UltraFill Service & Technical Information

PHILIPS

RESPIRONICS

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LIMITED WARRANTY

Philips Respironics, Inc. (“Philips Respironics”) warrants the UltraFill System (the “Product”) as set forth in the following paragraphs.

Philips Respironics warrants that the UltraFill, except as otherwise stated herein, is free from defects in materials and workmanship under normal and proper use and when correctly maintained in accordance with applicable instructions, for a period of three (3) years or five thousand (5,000) hours (whichever comes first) from the date of shipment by Philips Respironics to the original purchaser (the “Warranty Period”).

Philips Respironics warrants that the cylinder and post valve, except as otherwise stated herein, is free from defects in materials and workmanship under normal and proper use and when correctly maintained in accordance with applicable instructions, for a period of three (3) years from the date of shipment by Philips Respironics to the original purchaser (the “Warranty Period”).

LIMITATIONS

If any Product purchased from Philips Respironics fails to conform to the warranties set forth herein during the Warranty Period, as determined by Philips Respironics in its sole discretion, Philips Respironics may discharge its warranty obligation by repairing or replacing the Product, in Philips Respironics’ sole discretion. This may be accomplished by installing new or remanufactured assemblies or components, or by other repairs deemed appropriate in the sole discretion of Philips Respironics. The choice of repair or replacement by Philips Respironics shall be the sole and exclusive remedy of the original purchaser. Philips Respironics reserves the right, in its sole discretion, to refund the purchase price in lieu of repair or replacement of the Product. In no event shall Philips Respironics’ maximum liability under these warranties exceed the price paid to Philips Respironics by the original purchaser for the Product.

CONDITIONS

This warranty does not cover damage or injury whether to the Product or to personal property or persons caused by accident, misuse, abuse, negligence, failure to install in accordance with Philips Respironics’ installation instructions, failure to operate under conditions of normal use and in accordance with the terms of the operating manual and instructions, failure to maintain in accordance with the applicable service manuals, or alteration or any defects not related to materials or workmanship of the Product.

This warranty does not cover damage which may occur in shipment. This warranty does not apply to any Product or individual part of a Product that may have been repaired or altered by anyone other than Philips Respironics or an authorized Philips Respironics service center. This warranty does not apply to any Product which is not purchased new.

EXCLUSIONS OF WARRANTIES

EXCEPT AS SET FORTH IN THIS LIMITED WARRANTY, RESPIRONICS MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE, REGARDING THE PRODUCT, ITS QUALITY OR PERFORMANCE. RESPIRONICS SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RESPIRONICS BE LIABLE FOR THE COST OF PROCUREMENT OF SUBSTITUTE PRODUCTS OR FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR INCIDENTAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, COMMERCIAL LOSS OR LOST REVENUES), FOR ANY CAUSE OF ACTION, WHETHER IN CONTRACT OR TORT, AND WHETHER OR NOT RESPIRONICS WAS AWARE OR SHOULD HAVE BEEN AWARE OF THE POSSIBILITY OF THESE DAMAGES. EXCEPT FOR THE OBLIGATIONS UNDER THIS LIMITED WARRANTY, RESPIRONICS SHALL NOT HAVE ANY OBLIGATION OR LIABILITY FOR ANY OTHER LOSS,

DAMAGE OR INJURY RESULTING DIRECTLY OR INDIRECTLY FROM THE PRODUCT. PURCHASER'S SOLE AND EXCLUSIVE REMEDY FOR BREACH OF THE WARRANTIES SET FORTH IN THIS DOCUMENT SHALL BE AS PROVIDED IN THE PARAGRAPH DESCRIBING LIMITATIONS.

To exercise your rights under this warranty, contact your local authorized Philips Respironics, Inc. dealer or contact Philips Respironics, Inc. at:

1001 Murry Ridge Lane
Murrysville, PA 15668

CHAPTER 1: INTRODUCTION

1.0 CHAPTER OVERVIEW

This chapter provides an introduction for the UltraFill as well as contact and service training information.

1.1 ULTRAFILL INTENDED USE

The intended use of the UltraFill System is to provide supplemental oxygen to patients and to supply pressurized oxygen to fill cylinders for the patients' personal ambulatory use. The device is not intended to be life supporting or life sustaining.

1.2 ULTRAFILL SYSTEM DESCRIPTION

The UltraFill System is comprised of an oxygen filling station, a compatible oxygen concentrator, one or more oxygen cylinders and an oxygen conserving device or regulator.

While the UltraFill is filling a cylinder, a 5-liter concentrator will provide patient flow up to a maximum of 3 lpm and fill the cylinder continuously. The UltraFill cannot be used with a 5-liter concentrator when the required patient flow is greater than 3 lpm.

1.3 SERVICE NOTICE

The UltraFill device is designed so that trained Service Technicians can perform repair and testing procedures. Trained and qualified personnel can repair this product.

1.4 SERVICE TRAINING

Philips Respironics offers service training for the UltraFill. Training includes complete disassembly of the device, troubleshooting subassemblies and components, and necessary testing. For more information, contact the Service Marketing department at:

E-mail: Respironics.service.operations@philips.com
Phone: (724) 755-8220
Fax: (724) 755-8230

1.5 SERVICE/TECHNICAL SUPPORT STATEMENT

For technical assistance, please contact Philips Respironics Customer Satisfaction.

U.S.A. and Canada
Phone:1-800-345-6443
Fax: 1-800-886-0245

International
Phone: 1-724-387-4000
Fax: 1-724-387-5012

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CHAPTER 2: WARNINGS, CAUTIONS, & NOTES

2.0 CHAPTER OVERVIEW

Warnings, cautions, and notes are used throughout this manual to identify possible safety hazards, conditions that may result in equipment or property damage, and important information that must be considered when performing service and testing procedures. Please read this chapter carefully before servicing UltraFill.

WARNING

Warnings indicate the possibility of injury to people.

CAUTION

Cautions indicate the possibility of damage to the device.

NOTE

Notes are used to emphasize a characteristic or important consideration.

2.1 WARNINGS

WARNINGS

- *If while using the system you experience any discomfort or signs of any unusual physical symptoms, contact your physician immediately.*
- *Oxygen can promote rapid burning when exposed to an open flame. Do not allow any smoking objects or open flames near this unit.*
- *Do not use any oil, grease, or petroleum-based products on or near this unit.*
- *Do not smoke while the device is in use.*
- *Protect the device against the spillage of fluids on or around it. Do not place drinks on it. Do not allow fluids to come in contact with the device.*
- *Do not set any objects on, or allow to be draped over, the UltraFill Station as they might block air flow into the device. Place the unit in a ventilated location with the sides and rear two feet away from any object.*
- *Do not allow minors or children to operate the UltraFill System. Do not allow unsupervised children to play on or near the device.*
- *To prevent an accidental tip over, do not attempt to move the UltraFill when it is connected to a cylinder.*

WARNINGS CONTINUED

- *Do not use the UltraFill System if either the plug or power cord is damaged. Do not use an extension cord with the UltraFill System.*
- *Do not connect the UltraFill System to an electrical outlet controlled by a wall switch or ground fault interrupter. Make sure there is no other high power device such as a TV, stereo, computer, radio transmitter, space heater, hair dryer, refrigerator, microwave oven, electrical range, or other large appliance connected to this outlet.*
- *Electrical shock hazard: Do not remove the cabinet of the UltraFill Station. The removal of the cabinet should only be performed by Philips Respironics, Inc. or a trained representative.*
- *Disconnect the power cord from the electrical outlet before cleaning the housing of the UltraFill Station.*
- *This equipment complies with IEC 60601-1-2 for electromagnetic compatibility for medical electrical equipment and/or systems. This standard is designed to provide reasonable protection against harmful interference in a typical medical installation. However, because of the proliferation of radio-frequency transmitting equipment and other sources of electrical noise in health care and other environments, it is possible that high levels of such interference due to close proximity or strength of a source might disrupt the performance of this device. Medical electrical equipment needs special precautions regarding EMC, and all equipment must be installed and put into service according to the EMC information specified in this manual.*
- *Take precautions to prevent electrostatic discharge (ESD). Precautionary procedures include methods to prevent buildup of electrostatic discharge (e.g., air conditioning, humidification, conductive floor coverings, and non-synthetic clothing), discharging one's body to the frame of the equipment or system or to earth or a large metal object, and bonding oneself by means of a wrist strap to the equipment or system, or to earth.*
- *All cylinders must be inspected before attempting to fill. Otherwise, injury or damage may occur.*
- *Do not fill cylinders that have not been tested in the past 5 years. Otherwise, serious personal injury may result. Contact your dealer for replacement.*
- *Never use tools of any kind to disconnect the cylinder from the UltraFill Station. Otherwise, severe injury and/or damage may occur.*
- *Do not drop oxygen cylinders. Use two hands when handling/transporting oxygen cylinders. Otherwise, injury or damage may occur.*
- *Do not use a liquid leak detector to test for leaks.*
- *Do not direct the flow of oxygen at any person or flammable material when adjusting the flow.*
- *When the pointer on the cylinder contents gauge enters the red zone, it is recommended to refill the cylinder.*
- *No oxygen is delivered between cylinder settings. To obtain desired flow, the indicating pointer must align with a specific number on the dial.*
- *To avoid injury to the patient, always confirm prescribed setting before administering to the patient.*

2.2 CAUTIONS

CAUTIONS
• *US federal law restricts this device to sale by or on the order of a physician.* • *Do not use cleaning solutions.* • *Do not immerse the cylinders in any kind of liquid.*

2.3 NOTES

NOTES
• *Additional Warnings, Cautions and Notes are located throughout this manual.* • *Refer to the UltraFill Provider Manuals for additional Warnings, Cautions and Notes.*

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CHAPTER 3: SPECIFICATIONS, CLASSIFICATIONS, & SYSTEM FEATURES

3.0 CHAPTER OVERVIEW

This chapter identifies the specifications, classifications, & system features for the UltraFill.

3.1 ULTRAFILL DEVICE SPECIFICATIONS

3.1.1 ENVIRONMENTAL SPECIFICATIONS

	Operating	*Storage*
Temperature	*54° F to 90° F (12° to 32° C)*	*-4° F to 140° F (-20 to 60 ° C)*
Relative Humidity	*20 to 90% (non-condensing)*	*15 to 95% (non-condensing)*

3.1.2 PHYSICAL SPECIFICATIONS

Height	*25.5 in (648 mm)*
Weight	*45 lb (20.4 kg)*

3.1.3 ELECTRICAL SPECIFICATIONS

Nominal Voltage	*120 VAC, 60 Hz*	*230V, 50 Hz*
Power	*110 W*	*110 W*
Amps	*1.0 at 120V*	*0.5 A at 230V*

3.1.4 STANDARDS COMPLIANCE

This device is designed to conform to the following standards:

- IEC 60601-1, 2nd edition, Medical Electrical Equipment - Part 1: General Requirements for Safety (plus national deviations)
- IEC 60601-1-2: 2001: Medical electrical equipment – Part 1-2: General requirements for safety-Collateral standard: Electromagnetic compatibility – Requirements and tests

3.1.5 IEC 60601-1 CLASSIFICATION

- Degree of Protection Against Electric Shock: Class II
- Type B Applied Part
- Protection against ingress of liquids: IPX1
- Continuous Operation

3.2 CYLINDER SPECIFICATIONS

3.2.1 ENVIRONMENTAL SPECIFICATIONS

	Operating	Storage
Temperature	41° F to 104° F (5° to 40° C)	-4° F to 130° F (-20 to 54 ° C)
Relative Humidity	0 to 90% (non-condensing)	0 to 90% (non-condensing)

3.2.2 2000 PSI AND 3000 PSI CYLINDER SPECIFICATIONS

Bonsai Model 800	Volume (L)	Fill Times	Empty Weight	Dimensions	Operating Range
2000 psi					
M4	103	45 min	2.9 lbs (1.3 kg)	3.2"D x 12.75"L (81mm x 324mm)	200 to 2000 PSIG (14 to 138 bar)
M6	148	1 hr 5 min	3.2 lbs (1.4 kg)	3.2"D x 15.55"L (81mm x 395mm)	
M9	246	1 hr 50 min	4.7 lbs (2.1 kg)	4.4"D x 14.35"L (112mm x 365mm)	
MD15	413	3 hr 5 min	6 lbs (2.7 kg)	4.4"D x 19.95"L (112mm x 507mm)	
ME24	679	5 hr	8.6 lbs (3.9 kg)	4.4"D x 28.95"L (112mm x 735mm)	
3000 psi					200 to 3000 PSIG (14 to 207 bar)
MB08	232	1 hr 45 min	3.2 lbs (1.4 kg)	3.2"D x 15.55"L (81mm x 395mm)	
MC13	354	2 hr 35 min	5 lbs (2.3 kg)	4.4"D x 14.35"L (81mm x 324mm)	
MD22	604	4 hr 25 min	6.7 lbs (3 kg)	4.4"D x 20.05"L (81mm x 324mm)	
ME36	992	7 hr 20 min	9 lbs (4.45 kg)	4.4"D x 29.05"L (81mm x 324mm)	

3.2.3 1 LITER AND 2 LITER CYLINDER SPECIFICATIONS

Cylinder Size	1 L (Regulator)	1 L (Conserver)	2 L (Regulator)	2 L (Conserver)
Pressure (Bar)	200	200	200	200
O2 Capacity	214	214	427	427
Fill Time (min)	122	122	244	244
Height (mm)	440.6	474.3	478.6	512.3
Weight (kg) - Empty	1.7	1.9	2.7	3.0
Weight (kg) - Full	2.0	2.3	3.3	3.5
Diameter (mm)	75	75	102	102

3.2.4 2000 PSI AND 3000 PSI CYLINDER USE TIMES

The pulse dose will vary on each individual's breathing patterns. The use time will vary depending on the patient's prescription, breath rate and type of conserving device being used. All use times are calculated using a setting of 2 and at a breath rate of 20-breaths per minute for pulse dose.

Philips Respironics will offer both an oxygen conserving device (CHAD Therapeutics Bonsai) and two regulators (CHAD Therapeutics 4800 and 3100) with our system package. The use times are calculated below:

		DURATION (AT BONSAI SETTINGS)							
Cylinder Type	*Volume (L)*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*2 lpm CF*
M4	*103*	*6 hr 26 min*	*3 hr 51 min*	*2 hr 45 min*	*2 hr 9 min*	*1 hr 53 min*	*1 hr 43 min*	*1 hr 27 min*	*52 min*
M6	*148*	*9 hr 15 min*	*5 hr 33 min*	*3 hr 57 min*	*3 hr 5 min*	*2 hr 43 min*	*2 hr 28 min*	*2 hr 6 min*	*1 hr 14 min*
M9	*246*	*15 hr 23 min*	*9 hr 14 min*	*6 hr 34 min*	*5 hr 8 min*	*4 hr 31 min*	*4 hr 6 min*	*3 hr 29 min*	*2 hr 3 min*
MD 15	*413*	*25 hr 48 min*	*15 hr 29 min*	*11 hr 1 min*	*8 hr 36 min*	*7 hr 34 min*	*6 hr 53 min*	*5 hr 51 min*	*3 hr 27 min*
ME 24	*679*	*42 hr 26 min*	*25 hr 28 min*	*18 hr 6 min*	*14 hr 9 min*	*12 hr 27 min*	*11 hr 19 min*	*9 hr 37 min*	*5 hr 40 min*
MB08	*232*	*14 hr 30 min*	*8 hr 42 min*	*6 hr 11 min*	*4 hr 50 min*	*4 hr 15 min*	*3 hr 52 min*	*3 hr 17 min*	*1 hr 56 min*
MC13	*354*	*22 hr 8 min*	*13 hr 17 min*	*9 hr 26 min*	*7 hr 23 min*	*6 hr 29 min*	*5 hr 54 min*	*5 hr 1 min*	*2 hr 57 min*
MD22	*604*	*37 hr 45 min*	*22 hr 39 min*	*16 hr 6 min*	*12 hr 35 min*	*11 hr 4 min*	*10 hr 4 min*	*8 hr 33 min*	*5 hr 2 min*
ME36	*992*	*62 hr*	*37 hr 12 min*	*26 hr 27 min*	*20 hr 40 min*	*18 hr 11 min*	*16 hr 32 min*	*14 hr 3 min*	*8 hr 16 min*

		Duration (CF Setting)										
Cylinder Type	Volume (L)	.5	1	2	3	4	5	6	8	10	12	15
M4	103	3 hr 26 min	1 hr 43 min	51 min	34 min	26 min	21 min	17 min	13 min	10 min	9 min	7 min
M6	148	4 hr 56 min	2 hr 28 min	1 hr 14 min	49 min	37 min	30 min	25 min	19 min	15 min	12 min	10 min
M9	246	8 hr 12 min	4 hr 6 min	2 hr 3 min	1 hr 22 min	1 hr 2 min	49 min	41 min	31 min	25 min	21 min	16 min
MD 15	413	13 hr 46 min	6 hr 53 min	3 hr 26 min	2 hr 18 min	1 hr 43 min	1 hr 23 min	1 hr 9 min	52 min	41 min	34 min	28 min
ME 24	679	22 hr 38 min	11 hr 19 min	5 hr 39 min	3 hr 46 min	2 hr 50 min	2 hr 16 min	1 hr 53 min	1 hr 25 min	1 hr 8 min	57 min	45 min
MB08	232	7 hr 44 min	3 hr 52 min	1 hr 56 min	1 hr 17 min	58 min	46 min	39 min	29 min	23 min	19 min	16 min
MC13	354	11 hr 48 min	5 hr 54 min	2 hr 57 min	1 hr 58 min	1 hr 29 min	1 hr 11 min	59 min	44 min	35 min	30 min	24 min
MD22	604	20 hr 8 min	10 hr 4 min	5 hr 2 min	3 hr 21 min	2 hr 31 min	2 hr 1 min	1 hr 41 min	1 hr 16 min	1 min	50 min	40 min
ME36	992	33 hr 4 min	16 hr 32 min	8 hr 16 min	5 hr 31 min	4 hr 8 min	3 hr 18 min	2 hr 45 min	2 hr 4 min	1 hr 39 min	1 hr 23 min	1 hr 6 min

3.2.5 1 Liter and 2 Liter Cylinder Use Times

Cylinder with Integrated Regulator			
Settings	Flow (lpm)	1 L Dur (min	2 L Dur (min)
1	0	N/A	N/A
2	0.25	813	1623
3	0.5	407	811
4	0.75	271	541
5	1	203	406
6	1.5	136	270
7	2	102	203
8	2.5	81	162
9	3	68	135
10	4	51	101
11	5	41	81
12	6	34	68

Cylinder with Integrated Conserving Device					
Mode	Knob Setting	Continuous/Pulse Setting	Delivery Amount	1 L Dur (min)	2 L Dur (min)
1	0	Pulse	0 lpm	N/A	N/A
		Continuous	0 lpm		
2	0.25	Pulse	0.25 lpm	813	1623
		Continuous	0.25 lpm		
3	0.5	Pulse	0.50 lpm	407	811
		Continuous	0.50 lpm		
4	0.75	Pulse	0.75 lpm	271	541
		Continuous	0.75 lpm		
5	1	Pulse	17 ml/breath	615	1229
	0.4	Continuous	0.40 lpm	508	1014
6	1.5	Pulse	25 ml/breath	410	819
	0.5	Continuous	0.50 lpm	407	811
7	2	Pulse	33 ml/breath	307	614
	1	Continuous	1.0 lpm	203	406
8	2.5	Pulse	41 ml/breath	246	492
	1.5	Continuous	1.50 lpm	136	270

Cylinder with Integrated Conserving Device					
9	3	Pulse	50 ml/breath	205	409
	2	Continuous	2.0 lpm	102	203
10	4	Pulse	67 ml/breath	153	306
	2.5	Continuous	2.50 lpm	81	162
11	5	Pulse	83 ml/breath	123	246
	3.5	Continuous	3.50 lpm	58	116
12	6	Pulse	6 ml/breath	100	102
	4.5	Continuous	4.50 lpm	45	90

3.3 System Features

3.3.1 Compatibility with Oxygen Devices

The UltraFill Oxygen filling station is compatible with the following devices:

Concentrators

- Philips Respironics EverFlo Stationary Oxygen Concentrator
- Philips Respironics EverFlo Q Stationary Oxygen Concentrator
- Philips Respironics Millennium M600 and M605 Series Concentrator
- Philips Respironics Millennium M10 Concentrator

Cylinders

Philips Respironics UltraFill 2000 PSI Cylinders:

- M4
- M6
- M9
- MD15
- ME24

Philips Respironics UltraFill 3000 PSI Cylinders

- MB08
- MC13
- MD22
- ME36

Philips Respironics UltraFill 200 bar Cylinders

- 1.0 L with conserver
- 1.0 L with regulator
- 2.0 L with conserver
- 2.0 L with regulator

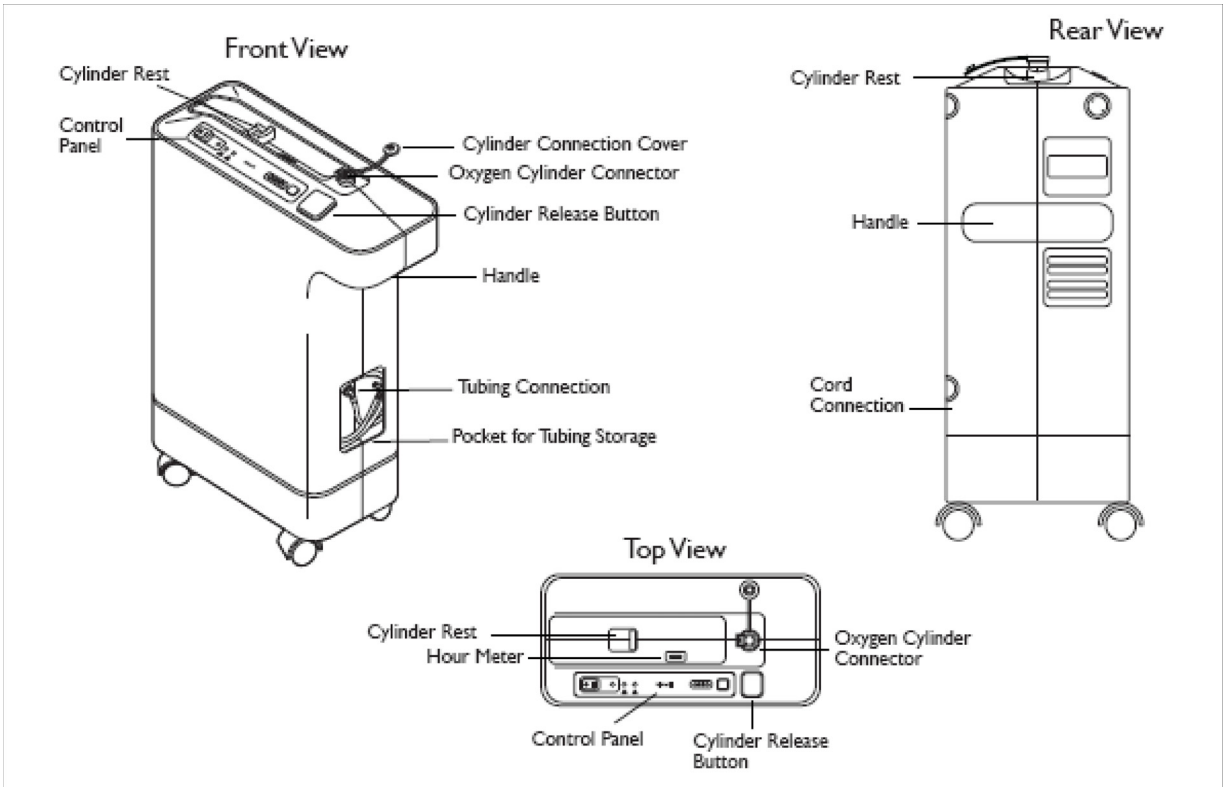
Oxygen Conserving Devices and Regulators

- CHAD Therapeutics Bonsai®
- CHAD Therapeutics 4800 Regulator
- CHAD Therapeutics 3100 Regulator
- CHAD Therapeutics 3100 Pediatric Regulator

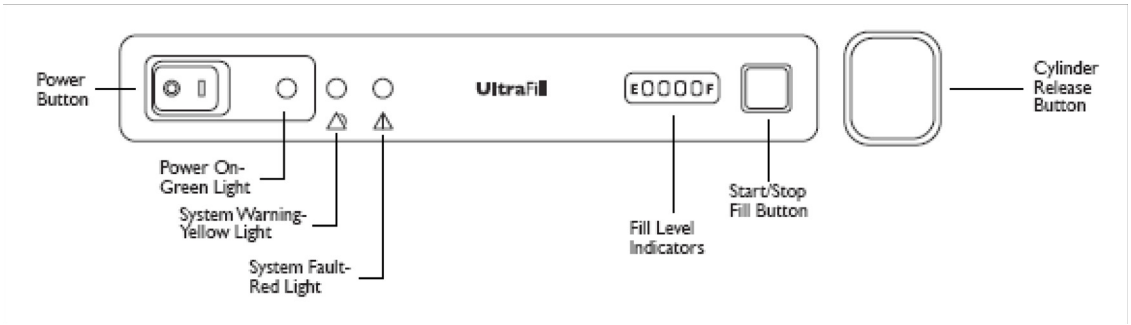
NOTE

UltraFill 2000 psi and 3000 psi cylinders are equipped to connect to any CGA-870 compatible conserving devices and regulators. It is important to ensure the conserving device or regulator has been designed, manufactured, and tested for use at the pressure rating of the cylinder. The CHAD Therapeutics 3100 Regulator and Bonsai Conserving Device offered by Philips Respironics have been designed, manufactured and tested for use on both 2000 psi and 3000 psi cylinders.

3.3.2 ULTRAFILL EXTERNAL FEATURES



3.3.3 CONTROL PANEL FEATURES



DESCRIPTION	COLOR	FUNCTION	MODES
Power Button	*Power Off - None* *Power On - Green*	*When the switch is turned so that the "I" symbol is down, the device is operational.*	*Off - The device is turned off; mains power is not connected.*
			Green light on - the device is on with no faults detected.
System Warning 	*Yellow*	*When lit, this indicates the device has detected a possible fault. The audible alarm will not shut off until the user stops the filling process and checks the deivce.*	*Off - no system issue detected.*
			Flashing yellow with periodic audible beep - the device has detected that there is a low pressure fault.
			Steady yellow - the device has detected a possible O_2 purity issue.
			Steady yellow and flashing red with a constant audible alarm - the device has detected an O_2 purity issue with the oxygen cylinder.
System Fault 	*Red*	*When lit, this indicates the device has detected a fault that requires service by the provider. The device has stopped filling and will not begin filling again until the problem is corrected.*	*Off - No system faults have been detected.*
			Steady On with Constant Audible alarm - the device has detected a problem that prevents it from operating.

DESCRIPTION	COLOR	FUNCTION	MODES
Fill Level Indicator	*Blue*	*When at least one segment is lit, it indicates that the cylinder is connected properly to the device.*	*Segment Off - A cylinder is not connected or not connected properly to the device.*
		When one segment is blinking, the cylinder is currently filling. Each solid lit segment represents 25% of the cylinder fill volume.	*On Segment Flashing - The device is currently filling the cylinder.*
		When all four segments are steadily lit, the cylinder is full and can be disconnected from the device.	*All Segments Steady On - the cylinder is full.*
Start/Stop Fill Button	*Black*	*When pressed, the device will start or stop the cylinder fill process.*	*Start - The cylinder will begin to fill if it is connected properly.*
			Stop - The cylinder will stop filling.
Cylinder Release Button	*Blue*	*When pressed, the cylinder will be disconnected from the device.*	*Connected - At least one segment from the fill level indicator will be illuminated.*
			Disconnected - No segments illuminated on the fill level indicator.

3.4 WEEE/RoHS Recycling Directives

If you are subject to the WEEE/RoHS recycling directives, refer to www.respironics.com for the passport for recycling this product and the batteries.

3.5 Disposal

When it becomes necessary, dispose of the device in accordance with local regulations.

3.6 EMC INFORMATION

3.6.1 GUIDANCE AND MANUFACTURER'S DECLARATION - ELECTROMAGNETIC EMISSIONS

This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

EMISSIONS TEST	COMPLIANCE	ELECTROMAGNETIC ENVIRONMENT - GUIDANCE
RF emissions CISPR 11	*Group 1*	*The device uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.*
RF emissions CISPR 11	*Class B*	*The device is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies building used for domestic purpose.*
Harmonic emissions IEC 61000-3-2	*NA*	*No test requirements for devices that operate at 115 VAC 60 Hz.*
Voltage fluctuations/Flicker emissions IEC 61000-3-3	*NA*	

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3.6.2 GUIDANCE AND MANUFACTURER'S DECLARATION - ELECTROMAGNETIC IMMUNITY

This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT - GUIDANCE
Electrostatic Discharge (ESD) *IEC 61000-4-2*	*±6 kV contact* *±8 kV air*	*±6 kV contact* *±8 kV air*	*Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.*
Electrical Fast Transient/Burst *IEC 61000-4-4*	*±2 kV for power supply lines*	*±2 kV for power supply mains*	*Mains power quality should be that of a typical home or hospital environment.*
Surge *IEC 61000-4-5*	*±1 kV Line to Line*	*±1 kV Line to Line*	*Mains power quality should be that of a typical home or hospital environment.*
Voltage dips, short interruptions and voltage variations on power supply input lines *IEC 61000-4-11*	*<5% U_T (>95% dip in U_T) for 0.5 cycle* *40% U_T (60% dip in U_T) for 5 cycles* *70% U_T (30% dip in U_T) for 25 cycles* *<5% U_T (>95% dip in U_T) for 5 sec*	*<5% U_T (>95% dip in U_T) for 0.5 cycle* *40% U_T (60% dip in U_T) for 5 cycles* *70% U_T (30% dip in U_T) for 25 cycles* *<5% U_T (>95% dip in U_T) for 5 sec*	*Mains power quality should be that of a typical home or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery.*
Power frequency (50/60 Hz) magnetic field *IEC 61000-4-8*	*3 A/m*	*3 A/m*	*Power frequency magnetic fields should be at levels characteristic of a typical home or hospital environment.*
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

3.6.3 GUIDANCE AND MANUFACTURER'S DECLARATION - ELECTROMAGNETIC IMMUNITY

This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL (FDA)	ELECTROMAGNETIC ENVIRONMENT - GUIDANCE
			Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. *Recommended separation distance:*
Conducted RF *IEC 61000-4-6*	*3 Vrms* *150 kHz to 80 MHz*	*3 V*	$d = 1.2\sqrt{P}$ *150 kHz to 80 MHz*
Radiated RF *IEC 61000-4-3*	*3 V/m* *80 MHz to 2.5 GHz*	*3 V/m*	$d = 1.2\sqrt{P}$ *80 MHz to 800 MHz* $d = 2.3\sqrt{P}$ *800 MHz to 2.5 GHz* *where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).* *Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b].* *Interference may occur in the vicinity of equipment marked with the following symbol:* 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the device.

b Over the frequency range 150 kHz to 80 MHz, the field strengths should be less than 3 V/m.

3.6.4 RECOMMENDED SEPARATION DISTANCES BETWEEN PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT

The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and this device as recommended below, according to the maximum output power of the communications equipment.

RATED MAXIMUM POWER OUTPUT OF TRANSMITTER (W)	SEPARATION DISTANCE ACCORDING TO FREQUENCY OF TRANSMITTER (M)		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	*80 MHz to 800 MHz* $d = 1.2\sqrt{P}$	*800 MHz to 2.5 GHz* $d = 2.3\sqrt{P}$
0.01	*0.12*	*0.12*	*0.23*
0.1	*0.38*	*0.38*	*0.73*
1	*1.2*	*1.2*	*2.3*
10	*3.8*	*3.8*	*7.3*
100	*12*	*12*	*23*

*For transmitters rated at a maximum output power not listed above, the recommended separation distance **d** in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.*

***Note 1:** At 80 MHz and 800 MHz, the seperation distance for the higher frequency range applies.*
***Note 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.*

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CHAPTER 4: THEORY OF OPERATION

4.0 CHAPTER OVERVIEW

This chapter describes the theory of operation for the UltraFill device.

4.0.1 SYSTEM DESCRIPTION

The UltraFill device fills Philips Respironics oxygen cylinders with gaseous oxygen supplied from an oxygen concentrator.

The UltraFill device is attached to a concentrator via a pneumatic tube. Acceptable concentrators are: EverFlo and Millennium M5 & M10.

The UltraFill device monitors incoming O_2 pressure and will alarm if the pressure is too low. (below about 7 psi)

The UltraFill device also monitors oxygen purity. Instantaneous purity and average cylinder purity are tracked. If the instantaneous purity goes below 90% the yellow light will illuminate. If the average purity in the cylinder goes below 90% the audible alarm will start and the red light will blink.

The UltraFill device detects when a cylinder is connected via an electromechanical switch. When a cylinder is attached, at least one of the blue lights will illuminate steady. To start filling, the user presses the start/stop switch.

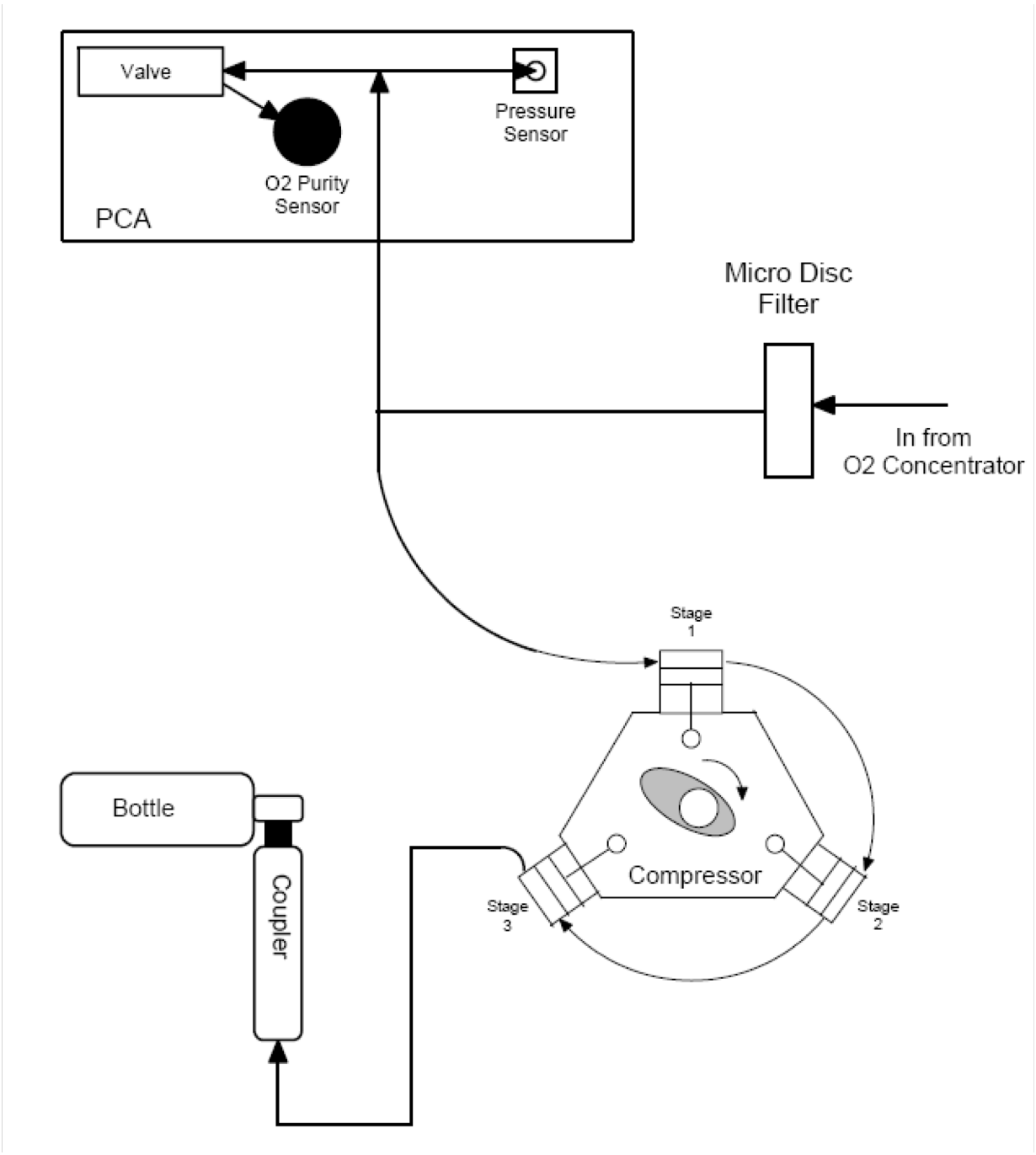
As the cylinder is filling the left most blue light will blink. The approximate percentage of fill is indicated by the number of lights illuminated. When the cylinder is full all lights will be illuminated steady. The start/stop switch can be pressed to stop filling at any time. The user can also disconnect the cylinder without pressing the start/stop switch.

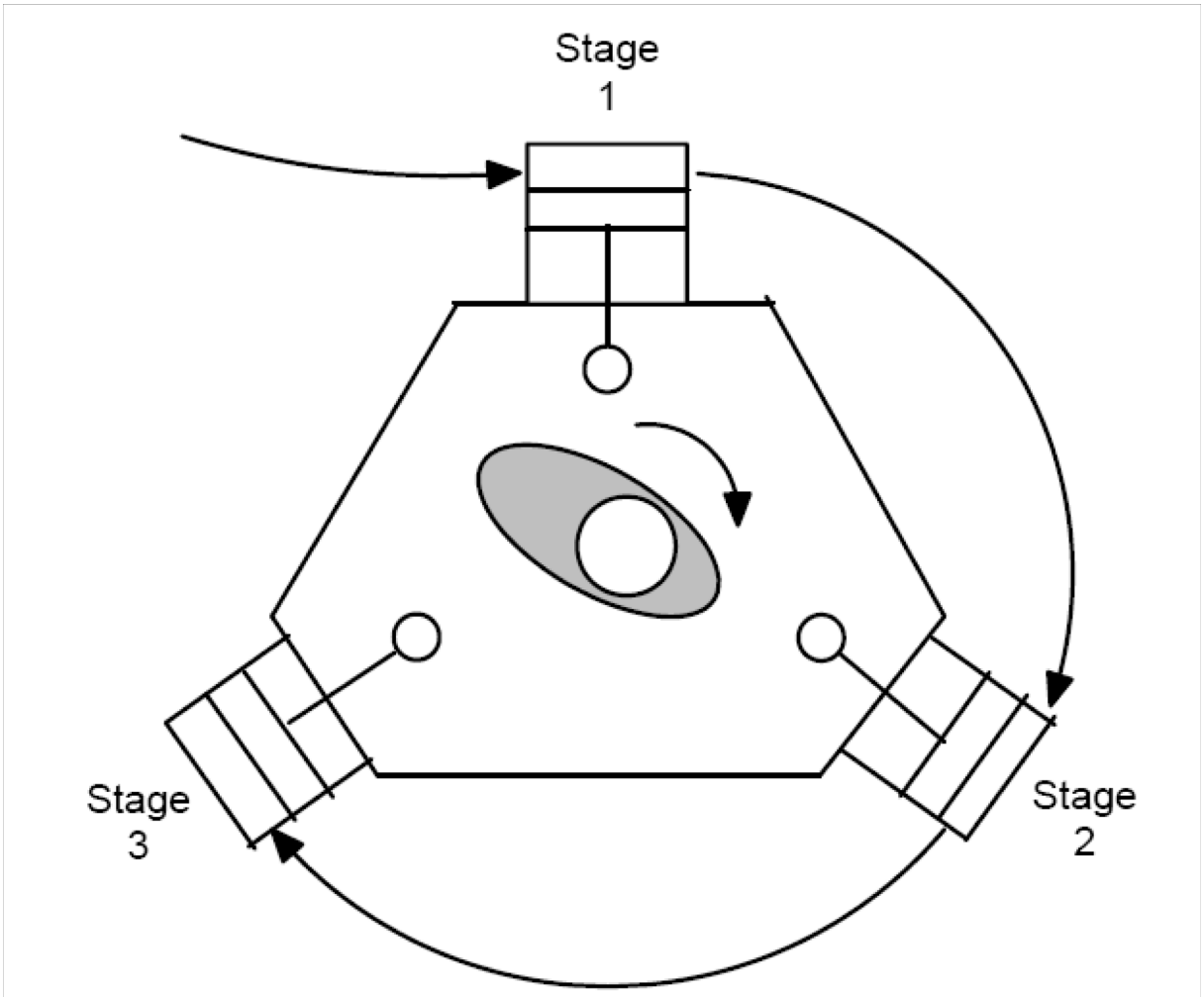
The cylinder fill pressure can be either 2000 psi or 3000 psi, which is detected by two Hall effect sensors on the fill connector. Hall effect sensors are transducers that vary output voltage in response to changes in magnetic fields. Hall sensors are used for proximity switching and positioning applications. The 3000 psi cylinder valve has a magnet which triggers the Hall effect sensors. Without a magnet signal, the UltraFill will stop filling at 2000 psi.

The UltraFill device has an internal burst disc to prevent overpressure of the system. The cylinder valve also has a burst disc. The burst disc rating for 2000 psi cylinders is 3204 – 3560 psi. The burst disc rating for UltraFill and the 3000 psi cylinder is 4500 – 5000 psi.

The UltraFill device will only connect to Philips Respironics cylinders. These cylinders must be properly labeled to indicate oxygen is supplied by an oxygen concentrator.

4.0.2 ULTRAFILL PNEUMATIC DIAGRAM





- The 3 stage high pressure compressor driven by a gear motor.
- The compressor turns at about 22 rpm
- Camshaft pushes each of the 3 cylinders outward
- Cylinders retract from pressure supplied at the cylinder inlet
- First stage of the compressor compresses oxygen to about 200 psi
- Second stage compresses to about 1000 psi
- Third stage compresses to 2000 psi or 3000 psi depending the type of cylinder attached

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CHAPTER 5: SYSTEM SETUP

NOTE
Please refer to the appropriate Provider and/or User Manual for additional information.

5.0 CHAPTER OVERVIEW

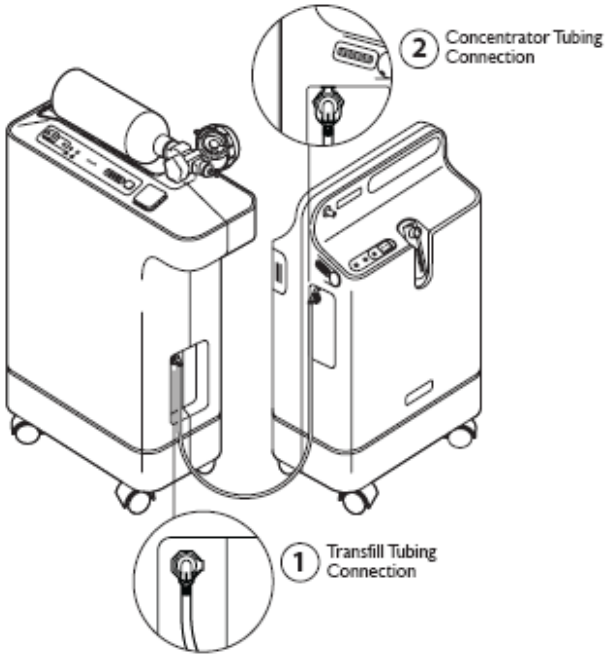
This chapter provides information regarding setup and operation of the UltraFill device as needed for servicing, repairing, and testing of the device.

5.1 INITIAL SETUP

1. Place the UltraFill system in an appropriate area (see the Specification section of this manual).
2. Place the UltraFill in a room with adequate ventilation. The sides and rear of the device must be at least 24 inches away from any object.
3. Plug the UltraFill in to a standard 120V outlet. Do not connect the UltraFill System to an electrical outlet controlled by a wall switch or ground fault interrupter. Make sure that no other high power device such as a TV, stereo, computer, refrigerator, microwave oven, electrical range, or other large appliance is connected to this outlet.

5.2 CONNECTING THE ULTRAFILL TO AN OXYGEN CONCENTRATOR

1. Ensure that one end of the tubing is connected to the transfill outlet connection.
2. Connect the other end of the tubing to the concentrator outlet connection.



5.3 EXAMINING THE CYLINDER

Before using and/or filling the Cylinder:

1. Examine the outside of the cylinder for the following:
   - Dents or Dings
   - Oil or Grease
   - Any other signs that may cause the cylinders to be unsafe for use
2. Check the cylinder for fire or thermal damage.
3. Examine the cylinder fill connector for:
   - Debris, oil, or grease
   - Noticeable signs of damage
   - Signs of excessive heat or fire damage
   - Signs of corrosion inside the valve

If any of the above conditions exist, do not use the cylinder for testing of the device.

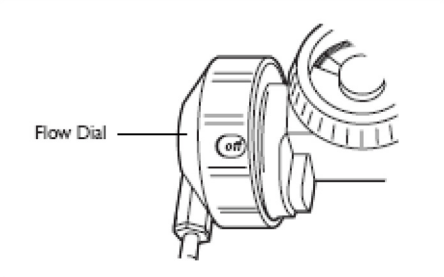
5.4 CONNECTING THE CYLINDER

1. Make sure the UltraFill is plugged in and the concentrator is turned on.

NOTE
Allow the concentrator to warm up for 5 minutes prior to filling a cylinder.

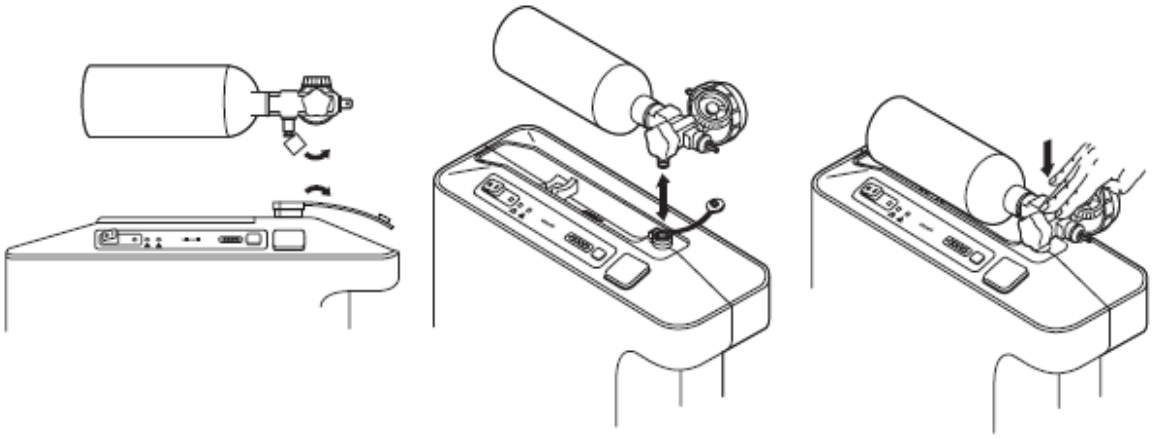
2. Press the power button to turn on the UltraFill. The green, yellow, and red level indicator lights will flash and the system will beep. Then the yellow and red level indicators will turn off and the green level indicator light will be solid.
3. Check to see that the OCD or regulator is set to “OFF”.

NOTE
If filling the cylinder without an OCD or regulator attached, close the cylinder valve to ensure the cylinder fills properly



4. Remove the protective caps from the oxygen cylinder connector and the cylinder fill connector (if necessary).

5. Line up and place the cylinder fill connector inside the oxygen cylinder connector.
6. Lightly push the cylinder in to the oxygen cylinder connector.



5.5 Filling a Cylinder

Once the cylinder is properly connected, you can begin filling it.

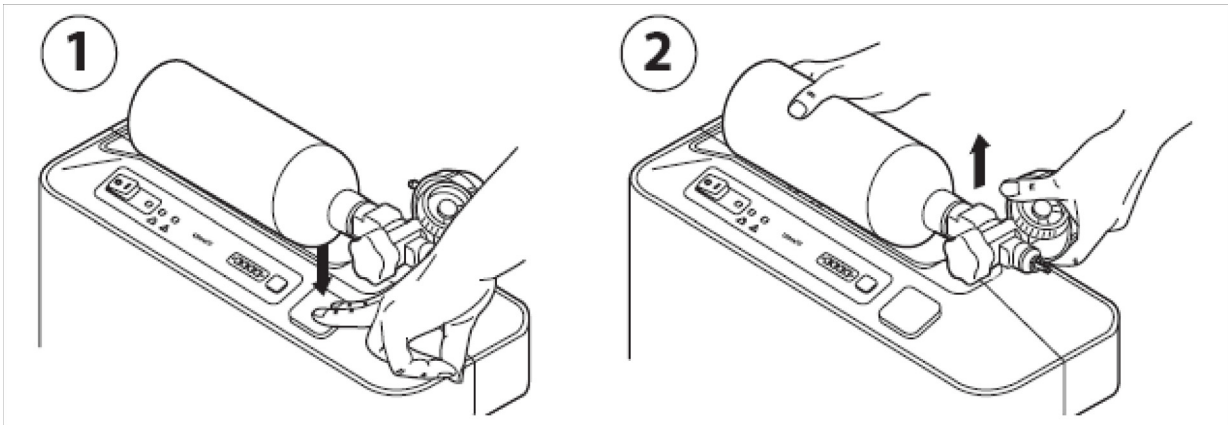
1. Press the stop/start button.
2. As the oxygen cylinder fills, the level indicators on the UltraFill will illuminate. The first level indicator blinks while the oxygen cylinder is filling, then turns solid when the device is 25% full. As the oxygen cylinder continues to fill, each level indicator will blink, then illuminate.
3. When the cylinder is full, all level indicators will be solid. The UltraFill will automatically turn off and the cylinder can be disconnected.

NOTE

If the yellow LED is let continuously and the red LED is flashing with a constant audible alarm, the O_2 purity in the cylinder has dropped below 90%. Remove and empty the cylinder. Wait five minutes and start the filling process again.

5.6 DISCONNECTING A CYLINDER

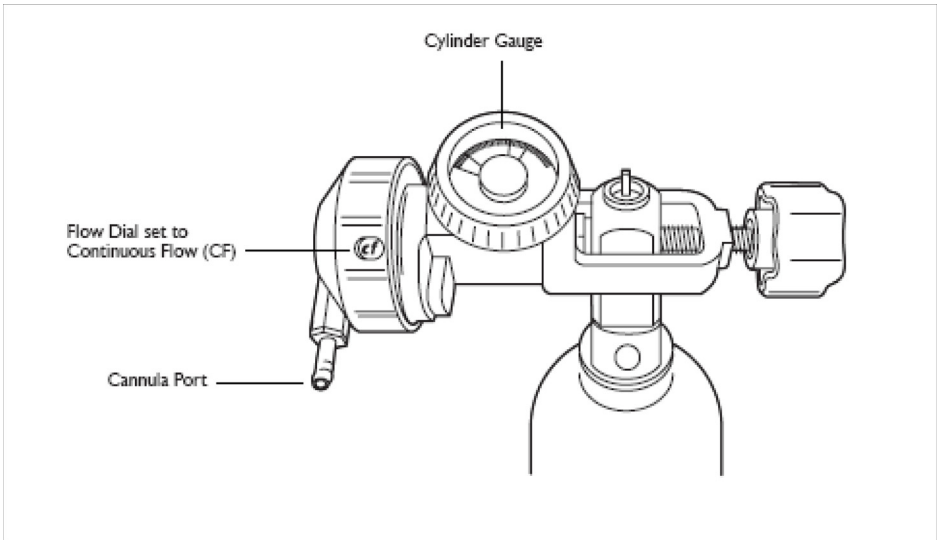
1. Press the cylinder release button on the control panel. The cylinder will disconnect and the fill level indicators will turn off.
2. Remove the cylinder from the oxygen cylinder connector.



5.7 EMPTYING A CYLINDER

If the O_2 purity in the cylinder has dropped below 90%, the cylinder will need to be emptied.

To empty your O_2 cylinder, first ensure that the shut-off valve is fully in the Open position. Then adjust your conserving device or regulator to the highest continuous flow setting and wait for it to empty. After the cylinder has been emptied, it can be refilled again. (Please see the section on Filling a Cylinder).



CHAPTER 6: TROUBLESHOOTING & ALARMS

6.0 CHAPTER OVERVIEW

This chapter identifies the alarms associated with the UltraFill System. This chapter should be used to help service technicians diagnose problems with the UltraFill device, along with determining what parts, if any, need to be replaced.

6.1 ULTRAFILL TROUBLESHOOTING TABLE

PROBLEM	POSSIBLE CAUSE	REQUIRED ACTION
Power switch is on but no LED's are illuminated	*Device is not plugged in or there is a power failure*	*Check the power outlet and verify that the device is plugged in.*
Cylinder is connected but no blue LED's are illuminated	*Cylinder is not fully connected.*	*Press cylinder disconnect button and remove cylinder. Verify there is no obstruction to cylinder fill connection. Retry connecting cylinder with firm downward force. DO NOT LUBRICATE CYLINDER FITTING WITH OIL OR GREASE.*
Cylinder is connected, at least one blue LED is illuminated, but fill will not start	*Cylinder is not fully connected. Internal part failure*	*Press the cylinder disconnect button and remove the cylinder. Verify there is no obstruction to the cylinder fill connection. Retry connecting the cylinder with firm downward force. DO NOT LUBRICATE CYLINDER FITTING WITH OIL OR GREASE.*
Yellow LED is blinking with periodic beep.	*Low oxygen pressure. Cylinder regulator or conserver may not be in the OFF position*	*Press the stop button. Verify that the oxygen concentrator and UltraFill are connected properly. Check for kinked or obstructed tubing. Verify that the cylinder regulator or conserver is in the OFF position.*
Yellow LED is illuminated	*The UltraFill device has detected low oxygen purity*	*Press the stop button. Check the flowmeter on the concentrator and verify the flow is $\leq$ 3 LPM (%L concentrator) or $\leq$ 7 LPM (10L concentrator). Wait 5 minutes and press the start button.*
Yellow LED is illuminated, Red LED is blinking and the audible alarm is sounding continuously	*Average O_2 purity in the cylinder is below 90%*	*Press the stop button. Disconnect the cylinder from the device and empty it. Do not use the cylinder. Check the flowmeter on the concentrator and verify the flow is $\leq$ 3 LPM (5L concentrator) or $\leq$ 7 LPM (10L concentrator). Wait 5 minutes. Attach a new cylinder and press the start button.*
Red LED is illuminated and the audible alarm is sounding continuously	*The device has detected a system malfunction*	*Turn off the device and wait 5 minutes. Restart the device.*

PROBLEM	POSSIBLE CAUSE	REQUIRED ACTION
One blue LED is flashing but the cylinder pressure is not increasing	*Internal Part Failure. Cylinder valve may be open. (Only applicable if the OCD/Regulator is not attached).*	*Press the cylinder disconnect button and remove the cylinder. Verify there is no obstruction to the cylinder fill connection. DO NOT LUBRICATE CYLINDER FITTING WITH OIL OR GREASE.* *If the OCD/Regulator is not attached to the cylinder, check to make sure the cylinder valve is closed.* *Reconnect the cylinder.* *Press the start button.*

CHAPTER 7: MAINTENANCE

7.0 CHAPTER OVERVIEW

This chapter describes the Maintenance intervals and procedures for the UltraFill System.

7.1 ROUTINE MAINTENANCE

Routine maintenance involves periodic checking, cleaning, and or replacing the following item as necessary:

- Micro-disk Filter

7.2 UltraFill Maintenance Record

MODEL NUMBER	SERIAL NUMBER

DATE PURCHASED	RUN TIME METER

MICRO-DISK FILTER / DATE REPLACED

7.3 Cleaning and Transporting Procedures

7.3.1 Cleaning

WARNING

Disconnect the power cord from the electrical outlet before cleaning the housing of the UltraFill Station.

WARNING

Do not use any oil, grease, or petroleum-based product on or near this unit.

The outer housing of the UltraFill Station may be cleaned with a mild household detergent and a damp cloth or sponge. Avoid using large quantities of water to clean the unit and do not use any petroleum-based solvents or cleaning agents.

Wipe the device completely dry after you have finished cleaning it.

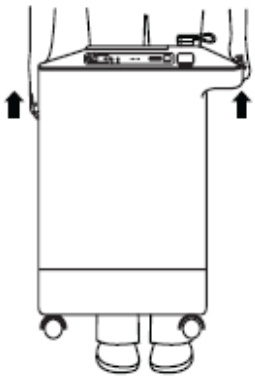
7.3.2 Transporting the System

WARNING

To prevent an accidental tip over, do not attempt to move the UltraFill when it is connected to a cylinder.

During operation, the device is should be upright with the all four wheels contacting the floor.

Use the handles on either side of the UltraFill device to lift it (see illustration). The device can be transported in any orientation. Verify the protective cap is covering the oxygen cylinder connector before transport.



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CHAPTER 8: REPAIR & REPLACEMENT

8.0 OVERVIEW

This chapter illustrates the replaceable components for the UltraFill device. Procedures for replacing the components are also provided in this chapter.

NOTE

Refer to the Testing Section for required testing after component replacement.

NOTE

Refer to the Repair Kits Section for proper repair kit identification.

WARNING

- *The UltraFill device contains parts that are classified as O2 clean materials. These materials should be replaced using clean latex or nitrile gloves, in an environment that is free of oil, grease, or dust. The kits identified as O2 clean are pre-cleaned to the ASTM G-93, level C, level 500 standard, before being packaged. For your safety and to insure the proper function of the device, we strongly suggest that the repair environment is designed and maintained to preserve that level of cleanliness. For more details about maintaining levels of cleanliness during assembly refer to section 13 of ASTM G-93.*
- *To prevent electrical shock, disconnect the electrical supply before attempting to make any repairs to the UltraFill device*
- *Use extreme caution when handling the Capacitor. The Capacitor can hold a substantial electrical charge until it is properly discharged.*
- *Even with the unit disconnected from the electrical supply, the Capacitor may still hold an electrical charge strong enough to cause serious bodily injury. DO NOT touch the capacitor terminals simultaneously until the Capacitor has been completely discharged. Discharge the Capacitor by shorting the two posts with an insulated screw driver.*

CAUTION

- *Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.*
- *During all repair and replacement procedures, ensure that any connections that are broken during the process ((fittings, tubing, and hoses) are reconnected securely).*
- *When using a leak detector, be careful that it does not come in contact with any electrical components.*
- *The fuse on the Main PCA, must be replaced with the fuse called out in the Repair Kits Section of this Service Manual. Failure to do so will result in damage to the unit.*

8.1 CASTER REPLACEMENT

Removal

1. Pull the Caster out of either Cabinet.

Install

1. Push the Caster into the hole on either Cabinet.

8.2 REAR CABINET/POWER CORD/SUPPORT POST/CYLINDER HOLDER REPLACEMENT

Removal

1. Remove the six 5/16” Hex Head Screws that secure the Rear Cabinet to the Front Cabinet.
2. Remove the Cabinet Support Post from the Rear Cabinet.
3. Remove the Cylinder Holder from the Cabinet.
4. Using Slip Joint Pliers remove the Strain Relief from the Rear Cabinet.
5. Remove the Power Cord Connection from locations J1 and J2 on the Main PCA.
6. Remove the Power Cord from the device.

Install

1. Thread the Power Cord through the hole in the Rear Cabinet, leaving approximately 40” of cord inside the Cabinet. The Power Cord should be threaded around the compressor, see Figure 8-2 for correct placement.

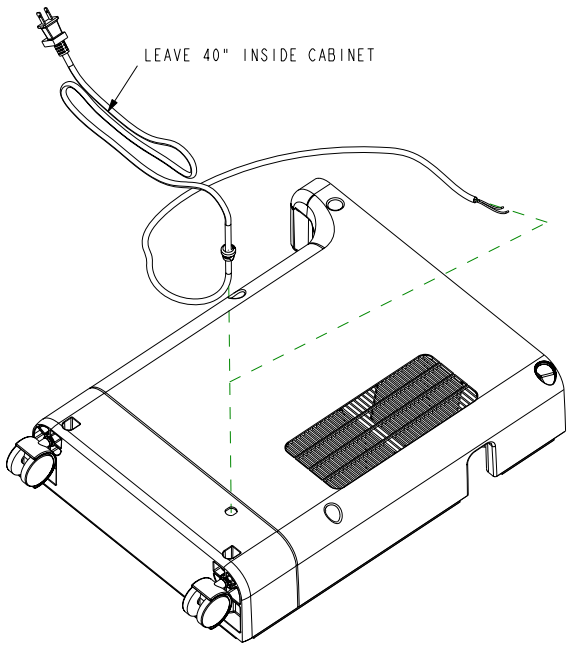

FIGURE 8-1 POWER CORD

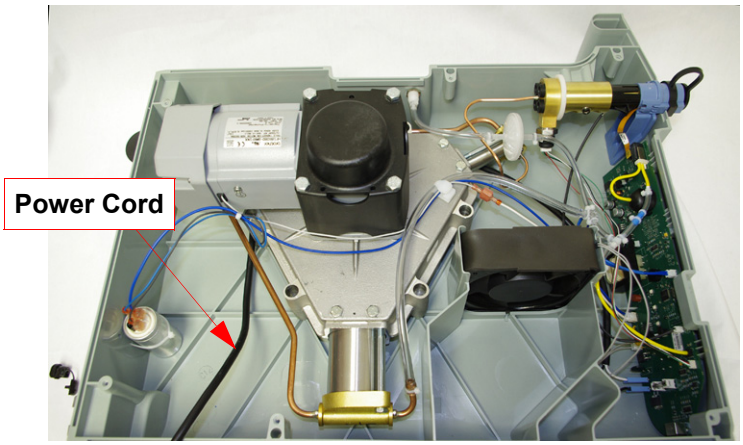

FIGURE 8-2 POWER CORD PLACEMENT

2. Connect the Power Cord to locations J1 (white wire) and J2 (black wire) on the Main PCA. Refer to Figure 8-12 for Main PCA details.
3. Place the Strain Relief around the Power Cord and push into the Cabinet hole.
4. Place the Cylinder Holder into place on top of the Cabinet.

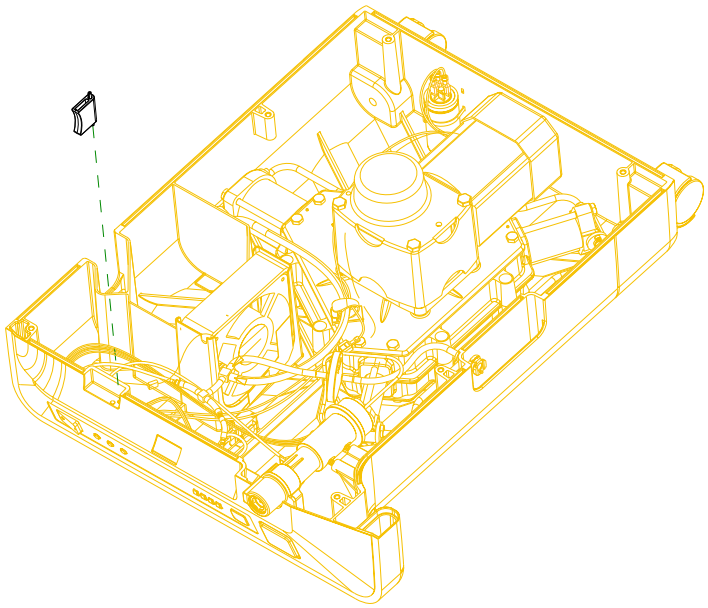

FIGURE 8-3 CYLINDER HOLDER PLACEMENT

5. Place the Cabinet Support Post into the Rear Cabinet.
6. Place the Rear Cabinet onto the Front Cabinet.
7. Tighten the six Hex Head Screws to 45 in-lbs to secure the cabinets together.

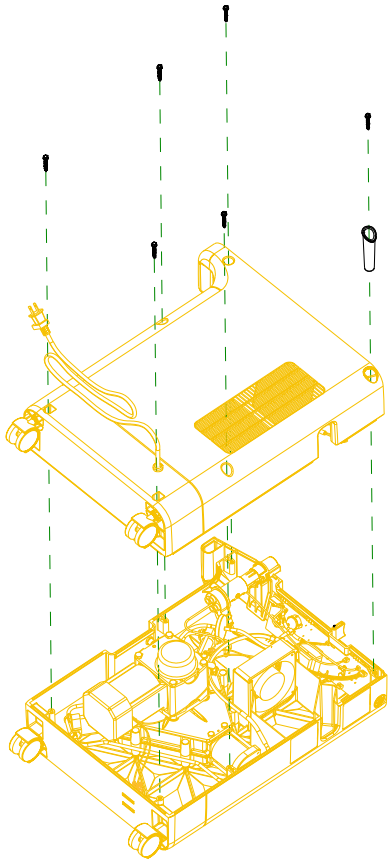

FIGURE 8-4 CABINET HEX SCREW PLACEMENT

8.3 VALVE ASSEMBLY REPLACEMENT

WARNING

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Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the Ribbon from location J7 on the Main PCA. Refer to Figure 8-12 for Main PCA details.
3. Remove the Pressure Sensor from location J6 on the Main PCA.
4. Remove the Switch Cable from location J5 on the Main PCA.
5. Remove the two 7/64” Allen screws from the 3rd stage cylinder and remove the tube flange from the cylinder. Refer to Figure 8-6.
6. Remove the two 5/16” Hex Head screws from Valve body. Refer to Figure 8-5.
7. Remove the Standoffs from the device.
8. Remove the Cylinder Cover from the Valve.
9. Remove the Valve Assembly from the device.
10. Remove the High Pressure Sensor from the coupler and place in a secure location.

Install

1. Install the High Pressure Sensor to the Valve Assembly and tighten to 70 in-lbs.
2. Place the Valve Assembly into the Front Cabinet.
3. Place the Cylinder Cover onto the Valve.
4. Place the Standoffs in the Valve Body.
5. Install the two Hex Head screws and secure the Valve Body to the Front Cabinet.
6. Ensure the o-ring is present on flange.
7. Install the two Allen Screws and secure the 3rd Stage Cylinder to the Tube Flange by tightening to 16 in-lbs. Refer to Figure 8-6.
8. Connect the Switch Cable (black) to location J5 on the Main PCA. Refer to Figure 8-12 for Main PCA details.
9. Connect the Pressure Sensor to location J6 on the Main PCA.
10. Connect the Ribbon Cable to location J7 on the Main PCA.
11. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

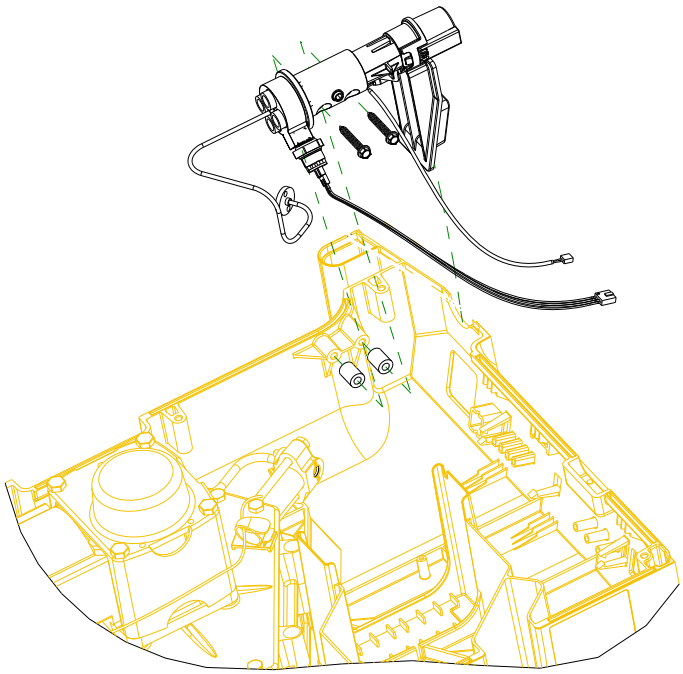

FIGURE 8-5 VALVE ASSEMBLY

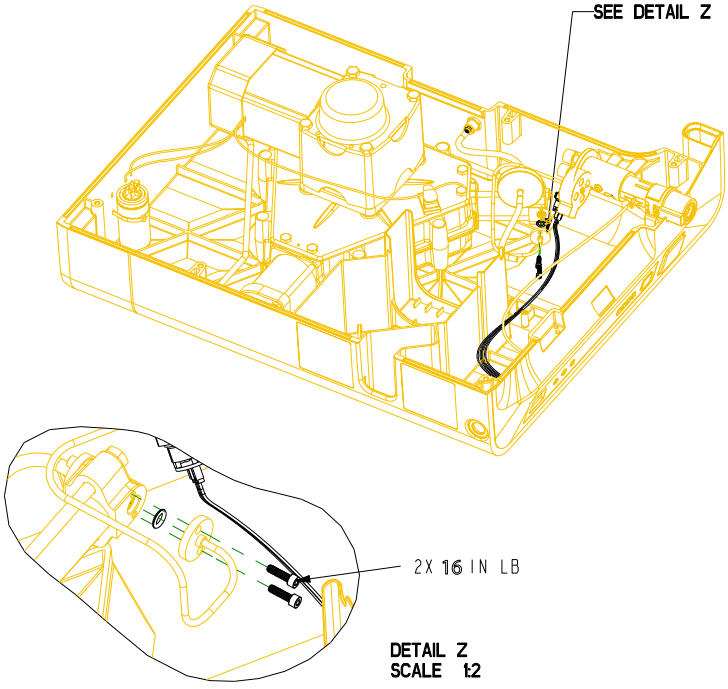

FIGURE 8-6 3RD STAGE CYLINDER DETAIL

8.4 MICRO DISK FILTER REPLACEMENT

Removal

1. Remove the Rear Cover. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Cut the Tie wrap securing the one piece of tubing from the Inlet O_2 Quick Connect. Refer to Figure 8-7.
3. Remove the tubing from the Inlet O_2 Quick Connect.
4. Cut the Tie wrap securing the second piece of tubing from the Tee Adaptor.
5. Remove the Micro Disk Assembly from the device.

Install

1. Connect the one piece of tubing the Inlet O_2 Quick Connect.
2. Connect the other piece of tubing to the Tee Adaptor.
3. Secure both piece of tubing with a Tie Wrap.
4. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

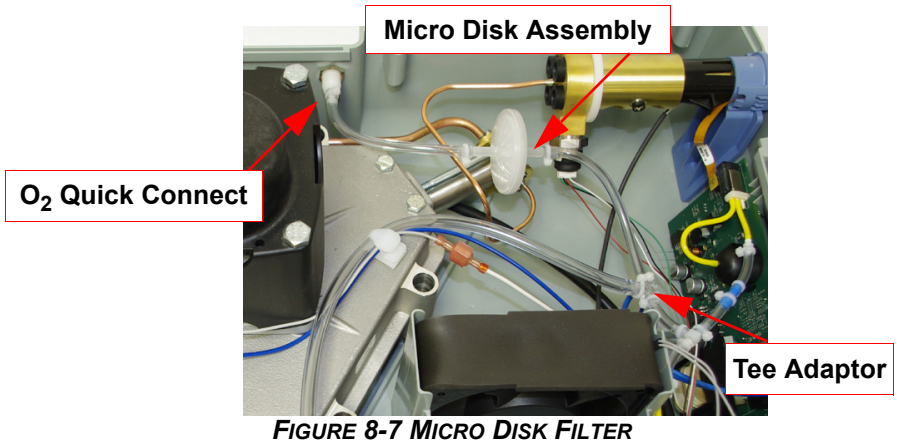

FIGURE 8-7 MICRO DISK FILTER

8.5 INLET O_2 QUICK CONNECT REPLACEMENT

Removal

1. Cut the Tie Wrap securing the Inlet Filter tubing to the Inlet O_2 Quick Connect.
2. Remove the Tubing from the Inlet O_2 Quick Connect.
3. Loosen and remove the locking nut securing the Inlet O_2 Quick Connect to the Front Cabinet.
4. Remove the Inlet O_2 Quick Connect from the device.

Install

1. Place the Inlet O_2 Quick Connect into the Front Cabinet.
2. Using the locking nut, secure the Inlet O_2 Quick Connect to the Front Cabinet by tightening to 7.5 in-lbs.
3. Place the Inlet Filter tubing on the Inlet O_2 Quick Connect and secure with a Tie Wrap.
4. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

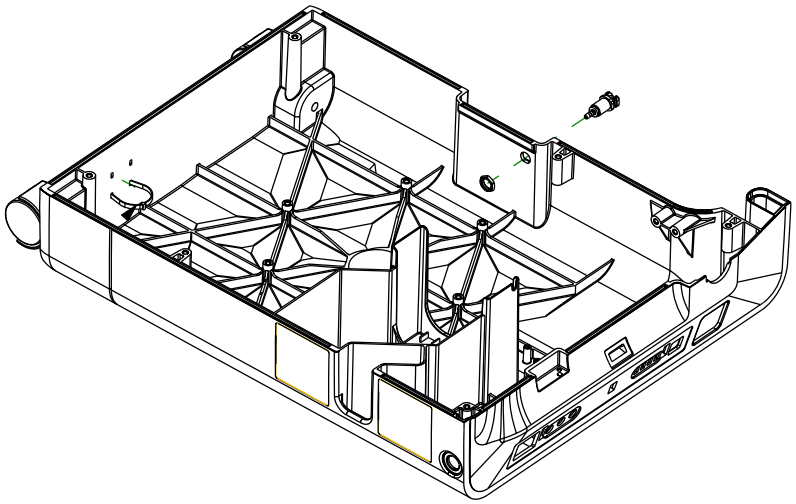

FIGURE 8-8 O_2 QUICK CONNECT

8.6 TUBING REPLACEMENT

Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the yellow tubing from the middle port on the three way valve.

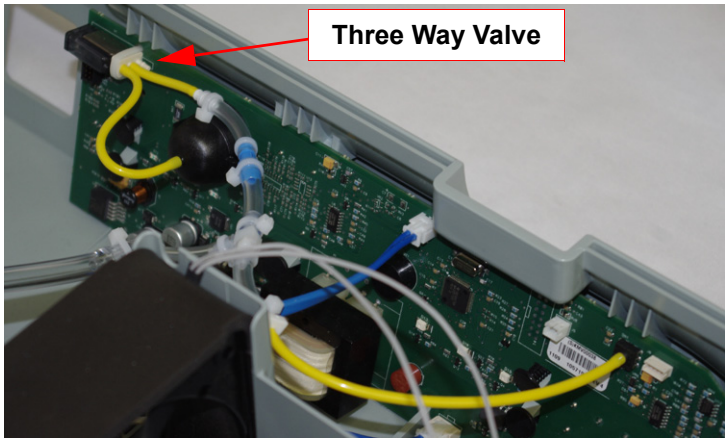

FIGURE 8-9 THREE WAY VALVE

3. Remove the other piece of yellow tubing from location SN1 on the Main PCA.
4. Cut the tie wraps securing tubing to any Cabling.
5. Remove the long piece of clear tubing from the 1st Stage Cylinder Inlet. Refer to Figure 8-19.
6. Remove the tubing from the Tee Adaptor going to the Micro Disk Filter. Refer to Figure 8-7.

Install

1. Connect the tubing from the Micro Disk Filter to the Tee Adaptor. Refer to Figure 8-7.
2. Connect the long piece of clear tubing to the 1st Stage Cylinder Inlet. Refer to Figure 8-19.
3. Connect the yellow tubing to location SN1 on the Main PCA. Refer to Figure 8-12 for Main PCA details.
4. Connect the other piece of yellow tubing to the middle port of the three way valve on the Main PCA.
5. Replace any tie wraps that were cut during removal.
6. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

8.7 FAN REPLACEMENT

Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the Fan Connection from location J3 on the Main PCA.
3. Lift the Fan up and out of the Front Cabinet.

Install

1. Place the Fan in the Front Cabinet ensuring that the cable is routed through the channel. The metal brace should face the Valve Assembly.
2. Connect the Fan to location J3 on the Main PCA. Refer to Figure 8-12 for Main PCA details.
3. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

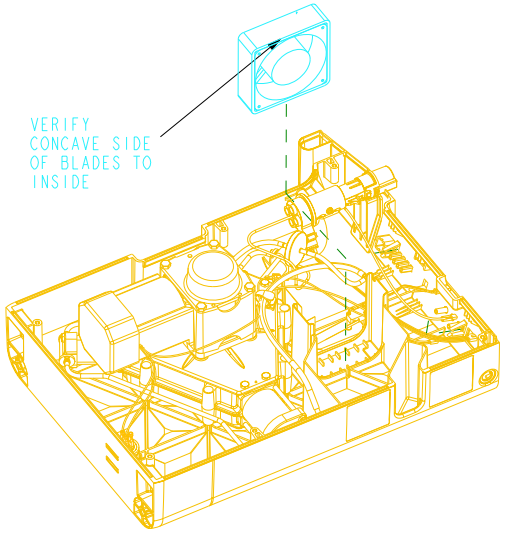

FIGURE 8-10 FAN PLACEMENT

8.8 FAN SWITCH REPLACEMENT

Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the Fan Switch Cable from location J8 on the Main PCA.
3. Remove two Phillips head screws that secure the Fan Switch to the Front Cabinet.
4. Remove the Fan Switch from the device.

Install

1. Place the Fan Switch into the Front Cabinet.
2. Secure the Fan Switch to the Front Cabinet by tightening the two Phillips screws to 8 in-lbs.
3. Connect the Fan Switch Cable to location J8 on the Main PCA. Refer to Figure 8-12 for Main PCA details.
4. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

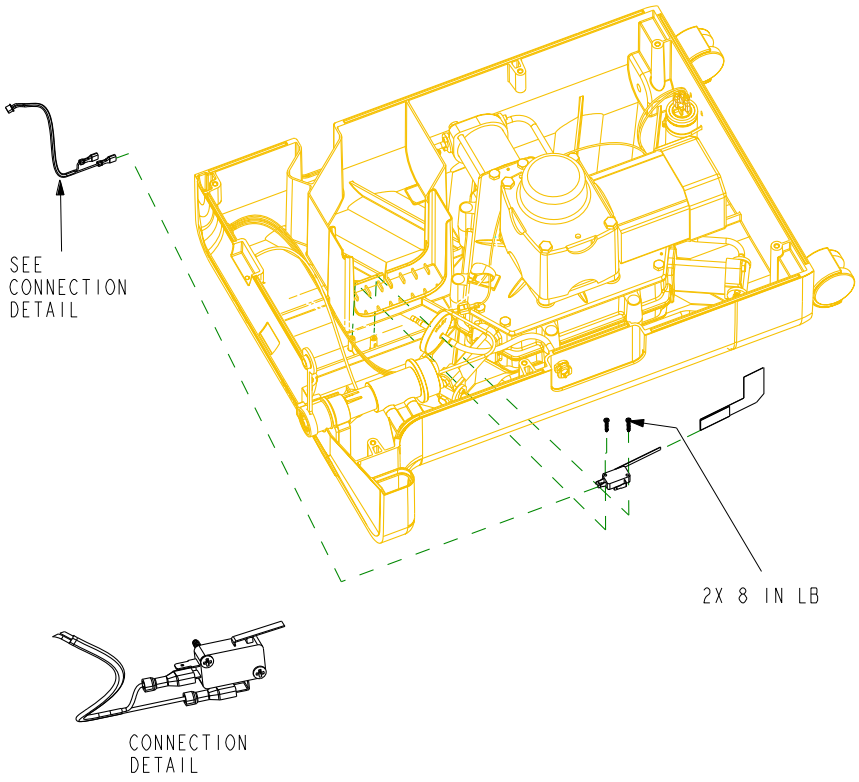

FIGURE 8-11 FAN SWITCH DETAIL

8.9 PCA REPLACEMENT

WARNING

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Removal

1. Remove the Rear Cabinet. Refer to the Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the electrical connections from locations J7, J8, J5, J6, J2, J1, J3, J4.

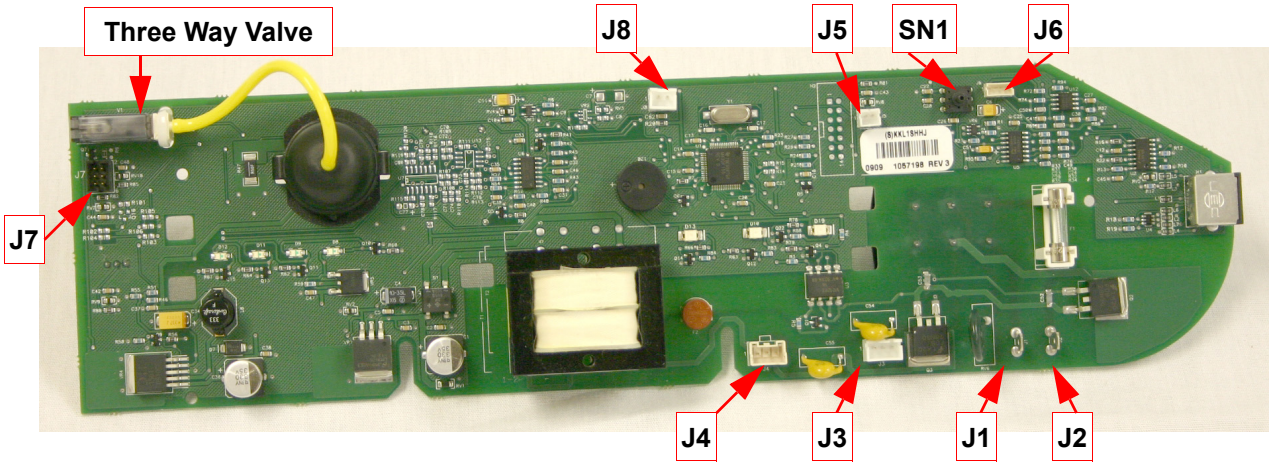

FIGURE 8-12 MAIN PCA

3. Remove the yellow tubing from SN1 and yellow tubing from the three way valve middle port.
4. Remove the five retaining plugs from the PCA mounts.

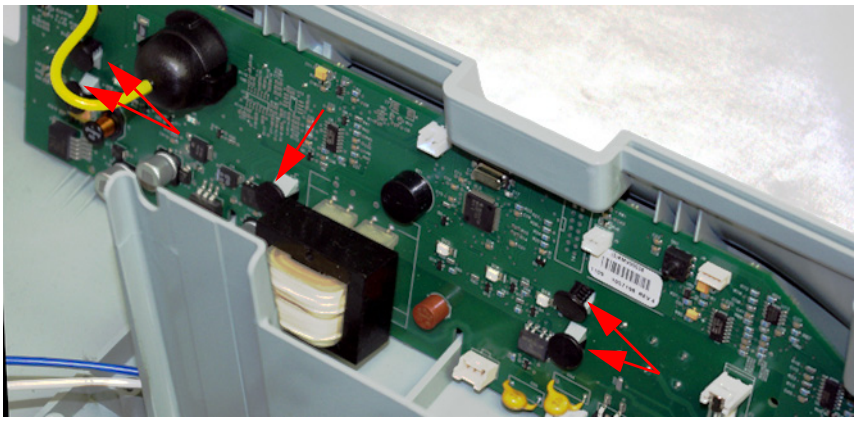

FIGURE 8-13 RETAINING PLUGS

5. Beginning on the left side spread the PCA mounts apart and pull the PCA away from the mounts.
6. Remove the PCA from the device.
7. Remove the High Pressure Sensor from the Valve Assembly.

Install

1. If the Main PCA kit comes with a new High Pressure Sensor, install the replacement High Pressure Sensor to the Valve Assembly and tighten to 70 in-lbs.
2. Install the PCA to the PCA mounts of the Front Cabinet.
3. Insert the five mount plugs.
4. Connect the long piece of yellow tubing to SN1 and the short piece of yellow tubing to the middle port of the three way valve.
5. Install the following electrical connections J7, J8, J5, J6, J2, J1, J3, J4. Refer to Figure 8-12 for Main PCA details.
6. Install the Rear Cabinet. Refer to the Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

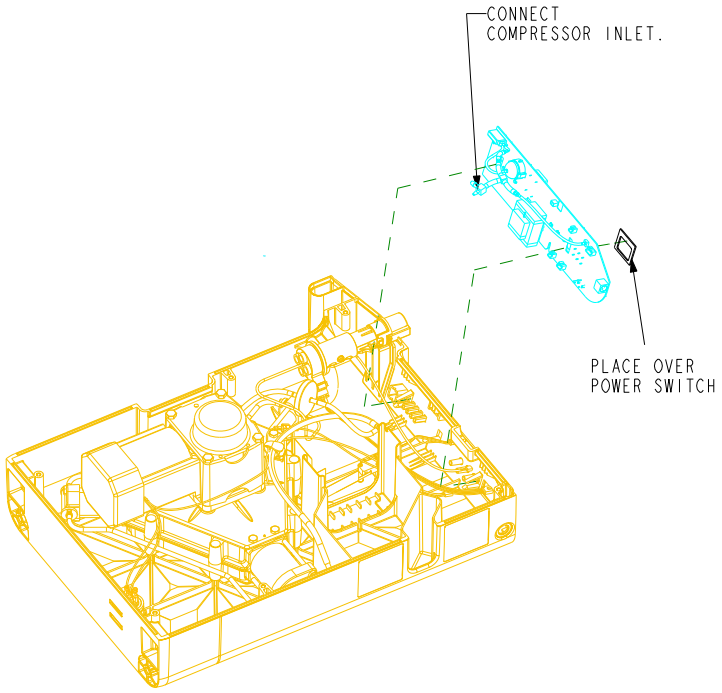

FIGURE 8-14 MAIN PCA DETAIL

8.10 MOTOR CAPACITOR REPLACEMENT

Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the three cables from the contacts located on the top of the Capacitor.
3. Discharge the Capacitor by shorting the contacts using a screwdriver.
4. Cut the tie wrap securing the Capacitor to the Front Cabinet.
5. Remove the Capacitor from the Front Cabinet.

Install

1. Place the Capacitor into the Front Cabinet.
2. By threading a tie wrap through the bottom holes of the cabinet, secure the Capacitor to the Front Cabinet.
3. Connect the three cables to the contacts located on the top of the Capacitor. Refer to Figure 8-16 for correct placement.
4. Ensure that there is a cap present on the unused contact.
5. Install the Front Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

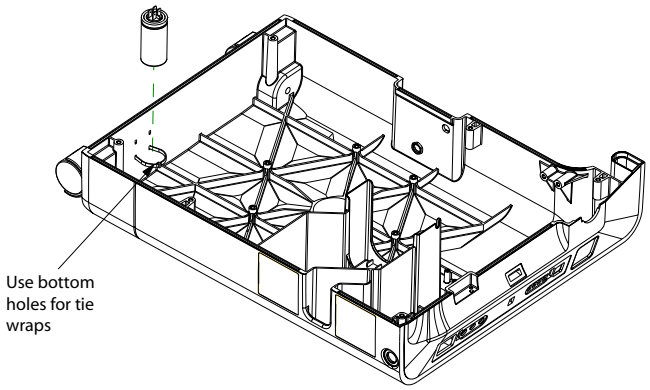

FIGURE 8-15 CAPACITOR PLACEMENT

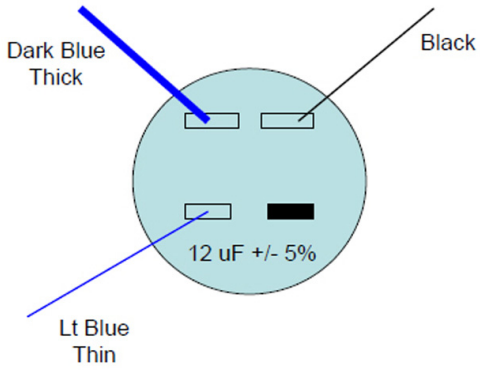

FIGURE 8-16 CABLE PLACEMENT

8.11 Motor/Motor Cover Replacement

Removal

1. Remove the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the four 1/2” bolts that secure the Motor Cover to the Motor. Remove the Motor Cover from the Device.
3. Cut the Tie Wrap securing the Motor Cabling.
4. Remove the Motor’s Black and Blue wires that are connected to the contacts on top of the Capacitor.
5. Using a screwdriver discharge the capacitor.
6. Disconnect the Motor’s white wire from the wire harness.

IMPORTANT

When attempting to separate the Motor from the Compressor it is important to lift the Motor directly upwards to ensure the Motor Shaft key is not lost in the Compressor Housing, refer to Figure 8-17. If the Motor Shaft Key does fall into the Compressor Housing use a magnet to remove the Key from the Housing.

7. Separate the Motor from the Compressor.

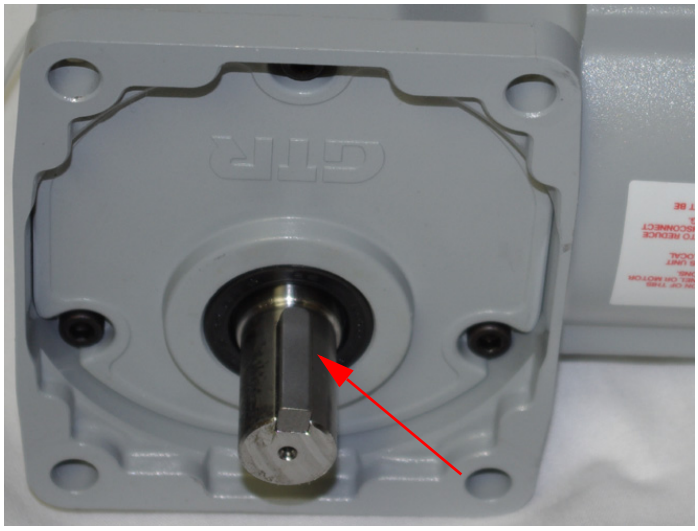

Figure 8-17 Motor Key

Install

1. Ensure Key is in place on motor shaft.

WARNING
No compound is to be used while installing the Motor to the Compressor.

2. Align the Key and install the Motor onto the Compressor.
3. Ensure the Motor is properly oriented on the Compressor.
4. Place the Motor Cover on the Motor.
5. Secure the Motor and Motor Cover to the Compressor by tightening the bolts to 125 in-lbs.
6. Connect the Motor's white wire to the wire harness.
7. Connect the Motor's blue and black wires to the proper contacts on the Capacitor. Refer to Figure 8-16 for correct placement.
8. Secure the Motor Cabling with a Tie Wrap.
9. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

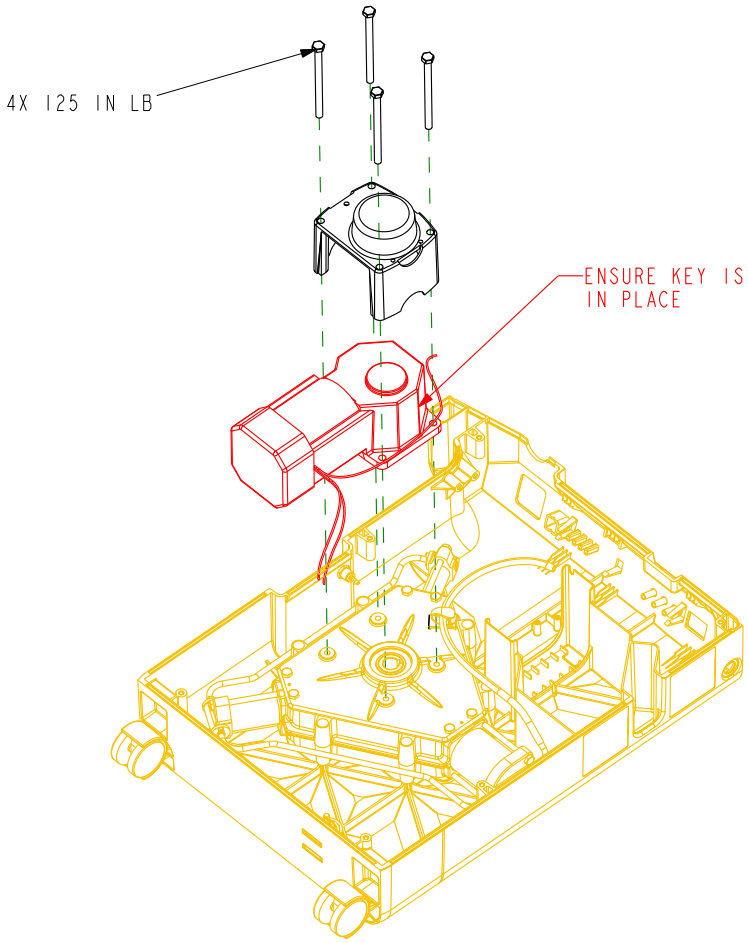

FIGURE 8-18 MOTOR/MOTOR COVER PLACEMENT

8.12 Compressor Replacement

WARNING

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Removal

1. Remove the Rear Cover. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the Motor/Motor Cover. Refer to Motor/Motor Cover Replacement Section for more details.
3. Remove the inlet tube from the Compressor.
4. Remove the two 7/64” Allen screws from the 3rd stage Cylinder and remove the tube flange from the cylinder. Ensure that the O-ring is removed with the flange. Refer to Valve Assembly Replacement Section for more details.
5. Remove the six 5/16” Hex head screws that secure the Compressor to the Front Cabinet.
6. Remove the Compressor from the Front Cabinet.

Install

1. Connect the inlet tube to the Compressor and secure with a Tie Wrap.
2. Place the Compressor into the Front Cabinet. The Third Stage Cylinder (smallest) should be facing the Valve Assembly.
3. Using the six 5/16” Hex Head Screws, secure the Compressor to the Front Cabinet by tightening the screws to 45 in-lbs.
4. Ensure that the o-ring is present on flange.
5. Using two 7/64” Allen screws, secure the tube flange to the 3rd Stage Cylinder by tightening to 16 in-lbs. Refer to Valve Assembly Replacement Section for more details.
6. Install the Motor/Motor Cover. Refer to Motor/Motor Cover Replacement Section for more details.

7. Install the Rear Cabinet. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.

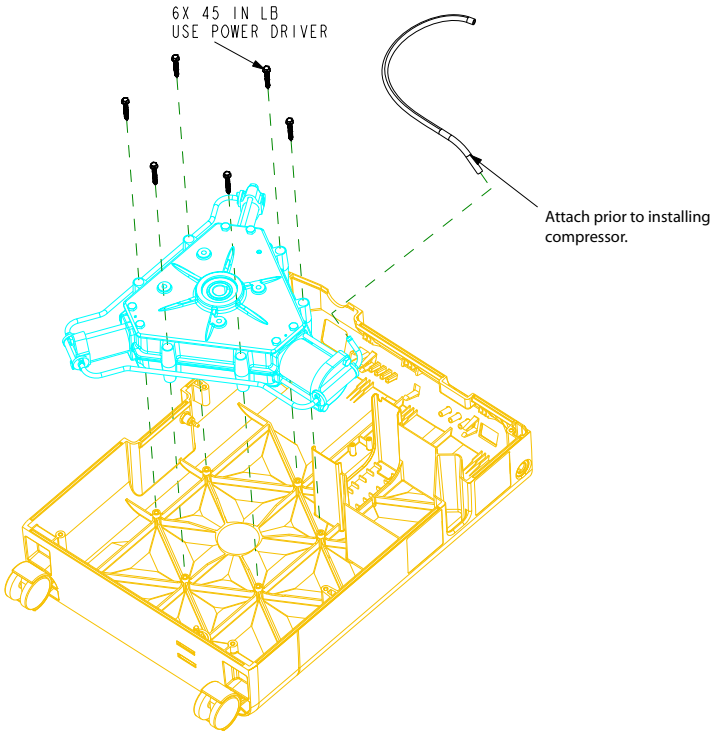

FIGURE 8-19 COMPRESSOR REPLACEMENT

8.13 Front Cabinet Replacement

Removal

1. Remove Rear Cabinet/Power Cord. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
2. Remove the Valve Assembly. Refer to Valve Assembly Replacement Section for more details.
3. Remove the Mico-disk Filter. Refer to Micro Disk Filter Replacement Section for more details.
4. Remove the Inlet O_2 Quick Connect. Refer to Inlet O2 Quick Connect Replacement Section for more details.
5. Remove the Tubing. Refer to Tubing Replacement Section for more details.
6. Remove the Fan. Refer to Fan Replacement Section for more details.
7. Remove the Fan Switch. Refer to Fan Switch Replacement Section for more details.
8. Remove the PCA. Refer to PCA Replacement Section for more details.
9. Remove the Motor Capacitor. Refer to Motor Capacitor Replacement Section for more details.
10. Remove the Motor/Motor Cover. Refer to Motor/Motor Cover Replacement Section for more details.
11. Remove the Compressor. Refer to Compressor Replacement Section for more details.

Install

1. Install the Compressor. Refer to Compressor Replacement Section for more details.
2. Install the Motor/Motor Cover. Refer to Motor/Motor Cover Replacement Section for more details.
3. Install the Motor Capacitor. Refer to Motor Capacitor Replacement Section for more details.
4. Install the PCA. Refer to PCA Replacement Section for more details.
5. Install the Fan Switch. Refer to Fan Switch Replacement Section for more details.
6. Install the Fan. Refer to Fan Replacement Section for more details.
7. Install the Tubing. Refer to Tubing Replacement Section for more details.
8. Install the Inlet O_2 Quick Connect. Refer to Inlet O2 Quick Connect Replacement Section for more details.
9. Install the Mico-disk Filter. Refer to Micro Disk Filter Replacement Section for more details.
10. Install the Valve Assembly. Refer to Valve Assembly Replacement Section for more details.
11. Install the Rear Cabinet/Power Cord. Refer to Rear Cabinet/Power Cord/Support Post/Cylinder Holder Replacement Section for more details.
12. Ensure the Warning Label is in place on the front cabinet.
13. Print out two labels. One must include the serial number of the device and one must include the model number of the device.

IMPORTANT!
The labels MUST be type written. Handwritten text is unacceptable.

NOTE

The following specifications are required for the new Serial and Model number labels.

- Label Size: 1/2” x 1 3/4” (Maximum Size)
- Font Size: 10 point (Minimum)

NOTE

The new Serial and Model Number Labels must include the same serial and model number as those of which are on the original label.

14. Place the two labels onto the Front Cabinet and align with the clear sections of the Repair Serial Label.
15. Place the Serial Label over the two generic labels and onto the Front Cabinet in the proper location.

8.14 Cylinder Valve Replacement Procedure

WARNING

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8.14.1 Required Tools

- 70 ft.-lb. Torque Wrench
- 1” Crowfoot Wrench
- Belt Vise (or equivalent)

8.14.2 PROCEDURE

1. Place the cylinder in a belt vise (or equivalent) and tighten the belt to the cylinder.

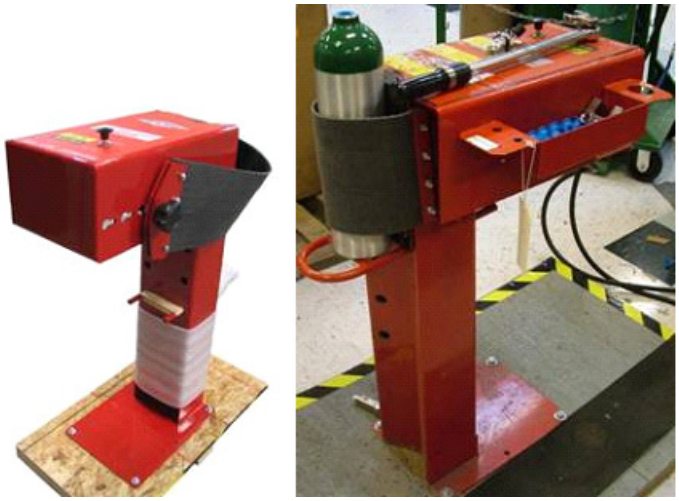

FIGURE 8-20 BELT VISE

2. Using a 1” Crowfoot wrench, un-thread the valve from the cylinder.
3. Place the Teflon ring on the new valve threads and thread the valve to the cylinder. Tighten to 70 ft.-lbs.
4. Remove the cylinder from the vise and place on an UltraFill connected to a compatible oxygen concentrator. Fill the cylinder until one segment is full (solid blue LED).
5. Remove the cylinder from the UltraFill.
6. Using a leak detecting solvent (Snoop brand or equivalent), test the threaded connection for leaks.
   a. If a leak is found, repeat steps 1 through 6.

CHAPTER 9: REPAIR KITS

9.0 CHAPTER OVERVIEW

This chapter illustrates the names and components for each of the repair kits for the UltraFill System. For technical assistance or replacement part ordering information, contact Philips Respironics Product Support.

USA and Canada

Phone: 1-800-345-6443
Fax: 1-800-866-0245
Email: Respironis.service.operations@philips.com

International

Phone: 1-724-387-4000
Fax: 1-800-387-5012

Visit Respironics Home Page on the World Wide Web at:

www.respironics.com

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9.1 Repair Kit Reference Table

NOTE

For kits with multiple part number listings, refer to the individual page to ensure proper ordering.

PART NUMBER(S)	REPAIR KIT NAME	PAGE IDENTIFIER
1069425	*2000 PSI Post Valve Kit**	*page 18*
1069586	*2000 PSI Post Valve Upgrade Kit**	*page 18*
1069523	*3000 PSI Post Valve Kit**	*page 18*
1069517	*Button Cover Kit*	*page 16*
1069355	*Cabinet Support Post Kit*	*page 4*
1069427 / 1081173	*Capacitor Kits*	*page 7*
H624 / 1026632 / H649	*Caster Kits*	*page 6*
1069431	*Compressor Kit**	*page 11*
1069518 / 1082799	*Control Panel Kits*	*page 17*
1069601	*Cover Kit*	*page 21*
1069433	*Cylinder Holder Kit*	*page 12*
1082803	*Data Port Cover*	*page 21*
1069428 / 1081176	*Fan Kits*	*page 8*
1069447	*Fan Switch Kit*	*page 13*
1069522 / 1082800	*Front Cabinet Kits*	*page 15*
1069521	*Hardware Kit*	*page 18*
1082460	*High Pressure Sensor 230V**	*page 22*
1069519	*O2 Quick Connect Kit*	*page 17*
1069426 / 1081171	*Main PCA Kits**	*page 16*
1069600	*Micro Disk Filter Kit*	*page 14*
1069432	*Motor Cover Kit*	*page 11*
1069430 / 1081175	*Motor Kits*	*page 10*
1069598 / 1082801	*No Oil Label Kits*	*page 19*
1069520	*Packaging Kit*	*page 18*
1069356 / 1081227 / 1081228 / 1081229	*Power Cord Kits*	*page 5*
1081230	*Pressure Sensor Harness Kit*	*page 22*
1069449	*Rear Cabinet Kit*	*page 15*
1082802	*International Regulator & OCD Cover Kit*	*page 22*
1069436	*Spacer Kit*	*page 13*
1069448	*Tubing Kit*	*page 14*
1069435	*Valve Kit**	*page 12*

PART NUMBER(S)	REPAIR KIT NAME	PAGE IDENTIFIER
1069599 / 1081174	*Warning Label Kits*	*page 20*
1069429	*Wire Harness Kit*	*page 9*
**Note: The kits marked with an asterisk are identified as O_2 clean components and cannot be purchased until Philips Respironics Service Training is completed.*		

9.2 CABINET SUPPORT POST KIT

PART NUMBER: 1069355
Included in Kit
Support Post

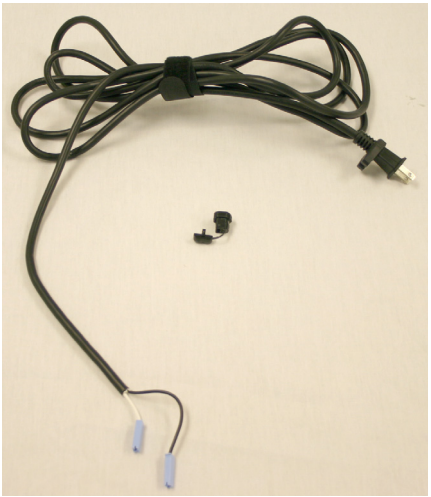
9.3 Power Cord Kits

PART NUMBER: 1069356
Included in Kit
120V Power Cord Strain Relief

PART NUMBER: 1081227
Included in Kit
Australian Power Cord Strain Relief

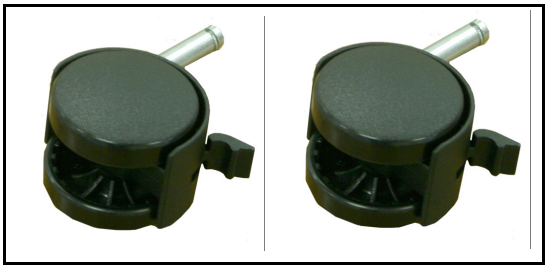
PART NUMBER: 1081228
Included in Kit
European Power Cord Strain Relief

PART NUMBER: 1081229
Included in Kit
United Kingdom Power Cord Strain Relief



9.4 CASTER KITS

PART NUMBER: H624
Included in Kit
Casters (x4)
PART NUMBER: 1026632
Included in Kit
Casters (x1)
PART NUMBER: H649
Included in Kit
Caster w/ brake (x2)



9.5 CAPACITOR KITS

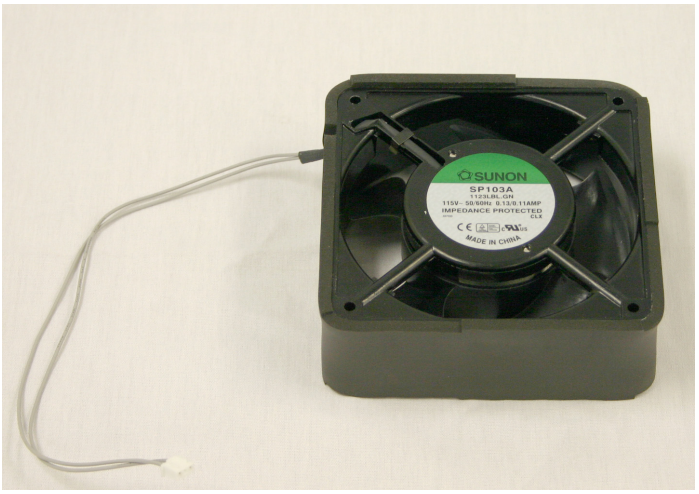
PART NUMBER: 1069427
Included in Kit
120V Capacitor Cap Tie Wrap

PART NUMBER: 1081173
Included in Kit
230V Capacitor Cap Tie Wrap

9.6 FAN KITS

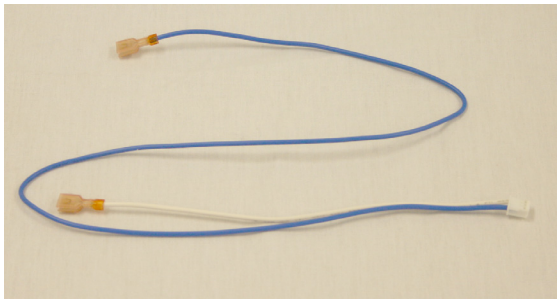
PART NUMBER: 1069428
Included in Kit
120V Fan Assembly

PART NUMBER: 1081176
Included in Kit
230V Fan Assembly



9.7 Wire Harness Kit

PART NUMBER: 1069429
Included in Kit
Wire Harness



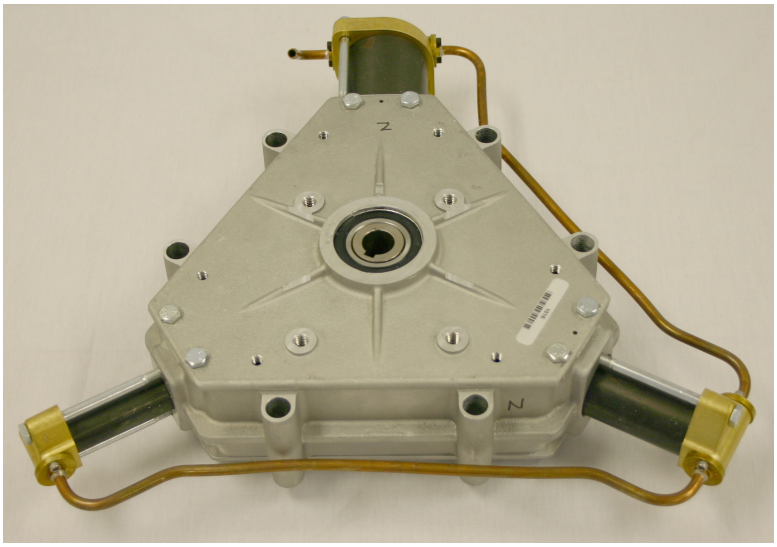
9.8 Motor Kits

PART NUMBER: 1069430
Included in Kit
120V Motor

PART NUMBER: 1081175
Included in Kit
230V Motor

9.9 COMPRESSOR KIT

PART NUMBER: 1069431
Included in Kit
Compressor Assembly

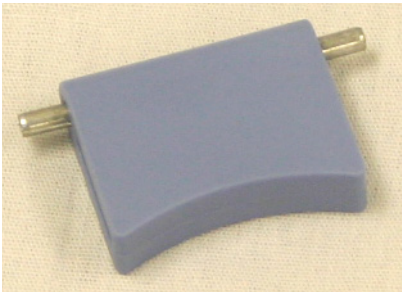


9.10 MOTOR COVER KIT

PART NUMBER: 1069432
Included in Kit
Motor Cover

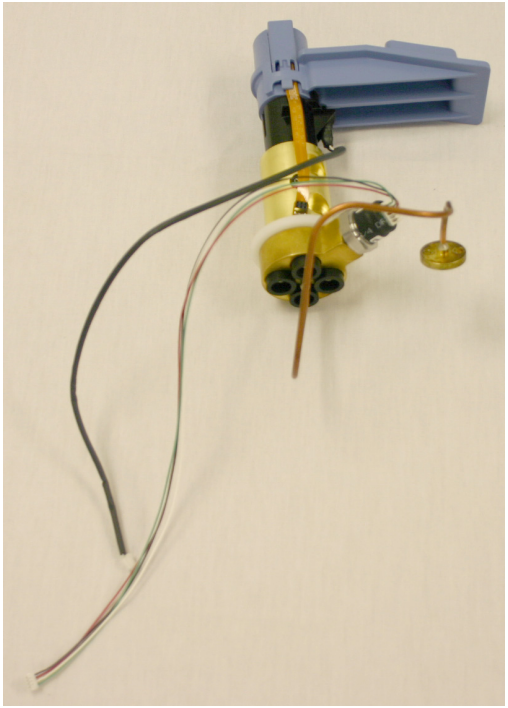
9.11 Cylinder Holder Kit

PART NUMBER: 1069433
Included in Kit
Cylinder Holder Assembly



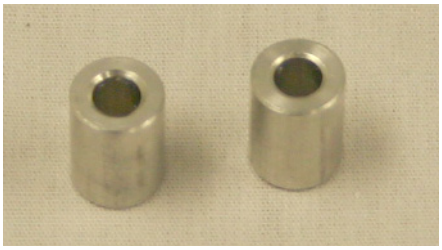
9.12 Valve Kit

PART NUMBER: 1069435
Included in Kit
Valve Assembly



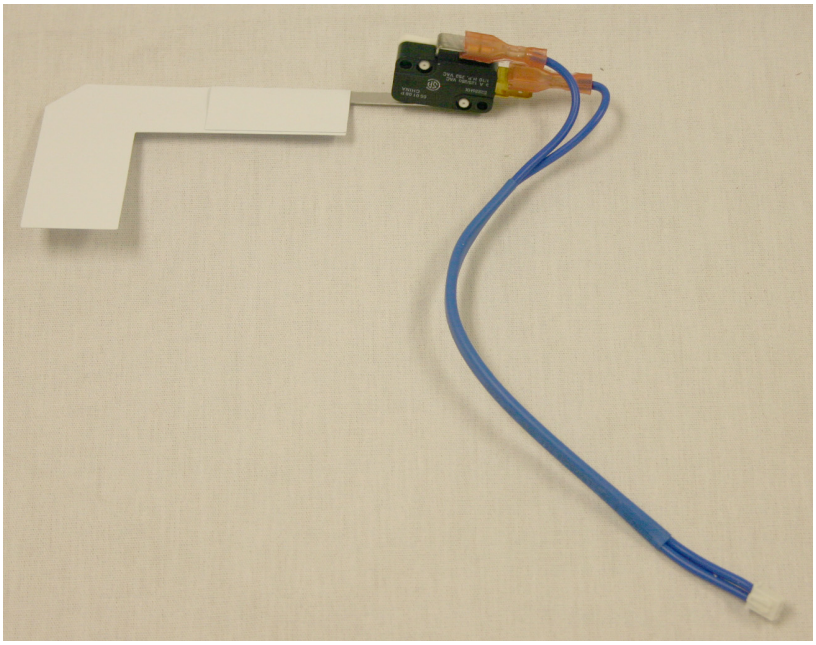
9.13 Spacer Kit

PART NUMBER: 1069436
Included in Kit
Spacer (Qty: 2)



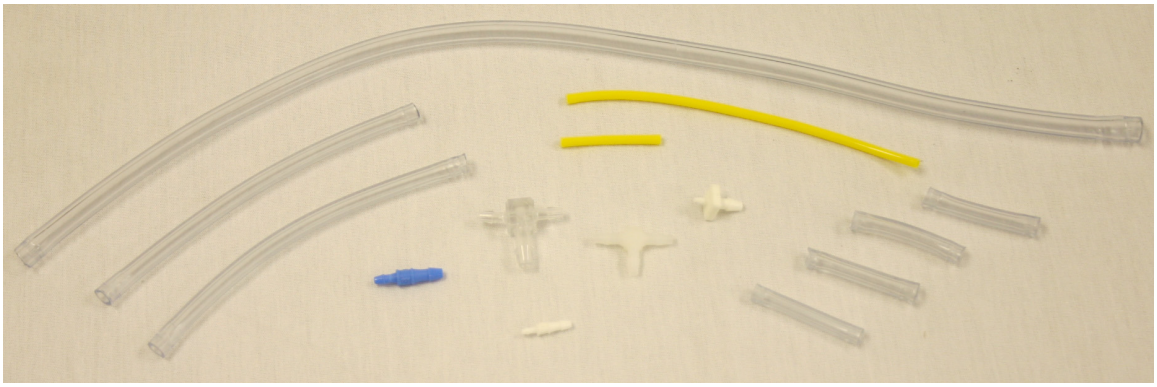
9.14 Fan Switch Kit

PART NUMBER: 1069447
Included in Kit
Fan Switch Assembly



9.15 Tubing Kit

PART NUMBER: 1069448
Included in Kit
Tubing Assembly



9.16 Micro Disk Filter Kit

PART NUMBER: 1069600
Included in Kit
Micro Disk Filter Assembly

9.17 Rear Cabinet Kit

PART NUMBER: 1069449
Included in Kit
Rear Cabinet No Oil Label

9.18 Front Cabinet Kits

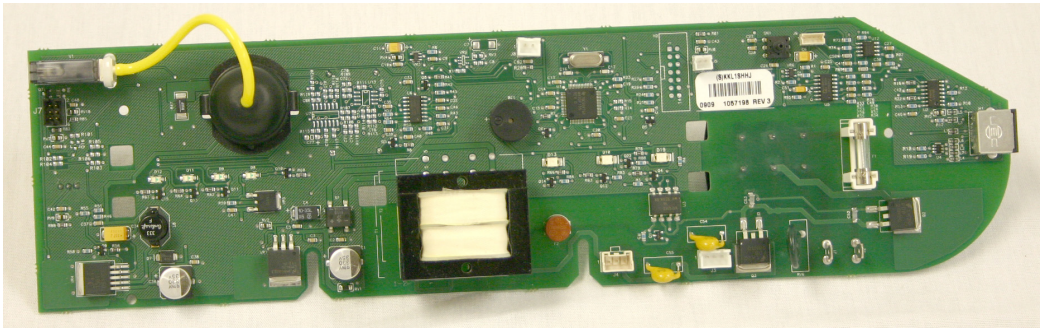
PART NUMBER: 1069522
Included in Kit
120V Front Cabinet Assembly Warning Label Repair Label

PART NUMBER: 1082800
Included in Kit
230V Front Cabinet Assembly Warning Label Repair Label

9.19 Main PCA Kits

PART NUMBER: 1069426
Included in Kit
120V Main PCA Assembly High Pressure Sensor

PART NUMBER: 1081171
Included in Kit
230V Main PCA Assembly



9.20 Button Cover Kit

PART NUMBER: 1069517
Included in Kit
Button Cover

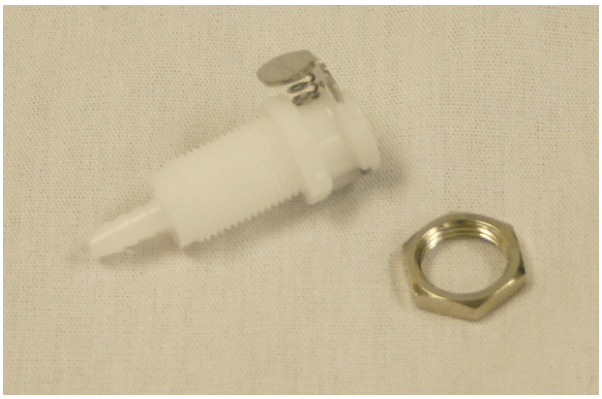
9.21 Control Panel Kits

PART NUMBER: 1069518 (SHOWN BELOW)
Included in Kit
120V Control Panel Label Light Pipe (Qty: 2)

PART NUMBER: 1082799
Included in Kit
230V Control Panel Label Light Pipe (Qty: 2)

9.22 O_2 Quick Connect Kit

PART NUMBER: 1069519
Included in Kit
O_2 Quick Connect Hex Nut



9.23 Hardware Kit

PART NUMBER: 1069521
Included in Kit
Various Screws and Tie Wraps

9.24 Packaging Kit

PART NUMBER: 1069520
Included in Kit
Shipping Carton Foam Insert Top Foam Insert Bottom Bag

9.25 2000 PSI Post Valve Kit

PART NUMBER: 1069425
Included in Kit
2000 PSI Post Valve Assembly

9.26 3000 PSI Post Valve Kit

PART NUMBER: 1069523
Included in Kit
3000 PSI Post Valve Assembly

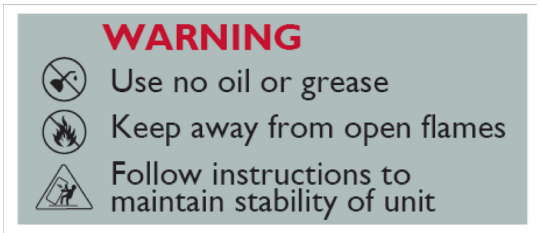
9.27 2000 PSI Post Valve Upgrade Kit

PART NUMBER: 1069586
Included in Kit
2000 PSI Post Valve Assembly 2000 PSI Cylinder Labels Black Ring Label

9.28 No Oil Label Kits

PART NUMBER: 1069598 (SHOWN BELOW)
Included in Kit
120V No Oil Label

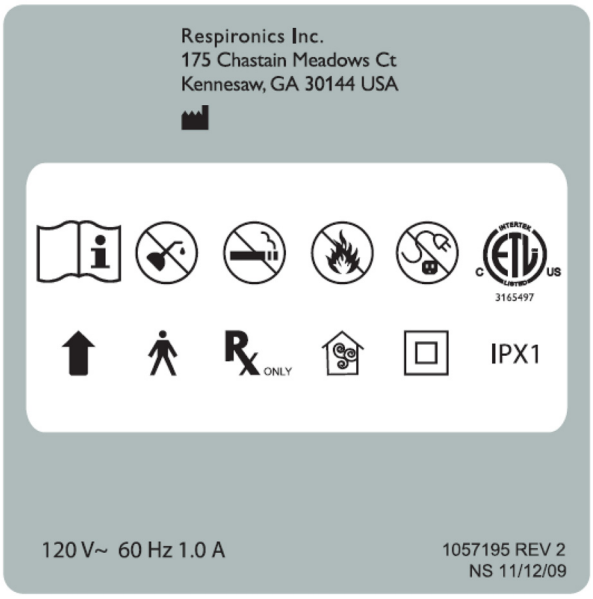
PART NUMBER: 1082801
Included in Kit
230V No Oil Label



9.29 WARNING LABEL KITS

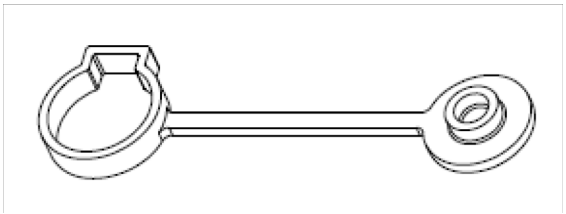
PART NUMBER: 1069599 (SHOWN BELOW)
Included in Kit
120V Warning Label

PART NUMBER: 1081174
Included in Kit
230 V Warning Label



9.30 Cover Kit

PART NUMBER: 1069601
Included in Kit
Cover



9.31 Data Port Cover

PART NUMBER: 1082803
Included in Kit
Data Port Cover

9.32 230V High Pressure Sensor

PART NUMBER: 1082460
Included in Kit
High Pressor Sensor

9.33 International Regulator & OCD Cover Kit

PART NUMBER: 1082802
Included in Kit
Regulator & OCD Cover

9.34 Pressure Sensor Harness Kit

PART NUMBER: 1081230
Included in Kit
Pressure Sensor Wire Harness

CHAPTER 10: ULTRAFILL TESTING

10.0 CHAPTER OVERVIEW

This chapter provides the necessary performance and service testing procedures. The intervals for the specific tests are listed in the testing procedure sections below.

10.1 PERFORMANCE VERIFICATION TEST

This test procedure should be performed prior to connecting the device to a patient or in between patient usage.

Procedure

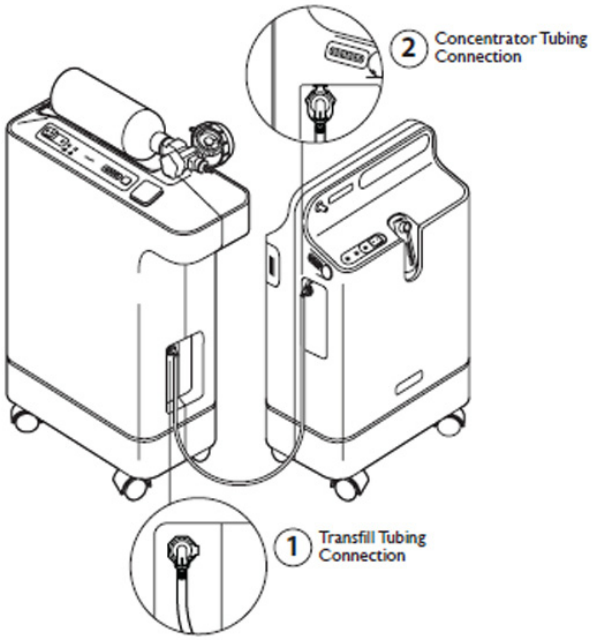
1. Plug the device into a wall outlet.
2. Turn the power ON and verify the following audible tone and LED sequence:
   a. Audible tone for ~ 3 seconds
   b. Power, Warning, and Fault LED's ON
   c. Level Fill LED's all ON

3. After 2-3 Seconds, the Warning and Fault LED's turn OFF. Power and Level Fill LED's are ON.

4. After ~ 4 seconds, the Level Fill LED's turn OFF and the Warning LED flashes with a pulsed audible tone. The unit is operating as it is intended when the alarm sounds.

5. Connect the UltraFill to a powered ON EverFlo T via the transfer tube.
6. Once connected, the Warning LED and pulsed audible tone will subside.

7. Connect an empty cylinder to UltraFill (refer to the User Manual for detailed instructions).



8. Depress the Start/Stop Fill push button to begin the fill process.
9. You should hear the compressor operate. The Level Fill will show (1) flashing LED on the far left side of the display.
10. After approximately 20 minutes, using the M6 2000 PSI cylinder, the far left LED will be solid and the 2nd LED will flash.

10.2 Performance Verification Test Data Sheet

10.2.1 Visual Inspection

Damaged Parts?	*YES*	*NO*

10.2.2 Setting & Alarm Tests

Verify audible tone and LED sequence?	*PASS*	*FAIL*

LEDs OFF and Level Fill LEDs On?	*PASS*	*FAIL*

Level LEDs turn Off and Warning LED flashes?	*PASS*	*FAIL*

Once transfer tube connected Warning LED and audible tone go away?	*PASS*	*FAIL*

UltraFill begins fill process?	*PASS*	*FAIL*

Level Fill LED shows one flashings LED?	*PASS*	*FAIL*

After approximately 20 minutes using M6 2000 psi cylinder the far left LED will be solid and the second LED will flash?	*PASS*	*FAIL*

Signature:_____

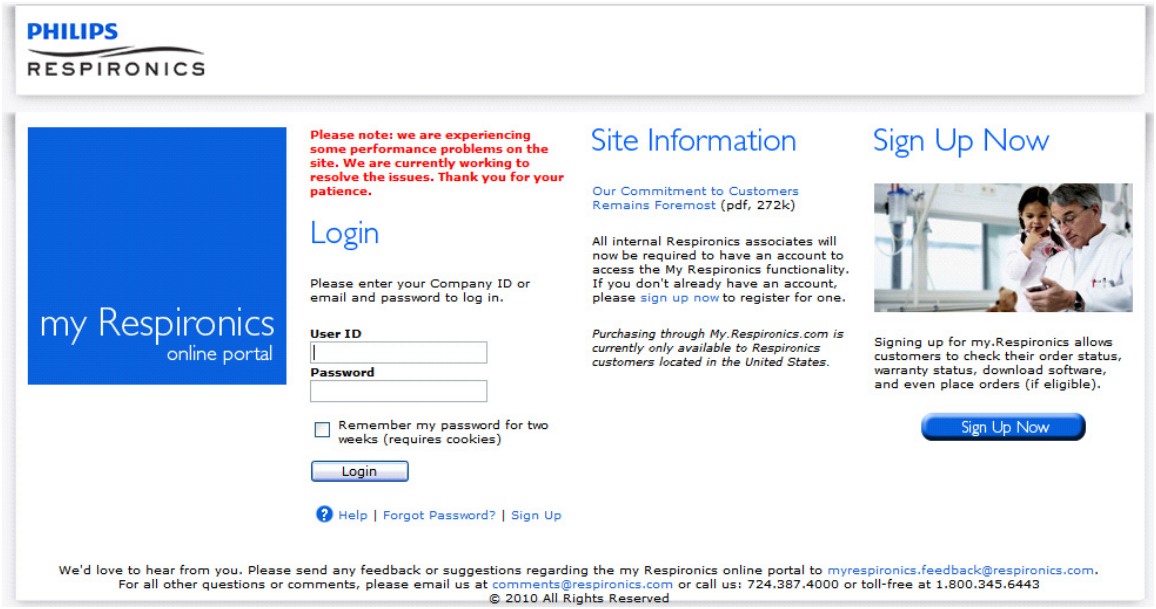
Date:_____

Serial Number: _____

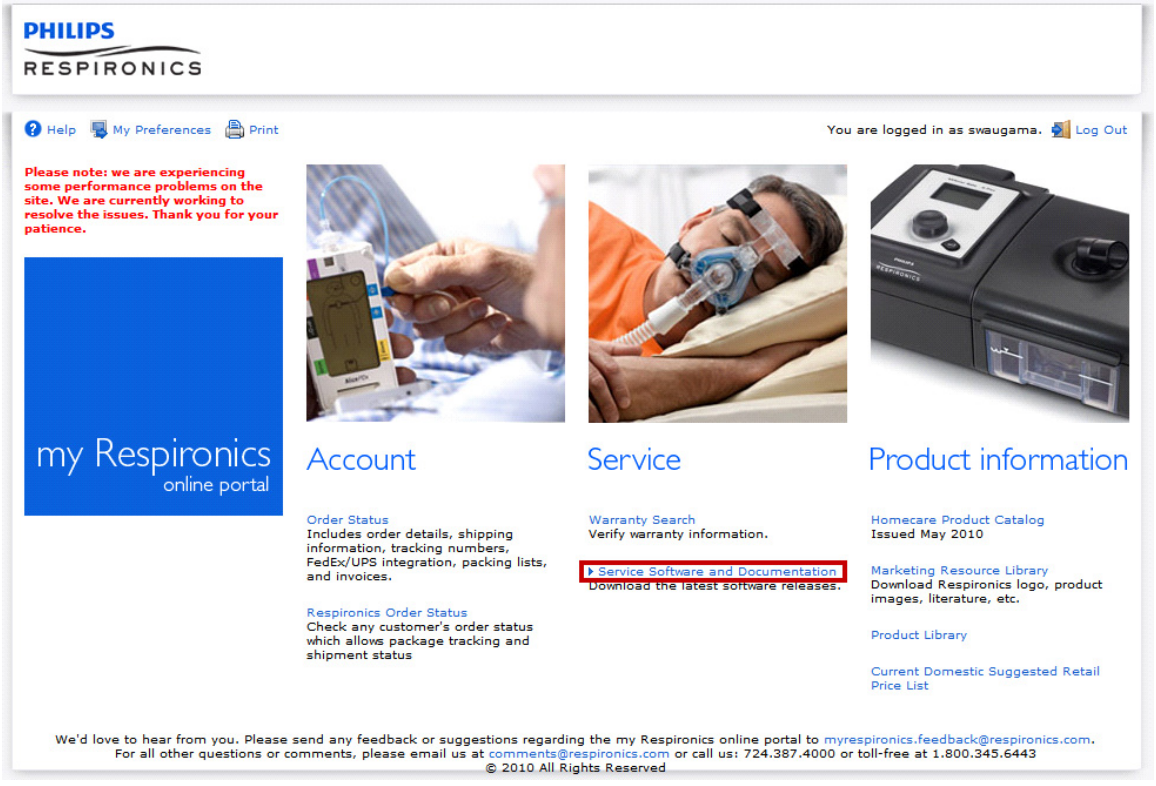
Model Number:_____

10.3 ULTRAFILL SERVICE VIEWER DOWNLOAD

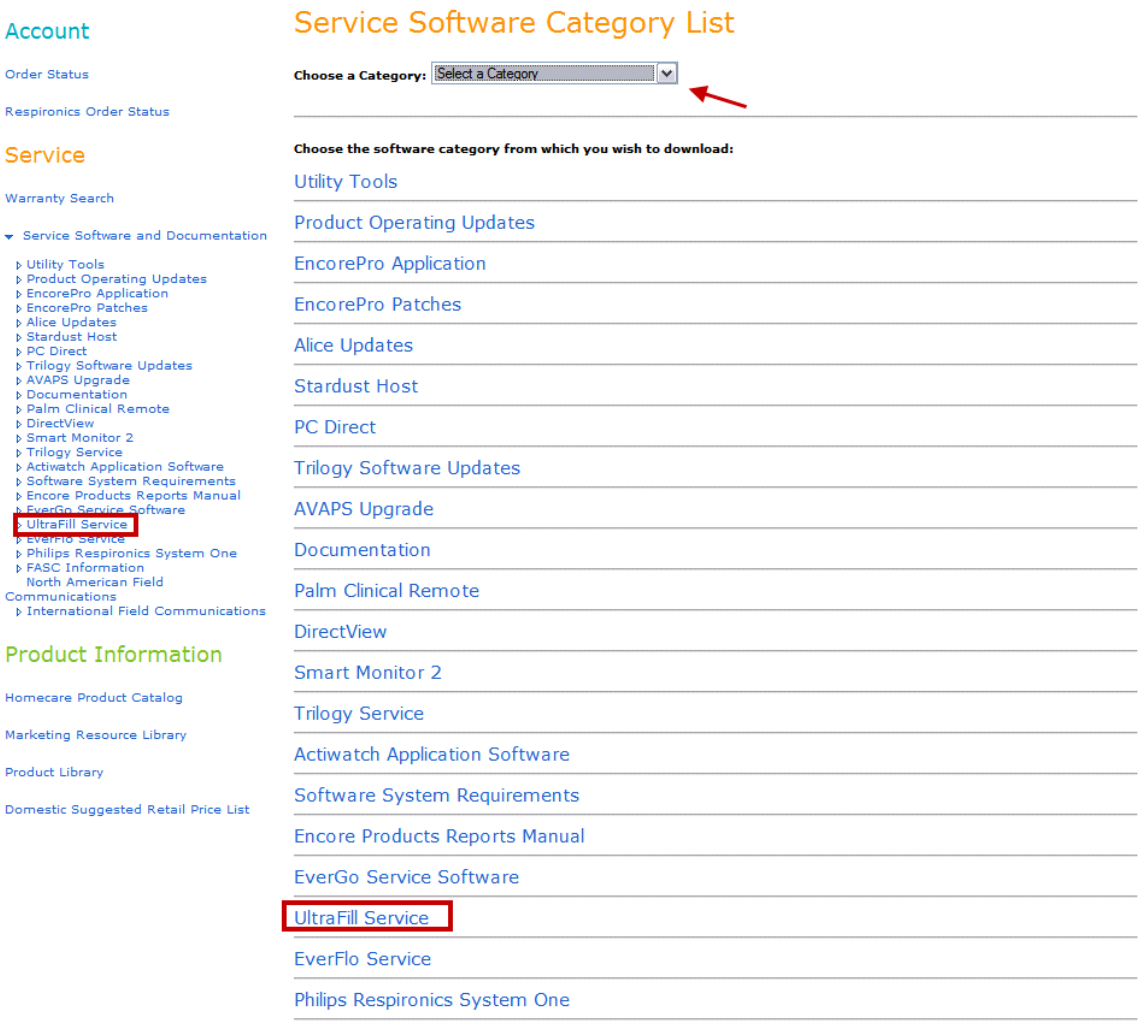
1. Go to my.respironics.com and log into your account.



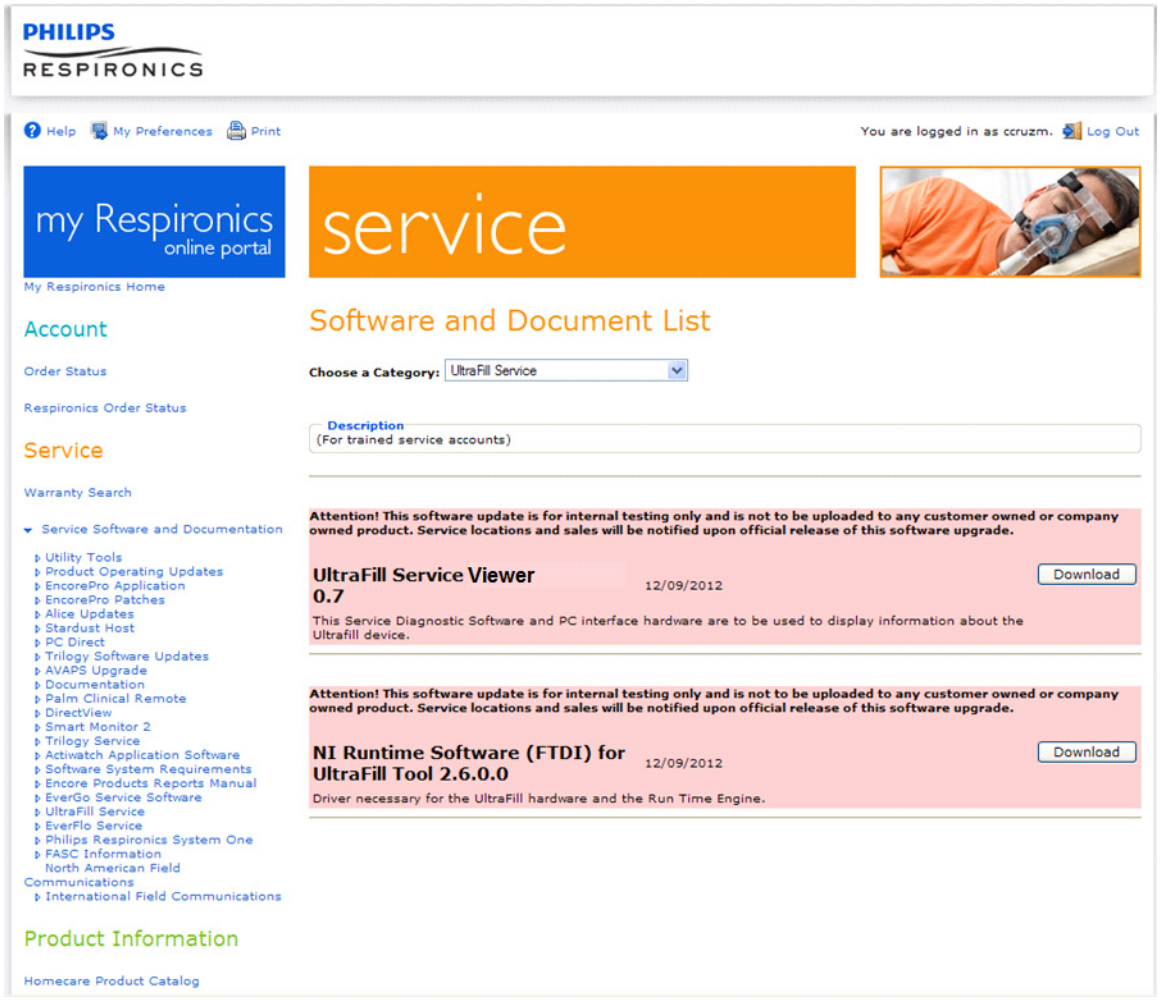
2. Select Service Software and Documentation.



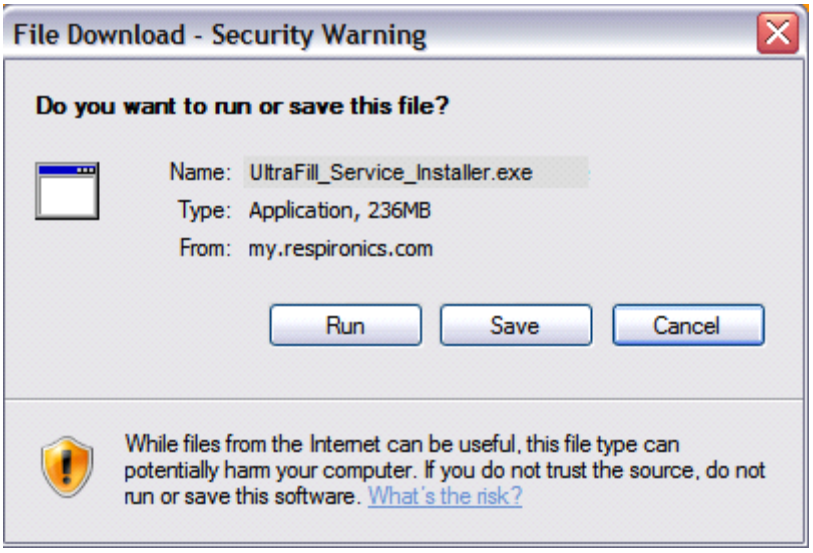
3. Either in the drop down menu, left column menu, or center menu, select UltraFill Service.



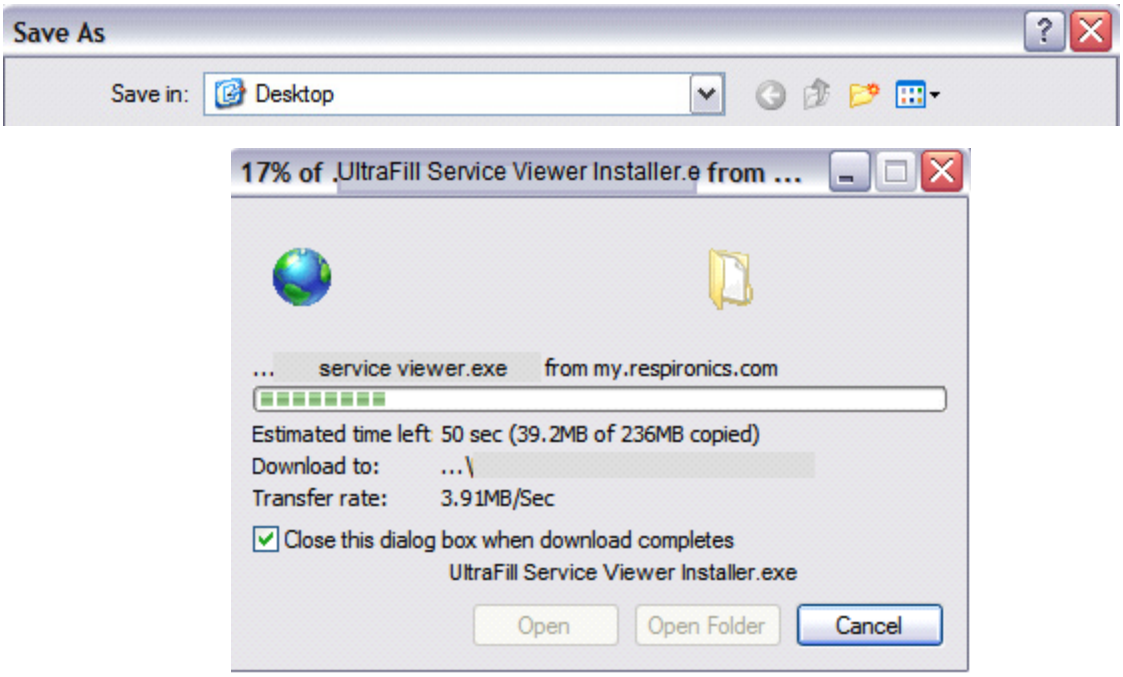
4. Select Download for UltraFill Service Viewer 0.7.



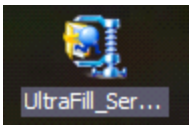
5. When prompted to select Run or Save, select Save.



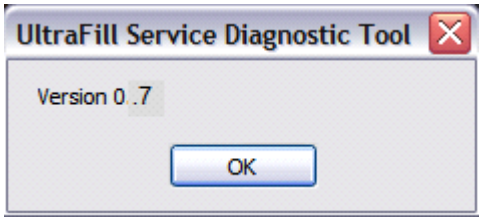
6. Use the default file location of Desktop for the Save location.



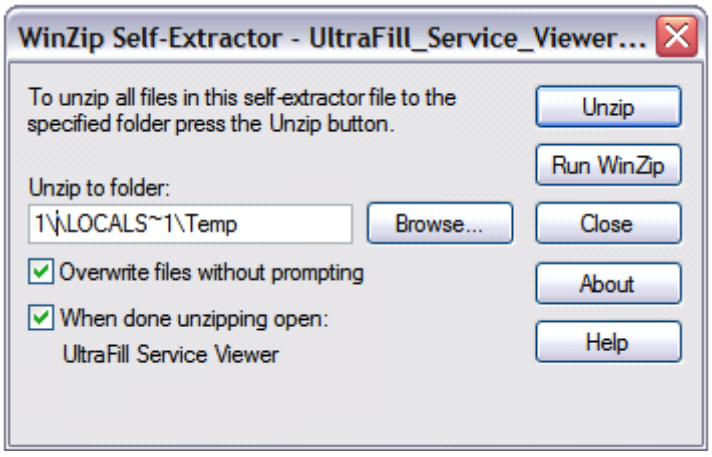
7. After the installer download is complete, the following Icon will then be displayed on the desktop.



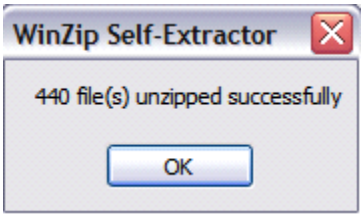
8. Double-click the Icon. The following screen will appear. Click OK.

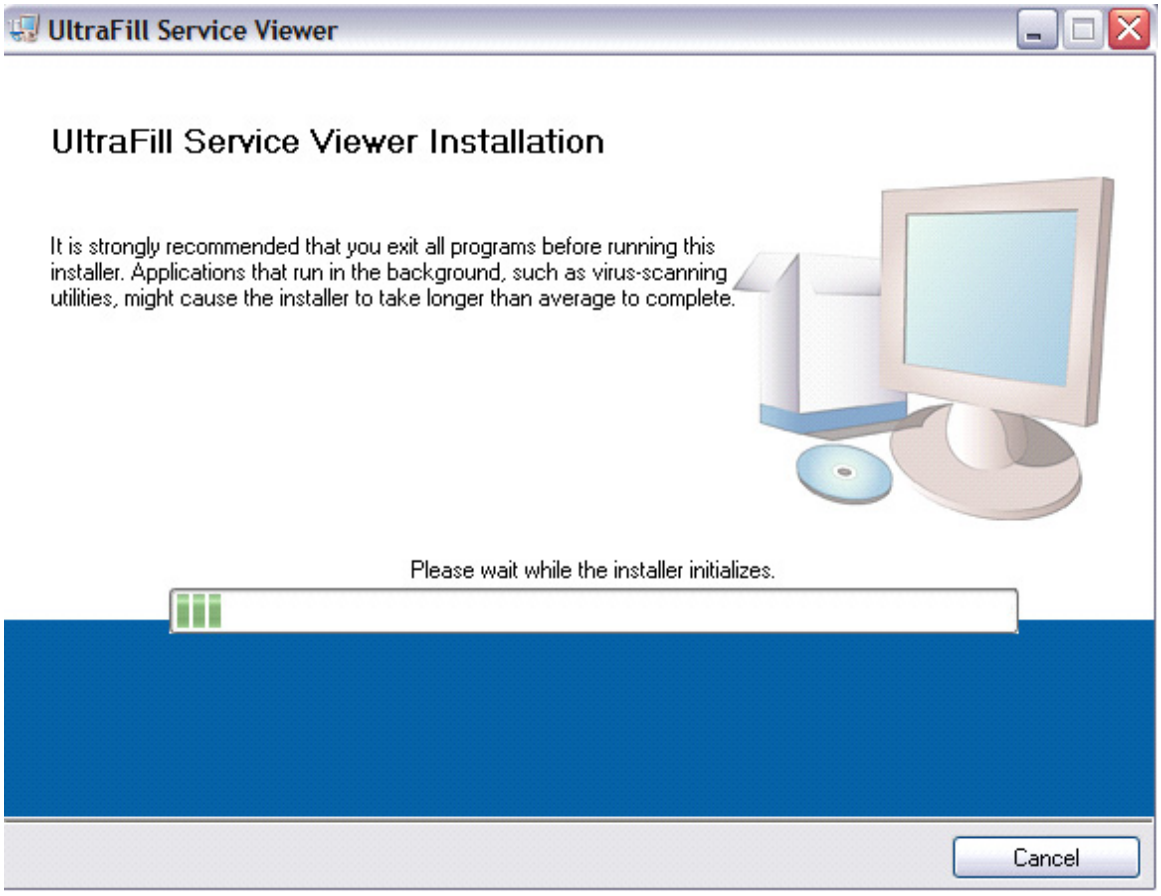


9. Click Unzip. The WinZip Self Extractor will Unzip the necessary files.

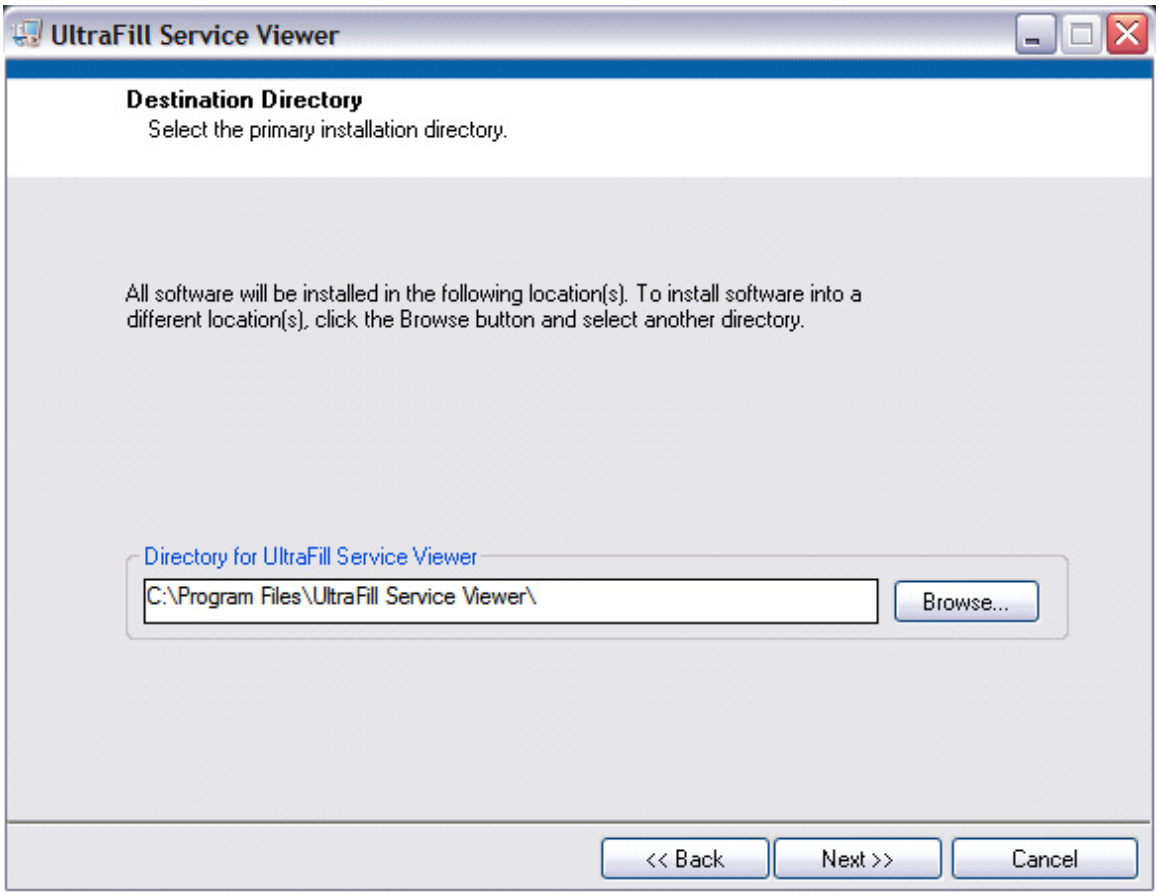


10. When prompted, select the OK button and the following screen will be displayed.





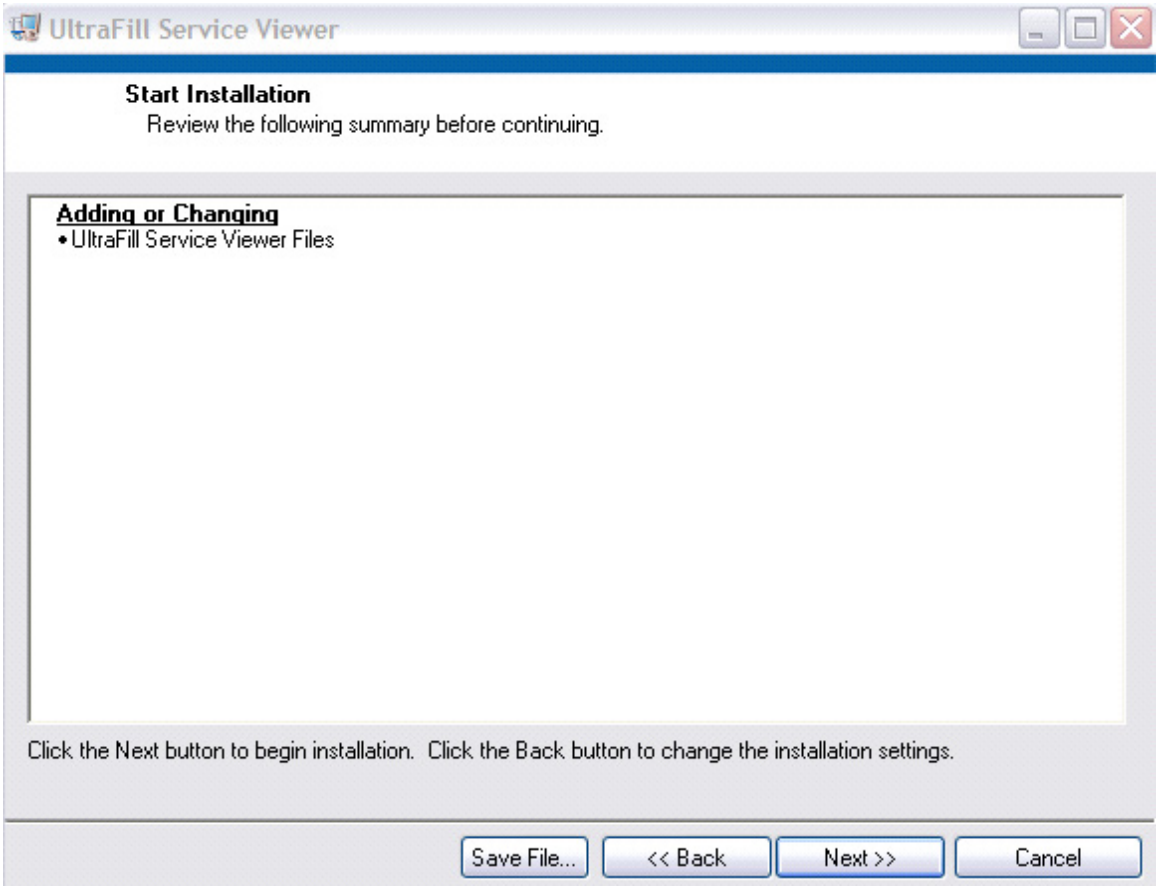
11. When the following screen appears, select Next.



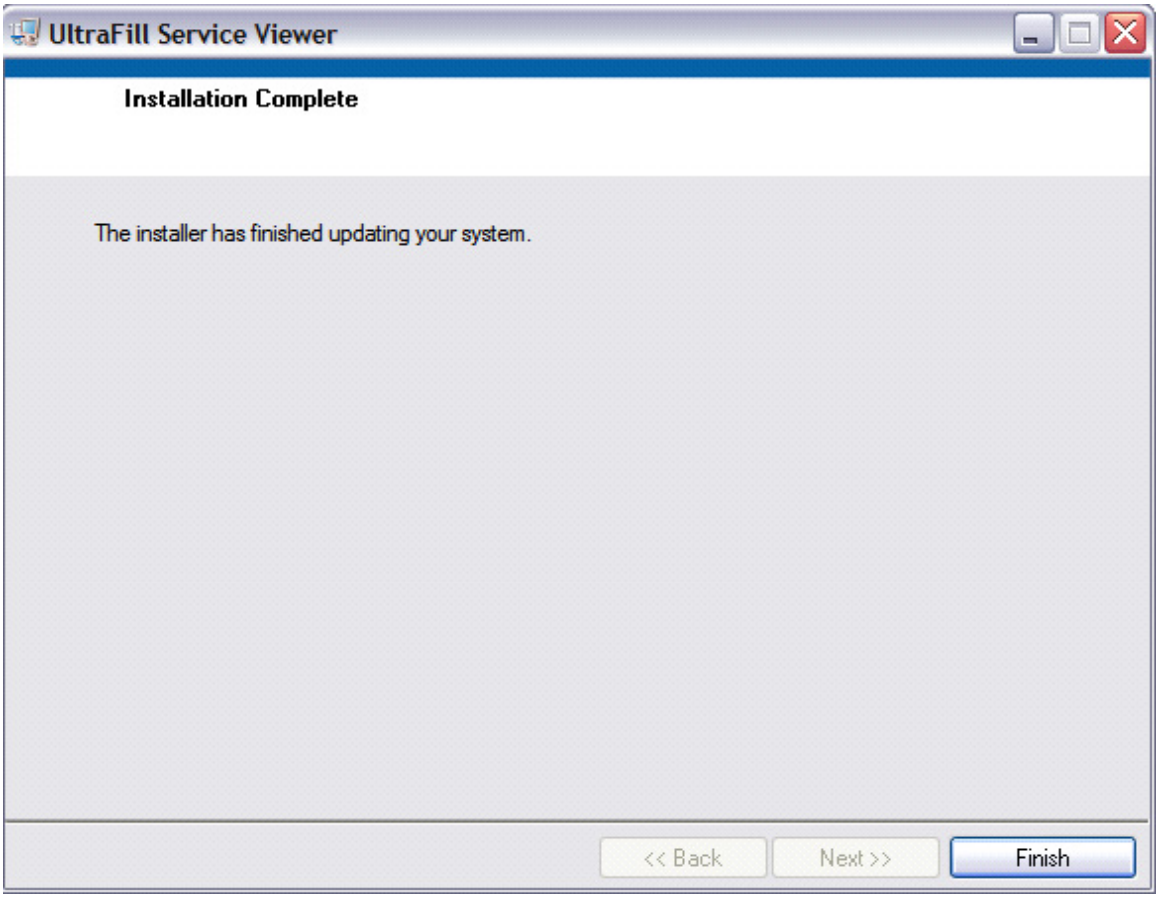
IMPORTANT

To avoid possible application errors, it is recommended to use all default file locations.

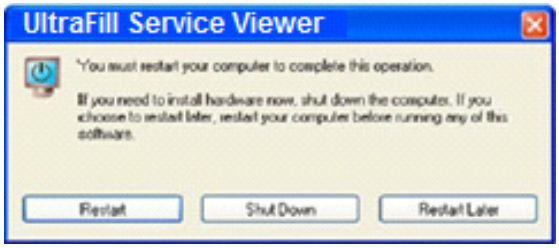
12. Select Next to begin the installation.



13. When the installation is complete, select Finish.



14. When you reach the following screen, ensure all programs have completed installation. Then, select Restart.

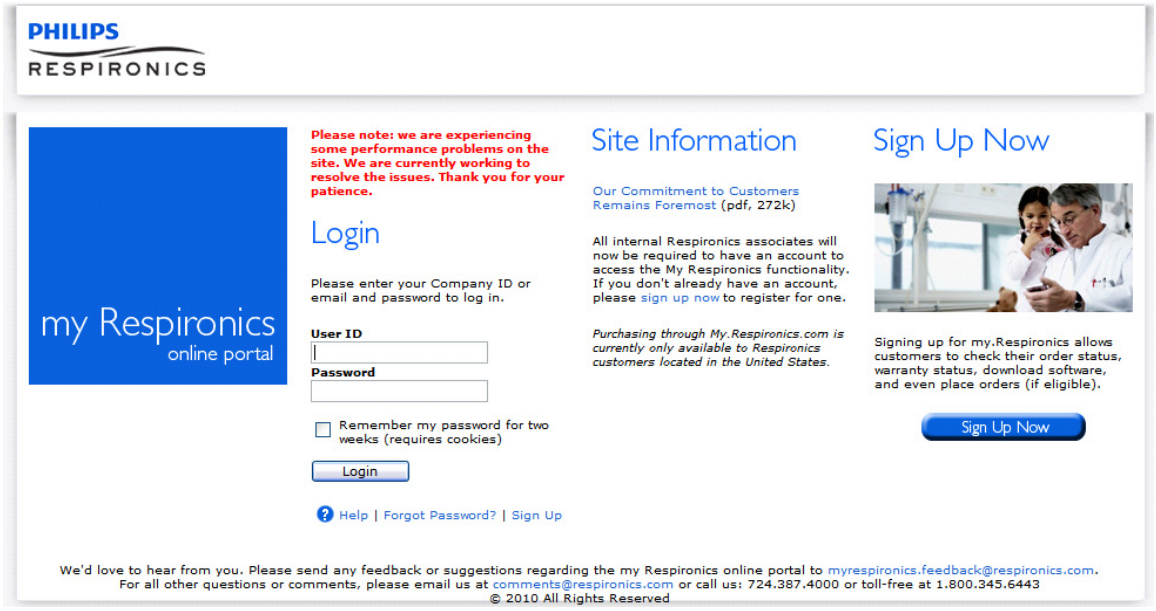


10.4 ULTRAFILL RUNTIME AND FTDI DRIVER INSTALLATION

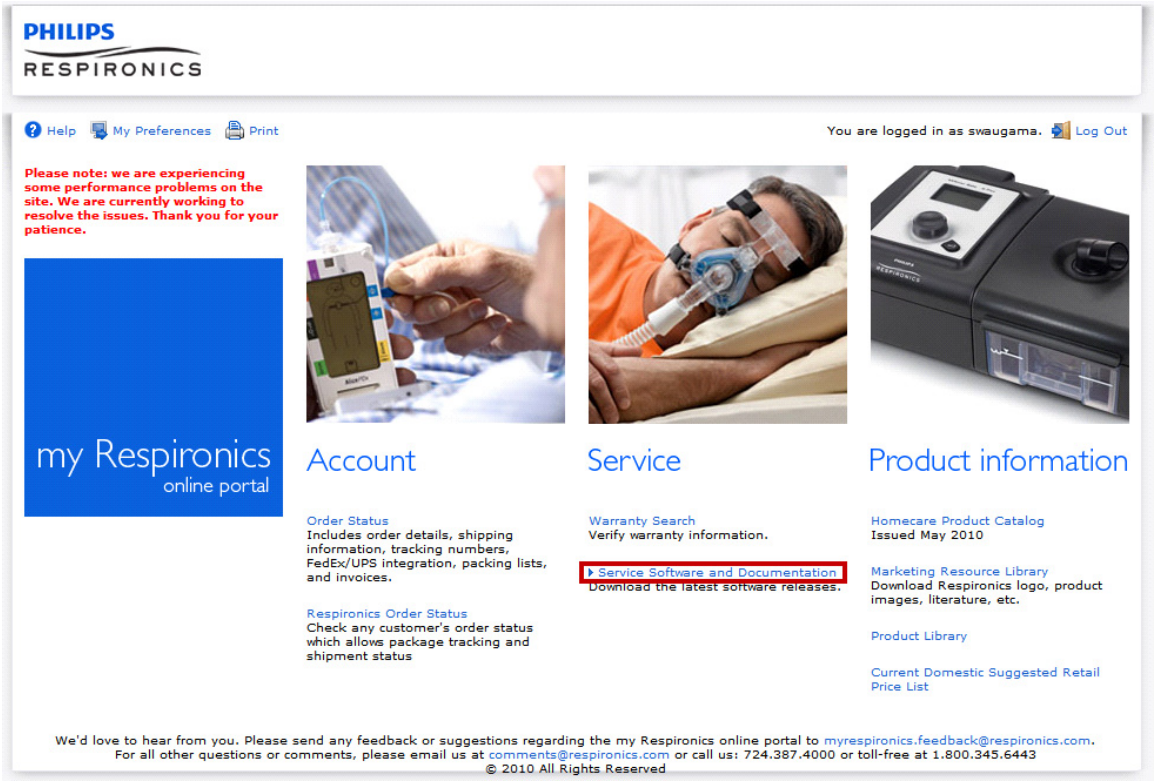
NOTE

Only download and install the National Instruments (NI) runtime and FTDI Driver if not currently installed on the PC.

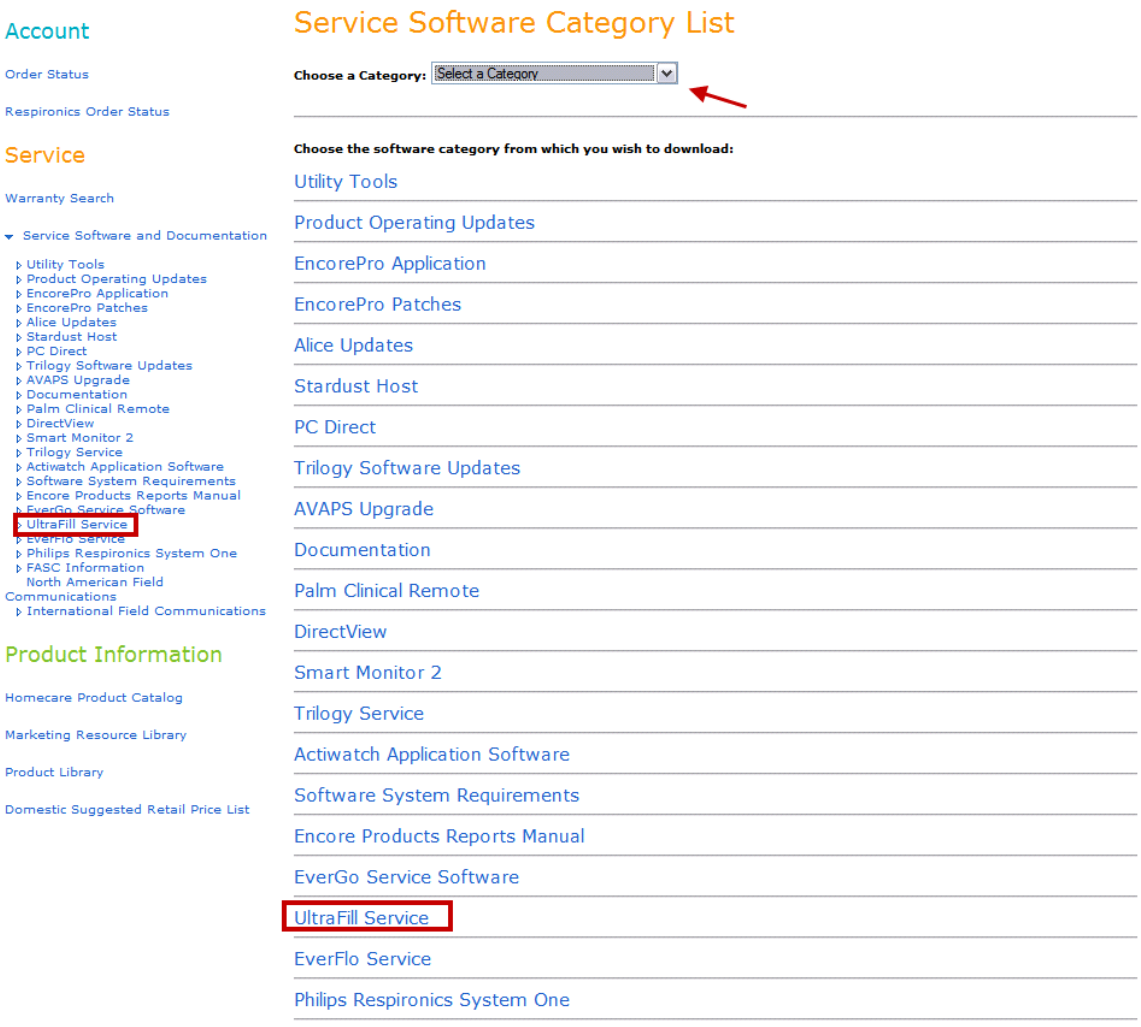
1. Go to my.respironics.com and log into your account.



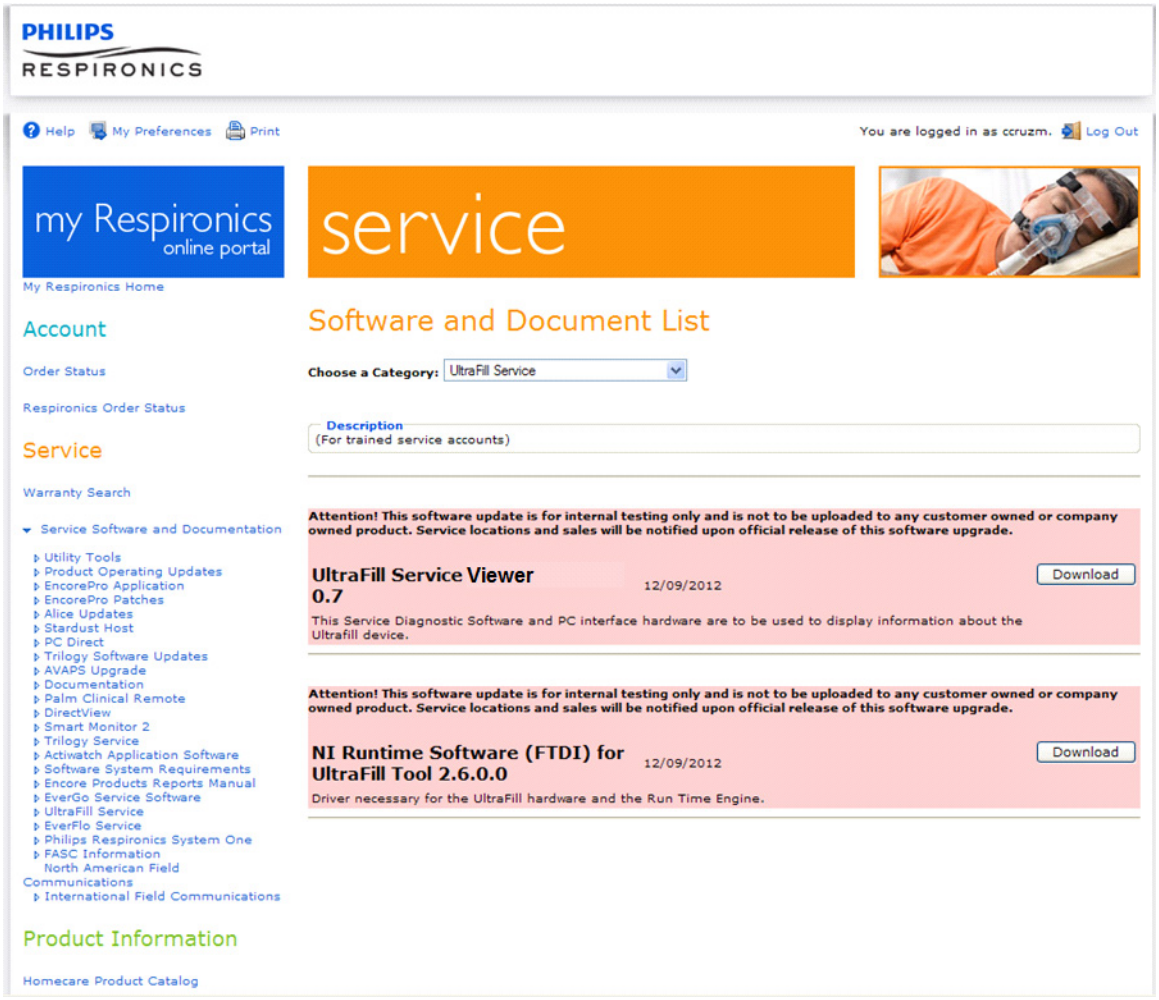
2. Select Service Software and Documentation.



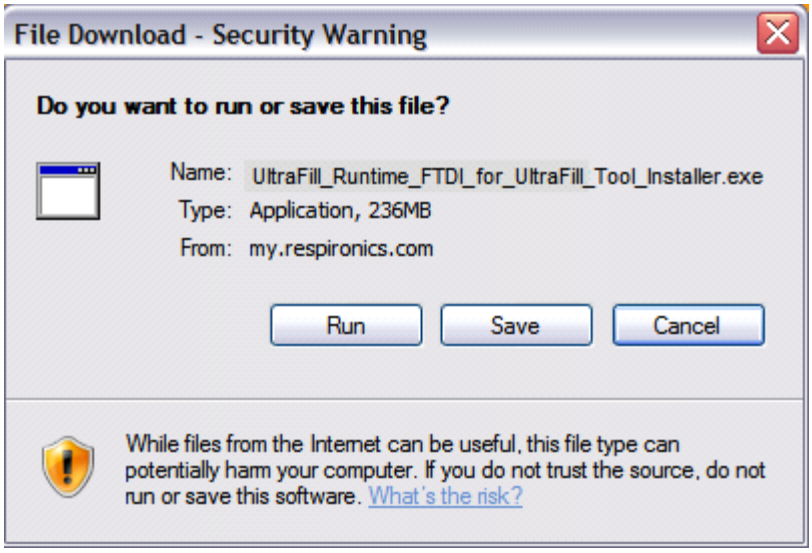
3. Either in the drop down menu, left column menu, or center menu, select UltraFill Service.



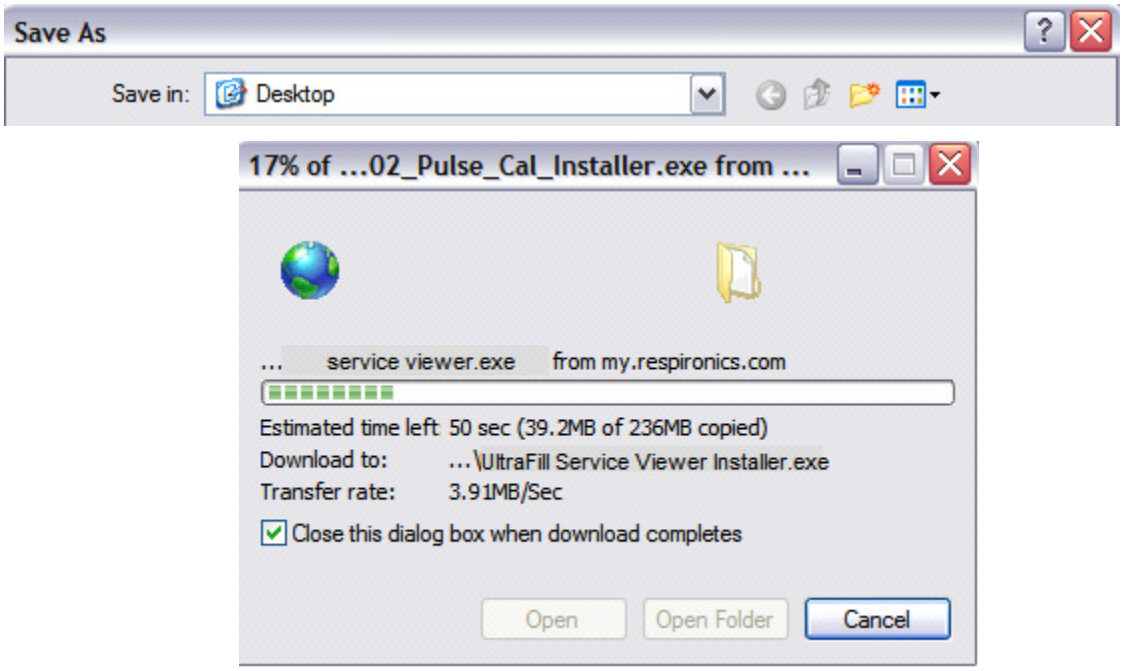
4. Select Download for NI Runtime Software (FTDI) for UltraFill Tool 2.6.0.0.



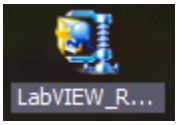
5. When prompted to select Run or Save, select Save.



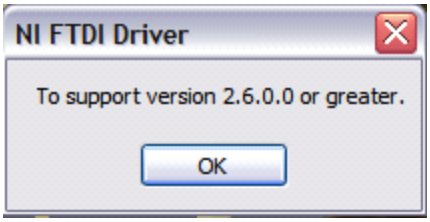
6. Use the default file location of Desktop for the Save location.



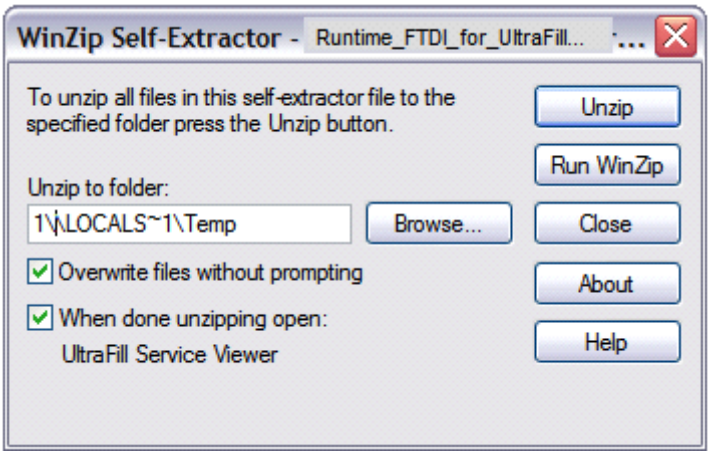
7. After the installer download is complete, the following Icon will then be displayed on the desktop.



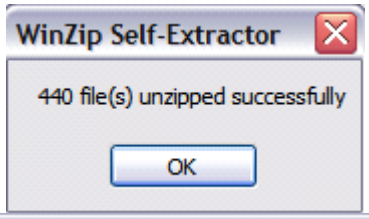
8. Double-click the Icon. The following screen will appear. Click on OK.

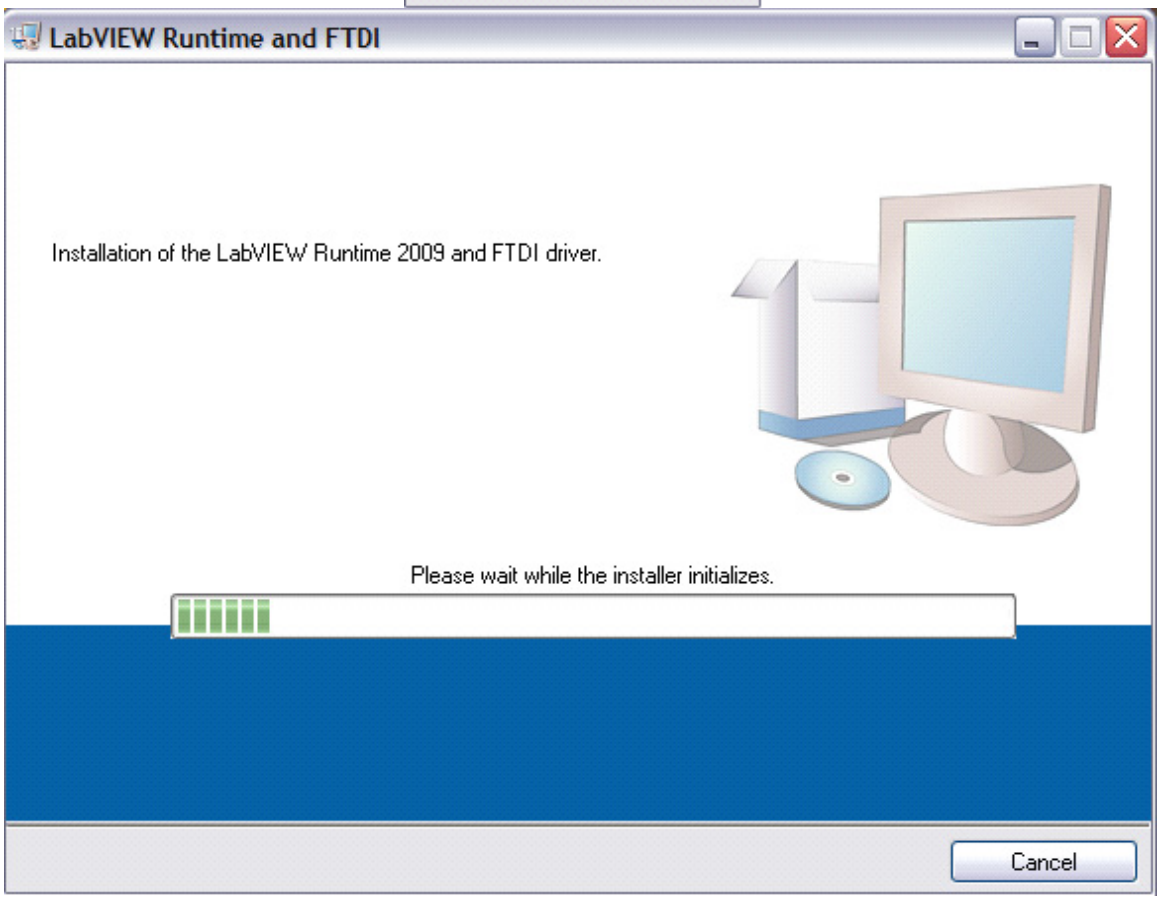


9. The following screen will appear. Click Unzip. The WinZip Self Extractor will Unzip the necessary files

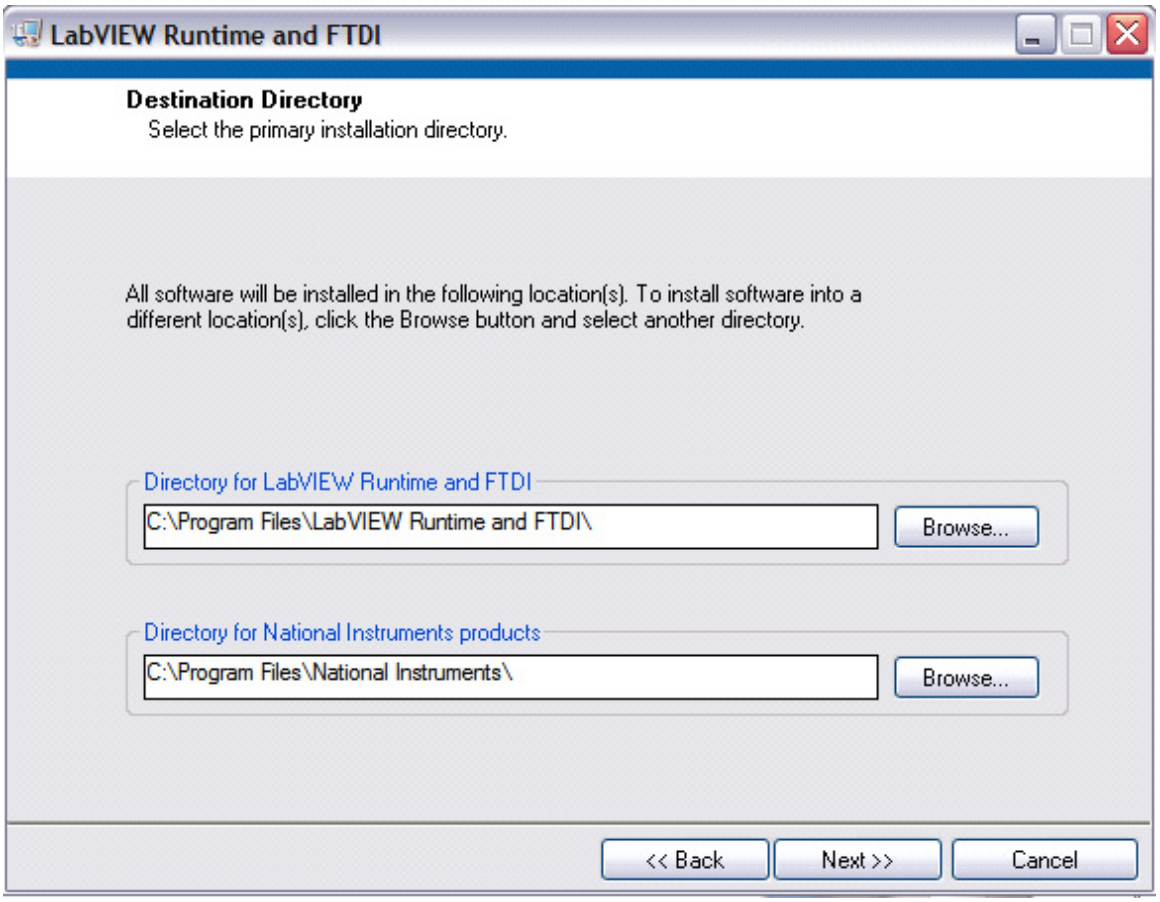


10. When prompted, select the OK button and the following screen will be displayed.





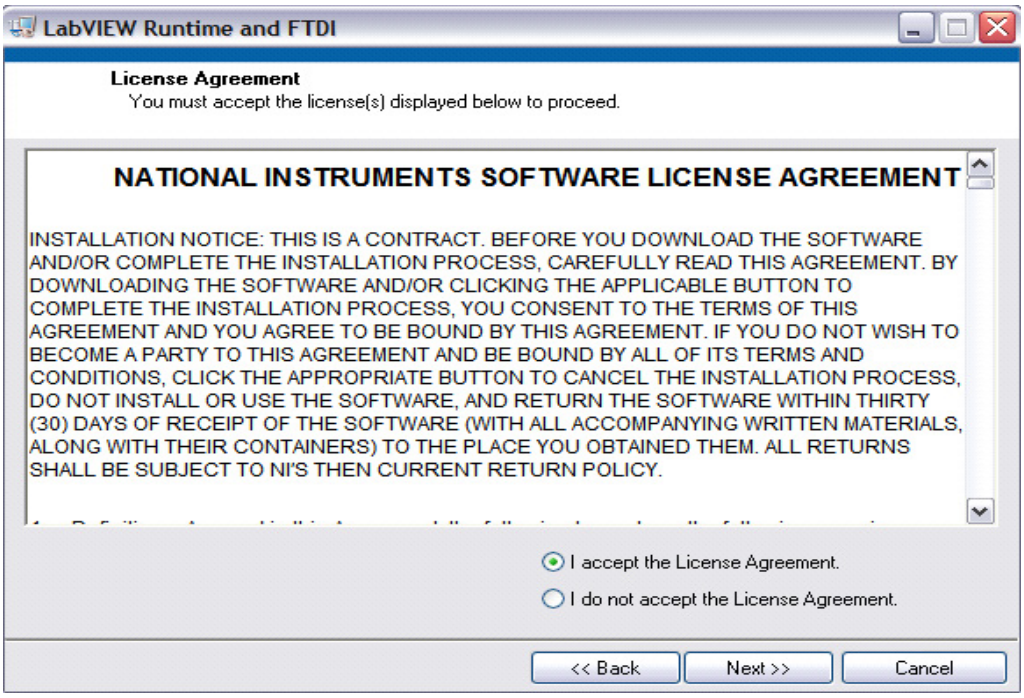
11. When the following screen appears, select Next.

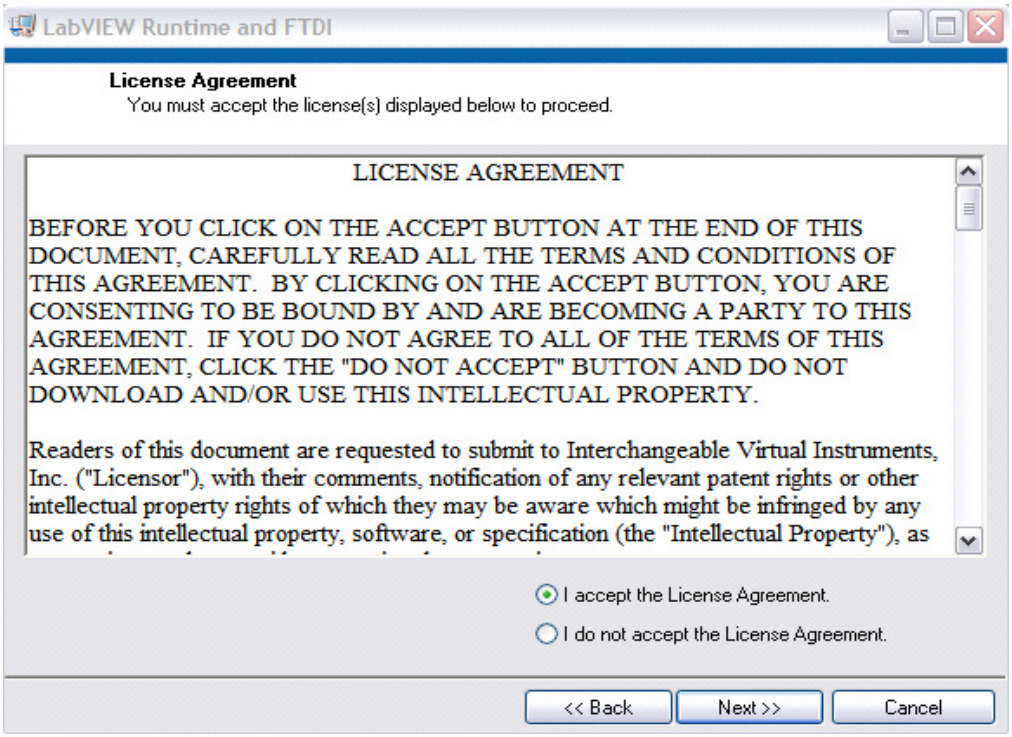


IMPORTANT

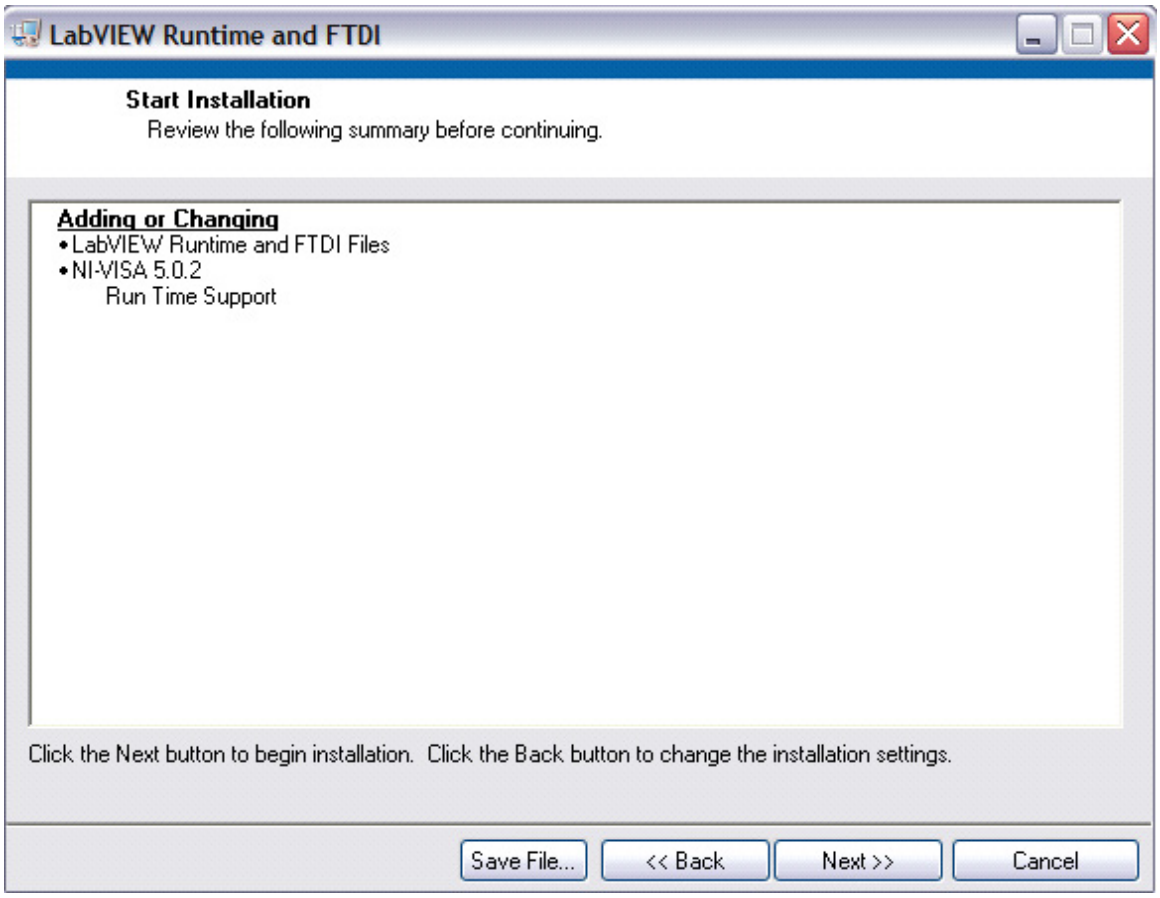
To avoid possible application errors, it is recommended to use all default locations.

12. Select I accept the License Agreement and select Next. There are two License Agreements that you must accept.

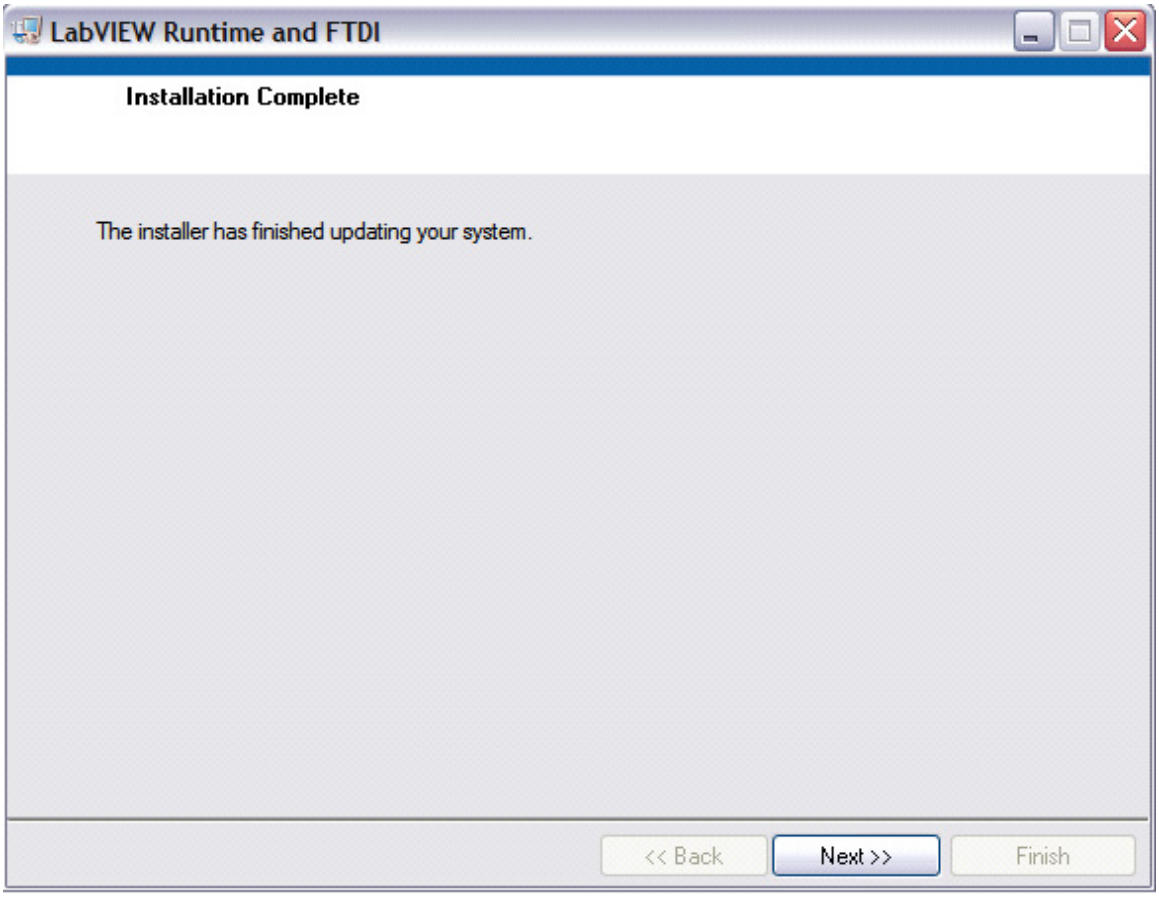




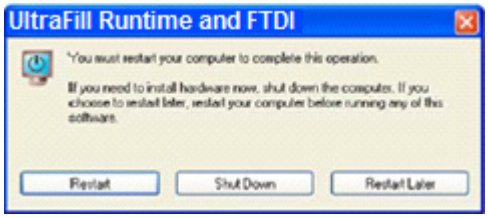
13. Select Next to begin the installation.



14. When the installation is complete, select Finish.

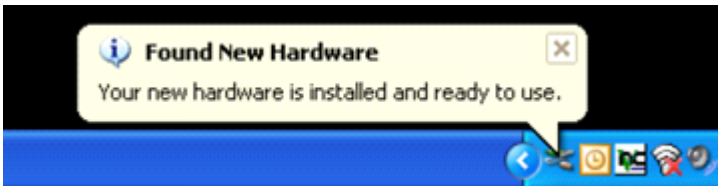


15. When you reach the following screen, ensure all programs have completed installation. Then, select Restart.



16. After restart, attach the Oxygen Interface Hardware Kit to the PC using the USB cable.

17. Once the computer has restarted, the first time this device is introduced to a PC, you will see a succession of four pop-up windows in the task bar area. Wait for the USB device to be recognized.



18. Select START. Right click on My Computer Icon and select Manage.
19. From the Device Manager, open the Ports (Comm & LPT) option and find your USB Serial Port assigned to the FTDI box. Make a note of the port number for future use in the application.

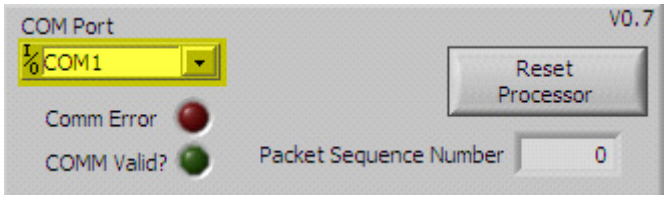
10.5 UltraFill Communication Hardware Setup Procedure

CAUTION
The following procedure must be completed in the following order.

1. If the PC is ON, power OFF the PC.

2. Connect USB to O2 Interface Module with O2 Interface Module switch in No Programming position.

3. Power ON PC.
4. Open the Service Viewer Application.
5. Assign Com Port.
   a. Click on START.
   b. Right click on the My Computer icon.
   c. Select Manage.
   d. Left click on Device Manager.
   e. Click on the “+” sign to expand Ports (COM & LPT).
   f. Note USB Serial Port # and enter in highlighted box shown below.

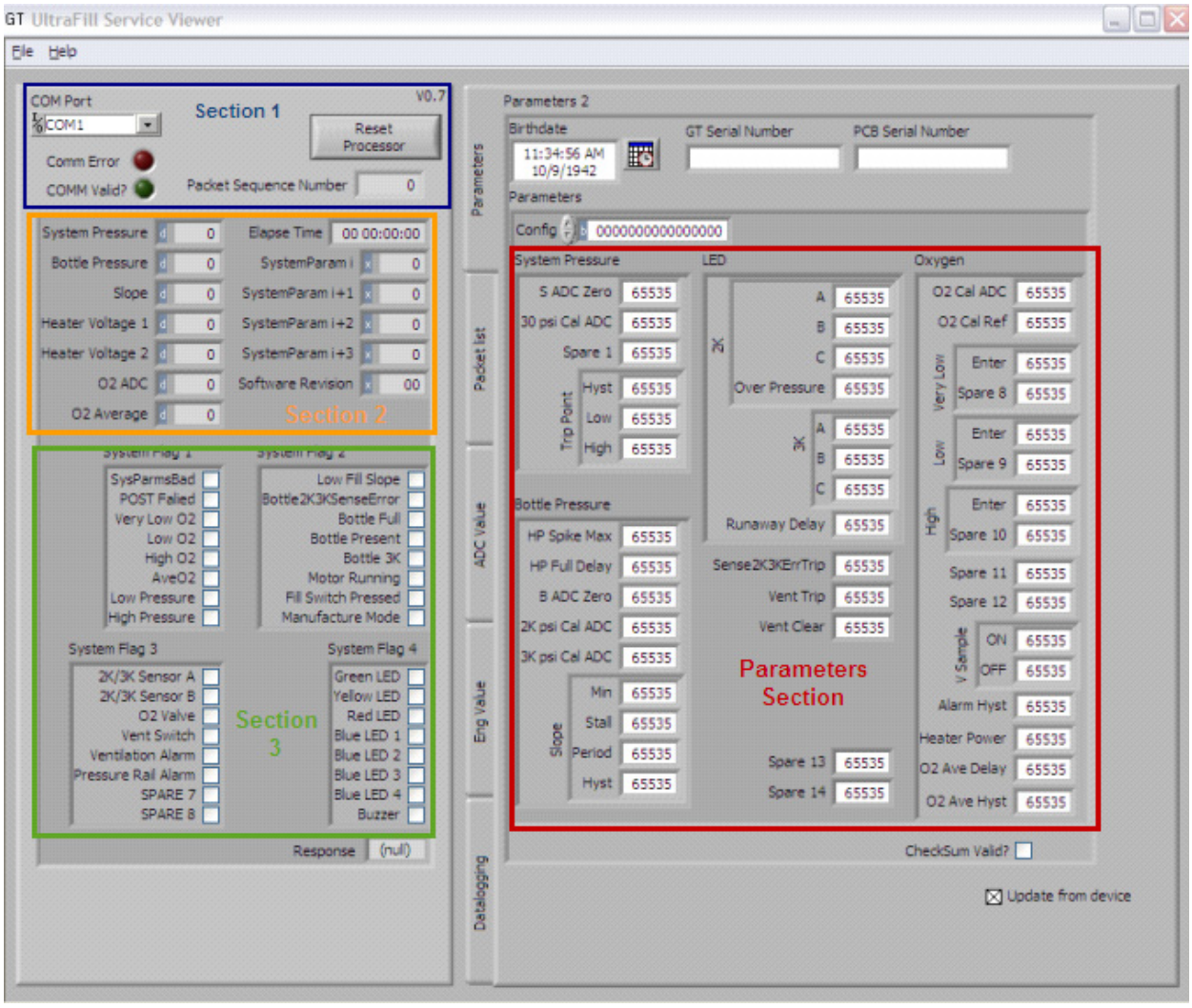


6. Connect DIN7 cable to O2 Interface Module and to the UltraFill.
7. Connect Concentrator to UltraFill via the transfill tube.
8. Power ON the concentrator.
9. Power ON the UltraFill.

10.6 SERVICE VIEWER SCREEN OVERVIEW

NOTE

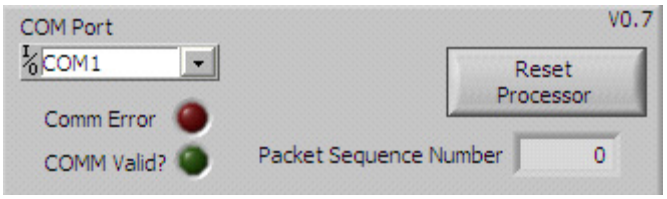
The parameters section (Red Box) is referenced by sections 1, 2, and 3 definitions.



NOTE

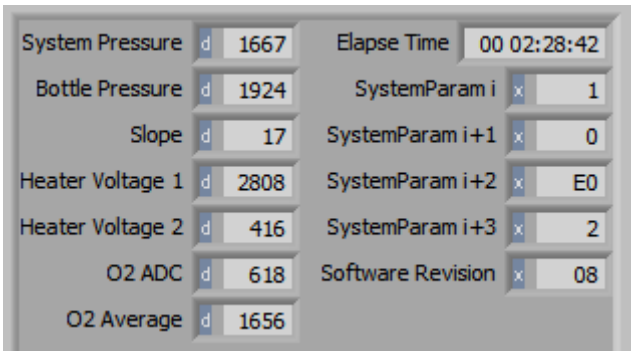
ADC = Analog to Digital Conversion

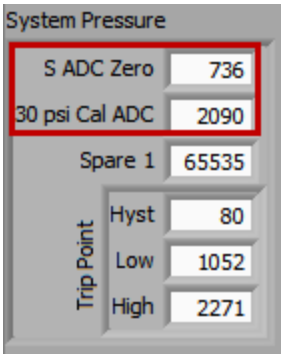
10.6.1 SECTION 1 SCREEN OVERVIEW

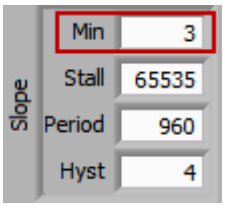
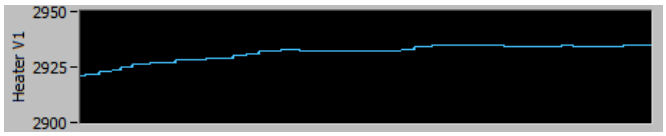
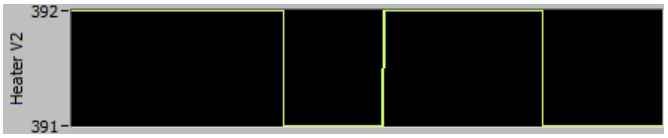
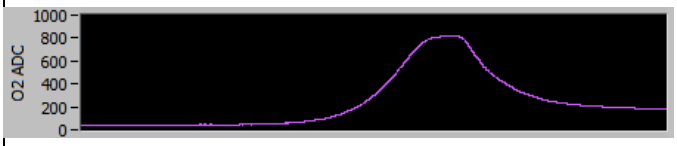


INDICATOR / BUTTON	DEFINITION / TOLERANCE	ACTION
COM Port	*PC communication port used for data transfer to and from the UltraFill device*	*Adjusted to the USB Serial Port number.*
Comm Error LED	*Illuminates RED to indicate no communication between the viewer and the UltraFill device.*	*If illuminated, check USB and DIN connections on the communication module.*
COM Valid?	*Illuminates GREEN to indicate proper communication attained between the viewer and the UltraFill device.*	*If not illuminated, repeat the steps in the UltraFill communication hardware setup procedure.*
Reset Processor Button	*Power reset.*	*When depressed, cycles the device's power.*
Packet Sequence Number	*Not used.*	*Not used.*

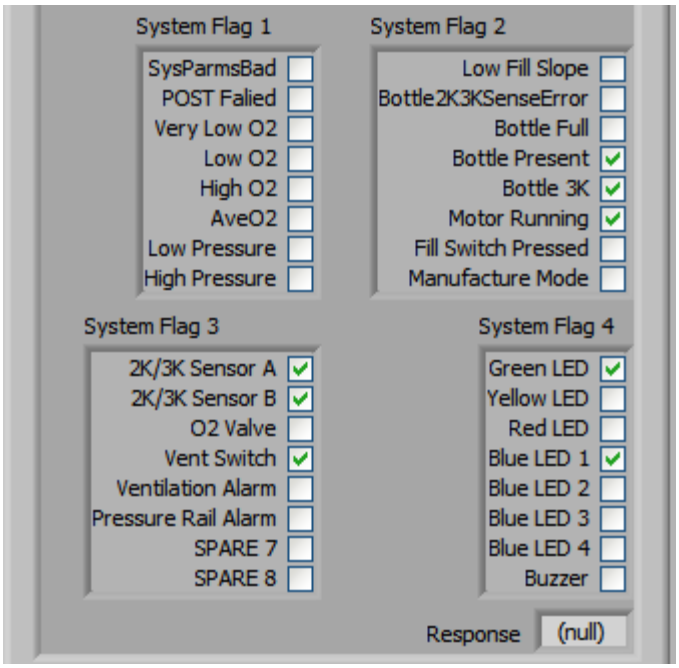
10.6.2 SECTION 2 SCREEN OVERVIEW



INDICATOR / BUTTON	DEFINITION / TOLERANCE	ACTION
System Pressure	*Displayed ADC input pressure from the oxygen concentrator.* *Raw ADC Value should stay between the 0 psi calibration value and the 30 psi calibration value shown in the system parameters.*  *Parameters Section Screen Reference*  	*If not within the calibration values, replace the PCA.*
Bottle Pressure	*Real time ADC value of internal bottle pressure as the bottle is filling.* *NOTE: The UltraFill must be filling a bottle for this parameter to be valid.*	*ADC bottle pressure should increase steadily as the bottle is filling. If not, check for leaks and compressor operation.*

INDICATOR / BUTTON	DEFINITION / TOLERANCE	ACTION
Slope	*A number describing the rate the pressure in the bottle is rising. The lowest acceptable value is 3.* 	*If below 3, check for internal/bottle leaks.*
Heater Voltage 1	*Only displays when the compressor is operational. The value should be 3000 +/- 300 after the 5 minute warm up period.* 	*If not within tolerance, replace the PCA.*
Heater Voltage 2	*Only displays when the compressor is operational. The value should be 400 +/- 100 after the 5 minute warm up period.* 	*If not within tolerance, replace the PCA.*
O_2 ADC	*Should rise to form a "hump" every 80 seconds after the compressor has started and the O_2 warm up period (five minutes) has finished.* 	*If not within tolerance, replace the PCA.*
O_2 ADC Average	*Tracks the average of the peaks for the O_2 ADC value.* 	*No action required.*
Elapsed Time	*Amount of time the device has been powered on.*	*No action required.*
System Param i - i+3	*Not used.*	*Not used.*
Software Revision	*NA*	*NA*

10.6.3 SECTION 3 OVERVIEW OF SYSTEM FLAGS



INDICATOR	DEFINITION / TOLERANCE	ACTION
SysParmsBad	*Error in the system parameters*	*If checked, replace the PCA.*
POST Failed	*Error within the micro controller*	*Contact Product Support 800-345-6443.*
Very Low O_2	*O_2 sensor broken or O_2 flow not reaching sensor.*	*Check/replace PCA. Check the quality of O_2 from the concentrator. Repair/replace the concentrator.*
Low O_2	*Indicates instantaneous O_2 < 90%.*	*Check/replace PCA. Check the quality of O_2 from the concentrator. Repair/replace the concentrator.*
High O_2	*O_2 sensor is broken or not calibrated.*	*Check/replace PCA. After PCA replacement final test procedure must be run again.*

INDICATOR	DEFINITION / TOLERANCE	ACTION
Ave O_2	*Indicates that the average O_2 to the bottle is below 90%.*	*Check/replace PCA. Check the quality of O_2 from the concentrator. Repair/replace the concentrator.*
Low Pressure	*Indicates that the O_2 pressure from the concentrator is < 7 psi.*	*Check concentrator to UltraFIll pressure. If < 7 psi, repair/replace concentrator. If > 7 psi, replace the UltraFill PCA.*
High Pressure	*Indicates O_2 pressure from the concentrator is > 34 psi.*	*Check concentrator to UltraFill pressure. If > 34 psi, repair/replace concentrator. If < 34 psi, replace the UltraFill PCA.*
Low Fill Slope	*Indicates the fill rate of the bottle is lower than alarm threshold.*	*Check for internal leaks. Check/replace compressor. Check/replace motor.*
Bottle 2K3KSenseError	*Indicates that the hall effect sensors are not functioning correctly.*	*Replace the coupler.*
Bottle Full	*Indicates that the high pressure sensor is showing a full bottle.*	*If this condition does not occur after the predetermined amount of time to fill the attached bottle, check for leaks either internally or on the bottle post valve.*
Bottle Present	*Indicates that the switch for bottle sensing has detected a bottle fitted to the device.*	*If this condition does not occur after the bottle is attached, check/replace the coupler.*
Bottle 3K	*Indicates a 3000 psi bottle is attached to the device. If not checked, a 2000 psi bottle is attached.*	*If this condition does not occur after a 3k bottle is attached, check/replace the coupler.*
Motor Running	*Indicates that the high pressure compressor motor is running.*	*If this condition does not occur when a less than full bottle is attached and the stop/start motor button is pressed, check/replace the motor.*

INDICATOR	DEFINITION / TOLERANCE	ACTION
Fill Switch Pressed	*Indicates that the fill start/stop switch is depressed.*	*If this condition does not occur when the fill switch is depressed, replace the PCA.*
Manufacture Mode	*Not used.*	*Not used.*
2K/3K Sensor A	*Indicates that hall effect sensor A detects a 3K bottle.*	*If this condition does not occur when a 3k bottle is attached, check/replace the coupler and/or PCA.*
2K/3K Sensor B	*Indicates that hall effect sensor B detects a 3k bottle.*	*If this condition does not occur when a 3k bottle is attached, check/replace the coupler and/or PCA.*
O_2 Valve	*Indicates that the 3 way valve on the PCA is active.*	*If this condition does not occur when the 3 way valve is active, replace the PCA.*
Vent Switch	*Indicates that the fan switch is closed and the cooling fan is ON.*	*If this condition does not occur when the fan switch is closed, check/replace the fan switch.*
Ventilation Alarm	*Indicates that the fan switch is NOT closed and the device is turned ON.*	*Check/replace the fan and or fan switch.*
Pressure Rail Alarm	*High pressure sensor is beyond reasonable boundaries. Pressure sensor has likely failed.*	*Replace the PCA.*
Spare 7	*Motor stall flag. The bottle pressure sensor detects falling pressure when it should be rising.*	*Check/replace the compressor motor and compressor. Check for internal/bottle leaks.*
Spare 8	*Runaway motor flag. The bottle pressure is rising when it shouldn't be, or it has exceeded its limits.*	*Check/replace the PCA. Check/replace the compressor. Check/replace the compressor motor.*
Green LED	*Indicates the LED is lit*	*NA*
Yellow LED	*Indicates the LED is lit*	*NA*
Red LED	*Indicates the LED is lit*	*NA*
Blue LED 1	*Indicates the LED is lit*	*NA*
Blue LED 2	*Indicates the LED is lit*	*NA*

INDICATOR	DEFINITION / TOLERANCE	ACTION
Blue LED 3	*Indicates the LED is lit*	*NA*
BLue LED 4	*Indicates the LED is lit*	*NA*
Buzzer	*Indicates the buzzer is powered*	*NA*
Response	*Not used.*	*Not used.*

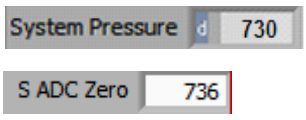
10.7 RUN-IN PROCEDURE

1. Attach a transfill capable stationary oxygen concentrator to the UltraFill via the transfill tube.
2. Power ON the stationary oxygen concentrator and the UltraFill.
3. Attach an ME36 cylinder to the UltraFill and depress the Start/Stop Fill push button to start filling.
4. After approximately 8 hours, the cylinder should be full and all 4 blue LED's should be lit steadily.
   a. If the cylinder does not show full, remove the cylinder from the device and test the UltraFill and Cylinder Post Valve for leaks.
   b. After repair, reconnect the ME36 cylinder and continue the fill process.
5. Remove the ME36 cylinder from the UltraFill.
6. Power OFF the UltraFill and transfill capable stationary oxygen concentrator and disconnect the Transfill Tube from both devices.

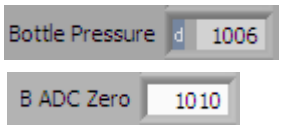
10.8 FINAL TEST PROCEDURE

1. With the UltraFill OFF, attach the O2 Hardware Interface Kit to the PC and ensure that the UltraFill Diagnostic Software Tool is running.
2. Attach the miniDIN7 Com cable to the UltraFill.
3. Power ON the oxygen concentrator making sure that the transfill tube is disconnected from the UltraFill and there is no bottle connected to the UltraFill.
4. Power ON the UltraFill.
5. The alarm, all LEDs including BLUE LEDs should activate for ~2 seconds. After ~2 seconds only the GREEN LED should be active.
6. Low input pressure alarm should begin after 30 seconds represented by a flashing yellow indicator and a pulsed tone.

7. On the Diagnostic Tool, examine the System Parameters and make sure they are reasonable.
   a. Verify System Pressure is S ADC Zero +/- 50.

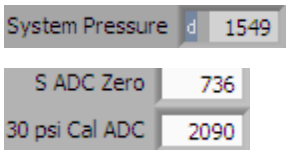


b. Discharge any pressure in the UltraFill by depressing the fill coupler valve pin. Then Verify Bottle Pressure is B ADC Zero +/- 75.



c. Attach input pressure by attaching a transfill ready concentrator to the UltraFill via the Transfill Tube.

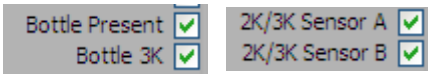
8. The low input pressure alarm should subside
9. Verify that the System Pressure signal is within its normal range. The System Pressure value should be between the values for “S ADC Zero” and “30 psi Cal ADC”.



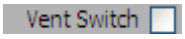
10. Verify that with no bottle connected the “Bottle Present”, “Bottle3K”, “2k/3k Sensor A”, and “2k/3k Sensor B” boxes are not checked.

11. Connect a 2000 psi bottle and verify that the “Bottle Present” box becomes checked.

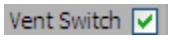
12. Connect a 3000 psi bottle and verify that the “Bottle Present”, “Bottle3K”, “2k/3k Sensor A”, and “2k/3k Sensor B” boxes become checked.



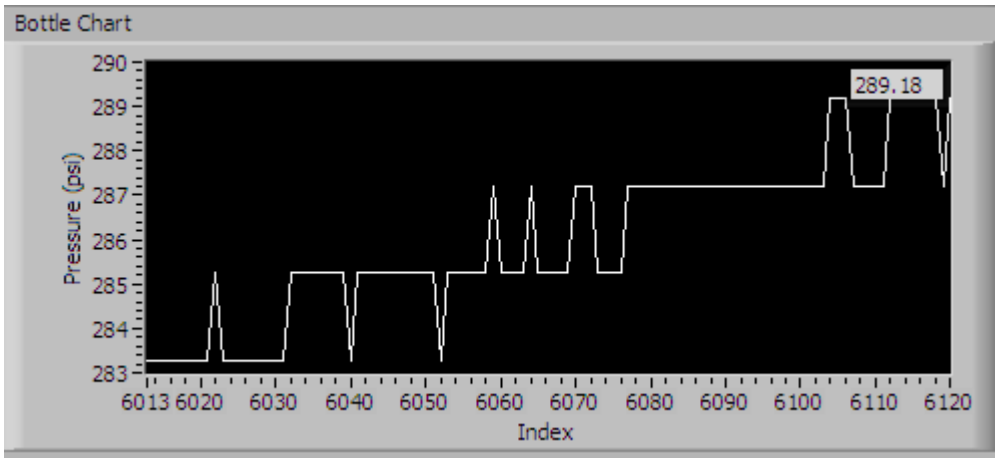
13. Cover the Ultrafill vent with a piece of paper and verify that the “Vent Switch” box becomes unchecked.



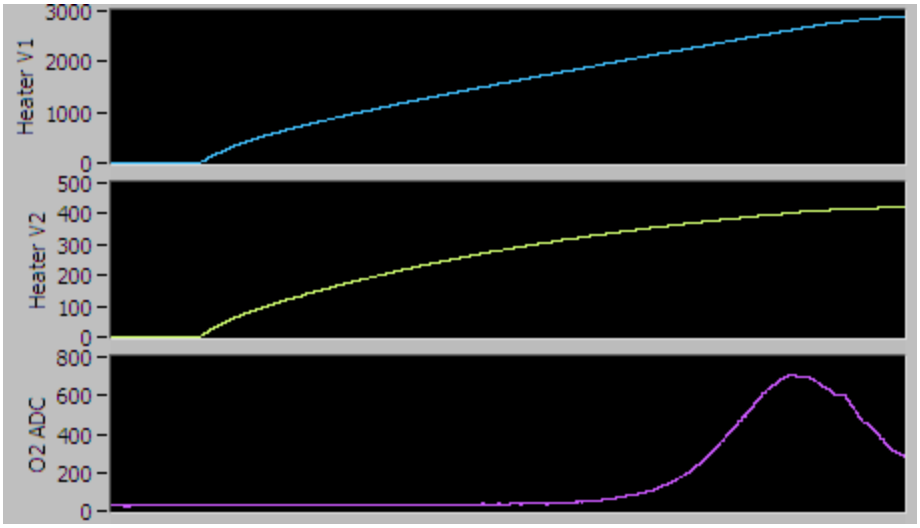
14. Remove the piece of paper and verify that the box becomes checked again within a few seconds.



15. Press the start fill button.
    a. Using a full 3000 psi bottle: (This will allow the ability to find problems with the compressor in 30 seconds instead of 1.5 hours.) The pressure should quickly reach 3000 psi. The unit stops and sets the “Bottle Full” flag in the Diagnostic Tool. This proves that the compressor is capable of making 3000 psi.
    b. Using an empty MB08 3000 psi bottle: Observe Bottle Chart located under the Eng Value tab. Pressure should increase steadily to 3000 psi. If pressure remains constant at any value below 3000 psi or a Low Filling Slope alarm occurs, check for internal leak or compressor failure.



c. Observe ADC Value charts located under the ACD Value tab. Soon after start Heater V1 will peak between 2500 – 3000. Heater V2 will peak between 300–400. O2 ADC will also reach a peak after V1 and V2 peak.



16. Observe % O2 Chart located under the Eng Value tab. O2 purity should periodically rise above 90%.
17. Unit stops filling at 3000 psi with no alarms.

10.9 ULTRAFILL FINAL TEST DATA SHEET

NOTE

All information on this data sheet should be entered in the correct location after the associated test was completed. The data sheet must then be signed in ink and dated by the technician performing tests. Enter NA in all unused test boxes.

Serial Number: _____ *Model Number:* _____

Step 5			*Step 12*		
Alarm, LEDs displayed appropriately?	*PASS*	*FAIL*	*Bottle present Bottle 3K Bottle 2K/3K A Bottle 2K/3K B checked?*	*PASS*	*FAIL*
Step 6			*Step 13*		
Low pressure alarm displayed appropriately?	*PASS*	*FAIL*	*Vent switch box unchecked?*	*PASS*	*FAIL*
Step 7a			*Step 14*		
System pressure is S ADC Zero +/- 50?	*PASS*	*FAIL*	*Vent switch box checked?*	*PASS*	*FAIL*
Step 7 b			*Step 15 a*		
Bottle pressure is B ADC Zero +/- 75?	*PASS*	*FAIL*	*Pressure steadily increased to 3000 psi?*	*PASS*	*FAIL*
Step 8			*Step 15 b*		
Low input pressure alarm subsided?	*PASS*	*FAIL*	*Heaters V!, V2, and O_2 ADC peaked properly?*	*PASS*	*FAIL*
Step 9			*Step 16*		
System pressure signal within normal range?	*PASS*	*FAIL*	*O_2 purity periodically rose abovce 90%?*	*PASS*	*FAIL*
Step 10			*Step 17*		
Bottle present Bottle 3K 2K/3K A 2K/3KB Not Checked?	*PASS*	*FAIL*	*UNit stopped filling at 3000 psi?*	*PASS*	*FAIL*
Step 11					
Bottle present checked?	*PASS*	*FAIL*			

Printed Name: _____ *Signature:* _____ *Date:*_____

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CHAPTER 11: TOOLS AND EQUIPMENT

11.0 CHAPTER OVERVIEW

This chapter details the necessary hand tools and supplies for troubleshooting, testing, and repairing the UltraFill System.

11.1 COMMON HAND TOOLS

- Antistatic, Electro-Static Discharge (ESD)-protected work station - minimum requirement is a grounded mat and wrist strap
- #1 Phillips Head Screwdriver
- #2 Phillips Head Screwdriver
- 5/16” Hex Head Bit
- 3/8” Ratchet
- 1/2” Socket x 3/8” Drive
- 7/16” Socket x 3/8” Drive
- 7/64” Allen
- Needle Nose Pliers
- 8 in-lbs Torque Driver
- 5/8” Box Wrench
- Crimping Clamp Tool (Philips Respironics Part Number H645)

11.2 EQUIPMENT

- EverFlo Transfill Oxygen Concentrator / Millennium (5L/10L) Transfill Oxygen Concentrator

11.3 SUPPLIES

- Transfer Tube (Philips Respironics Part Number: 1065696)

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CHAPTER 12: SCHEMATICS

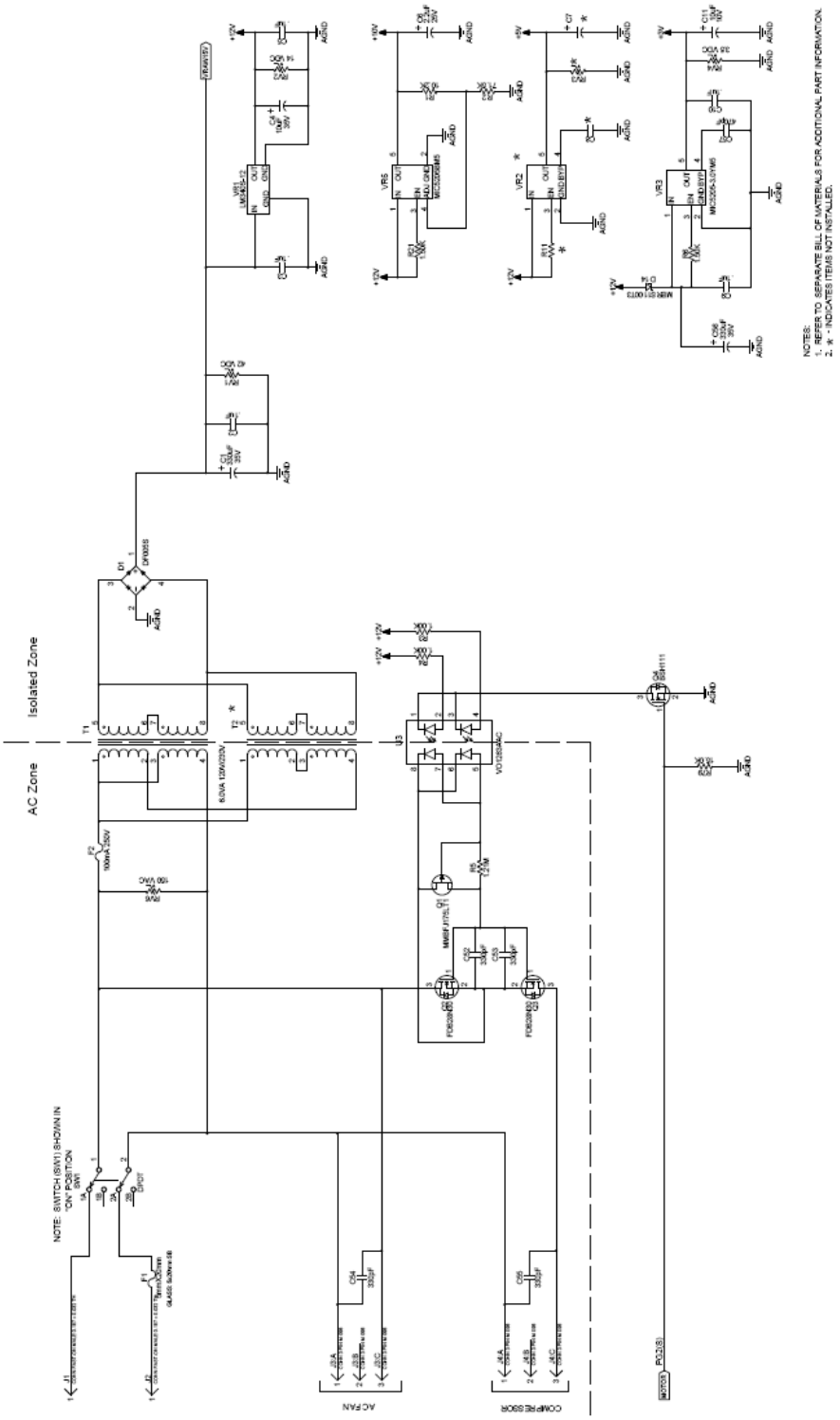
12.0 SCHEMATICS STATEMENT

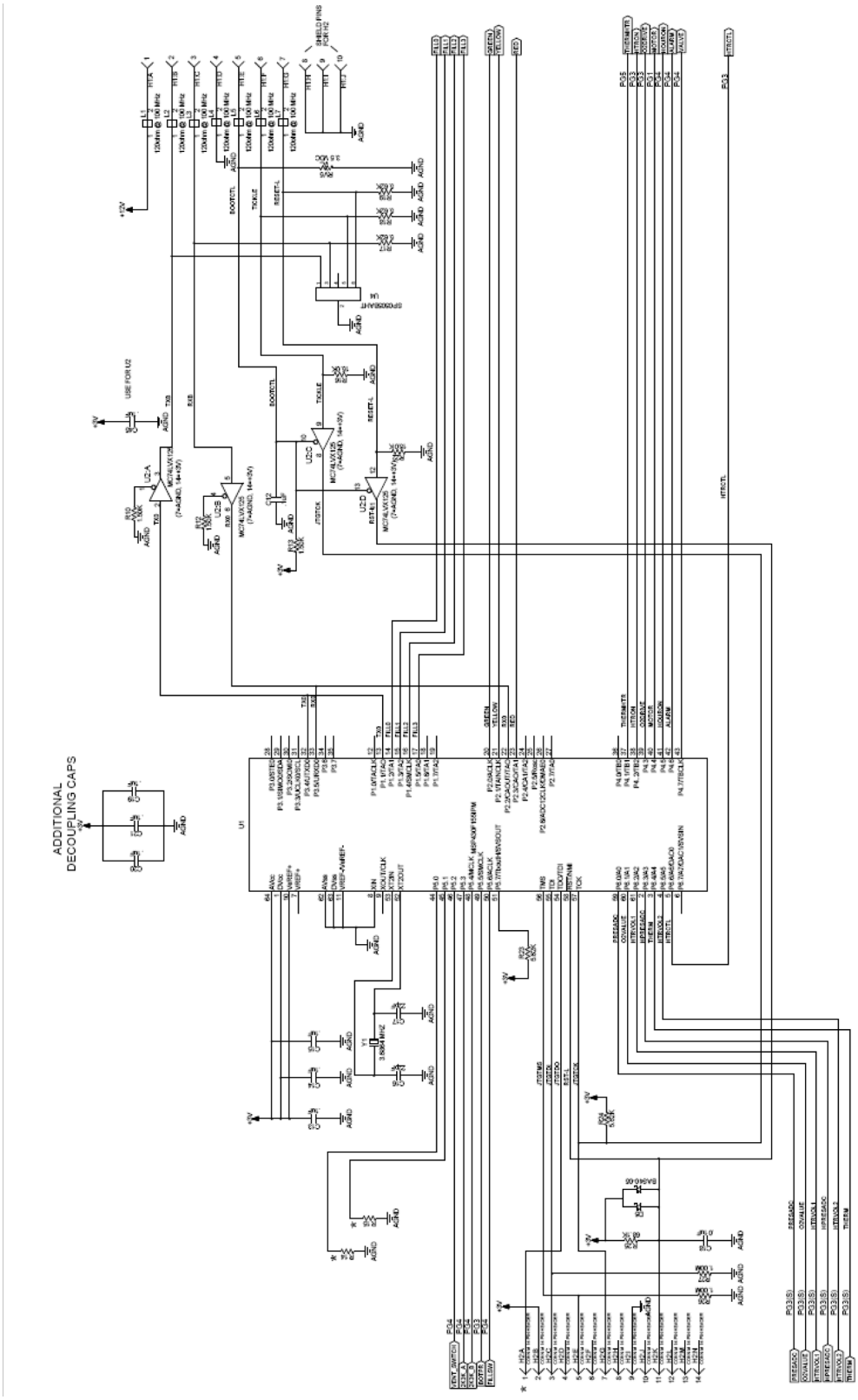
Schematics are supplied with this manual in direct support of the sale and purchase of this product.

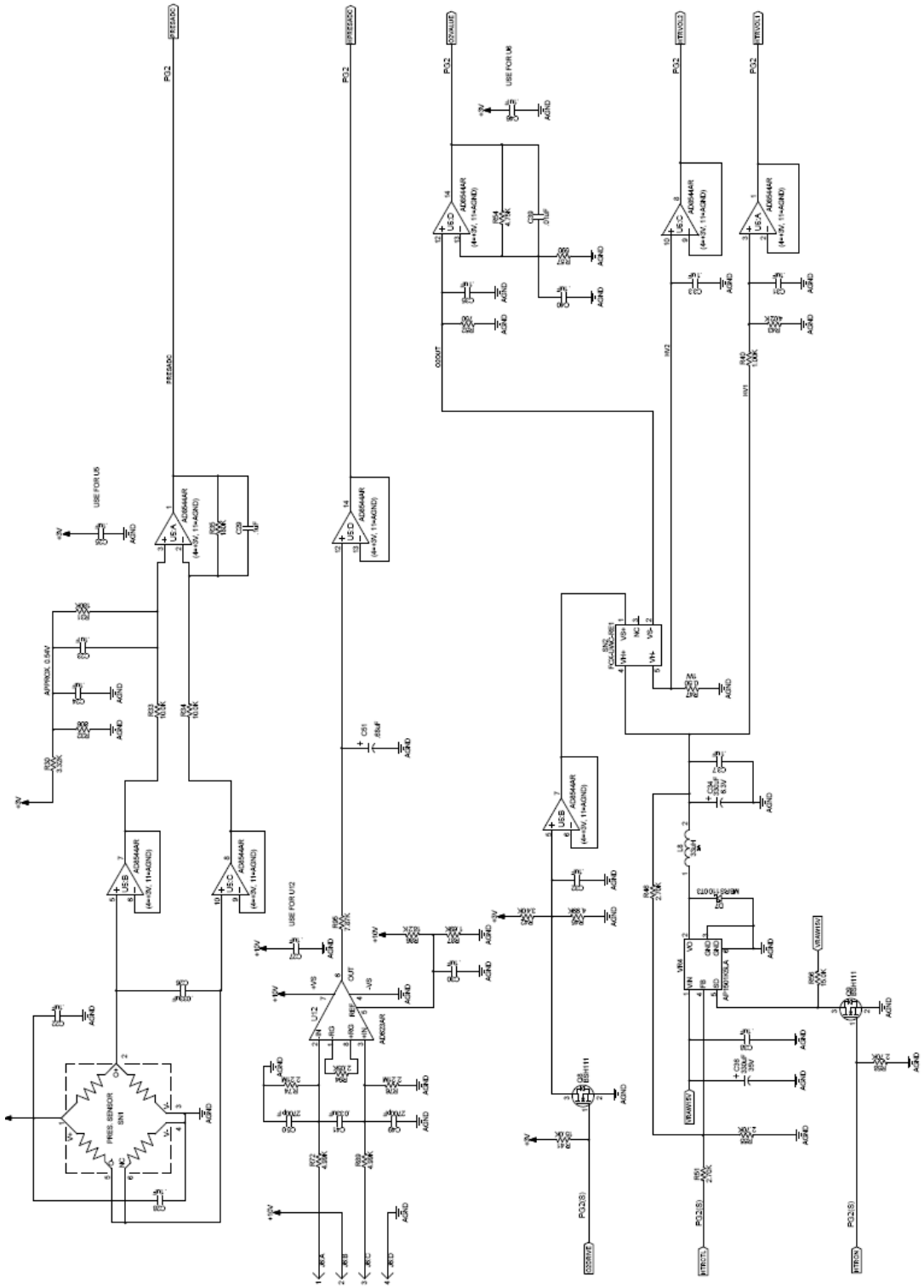
The schematics are proprietary and confidential. Do not copy the schematics or disclose them to third parties beyond the purpose for which they are intended. Patents are pending.

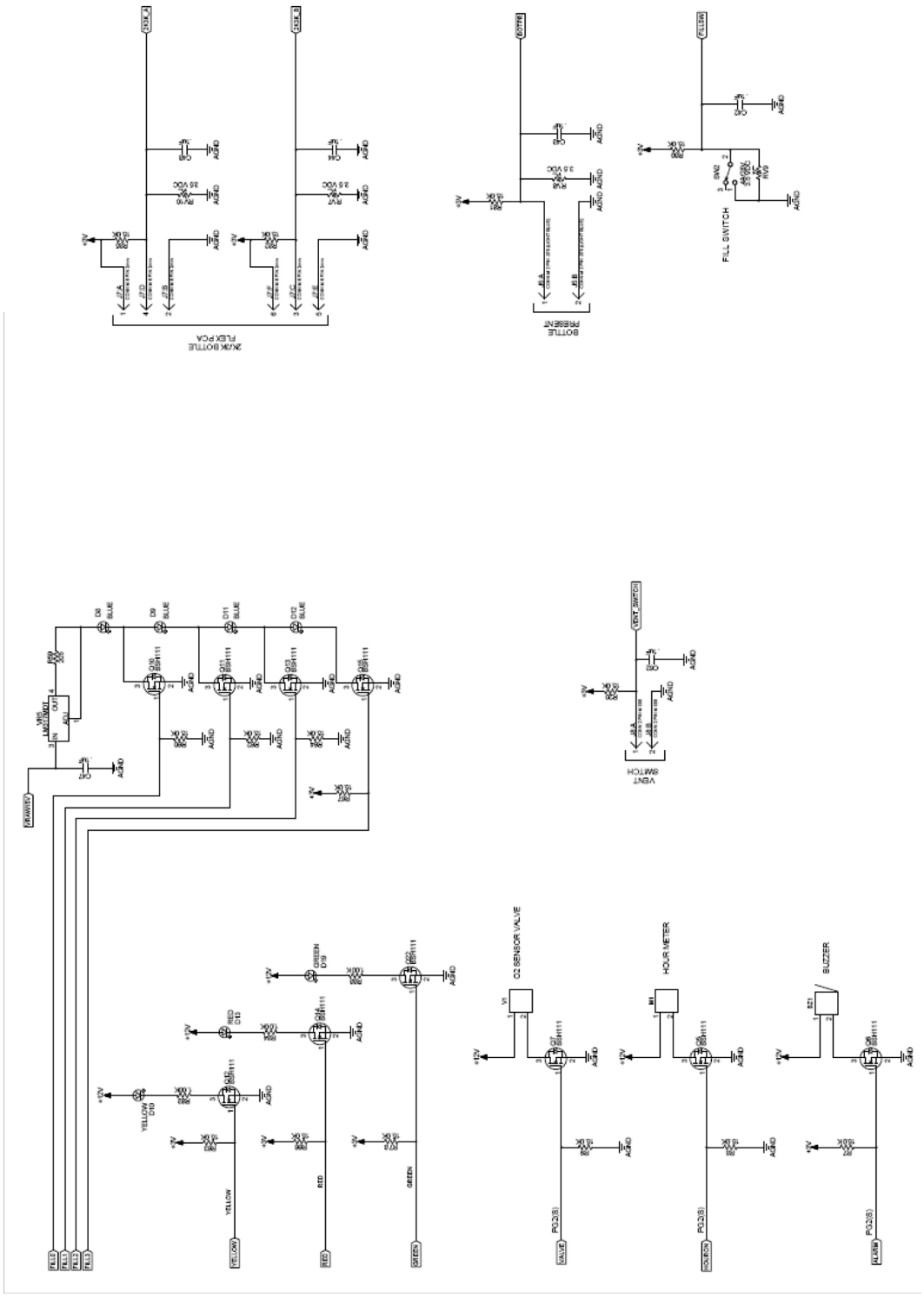
The schematics are intended to satisfy administrative requirements only. They are not intended to be used for component level testing and repair. Any changes of components could effect the reliability of the device, prohibit lot tracking of electronic components, and void warranties. Repairs and testing are supported only at the complete board level.

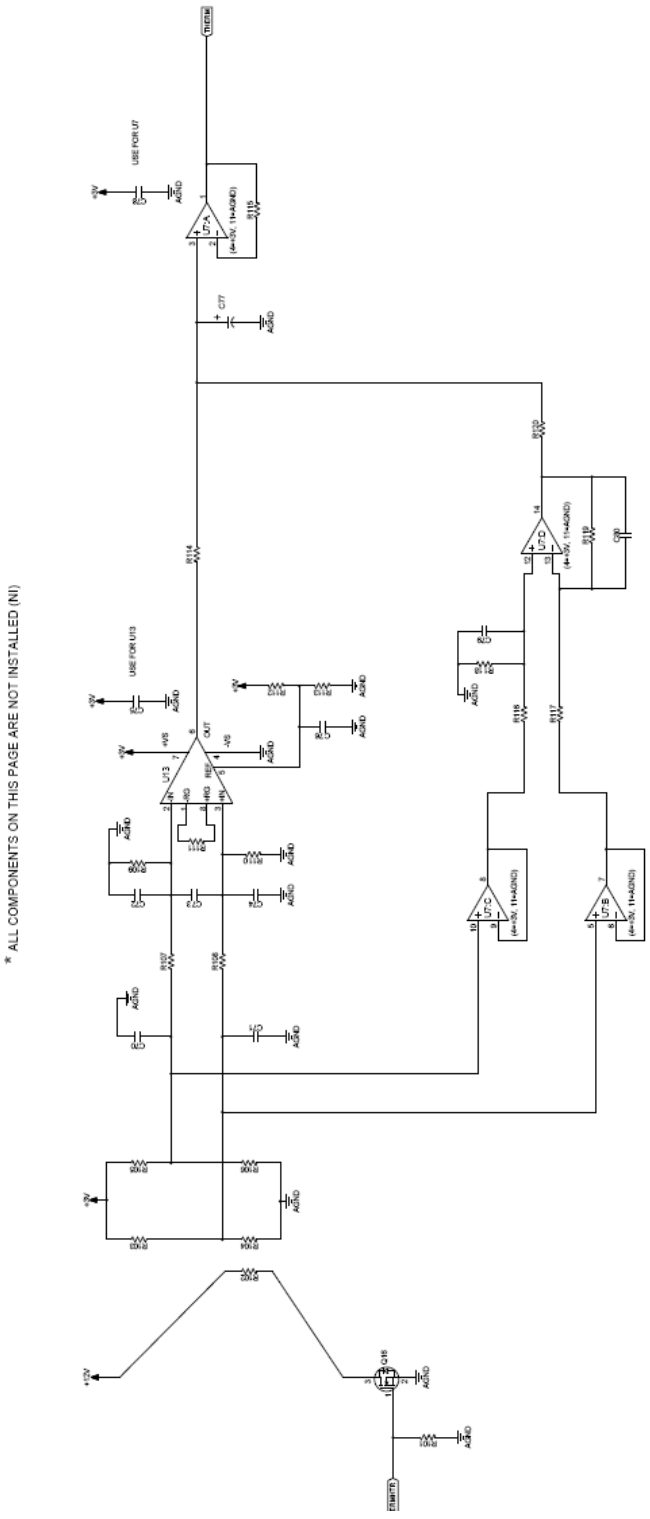
The schematics are of the revision level in effect at the time this manual was last revised. New revisions may or may not be distributed in the future.


Isolated Zone
AC Zone
NOTES:
1. REFER TO SEPARATE BILL OF MATERIALS FOR ADDITIONAL PART INFORMATION.
2. # - INDICATES ITEMS NOT INSTALLED.
NOTE: SWITCH (SW1) SHOWN IN "ON" POSITION
AC FAN
COMPRESSOR






2K/3K BOTTLE FLEX PCA
BOTTLE PRESENT
FILL SWITCH
VENT SWITCH
O2 SENSOR VALVE
HOUR METER
BUZZER


* ALL COMPONENTS ON THIS PAGE ARE NOT INSTALLED (NI)

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CE 0123

1069605, R0
BRM 2/9/2010