Versa-Matic

Service & Operating Manual

Original Instructions

3" Clamped Metallic Hazardous Service Ball Valve

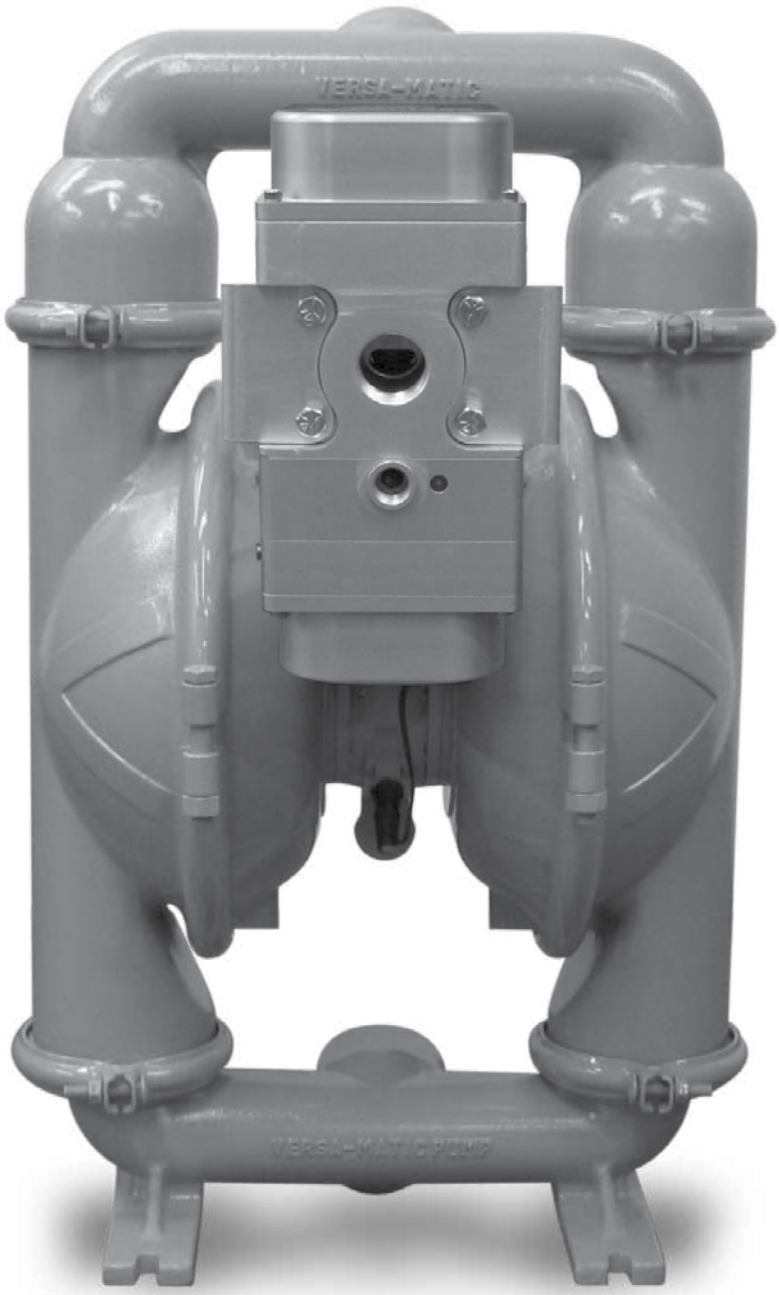
AirVantage™ Energy Saving Technology

RE3

RE3 Metallic Pumps

- Aluminum
- Stainless Steel
- Hastelloy C

0518



VERSA-MATIC®

1: PUMP SPECS

2: INSTAL & OP

3: EXP VIEW

4: WARRANTY

VERSA-MATIC® • Warren Rupp, Inc. • A Unit of IDEX Corporation
800 North Main Street, Mansfield, OH 44902 USA • Phone: (419) 526-7296 • **www.versamatic.com**

Safety Information

⚠ IMPORTANT

Read the safety warnings and instructions in this manual before pump installation and start-up. Failure to comply with the recommendations stated in this manual could damage the pump and void factory warranty.

When the pump is used for materials that tend to settle out or solidify, the pump should be flushed after each use to prevent damage. In freezing temperatures the pump should be completely drained between uses.

⚠ CAUTION

Before pump operation, inspect all fasteners for loosening caused by gasket creep. Retighten loose fasteners to prevent leakage. Follow recommended torques stated in this manual.

Nonmetallic pumps and plastic components are not UV stabilized. Ultraviolet radiation can damage these parts and negatively affect material properties. Do not expose to UV light for extended periods of time.

<u>WARNING</u>
Pump not designed, tested or certified to be powered by compressed natural gas. Powering the pump with natural gas will void the warranty.

Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC. Contact your local waste recovery agency for a designated collection facility in your area.

2002/95/EC

None of the equipment supplied within the AirVantage unit either use of exceed the amounts stated above hazardous substances. A signed declaration from our supplier of the electronic/ electrical portion of the AirVantage unit will be held on file stating their adherence to the RoHS, 2002/95/EC regulation.

The enclosure is non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth."

⚠ WARNING

When used for toxic or aggressive fluids, the pump should always be flushed clean prior to disassembly.

Before maintenance or repair, shut off the compressed air line, bleed the pressure, and disconnect the air line from the pump. Be certain that approved eye protection and protective clothing are worn at all times. Failure to follow these recommendations may result in serious injury or death.

Airborne particles and loud noise hazards. Wear eye and ear protection.

In the event of diaphragm rupture, pumped material may enter the air end of the pump, and be discharged into the atmosphere. If pumping a product that is hazardous or toxic, the air exhaust must be piped to an appropriate area for safe containment.

Take action to prevent static sparking. Fire or explosion can result, especially when handling flammable liquids. The pump, piping, valves, containers and other miscellaneous equipment must be properly grounded.

This pump is pressurized internally with air pressure during operation. Make certain that all fasteners are in good condition and are reinstalled properly during reassembly.

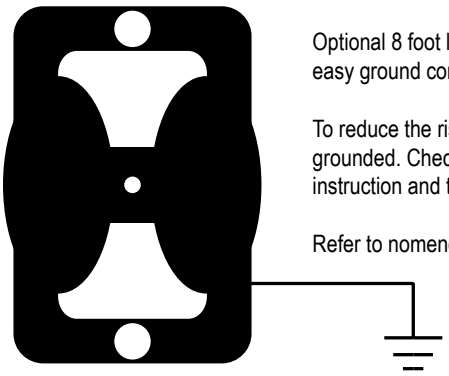
Use safe practices when lifting

Special Conditions for Safe Use:

- For the safe operation of the equipment, it is necessary for the air supply line to be in a safe area
- The cable entry hole should be fitted with a suitably certified cable gland
- For the safe operation of the equipment, the pneumatic pump should be grounded
- The enclosure is non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high pressure steam) which might cause a build-up of electrostatic charge on the non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.

Grounding the Pump

To be fully groundable, the pumps must be ATEX Compliant. Refer to the nomenclature page for ordering information.



Optional 8 foot long (244 centimeters) Ground Strap is available for easy ground connection.

To reduce the risk of static electrical sparking, this pump must be grounded. Check the local electrical code for detailed grounding instruction and the type of equipment required.

Refer to nomenclature page for ordering information.

⚠ WARNING

Take action to prevent static sparking. Fire or explosion can result, especially when handling flammable liquids. The pump, piping, valves, containers or other miscellaneous equipment must be grounded.

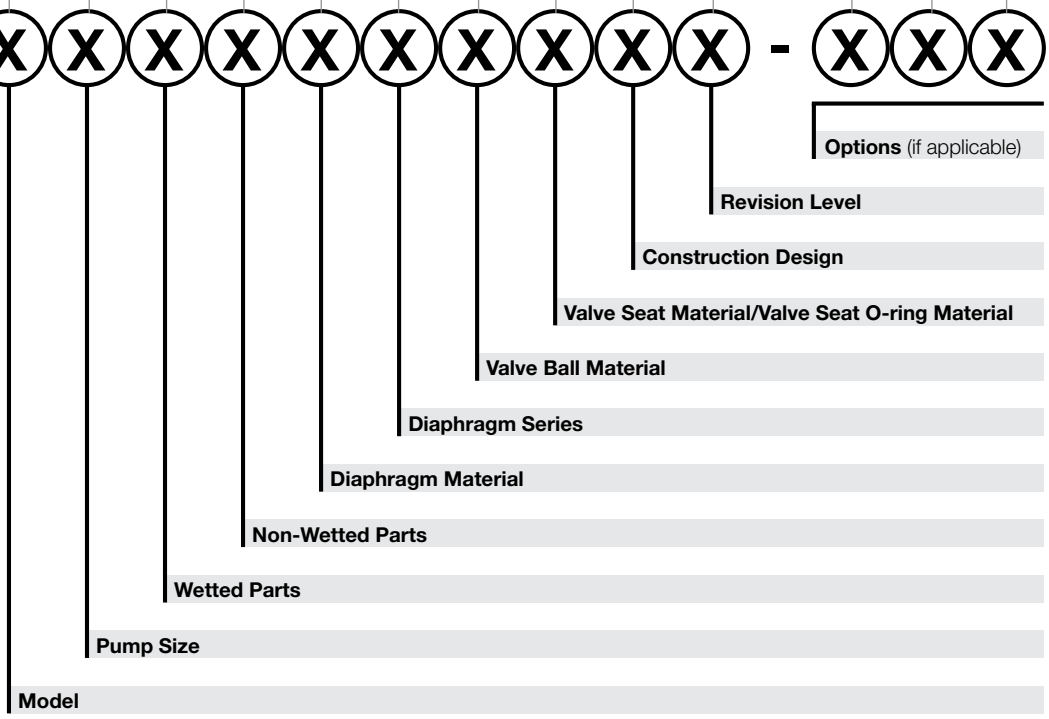
Table of Contents

Explanation of Pump Nomenclature

Your Serial #: *(fill in from pump nameplate)* _____

Your Model #:
(fill in from pump nameplate)

Model #: X X X X X X X X X X - X X X



Model
E Elima-Matic
U Ultra-Matic
V V-Series
RE AirVantage

Pump Size
6 1/4"
8 3/8"
5 1/2"
7 3/4"
1 1"
4 1-1/4" or 1-1/2"
2 2"
3 3"

Wetted Parts
A Aluminum
C Cast Iron
S Stainless Steel
H Alloy C
P Polypropylene
K Kynar
G Groundable Acetal
B Aluminum (screen mount)

Non-Wetted Parts
A Aluminum
S Stainless Steel
P Polypropylene
G Groundable Acetal
Z PTFE-coated Aluminum
J Nickel-plated Aluminum
C Cast Iron
Q Epoxy-Coated Aluminum

Diaphragm Material
1 Neoprene
2 Nitrile (Nitrile)
3 FKM (Fluorocarbon)
4 EPDM
5 PTFE
6 Santoprene XL
7 Hytrel
9 Geolast

Diaphragm Series
R Rugged
D Dome
X Thermo-Matic
T Tef-Matic (2-piece)
B Versa-Tuff (1-piece)
F FUSION (one-piece integrated plate)

Valve Ball Material Valve
1 Neoprene
2 Nitrile
3 (FKM) Fluorocarbon
4 EPDM
5 PTFE
6 Santoprene XL
7 Hytrel
8 Polyurethane
9 Geolast
A Acetal
S Stainless Steel

Seat/Valve Seat O-Ring Material
1 Neoprene
2 Nitrile
3 (FKM) Fluorocarbon
4 EPDM
5 PTFE
6 Santoprene XL
7 Hytrel
8 Polyurethane
9 Geolast
A Aluminum w/ PTFE O-Rings
S Stainless Steel w/ PTFE O-Rings
C Carbon Steel w/ PTFE O-Rings
H Alloy C w/ PTFE O-Rings
T PTFE Encapsulated Silicone O-Rings

Construction Design
9 Bolted
0 Clamped

Materials

Material Profile:	Operating Temperatures:	
⚠ *CAUTION! Operating temperature limitations are as follows:*	Max.	Min.
Conductive Acetal: Tough, impact resistant, ductile. Good abrasion resistance and low friction surface. Generally inert, with good chemical resistance except for strong acids and oxidizing agents.	190°F 88°C	-20°F -29°C
EPDM: Shows very good water and chemical resistance. Has poor resistance to oils and solvents, but is fair in ketones and alcohols.	280°F 138°C	-40°F -40°C
FKM: (Fluorocarbon) Shows good resistance to a wide range of oils and sovents; especially all aliphatic, aromatic and halogenated hydrocarbons, acids, animal and vegetable oils. Hot water or hot aqueous solutions (over 70°F) will attack FKM.	350°F 177°C	-40°F -40°C
Hytrel®: Good on acids, bases, amines and glycols at room temperatures only.	220°F 104°C	-20°F -29°C
Neoprene: All purpose. Resistance to vegetable oils. Generally not affected by moderate chemicals, fats, greases and many oils and solvents. Generally attacked by strong oxidizing acids, ketones, esters and nitro hydrocarbons and chlorinated aromatic hydrocarbons.	200°F 93°C	-10°F -23°C
Nitrile: General purpose, oil-resistant. Shows good solvent, oil, water and hydraulic fluid resistance. Should not be used with highly polar solvents like acetone and MEK, ozone, chlorinated hydrocarbons and nitro hydrocarbons.	190°F 88°C	-10°F -23°C
Nylon: 6/6 High strength and toughness over a wide temperature range. Moderate to good resistance to fuels, oils and chemicals.	180°F 82°C	32°F 0°C
Polypropylene: A thermoplastic polymer. Moderate tensile and flex strength. Resists stong acids and alkali. Attacked by chlorine, fuming nitric acid and other strong oxidizing agents.	180°F 82°C	32°F 0°C
PVDF: (Polyvinylidene Fluoride) A durable fluoroplastic with excellent chemical resistance. Excellent for UV applications. High tensile strength and impact resistance.	250°F 121°C	0°F -18°C
Santoprene®: Injection molded thermoplastic elastomer with no fabric layer. Long mechanical flex life. Excellent abrasion resistance.	275°F 135°C	-40°F -40°C
UHMW PE: A thermoplastic that is highly resistant to a broad range of chemicals. Exhibits outstanding abrasion and impact resistance, along with environmental stress-cracking resistance.	180°F 82°C	-35°F -37°C
Urethane: Shows good resistance to abrasives. Has poor resistance to most solvents and oils.	150°F 66°C	32°F 0°C
Virgin PTFE: (PFA/TFE) Chemically inert, virtually impervious. Very few chemicals are known to chemically react with PTFE; molten alkali metals, turbulent liquid or gaseous fluorine and a few fluoro-chemicals such as chlorine trifluoride or oxygen difluoride which readily liberate free fluorine at elevated temperatures.	220°F 104°C	-35°F -37°C

Maximum and Minimum Temperatures are the limits for which these materials can be operated. Temperatures coupled with pressure affect the longevity of diaphragm pump components. Maximum life should not be expected at the extreme limits of the temperature ranges.

Metals:

Alloy C: Equal to ASTM494 CW-12M-1 specification for nickel and nickel alloy.

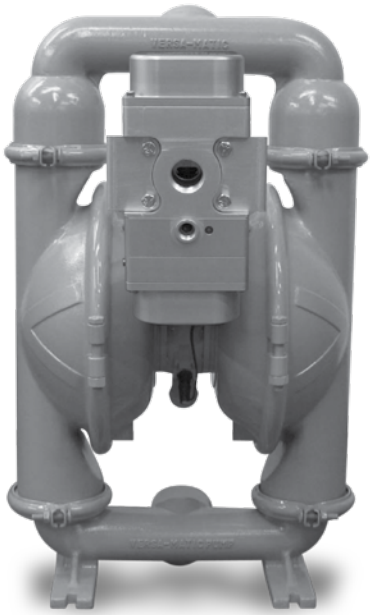
Stainless Steel: Equal to or exceeding ASTM specification A743 CF-8M for corrosion resistant iron chromium, iron chromium nickel and nickel based alloy castings for general applicaitons. Commonly referred to as 316 Stainless Steel in the pump industry.

For specific applications, always consult the Chemical Resistance Chart.

Performance

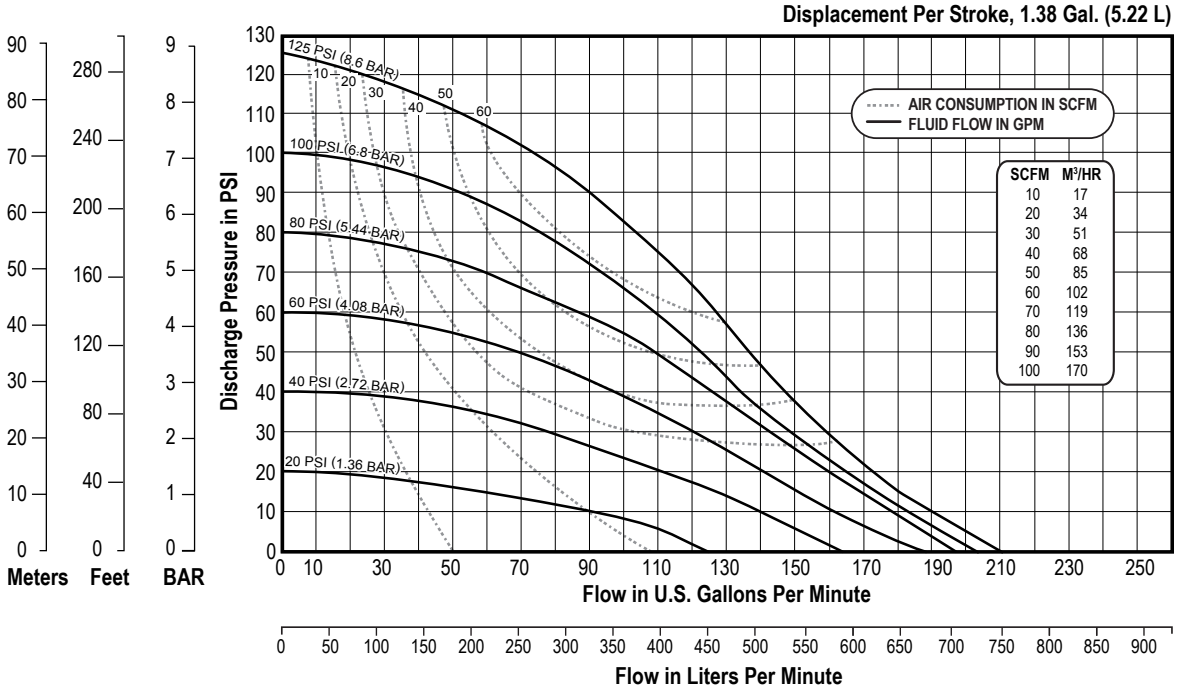
RE3 Clamped

Flow Rate
Adjustable to . . . . . 0-210 gpm (795 lpm)
Port Size
Suction . . . . . .3" NPT (BSP)
Discharge . . . . . .3" NPT (BSP)
Air Inlet . . . . . 1" NPT
Air Exhaust . . . . . 1" NPT
Suction Lift
Dry . . . . . .20' (6.10 m)
Wet . . . . . .25' (7.62 m)
Suction Lift (PTFE)
Dry . . . . . .10' (3.05 m)
Wet . . . . . .20' (6.10 m)
Max Solid Size (Diameter)
. . . . . .0.75" (19.1 mm)
Max Noise Level . . . . . 92 dB(A)
Shipping Weights
Aluminum . . . . . .120 lbs (54.6 kg)
Stainless Steel . . . . . .215 lbs (97.7 kg)
Hastelloy C . . . . . .225 lbs (102.2 kg)
Cast Iron . . . . . .215 lbs (97.7 kg)



CAUTION: Do not exceed 125 psig (8.5 bar) air supply or liquid pressure.

NOTE: For RE3AA pumps fitted with PTFE diaphragms. Suction lift is reduced to 10' (3.05m) dry and 20' (6.10m) wet.

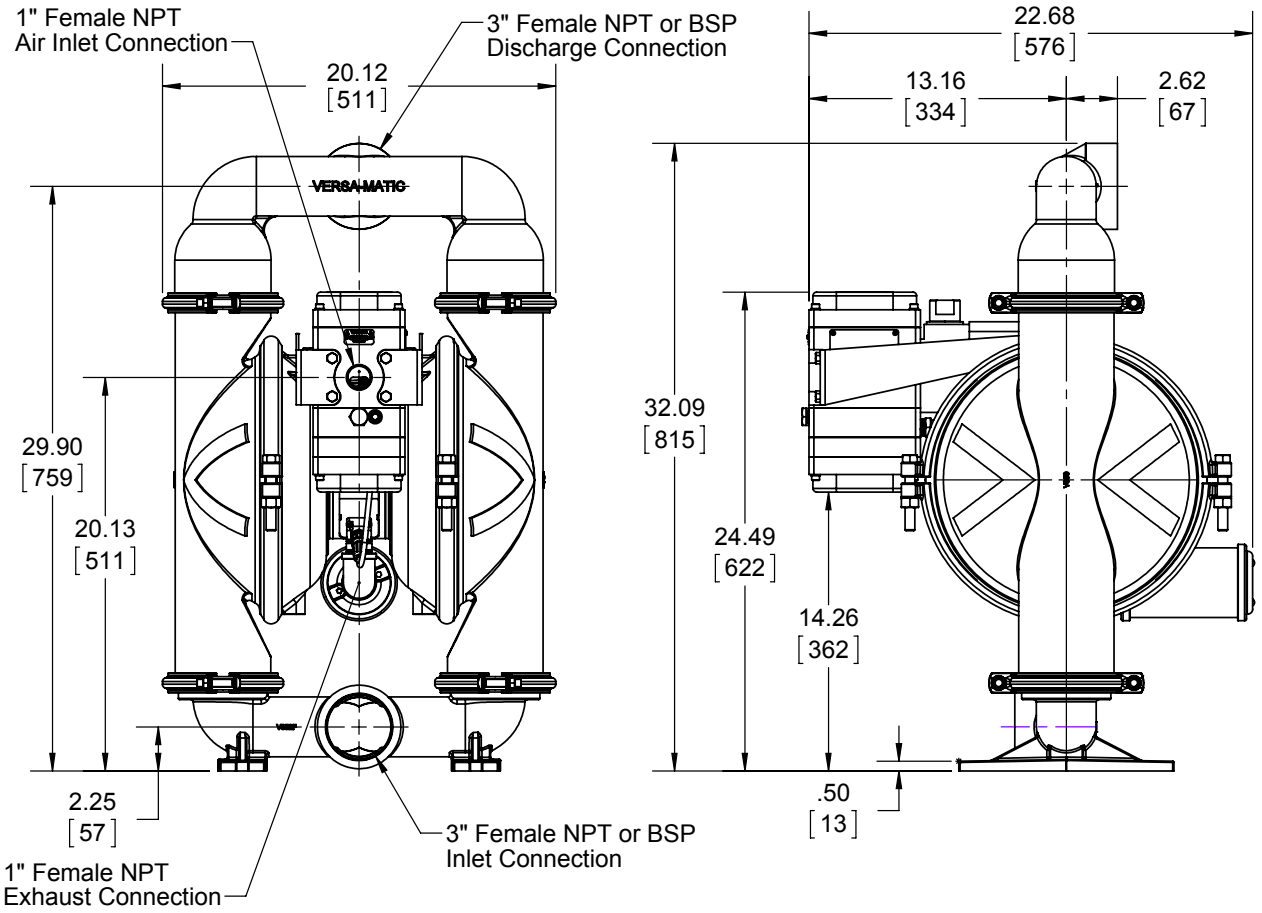


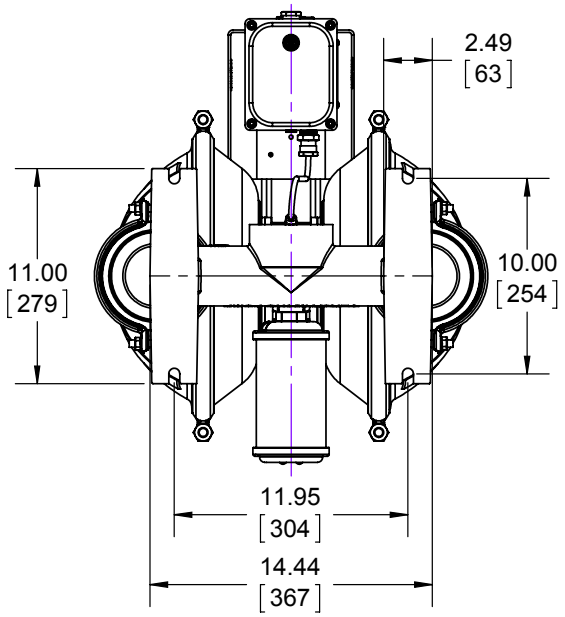
Dimensional Drawings

RE3 Clamped

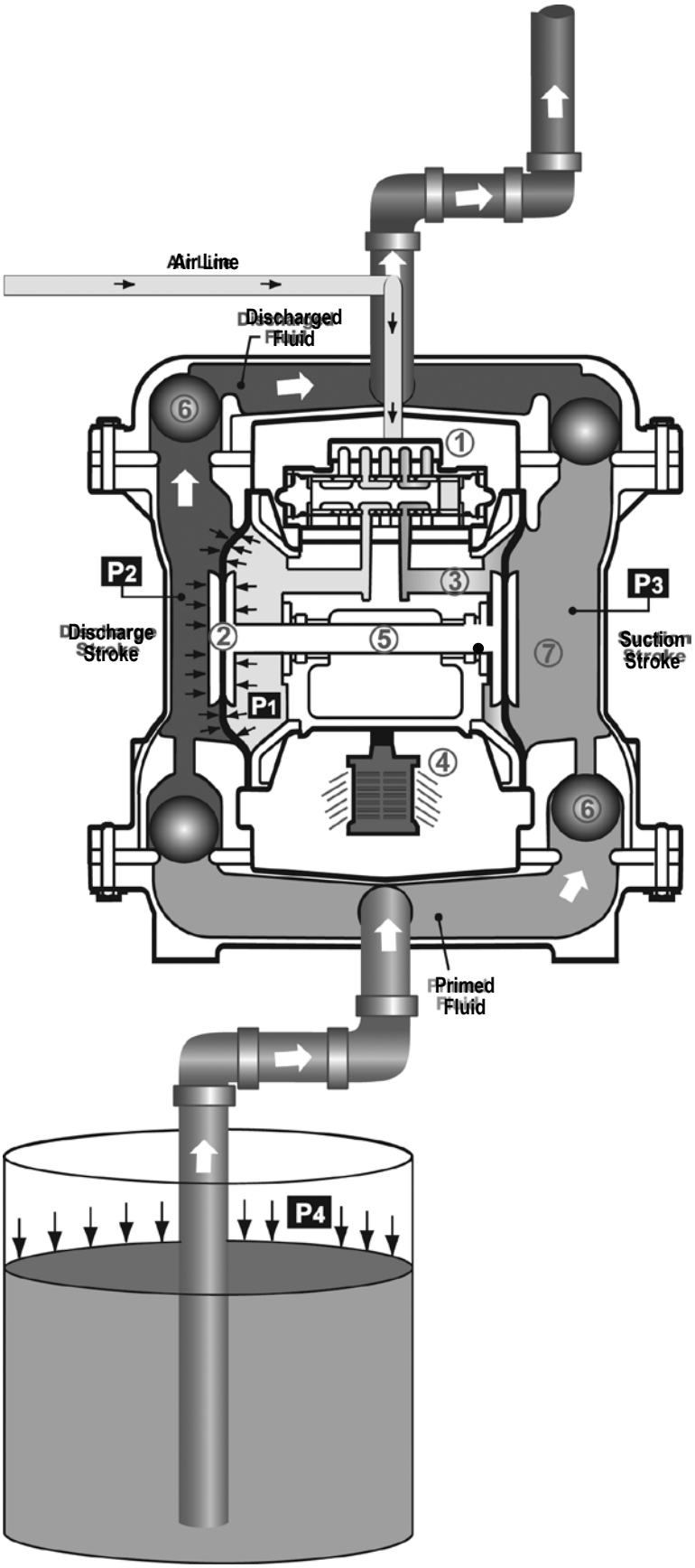
Dimensions in inches (mm dimensions in brackets)

The dimensions on this drawing are for reference only. A certified drawing can be requested if physical dimensions are needed.





Principle of Pump Operation



Air-Operated Double Diaphragm (AODD) pumps are powered by compressed air or nitrogen.

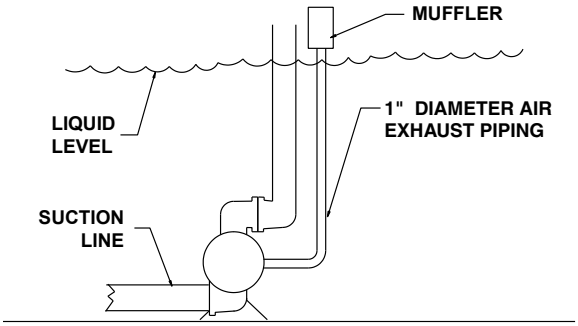
The main directional (air) control valve ① distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm ②. At the same time, the exhausting air ③ from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port ④.

As inner chamber pressure **(P1)** exceeds liquid chamber pressure **(P2)**, the rod ⑤ connected diaphragms shift together creating discharge on one side and suction on the opposite side. The discharged and primed liquid's directions are controlled by the check valves (ball or flap)⑥ orientation.

The pump primes as a result of the suction stroke. The suction stroke lowers the chamber pressure **(P3)** increasing the chamber volume. This results in a pressure differential necessary for atmospheric pressure **(P4)** to push the fluid through the suction piping and across the suction side check valve and into the outer fluid chamber ⑦.

Suction (side) stroking also initiates the reciprocating (shifting, stroking or cycling) action of the pump. The suction diaphragm's movement is mechanically pulled through its stroke. The diaphragm's inner plate makes contact with an actuator plunger aligned to shift the pilot signaling valve. Once actuated, the pilot valve sends a pressure signal to the opposite end of the main directional air valve, redirecting the compressed air to the opposite inner chamber.

SUBMERGED ILLUSTRATION

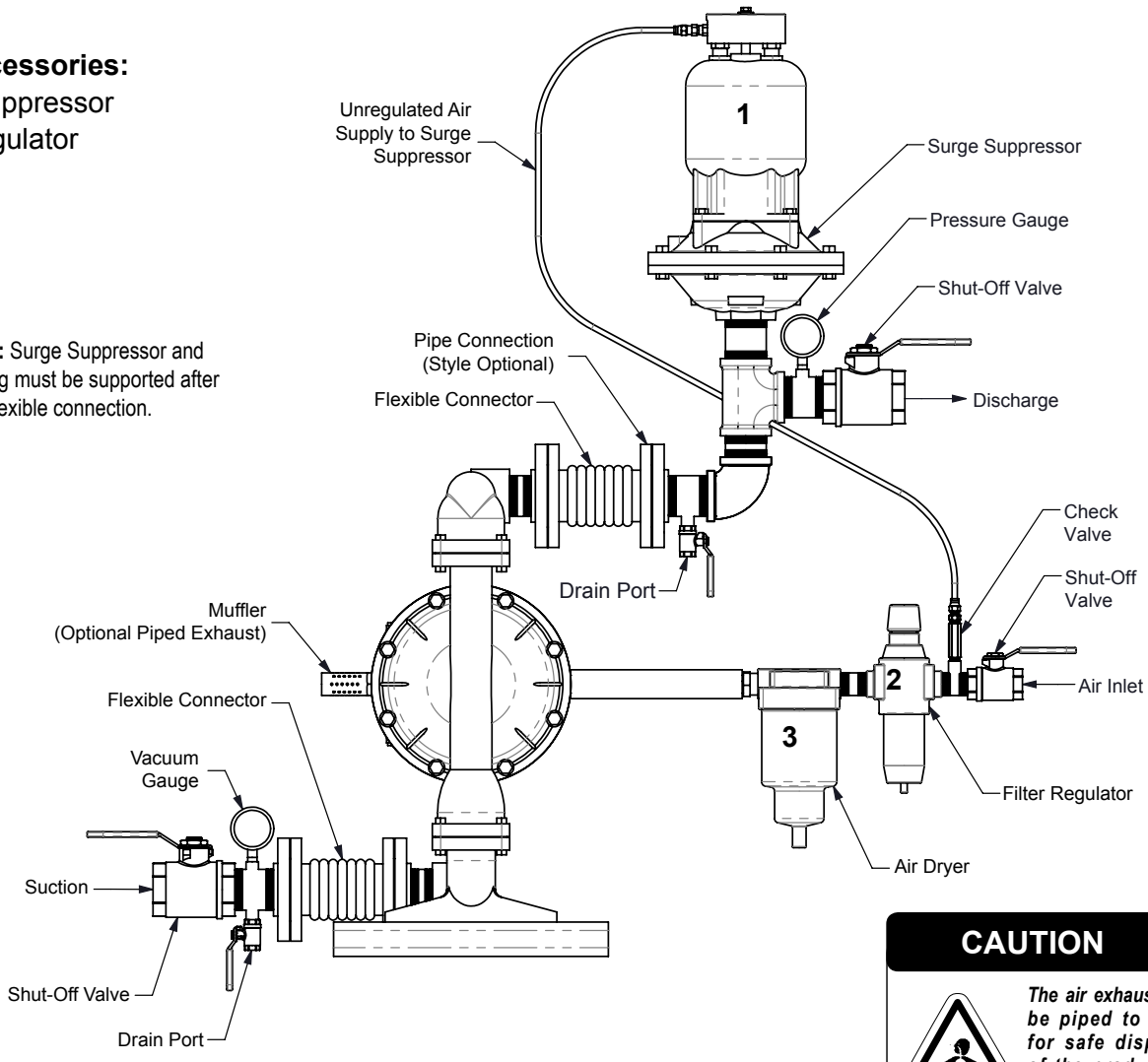


Pump can be submerged if the pump materials of construction are compatible with the liquid being pumped. The air exhaust must be piped above the liquid level. When the pumped product source is at a higher level than the pump (flooded suction condition), pipe the exhaust higher than the product source to prevent siphoning spills.

Recommended Installation Guide

Available Accessories:

1. Surge Suppressor
2. Filter/Regulator
3. Air Dryer



Note: Surge Suppressor and Piping must be supported after the flexible connection.

CAUTION

The air exhaust should be piped to an area for safe disposition of the product being pumped, in the event of a diaphragm failure.

Installation And Start-Up
Locate the pump as close to the product being pumped as possible. Keep the suction line length and number of fittings to a minimum. Do not reduce the suction line diameter.

Air Supply
Connect the pump air inlet to an air supply with sufficient capacity and pressure to achieve desired performance. A pressure regulating valve should be installed to insure air supply pressure does not exceed recommended limits.

Air Valve Lubrication
The air distribution system is designed to operate WITHOUT lubrication. This is the standard mode of operation. If lubrication is desired, install an air line lubricator set to deliver one drop of SAE 10 non-detergent oil for every 20 SCFM (9.4 liters/sec.) of air the pump consumes. Consult the Performance Curve to determine air consumption.

Air Line Moisture
Water in the compressed air supply may cause icing or freezing of the exhaust air, causing the pump to cycle erratically or stop operating. Water in the air supply can be reduced by using a point-of-use air dryer.

Air Inlet And Priming
To start the pump, slightly open the air shut-off valve. After the pump primes, the air valve can be opened to increase air flow as desired. If opening the valve increases cycling rate, but does not increase the rate of flow, cavitation has occurred. The valve should be closed slightly to obtain the most efficient air flow to pump flow ratio.

Troubleshooting Guide

Symptom:	Potential Cause(s):	Recommendation(s):
Pump Cycles Once	Deadhead (system pressure meets or exceeds air supply pressure).	Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).
	Air valve or intermediate gaskets installed incorrectly.	Install gaskets with holes properly aligned.
	Bent or missing actuator plunger.	Remove pilot valve and inspect actuator plungers.
Pump Will Not Operate / Cycle	Pump is over lubricated.	Set lubricator on lowest possible setting or remove. Units are designed for lube free operation.
	Lack of air (line size, PSI, CFM).	Check the air line size and length, compressor capacity (HP vs. cfm required).
	Check air distribution system.	Disassemble and inspect main air distribution valve, pilot valve and pilot valve actuators.
	Discharge line is blocked or clogged manifolds.	Check for inadvertently closed discharge line valves. Clean discharge manifolds/piping.
	Deadhead (system pressure meets or exceeds air supply pressure).	Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).
	Blocked air exhaust muffler.	Remove muffler screen, clean or de-ice, and re-install.
	Pumped fluid in air exhaust muffler.	Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.
	Pump chamber is blocked.	Disassemble and inspect wetted chambers. Remove or flush any obstructions.
Pump Cycles and Will Not Prime or No Flow	Cavitation on suction side.	Check suction condition (move pump closer to product).
	Check valve obstructed. Valve ball(s) not seating properly or sticking.	Disassemble the wet end of the pump and manually dislodge obstruction in the check valve pocket. Clean out around valve ball cage and valve seat area. Replace valve ball or valve seat if damaged. Use heavier valve ball material.
	Valve ball(s) missing (pushed into chamber or manifold).	Worn valve ball or valve seat. Worn fingers in valve ball cage (replace part). Check Chemical Resistance Guide for compatibility.
	Valve ball(s)/seat(s) damaged or attacked by product.	Check Chemical Resistance Guide for compatibility.
	Check valve and/or seat is worn or needs adjusting.	Inspect check valves and seats for wear and proper setting. Replace if necessary.
	Suction line is blocked.	Remove or flush obstruction. Check and clear all suction screens or strainers.
	Excessive suction lift.	For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.
	Suction side air leakage or air in product.	Visually inspect all suction-side gaskets and pipe connections.
	Pumped fluid in air exhaust muffler.	Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.
Pump Cycles Running Sluggish/Stalling, Flow Unsatisfactory	Over lubrication.	Set lubricator on lowest possible setting or remove. Units are designed for lube free operation.
	Icing.	Remove muffler screen, de-ice, and re-install. Install a point of use air drier.
	Clogged manifolds.	Clean manifolds to allow proper air flow
	Deadhead (system pressure meets or exceeds air supply pressure).	Increase the inlet air pressure to the pump. Pump is designed for 1:1 pressure ratio at zero flow. (Does not apply to high pressure 2:1 units).
	Cavitation on suction side.	Check suction (move pump closer to product).
	Lack of air (line size, PSI, CFM).	Check the air line size, length, compressor capacity.
	Excessive suction lift.	For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.
	Air supply pressure or volume exceeds system hd.	Decrease inlet air (press. and vol.) to the pump. Pump is cavitating the fluid by fast cycling.
	Undersized suction line.	Meet or exceed pump connections.
	Restrictive or undersized air line.	Install a larger air line and connection.
	Suction side air leakage or air in product.	Visually inspect all suction-side gaskets and pipe connections.
	Suction line is blocked.	Remove or flush obstruction. Check and clear all suction screens or strainers.
	Pumped fluid in air exhaust muffler.	Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.
	Check valve obstructed.	Disassemble the wet end of the pump and manually dislodge obstruction in the check valve pocket.
	Check valve and/or seat is worn or needs adjusting.	Inspect check valves and seats for wear and proper setting. Replace if necessary.
	Entrained air or vapor lock in chamber(s).	Purge chambers through tapped chamber vent plugs. Purging the chambers of air can be dangerous.
Product Leaking Through Exhaust	Diaphragm failure, or diaphragm plates loose.	Replace diaphragms, check for damage and ensure diaphragm plates are tight.
	Diaphragm stretched around center hole or bolt holes.	Check for excessive inlet pressure or air pressure. Consult Chemical Resistance Chart for compatibility with products, cleaners, temperature limitations and lubrication.
Premature Diaphragm Failure	Cavitation.	Enlarge pipe diameter on suction side of pump.
	Excessive flooded suction pressure.	Move pump closer to product. Raise pump/place pump on top of tank to reduce inlet pressure. Install Back pressure device (Tech bulletin 41r). Add accumulation tank or pulsation dampener.
	Misapplication (chemical/physical incompatibility).	Consult Chemical Resistance Chart for compatibility with products, cleaners, temperature limitations and lubrication.
	Incorrect diaphragm plates or plates on backwards, installed incorrectly or worn.	Check Operating Manual to check for correct part and installation. Ensure outer plates have not been worn to a sharp edge.
Unbalanced Cycling	Excessive suction lift.	For lifts exceeding 20' of liquid, filling the chambers with liquid will prime the pump in most cases.
	Undersized suction line.	Meet or exceed pump connections.
	Pumped fluid in air exhaust muffler.	Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.
	Suction side air leakage or air in product.	Visually inspect all suction-side gaskets and pipe connections.
	Check valve obstructed.	Disassemble the wet end of the pump and manually dislodge obstruction in the check valve pocket.
	Check valve and/or seat is worn or needs adjusting.	Inspect check valves and seats for wear and proper setting. Replace if necessary.
	Entrained air or vapor lock in chamber(s).	Purge chambers through tapped chamber vent plugs.

For additional troubleshooting tips contact After Sales Support at service.warrenrupp@idexcorp.com or 419-524-8388

AirVantage Troubleshooting Guide

⚠ Caution! Whenever troubleshooting or performing any repairs on any IDEX AODD equipment, always remove air supply line to the pump and wear proper personal protective equipment.

LED OUTPUT FOR AirVantage UNIT

STATE	LED OUTPUT
Startup/Settle/Deadhead	Solid
Standby/Low Flow	1 Second ON / 1 Second OFF
Learn Mode	0.1 Seconds ON / 0.1 Seconds OFF
Seek/Optimize	1 Second ON / 0.1 Seconds OFF
Steady State/Air Savings	OFF / ON in rhythm with Cycle Rate of Pump

AirVantage LED DOES NOT LIGHT UP AT ALL

What to Check:
- Make sure power switch on the control module is turned on, (depressed to the left)
- Make sure air is being supplied to pump or make sure 110 VAC unit has power being supplied to it

Corrective Action:
- Cycle power switch off/on
- Unplug patch cable and cycle power switch off/on
- Consult Factory After Sales Support team

AirVantage LED LIGHTS UP AND STAYS ON SOLID

What to Check:
- Make sure patch cable is plugged in and locked

Corrective Action:
- Consult Factory After Sales Support team

VALVE FIRES ONCE AND IMMEDIATELY RESETS

Corrective Action:
- Consult Factory After Sales Support team

VALVE LED NEVER LEAVES SEEK MODE - AirVantage LED PULSING IN TIME TO PUMP, BUT VALVE NOT ACTUATING AND THE PUMP IS NOT SAVING AIR

Corrective Action:
- Consult Factory After Sales Support team

UNEXPECTED OPERATING CONDITION (AIR SAVINGS OR FLOW RATE)

What to Check:
- Check for varying environmental pumping conditions (changing head or suction)
- Check ice buildup in exhaust area
- Inspect sleeve and spool for damage

Corrective Action:
- Consult Factory After Sales Support team

PUMP CYCLING IS UNSTABLE OR ERRATIC

What to Check:
- Run pump without AirVantage and check pump operation
- Make sure patch cable plug is connected and locked
- Make sure power wire connectors are tight

Corrective Action:
- Consult Factory After Sales Support team

PUMP RUNNING SLOWLY

What to Check:
- Run pump without AirVantage and check operation
- Cycle the power off/on to the control module to reset controller
- Check ice buildup in exhaust area
- Inspect sleeve and spool set for damage

Corrective Action:
- Consult Factory After Sales Support team
- Cycle the power switch on the control module off/on

AirVantage Troubleshooting Guide

AirVantage RESETS AND ENTERS LEARN MODE TOO FREQUENTLY

What to Check:
- Check for excessive varying environmental pumping conditions (changing head or suction)
- Check ice buildup in exhaust area
- Inspect sleeve and spool for damage
- Make sure patch cable plug is connected and locked

Corrective Action:
- Consult Factory After Sales Support Team

PUMP STALLS, RESETS, LEARNS, SEEKS AND REPEATS

What to Check:
- Make sure patch cable plug is connected and locked
- Check ice buildup in exhaust area

Corrective Action:
- Consult Factory After Sales Support Team

PUMP MOVES OUT OF STEADY STATE AND NEVER ATTEMPTS TO RELEARN (LED ON)

What to Check:
- Make sure patch cable plug is connected and locked
- Cycle the power off/on to the control module

Corrective Action:
- Consult Factory After Sales Support Team
- Cycle the power switch on the control module off/on

WHAT TO DO IN THE EVENT OF A DIAPHRAGM FAILURE

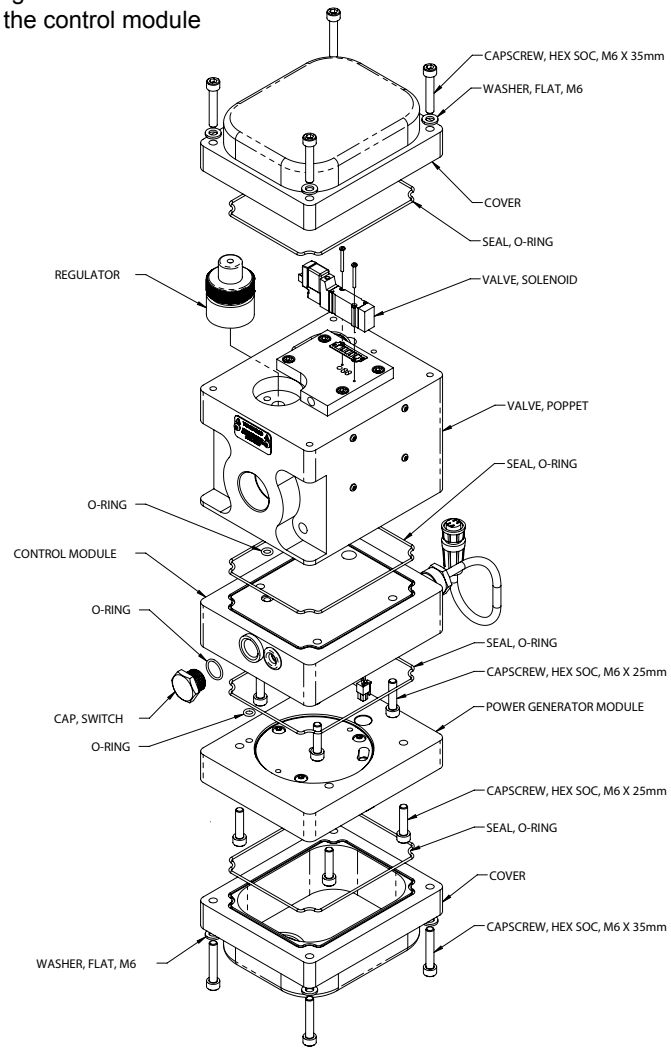
If a diaphragm failure has been detected in pumps fitted with AirVantage,
see page 5 for shut-down procedure.

What to Check:
- Has product migrated to the sensor?

Corrective Action:
- If the sensor has been submerged in product, the sensor will need to be replaced. Consult the AirVantage servicing section of the manual for detailed instructions.

What to Check:
- Has product contaminated the poppet valve?

Correct Action:
- If a significant amount of product has made it into the poppet valve, then the unit will need to be disassembled for inspection. Consult the AirVantage servicing section (p.24).



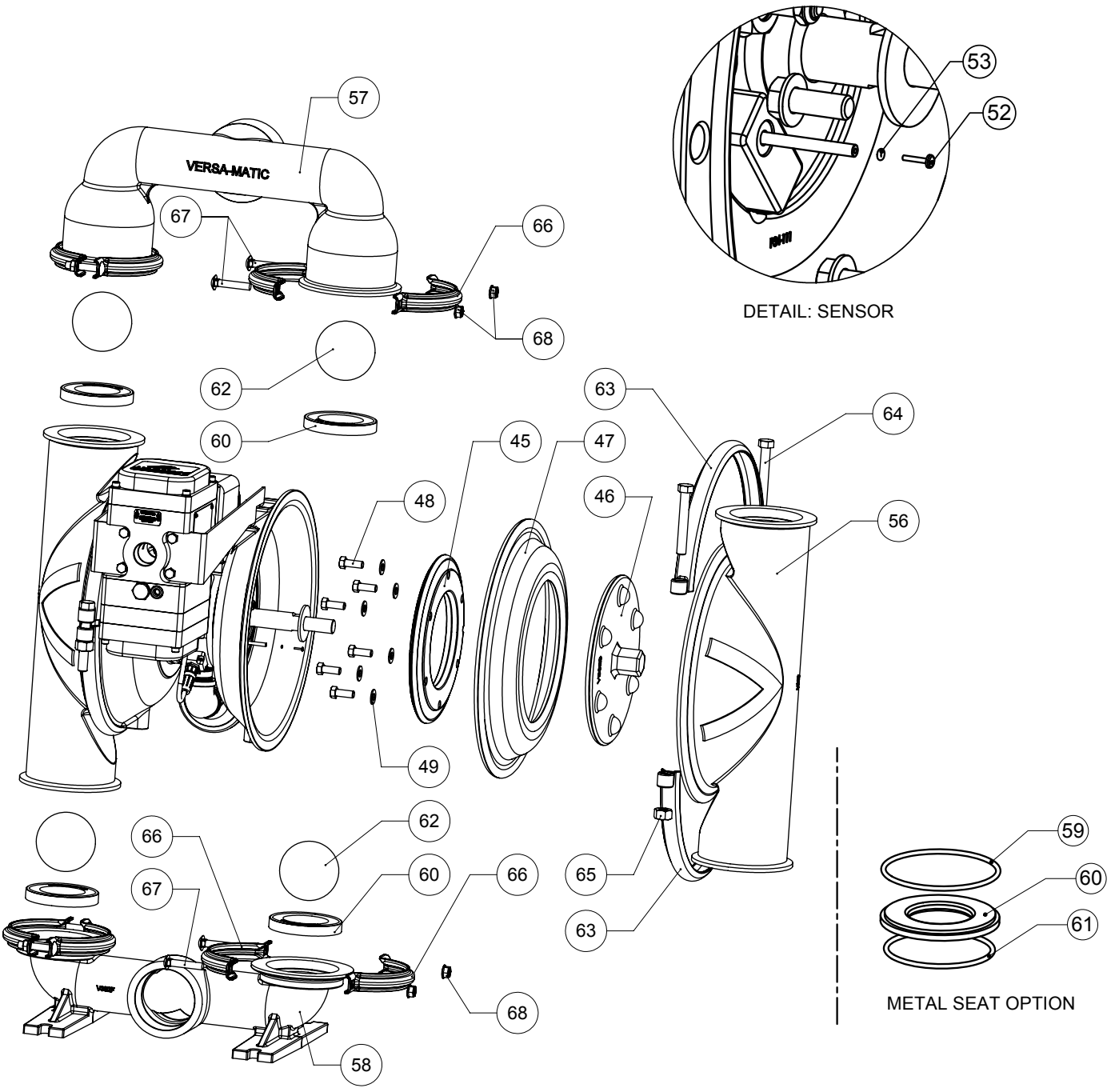
⚠ WARNING

Substitution of components may impair intrinsic safety.

⚠ WARNING

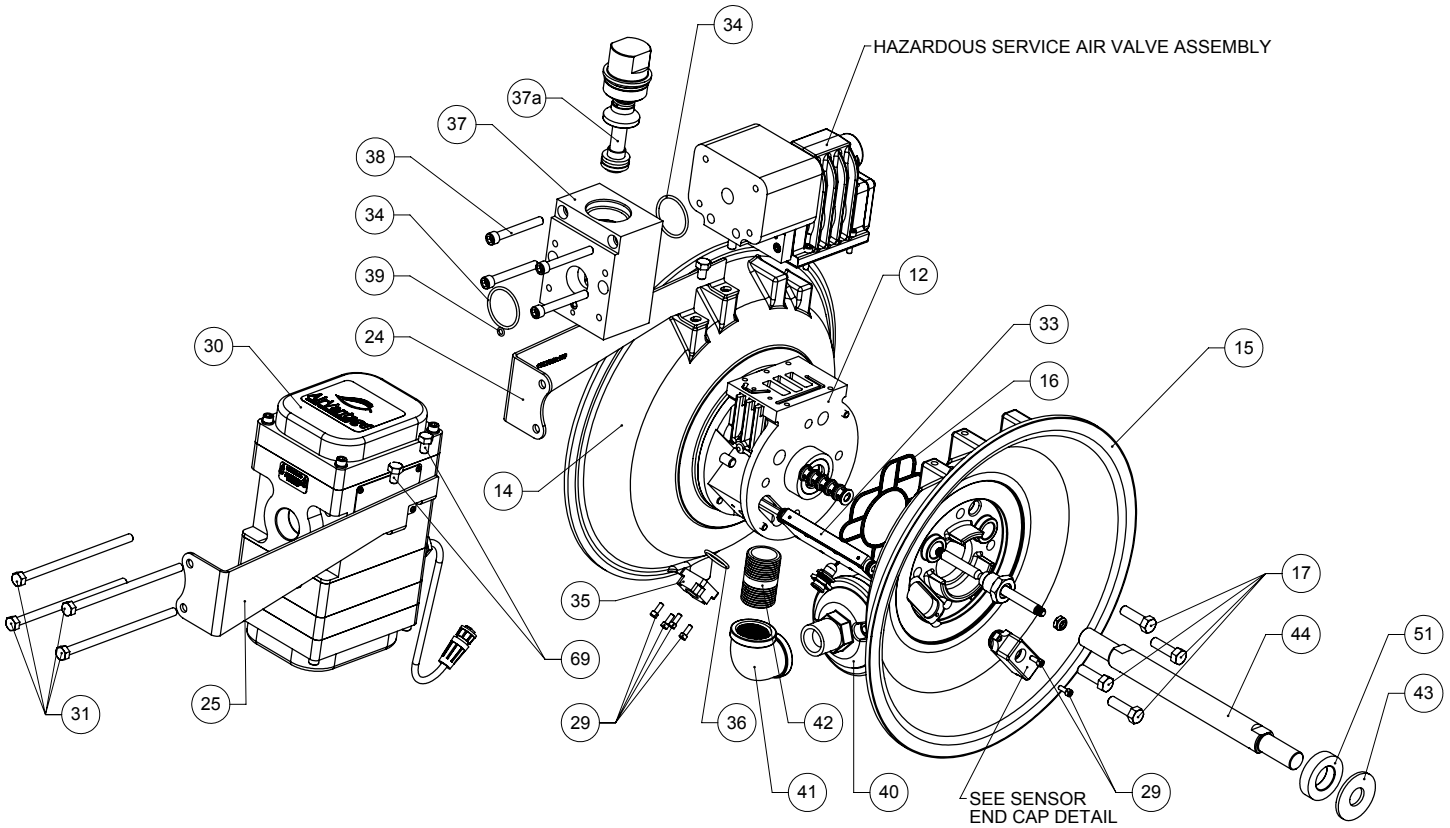
Do not open when an explosive atmosphere may be present.

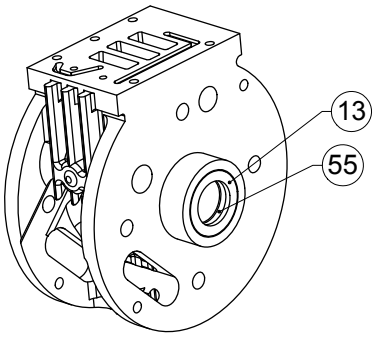
Composite Repair Parts Drawing
Exploded View



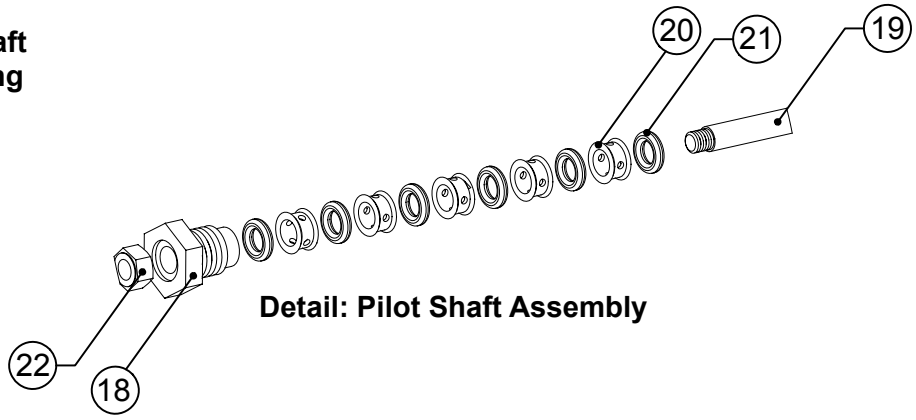
Torque Settings	
Small Clamp Bolts	50 in-lbs (5.6 N-m)
Large Clamp Bolts	20 ft-lbs (27 N-m)
Diaphragm Plates — Rubber	65 ft-lbs (88 N-m)
Diaphragm Plates — PTFE	65 ft-lbs (88 N-m)
Air Valve Cap Screws	25 in-lbs (2.8 N-m)

Composite Repair Parts Drawing
Center Assembly





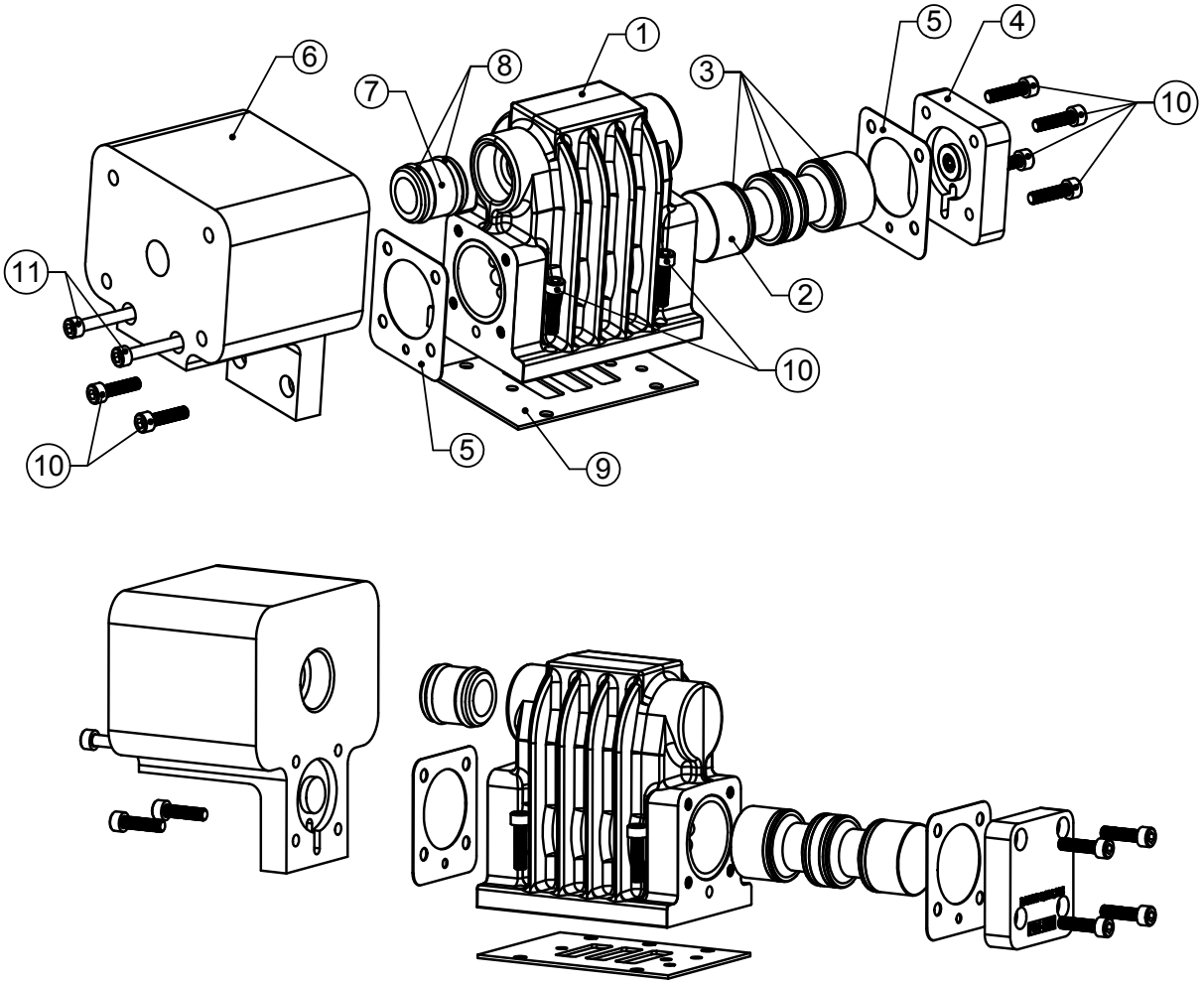
Detail: Main Shaft Bushing / O-Ring



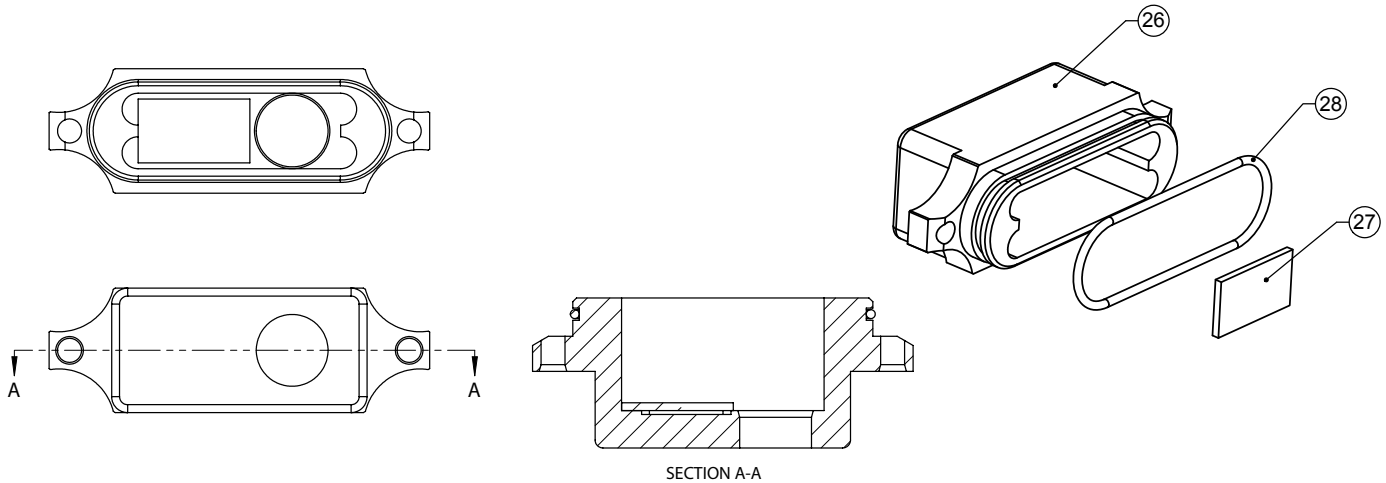
Detail: Pilot Shaft Assembly

Composite Repair Parts Drawing
Detail Views

Air Valve

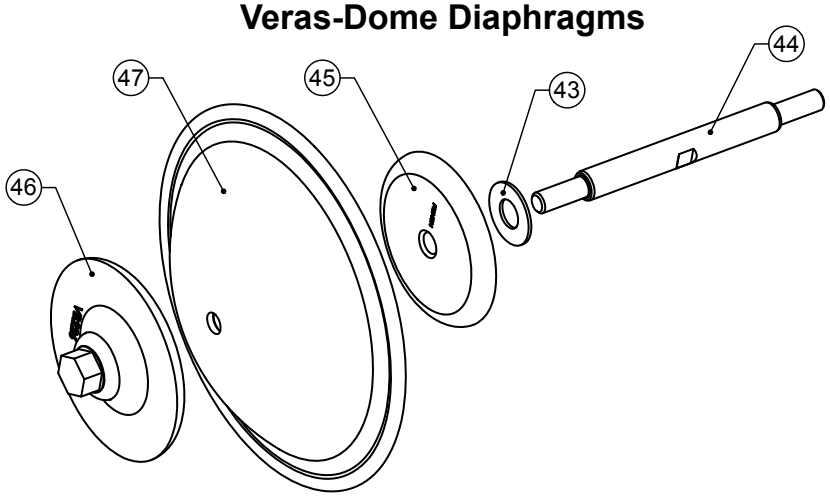


Sensor End Cap

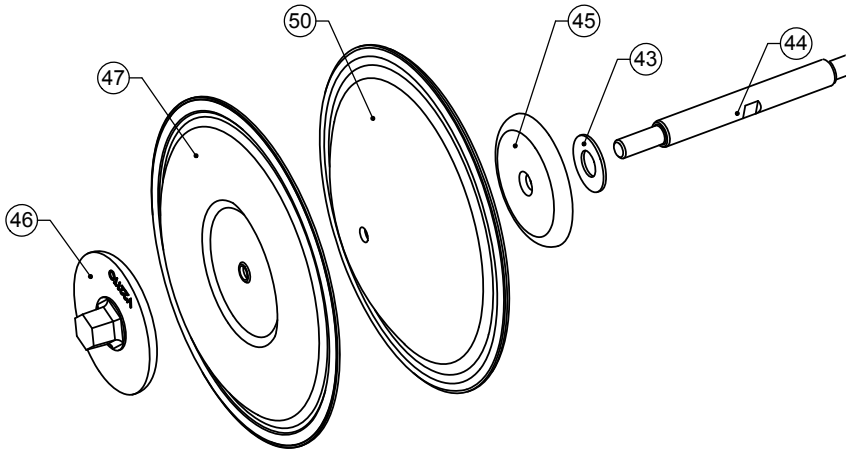


Composite Repair Parts Drawing
Diaphragm Assembly

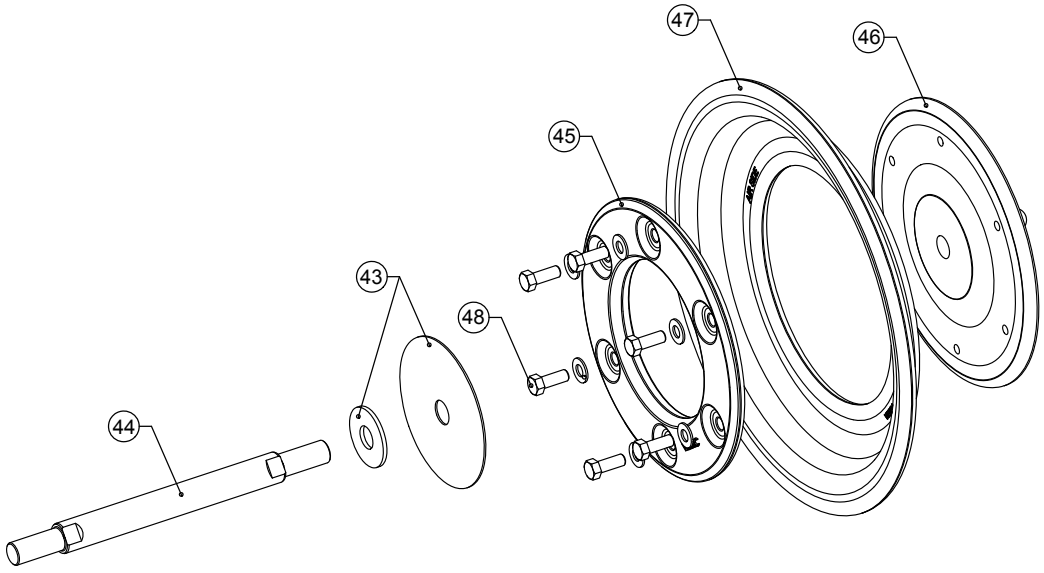
Veras-Dome Diaphragms



PTFE Diaphragms



Stainless/Hastelloy Rugged Diaphragms



Composite Repair Parts List

AIR VALVE ASSEMBLY			
Item	**Qty**	**Description**	**Standard: Aluminum**
	1	Air Valve Assembly (Includes items 1-10)	P126-0085
1	1	Valve Body	P126-0003
2	1	Valve Spool	P126-0063
3	4	Valve Spool Glyd Ring	P34-204F
4	1	End Cap	P34-300
5	2	End Cap Gasket	P24-205
6	1	Adapter, Air Inlet	P126-0070
7	1	Tube, Air Inlet Seal	P126-0005
8	2	Air Inlet O-ring	560.024.360
9	1	Valve Gasket	P24-202
10	11	Valve Cap Screw	S1001
11	2	Valve Cap Screw	P24-209
AIR END ASSEMBLY			
Item	**Qty**	**Description**	**Standard: Aluminum**
12	1	Center Block	P126-0020
13	1	Main Shaft Bushing	P34-402
14	1	Air Chamber, Left	P126-0079
15	1	Air Chamber, Right	P126-0080
16	2	Air Chamber Gasket	P79-109
17	8	Air Chamber Bolt	P24-110
18	2	Bushing	P34-105
19	1	Pilot Shaft	P34-104
20	5	Pilot Shaft Spacer	P24-106
21	6	Pilot Shaft O-Ring	P24-107
22	2	Stop Nut	P24-108
24	1	Mounting Bracket Left	115.V019.159
25	1	Mounting Bracket Right	115.V020.159
26	2	Retainer Plate	P126-0024
27	2	Retainer Foam	P126-0011
28	2	Retainer O-Ring	560.203.360
29	8	Retainer Cap Screw	P126-0032
30	1	AirVantage Unit	P126-0082
31	4	AirVantage Unit Cap Screw	170.125.330
33	1	AirVantage Sensor	P126-0039
34	1	AirVantage Unit Face Seal O-ring	560.011.360
35	1	AirVantage Connector Plate	P126-0055
36	1	AirVantage Connector Plate O-ring	V110BN
37	1	Check Valve	894.014.000
37a	1	Check Valve Cartridge	031.206.000
38	4	Check Valve Cap Screw	171.100.115
39	1	Check Valve O-Ring	560.200.360
40	1	Muffler	530.038.000
41	1	Muffler Adapter	312.045.335
42	1	Muffler Nipple	538.110.335

Composite Repair Parts List

DIAPHRAGM ASSEMBLY						
Item	**Qty**	**Description**	**Dome**	**Rugged**	**PTFE Bonded**	**PTFE 2-Piece**
43	2 Each	Washer, Spacer	P126-0071	P126-0071 and 901.V003.330	P126-0071	P126-0071
44	1	Main Shaft	P34-103	P34-103	P34-103	P34-103
45	2	Inner Diaphragm Plate	P126-0027	V302C	P126-0028	P126-0028
46	2	Outer Diaphragm Plate	VB307 SVB307/HVB307	V302B 612.V002.110/ 612.V002.112	V302TO SV302TO HV302TO	V302TO SV302TO HV302TO
47	2	Diaphragm	V306XX (refer to material chart)	V305XX (refer to material chart)	V305TX	V305TF-FB
48	12	Cap Screw, Dia Plate	N/A	V302G	N/A	N/A
49	12	Washer, Dia Plate	N/A	V302GA	N/A	N/A
50	2	Back-up Diaphragm	N/A	N/A	N/A	V305TFB
51	2	Bumper Washer	P34-501	P34-501	P34-501	P34-501
52	2	Probe Tip	846.001.167	846.001.167	846.001.167	E46.001.167
53	2	Probe Tip O-Ring	560.201.360	560.201.360	560.201.360	560.201.360
54	2	Sensor O-Ring	560.033.360	560.033.360	560.033.360	560.033.360
55	2	Main Shaft O-Ring	P34-403	P34-403	P34-403	P34-403
Item	**Qty**	**Description**	**Aluminum**	**Stainless Steel**	**Hastelloy C**	**Cast Iron**
56	2	Water Chamber	V350	SV350	HV350	WV350
57	1	Discharge Manifold	V351/V351BSP	SV351/SV351BSP	HV351/HV351BSP	WV351/ WV351BSP
58	1	Inlet Manifold	V352F/V352FBSP	SV352F/SV352FBSP	HV352F/HV352FBSP	WV352F/ WV352FBSP
59	4	Valve Seat O-Ring	SV456TES-2 (only used with metal seats			
60	4	Valve Seat	V456XX(refer to material chart)			
61	4	Valve Seat O-Ring	SV456TES-1 (only used with metal seats)			
62	4	Valve Ball	V455XX (refer to material chart)			
Option 1: 3 PC Center Port						
63	4	Large Clamp Half	V311A	SV311A	SV311A	V311A
64	4	Large Clamp Bolt	V311B	SV311B	SV311B	V311B
65	4	Large Clamp Nut	V311C	SV311C	SV311AC	V311C
66	8	Small Clamp Half	V354A	SV354A	SV354A	V354A
67	8	Small Clamp Bolt	V354B	SV354B	SV354B	V354B
68	8	Small Clamp Nut	V354C	SV354C	SV354C	V354C
69	4	Bracket Bolt	P126-0062	N/A	N/A	N/A

DIAPHRAGM MATERIAL CODES	
Suffix Codes	
N	Neoprene
BN	Nitrile
VT	FKM
ND	EPDM
TF	PTFE
XL/TPEXL	Santoprene
FG/TPEFG	Hytrel
G	Geolast

BALL MATERIAL CODES	
Suffix Codes	
N	Neoprene
BN	Nitrile
VT	FKM
ND	EPDM
TF	PTFE
XL/TPEXL	Santoprene
FG/TPEFG	Hytrel
G	Geolast
P	Polyurethane
A	Acetal
Prefix Codes	
S	Stainless Steel

SEAT MATERIAL CODES	
Suffix Codes	
N	Neoprene
BN	Nitrile
VT	FKM
ND	EPDM
TF	PTFE
XL/TPEXL	Santoprene
FG/TPEFG	Hytrel
G	Geolast
P	Polyurethane
A	Acetal
CS	Carbon Steel
Prefix Codes	
S	Stainless Steel
H	Hastelloy

RE3 Clamped - Service Kits

Item	Description	Qty	Part Number
	AIR VALVE KIT		E2/E3 A AV KIT
3	Glide Ring	4	P34-204F
5	End Cap Gasket	2	P24-205
9	Valve Gasket	1	P24-202
	PILOT VALVE KIT		E3A PV KIT
20	Pilot Shaft Spacer	5	P24-106
21	Pilot Shaft O-Ring	6	P24-107
22	Stop Nut	2	P24-108
55	Main Shaft O-Ring	2	P34-403
	ELASTOMER KITS		See Factory
47	Diaphragm	2	
60	Valve Seat	4	
62	Valve Ball	4	

Item	Description	Qty	Part Number
	COMPREHENSIVE		RE3-CMK-OE-RMB
	MAINTENANCE		
2	Valve Spool	1	P126-0063
3	Valve Spool Glyd Ring	4	P34-204F
5	End Cap Gasket	2	P24-205
9	Valve Gasket	1	P24-202
16	Air Chamber Gasket	2	P79-109
18	Bushing	2	P34-105
19	Pilot Shaft	1	P34-104
20	Pilot Shaft Spacer	5	P24-106
21	Pilot Shaft O-Ring	6	P24-107
22	Stop Nut	2	P24-108
40	Muffler	1	530.038.000
44	Main Shaft	1	P34-103
51	Bumper Washer	2	P34-501
52	Probe Tip	2	846.001.167
53	Probe Tip O-Ring	2	560.201.360
55	Main Shaft O-Ring	2	P34-403

Item	Description	Qty	Part Number
	RE3 Sensor Kit		**475.277.000**
33	Sensor	1	P126-0039
52	Probe Tips	2	846.001.167
54	Sensor O-ring	2	560.033.360
53	Probe Tip O-rings	2	560.201.360
	RE3 Control Module Kit ATEX (Power Gen Airvantage Only)		**476.297.000**
81	Control Module Assembly ATEX	1	249.022.000
73	Gasket	2	720.071.360
76	Cap Screw	4	171.091.115
80	O-ring	2	560.200.360
83	Switch Cap	1	165.135.330
88	Switch Cap O-ring	1	560.205.360
	Poppet Valve Kit ATEX		**476.289.000**
75	Poppet Valve Assembly ATEX	1	893.104.000
34	O-ring	1	560.011.360
	Poppet Valve Assembly Kit ATEX		**476.290.000**
75	Poppet Valve Assembly ATEX	1	893.104.000
34	O-ring	1	560.011.360
79	Regulator	1	020.069.000
74	Pilot Valve	1	765.004.000
	Power Gen Kit ATEX		**476.293.000**
77	Power Gen Assembly ATEX	1	031.202.000
73	Gasket	1	720.071.360
76	Cap Screw	4	171.091.115
80	O-ring	1	560.200.360
	Seal Kit ATEX		**476.280.000**
34	O-ring	1	560.011.360
73	Gasket	4	720.071.360
80	O-ring	2	560.200.360
	Probe Tip Kit		**476.283.000**
52	Probe Tips	1	846.001.167
53	Probe Tip O-rings	1	560.201.360

AirVantage Sensor Servicing

INTERMEDIATE AND AirVantage SENSOR SERVICING
To service the intermediate and AirVantage sensor, first shut off and bleed the air being supplied to the pump. For safety purposes, the air supply line should be disconnected from the pump. Shut off both the suction and discharge lines to the pump. Consult the “Composite Repair Parts Drawing”.

Step #1: Remove the Patch Cable
Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can either be removed from the intermediate or from the control module.

Step #2: Remove the AirVantage from the Pump
Use a ½” socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the plastic cover located on the bottom.

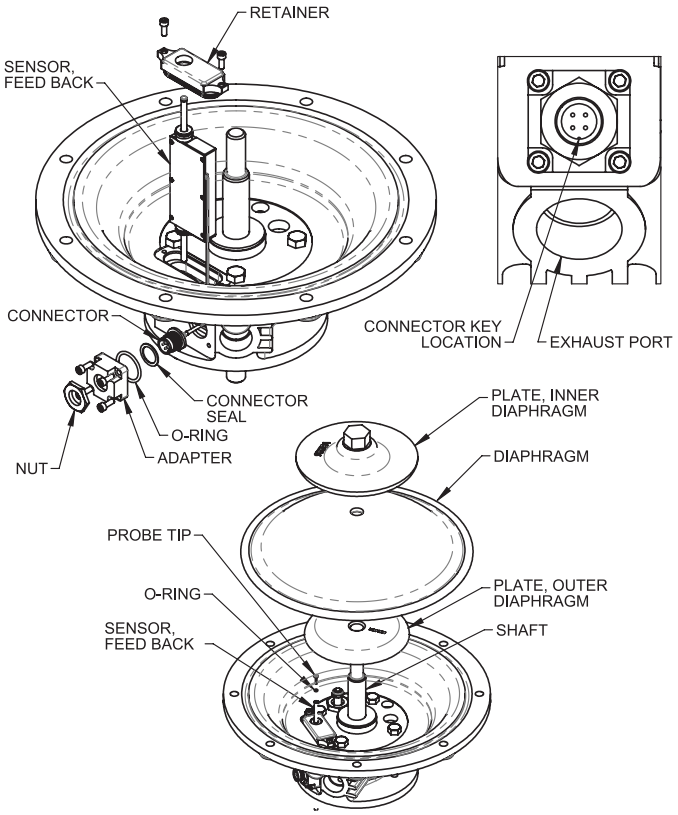
Step #3: Remove the Manifolds, Chambers, and Diaphragms (Refer to exploded views for disassembly)

Step #4: Remove the Diaphragm Assemblies
Refer to exploded views for disassembly.

“AirVantage CAUTION” – When the diaphragm assembly is removed, watch for the brass probe tips located on the end of the sensor rod. There is one brass probe tip and one o-ring per side. Inspect the probe tips and o-rings for wear. For every diaphragm service, these parts should be replaced and are available in kit form. Consult the “Composite Repair Parts Drawing” for part numbers and quantities.

Step #5: Accessing the AirVantage Sensor
Use a 9/64" hex key wrench to remove the 4 socket head cap screws from the sensor connector plate. Use a 13/16" socket and remove the plastic nut securing the connector to the connector plate. Remove the connector from the connector plate taking care not to lose/misplace the gasket on the connector or the o-ring that seals the connector plate. Next, use a 9/64" hex key wrench to remove the 2 socket head cap screws on each sensor end cap. Use a small flat screwdriver to gently pry the end caps from the inner chambers. Now slide the sensor out of the intermediate while feeding the connector and cable into the intermediate. Slide the Connector end of the cable out of the same opening as the sensor.

Step #6: Reinstallation
Note that the orientation of the sensor rod with respect to the pilot shaft location. The sensor rod side of the sensor should be on the "top" side of the pump (facing the air valve side of the pump). Slide the Connector end of the cable and then the sensor into the sensor opening. Feed the connector out through the opening in the intermediate. Ensure the gasket is on the connector and the connector plate o-ring is in the connector plate o-ring groove. Insert the connector into the connector plate. Use a 13/16" socket to install the plastic nut in order to secure the connector to the connector plate. Use a 9/64" hex key wrench to install the 4 socket head cap screws and secure the sensor connector plate to the intermediate. Install the sensor end caps. Be sure not to pinch or cut the sensor o-rings. Use a small amount of lubrication if necessary to ease assembly. Use a 9/64" hex key wrench to install the 2 socket head cap screws on each sensor end cap to secure the sensor.



⚠ WARNING
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⚠ WARNING
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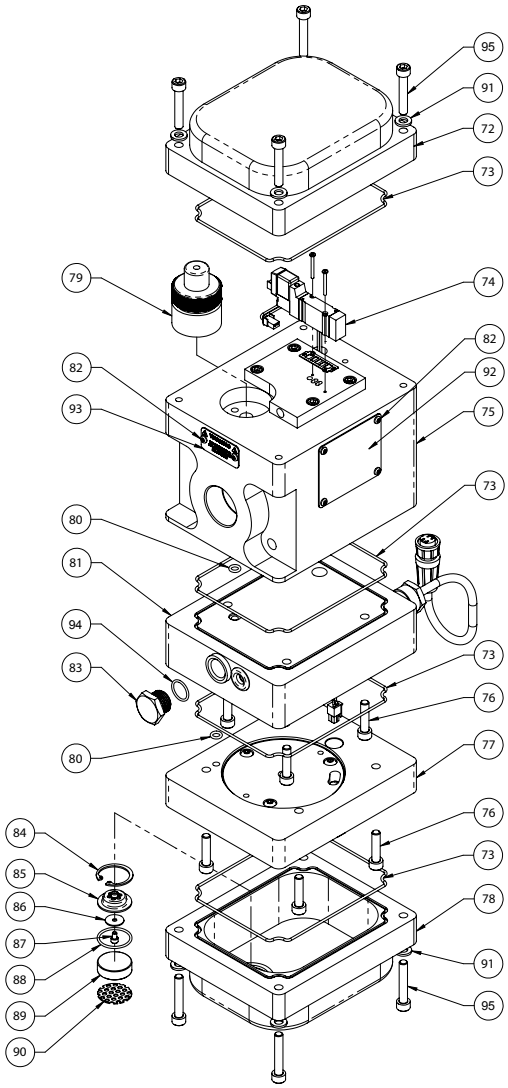
AirVantage Composite Repair Drawing



AirVantage Composite Parts List

ITEM No.	PART NUMBER	DESCRIPTION	QTY.
72	258.020.147	COVER, END, TOP, ATEX	1
73	720.071.360	GASKET, ENCLOSURE	4
74	765.004.000	PILOT VALVE	1
75	893.104.000	VALVE, POPPET, ATEX	1
76	171.091.115	CAPSCREW, HEX SOC HD, M6-1.0 X 25	8
77	031.202.000	ASSY, POWER GENERATOR, ATEX	1
78	258.022.147	COVER, END, BOTTOM, ATEX	1
79	020.069.000	REGULATOR	1
80	560.200.360	SEAL, O-RING	2
81	249.022.000	CONTROL MODULE, RE3 ATEX	1
82	710.010.115	SCREW, SELF TAPPING	6
83	165.135.330	CAP, SWITCH	1
84	675.067.115	RING, RETAINING	1
85	430.050.147	HOUSING, MUFFLER	1
86	720.073.365	SEAL, CHECK VALVE	1
87	171.093.115	CAPSCREW, HEX SOC HD, 5-40 X 3/16	1
88	560.205.360	SEAL, O-RING	1
89	530.045.115	MUFFLER, SPARK ARRESTOR	1
90	165.137.115	CAP, PERFORATED	1
91	901.051.115	WASHER, M6 18-8 STAINLESS	8
92	535.094.015	PLATE, NAME	1
93	535.096.000	TAG, WARNING LABEL - ATEX	1
94	560.104.360	SEAL, O-RING	1
95	171.092.115	CAPSCREW, HEX SOC HD, M6-1.0 X 35	8

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.

⚠ WARNING

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⚠ WARNING

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AirVantage Servicing - Pilot Valve & Pressure Regulator

Pilot Valve and Pressure Regulator
To service the pilot valve or the pressure regulator, first shut off and bleed the air being supplied to the pump. For safety purposes the air supply line should be disconnected from the pump. Then shut off the suction and discharge lines to the pump. Bleed the pressure from the pump suction and discharge lines and remove the lines from the pump. During the servicing of the AirVantage, consult the “AirVantage Composite Repair Parts Drawing”.

Step #1: Remove the Patch Cable
Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can then be removed from the intermediate.

Step #2: Remove the AirVantage from the Pump
Use a ½” socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the plastic cover located on the bottom. Inspect the o-ring between the poppet valve and the adapter plate for damage.

Step #3: Access the Pilot Valve and Pressure Regulator
Use a 5mm hex-key wrench and remove the four M6 x 35mm socket head cap screws securing the top cover on. Lift the cover off, exposing the pilot valve and pressure regulator. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove.

If the pilot valve needs to be replaced, unplug the connector attached to it. Use a jeweler's screwdriver and remove the two screws holding the pilot valve to the plate. The valve and gasket can now be removed and/replaced. When reinstalling the pilot valve, tighten the screws to snug with a jeweler's screwdriver.

“AirVantage Caution” – Be sure to reattach the connector to the pilot valve.

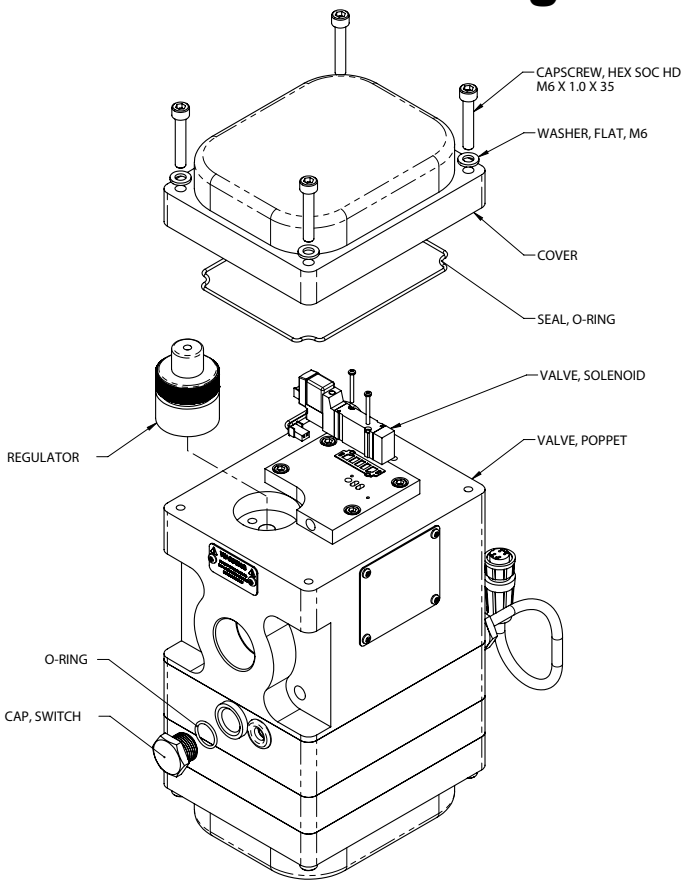
If the pressure regulator needs to be replaced, use slip-joint pliers to unscrew the regulator from the body by turning it in a counterclockwise direction.

“AirVantage CAUTION” – Do not loosen or tighten the regulator by turning the knurled portion of the unit. Place the slip-joint pliers on the smooth area underneath the knurled area of the regulator.

Step #4: Reinstallation
Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four M6 screws.

Reinstall the AirVantage right bracket, chamber bolts/nuts and four 5/16-18 x 5 1/2 cap screws, torque to 90 in-lbs.

“AirVantage Caution” – Be sure to reattach the patch cable connector that connects the AirVantage module to the intermediate.



Note: Refer to Parts List on page 23 for part numbers

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.

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⚠ WARNING
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AirVantage Servicing - Power Generation Module

To service the power generation module, first shut off and bleed the air being supplied to the pump. For safety purposes the air supply line should be disconnected from the pump. Then shut off the suction and discharge lines to the pump. Bleed the pressure from the pump suction and discharge lines and remove the lines from the pump. During the servicing of the AirVantage, consult the “AirVantage Composite Repair Parts Drawing”.

Step #1: Remove the Patch Cable
Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can then be removed from the intermediate..

Step #2: Remove the AirVantage from the Pump
Use a ½” socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the cover located on the top. Inspect the o-ring between the poppet valve and the adapter plate for damage.

Step #3: Access the Power Generation Module
Use a 5mm hex-key wrench and loosen the four M6 x 35mm socket head cap screws securing the bottom cover. Lift the bottom cover off, exposing the power generation module. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove.

If the power generation module needs to be replaced, unplug the connector that connects the power generator to the control board. Use a 4mm hex-key wrench to loosen the four M5 x 25mm socket head cap screws. The power generation module should now be loose. Carefully lift the power generation module off the rest of the assembly, making sure that the control board wire and connector slips through the hole in the power generation case.

"AirVantage Caution" - Take caution not to loosen the o-ring that seals between the components.

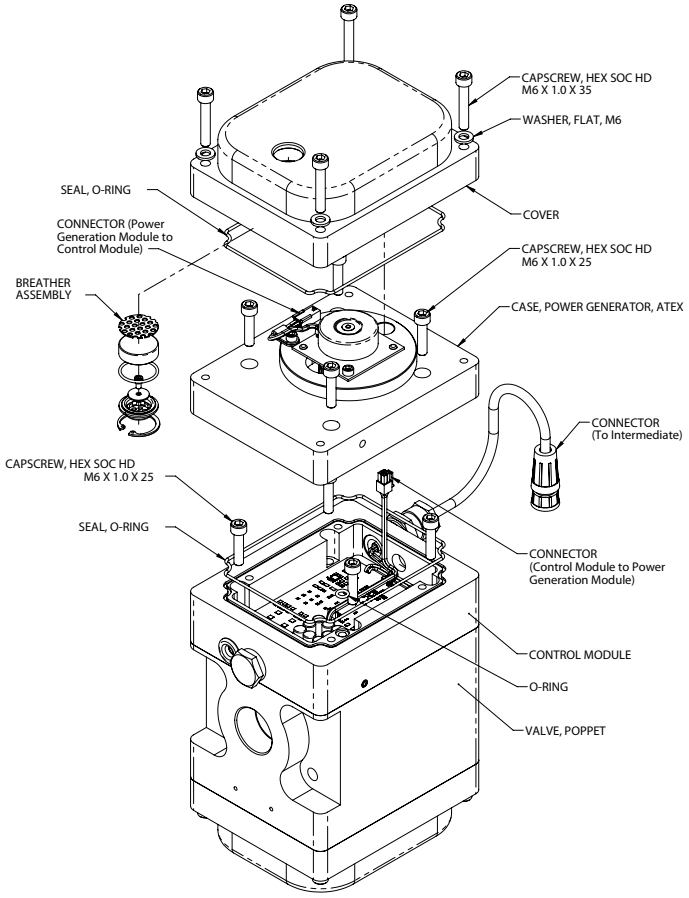
Step #4: Reinstallation
When reinstalling the new module make sure to feed the control module wire through the hole in the power generation case. Install the four M5 x 25mm socket head cap screws and tighten to 6.8 N-M.

“AirVantage Caution” – Be sure to reattach the connector from the power generator to the control board.

Reinstall the bottom cover, making sure the o-ring seal is still in the groove. Tighten the four M5 x 25mm socket head cap screws to 3.4 N-M.

Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four M6 screws. Reinstall the AirVantage right bracket, chamber bolts/nuts and four 5/16-18 x 5 1/2 cap screws, torque to 90 in-lbs.

“AirVantage Caution” – Be sure to reattach the patch cable connector that connects the AirVantage module to the intermediate.



Note: Refer to Composite Repair Parts List on page 23 for part numbers

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.

⚠ WARNING

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⚠ WARNING

Do not open when an explosive atmosphere may be present.

AirVantage Servicing - Control Module

To service the control module, first shut off and bleed the air being supplied to the pump. For safety purposes the air supply line should be disconnected from the pump. Then shut off the suction and discharge lines to the pump. Bleed the pressure from the pump suction and discharge lines and remove the lines from the pump. During the servicing of the AirVantage, consult the “AirVantage Composite Repair Parts Drawing”.

Step #1: Remove the Patch Cable

Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can then be removed from the intermediate.

Step #2: Remove the AirVantage from the Pump

Use a ½” socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the cover located on the bottom. Inspect the o-ring between the poppet valve and the adapter plate for damage.

Step #3: Access the Pilot Valve

Use a 5mm hex-key wrench and loosen the four M6 x 35mm socket head cap screws securing the top cover on. Lift the cover off, exposing the pilot valve. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove. The connector will need to be removed from the pilot valve. Once the plug has been removed, feed the wire assembly into the hole in the valve body to the point where the connector just enters the valve body. Reinstall the top cover and loosely reinstall the bolts. The connector will eventually need to be reconnected.

Step #4: Access the Control Module

Use a 5mm hex-key wrench and loosen the four M6 x 35mm socket head cap screws securing the bottom cover on. Lift the bottom cover off, exposing the power generation module. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove.

Unplug the connector that connects the power generator to the control board. Use a 4mm hex-key wrench to loosen the four M5 x 25mm socket head cap screws. The power generation module should now be loose. Carefully lift the power generation module off the rest of the assembly, making sure that the control board wire and connector slips through the hole in the power generation case.

"AirVantage Caution" - Take caution not to lose the o-ring seals between the components.

If the control module needs to be replaced, use an 4mm hex-key wrench and loosen the two M5 x 25mm socket head cap screws holding the control module to the poppet assembly. The control module should now be loose. Carefully lift the control module off the poppet assembly, making sure that the pilot valve connector wire slips through the hole in the poppet valve assembly.

"AirVantage Caution" - Take caution not to loosen the o-ring that seals between the components.

Step #5: Reinstalling

When reinstalling the new control module, make sure to feed the pilot valve connector wire through the hole in the poppet valve assembly. Install the two M5 x 25mm socket head cap screws and tighten to 3.4 N-M.

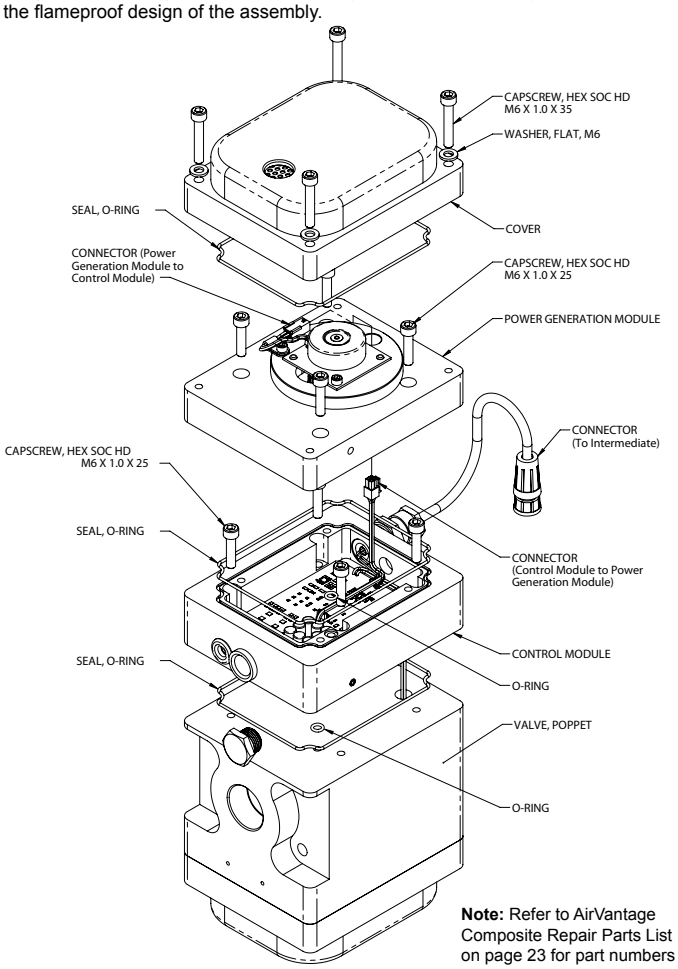
Reinstall the power generation module. Make sure to feed the control module wire through the hole in the power generation case. Install the four M5 x 25mm socket head cap screws and tighten to 6.8 N-M.

“AirVantage Caution” – Be sure to reattach the connector from the power generator to the control board.

Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four M6 screws. Reinstall the AirVantage right bracket, chamber bolts/nuts and four 5/16-18 x 5 1/2 cap screws, torque to 90 in-lbs.

“AirVantage Caution” – Be sure to reattach the patch cable connector that connects the AirVantage module to the intermediate.

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.



Note: Refer to AirVantage Composite Repair Parts List on page 23 for part numbers

⚠ WARNING

Substitution of components may impair intrinsic safety.

⚠ WARNING

Do not open when an explosive atmosphere may be present.

AirVantage Servicing - Sensor Assembly

To service the control module, first shut off and bleed the air being supplied to the pump. For safety purposes the air supply line should be disconnected from the pump. Then shut off the suction and discharge lines to the pump. Bleed the pressure from the pump suction and discharge lines and remove the lines from the pump. During the servicing of the AirVantage, consult the “AirVantage Composite Repair Parts Drawing”.

Step #1: Remove the Patch Cable
Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can then be removed from the intermediate.

Step #2: Remove the AirVantage from the Pump
Use a ½” socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the plastic cover located on the bottom.

Step #3: Diaphragm Disassembly
Refer to exploded views for disassembly.

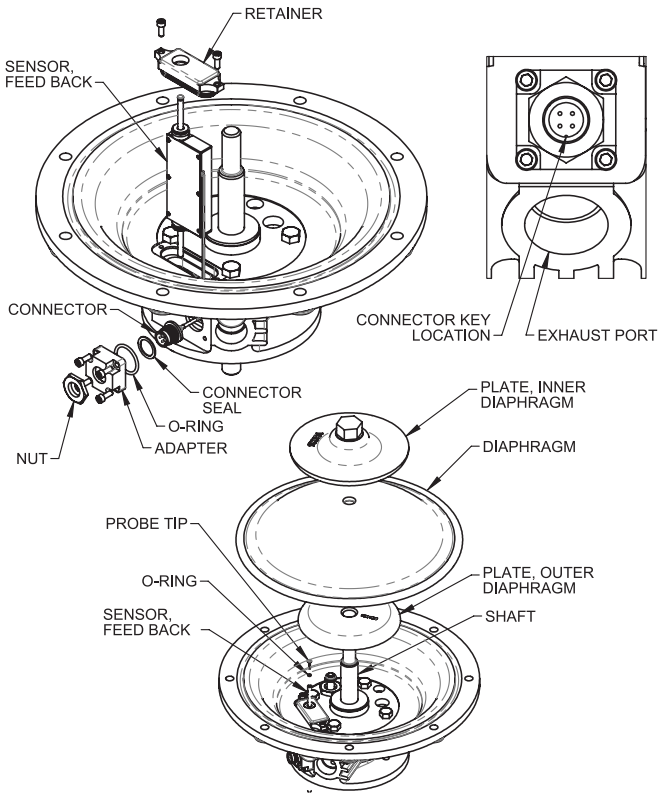
“AirVantage CAUTION” – When the diaphragm assembly is removed, watch for the brass probe tips located on the end of the sensor rod. There is one brass probe tip and one o-ring per side. Inspect the probe tips and o-rings for wear. Every time the diaphragm is serviced, these parts should be replaced and are available in kit form. Consult the “Composite Repair Parts Drawing” for part numbers and quantities.

Step #4: Accessing the Sensor Assembly
Use a 9/64" hex key wrench to remove the 4 socket head cap screws from the sensor connector plate. Use a 13/16" socket and remove the plastic nut securing the connector to the connector plate. Remove the connector from the connector plate taking care not to lose/misplace the gasket on the connector or the o-ring that seals the connector plate. Next, use a 9/64" hex key wrench to remove the 2 socket head cap screws on each sensor end cap. Use a small flat screwdriver to gently pry the end caps from the inner chambers.

Now slide the sensor out of the intermediate while feeding the connector and cable into the intermediate. Slide the Connector end of the cable out of the same opening as the sensor.

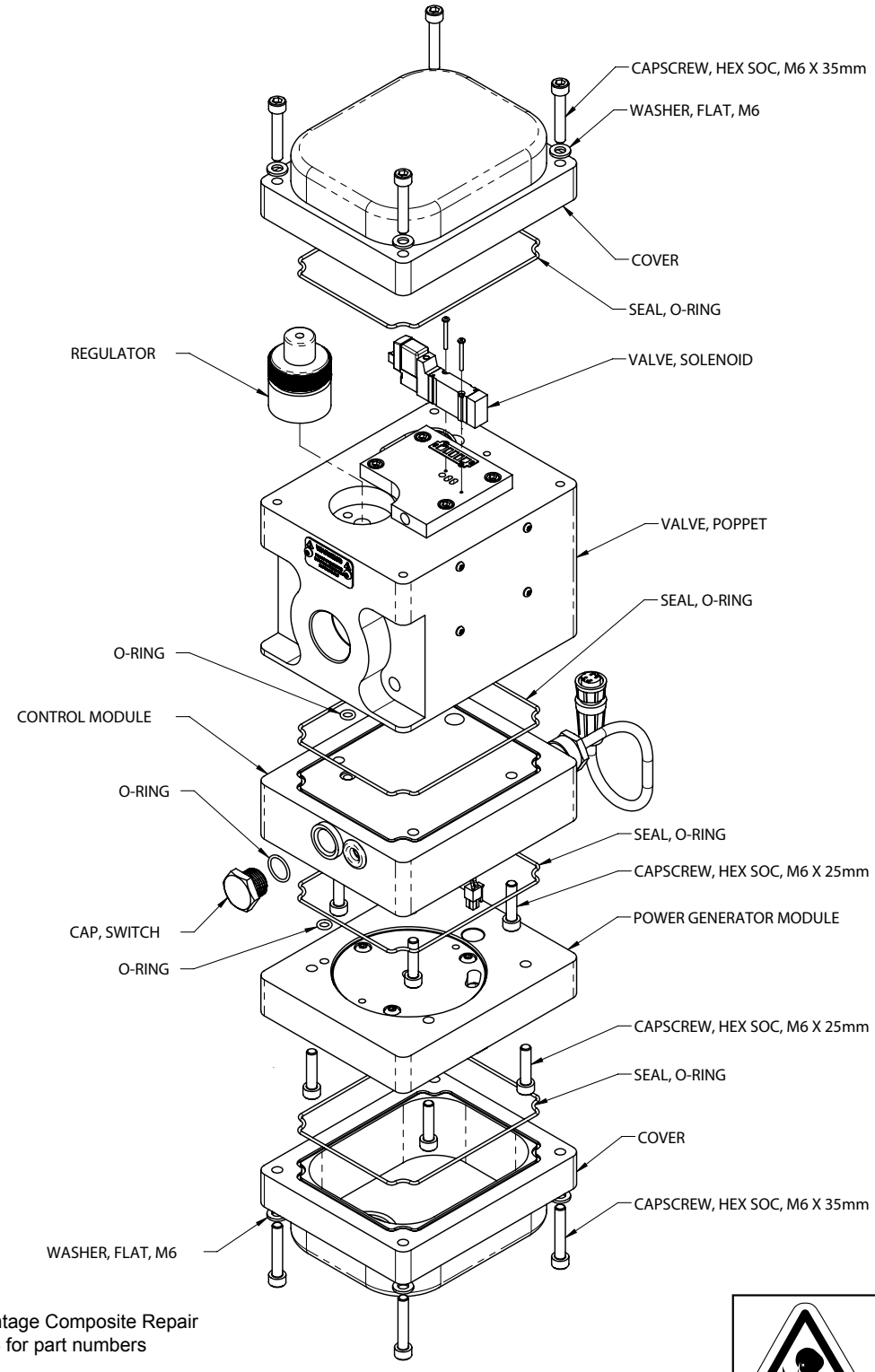
Step #5: Reinstallation
Note the orientation of the sensor rod with respect to the pilot shaft location. The sensor rod side of the sensor should be on the "top" side of the pump (facing the air valve side of the pump). Slide the Connector end of the cable and then the sensor into the sensor opening. Feed the connector out through the opening in the intermediate. Ensure the gasket is on the connector and the connector plate o-ring is in the connector plate o-ring groove. Insert the connector into the connector plate. Use a 13/16" socket to install the plastic nut in order to secure the connector to the connector plate. Use a 9/64" hex key wrench to install the 4 socket head cap screws and secure the sensor connector plate to the intermediate. Install the sensor end caps. Be sure not to pinch or cut the sensor o-rings. Use a small amount of lubrication if necessary to ease assembly. Use a 9/64" hex key wrench to install the 2 socket head cap screws on each sensor end cap to secure the sensor.

Refer to the “Diaphragm Servicing” section of the manual to finish the diaphragm installation procedure.



Note: Refer to Composite Repair Parts List on page 23 for part numbers

AirVantage Servicing - Poppet Valve Drawing



Note: Refer to AirVantage Composite Repair Parts List on page 23 for part numbers

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.

⚠ WARNING

Substitution of components may impair intrinsic safety.

⚠ WARNING

Do not open when an explosive atmosphere may be present.

AirVantage Servicing - Poppet Valve

Step #1: Remove the Patch Cable

Twist the ribbed portion of the patch cable connector in a counterclockwise direction, until it unthreads from the connector. The cable can then be removed from the intermediate.

Step #2: Remove the AirVantage from the Pump

Use a ½" socket and remove the four 5/16-18 x 5 1/2 cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the cover located on the bottom. Inspect the o-ring between the poppet valve and the adapter plate for damage.

Step #3: Access the Pilot Valve and Pressure Regulator

Use a 5mm hex-key wrench and loosen the four M6 x 35mm socket head cap screws securing the top cover on. Lift the cover off, exposing the pilot valve and pressure regulator. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove.

Unplug the connector attached to it. Use a miniature 4-way Phillips screwdriver and remove the two screws securing the pilot valve to the plate. The valve and gasket can now be removed and/or replaced.

Use slip-joint pliers to unscrew the regulator from the body by turning it in a counterclockwise direction.

"AirVantage CAUTION" – Do not loosen or tighten the regulator by turning the knurled portion of the unit. Place the slip-joint pliers on the smooth area underneath the knurled area of the regulator.

Reinstall the top cover and loosely reinstall the bolts. Turn the assembly over and let it now rest on the top cover.

Step #4: Access the Power Generation Module

Use a 5mm hex-key wrench and remove the four M6 x 35mm socket head cap screws securing the bottom cover on. Lift the bottom cover off, exposing the power generation module. There is a molded o-ring seal located on the underside of the cap. Make sure the o-ring stays located within the groove.

Unplug the connector that connects the power generator to the control board. Use a 4mm hex-key wrench to loosen the four M5 x 25mm socket head cap screws. The power generation module should now be loose. Carefully lift the power generation module off the rest of the assembly, making sure that the control board wire and connector slips through the hole in the power generation case.

Step #5: Access the Control Module

Use a 4mm hex-key wrench and loosen the two M5 x 25mm socket head cap screws securing the control module to the poppet assembly. The control module should now be loose. Carefully lift the control module off the poppet assembly, making sure that the pilot valve connector wire slips through the hole in the poppet valve assembly.

The Poppet valve assembly can now be replaced.

Step #6: Reinstallation

Install the control module on the poppet valve assembly. Make sure to feed the pilot valve connector wire through the hole in the poppet valve assembly. Install the two M5 x 25mm socket head cap screws and tighten to 3.4 N-M.

Install the power generation module onto the control module. Make sure to feed the control module wire through the hole in the power generation case. Install the four M5 x 25mm socket head cap screws and tighten to 6.8 N-M.

"AirVantage Caution" – Be sure to reattach the connector from the power generator to the control board.

Install the bottom cover, making sure the o-ring seal is still in the groove. Tighten the four M6 screws. The unit can now be turned over and set on the bottom cover.

Install the pilot valve, tighten the screws snug with a jeweler's screwdriver.

"AirVantage Caution" – Be sure to reattach the connector to the pilot valve.

AirVantage Caution" – Be sure to reattach the patch cable connector that connects the AirVantage module to the intermediate.

If the pressure regulator needs to be replaced, use slip-joint pliers to unscrew the regulator from the body by turning it in a counterclockwise direction.

"AirVantage CAUTION" – Do not loosen or tighten the regulator by turning the knurled portion of the unit. Place the slip-joint pliers on the smooth area underneath the knurled area of the regulator.

Step #4: Reinstallation

Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four M6 screws.

Reinstall the AirVantage right bracket, chamber bolts/nuts and four 5/16-18 x 5 1/2 cap screws, torque to 90 in-lbs.

"AirVantage Caution" – Be sure to reattach the patch cable connector that connects the AirVantage module to the intermediate.

Refer to Page 27 for Illustration.

Note: Ensure all mating faces are free from scores or damage prior to re-assembly. Check each metallic face joint with a 0.003" feeler gage to ensure all flange faces are fully closed after assembly. Failure to do so may compromise the flameproof design of the assembly.

AirVantage Servicing - Check Valve

AirVantage – Check Valve Assembly

To service the check valve, first shut off and bleed the air being supplied to the pump. For safety purposes the air supply line should be disconnected from the pump. Then shut off the suction and discharge lines to the pump. Bleed the pressure from the pump suction and discharge lines and remove the lines from the pump. During the servicing of the AirVantage, consult the "AirVantage Composite Repair Parts Drawing" (Page 11)

Step #1: Remove the Patch Cable

Twist the ribbed portion of the patch cable connector in the counterclockwise direction, until it un-threads from the connector. The cable can be either be removed from the intermediate or from the control module.

Step #2: Remove the AirVantage from the Pump

Use a ½" socket and remove the four 5/16 x 5 ½ cap screws that hold the AirVantage to the pump. Remove the two chamber bolts/nuts that are holding the right side bracket to be able to remove the right bracket and the AirVantage unit from the pump. Be sure to support the weight of the AirVantage while removing the last cap screw. After the AirVantage is removed from the pump, set the unit down on the plastic cover located on the bottom. Inspect the o-ring between the poppet valve and adapter plate for damage.

Step 3: Remove the Check Valve from the Pump

Use a ½" socket and remove the four 5/16 x 2 ½ cap screw that holds the check valve to the pump.

Step 4: Inspect Check Valve

Using a 1 ¼" open socket wrench, remove the cartridge valve. Inspect o-rings and mechanism for any signs of wear, degradation, or damage. If any is present, replace with new cartridge valve assembly. Remove any remaining fluid contamination on inside of body and/or cartridge valve. Be careful not to lose the large and small o-rings on either face of the check valve body.

Step 5: Re-assembly of Check Valve

Apply a thin layer of white lithium grease to the threads on the valve cartridge. Insert cartridge valve into body and hand-tighten being careful not to pinch o-ring. Using a 9" torque wrench with crow-foot, torque cartridge vale to 250 in-lbs. Re-apply o-rings, as necessary, to both faces of check valve. After applying Blue Loctite 248, 222 (or equivalent) secure check valve back to pump with four 5/16 x 2 ½ cap screws, re-torque to 90 in-lbs.

To secure the AirVantage, re-install the four 5/16 x 5 ½ cap screws, torquing to 90 in-lbs. Re-install Patch cable.

Written Warranty

5 - YEAR Limited Product Warranty

Quality System ISO9001 Certified • Environmental Management Systems ISO14001 Certified

Versa-Matic warrants to the original end-use purchaser that no product sold by Versa-Matic that bears a Versa-Matic brand shall fail under normal use and service due to a defect in material or workmanship within five years from the date of shipment from Versa-Matic's factory.

~ See complete warranty at http://www.versamatic.com/pdfs/VM%20Product%20Warranty.pdf ~

DECLARATION OF CONFORMITY

DECLARATION DE CONFORMITE • DECLARACION DE CONFORMIDAD • ERKLÄRUNG BEZÜGLICH EINHALTUNG DER VORSCHRIFTEN
DICHIARAZIONE DI CONFORMITÀ • CONFORMITEITSVERKLARING • DEKLARATION OM ÖVERENSSTÄMMELSE
EF-OVERENSSTEMMELSESERKLÆRING • VAATIMUSTENMUKAISUUSVAKUUTUS • SAMSVARSERKLÄRING
DECLARAÇAO DE CONFORMIDADE

MANUFACTURED BY:
FABRIQUE PAR:
FABRICADA POR:
HERGESTELLT VON:
FABBRICATO DA:
VERVAARDIGD DOOR:
TILLVERKAD AV:
FABRIKANT:
VALMISTAJA:
PRODUSENT:
FABRICANTE:

VERSA-MATIC®
Warren Rupp, Inc.
A Unit of IDEX Corporation
800 North Main Street
P.O. Box 1568
Mansfield, OH 44901-1568 USA

Tel: 419-526-7296
Fax: 419-526-7289

PUMP MODEL SERIES: E SERIES, V SERIES, VT SERIES, VSMA3, SPA15, RE SERIES AND U2 SERIES

This product complies with the following European Community Directives:
Ce produit est conforme aux directives de la Communauté européenne suivantes:
Este producto cumple con las siguientes Directrices de la Comunidad Europea:
Dieses produkt erfüllt die folgenden Vorschriften der Europäischen Gemeinschaft:
Questo prodotto è conforme alle seguenti direttive CEE:
Dir produkt voldoet aan de volgende EG-richtlijnen:
Denna produkt överensstämmer med följande EU direktiv:
Versa-Matic, Inc., erklærer herved som fabrikant, at ovennævnte produkt er i overensstemmelse med bestemmelserne i Direkktive:
Tämä tuote täyttää seuraavien EC Direktiivien vaatimukstet:
Dette produkt oppfyller kravene til følgende EC Direktiver:
Este produto está de acordo com as seguintes Directivas comunitárias:

2006/42/EC
on Machinery, according to Annex VIII

This product has used the following harmonized standards to verify conformance:
Ce materiel est fabriqué selon les normes harmonisées suivantes, afin d' en garantir la conformité:
Este producto cumple con las siquientes directrices de la comunidad europa:
Dieses produkt ist nach folgenden harmonisierten standards gefertigtworden, die übereinstimmung wird bestätigt:
Questo prodotto ha utilizzato i seguenti standards per verificare la conformita´:
De volgende geharmoniseerde normen werden gehanteerd om de conformiteit van dit produkt te garanderen:
För denna produkt har följande harmoniserande standarder använts för att bekräfta överensstämmelse:
Harmoniserede standarder, der er benyttet:
Tässä tuotteessa on sovellettu seuraavia yhdenmukaistettuja standardeja:
Dette produkt er produsert i overenstemmelse med fløgende harmoniserte standarder:
Este produto utilizou os seguintes padrões harmonizados para varificar conformidade:

EN809:1998+ A1:2009

AUTHORIZED/ APPROVED BY:
Approuve par:
Aprobado por:
Genehmigt von:
approvato da:
Goedgekeurd door:
Underskrift:
Valtuutettuna:
Bemyndiget av:
Autorizado Por:

David Roseberry
Dave Roseberry
Engineering Manager

DATE: August 10, 2011
FECHA:
DATUM:
DATA:
DATO:
PÄIVÄYS:

CE

04/19/2012 REV 07

VMQR 044FM

VERSA-MATIC®

EC Declaration of Conformity

In accordance with ATEX Directive 94/9/EC,
Equipment intended for use in potentially explosive environments.

Manufacturer:
Warren Rupp, Inc.®
A Unit of IDEX Corportion
800 North Main Street
Mansfield, OH 44902 USA

Airvantage-equipped ATEX-Certified Air-Operated Double Diaphragm RE2 and RE3 Bolted or Clamp Design Model Pumps.

Certificate Number:
Sira 10ATEX1151X Issue: 2
Equiptment: AirVantage Air Flow Control Unit

Sira Certification Service
Rake Lane
Eccleston
Chester
CH4 SJN
United Kingdom

Applicable Standard:

AirVantage	Marking:
EN 60079-0:2009	II 2 G D
EN 60079-1:2007	Ex d ib IIB T4 Gb
IEC 60079-31:2006	Ex tb IIIC 135° C Db IP66

Position Sensor	Rating (not marked):
EN 60079-0:2006	II 2 G D
EN 60079-11:2007	Ex ib IIB T4
EN 61241-0:2006	Ex ibD 21 T132° C
EN 61242-11:2006	

CE 0518

AirVantage®
ENERGY SAVING TECHNOLOGY

DATE/APPROVAL/TITLE:
05 DECEMBER 2011

David Roseberry
David Roseberry, Engineering Manager

IDEX FLUID & METERING

VERSA-MATIC®

Declaration of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

Manufacturer:
Warren Rupp, Inc.®
A Unit of IDEX Corportion
800 North Main Street
Mansfield, OH 44902 USA

Airvantage-equipped Air-Operated Double Diaphragm RE2 and RE3 Bolted or Clamped Design Pump Models.

Certificate Number:
IECEx SIR 10.0110X Issue: 2
Equiptment: AirVantage Air Flow Control Unit

Sira Certification Service
Rake Lane
Eccleston
Chester
CH4 SJN
United Kingdom

Applicable Standard:

AirVantage	**Marking:**
IEC 60079-0:2004	Ex d ib IIB T4 Gb
IEC 60079-1:2007-4	Ex tb IIIC 135° C Db IP66
IEC 60079-31:2008	

Position Sensor	**Rating (not marked):**
IEC 60079-0:2007-10	Ex ib IIB T4
IEC 60079-11:2006	Ex ibD 21 T132° C
IEC 61241-0:2004	
IEC 61242-11:2005	

AirVantage®
ENERGY SAVING TECHNOLOGY

DATE/APPROVAL/TITLE:
05 DECEMBER 2011

David Roseberry
David Roseberry, Engineering Manager

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