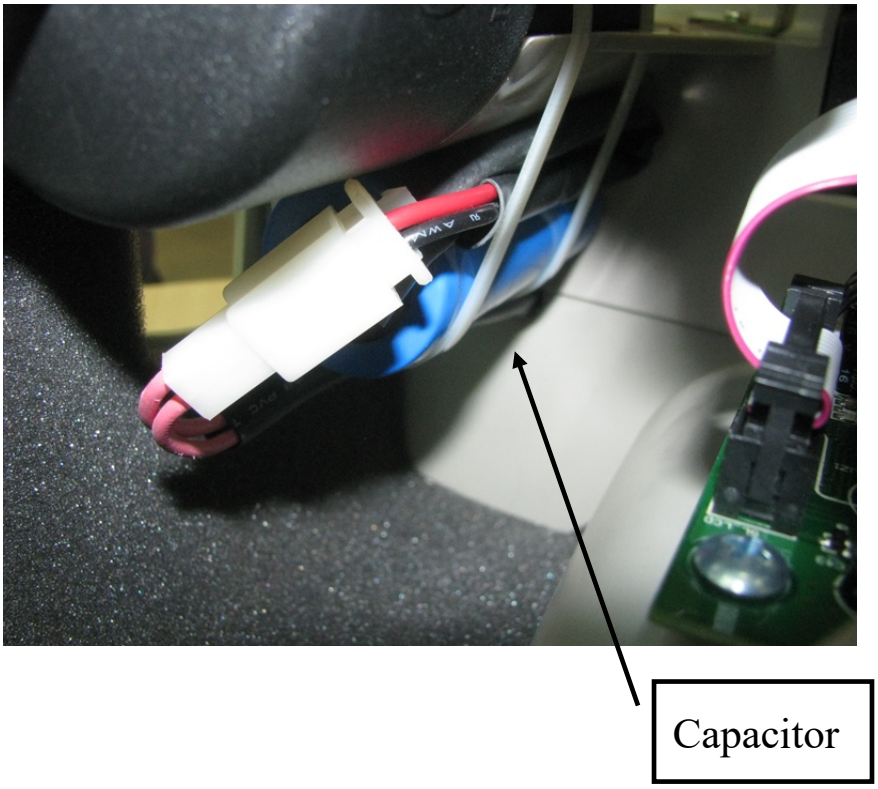
Adjust or replace Solenoid Valve [Part 3.02.0176]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Adjust Relief Regulator (turn the nut)
5. Unscrew and disconnect the Solenoid Valve if necessary
6. Change a new Solenoid Valve, beware on the mounting status to avoid leakage
7. Connect with Control Board [3.02.0404]
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



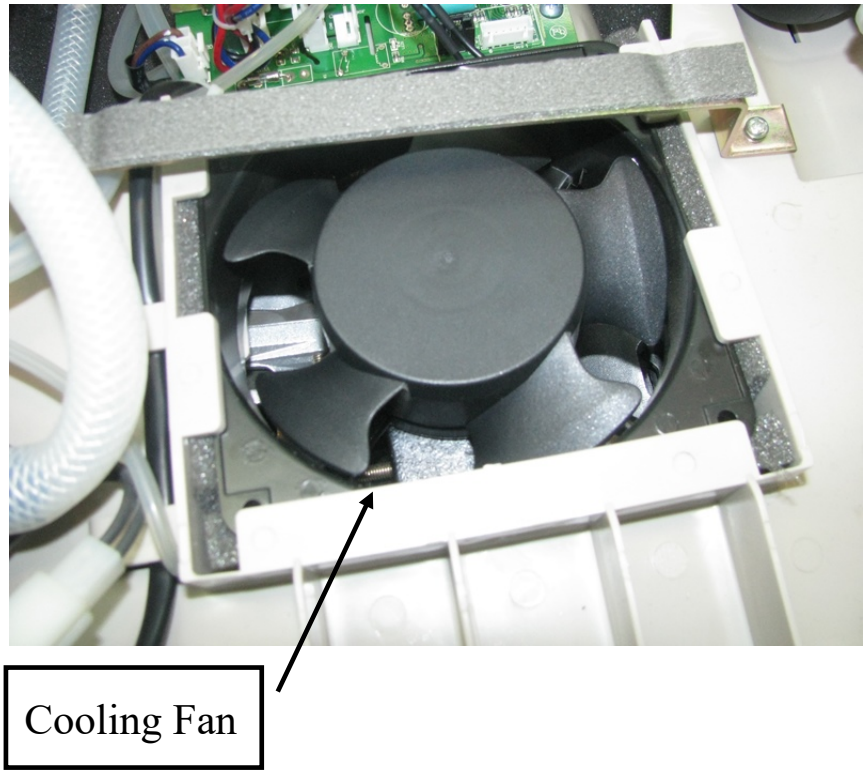
Replace Capacitor [Part 3.02.0024]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect Capacitor connector
5. Cut the cable tie and take off the used Capacitor
6. Tie the new Capacitor
7. Connect Capacitor
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



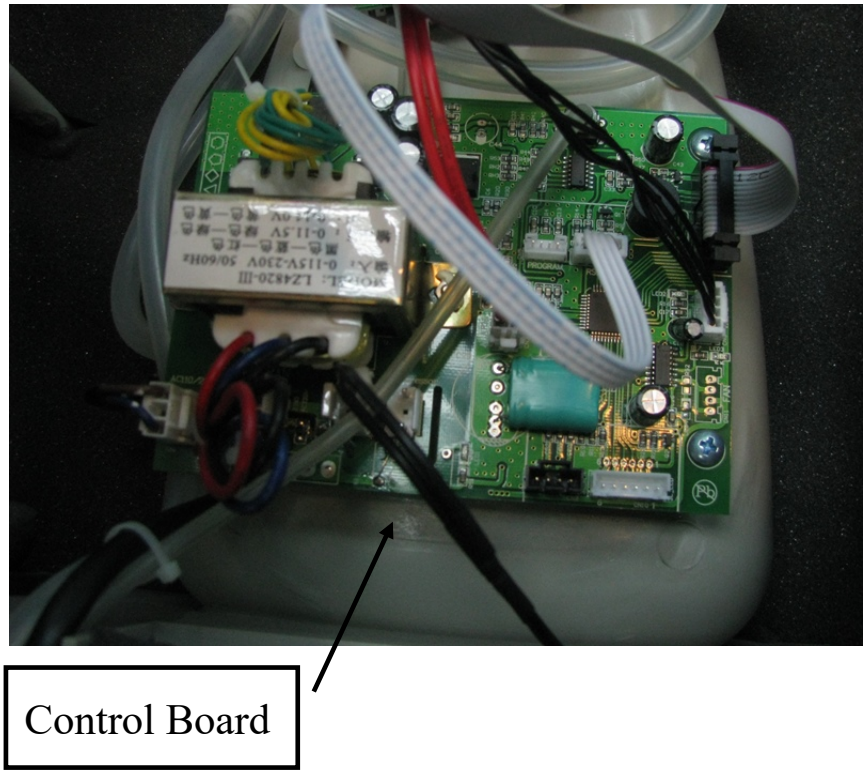
Replace Cooling Fan [Part 3.02.0022]

1. After step 5 of “Replace Compressor”
2. Disconnect Cooling Fan connector
3. Unscrew the used Cooling Fan from the Frame
4. Replace a new Cooling Fan
5. Connect Cooling Fan
6. Put the Frame back and mount it well
7. Put the Oxygen System [1.01.058] back and connect it well
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



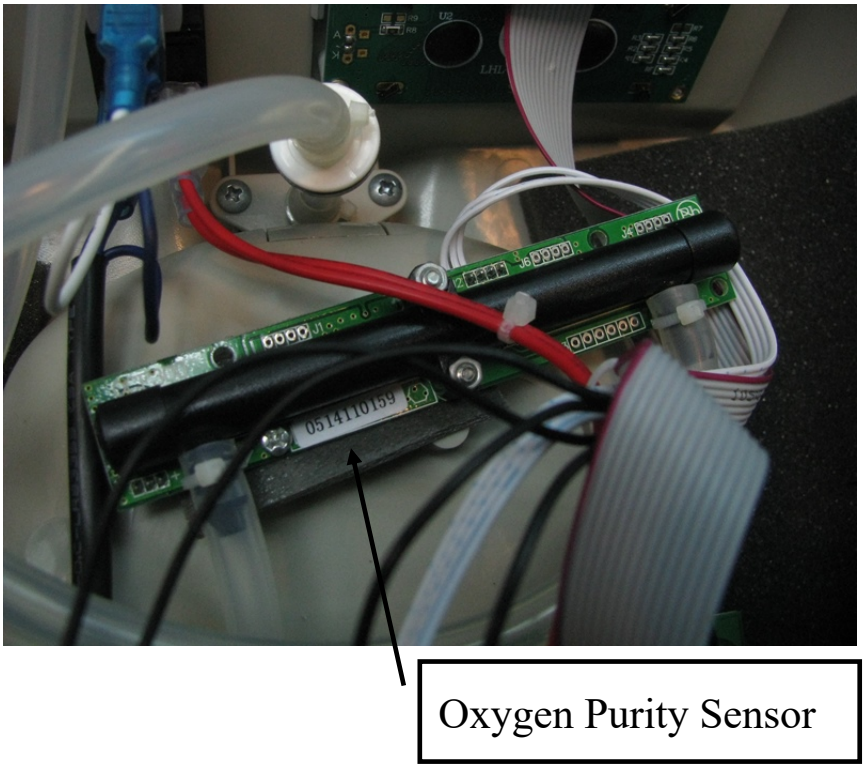
Replace Control Board [Part 3.02.0404]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect all the connector on the Board
5. Unscrew the used Control Board
6. Replace a new Control Board
7. Connect all connectors properly
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



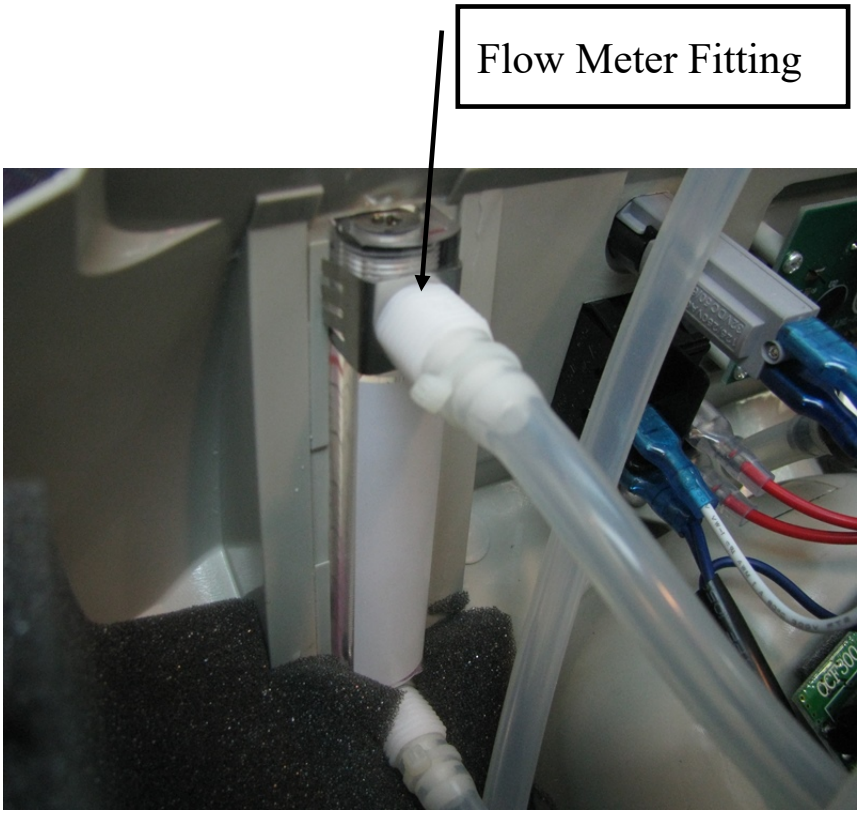
Replace Oxygen Purity Sensor [Part 3.02.0007]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect the connector and tube on Oxygen Purity Sensor
5. Unscrew the used Oxygen Purity Sensor
6. Replace with a new Oxygen Purity Sensor
7. Connect all connectors and tubes properly
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



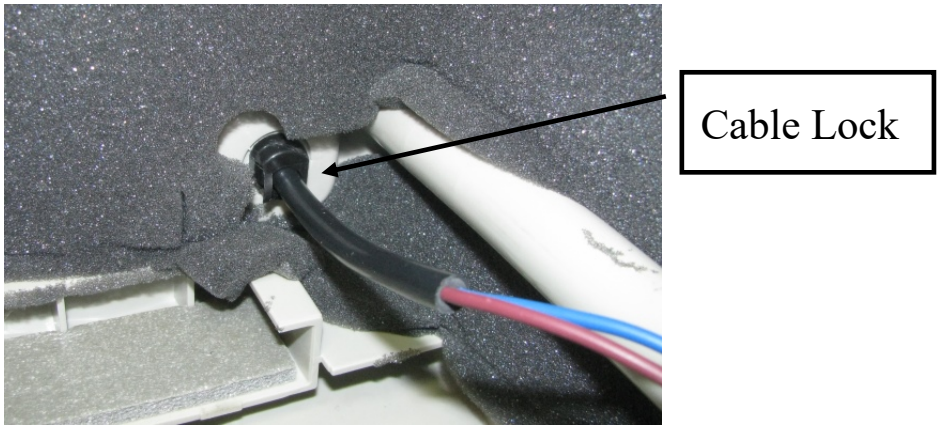
Replace Flow Meter [Part 3.07.0005]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect the silicon tube on Flow Meter
5. Unscrew the nut on Flow Meter Fitting
6. Take off Flow Meter
7. Replace a new Flow Meter
8. Connect and tie the tube
9. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



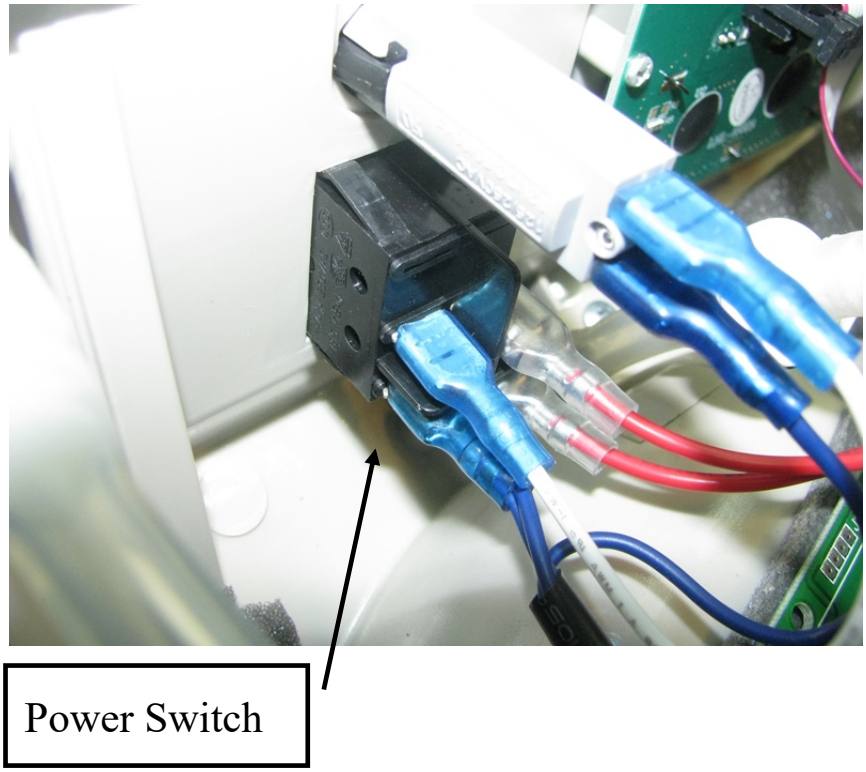
Replace the AC Cord

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect the connector for AC Cord
5. Put off Cable Lock with a specified pliers.
6. Take out the used AC Cord
7. Replace AC Cord and mount it with a specified pliers
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



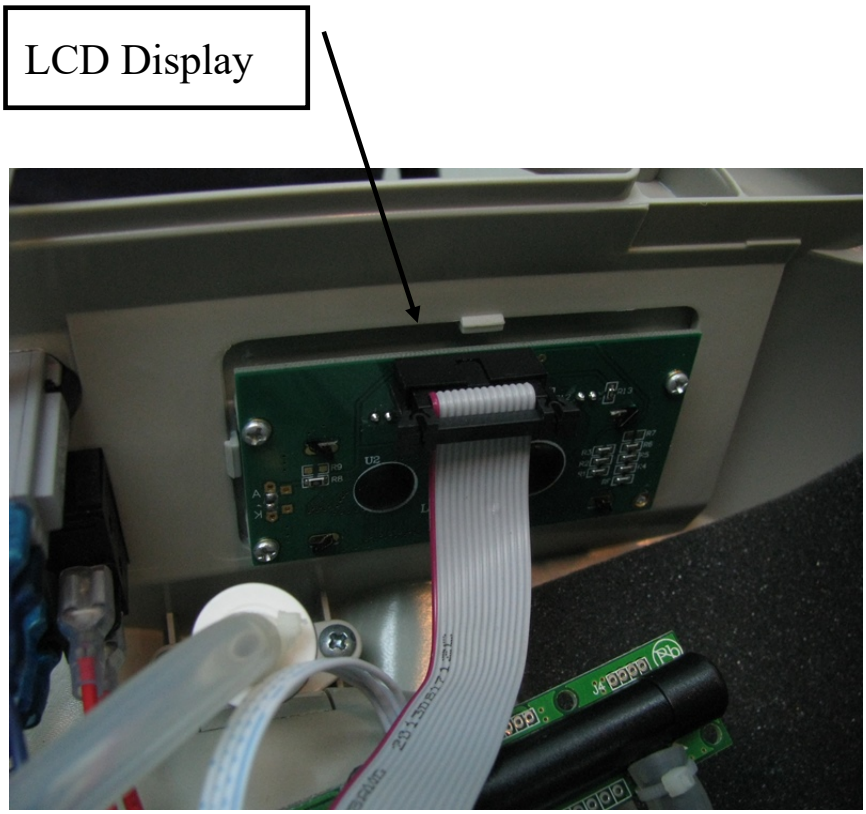
Replace Power Switch [Part 3.02.0012]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect Power Switch
5. Release the lock and take off the used Power Switch
6. Replace a new Power Switch
7. Reconnect Power Switch
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



Replace LCD Display [Part 3.02.0405]

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Disconnect LCD Display
5. Unscrew and take off the used LCD Display
6. Replace with a new LCD Display
7. Reconnect the LCD Display with the Control Board [3.02.0404]
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)



Leakage Test

1. Confirm the Power Switch is “OFF”
2. Unplug AC Plug
3. Take off Rear Cabinet (Please refer to “take off Rear Cabinet”)
4. Reconnect the AC Cord Connector with another AC Cord
5. Turn on the machine
6. Perform leakage test with soap water
7. Fix the leak point if any
8. Put on Rear Cabinet (refer to “put on Rear Cabinet”)