# SERVICE & OPERATING MANUAL

**Original Instructions**



## Certified Quality

*Quality System*
*ISO 9001 Certified*

*Environmental Management System*
*ISO 14001 Certified*

Member of: Hydraulic Institute

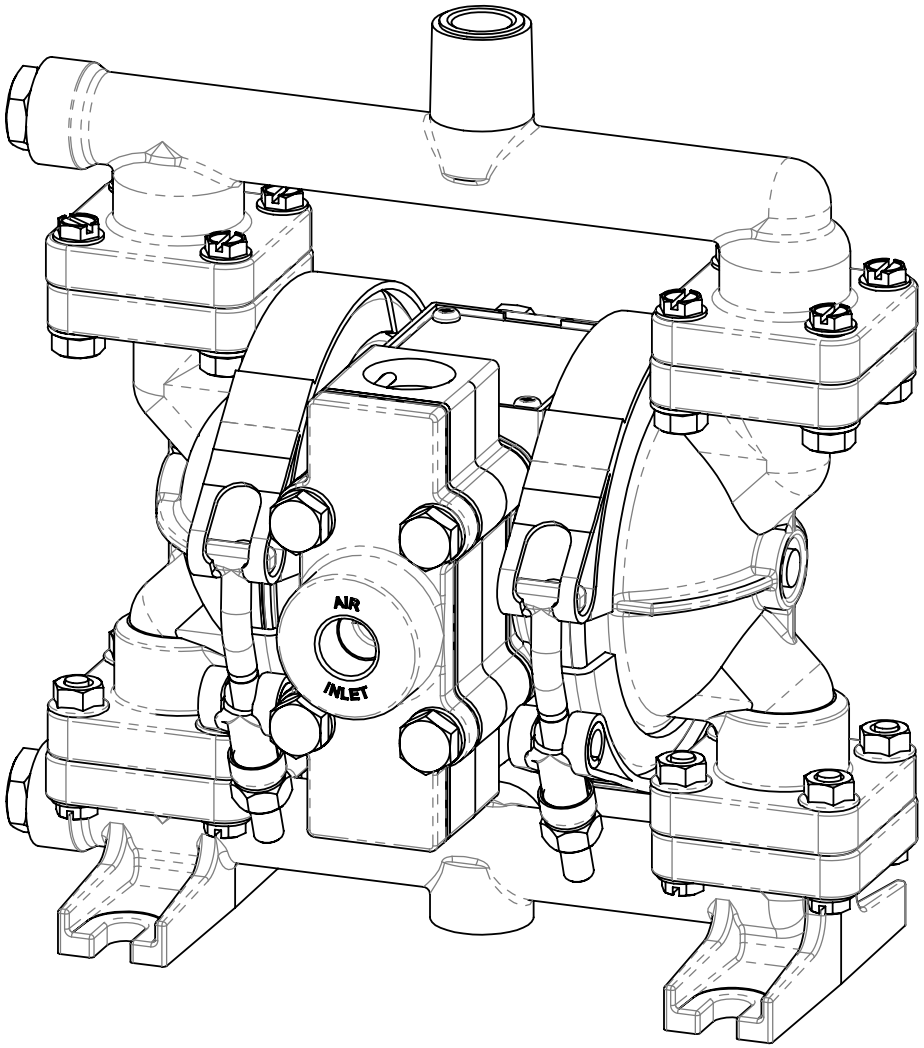
**Warren Rupp, Inc.**
A Unit of IDEX Corporation
800 N. Main St.,
Mansfield, Ohio 44902 USA
Telephone 419.524.8388
Fax 419.522.7867
SANDPIPERPUMP.COM

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# Model PB¼

## Non-Metallic

## Type 4




SANDPIPER®
A WARREN RUPP, INC. BRAND
SANDPIPERPUMP.COM

# Safety Information

## ⚠ IMPORTANT



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



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

## ⚠ CAUTION



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



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



*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 and piping connections are in good condition and are reinstalled properly during reassembly.*



*Use safe practices when lifting*

# ATEX Pumps - Conditions For Safe Use

1. Ambient temperature range is as specified in tables 1 to 3 on the next page *(per Annex I of DEKRA 18ATEX0094X)*

2. ATEX compliant pumps are suitable for use in explosive atmospheres when the equipment is properly grounded in accordance with local electrical codes

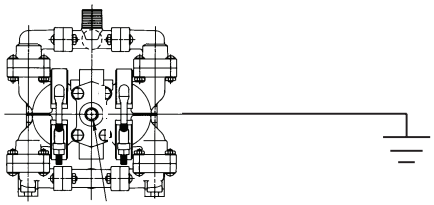
3. **Non-Metallic ATEX Pumps only — See Explanation of Pump Nomenclature / ATEX Details Page**
   Conductive Polypropylene, conductive Acetal or conductive PVDF pumps are not to be installed in applications where the pumps may be subjected to oil, greases and hydraulic liquids.

4. The optionally provided solenoids shall be protected by a fuse corresponding to its rated current (max 3*Irat according to EN 60127) or by a motor protecting switch with short circuit and thermal instantaneous tripping (set to the rated current) as short circuit protection. For solenoids with a very low rated current, a fuse with the lowest current value according to the indicated standard will be sufficient. The fuse may be accommodated in the associated supply unit or shall be separately arranged. The rated voltage of the fuse shall be equal or greater than the stated rated voltage of the solenoid. The breaking capacity of the fuse shall be as high as or higher than the maximum expected short circuit current at the location of the installation (usually 1500 A). The maximum permissible ripple is 20% for all dc solenoids.
   ***Not applicable for all pump models — See Explanation of Pump Nomenclature / ATEX Details Page**

5. When operating pumps equipped with non-conductive diaphragms that exceed the maximum permissible projected area, as defined in EN ISO 80079-36 : 2016 section 6.7.5 table 8, the following protection methods must be applied
   - Equipment is always used to transfer electrically conductive fluids or
   - Explosive environment is prevented from entering the internal portions of the pump, i.e. dry running.

6. Pumps provided with the pulse output kit and used in the potentially explosive atmosphere caused by the presence of the combustible dust shall be installed in such a way that the pulse output kit is protected against impact
   ***Not applicable for all pump models — See Explanation of Pump Nomenclature / ATEX Details Page**

7. To reduce the risk of static electrical sparking, ATEX compliant pumps must be grounded. Each ATEX compliant pump will be shipped with grounding cable. Grounding cable should be fastened to pump hardware. Check the local electrical code for detailed grounding instruction and the type of equipment required.



# Temperature Tables

### Table 1. Category 1 & Category 2 ATEX Rated Pumps

| Ambient Temperature Range [°C] | Process Temperature Range [°C][1] | Temperature Class | Maximum Surface Temperature [°C] |
|---|---|---|---|
| -20°C to +60°C | -20°C to +80°C | T5 | T100°C |
| | -20°C to +108°C | T4 | T135°C |
| | -20°C to + 160°C | T3 | T200°C |
| | -20°C to +177°C | (225°C) T2 | |

[1]Per CSA standards ANSI LC6-2018 US & Canadian Technical Letter R14, G-Series Natural Gas Models are restricted to (-20°C to + 80°C) process temperature

### Table 2. Category 2 ATEX Rated Pumps Equipped with Pulse Output Kit or Integral Solenoid:

| Ambient Temperature Range [°C] | Process Temperature Range [°C] | Temperature Class | Maximum Surface Temperature [°C] | Options | |
|---|---|---|---|---|---|
| | | | | Pulse Output Kit | Integral Solenoid |
| -20°C to +60°C | -20°C to +100°C | T5 | T100 | X | |
| -20°C to +50°C | -20°C to +100°C | T5 | T100 | | X |

[2]ATEX Pulse output or Intergral Solenoid Not Available For All Pump Models See Explanation of Pump Nomenclature / ATEX Details Page

### Table 3. Category M1 ATEX Rated Pumps for Mining

| Ambient Temperature Range [°C] | Process Temperature Range [°C] |
|---|---|
| -20°C to +60°C | -20°C to +150°C |

Note: The ambient temperature range and the process temperature range should not exceed the operating temperature range of the applied non-metallic parts as listed in the manuals of the pumps.

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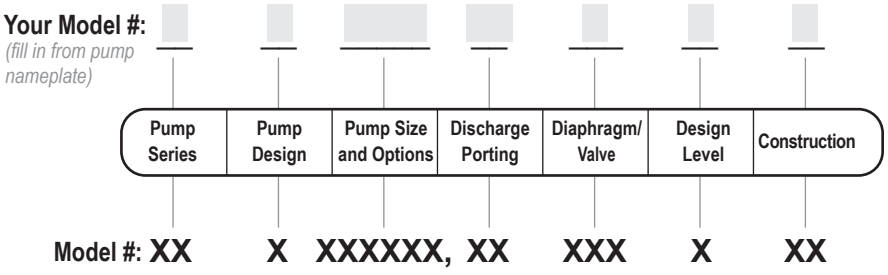
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# Explanation of Pump Nomenclature




**Pump Series**
**P** Plastic

**Pump Design**
**B** Soilid Ball

**Pump Size and Options**
**1/4** 1/4" NPT
**P1** Intrinsically Safe ATEX Compliant Pulse Output
**P0** 10-30VDC Pulse Output Option
**P2** 110/120 or 220/240VAC Pulse Output Option
**E0** Integral Solenoid 24VDC Coil
**E1** Integral Solenoid 24VDC Explosion-Proof Coil
**E2** Integral Solenoid 24VAC/12VDC Coil
**E3** Integral Solenoid 12VDC Explosion-Proof Coil
**E4** Integral Solenoid 110VAC Coil
**E5** Integral Solenoid 110VAC Explosion-Proof Coil
**E6** Integral Solenoid 220VAC Coil
**E7** Integral Solenoid 220VAC Explosion-Proof Coil
**E8** Integral Solenoid 115VAC, 50Hz Explosion-Proof Coil
**E9** Integral Solenoid 230VAC, 50Hz, Explosion-Proof Coil

**Discharge Porting Position**
**T** Horizontal Suction, Vertical Discharge

**Diaphragm Check Valve Materials**
**R** Hytrel
**S** Santoprene
**T** Virgin PTFE
**U** Santoprene Diaphragms/PTFE Ball

**Design Level**
**4**

**Construction**
**P** Polypropylene Wet End and Center
**K** PVDF Wet End and Polypropylene Center
△ **CA** Conductive Acetal Wet End and Center

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

# ATEX Detail

| | ATEX Details | Construction | Options |
|---|---|---|---|
| Ex | II 2 G Ex h IIC T5...225°C (T2) Gb<br>II 2 D Ex h IIIC T100°C...T200°C Db | CA | 00 |
| | II 2 G Ex h ia IIC T5 Gb<br>II 2 D Ex h ia IIIC T100°C Db | CA | P1 |

# Performance

## PB¼ NON-METALLIC

**SUCTION/DISCHARGE PORT SIZE**
- ¼" NPT (internal)
- ½" NPT (external)

**CAPACITY**
- 0 to 5 gallons per minute (0 to 19 liters per minute)

**AIR DISTRIBUTION VALVE**
- No-lube, no-stall design

**SOLIDS-HANDLING**
- Up to 0.032 in. (1mm)

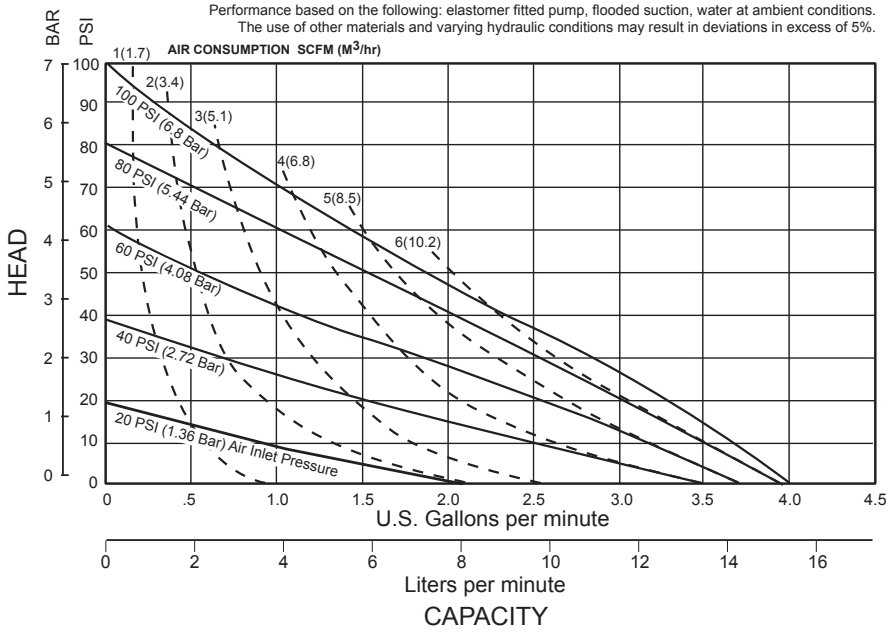
**HEADS UP TO**
- 100 psi or 231 ft. of water (7 bar or 70 meters)

**DISPLACEMENT/STROKE**
- .01 Gallon / .04 liter

**SHIPPING WEIGHT**
- Polypropylene 3.3 lbs. (1.5kg)
- PVDF 3.9 lbs. (1.8kg)
- Conductive Acetal 3.9 lbs. (1.8kg)

**MODEL PB¼-A Performance Curve**

Performance based on the following: elastomer fitted pump, flooded suction, water at ambient conditions. The use of other materials and varying hydraulic conditions may result in deviations in excess of 5%.




# Materials

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

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

## Metals:

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

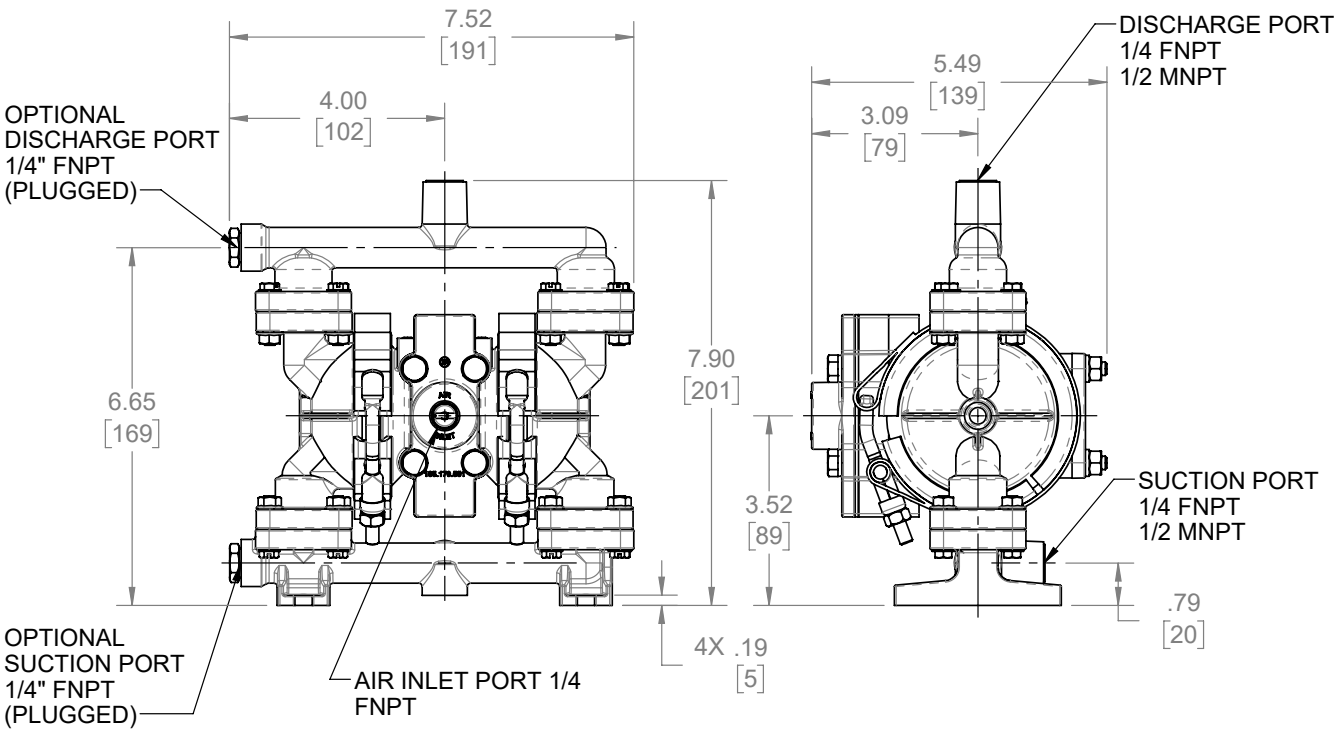
**Stainless Steel:** Equal to or exceeding ASTM specification A743 CF-8M for corrosion resistant iron chromium, iron chromium nickel and nickel based alloy castings for general applicaitons. Commonly referred to as 316 Stainless Steel in the pump industry.

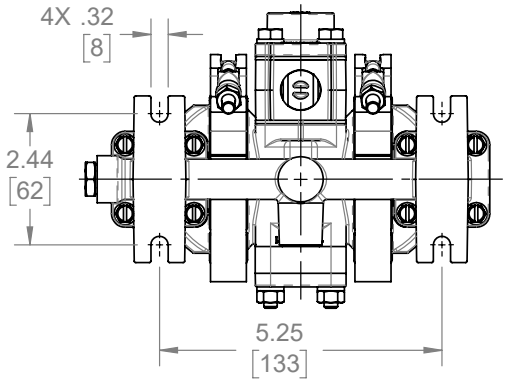
For specific applications, always consult the Chemical Resistance Chart.

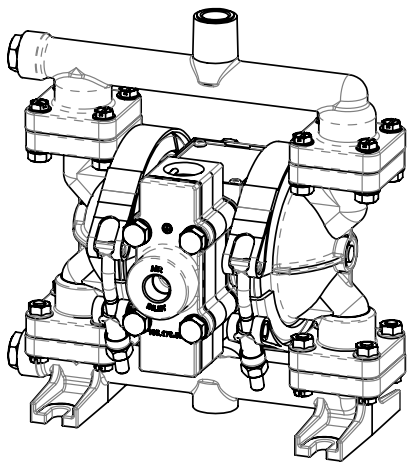
# Dimensional Drawing

## PB¼ Non-Metallic

Dimensions in inches (metric dimensions in brackets). Dimensional Tolerance .125" (3mm).



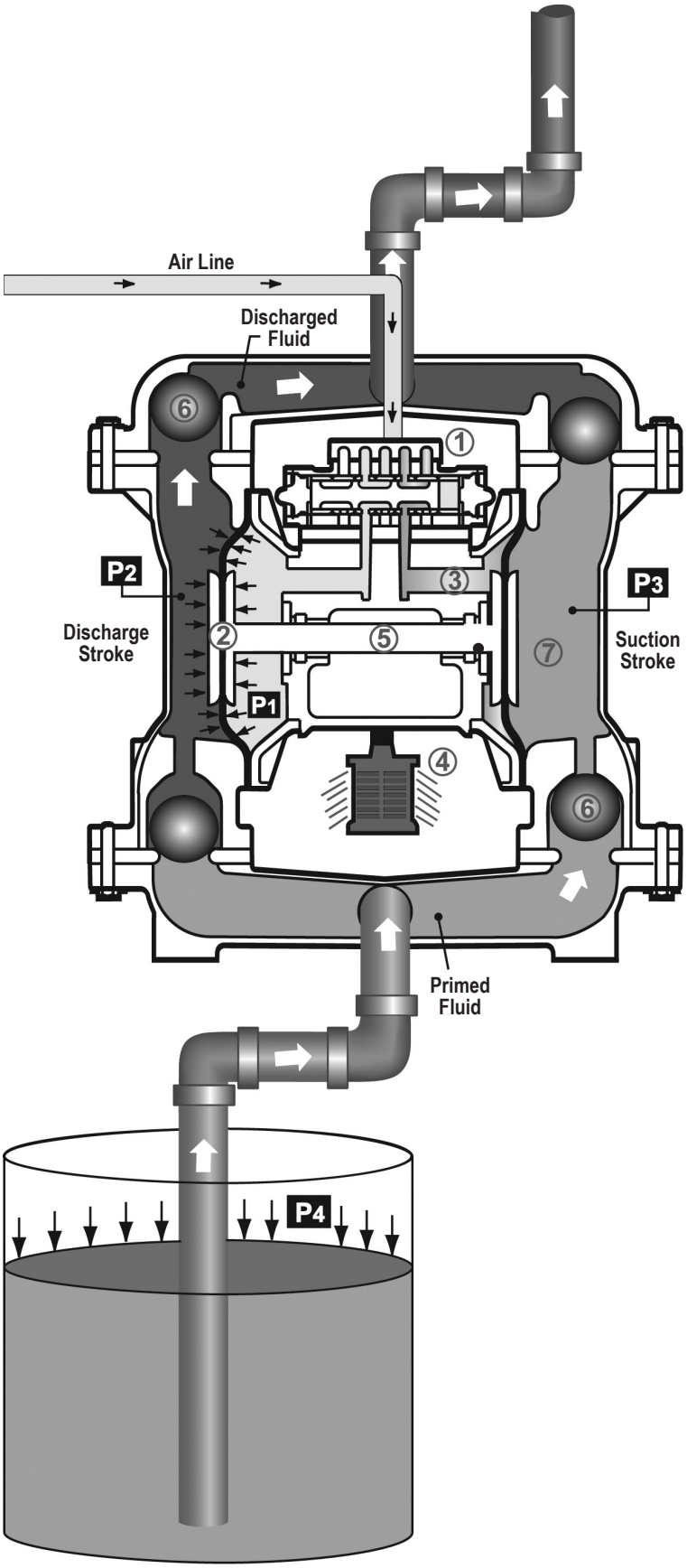



# PB 1/4 NON-METALLIC

## DESIGN LEVEL 4

DIMENSIONAL TOLERANCE = ±.125 [3mm]

# Principle of Pump Operation




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

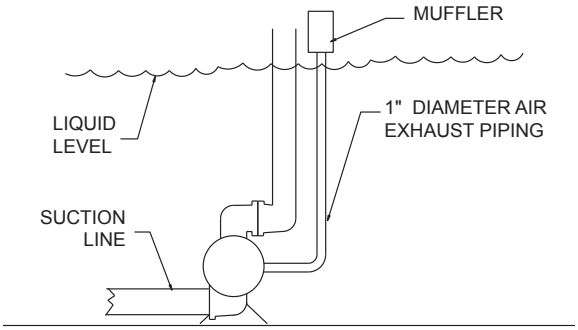
The main directional (air) control valve distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm . At the same time, the exhausting air from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port .

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



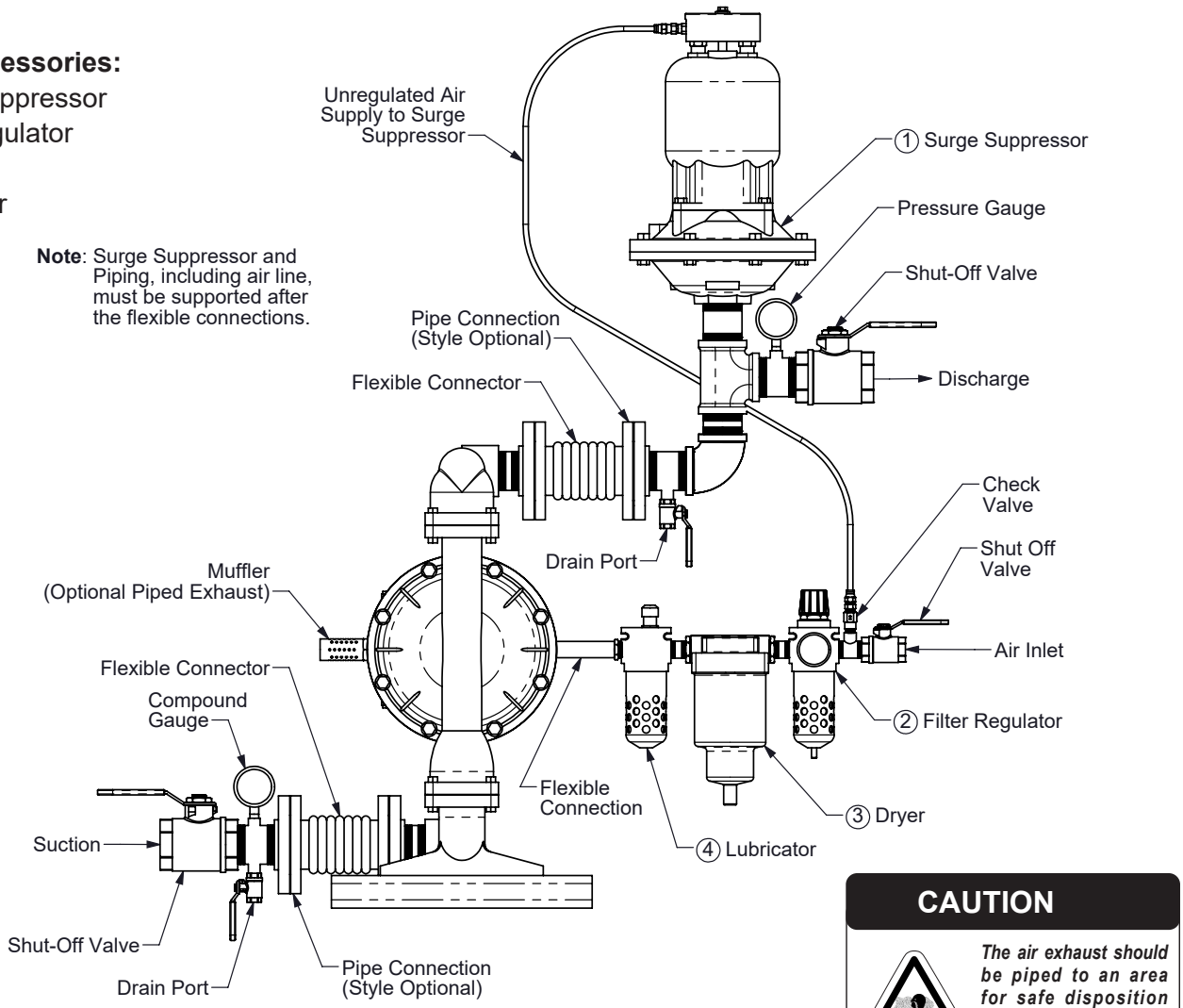

Pump can be submerged if the pump materials of construction are compatible with the liquid being pumped. The air exhaust must be piped above the liquid level. When the pumped product source is at a higher level than the pump (flooded suction condition), pipe the exhaust higher than the product source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

# Recommended Installation Guide

**Available Accessories:**

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

**Note**: Surge Suppressor and Piping, including air line, must be supported after the flexible connections.




**CAUTION**

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

**Installation And Start-Up**

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

**Air Supply**

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

**Air Valve Lubrication**

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

**Air Line Moisture**

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

**Air Inlet And Priming**

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

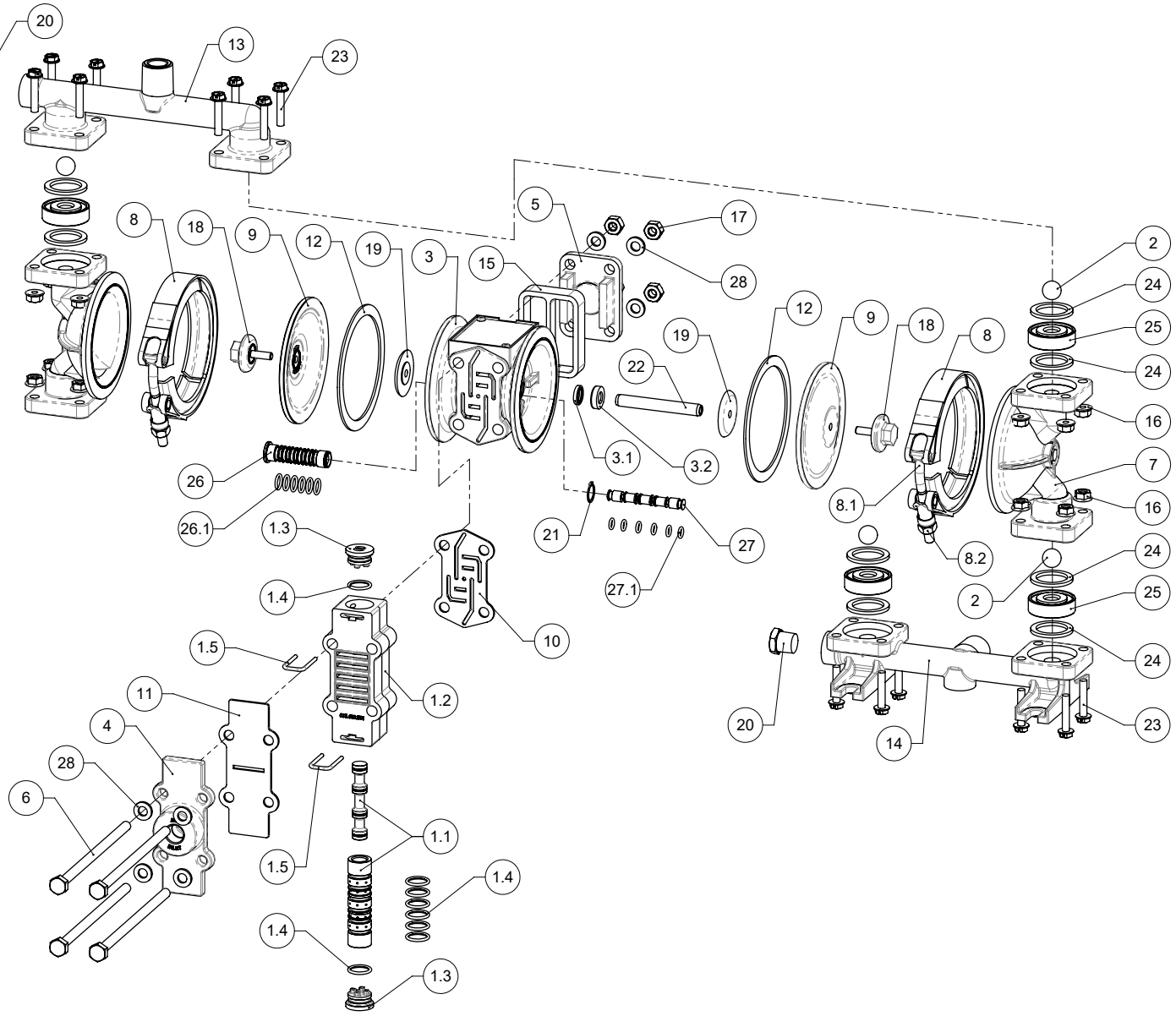
# Troubleshooting Guide



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

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

# Composite Repair Parts Drawing




3: EXP VIEW

# Service & Repair Kits

**031.224.551** Main Air Valve Body Assembly
**031.224.503** Main Air Valve Body Assembly (Conductive Acetal only)
**031.101.000** Pilot Valve Assembly
**475.145.000** Air Exhaust Conversion Kit
**476.388.354** Wetted End Kit Santoprene Diaphragms & Balls
**476.388.356** Wetted End Kit Hytrel Diaphragms & Balls
**476.388.600** Wetted End Kit PTFE Diaphragms & Balls
**476.388.644** Wetted End Kit Santoprene Diaphragms & PTFE Balls
**476.129.000** Air End Kit

# Composite Repair Parts List

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 031.224.551 | Valve, Main Air | 1 |
| ⚠ | 031.224.503 | Valve, Main Air (Conductive Acetal) | 1 |
| 1.1 | 031.106.000 | Sleeve and Spool Set (Includes O-Rings) | 1 |
| 1.2 | 095.132.551 | Body, Air Valve | 1 |
| ⚠ | 095.132.503 | Body, Air Valve (Conductive Acetal) | 1 |
| 1.3 | 165.170.551 | Cap, End, Air Valve | 1 |
| ⚠ | 165.170.503 | Cap, End, Air Valve (Conductive Acetal) | 2 |
| 1.4 | 560.101.360 | O-Ring | 8 |
| 1.5 | 675.062.115 | Retainer, Valve End Cap | 2 |
| 2 | 050.033.354 | Ball, Check (Santoprene) | 4 |
| | 050.033.356 | Ball, Check (Hytrel) | 4 |
| | 050.034.600 | Ball, Check (PTFE) | 4 |
| 3 | 114.019.551 F | Intermediate | 1 |
| ⚠ | 114.019.503 F | Intermediate (Conductive Acetal) | 1 |
| 3.1 | 720.031.359 | Seal, Diaphragm Rod | 2 |
| 3.2 | 449.021.551 | Insert, Gland | 2 |
| ⚠ | 449.021.503 | Insert, Gland (Conductive Acetal) | 2 |
| 4 | 165.072.551 | Cap. Air Inlet | 1 |
| ⚠ | 165.072.503 | Cap. Air Inlet (Conductive Acetal) | 1 |
| 5 | 165.073.551 | Cap, Muffler | 1 |
| ⚠ | 165.073.503 | Cap, Muffler (Conductive Acetal) | 1 |
| 6 | 170.103.115 | Capscrew, Hex HD, 1/4-20 X 5" | 4 |
| 7 | 196.145.552 | Chamber, Outer (Polypropylene) | 2 |
| | 196.145.520 | Chamber, Outer (PVDF) | 2 |
| ⚠ | 196.145.502 | Chamber, Outer (Conductive Acetal) | 2 |
| 8 | 200.057.115 | Clamp (Includes 8.1 & 8.2) | 2 |
| 8.1 | 100.002.115 | T-Bolt | 2 |
| 8.2 | 545.027.337 | Nut, Hex, 1/4-28UNF | 2 |
| 9 | 286.069.354 | Diaphragm (Santoprene) | 2 |
| | 286.069.356 | Diaphragm (Hytrel) | 2 |
| | 286.070.600 | Diaphragm (PTFE) | 2 |
| 10 | 360.084.360 | Gasket, Intermediate | 1 |
| ⚠ | 360.084.379 | Gasket, Intermediate (Cond Acetal Pumps) | |
| 11 | 360.132.360 | Gasket, Valve Body | 1 |
| ⚠ | 360.132.379 | Gasket, Valve Body (Cond Acetal Pumps) | 1 |

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 12 | 360.086.360 | Gasket, Spacer | 2 |
| 13 | 518.210.552 | Manifold, Discharge (Polypropylene) (Includes Plug) | 1 |
| | 518.210.520 | Manifold, Discharge (PVDF) (Includes Plug) | 1 |
| ⚠ | 518.210.502 | Manifold, Discharge (Conductive Acetal) (Includes Plug) | 1 |
| 14 | 518.211.552 | Manifold, Suction (Polypropylene) (Includes Plug) | 1 |
| | 518.211.520 | Manifold, Suction (PVDF) (Includes Plug) | 1 |
| ⚠ | 518.211.502 | Manifold, Suction (Conductive Acetal) (Includes Plug) | 1 |
| 15 | 530.022.550 | Muffler | 1 |
| 16 | 544.004.115 | Nut, Hex Flange, 10-32 | 16 |
| 17 | 545.003.330 | Nut, Hex, 1/4-20 | 4 |
| 18 | 612.146.552 | Plate, Outer Diaphragm (Polypropylene) | 2 |
| | 612.146.520 | Plate, Outer Diaphragm (PVDF) | 2 |
| ⚠ | 612.146.502 | Plate, Outer Diaphragm (Conductive Acetal) | 2 |
| 19 | 612.147.150 | Plate, Inner Diaphragm | 2 |
| 20 | 618.056.552 | Plug, Manifold (Polypropylene) | 2 |
| | 618.056.520 | Plug, Manifold (PVDF) | 2 |
| ⚠ | 618.056.502 | Plug, Manifold (Conductive Acetal) | 2 |
| 21 | 675.047.115 | Ring, Retaining | 1 |
| 22 | 685.046.120 | Rod, Diaphragm | 1 |
| 23 | 706.023.115 | Screw, Slotted Hex, Flange, 10-32 X 1.00 | 16 |
| 24 | 720.032.600 | Seal, Check Valve | 8 |
| 25 | 722.073.552 | Seat, Check Valve (Polypropylene) | 4 |
| ⚠ | 722.073.520 | Seat, Check Valve (PVDF) | 4 |
| | 722.073.506 | Seat, Check Valve (Conductive Acetal) | 4 |
| 26 | 755.038.000 | Sleeve, Pilot Valve (Includes O-Ring) | 1 |
| 26.1 | 560.066.360 | O-Ring | 6 |
| 27 | 775.038.000 | Spool, Pilot Valve (Includes O-Ring) | 1 |
| 27.1 | 560.029.374 | O-Ring | 6 |
| 28 | 901.037.115 | Washer, Flat, 1/4 | 8 |
| 39 ⚠ | 920.025.000 | Grounding Cable (Conductive Acetal) (Not Shown) | 1 |

# Material Codes - The Last 3 Digits of Part Number

000 Assembly, sub-assembly; and some purchased items
010 Cast Iron
015 Ductile Iron
020 Ferritic Malleable Iron
080 Carbon Steel, AISI B-1112
110 Alloy Type 316 Stainless Steel
111 Alloy Type 316 Stainless Steel (Electro Polished)
112 Alloy C
113 Alloy Type 316 Stainless Steel (Hand Polished)
114 303 Stainless Steel
115 302/304 Stainless Steel
117 440-C Stainless Steel (Martensitic)
120 416 Stainless Steel (Wrought Martensitic)
148 Hardcoat Anodized Aluminum
150 6061-T6 Aluminum
152 2024-T4 Aluminum (2023-T351)
155 356-T6 Aluminum
156 356-T6 Aluminum
157 Die Cast Aluminum Alloy #380
158 Aluminum Alloy SR-319
162 Brass, Yellow, Screw Machine Stock
165 Cast Bronze, 85-5-5-5
166 Bronze, SAE 660
170 Bronze, Bearing Type, Oil Impregnated
180 Copper Alloy
305 Carbon Steel, Black Epoxy Coated
306 Carbon Steel, Black PTFE Coated
307 Aluminum, Black Epoxy Coated
308 Stainless Steel, Black PTFE Coated
309 Aluminum, Black PTFE Coated
313 Aluminum, White Epoxy Coated
330 Zinc Plated Steel
332 Aluminum, Electroless Nickel Plated
333 Carbon Steel, Electroless Nickel Plated
335 Galvanized Steel
337 Silver Plated Steel
351 Food Grade Santoprene®
353 Geolast; Color: Black
354 Injection Molded #203-40 Santoprene® Duro 40D +/-5; Color: RED
356 Hytrel®
357 Injection Molded Polyurethane
358 Urethane Rubber (Some Applications) (Compression Mold)
359 Urethane Rubber
360 Nitrile Rubber Color coded: RED
363 FKM (Fluorocarbon) Color coded: YELLOW
364 E.P.D.M. Rubber Color coded: BLUE
365 Neoprene Rubber Color coded: GREEN
366 Food Grade Nitrile
368 Food Grade EPDM
371 Philthane (Tuftane)
374 Carboxylated Nitrile
375 Fluorinated Nitrile
378 High Density Polypropylene
379 Conductive Nitrile
408 Cork and Neoprene
425 Compressed Fibre
426 Blue Gard
440 Vegetable Fibre
500 Delrin® 500
502 Conductive Acetal, ESD-800
503 Conductive Acetal, Glass-Filled
506 Delrin® 150
520 Injection Molded PVDF Natural color
540 Nylon
542 Nylon
544 Nylon Injection Molded
550 Polyethylene
551 Glass Filled Polypropylene
552 Unfilled Polypropylene
555 Polyvinyl Chloride
556 Black Vinyl
557 Unfilled Conductive Polypropylene
558 Conductive HDPE
559 Glass-Filled Conductive Polypropylene
570 Rulon II®
580 Ryton®
600 PTFE (virgin material) Tetrafluorocarbon (TFE)
603 Blue Gylon®
604 PTFE
606 PTFE
607 Envelon
608 Conductive PTFE
610 PTFE Encapsulated Silicon
611 PTFE Encapsulated FKM
632 Neoprene/Hytrel®
633 FKM/PTFE
634 EPDM/PTFE
635 Neoprene/PTFE
637 PTFE, FKM/PTFE
638 PTFE, Hytrel®/PTFE
639 Nitrile/TFE
643 Santoprene®/EPDM
644 Santoprene®/PTFE
656 Santoprene® Diaphragm and Check Balls/EPDM Seats
661 EPDM/Santoprene®
666 FDA Nitrile Diaphragm, PTFE Overlay, Balls, and Seals
668 PTFE, FDA Santoprene®/PTFE

Delrin and Hytrel are registered tradenames of E.I. DuPont.

Nylatron is a registered tradename of Polymer Corp.

Gylon is a registered tradename of Garlock, Inc.

Santoprene is a registered tradename of Exxon Mobil Corp.

Rulon II is a registered tradename of Dixion Industries Corp.

Ryton is a registered tradename of Phillips Chemical Co.

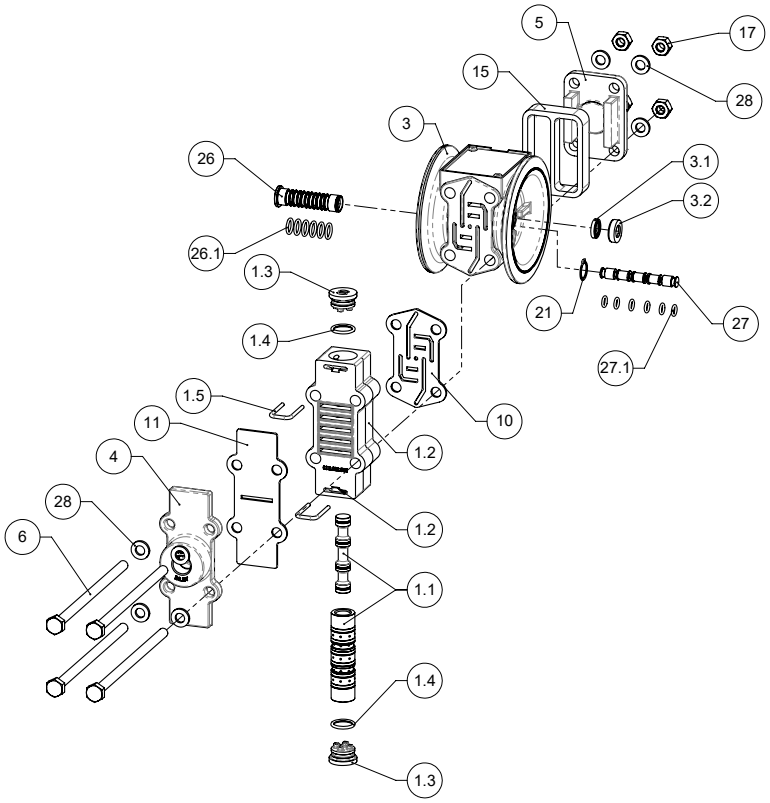
Valox is a registered tradename of General Electric Co.



# RECYCLING

Warren Rupp is an ISO14001 registered company and is committed to minimizing the impact our products have on the environment. Many components of SANDPIPER® AODD pumps are made of recyclable materials. We encourage pump users to recycle worn out parts and pumps whenever possible, after any hazardous pumped fluids are thoroughly flushed. Pump users that recycle will gain the satisfaction to know that their discarded part(s) or pump will not end up in a landfill. The recyclability of SANDPIPER products is a vital part of Warren Rupp's commitment to environmental stewardship.

# Main Air Distribution Valve and Pilot Valve






## Air Distribution Valve Servicing

See repair parts drawing, remove screws.
**Step 1:** Remove end cap retainer (1.5).
**Step 2:** Remove end cap (1.3).
**Step 3:** Remove spool part of (1.1) (caution: do not scratch).
**Step 4:** Press sleeve (1.1) from body (1.2).
**Step 5:** Inspect O-Rings (1-4) and replace if necessary.
**Step 6:** Lightly lubricate O-Rings (1-4) on sleeve (1.1).
**Step 7:** Press sleeve (1.1) into body (1.2).
**Step 8:** Reassemble in reverse order, starting with step 4.

Note: Sleeve and spool (1-1) set is match ground to a specified clearance. Sleeve and spools (1-1) cannot be interchanged.

## Pilot Valve Servicing

With Pilot Valve removed from pump.
**Step 1:** Remove snap ring (21).
**Step 2:** Remove sleeve (26), inspect O-Rings (26.1), replace if required.
**Step 3:** Remove spool (27) from sleeve (27.1), inspect O-Rings (3E), replace if required.
**Step 4:** Lightly lubricate O-Rings (26.1) and (27.1). Reassemble in reverse order.

**⚠ IMPORTANT**

***Read these instructions completely, before installation and start-up. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory warranty.***

**ATEX Compliant**

## Main Air Valve Assembly Parts List

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 031.224.551 | Valve, Main Air | 1 |
| 1.1 | 031.106.000 | Sleeve and Spool Set (Includes O-Rings) | 1 |
| 1.2 | 095.132.551 | Body, Air Valve | 1 |
| 1.3 | 165.074.551 | Cap, End, Air Valve | 2 |
| 1.4 | 560.101.360 | O-Ring | 8 |
| 1.5 | 675.062.115 | Retainer, Valve End Cap | 2 |

## Main Air Valve Assembly Parts List

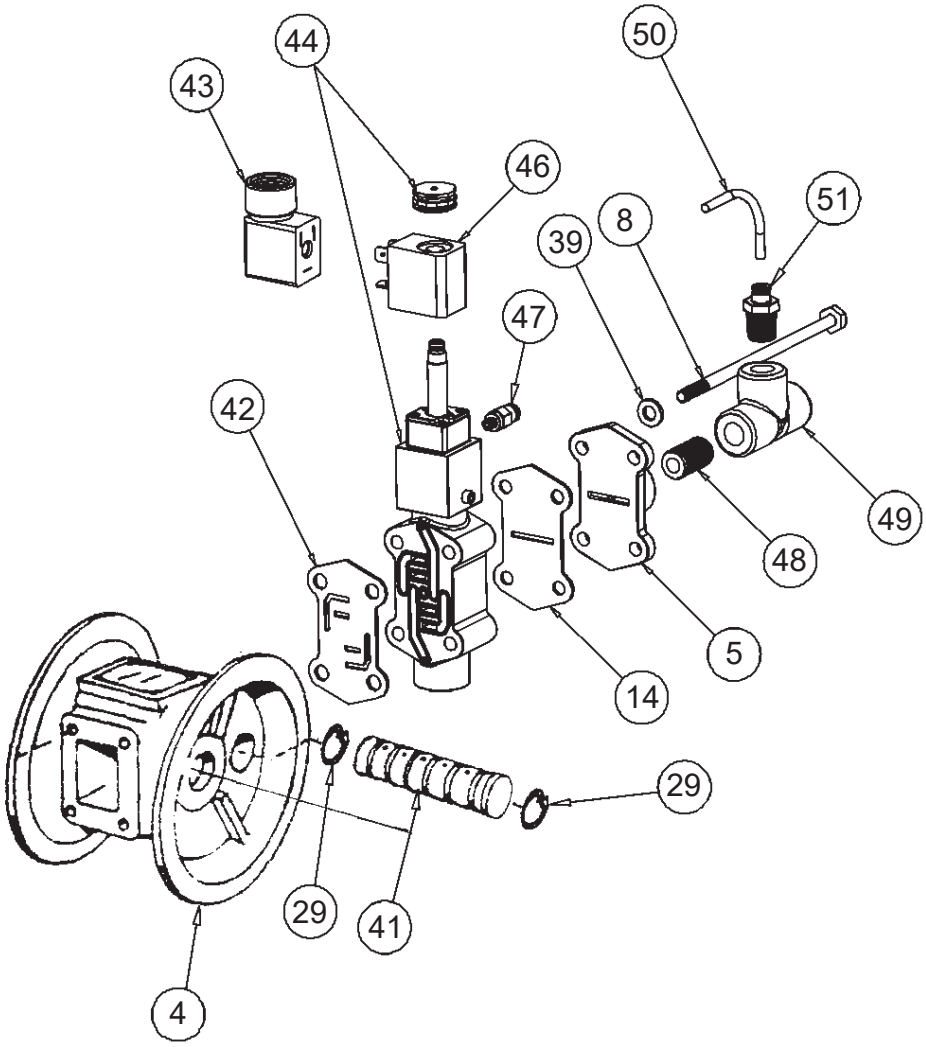
| Item | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 031.224.503 | Valve, Main Air (Conductive Acetal) | 1 |
| 1.1 | 031.106.000 | Sleeve and Spool Set (Includes O-Rings) | 1 |
| 1.2 | 095.132.503 | Body, Air Valve | 1 |
| 1.3 | 165.074.503 | Cap, End, Air Valve | 2 |
| 1.4 | 560.101.360 | O-Ring | 8 |
| 1.5 | 675.062.115 | Retainer, Valve End Cap | 2 |

## Pilot Valve Assembly Parts List

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 21 | 675.047.115 | Ring, Retaining | 1 |
| 26 | 755.038.000 | Sleeve, Pilot Valve (Includes O-Ring) | 1 |
| 26.1 | 560.066.360 | O-Ring | 6 |
| 27 | 775.038.000 | Spool, Pilot Valve (Includes O-Ring) | 1 |
| 27.1 | 560.029.374 | O-Ring | 6 |

# Solenoid Shifted Option Drawing

**ASSEMBLY INSTRUCTIONS: Must Be Performed Prior To Start-Up.** The tee (item 49), nipple (item 48), fitting (item 51) and tubing (item 50) have been pre-assembled at the factory. Thread this assembly into the air inlet cap (item 5). Be careful not to over tighten. Push the free end of the tubing into the fitting (item 47) which is attached to the valve.




## SOLENOID SHIFTED AIR VALVE PARTS LIST

(Includes all items used on Composite Repair Parts List except as shown)

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 29 | 675.047.115 | Ring, Retaining . Pilot Plug Sleeve | 2 |
| 41 | 755.037.000 | Pilot Plug Sleeve with O.rings | 1 |
| 42 | 360.106.360 | Gasket, Intermediate Bracket | 1 |
| 43 | 241.001.000 | Connector, conduit | 1 |
| 44 | 893.095.000 | Solenoid Valve, NEMA 4 | 1 |
| 46 | 219.001.000 | Solenoid Coil, 24 VDC | 1 |
| | 219.004.000 | Solenoid Coil, 24 VAC/12 VDC | 1 |
| | 219.002.000 | Solenoid Coil, 120 VAC | 1 |
| | 219.003.000 | Solenoid Coil, 240 VAC | 1 |
| 47 | 866.068.000 | Tube Fitting | 1 |
| 48 | 538.083.555 | Nipple | 1 |
| 49 | 835.009.555 | Tee, Pipe | 1 |
| 50 | 860.062.540 | Tubing | 1 |
| 51 | 866.069.000 | Tube Fitting | 1 |

## FOR EXPLOSION PROOF SOLENOID VALVE

| | | | |
|---|---|---|---|
| 46 | 219.009.001 | Solenoid Coil, 120VAC 60 Hz | 1 |
| | 219.009.002 | Solenoid Coil, 240VAC 60 Hz | 1 |
| | 219.009.003 | Solenoid Coil, 12VDC | 1 |
| | 219.009.004 | Solenoid Coil, 24VDC | 1 |
| | 219.009.005 | Solenoid Coil, 110VAC 50 Hz | 1 |
| | 219.009.006 | Solenoid Coil, 230VAC 50 Hz | 1 |

# Solenoid Shifted Air Distribution Valve Option

Warren Rupp's solenoid shifted, air distribution valve option utilizes electrical signals to precisely control your SANDPIPER's speed. The solenoid coil is connected to a customer - supplied control. Compressed air provides the pumping power, while electrical signals control pump speed (pumping rate).

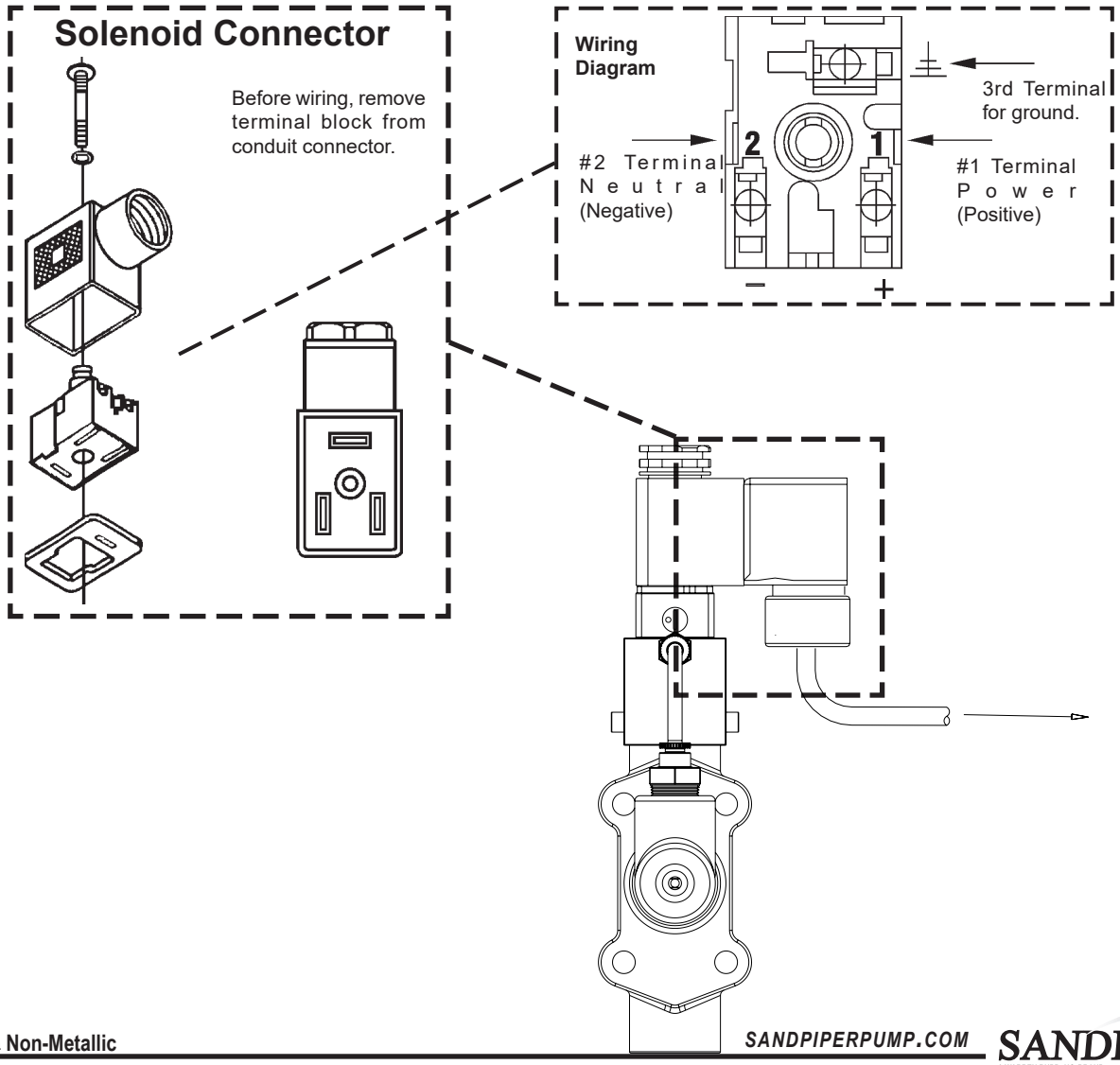
**OPERATION**

The Solenoid Shifted SANDPIPER has a solenoid operated, air distribution valve in place of the standard SANDPIPER's pilot operated, air distribution valve. Where a pilot valve is normally utilized to cycle the pump's air distribution valve, an electric solenoid is utilized. As the solenoid is powered, one of the pump's air chambers is pressurized while the other chamber is exhausted. When electric power is turned off, the solenoid shifts and the pressurized chamber is exhausted while the other chamber is pressurized. By alternately applying and removing power to the solenoid, the pump cycles much like a standard SANDPIPER pump, with one exception. This option provides a way to precisely control and monitor pump speed.

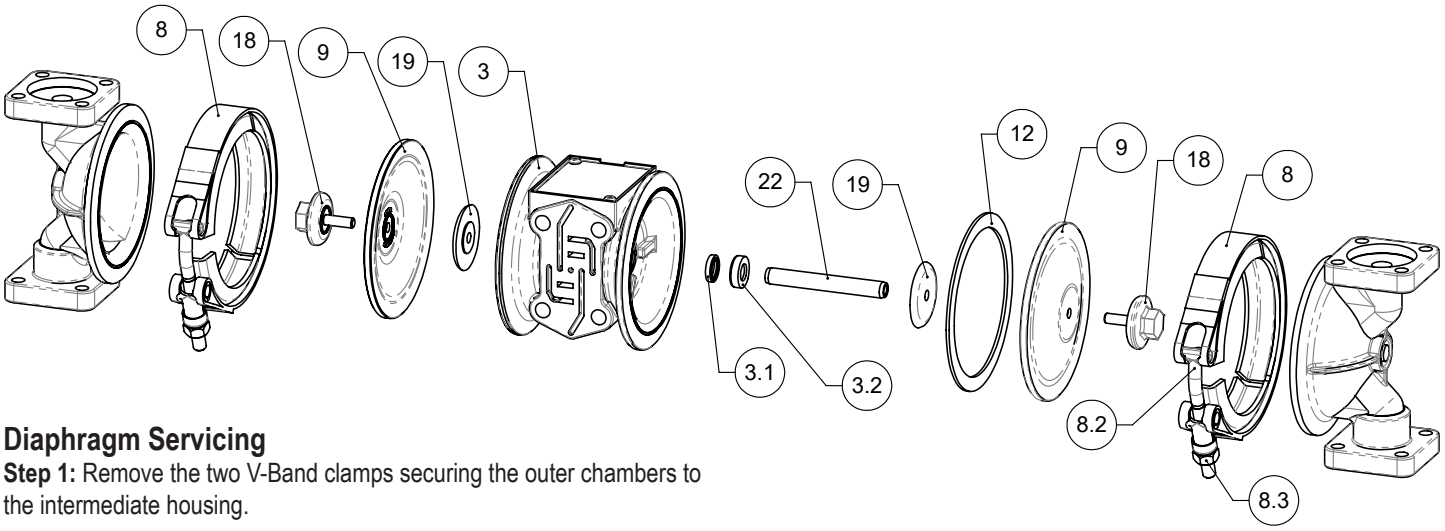
**BEFORE INSTALLATION**

Before wiring the solenoid, make certain it is compatible with your system voltage.





# Diaphragm and Rod Servicing




## Diaphragm Servicing

**Step 1:** Remove the two V-Band clamps securing the outer chambers to the intermediate housing.

**Step 2:** Remove the diaphragm assembly (outer plate, diaphragm, spacer gasket (for PFTE units only, inner plate) by turning the assembly counterclockwise using a 1/2" (1.27 cm) wrench on the outer plate lugs. (If a socket is used, it must be a six-point socket.) The interior components consisting of the shaft seal and pilot valve assembly are now accessible for service.

**Step 3:** Procedures for reassembling the diaphragms are the reverse of the above. Install the diaphragm with the natural bulge outward.

**Step 4:** Install the outer diaphragm plate on the outside of the diaphragm and make certain that the large radius side of the inner plate is toward the diaphragm.

**Step 5:** Tighten the outer diaphragm plate to approximately 30 in./lbs. (3.39 Newton meters). Torque while allowing the diaphragm to turn freely with plates. Use a wrench on the outer diaphragm plate of the opposite side to keep rod from rotating. If the opposite chamber is assembled, the rod need not be held.

## Diaphragm Rod Seals Servicing

**Step 1:** To service the rod seals first remove pilot valve, then remove the inserts on each of the intermediate brackets by prying them out with a small flat screwdriver.

**Step 2:** After removing the inserts take the K-R rod seals out of the inserts and replace.

**Step 3:** When reinstalling the seals, make sure the open side of the seals face into thecounterbore in the inserts.

**Step 4:** To install the inserts into intermediate bracket, simply press the insert into the counterbore in each of the intermediate bracket, making sure that the closed side of insert faces out. The inserts should be flush to the surface of the intermediate bracket or slightly below the surface when fully installed.

| Item | Part Number | Description | Qty |
|---|---|---|---|
| 3 | 114.019.551 F | Intermediate | 1 |
| ⚠ | 114.019.503 F | Intermediate (Conductive Acetal) | 1 |
| 3.1 | 720.031.359 | Seal, Diaphragm Rod | 2 |
| 3.2 | 449.021.551 | Insert, Gland | 2 |
| | 449.021.503 | Insert, Gland (Conductive Acetal) | 2 |
| 8 | 200.057.115 | Clamp (Includes 81 & 82) | 2 |
| 8.1 | 100.002.115 | T-Bolt | 2 |
| 8.2 | 545.027.337 | Nut, Hex, 1/4-28UNF | 2 |
| 9 | 286.069.354 | Diaphragm (Santoprene) | 4 |
| | 286.069.356 | Diaphragm (Hytrel) | 4 |
| | 286.070.600 | Diaphragm (PTFE) | 4 |
| 12 | 360.086.360 | Gasket, Spacer (PTFE Configuration Only) | 2 |
| 18 | 612.146.552 | Plate, Outer Diaphragm (Polypropylene) | 2 |
| | 612.146.520 | Plate, Outer Diaphragm (PVDF) | 2 |
| | 612.146.502 | Plate, Outer Diaphragm (Conductive Acetal) | 2 |
| 19 | 612.147.150 | Plate, Inner Diaphragm | 2 |
| 22 | 685.046.120 | Rod, Diaphragm | 1 |

**⚠ IMPORTANT**

***Read these instructions completely, before installation and start-up. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory warranty.***

**ATEX Compliant**

# 5 - YEAR Limited Product Warranty

*Warren Rupp, Inc. ("Warren Rupp") warrants to the original end-use purchaser that no product sold by Warren Rupp that bears a Warren Rupp 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 Warren Rupp's factory. Warren Rupp brands include Warren Rupp®,SANDPIPER®, SANDPIPER Signature Series™, MARATHON®, Porta-Pump®, SludgeMaster™ and Tranquilizer®.*

*The use of non-OEM replacement parts will void (or negate) agency certifications, including CE, ATEX, CSA, 3A and EC1935 compliance (Food Contact Materials). Warren Rupp, Inc. cannot ensure nor warrant non-OEM parts to meet the stringent requirements of the certifying agencies.*

*~ See sandpiperpump.com/content/warranty-certifications for complete warranty, including terms and conditions, limitations and exclusions. ~*

SANDPIPER®

# EC Declaration of Conformity

**Manufacturer:**
**Warren Rupp, Inc.**
**800 N. Main Street**
**Mansfield, Ohio, 44902 USA**

Certifies that Air-Operated Double Diaphragm Pump Models: DSB Series, DMF Series, G Series, HDB Series, HDF Series, HP Series, F Series, MS Series, S Series, SL Series, SP Series, SSB Series, T Series, U1F Series, WR Series; High Pressure Pump Models: EH Series, GH Series, SH Series; Submersible Pump Models: SMA3 Series, SPA Series; and Surge Dampener/ Suppressor Models: DA Series, TA Series comply with the European Community Directive 2006/42/EC on Machinery, according to Annex VIII. This product has used Harmonized Standard EN809:2012, Pumps and Pump Units for Liquids - Common Safety Requirements, to verify conformance.

October 3, 2022
DATE/APPROVAL/TITLE:

Technical File on record with:
DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
The Netherlands

Signature of authorized person

Dennis Hall
Printed name of authorized person

Engineering Manager
Title

IDEX

CE

SANDPIPER®

# EC Declaration of Conformity

**Manufacturer:**
**Warren Rupp, Inc.**
**800 N. Main Street**
**Mansfield, Ohio, 44902 USA**

Certifies that Air-Operated Double Diaphragm Pump Models: DSB Series, DMF Series, G Series, HDB Series, HDF Series, HP Series, F Series, MS Series, S Series, SL Series, SP Series, SSB Series, T Series, U1F Series, WR Series; High Pressure Pump Models: EH Series, GH Series, SH Series; Submersible Pump Models: SMA3 Series, SPA Series; and Surge Dampener/ Suppressor Models: DA Series, TA Series comply with the United Kingdom Statutory Instruments 2008 No. 1597, The Supply of Machinery (Safety) Regulations 2008, according to Annex VIII. This product has used Designated Standard EN809:2012, Pumps and Pump Units for Liquids - Common Safety Requirements, to verify conformance.

October 17, 2022

DATE/APPROVAL/TITLE:

Technical File on record with:
DEKRA Certification UK Limited
Stokenchurch House
Oxford Road
Stokenchurch
HP14 3SX



Signature of authorized person

Dennis Hall

Printed name of authorized person

Engineering Manager

Title

IDEX

UK CA

SANDPIPER®

# ATEX

IDEX

# EU Declaration of Conformity

## Manufacturer:

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

This declaration of conformity is issued under the sole responsibility of the manufacturer. Warren Rupp, Inc. declares that Air Operated Double Diaphragm Pumps (AODD) and Surge Suppressors listed below comply with the requirements of Directive **2014/34/EU** and applicable harmonized standards.

Harmonized Standards:

- EN ISO 80079-36: 2016
- EN ISO 80079-37: 2016
- EN 60079-25: 2010

1. AODD Pumps and Surge Suppressors - Technical File on record with: DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
The Netherlands

Hazardous Location Applied:

Ⓔx II 2 G Ex h IIC T5...225°C (T2) Gb
II 2 D Ex h IIIC T100°C...T200°C Db

- Metallic pump models with external aluminum components (DMF Series, EH Series, F Series, G & GH Series, HDB Series, HDF Series, MS Series, S Series, SH Series, SL Series, SPB Series, ST Series, T Series, and U1F Series)
- Conductive plastic pump models with integral muffler (PB1/4 Series, S Series, SL Series, SPE Series)
- Tranquilizer® surge suppressors (TA Series)

Ⓔx II 2 G Ex h IIB T5...225°C (T2) Gb
II 2 D Ex h IIIB T100°C...T200°C Db

- ST Series with sight tubes (VL) and HP Series because of the projected area of non-conductive external components

2. AODD Pumps - EU Type Examination Certificate No.: DEKRA 18ATEX0094X - DEKRA Certification B.V. (0344)
Meander 1051
6825 MJ Arnhem
The Netherlands

Hazardous Location Applied:

Ⓔx I M1 Ex h I Ma
II 1 G Ex h IIC T5...225°C (T2) Ga
II 1 D Ex h IIIC T100°C...T200°C Da

- Metallic pump models with no external aluminum (HDB Series, HDF Series, G Series, S Series, SPB Series)
- Conductive plastic pumps equipped with conductive muffler (S Series, SPE Series)

Ⓔx II 2 G Ex h ia IIC T5 Gb
II 2 D Ex h ia IIIC T100°C Db

- Pump models with ATEX rated pulse output kit option (HDB Series, HDF Series, PB1/4, S Series, SB Series)

Ⓔx II 2 G Ex h mb IIC T5 Gb
II 2 D Ex h mb tb IIIC T100° Db

- Pump model series S05, S1F, S15, S20, S30 equipped with ATEX rated integral solenoid option

➢ See “ATEX Details” page in user’s manual for more information
➢ See “Safety Information” page for conditions of safe use

DATE/APPROVAL/TITLE:
9 NOV 2023

Dennis Hall
Engineering Manager

B

SANDPIPER®

# UKEx

IDEX

# EU Declaration of Conformity

**Manufacturer:**

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

This declaration of conformity is issued under the sole responsibility of the manufacturer.
Warren Rupp, Inc declares that Air Operated Double Diaphragm Pumps (AODD) and Surge Suppressors listed below comply with the requirements of United Kingdom Statutory Instruments **2016 No. 1107** and all the applicable standards.

Designated Standards:

- EN ISO 80079-36: 2016
- EN ISO 80079-37: 2016
- EN 60079-25: 2010

1. AODD Pumps and Surge Suppressors - Technical File on record with: DEKRA Certification UK Limited
Stokenchurch House
Oxford Road
Stokenchurch
HP14 3SX

Hazardous Location Applied:



II 2 G Ex h IIC T5...225°C (T2) Gb
II 2 D Ex h IIIC T100°C...T200°C Db

- Metallic pump models with external aluminum components (DMF Series, EH Series, F Series, G & GH Series, HDB Series, HDF Series, MS Series, S Series, SH Series, SL Series, SPB Series, ST Series, T Series, and U1F Series)
- Conductive plastic pump models with integral muffler (PB1/4 Series, S Series, SL Series, SPE Series)
- Tranquilizer® surge suppressors (TA Series)



II 2 G Ex h IIB T5...225°C (T2) Gb
II 2 D Ex h IIIB T100°C...T200°C Db

- ST Series with sight tubes (VL) and HP Series because of the projected area of non-conductive external components

➢ See “ATEX Details” page in user’s manual for more information
➢ See “Safety Information” page for conditions of safe use

DATE/APPROVAL/TITLE:
9 NOV 2023

Dennis Hall
Engineering Manager