

## 2" Bolted Metallic Ball Valve Pumps

AirVantage™ Energy Saving Technology

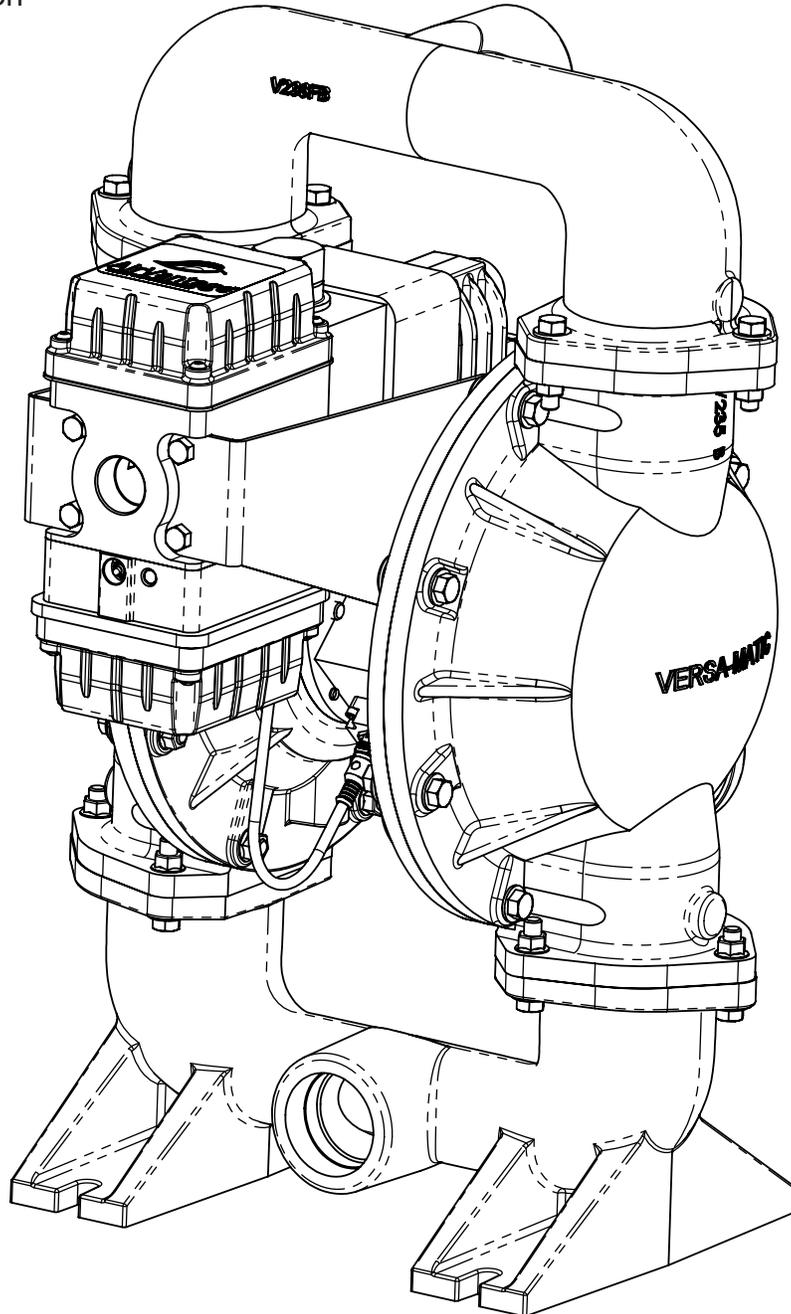
# RE2

### RE2 Metallic Pumps

- Aluminum
- Stainless Steel
- Hastelloy C
- Cast Iron



intertek  
Total Quality Assured.  
ISO 9001 Certified  
ISO 14001 Certified



**VERSA-MATIC®**

1: PUMP SPECS

2: INSTAL & OP

3: EXP VIEW

4: WARRANTY

# 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.

## 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

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1: PUMP SPECS

2: INSTAL & OP

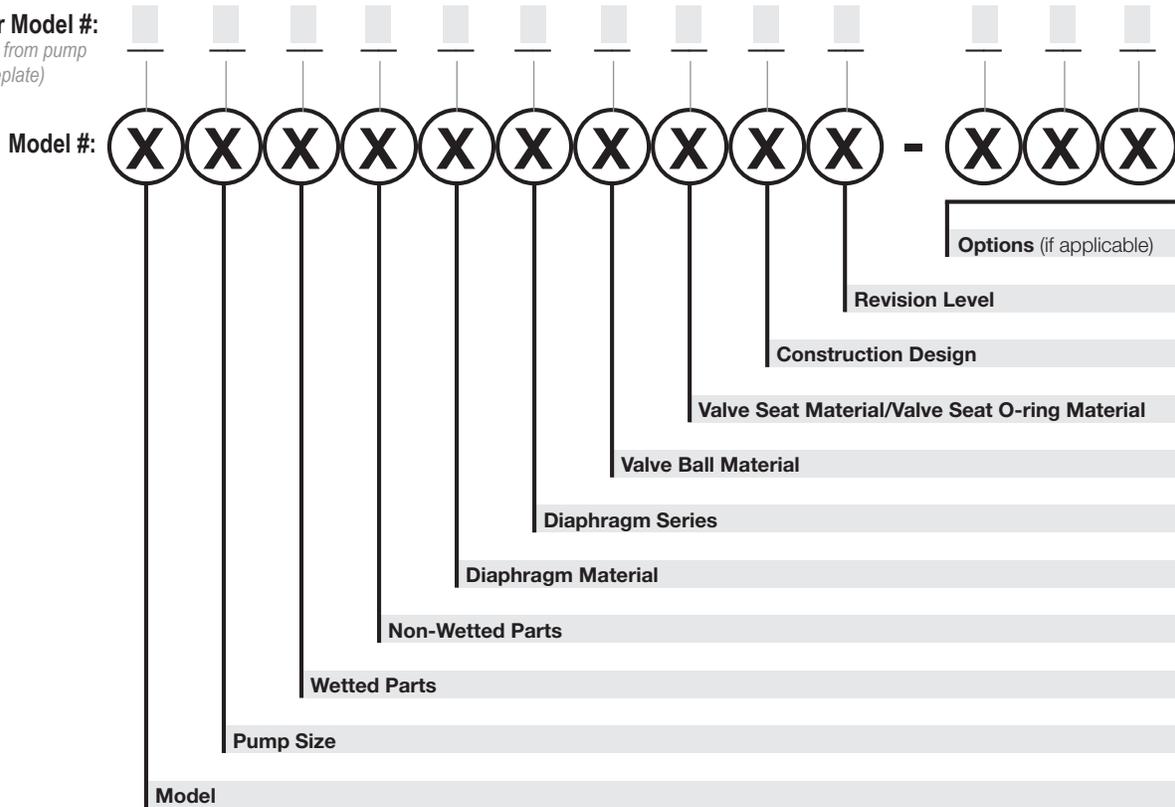
3: EXP VIEW

4: WARRANTY

# Explanation of Pump Nomenclature

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

Your Model #: (fill in from pump nameplate)



## Model

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

## Design Level

A

## Miscellaneous Options

OE Original Elima-Matic

# 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<br>88°C           | -20°F<br>-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<br>138°C          | -40°F<br>-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<br>177°C          | -40°F<br>-40°C |
| <b>Hytrel®:</b> Good on acids, bases, amines and glycols at room temperatures only.   | 220°F<br>104°C          | -20°F<br>-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<br>93°C           | -10°F<br>-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<br>88°C           | -10°F<br>-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<br>82°C           | 32°F<br>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<br>82°C  | 32°F<br>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<br>121°C | 0°F<br>-18°C   |
| <b>Santoprene®:</b> Injection molded thermoplastic elastomer with no fabric layer. Long mechanical flex life. Excellent abrasion resistance.   | 275°F<br>135°C | -40°F<br>-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<br>82°C  | -35°F<br>-37°C |
| <b>Urethane:</b> Shows good resistance to abrasives. Has poor resistance to most solvents and oils.  | 150°F<br>66°C  | 32°F<br>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<br>104°C | -35°F<br>-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.  |                |                |

1: PUMP SPECS

For specific applications, always consult the Chemical Resistance Chart.

## 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 Bolted - Aluminum

### Flow Rate

Adjustable to . . . . . 0-155 gpm (587 lpm)

### Port Size

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

Discharge . . . . . 2" 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)

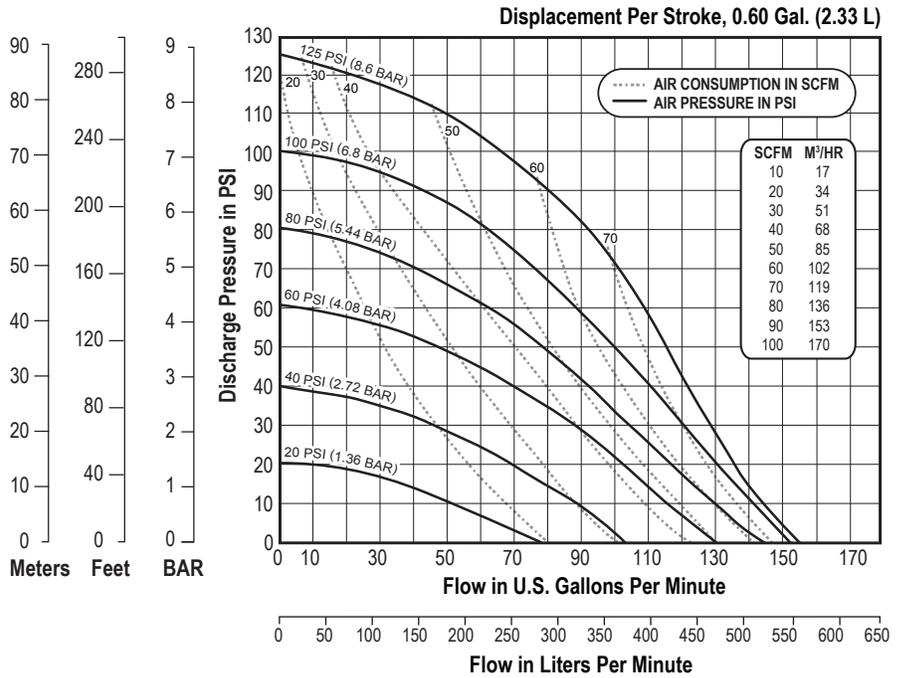
. . . . . 0.43" (11 mm)

**Max Noise Level** . . . . . 92 dB(A)

### Shipping Weights

Aluminum . . . . . 77.5 lbs (35 kg)

1: PUMP SPECS



**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.

## RE2 Bolted - Metallic

### Flow Rate

Adjustable to . . . . . 0-150 gpm (568 lpm)

### Port Size

Suction . . . 2" ANSI 150#(DIN 50 Compatible Flange)

Discharge. 2" ANSI 150#(DIN 50 Compatible Flange)

**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)

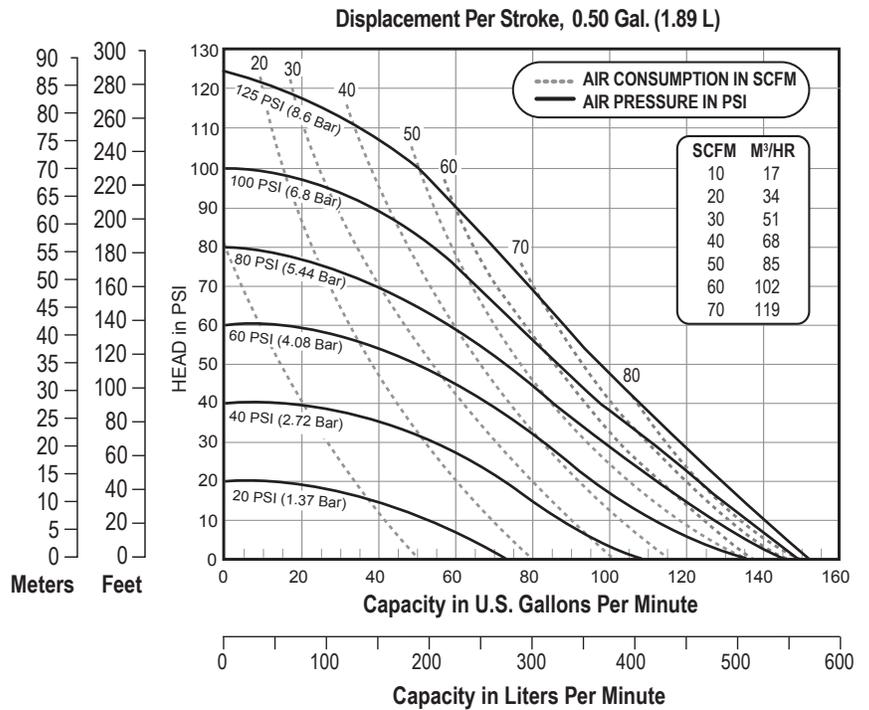
. . . . . 0.43" (11 mm)

**Max Noise Level** . . . . . 92 dB(A)

### Shipping Weights

Stainless/Cast Iron . . . . . 125.5 lbs (57 kg)

Hastelloy C . . . . . 137 lbs (62 kg)



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

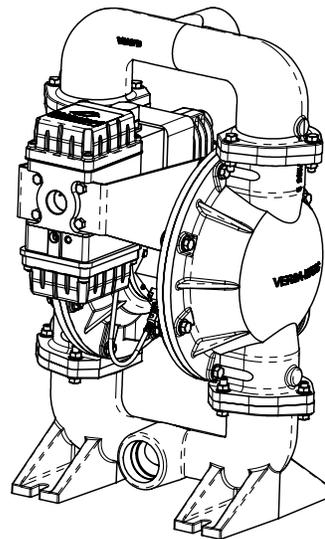
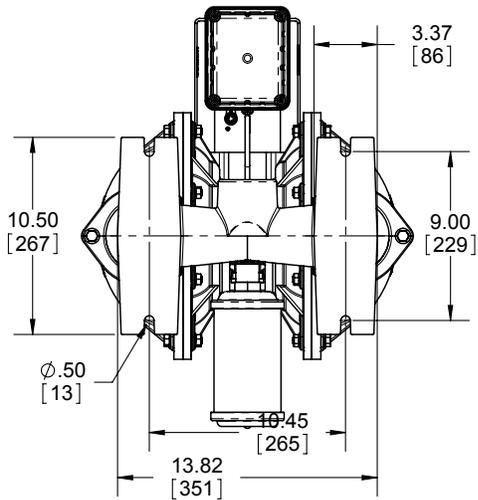
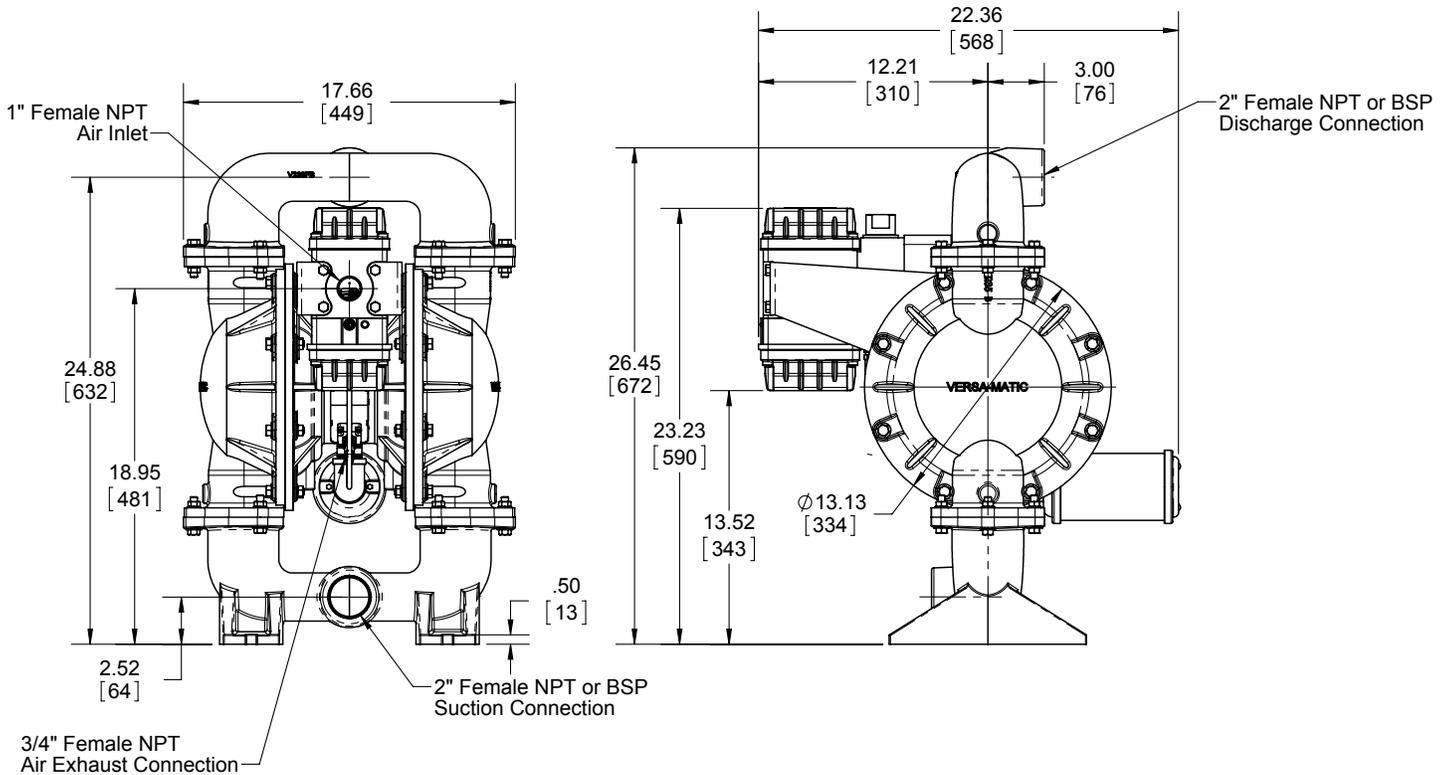
**NOTE:** For RE2SA pumps fitted with PTFE diaphragms, reduce water discharge figures by 10%. Suction lift is reduced to 10' (3.05m) dry and 20' (6.10m) wet.

# Dimensional Drawings

## RE2 Bolted - Aluminum

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

RE2 MB PG-4

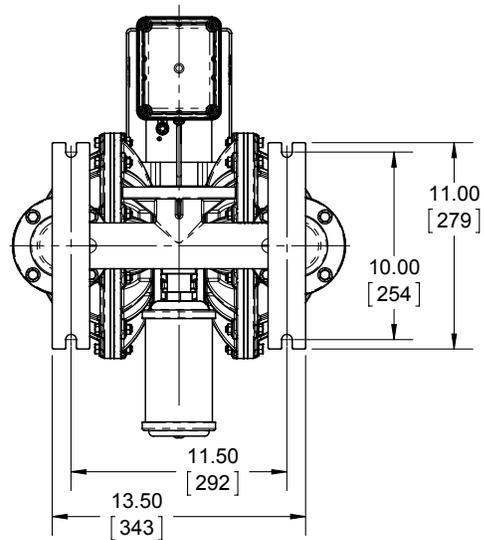
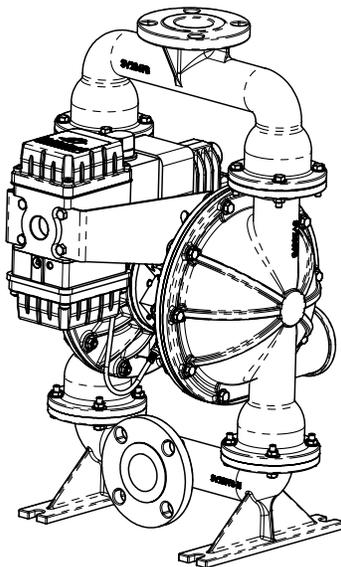
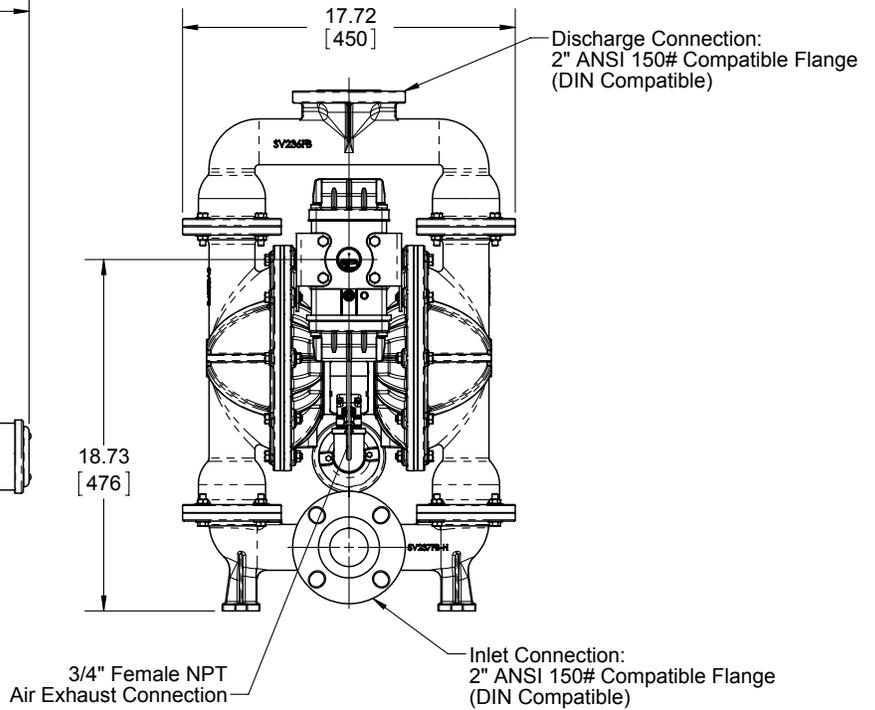
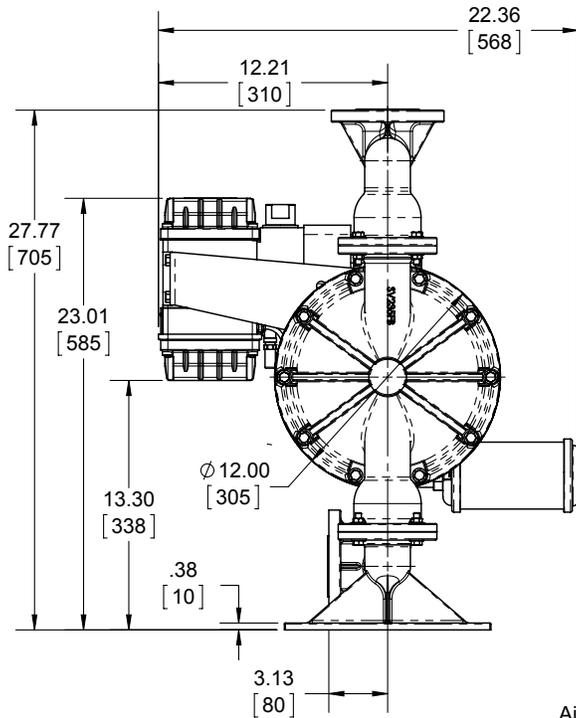
# Dimensional Drawings

## RE2 Bolted - Metallic

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.

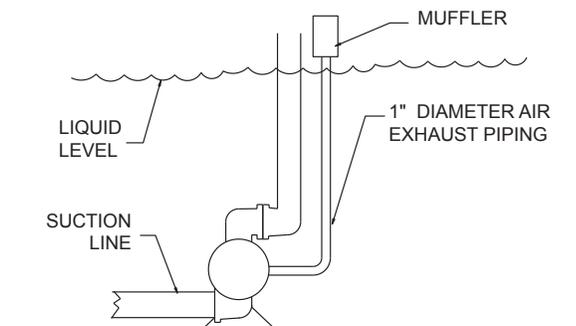
The main directional (air) control valve distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm. At the same time, the exhausting air from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port.

As inner chamber pressure (**P1**) exceeds liquid chamber pressure (**P2**), the rod 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) orientation.

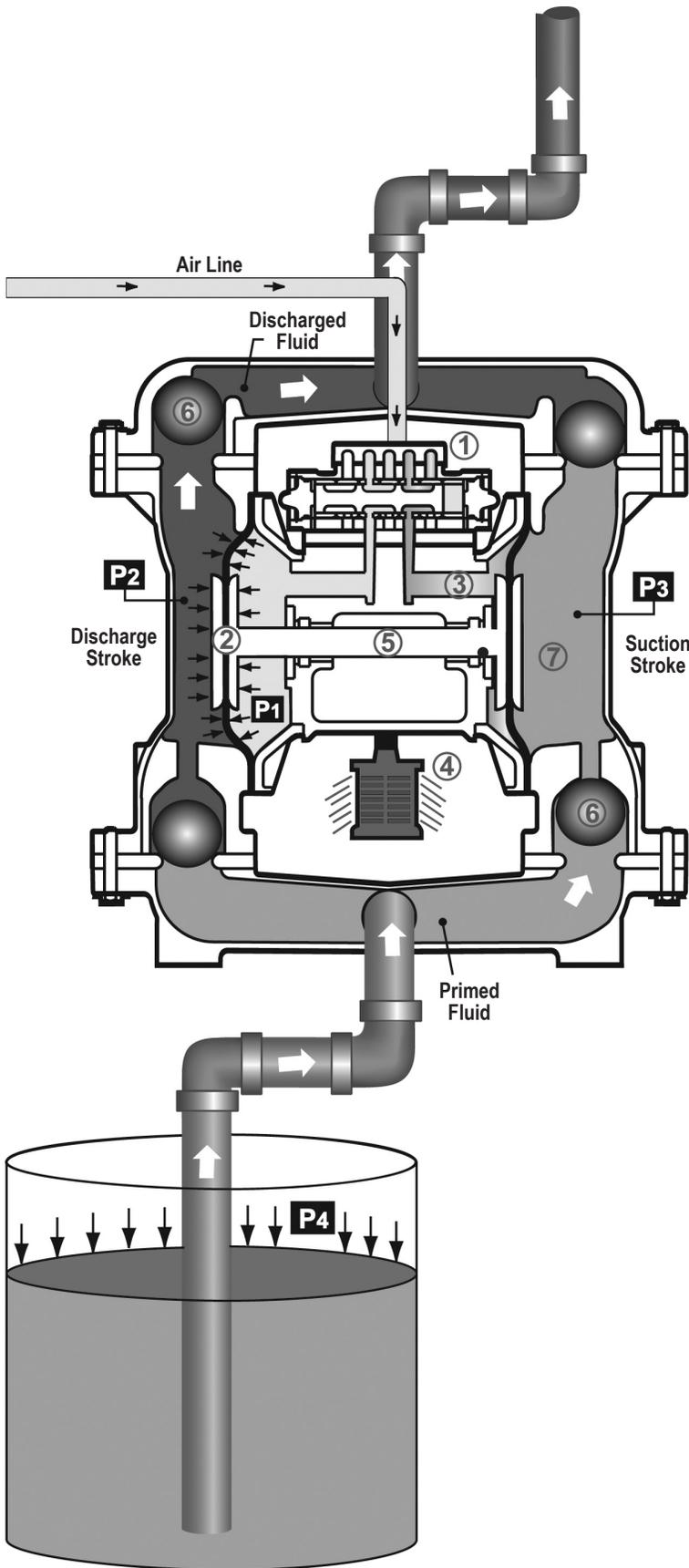
The pump primes as a result of the suction stroke. The suction stroke lowers the chamber pressure (**P3**) increasing the chamber volume. This results in a pressure differential necessary for atmospheric pressure (**P4**) to push the fluid through the suction piping and across the suction side check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

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.



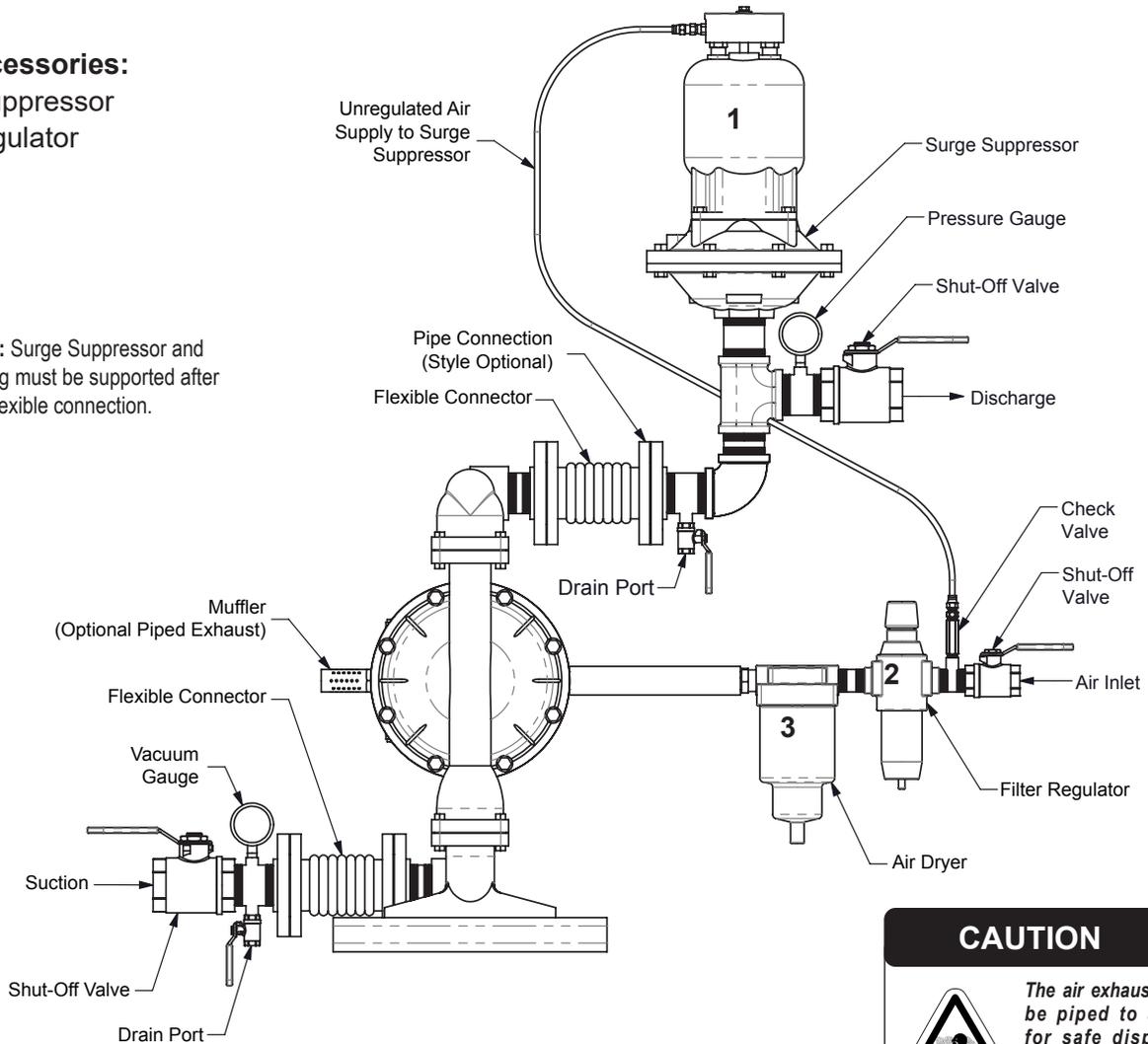
2: INSTAL & OP

# 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.  |
| <b>Pump Cycles and Will Not Prime or No Flow</b>                  | Pump chamber is blocked.  | Disassemble and inspect wetted chambers. Remove or flush any obstructions.   |
|   | 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.  |
| <b>Product Leaking Through Exhaust</b>                            | Entrained air or vapor lock in chamber(s).  | Purge chambers through tapped chamber vent plugs. Purging the chambers of air can be dangerous.  |
|   | Diaphragm failure, or diaphragm plates loose.                                     | Replace diaphragms, check for damage and ensure diaphragm plates are tight.  |
| <b>Premature Diaphragm Failure</b>                                | 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.  |
|   | 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.  |
| <b>Unbalanced Cycling</b>   | 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.   |
|   | 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.   |
| <b>Product Leaking Through Exhaust</b>                            | 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.  |

2: INSTAL & OP

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:

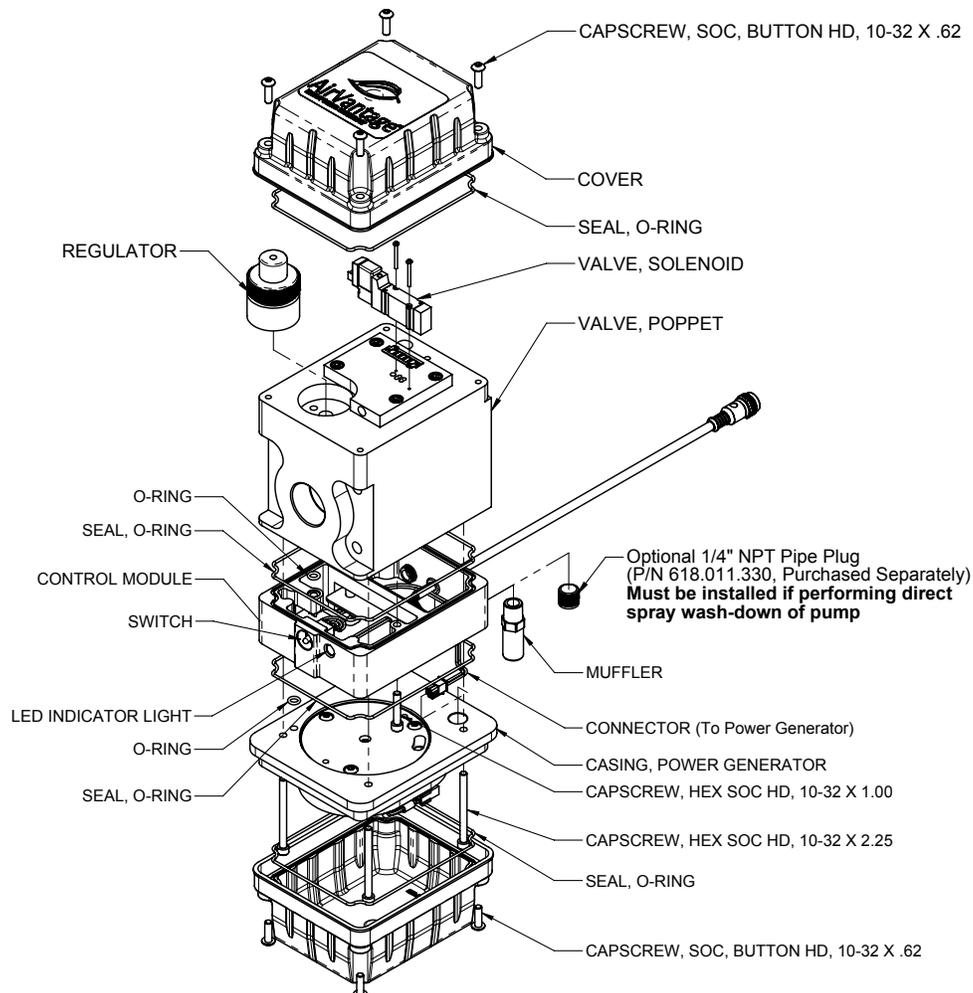
- If the sensor has been submerged in product, the sensor will need to be replaced. Consult the AirVantage servicing section of the manual for detailed instructions.

### What to Check:

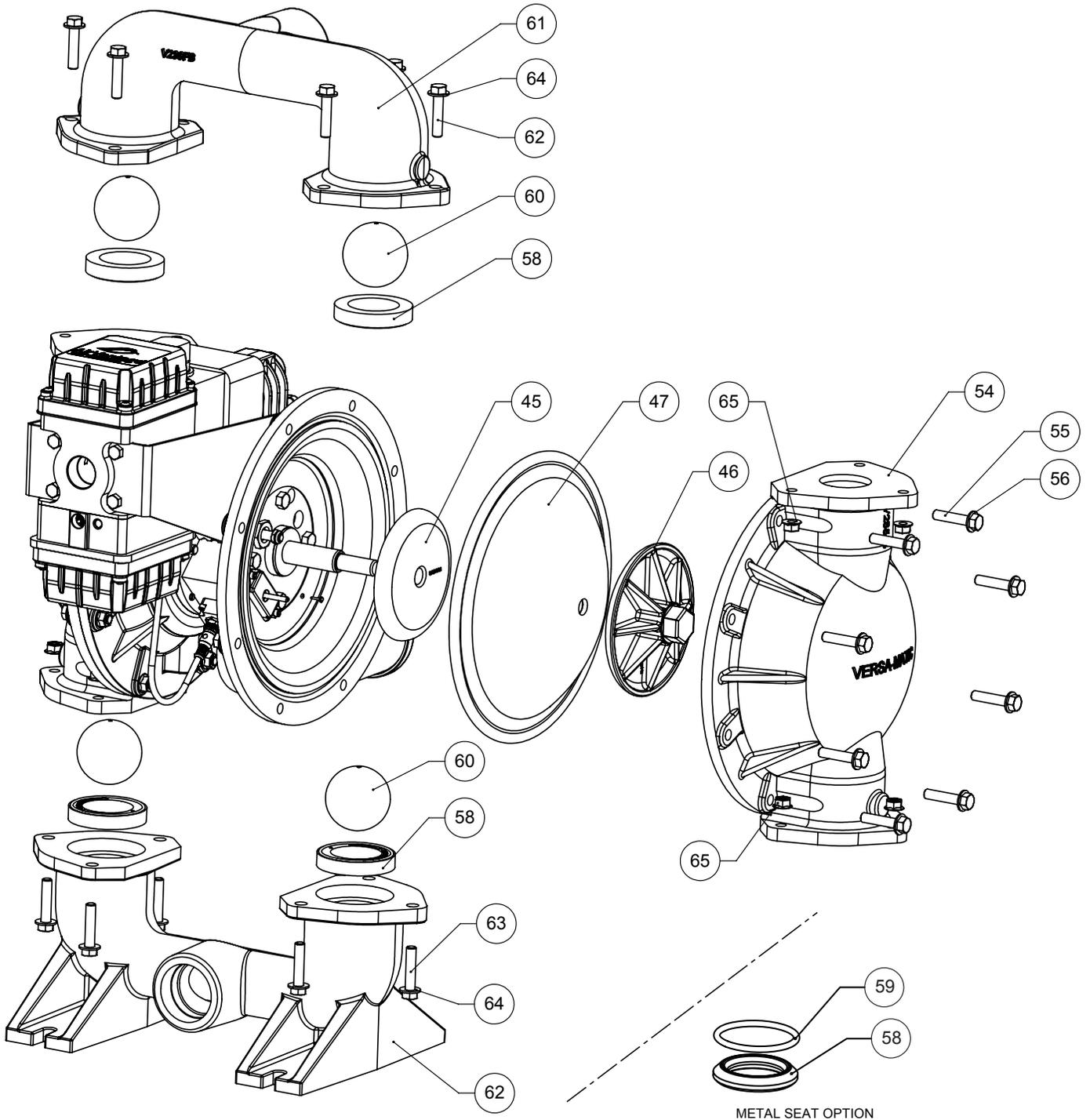
- Has product contaminated the check valve cartridge?

### Correct Action:

• If a significant amount of product has made it into the check valve assembly, then the unit will need to be disassembled for inspection. If the check valve assembly is damaged, then it will need to be replaced. Consult parts list for information.



# Composite Repair Parts Drawing - Aluminum Bolted Assembly

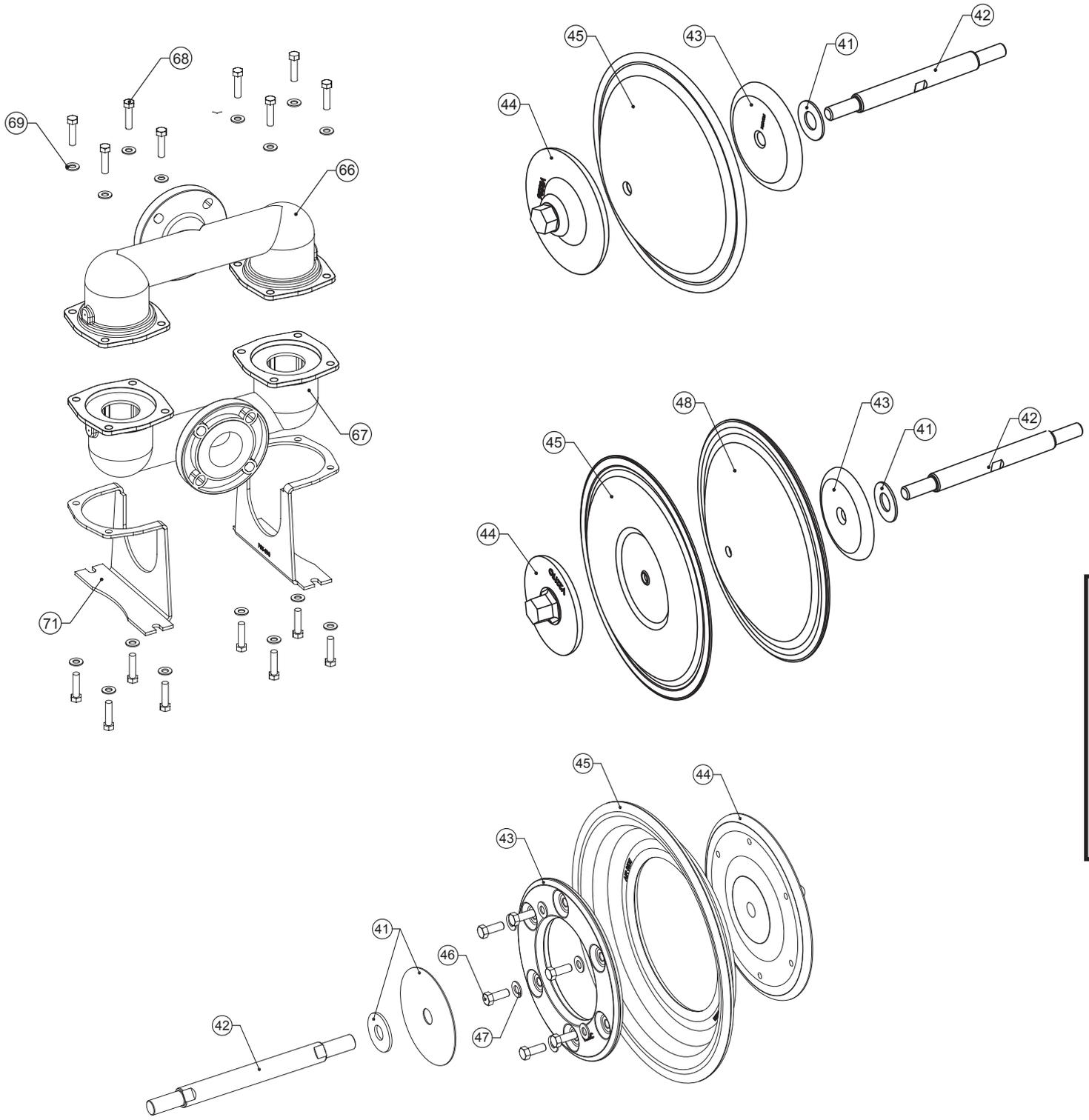


## Torque Settings

|                           |                     |
|---------------------------|---------------------|
| 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 - Aluminum

## Center and Diaphragm Assembly



3: EXP VIEW

# Composite Repair Parts List - Aluminum

## AIR VALVE ASSEMBLY

| Item | Description                                 | Qty | Standard: Aluminum |
|------|---|-----|--------------------|
|      | Air Valve Assembly<br>(Includes items 1-11) | 1   | P126-0036          |
| 1    | Valve Body                                  | 1   | P126-0003          |
| 2    | Valve Spool                                 | 1   | P126-0063          |
| 3    | Valve Spool Glyd Ring                       | 4   | P34-204F           |
| 4    | End Cap                                     | 1   | P34-300            |
| 5    | End Cap Gasket                              | 2   | P24-205            |
| 6    | Adapter, Air Inlet                          | 1   | P126-0004          |
| 7    | Tube, Air Inlet Seal                        | 1   | P126-0005          |
| 8    | Air Inlet O-ring                            | 2   | 560.024.360        |
| 9    | Valve Gasket                                | 1   | P24-202            |
| 10   | Valve Cap Screw                             | 11  | S1001              |
| 11   | Valve Cap Screw                             | 2   | P24-209            |

## AIR END ASSEMBLY

| Item | Description                       | Qty | Standard: Aluminum                           |
|------|-----------------------------------|-----|--|
| 12   | Center Block                      | 1   | 114.V003.150                                 |
| 13   | Main Shaft Bushing                | 1   | P24-402                                      |
| 14   | Air Chamber, Left                 | 1   | P126-0016                                    |
| 15   | Air Chamber, Right                | 1   | P126-0017                                    |
| 16   | Air Chamber Gasket                | 2   | P79-109                                      |
| 17   | Air Chamber Bolt                  | 8   | P24-110                                      |
| 18   | Bushing                           | 2   | P24-105                                      |
| 19   | Pilot Shaft                       | 1   | P24-104                                      |
| 20   | Pilot Shaft Spacer                | 5   | P24-106                                      |
| 21   | Pilot Shaft O-Ring                | 6   | P24-107                                      |
| 22   | Stop Nut                          | 2   | P24-108                                      |
| 24   | Mounting Bracket Left             | 1   | 115.V003.159                                 |
| 25   | Mounting Bracket Right            | 1   | 115.V004.159                                 |
| 26   | Retainer Plate                    | 2   | 165.150.150                                  |
| 28   | Retainer O-Ring                   | 2   | 560.203.360                                  |
| 29   | Retainer Cap Screw                | 8   | P126-0032                                    |
| 30   | AirVantage Unit                   | 1   | 032.068.000                                  |
| 31   | AirVantage Unit Cap Screw         | 4   | 170.121.330                                  |
| 33   | AirVantage Sensor                 | 1   | 724.010.000 (PTFE)<br>724.011.000 (Standard) |
| 34   | AirVantage Unit Face Seal O-ring  | 1   | 560.011.360                                  |
| 35   | AirVantage Connector Plate        | 1   | 086.021.150                                  |
| 36   | AirVantage Connector Plate O-ring | 1   | V110BN                                       |
| 37   | Check Valve                       | 1   | 894.014.000                                  |
| 37a  | Check Valve Cartridge             | 1   | 031.206.000                                  |
| 38   | Check Valve Cap Screw             | 4   | 171.100.115                                  |
| 39   | Check Valve O-Ring                | 1   | 560.200.360                                  |
| 40   | Muffler                           | 1   | 530.038.000                                  |
| 41   | Muffler Adapter                   | 1   | 312.045.335                                  |
| 42   | Muffler Nipple                    | 1   | 538.110.335                                  |
| 43   | Main Shaft O-Ring                 | 2   | P34-403                                      |

## DIAPHRAGM ASSEMBLY

| Item | Description           | Qty | Dome                                 | Rugged                               | PTFE      |
|------|-----------------------|-----|--------------------------------------|--------------------------------------|-----------|
| 43   | Main Shaft O-Ring     | 2   | P24-403                              | P24-403                              | P24-403   |
| 44   | Main Shaft            | 1   | P24-103                              | P24-103                              | P24-102   |
| 45   | Inner Diaphragm Plate | 2   | P126-0014                            | P126-0015                            | P126-0058 |
| 46   | Outer Diaphragm Plate | 2   | VB226                                | VB221                                | V221TO    |
| 47   | Diaphragm             | 2   | V225XX<br>(Refer to Materials Chart) | V224XX<br>(Refer to Materials Chart) | V224TF-FB |
| 48   | Bumper Washer         | 2   | P24-501                              | P24-501                              | P24-501   |
| 49   | Stud                  | 2   |                                      |                                      | V221F     |
| 50   | Back-Up Diaphragm     | 2   | N/A                                  | N/A                                  | V224TFB   |
| 53   | O-Ring Sensor         | 2   | 560.033.360                          | 560.033.360                          |           |

3: EXP VIEW

# Composite Repair Parts List - Aluminum

| WET END ASSEMBLY |                       |                           |  |
|------------------|-----------------------|---------------------------|--|
| Item             | Description           | Qty                       | Aluminum                                   |
| 54               | Water Chamber         | 2                         | V235FB                                     |
| 55               | Water Chamber Bolt    | 16                        | V251D                                      |
| 56               | Wetted Section Washer | 16                        | V302GA                                     |
| 57               | Wetted Section Nut    | 16                        | V354C                                      |
| 58               | Valve Seat            | 4                         | V240XX<br>(Refer to Materials Chart)       |
| 59               | Valve Seat O-Ring     | 8                         | V240T V240TES (only used with metal seats) |
| 60               | Valve Ball            | 4                         | V241XX<br>(Refer to Materials Chart)       |
|                  |                       | <b>Port Option 1: NPT</b> | <b>Port Option 2: BSP</b>                  |
| 61               | Discharge Manifold    | 1                         | V236FB V236FB BSP                          |
| 62               | Inlet Manifold        | 1                         | V237FB V237FB BSP                          |
| 63               | Manifold Bolt         | 12                        | V251D V251D                                |
| 64               | Manifold Washer       | 12                        | V302GA V302GA                              |
| 65               | Manifold Nut          | 12                        | V354C V354C                                |

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

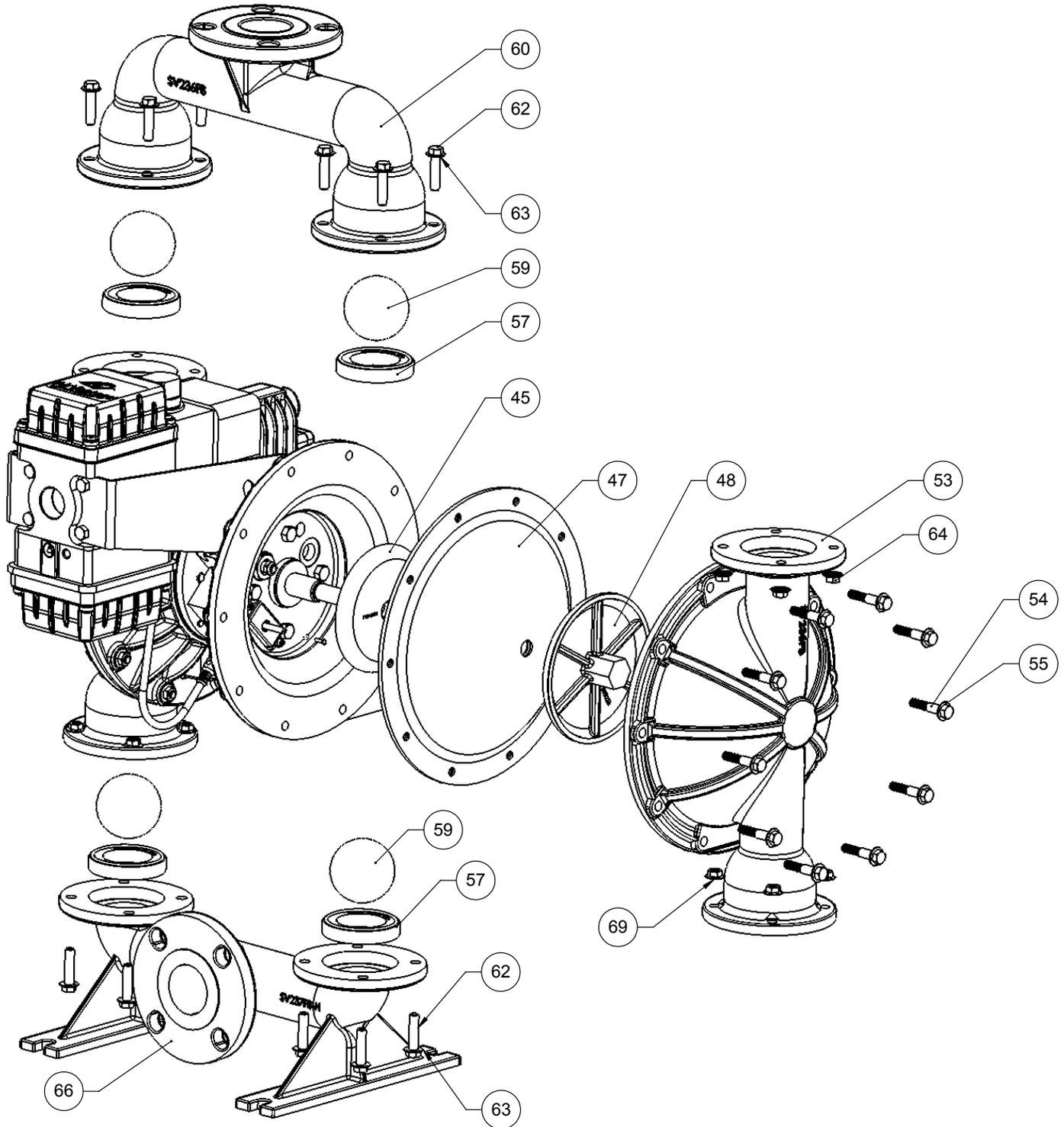
| BALL MATERIAL CODES |                 |
|---------------------|-----------------|
| Suffix Codes        |                 |
| N                   | Neoprene        |
| BN                  | Nitrile         |
| VT                  | FKM             |
| ND                  | EPDM            |
| TF                  | 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

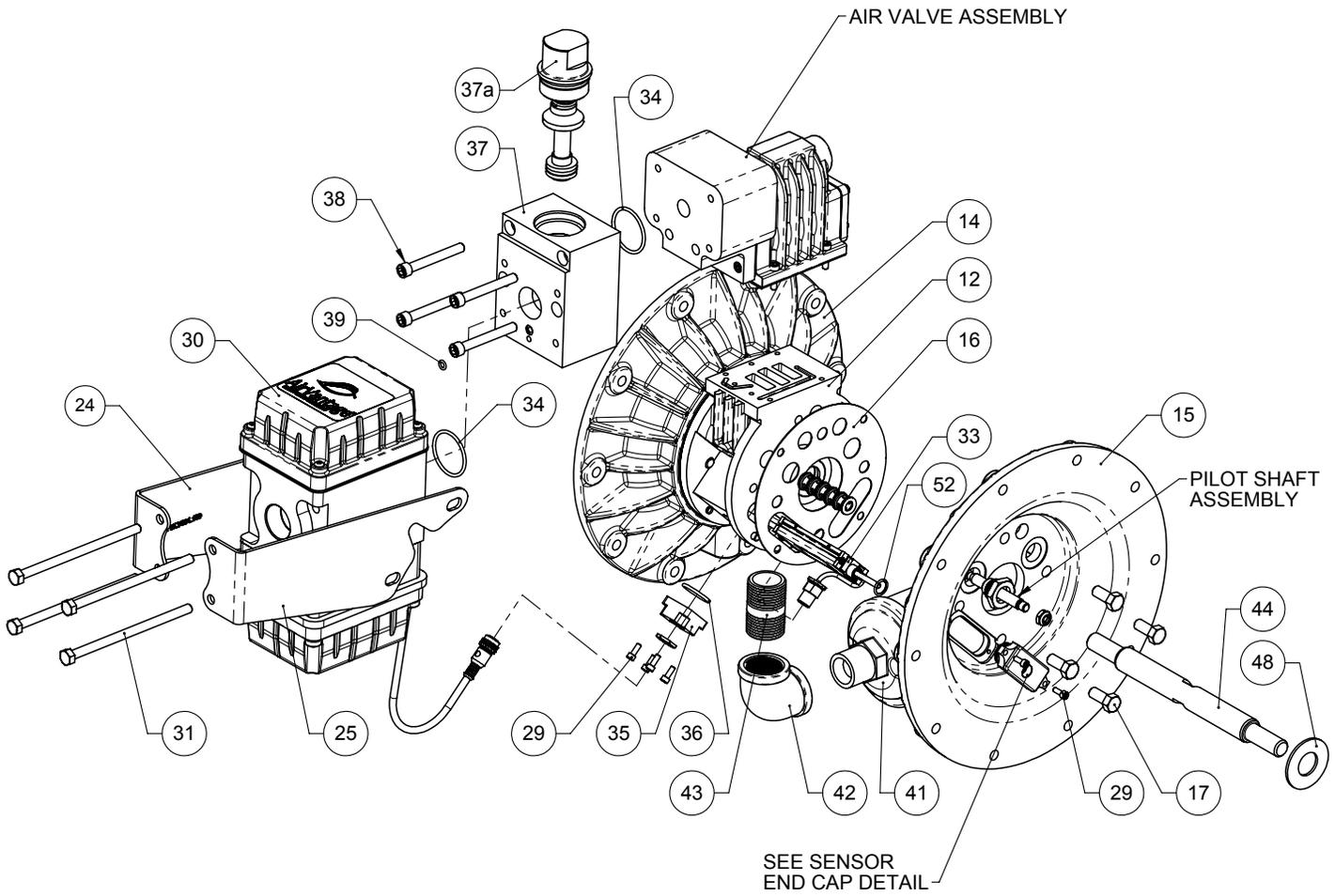
# Composite Repair Parts Drawing - Metallic Stainless & Hastelloy C Bolted Assembly

3: EXP VIEW



# Composite Repair Parts Drawing - Metallic

## Center Assembly and Details

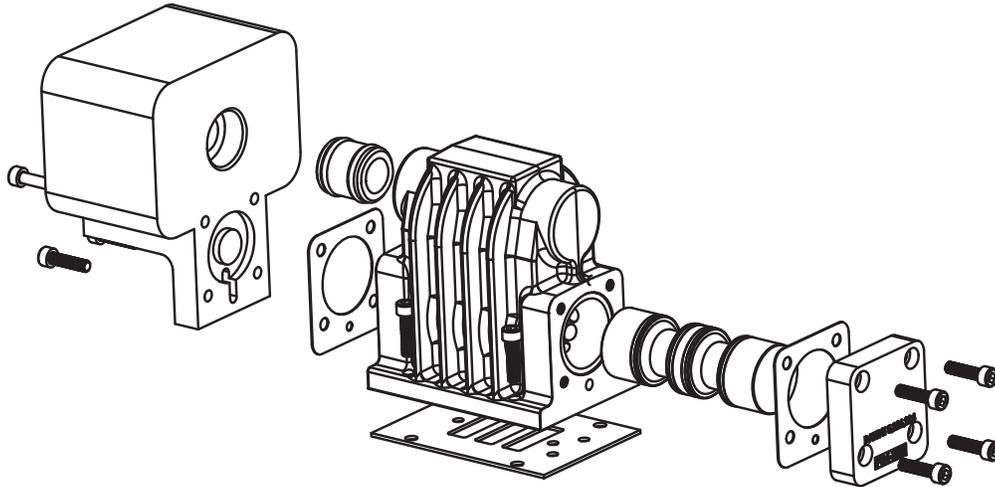
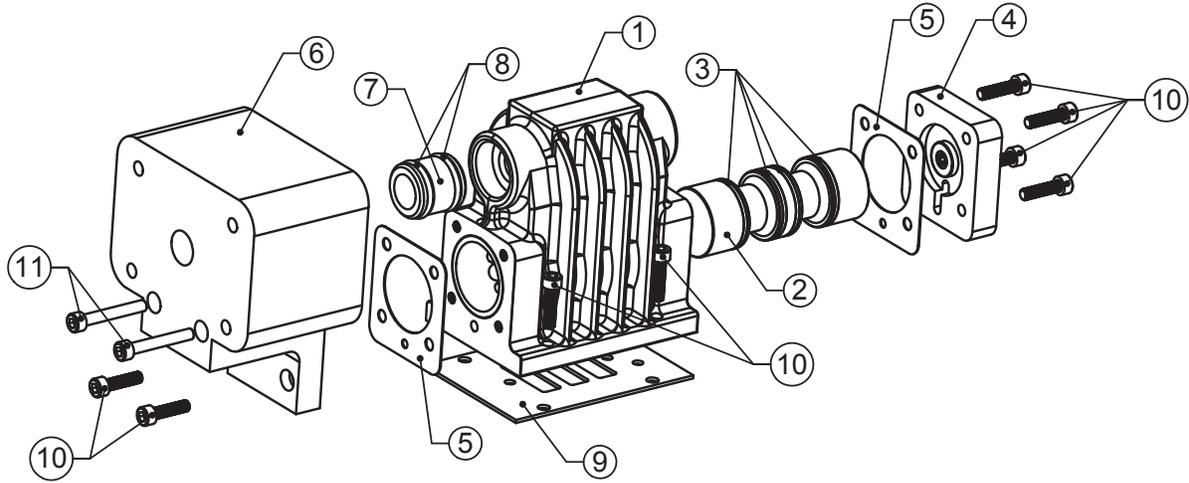


3: EXP VIEW

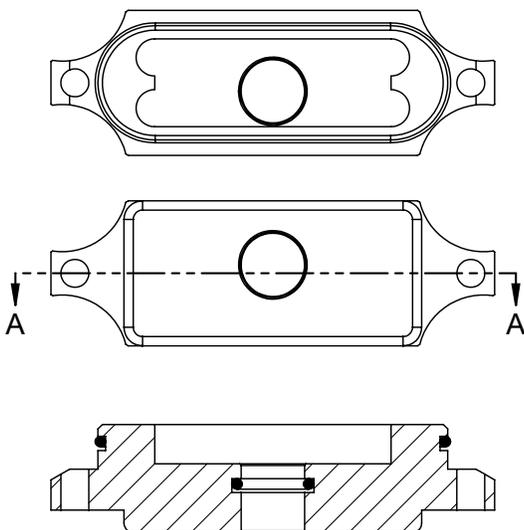
# Composite Repair Parts Drawing - Metallic

## Detail Views

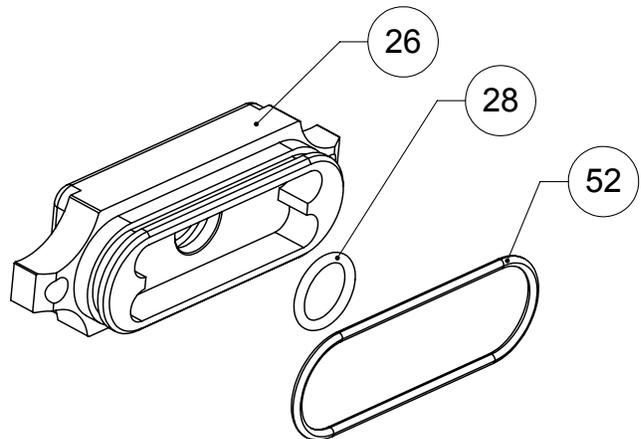
### Air Valve



### Sensor End Cap



SECTION A-A



3: EXP VIEW

# Composite Repair Parts List - Metallic

| AIR VALVE ASSEMBLY |   |     |                            |             |
|--------------------|---|-----|----------------------------|-------------|
| Item               | Description                                 | Qty | Standard: Aluminum         |             |
|                    | Air Valve Assembly<br>(Includes items 1-11) | 1   | P126-0036                  |             |
| 1                  | Valve Body                                  | 1   | P126-0003                  |             |
| 2                  | Valve Spool                                 | 1   | P126-0063                  |             |
| 3                  | Valve Spool Glyd Ring                       | 4   | P34-204F                   |             |
| 4                  | End Cap                                     | 1   | P34-300                    |             |
| 5                  | End Cap Gasket                              | 2   | P24-205                    |             |
| 6                  | Adapter, Air Inlet                          | 1   | P126-0004                  |             |
| 7                  | Tube, Air Inlet Seal                        | 1   | P126-0005                  |             |
| 8                  | Air Inlet O-ring                            | 2   | 560.024.360                |             |
| 9                  | Valve Gasket                                | 1   | P24-202                    |             |
| 10                 | Valve Cap Screw                             | 11  | S1001                      |             |
| 11                 | Valve Cap Screw                             | 2   | P24-209                    |             |
| AIR END ASSEMBLY   |   |     |                            |             |
| 12                 | Center Block                                | 1   | 114.V003.150               |             |
| 13                 | Main Shaft Bushing                          | 1   | P24-402                    |             |
| 14                 | Air Chamber, Left                           | 1   | P126-0006                  |             |
| 15                 | Air Chamber, Right                          | 1   | P126-0007                  |             |
| 16                 | Air Chamber Gasket                          | 2   | P126-0008                  |             |
| 17                 | Air Chamber Bolt                            | 8   | P24-110                    |             |
| 18                 | Bushing                                     | 2   | P24-105                    |             |
| 19                 | Pilot Shaft                                 | 1   | P24-104                    |             |
| 20                 | Pilot Shaft Spacer                          | 5   | P24-106                    |             |
| 21                 | Pilot Shaft O-Ring                          | 6   | P24-107                    |             |
| 22                 | Stop Nut                                    | 2   | P24-108                    |             |
| 24                 | Mounting Bracket Left                       | 1   | 115.V001.159               |             |
| 25                 | Mounting Bracket Right                      | 1   | 159.V002.159               |             |
| 26                 | Retainer Plate                              | 2   | 165.150.150                |             |
| 28                 | Retainer O-Ring                             | 2   | 560.203.360                |             |
| 29                 | Retainer Cap Screw                          | 8   | P126-0032                  |             |
| 30                 | AirVantage Unit                             | 1   | 032.068.000                |             |
| 31                 | AirVantage Unit Cap Screw                   | 4   | 170.121.330                |             |
| 33                 | AirVantage Sensor                           | 1   | 724.010.000 (PTFE)         |             |
|                    |   |     | 724.011.000 (Standard)     |             |
| 34                 | AirVantage Unit Face Seal O-ring            | 1   | 560.011.360                |             |
| 35                 | AirVantage Connector Plate                  | 1   | 086.021.150                |             |
| 36                 | AirVantage Connector Plate O-ring           | 1   | V110BN                     |             |
| 37                 | Check Valve                                 | 1   | 894.014.000                |             |
| 37a                | Check Valve Cartridge                       | 1   | 031.206.000                |             |
| 38                 | Check Valve Cap Screw                       | 4   | 171.100.115                |             |
| 39                 | Check Valve O-Ring                          | 1   | 560.200.360                |             |
| 40                 | Muffler                                     | 1   | 530.038.000                |             |
| 41                 | Muffler Adapter                             | 1   | 312.045.335                |             |
| 42                 | Muffler Nipple                              | 1   | 538.110.335                |             |
| 43                 | Main Shaft O-Ring                           | 2   | P34-403                    |             |
| DIAPHRAGM ASSEMBLY |   |     |                            |             |
| Item               | Description                                 | Qty | Dome                       | PTFE 2 Pc.  |
| 43                 | Main Shaft O-Ring                           | 2   | P24-403                    | P24-403     |
| 44                 | Main Shaft                                  | 1   | P24-103                    | P24-102     |
| 45                 | Inner Diaphragm Plate                       | 2   | P126-0014                  | P126-0058   |
| 46                 | Outer Diaphragm Plate                       | 2   | SVB226 HVB226              | SV221TO     |
| 47                 | Diaphragm                                   | 2   | V227XX                     | V227TF      |
|                    |   |     | (Refer to Materials Chart) |             |
| 48                 | Bumper Washer                               | 2   | P24-501                    | P24-501     |
| 49                 | Back-Up Diaphragm                           | 2   | N/A                        | V227TFB     |
| 52                 | Sensor O-Ring                               | 2   | 560.033.360                | 560.033.360 |

3: EXP VIEW

# Composite Repair Parts List - Metallic

| WET END ASSEMBLY                    |                       |     |  |             |           |
|-------------------------------------|-----------------------|-----|--|-------------|-----------|
| Item                                | Description           | Qty | Stainless Steel                            | Hastelloy C | Cast Iron |
| 53                                  | Water Chamber         | 2   | SV235FB                                    | HV235FB     | WV235FB   |
| 54                                  | Water Chamber Bolt    | 20  | SV187A                                     | SV187A      | SV187A    |
| 55                                  | Wetted Section Washer | 20  | SV189C                                     | SV189C      | SV189C    |
| 56                                  | Wetted Section Nut    | 20  | SV185B                                     | SV185B      | SV185B    |
| 57                                  | Valve Seat            | 4   | V240XX                                     |             |           |
| (Refer to Materials Chart)          |                       |     |  |             |           |
| 58                                  | Valve Seat O-Ring     | 8   | V240T V240TES (only used with metal seats) |             |           |
| 59                                  | Valve Ball            | 4   | V241XX                                     |             |           |
| (Refer to Materials Chart)          |                       |     |  |             |           |
| Port Option 1: Vertical Discharge   |                       |     |  |             |           |
| 60                                  | Discharge Manifold    | 1   | SV236FB                                    |             | WV236FB   |
| 61                                  | Inlet Manifold        | 1   | SV237FB-H                                  |             | WV237FB-H |
| 62                                  | Manifold Bolt         | 16  | SV189D                                     |             | SV189D    |
| 63                                  | Manifold Washer       | 16  | SV189C                                     |             | SV189C    |
| 64                                  | Manifold Nut          | 16  | SV185B                                     |             | SV185B    |
| Port Option 2: Horizontal Discharge |                       |     |  |             |           |
| 65                                  | Discharge Manifold    | 1   | SV236FB-H                                  | HV236FB-H   | WV236FB-H |
| 66                                  | Inlet Manifold        | 1   | SV237FB-H                                  | HV237FB-H   | WV237FB-H |
| 67                                  | Manifold Bolt         | 16  | SV189D                                     | SV189D      | SV189D    |
| 68                                  | Manifold Washer       | 16  | SV189C                                     | SV189C      | SV189C    |
| 69                                  | Manifold Nut          | 16  | SV185B                                     | SV185B      | SV185B    |

## DIAPHRAGM MATERIAL CODES

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

## 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       |

## 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 |

3: EXP VIEW

# RE2 Bolted Metallic Service Kits

| Item                      | Description           | Qty | Part Number      |
|---------------------------|-----------------------|-----|------------------|
| Comprehensive Maintenance |                       |     | RE2-CMK-OE-RB-MB |
| 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   | P24-105          |
| 19                        | Pilot Shaft           | 1   | P24-104          |
| 20                        | Pilot Shaft Spacer    | 5   | P24-106          |
| 21                        | Pilot Shaft O-Ring    | 6   | P24-107          |
| 22                        | Stop Nut              | 2   | P24-108          |
| 37                        | Muffler               | 1   | 530.041.000      |
| 44                        | Main Shaft            | 1   | P24-103          |
| 48                        | Bumper Washer         | 2   | P24-501          |
| 55                        | Main Shaft O-Ring     | 2   | 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.

### 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

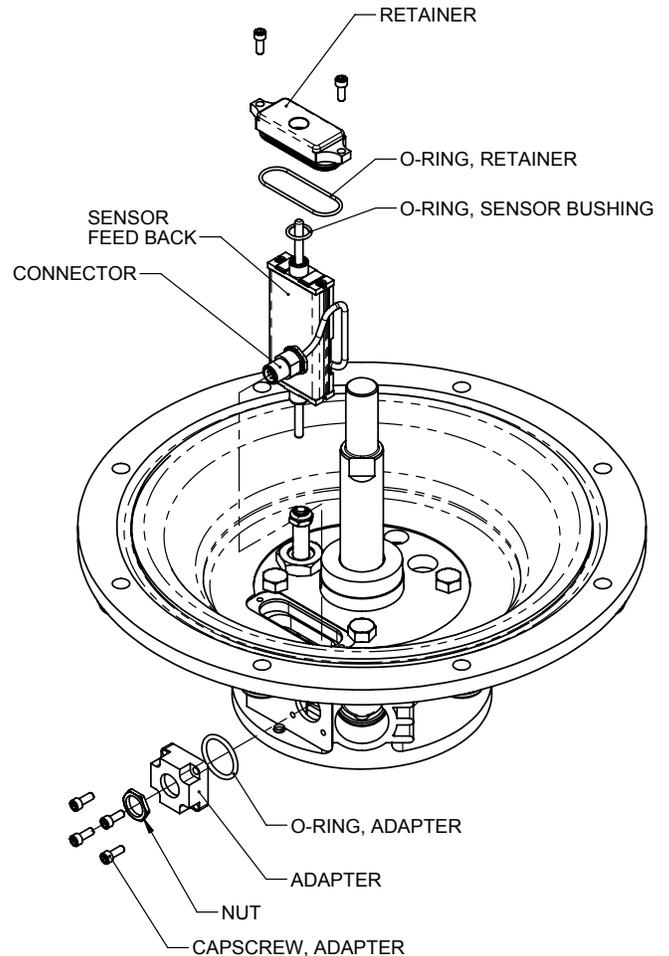
Refer to exploded views for disassembly.

### 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 18mm socket and remove the steel nut securing the connector to the connector plate. Remove the connector from the connector plate taking care not to lose/misplace the o-ring 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.

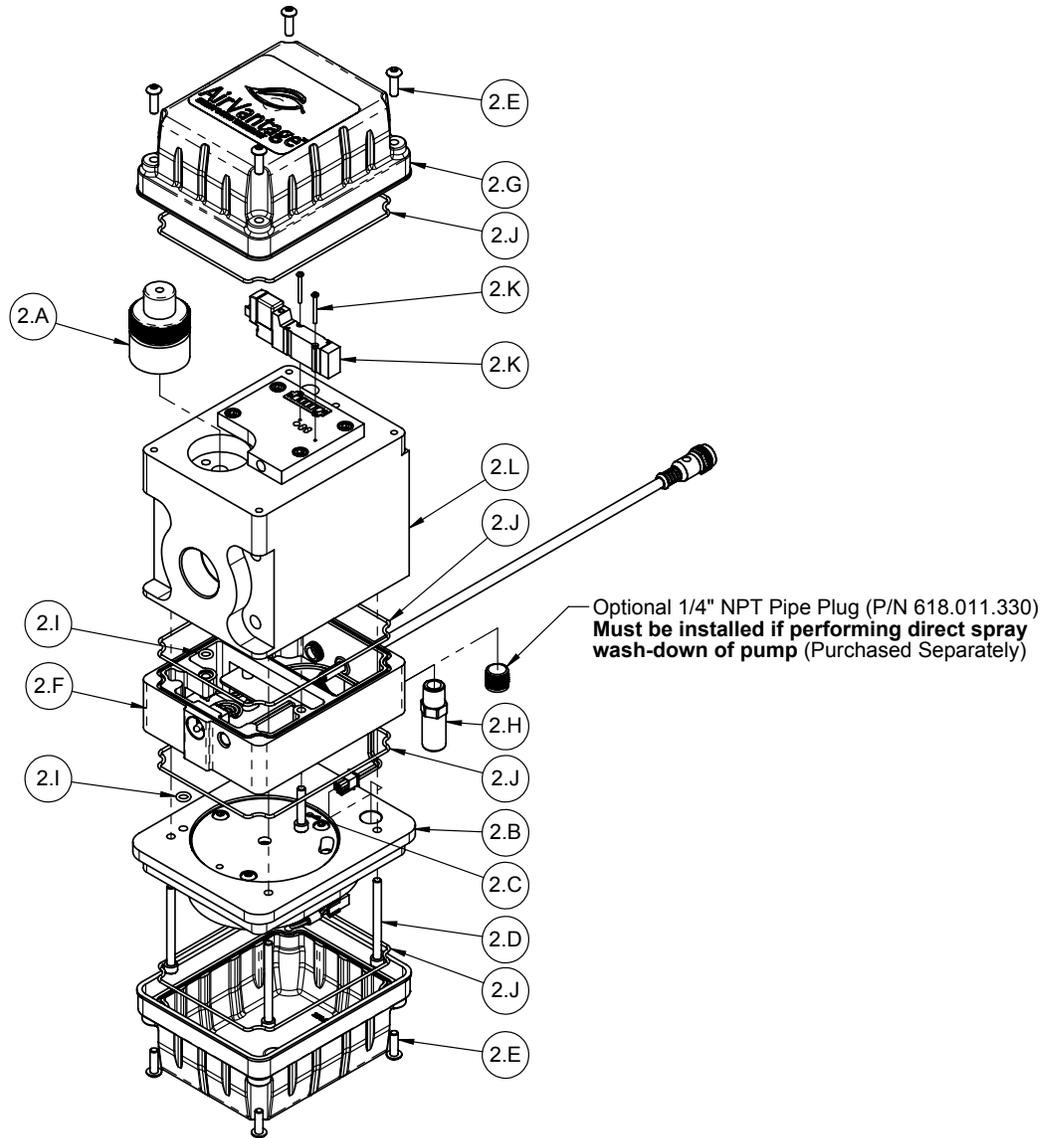
### Step #6: Reinstallation

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 18mm 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.



3: EXP VIEW

# AirVantage Composite Repair Drawing



| ITEM NO. | PART NUMBER | DESCRIPTION                           | QTY |
|----------|-------------|---------------------------------------|-----|
| 2.A      | 020.069.000 | REGULATOR                             | 1   |
| 2.B      | 031.199.000 | POWER GENERATION MODULE               | 1   |
| 2.C      | 171.080.115 | CAPSCREW, HEX SOC HD, 10-32 X 1.00    | 2   |
| 2.D      | 171.081.115 | CAPSCREW, HEX SOC HD, 10-32 X 2.25    | 4   |
| 2.E      | 171.089.115 | CAPSCREW, SOC, BUTTON HD, 10-32 X .62 | 8   |
| 2.F      | 249.030.000 | CONTROL MODULE                        | 1   |
| 2.G      | 258.018.551 | COVER                                 | 2   |
| 2.H      | 530.044.000 | MUFFLER                               | 1   |
| 2.I      | 560.200.360 | O-RING                                | 2   |
| 2.J      | 720.071.360 | SEAL, O-RING                          | 4   |
| 2.K      | 765.004.000 | VALVE, SOLENOID                       | 1   |
| 2.L      | 893.107.150 | VALVE, POPPET                         | 1   |

3: EXP VIEW

# 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.

### 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 5/32 hex-key wrench and remove the four 10-32 x .50 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.

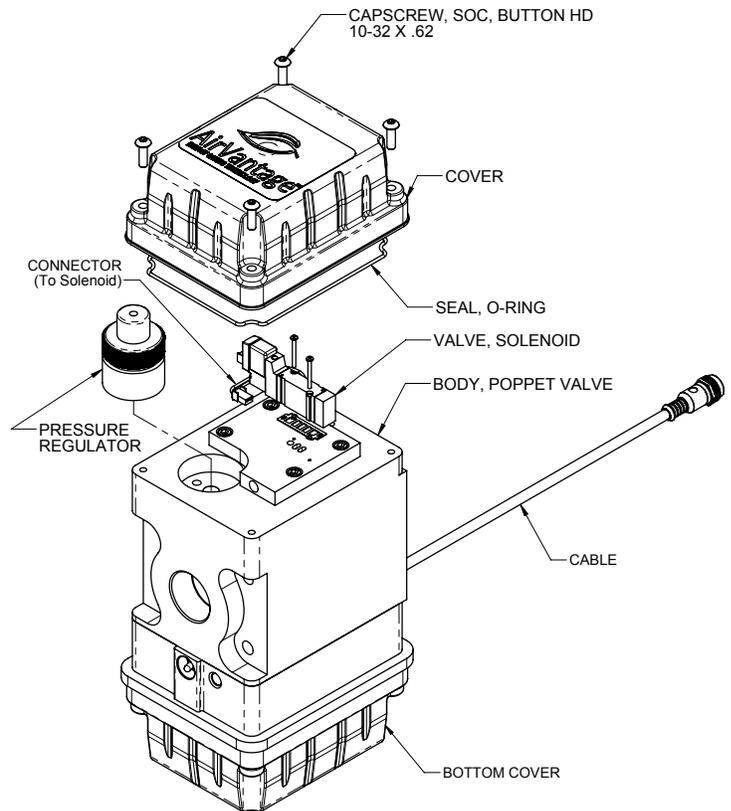
**"AirVantage CAUTION" – Do not loosen or tighten the regulator by turning the knurled portion of the unit. Place the slip-joint pliers on the smooth area underneath the knurled area of the regulator.**

### Step #4: Reinstallation

Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four 10-32 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

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.

## 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 Power Generation Module

Use a 5/32 hex-key wrench and loosen the four 10-32 x .50 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 5/32 hex-key wrench to loosen the four 10-32 x 2 1/4 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

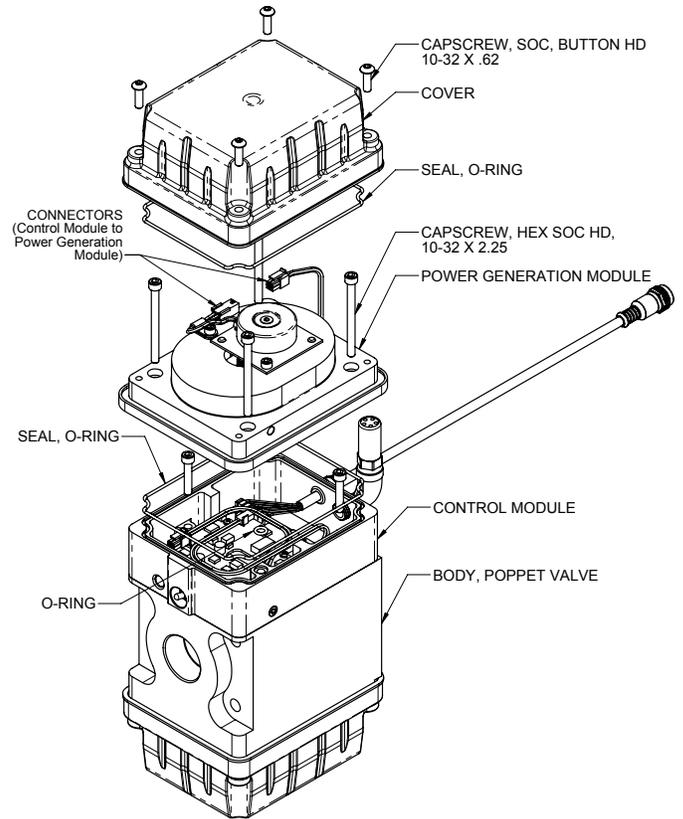
When reinstalling the new module make sure to feed the control module wire through the hole in the power generation case. Install the four 10-32 x 2 1/4 socket head cap screws and tighten to 60 in-lbs.

**"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 10-32 x .50 socket head cap screws to 30 in-lbs.

Reinstall the top cover, making sure the o-ring seal is still in the groove. Tighten the four 10-32 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

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.

## 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

Use a 5/32 hex-key wrench and loosen the four 10-32 x .50 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 5/32 hex-key wrench and loosen the four 10-32 x .50 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 5/32 hex-key wrench to loosen the four 10-32 x 2 1/4 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 a 5/32 hex-key wrench and loosen the two 10-32 x 1.00 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

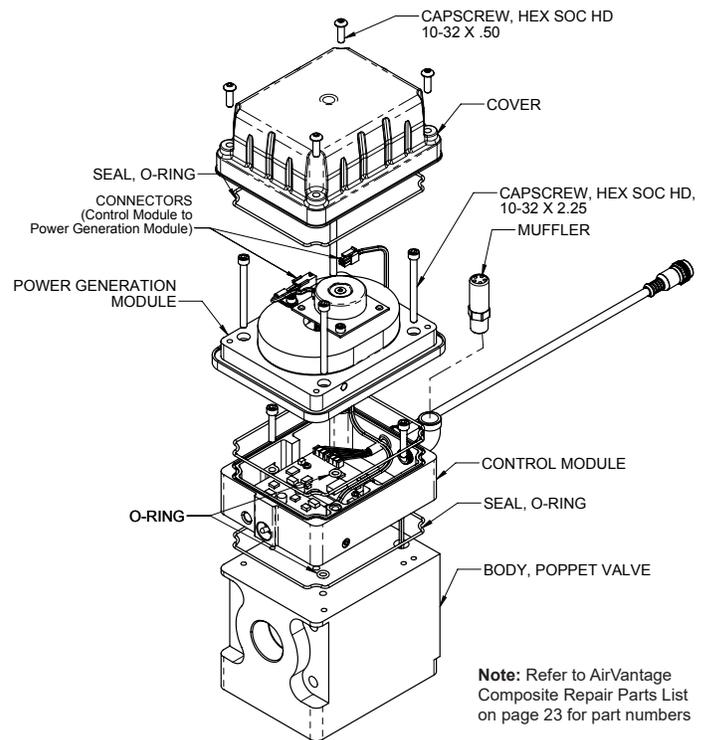
When reinstalling the new control module, make sure to feed the pilot valve connector wire through the hole in the poppet valve assembly. Install the two 10-32 x 1.00 socket head cap screws and tighten to 30 in-lbs.

Reinstall the power generation module. Make sure to feed the control module wire through the hole in the power generation case. Install the four 10-32 x 2 1/4 socket head cap screws and tighten to 60 in-lbs.

**"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 10-32 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.**



# 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.

## 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.

## 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 18mm 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.

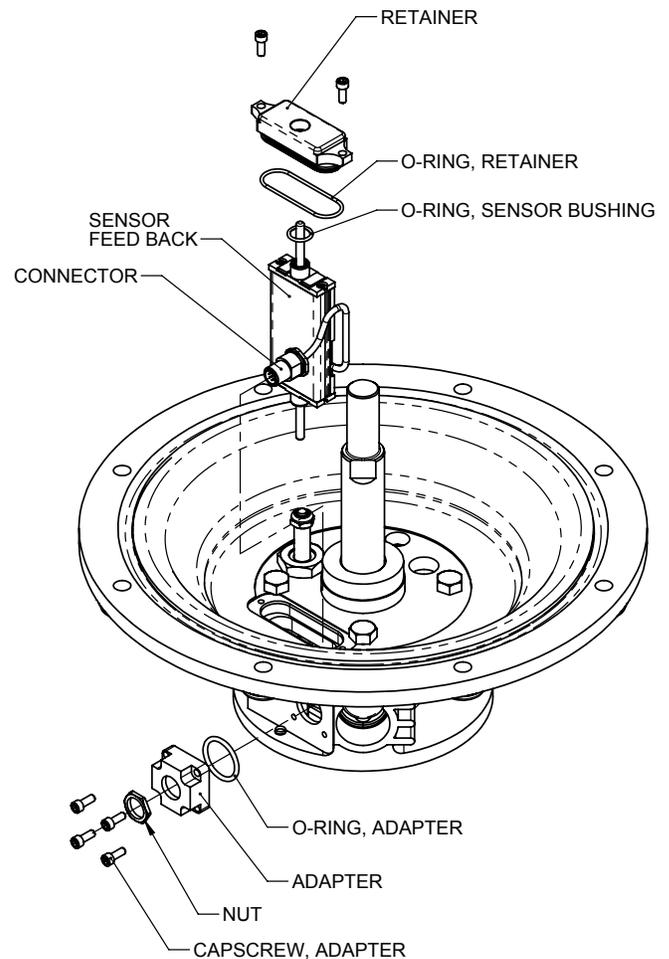
Now slide the sensor out of the intermediate while feeding the connector and cable into the intermediate. Slide the Connector end of the cable out of the same opening as the sensor.

## 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 18mm 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

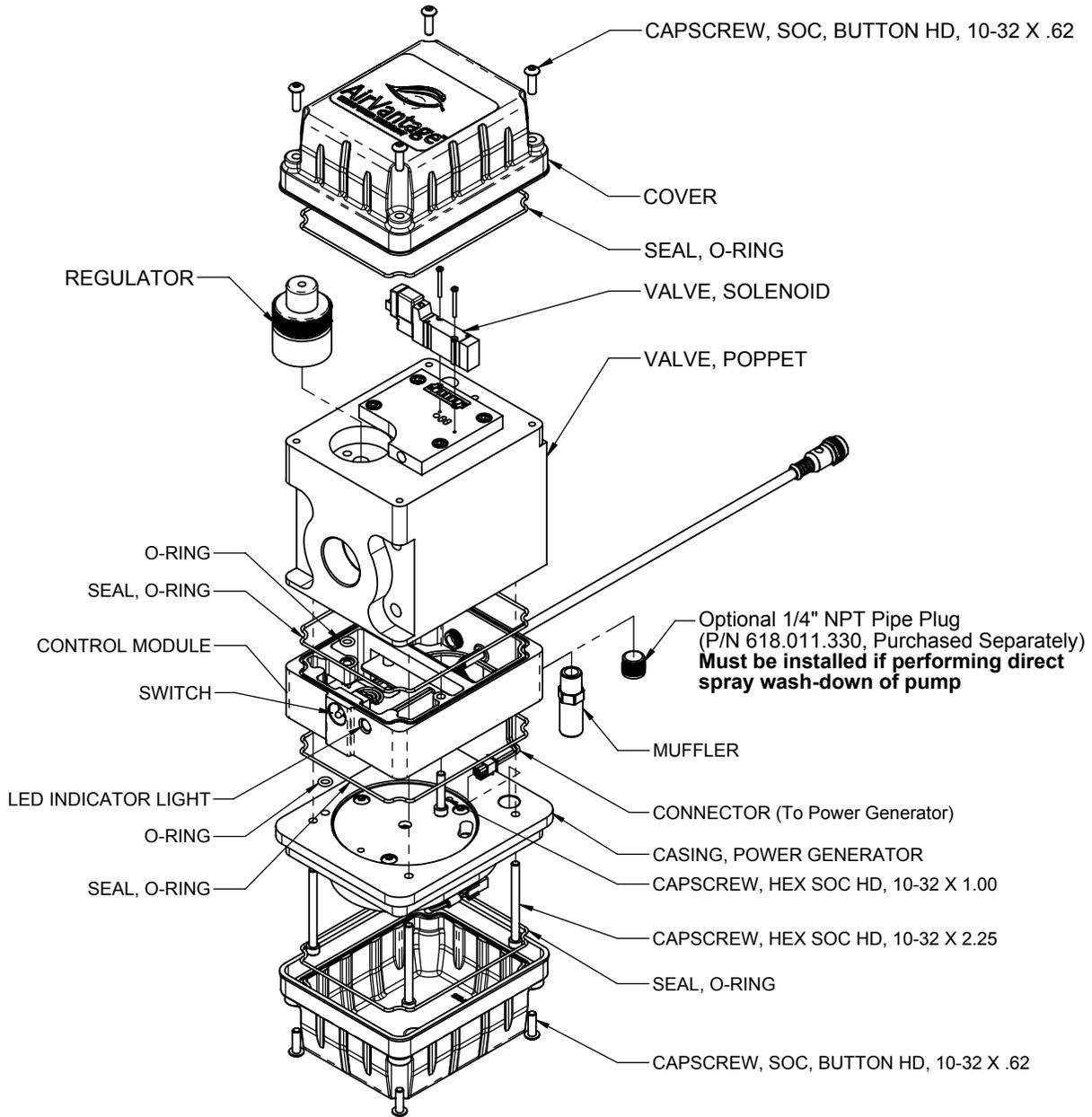
finish the diaphragm installation procedure.



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

3: EXP VIEW

# AirVantage Servicing - Poppet Valve Drawing



3: EXP VIEW

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

# 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.

## 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 5/32 hex-key wrench and loosen the four 10-32 x .50 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 5/32 hex-key wrench and remove the four 10-32 x .50 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 5/32 hex-key wrench to loosen the four 10-32 x 2 1/4 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 5/32 hex-key wrench and loosen the two 10-32 x 1.00 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 10-32 x 1.00 socket head cap screws and tighten to 30 in-lbs.

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 10-32 x 2 1/4 socket head cap screws and tighten to 60 in-lbs.

**“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 10-32 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 10-32 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.**

# 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.

### 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.

3: EXP VIEW



# 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 - CONFORMITETSERKLÄRUNG - DECLARATION ON OVERENSSTÄMMELSE  
EF-DIVERENSSTÄMMELSEERKLÄRUNG - VAATIMUSTENMUKAISUUSKILJUTUS - SAMMARSERKLÄRUNG  
DECLARAÇÃO DE CONFORMIDADE

#### MANUFACTURED BY:

FABRIQUE PAR:  
FABRICADA POR:  
HERGESTELLT VON:  
FABBRICATO DA:  
VERMAAKED DOOR:  
TILVERKAD AV:  
FABRIKANT:  
VALMISTAJA:  
PRODUSENT:  
FABRICANTE:

VERSA-MATIC®  
Walter Rupp, Inc.  
A Unit of IDEK Corporation  
808 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 Directivas de la Comunidad Europea:

Dieses produkt erfüllt die folgenden Vorschriften der Europäischen Gemeinschaft:

Questo prodotto è conforme alle seguenti direttive CEE:

Dit 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 Direktiver:

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 directivas de la comunidad europea:

Dieses produkt hat auch folgenden harmonisierten Standards geteilt, die Obereinstimmung wird bestätigt:

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

De volgende geharmoniseerde normen werden gehanteerd om de conformiteit van dit produkt te garanderen:

För denna produkt har följande harmoniserade standarder använts för att bekräfta överensstämmelse:

Harmoniseerde standarden, der er benyttet:

Täällä luokitellaan on sovellettu seuraavia yhdenmukaistettuja standardeja:

Dette produkt er produsert i overensstemmelse med følgende harmoniserte standarder:

Este produto utilizou as seguintes normas harmonizadas para verificar conformidade:

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

#### AUTHORIZED/APPROVED BY:

Approuvé par:  
Aprobado por:  
Genehmigt von:  
approvato da:  
Goedgekeurd door:  
Underskrift:  
Valtuuskilpura:  
Beimodiget av:  
Autorizado Por:

*David Roseberry*  
Dave Roseberry  
Engineering Manager

DATE: August 10, 2011

FECHA:  
DATUM:  
DATA:  
DATA:  
PÅRÅS:



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D4/192012 REV 07



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4: WARRANTY