

### 2" Clamped Metallic Hazardous Service Ball Valve

AirVantage™ Energy Saving Technology

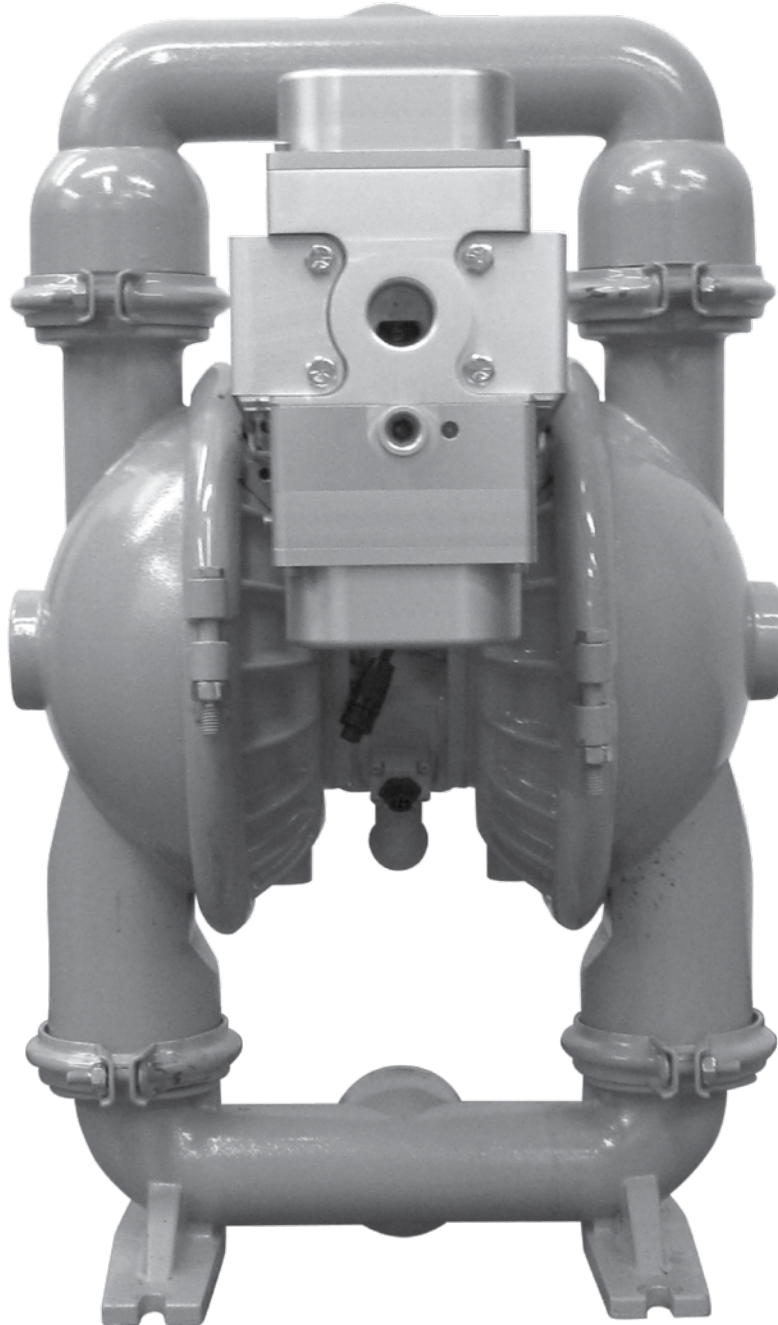
# RE2

#### RE2 Metallic Pumps

- Aluminum
- Stainless Steel
- Hastelloy C
- Cast Iron



0518



**VERSAMATIC®**

# 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.



### **WARNING**

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.



None of the equipment supplied within the Air/Vantage unit either use or exceed the amounts stated above hazardous substances. A signed declaration from our supplier of the electronic/electrical portion of the Air/Vantage 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.



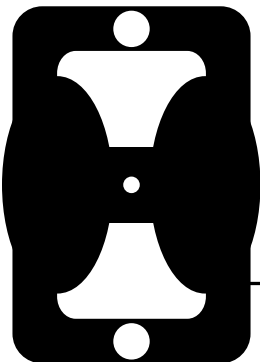
Use safe practices when lifting

## 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.

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1: PUMP SPECS

2: INSTAL & OP

3: EXP VIEW

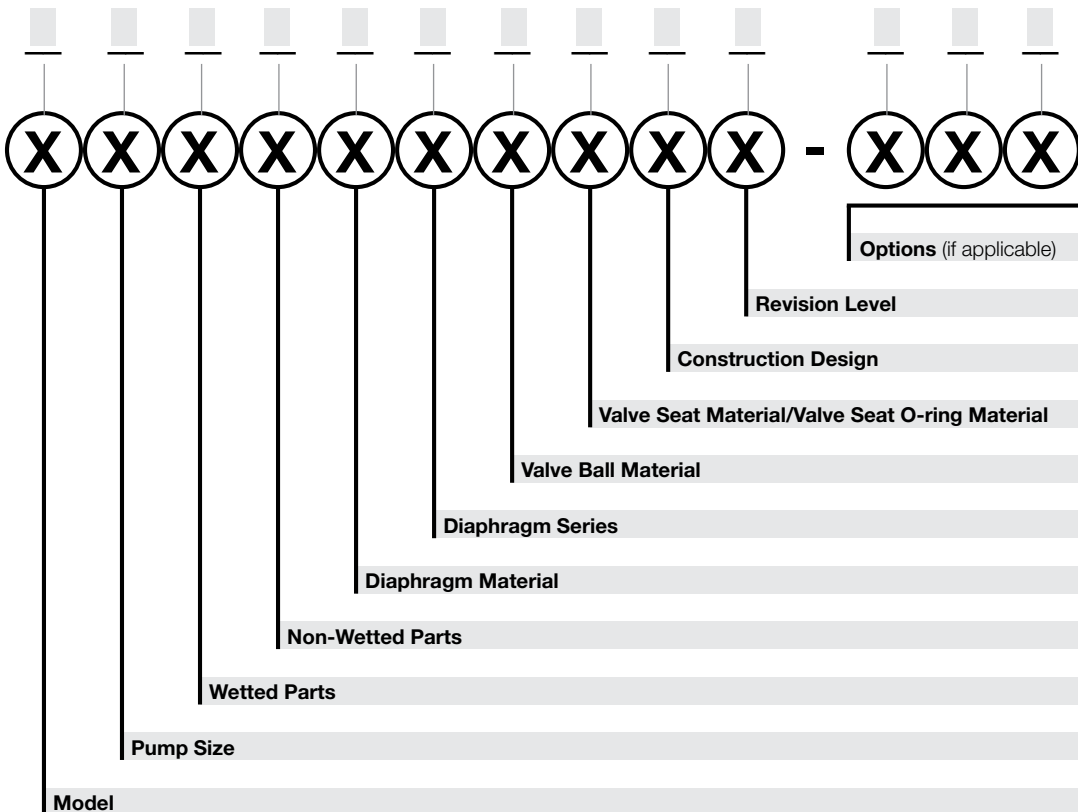
4: WARRANTY

# Explanation of Pump Nomenclature

Your Serial #: (fill in from pump nameplate) \_\_\_\_\_

Your Model #:  
(fill in from pump  
nameplate)

Model #:



## 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:	
	Max.	Min.
<b>CAUTION!</b> Operating temperature limitations are as follows:		
<b>Conductive Acetal:</b> 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
<b>EPDM:</b> 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
<b>FKM:</b> (Fluorocarbon) Shows good resistance to a wide range of oils and solvents; 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
<b>Hytrel®:</b> Good on acids, bases, amines and glycols at room temperatures only.	220°F 104°C	-20°F -29°C
<b>Neoprene:</b> 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
<b>Nitrile:</b> 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
<b>Nylon:</b> 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

<b>Polypropylene:</b> A thermoplastic polymer. Moderate tensile and flex strength. Resists strong acids and alkali. Attacked by chlorine, fuming nitric acid and other strong oxidizing agents.	180°F 82°C	32°F 0°C
<b>PVDF:</b> (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
<b>Santoprene®:</b> Injection molded thermoplastic elastomer with no fabric layer. Long mechanical flex life. Excellent abrasion resistance.	275°F 135°C	-40°F -40°C
<b>UHMW PE:</b> 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
<b>Urethane:</b> Shows good resistance to abrasives. Has poor resistance to most solvents and oils.	150°F 66°C	32°F 0°C
<b>Virgin PTFE:</b> (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
<i>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.</i>		
<b>Metals:</b>		
<b>Alloy C:</b> Equal to ASTM494 CW-12M-1 specification for nickel and nickel alloy.		
<b>Stainless Steel:</b> Equal to or exceeding ASTM specification A743 CF-8M for corrosion resistant iron chromium, iron chromium nickel and nickel based alloy castings for general applications. Commonly referred to as 316 Stainless Steel in the pump industry.		

For specific applications, always consult the Chemical Resistance Chart.

1: PUMP SPECS

## AFTERMARKET PARTS

### RIGHT PART, RIGHT NOW

**Pumper Parts** is your single source for parts that fit Air-Operated Double Diaphragm (AODD) pumps

- Wilden®
- ARO®
- Yamada®

**Designed to perform equal to or greater than original equipment manufacture.**



Phone: (419) 526-7296  
info@pumperparts.com  
www.pumperparts.com

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# Performance

## RE2 Clamped

### Flow Rate

Adjustable to . . . . . 0-165 gpm (625 lpm)

### Port Size

Suction . . . . . 2" NPT (BSP)

Discharge . . . . . 1" NPT (BSP)

**Air Inlet** . . . . . 1" NPT

**Air Exhaust** . . . . . 3/4" 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)

. . . . . 0.43" (11 mm)

### Max Noise Level

. . . . . 92 dB(A)

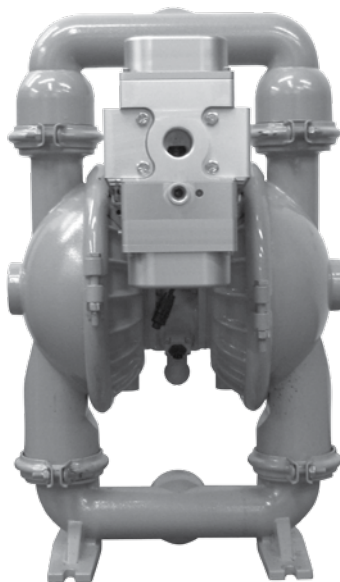
### Shipping Weights

Aluminum . . . . . 83 lbs (37.7 kg)

Stainless Steel . . . . . 128 lbs (58.2 kg)

Cast Iron . . . . . 128 lbs (58.2 kg)

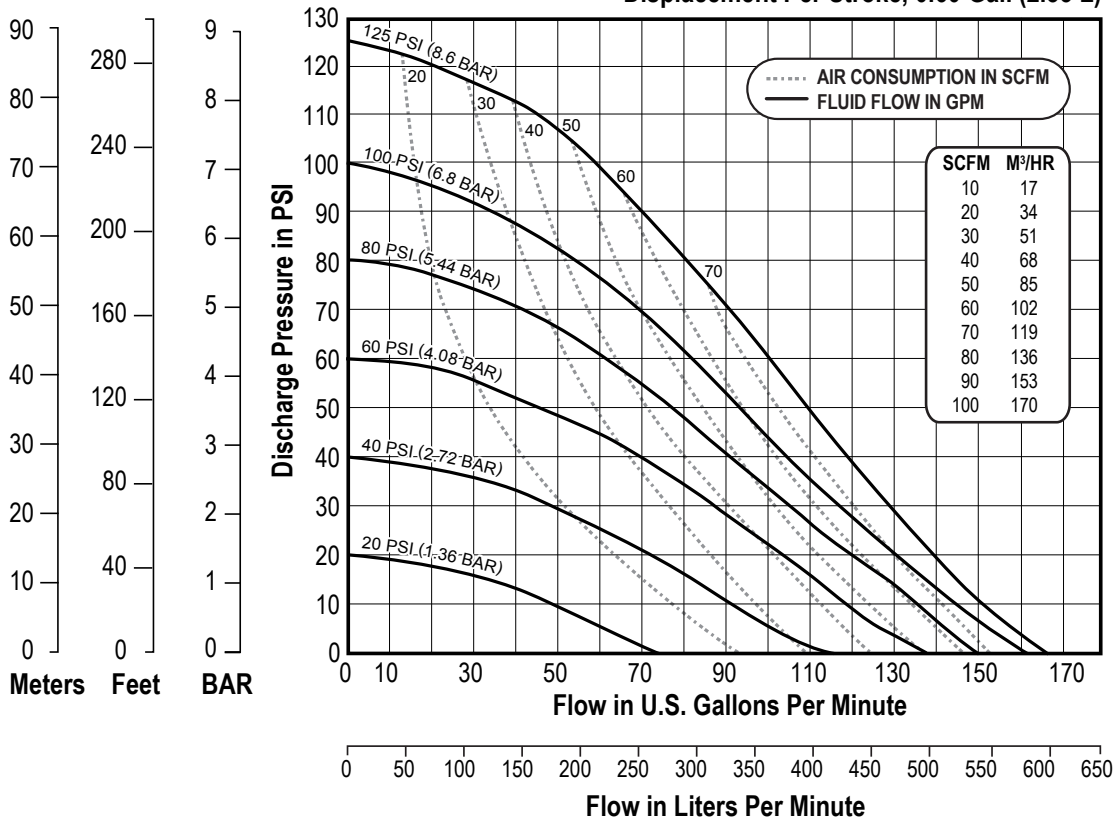
Hastelloy C . . . . . 138 lbs (62.7 kg)



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

**NOTE:** For RE2AA pumps fitted with PTFE diaphragms, reduce water discharge figures by 10%. Suction lift is reduced to 10' (3.05m) dry and 20' (6.10m) wet.

Displacement Per Stroke, 0.60 Gal. (2.33 L)

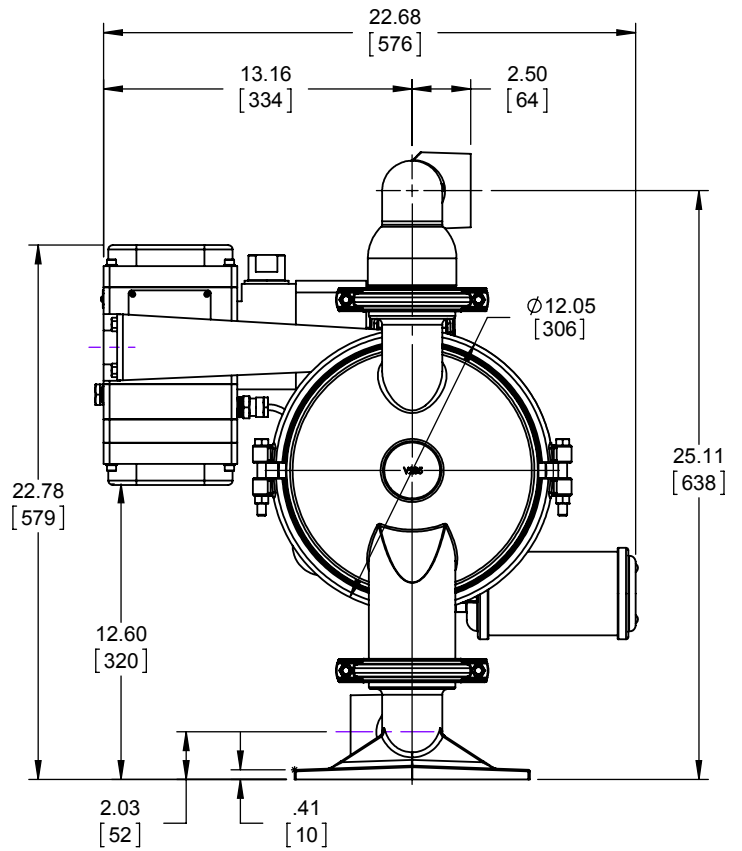
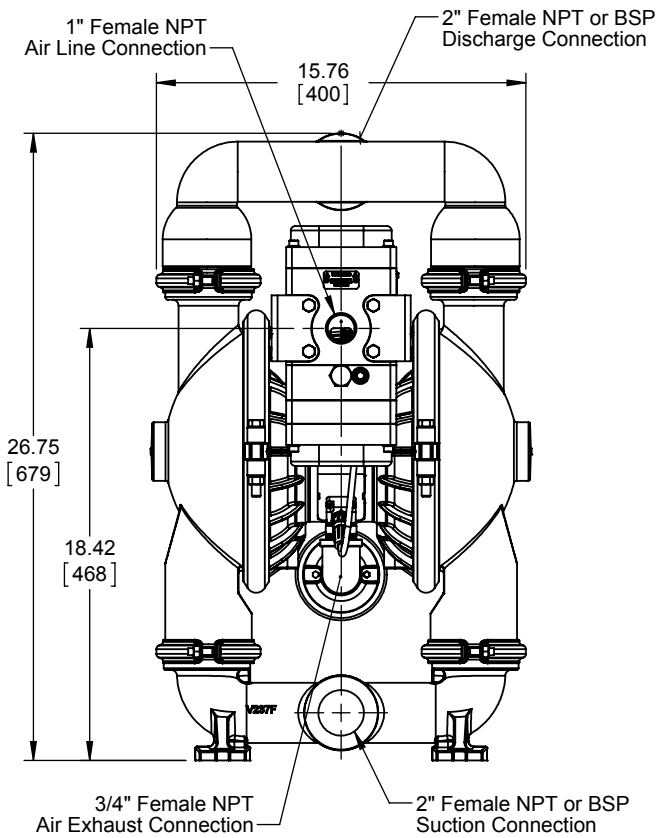


# Dimensional Drawings

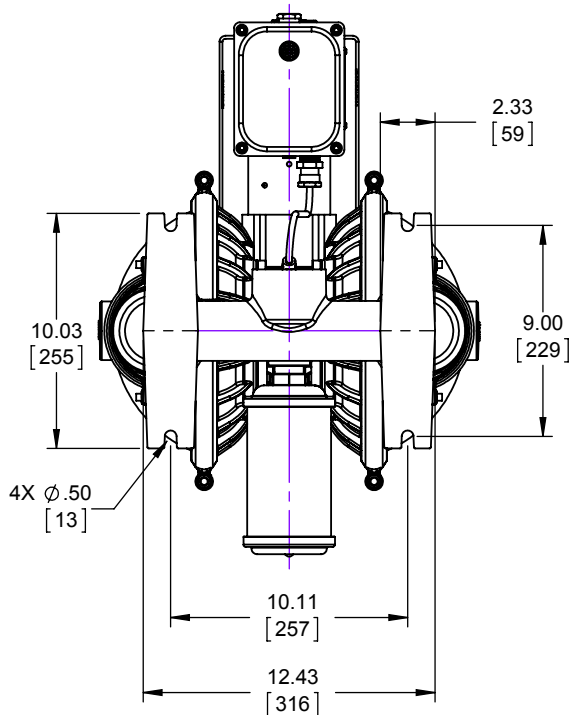
## RE2 Clamped

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.



1: PUMP SPECS



# Principle of Pump Operation

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

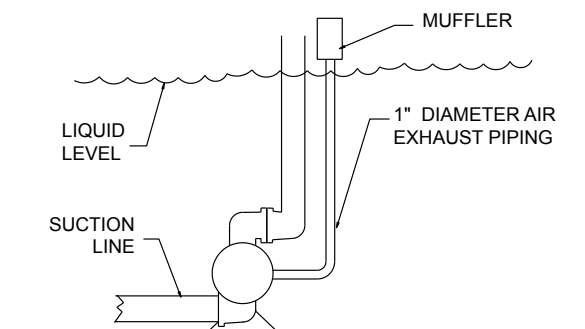
The main directional (air) control valve ① distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm ②. At the same time, the exhausting air ③ from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port ④.

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.

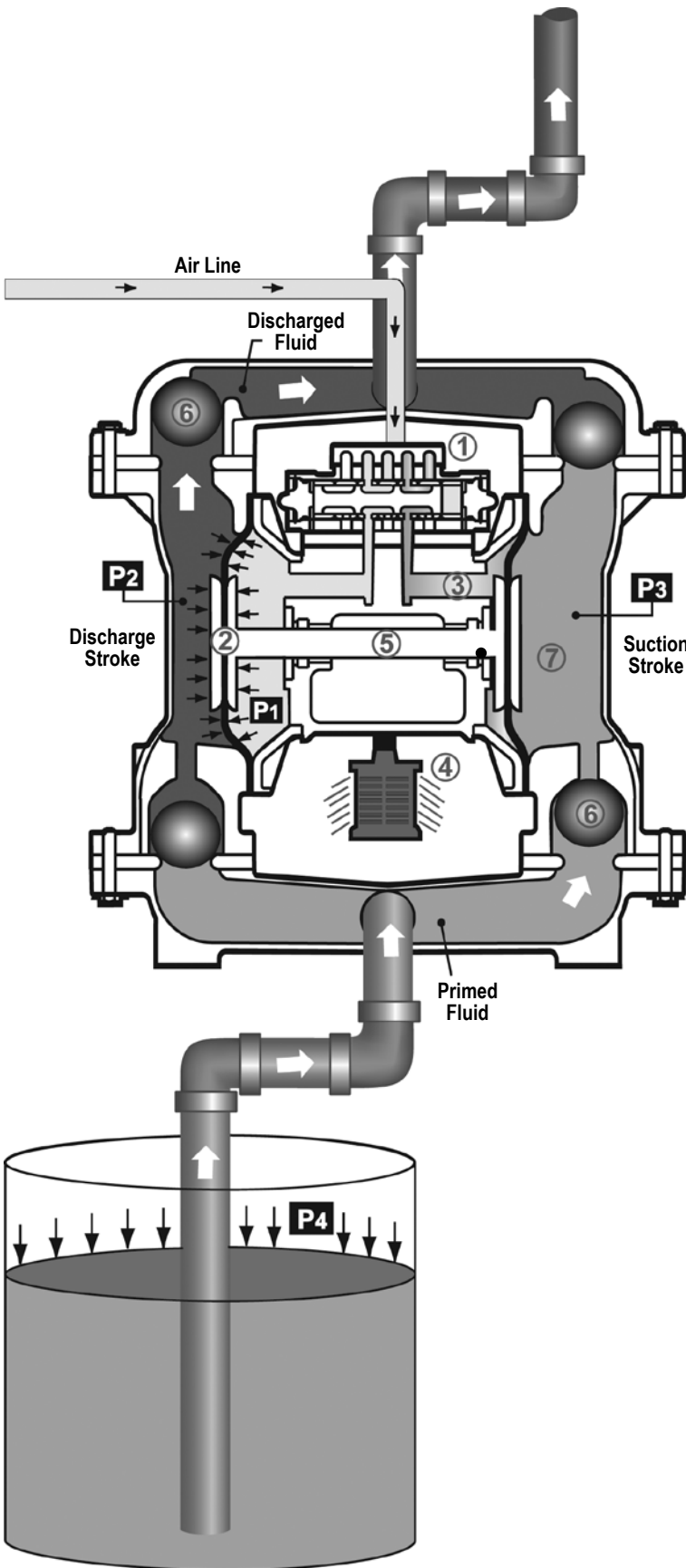
The pump primes as a result of the suction stroke. The suction stroke lowers the chamber pressure (**P3**) increasing the chamber volume. This results in a pressure differential necessary for atmospheric pressure (**P4**) to push the fluid through the suction piping and across the suction side check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

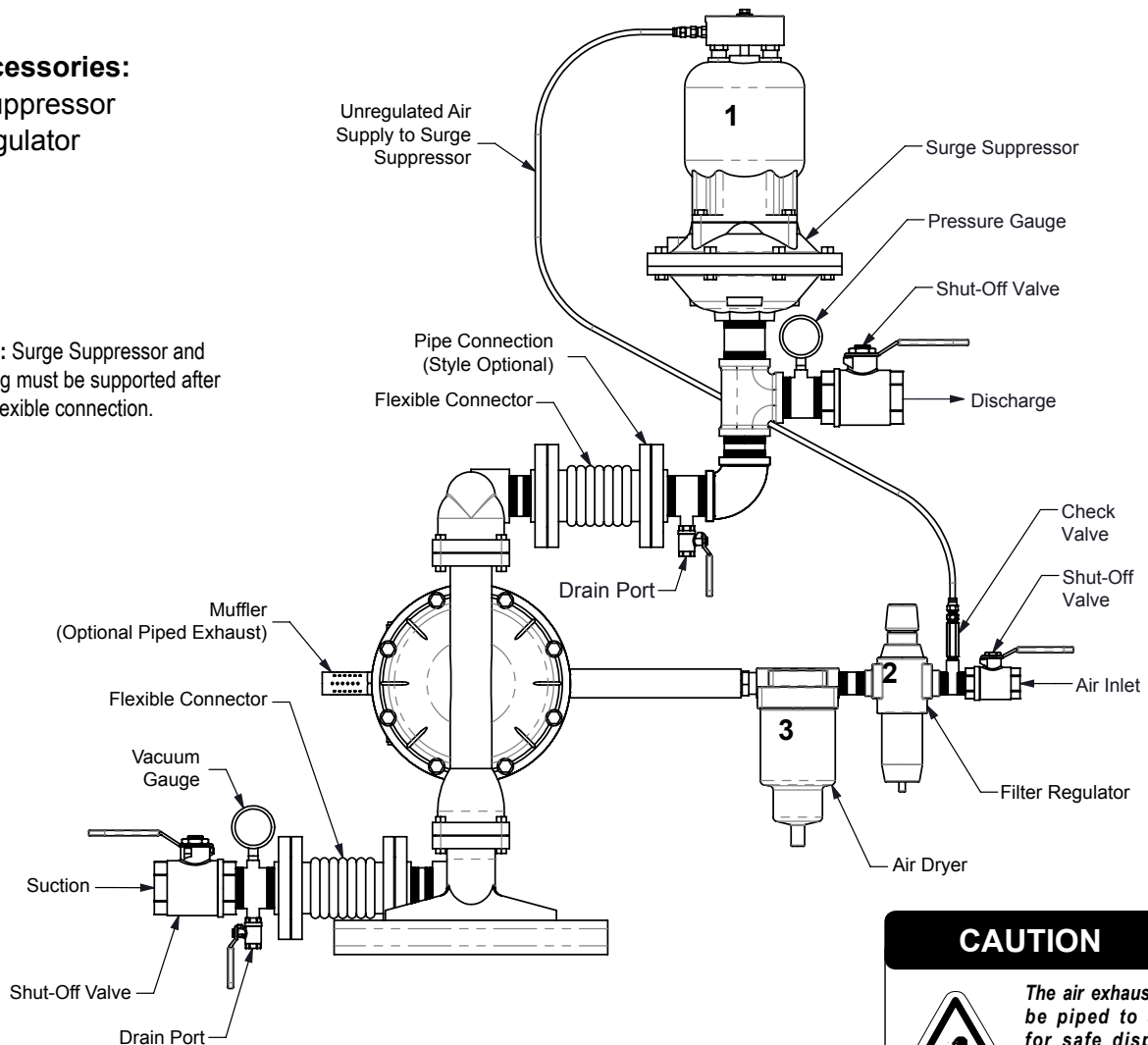


# Recommended Installation Guide

## 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):
<b>Pump Cycles Once</b>	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.
<b>Pump Will Not Operate / Cycle</b>	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.
<b>Pump Cycles and Will Not Prime or No Flow</b>	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.
<b>Pump Cycles Running Sluggish/Stalling, Flow Unsatisfactory</b>	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.
<b>Product Leaking Through Exhaust</b>	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.
<b>Premature Diaphragm Failure</b>	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.
<b>Unbalanced Cycling</b>	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](mailto: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

<u>STATE</u>	<u>LED OUTPUT</u>
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:

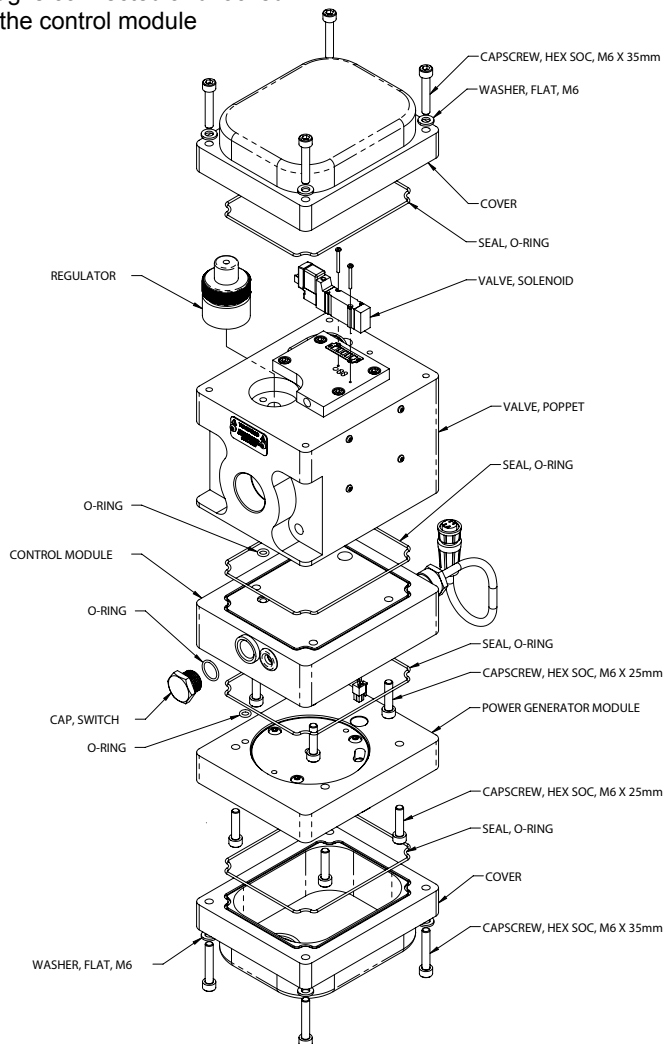
- If the sensor has been submerged in product, the sensor will need to be replaced. Consult the AirVantage servicing section of the manual for detailed instructions.

### What to Check:

- Has product contaminated the poppet valve?

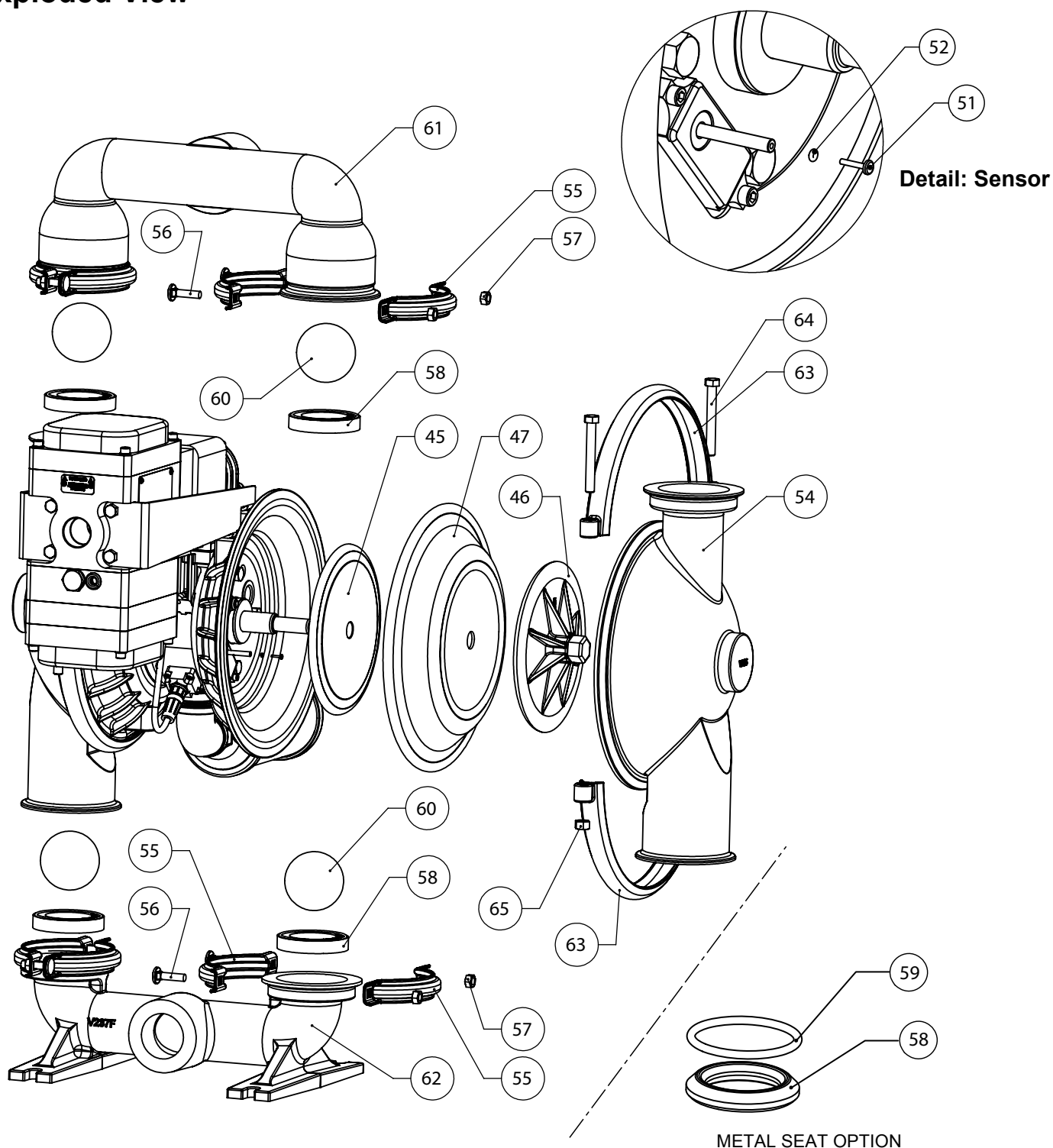
### Correct Action:

- 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).



# Composite Repair Parts Drawing

## Exploded View



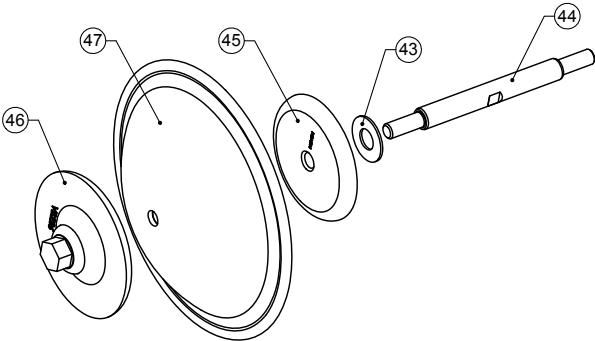
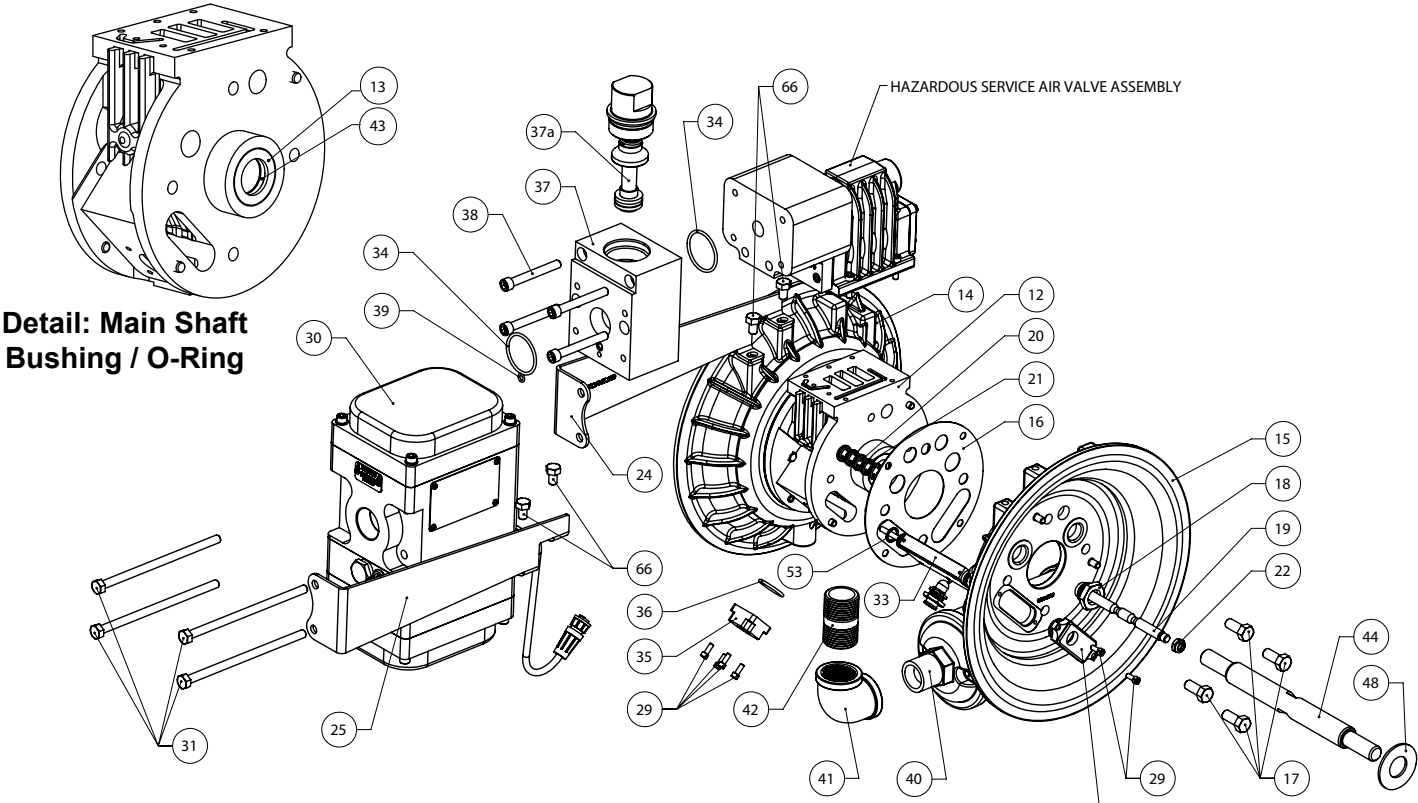
3: EXP VIEW

### Torque Settings

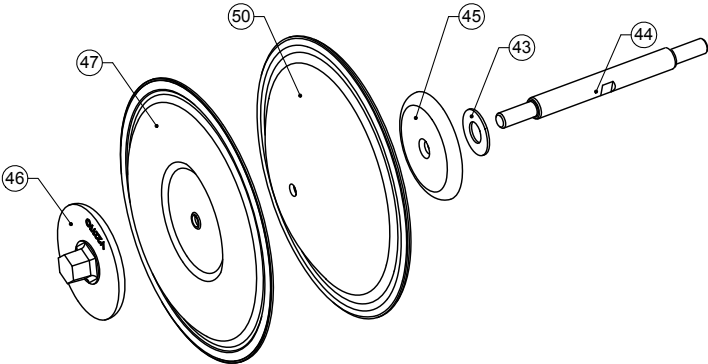
Small Clamp Bolts	50 in-lbs (5.6 N-m)
Large Clamp Bolts	20 ft-lbs (27 N-m)
Diaphragm Plates — Rubber	65 ft-lbs (88 N-m)
Diaphragm Plates — PTFE	65 ft-lbs (88 N-m)
Air Valve Cap Screws	25 in-lbs (2.8 N-m)

# Composite Repair Parts Drawing

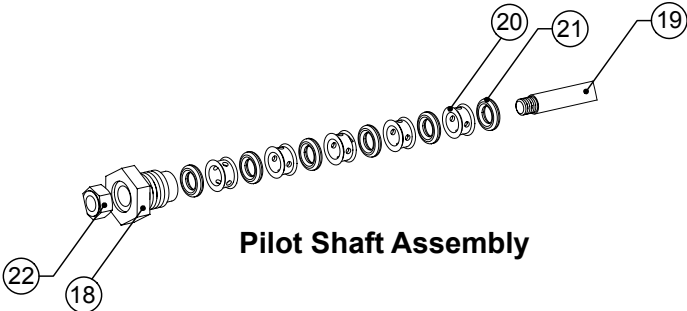
## Center and Diaphragm Assembly



Dome Diaphragms



PTFE Diaphragms - 2pc.



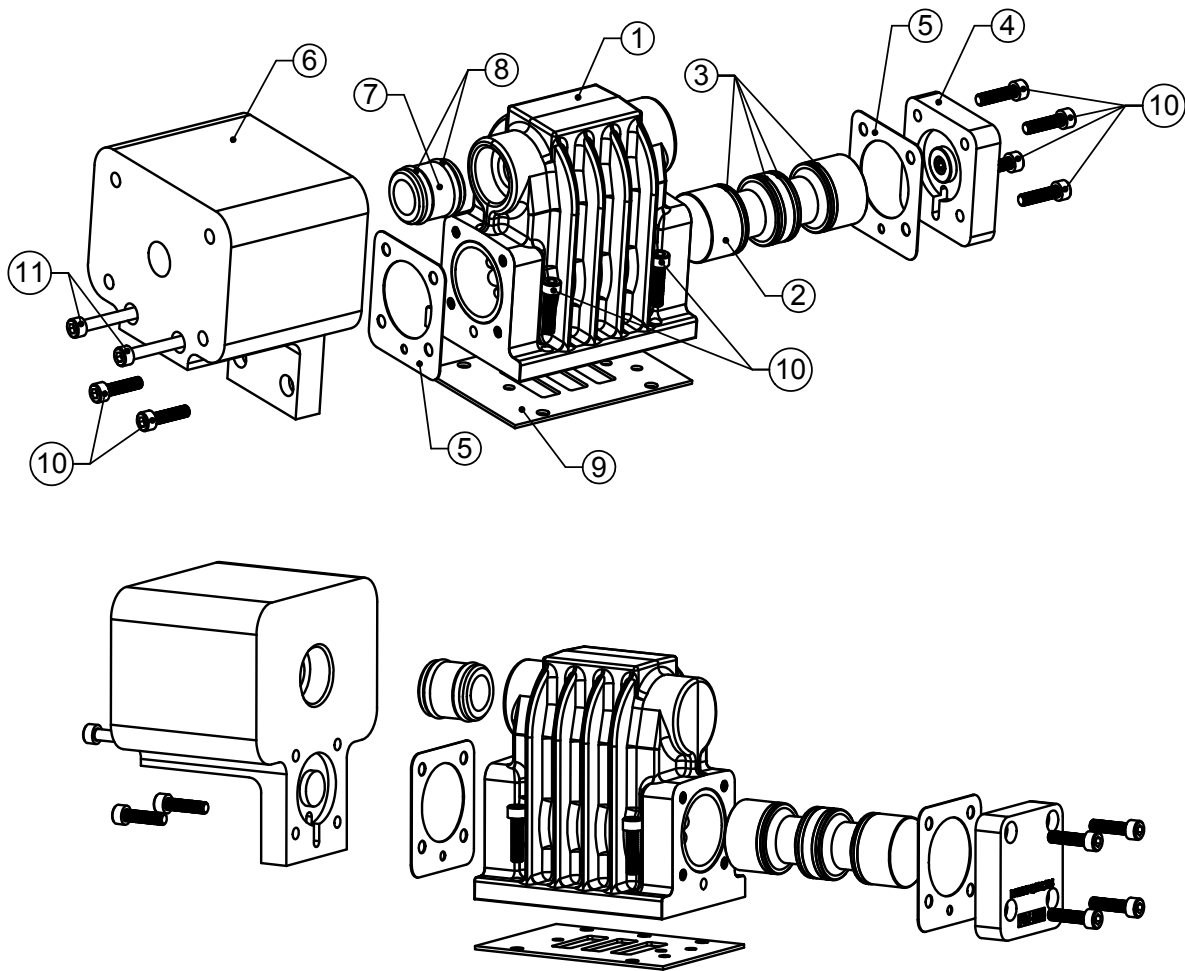
Pilot Shaft Assembly

3: EXP VIEW

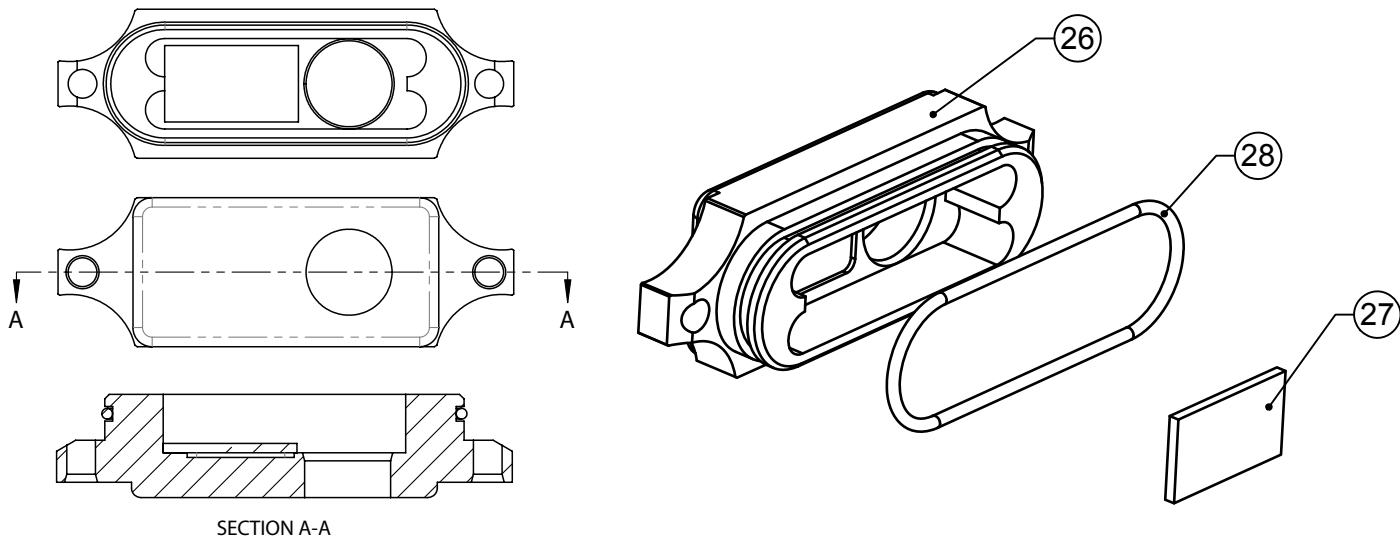
# Composite Repair Parts Drawing

## Detail Views

### Air Valve



### Sensor End Cap



3: EXP VIEW

# Composite Repair Parts List

AIR VALVE ASSEMBLY					
Item	Qty	Description	Standard: Aluminum		
	1	Air Valve Assembly (Includes items 1-11)	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	P126-0001		
13	1	Main Shaft Bushing	P24-402		
14	1	Air Chamber, Left	P126-0016		
15	1	Air Chamber, Right	P126-0017		
16	2	Air Chamber Gasket	P79-109		
17	8	Air Chamber Bolt	P24-110		
18	2	Bushing	P24-105		
19	1	Pilot Shaft	P24-104		
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.V013.159		
25	1	Mounting Bracket Right	115.V014.159		
26	2	Retainer Plate	P126-0010		
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	P126-0081		
31	4	AirVantage Unit Cap Screw	170.125.330		
33	1	AirVantage Sensor	P126-0035 (Standard)	P126-0059 (PTFE Diaphragm)	
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		
DIAPHRAGM ASSEMBLY					
Item	Qty	Description	Dome	Rugged	PTFE
43	2	Main Shaft O-Ring	P24-403	P24-403	P24-403
44	1	Main Shaft	P24-103	P24-103	P24-102
45	2	Inner Diaphragm Plate	P126-0014	P126-0015	P126-0058
46	2	Outer Diaphragm Plate	VB226	VB221	V221TO
47	2	Diaphragm	V225XX (Refer to Materials Chart)	V224XX (Refer to Materials Chart)	V224TF-FB
48	2	Bumper Washer	P24-501	P24-501	P24-501
49	2	Stud	N/A	N/A	V221F
50	2	Back-Up Diaphragm	N/A	N/A	V224TFB
51	2	Probe Tip	846.001.167	846.001.167	N/A
52	2	O-Ring Probe Tip	560.201.360	560.201.360	N/A
53	2	O-Ring Sensor	560.033.360	560.033.360	N/A

3: EXP VIEW

# Composite Repair Parts List

WET END ASSEMBLY						
Item	Qty	Description	Aluminum	Cast Iron	Stainless Steel	Hastelloy C
54	2	Water Chamber	V235	WV235	SV235	HV235
55	8	Small Clamp Half	V239A	V239A	SV239A	SV239A
56	8	Small Clamp Bolt	V239B	V239B	SV239B	SV239B
57	8	Small Clamp Nut	V239C	V239C	SV239C	SV239C
58	4	Valve Seat	V240XX (Refer to Materials Chart)			
59	8	Valve Seat O-Ring	V240T V240TES (only used with metal seats)			
60	4	Valve Ball	V241XX (Refer to Materials Chart)			
Port Type: NPT/BSP						
61	1	Discharge Manifold	V236/V236BSP	WV236/WV236BSP	SV236/SV236BSP	HV236/HV236BSP
62	1	Inlet Manifold	V237F/V237BSP	WV237F/WV237BSP	SV237F/SV237BSP	HV237F/HV237BSP
63	4	Large Clamp Half	V230A	V230A	SV230A	SV230A
64	4	Large Clamp Bolt	V230C	V230C	SV230C	SV230C
65	4	Large Clamp Nut	V230D	V230D	SV230D	SV230D
66	4	Bracket Bolt	P126-0062			

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

3: EXP VIEW

# RE2 Clamped - Service Kits

Item	Qty	Description	Part Number
<b>RE2 Sensor Kit</b>			<b>475.275.000</b>
33	1	Sensor, PTFE	P126-0035
51	2	Probe Tips	846.001.157
52	1	Probe Tip O-Ring	560.201.360
53	2	Sensor O-Ring	560.033.360
<b>RE2 PTFE Sensor Kit</b>			<b>475.276.000</b>
33	1	Sensor, PTFE	P126-0059
51	2	Probe Tips	846.001.157
52	1	Probe Tip O-Ring	560.201.360
53	2	Sensor O-Ring	560.033.360
<b>RE2 Control Module Kit ATEX (Power Gen Airvantage Only)</b>			<b>475.296.000</b>
81	1	Control Module Assembly	249.021.000
73	2	Gasket	720.071.360
76	2	Cap Screw	171.091.115
80	2	O-Ring	560.200.360
94	1	Switch Cap O-Ring	560.104.360
83	1	Switch Cap	165.135.33
<b>Poppet Valve Kit ATEX</b>			<b>476.289.000</b>
75	1	Poppet Valve Assembly	893.104.000
34	1	O-Ring	560.011.360
<b>Poppet Valve Assembly Kit ATEX</b>			<b>476.290.000</b>
75	1	Poppet Valve Assembly	893.104.000
34	1	O-Ring	560.011.360
79	1	Regulator	020.069.000
74	1	Pilot Valve	765.004.000
<b>Power Gen Kit</b>			<b>476.293.000</b>
77	1	Power Gen Assembly ATEX	031.202.000
73	1	Gasket	720.071.360
76	4	Cap Screw	171.091.115
80	1	O-Ring	560.200.360
<b>Seal Kit ATEX</b>			<b>476.280.000</b>
34	1	O-Ring	560.011.360
73	4	Gasket	720.071.360
80	2	O-Ring	560.200.360
<b>Probe Tip Kit</b>			<b>476.283.000</b>
51	1	Probe Tips	846.001.167
52	1	Probe Tip O-Rings	560.201.360

Item	Qty	Description	Part Number
<b>AIR VALVE KIT</b>			<b>E2/E3 A AV KIT</b>
3	4	Glide Ring	P34-204F
5	2	End Cap Gasket	P24-205
9	1	Valve Gasket	P24-202
<b>PILOT VALVE KIT</b>			<b>E3A PV KIT</b>
19	5	Pilot Shaft Spacer	P24-106
20	6	Pilot Shaft O-Ring	P24-107
21	2	Stop Nut	P24-108
43	2	Main Shaft O-Ring	P34-403
<b>ELASTOMER KITS</b>			<b>See Factory</b>
47	2	Diaphragm	
58	4	Valve Seat	
60	4	Valve Ball	

Item	Qty	Description	Part Number
<b>Comprehensive Maintenance</b>			<b>RE2-CMK-OE-RB-MB</b>
2	1	Valve Spool	P126-0063
3	4	Valve Spool Glyd Ring	P34-204F
5	2	End Cap Gasket	P24-205
9	1	Valve Gasket	P24-202
16	2	Air Chamber Gasket	P79-109
18	2	Bushing	P24-105
19	1	Pilot Shaft	P24-104
20	5	Pilot Shaft Spacer	P24-106
21	6	Pilot Shaft O-Ring	P24-107
22	2	Stop Nut	P24-108
40	1	Muffler	530.038.000
44	1	Main Shaft	P24-103
48	2	Bumper Washer	P24-501
51	2	Probe Tip	846.001.167
52	2	Probe Tip O-Ring	560.201.360
43	2	Main Shaft O-Ring	P24-403

3: EXP VIEW

# 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 1/2" 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.**

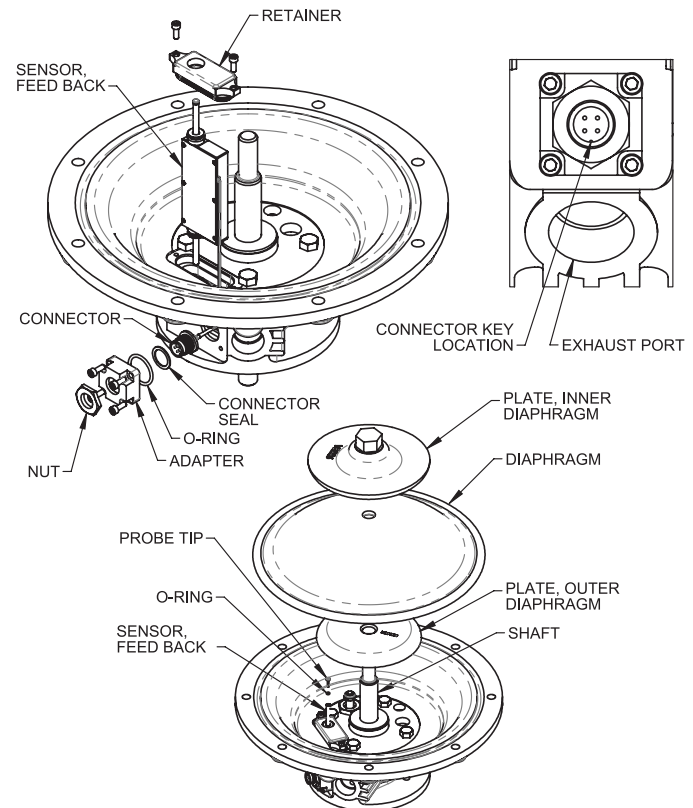
### Step #5: Accessing the AirVantage Sensor

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.

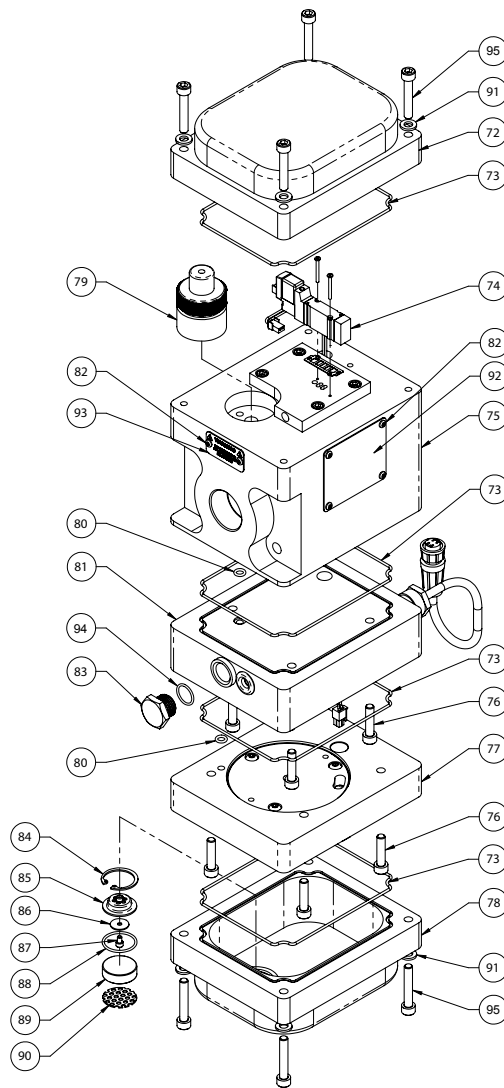
### Step #6: Reinstallation

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.



# 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, RE2 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

*Substitution of components may impair intrinsic safety.*



## WARNING

*Do not open when an explosive atmosphere may be present.*

# 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 1/2" 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.

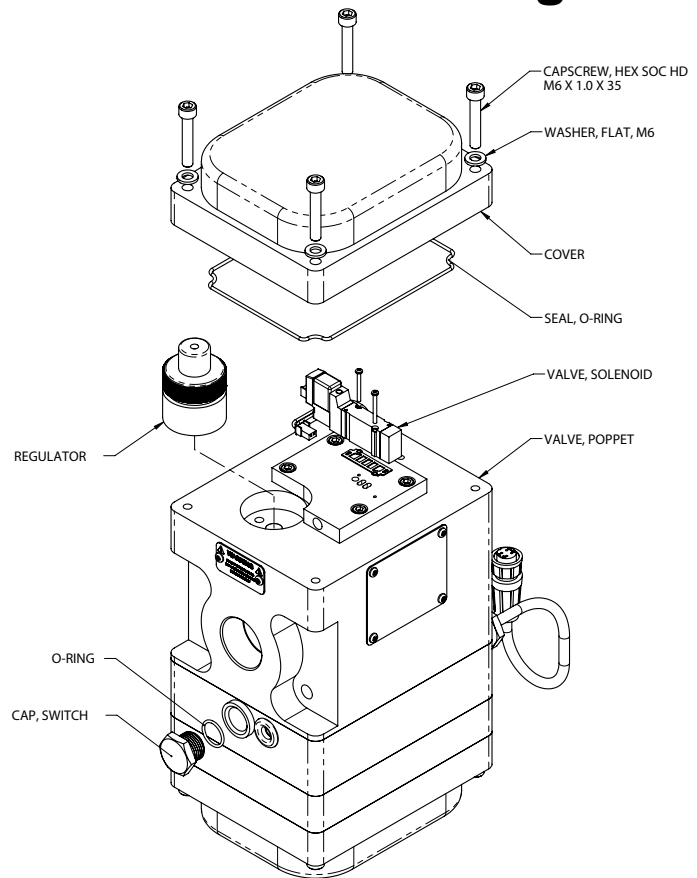
**"AirVantage CAUTION" – Do not loosen or tighten the regulator by turning the knurled portion of the unit. Place the slip-joint pliers on the smooth area underneath the knurled area of the regulator.**

### 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.

3: EXP VIEW



# 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 1/2" 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

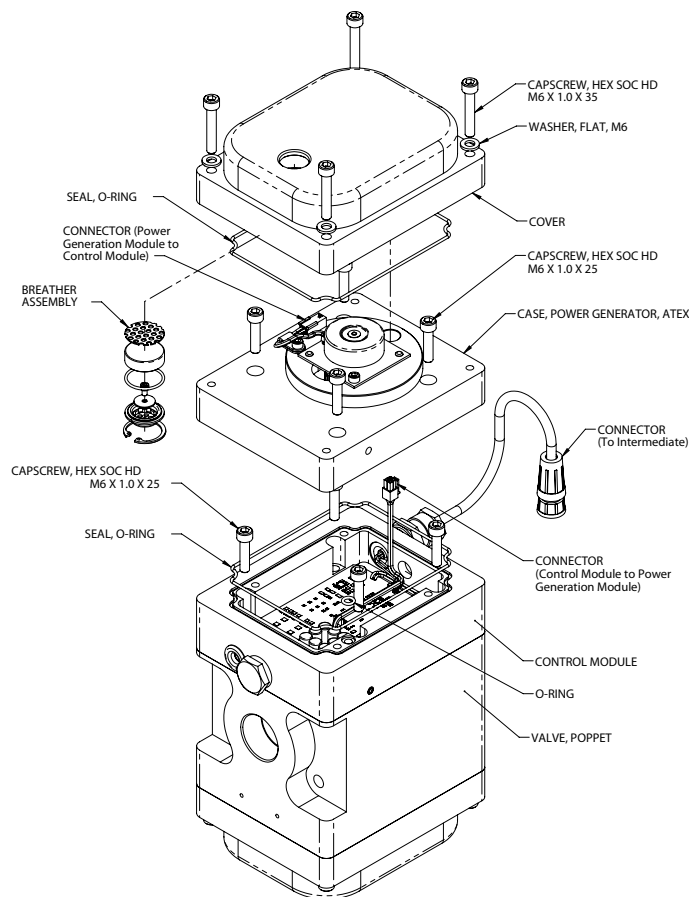
When reinstalling the new module make sure to feed the control module wire through the hole in the power generation case. Install the four M5 x 25mm socket head cap screws and tighten to 6.8 N-M.

**"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.

3: EXP VIEW



# 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 1/2" 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.

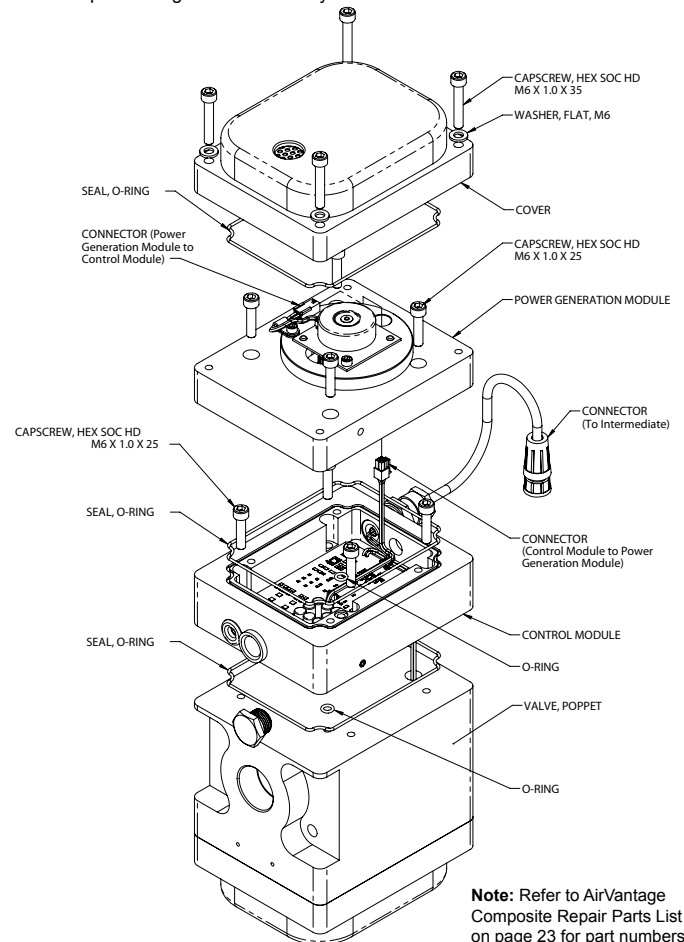
Reinstall the power generation module. Make sure to feed the control module wire through the hole in the power generation case. Install the four M5 x 25mm socket head cap screws and tighten to 6.8 N-M.

**"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.



3: EXP VIEW



### 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 1/2" 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.

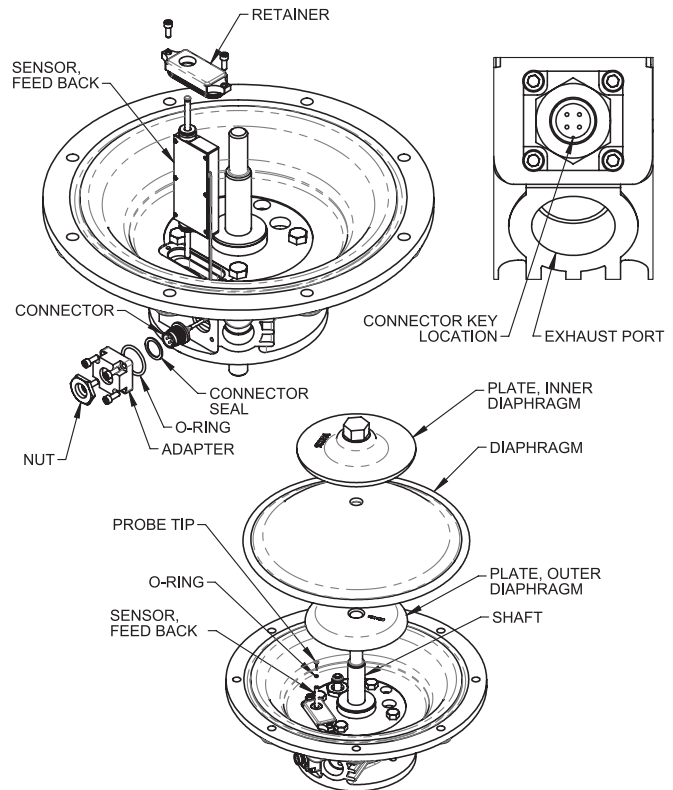
Now slide the sensor out of the intermediate while feeding the connector and cable into the intermediate. Slide the Connector end of the cable out of the same opening as the sensor.

## 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.

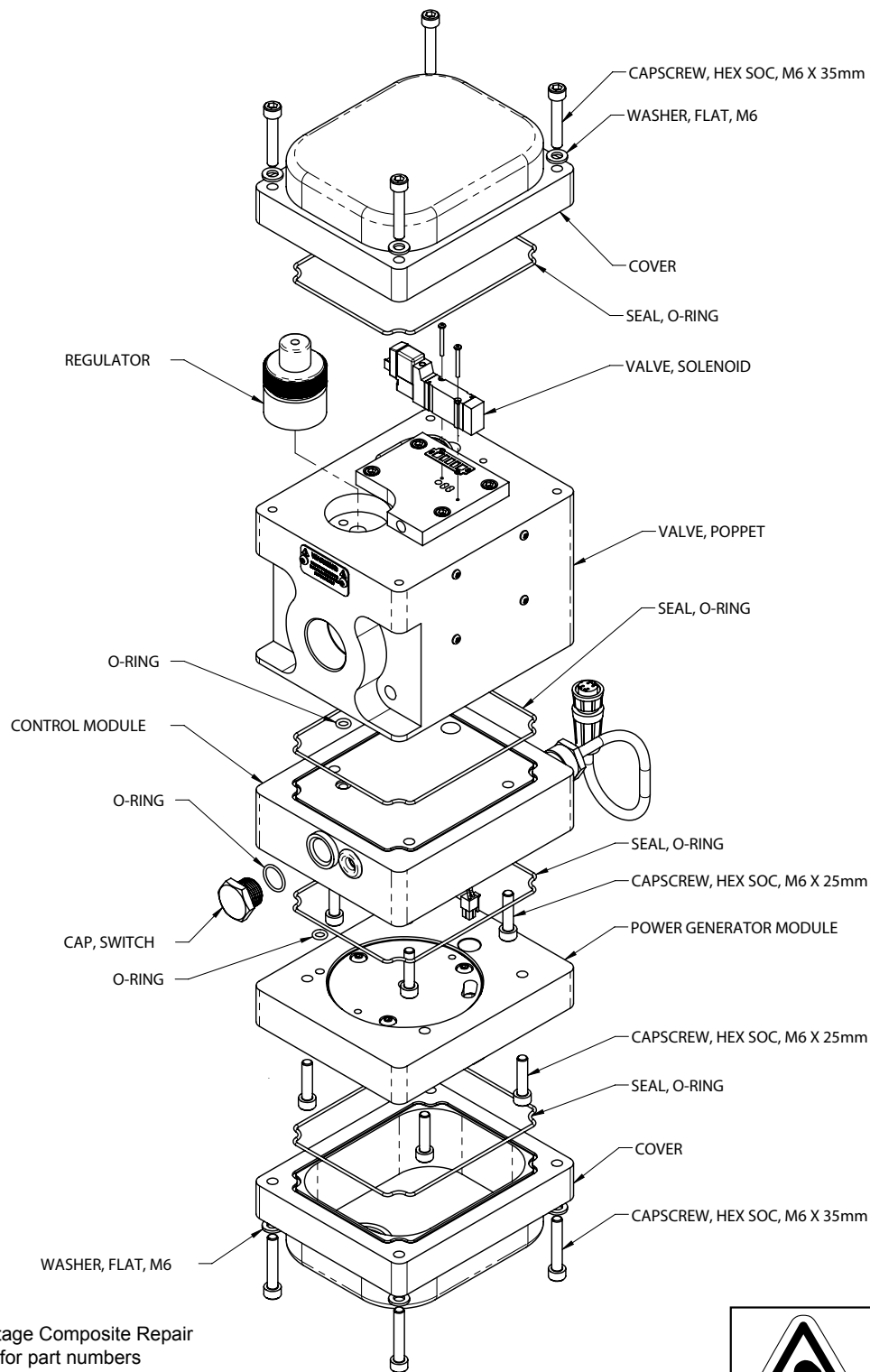
Refer to the "Diaphragm Servicing" section of the manual to finish the diaphragm installation procedure.



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



# AirVantage Servicing - Poppet Valve Drawing



3: EXP VIEW

**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.



# 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 1/2" 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 valve 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-ÖVERENSSTÄMMELSESERKLÄRING • VAATIMUSTENMUKAISUUSVAKUUTUS • SAMSVARERKLÄRING  
DECLARAÇÃO 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 Direktive:

Tämä tuote täyttää seuraavien EC Direktiivien vaatimukset:

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 matériel est fabriqué selon les normes harmonisées suivantes, afin d'en garantir la conformité:

Este producto cumple con las siguientes directrices de la comunidad europea:

Dieses produkt ist nach folgenden harmonisierten standards gefertigt worden, die übereinstimmung wird bestätigt:

Questo prodotto ha utilizzato i seguenti standards per verificare la conformità:

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 overensstemmelse med følgende harmoniserte standarder:

Este produto utilizou os seguintes padrões harmonizados para verificar conformidade:

**EN809:1998+**  
**A1:2009**

#### AUTHORIZED/APPROVED BY:

Approuvé par:  
Aprobado por:  
Genehmigt von:  
approvato da:  
Goedgekeurd door:  
Underskrift:  
Valtuutettuna:  
Bemyndiget av:  
Autorizado Por:

  
Dave Roseberry  
Engineering Manager

**DATE: August 10, 2011**

FECHA:  
DATUM:  
DATA:  
DATO:  
PÄIVÄYS:



VMQR 044FM

04/19/2012 REV 07



# 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 Corporation  
800 North Main Street  
Mansfield, OH 44902 USA



**Applicable Standard:**

**AirVantage**

EN 60079-0:2009  
EN 60079-1:2007  
IEC 60079-31:2006

**Marking:**

II 2 G D  
Ex d ib IIB T4 Gb  
Ex tb IIIC 135° C Db IP66

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

**Position Sensor**

EN 60079-0:2006  
EN 60079-11:2007  
EN 61241-0:2006  
EN 61242-11:2006

**Rating (not marked):**

II 2 G D  
Ex ib IIB T4  
Ex ibD 21 T132° C

**Certificate Number:**

Sira 10ATEX1151X Issue: 2  
Equipment: AirVantage Air Flow  
Control Unit



**Sira Certification Service**

Rake Lane  
Eccleston  
Chester  
CH4 5JN  
United Kingdom



DATE/APPROVAL/TITLE:  
05 DECEMBER 2011

*David Roseberry*  
David Roseberry, Engineering Manager





# Declaration of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION  
IEC Certification Scheme for Explosive Atmospheres

**Manufacturer:**

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

**Applicable Standard:****AirVantage**

IEC 60079-0:2004  
IEC 60079-1:2007-4  
IEC 60079-31:2008

**Marking:**

Ex d ib IIB T4 Gb  
Ex tb IIIC 135° C Db IP66

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

**Position Sensor**

IEC 60079-0:2007-10  
IEC 60079-11:2006  
IEC 61241-0:2004  
IEC 61242-11:2005

**Rating (not marked):**

Ex ib IIB T4  
Ex ibD 21 T132° C

**Certificate Number:**

IECEX SIR 10.0110X Issue: 2  
Equipment: AirVantage Air Flow  
Control Unit

**Sira Certification Service**

Rake Lane  
Eccleston  
Chester  
CH4 5JN  
United Kingdom



DATE/APPROVAL/TITLE:  
05 DECEMBER 2011

*David Roseberry*  
David Roseberry, Engineering Manager

