

# SERVICE & OPERATING MANUAL

## Original Instructions

### Certified Quality



ISO 9001 Certified  
ISO 14001 Certified



1935/2004/EC



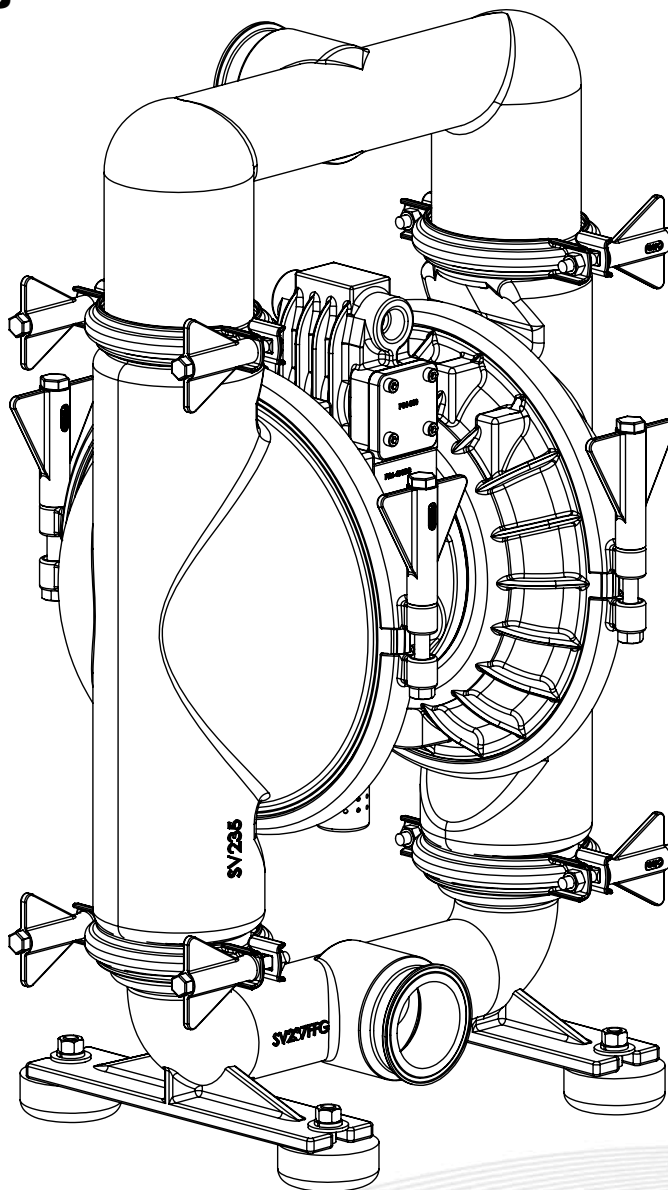
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## Model F20

**Metallic Food Processing Pump**  
**Constructed with FDA Compliant Materials**  
**Design Level 1**



1: PUMP SPECS

2: INSTAL & OP

3: EXP VIEW

4: WARRANTY

**SANDPIPER®**  
A WARREN RUPP, INC. BRAND

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# 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

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.

## ! 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 & 2 on the next page
2. ATEX compliant pumps are suitable for use in explosive atmospheres when the equipment is properly grounded in accordance with local electrical codes
3. 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. 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.

# Temperature Tables

**Table 1. Category 2 ATEX Rated Pumps**

Ambient Temperature Range [°C]	Process Temperature Range [°C]	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	

**Table 2. Category M2 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 plastic parts as listed in the manuals of the pumps.

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# Explanation of Pump Nomenclature

Your Model #: **F**

(fill in from pump nameplate)

Pump Brand	Pump Size	Check Valve	Design Level	Wetted Material	Diaphragm/Check Valve	Check Valve Seat	Non-Wetted Material	Porting Options	Pump Style	Muffler Options	Pump Options	

Model #: **F XX X X X X X X X X X XX**

## Pump Brand

**F** Food Processing

## Pump Size

**20** 2"

## Check Valve Type

**B** Ball

## Design Level

**1** Design Level

## Wetted Material

**S** Stainless Steel

## Diaphragm/Check Valve Materials

**D** FDA Santoprene / FDA Santoprene  
**H** FDA Hytrel / FDA Hytrel  
**K** PTFE with FDA Hytrel Backer / PTFE  
**Z** PTFE One-Piece Bonded Fusion Diaphragm / PTFE

## Check Valve Seat

**D** FDA Santoprene  
**H** FDA Hytrel  
**S** Stainless Steel

## Non-Wetted Material Options

**N** Nickel Plated Aluminum  
**S** Stainless Steel

## Porting Options

**T** 2 1/2" Sanitary Clamp

## Pump Style

**F** Food

## Muffler Options

**6** Metal Muffler

## Pump Options

**0** None

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

\*Complies with Code of Federal Regulations (CFR) Title 21 Part 177

# Performance

## 2" Clamped Metallic Pump – Food Processing TPE FITTED - Domed

### Flow Rate

Adjustable to . . . . . 0-167 gpm (632 lpm)

### Port Size

Suction . . . . . 2½" Sanitary Clamp

Discharge . . . . . 2½" Sanitary Clamp

**Air Inlet** . . . . . 1/2" NPT

**Air Exhaust** . . . . . 1" NPT

### Suction Lift

Dry . . . . . 18' (5.5 m)

Wet . . . . . 31' (9.4 m)

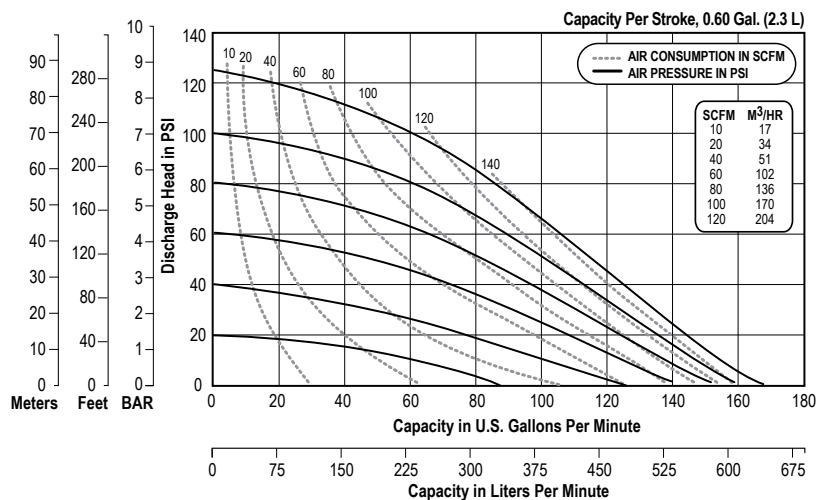
### Max Solid Size (Diameter)

. . . . . 1/4" (7.6 mm)

**Max Noise Level** . . . . . 97 dB(A)

### Shipping Weights

Stainless . . . . . 115 lbs (52.2 kg)



NOTE: Performance based on the following: elastomeric 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%.

## 2" Clamped Metallic Pump – Food Processing PTFE FITTED

### Flow Rate

Adjustable to . . . . . 0-153 gpm (579 lpm)

### Port Size

Suction . . . . . 2½" Sanitary Clamp

Discharge . . . . . 2½" Sanitary Clamp

**Air Inlet** . . . . . 1/2" NPT

**Air Exhaust** . . . . . 1" NPT

### Suction Lift

Dry . . . . . 11' (3.3 m)

Wet . . . . . 29' (8.8 m)

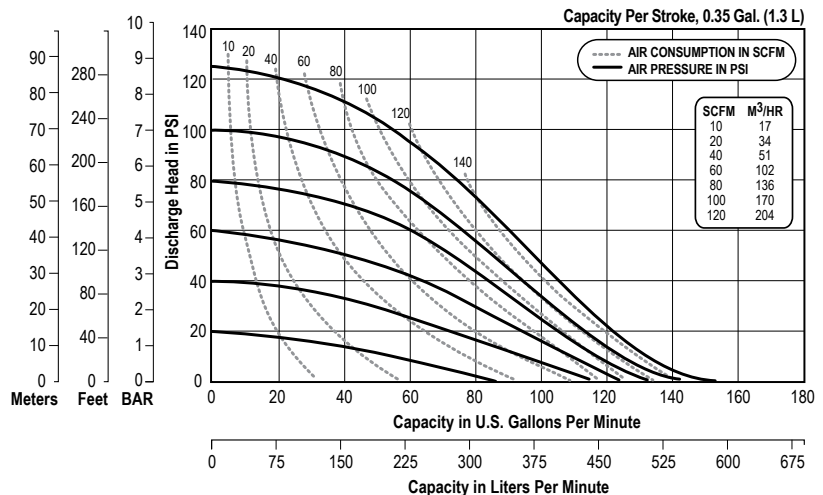
### Max Solid Size (Diameter)

. . . . . 1/4" (7.6 mm)

**Max Noise Level** . . . . . 102 dB(A)

### Shipping Weights

Stainless . . . . . 115 lbs (52.2 kg)



NOTE: Performance based on the following: PTFE 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:	
	Max.	Min.
<b>EPDM:</b> Shows very good water and chemical resistance. Has poor resistance to oils and solvents, but is fair in ketones and alcohols.	280°F 138°C	-40°F -40°C
<b>Hytrel®:</b> Good on acids, bases, amines and glycols at room temperatures only.	220°F 104°C	-20°F -29°C
<b>Santoprene®:</b> Injection molded thermoplastic elastomer with no fabric layer. Long mechanical flex life. Excellent abrasion resistance.	275°F 135°C	-40°F -40°C
<b>Virgin PTFE:</b> (PFA/TFE) Chemically inert, virtually impervious. Very few chemicals are known to chemically react with PTFE; molten alkali metals, turbulent liquid or gaseous fluorine and a few fluoro-chemicals such as chlorine trifluoride or oxygen difluoride which readily liberate free fluorine at elevated temperatures.	220°F 104°C	-35°F -37°C
<i>Maximum and Minimum Temperatures are the limits for which these materials can be operated. Temperatures coupled with pressure affect the longevity of diaphragm pump components. Maximum life should not be expected at the extreme limits of the temperature ranges.</i>		

**Ambient temperature range** -20 C to +40 C

**Process temperature range** -20 C to +80 C for models rated as category 1 equipment  
-20 c to +100 C for model rated as category 2 equipment

In addition, the ambient temperature range and the process temperature range do not exceed the operating temperature range of the applied non-metallic parts as listed in the manuals of the pumps.

For specific applications, always consult the Chemical Resistance Chart.

**Note:** This document is a high level guide. Please be aware that not all model and or material combinations are possible for all sizes. Please consult factory or your distributor for specific details.

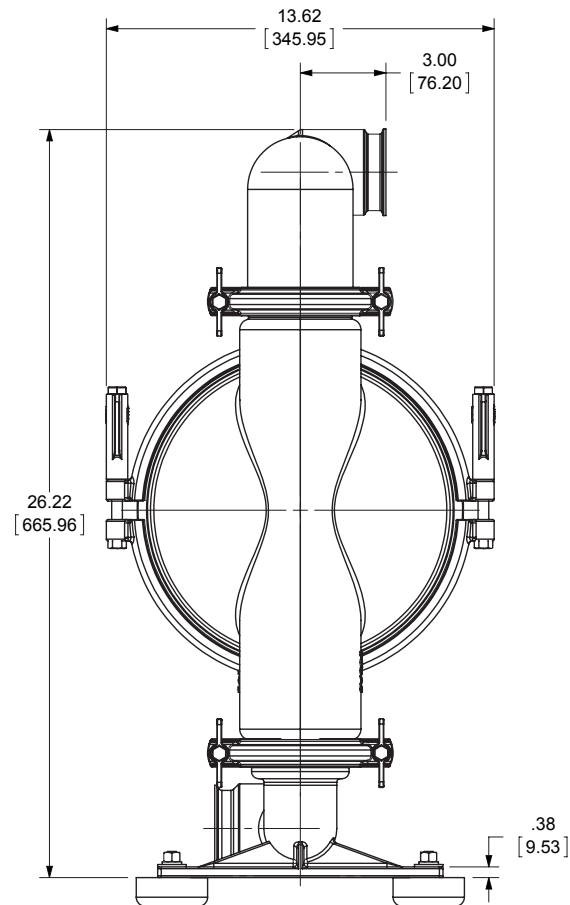
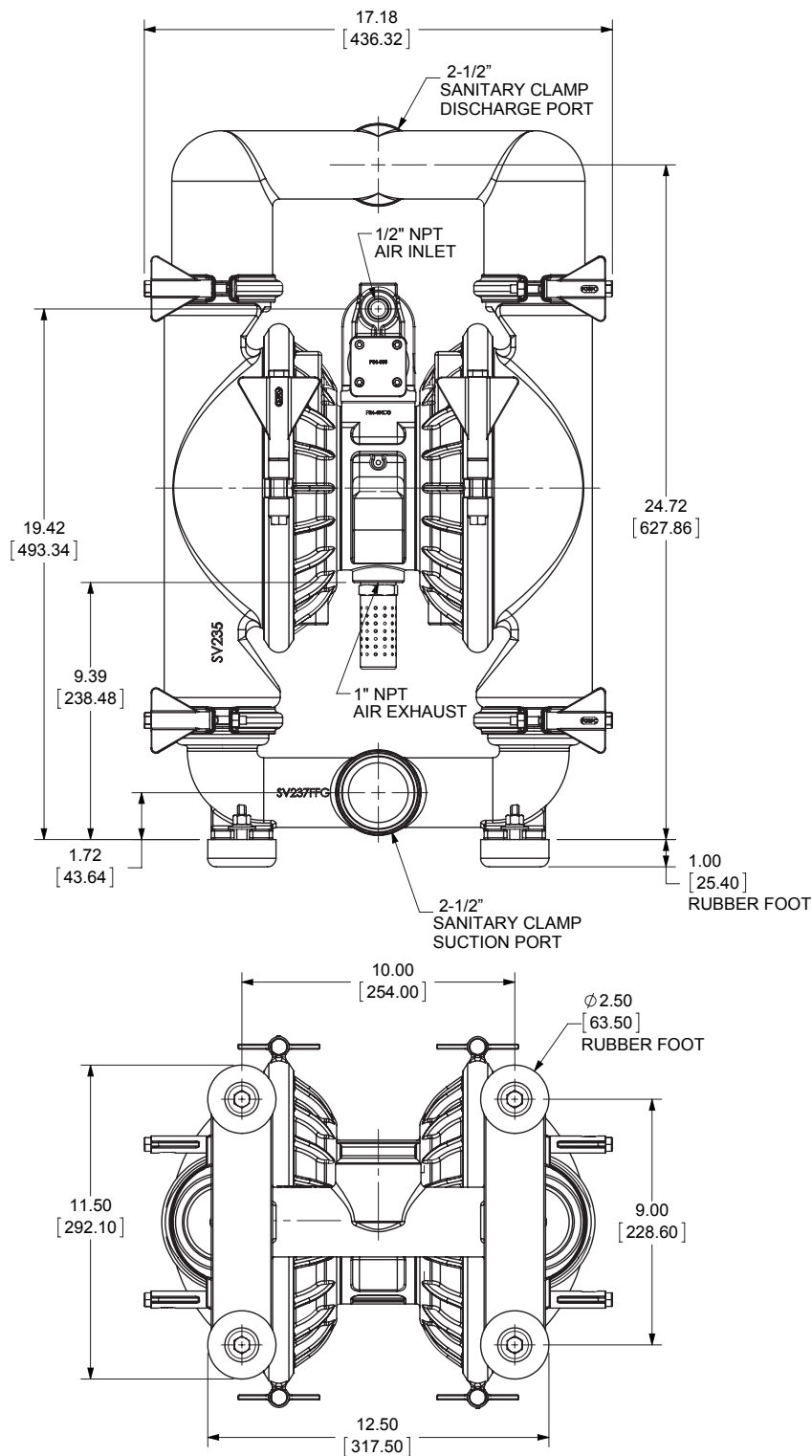
# Dimensional Drawings

## Food Processing Metallic

Dimensions in inches (mm dimensions in brackets).

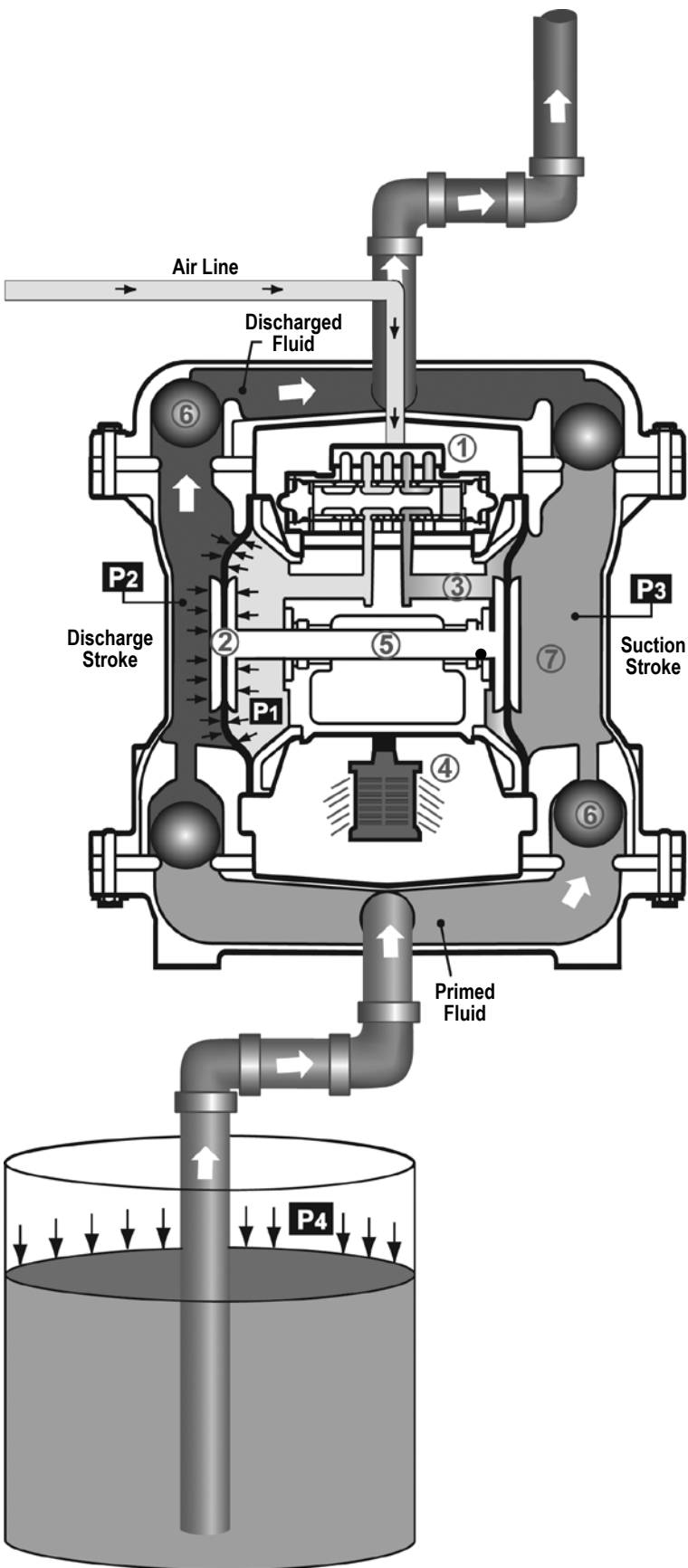
The dimensions on this drawing are for reference only. A certified drawing can be requested if physical dimensions are needed.

1: PUMP SPECS





# Principle of Pump Operation



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

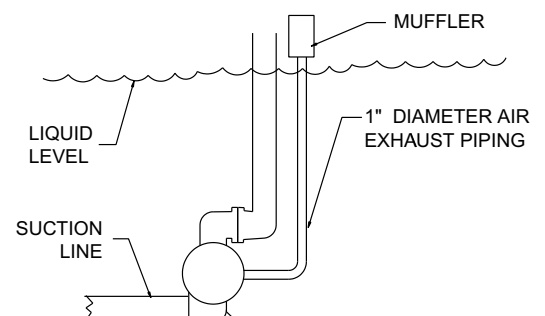
The main directional (air) control valve ① distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm ②. At the same time, the exhausting air ③ from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port ④.

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

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

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

## SUBMERGED ILLUSTRATION



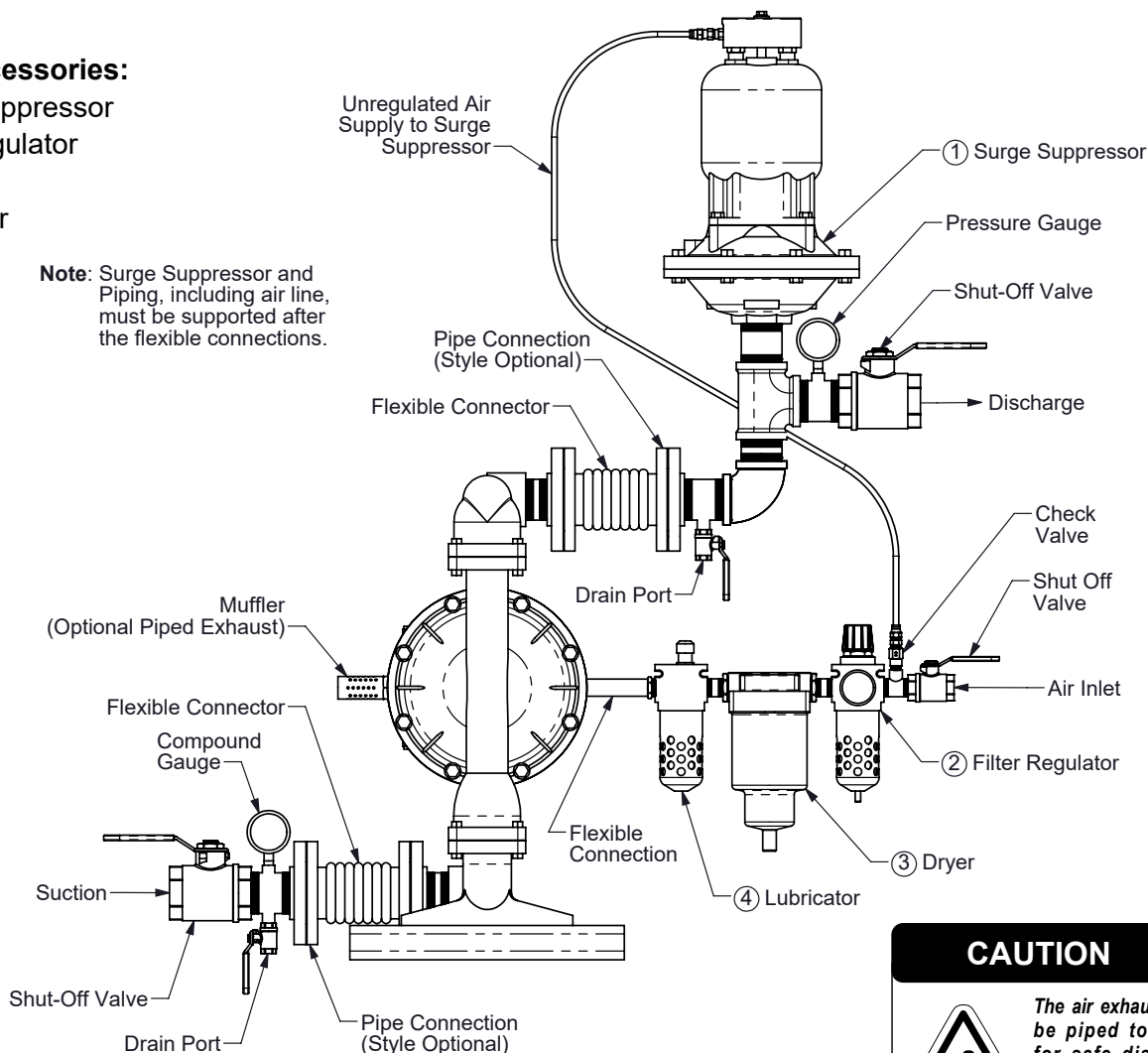
Pump can be submerged if the pump materials of construction are compatible with the liquid being pumped. The air exhaust must be piped above the liquid level. When the pumped product source is at a higher level than the pump (flooded suction condition), pipe the exhaust higher than the product source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

# Recommended Installation Guide

## Available Accessories:

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

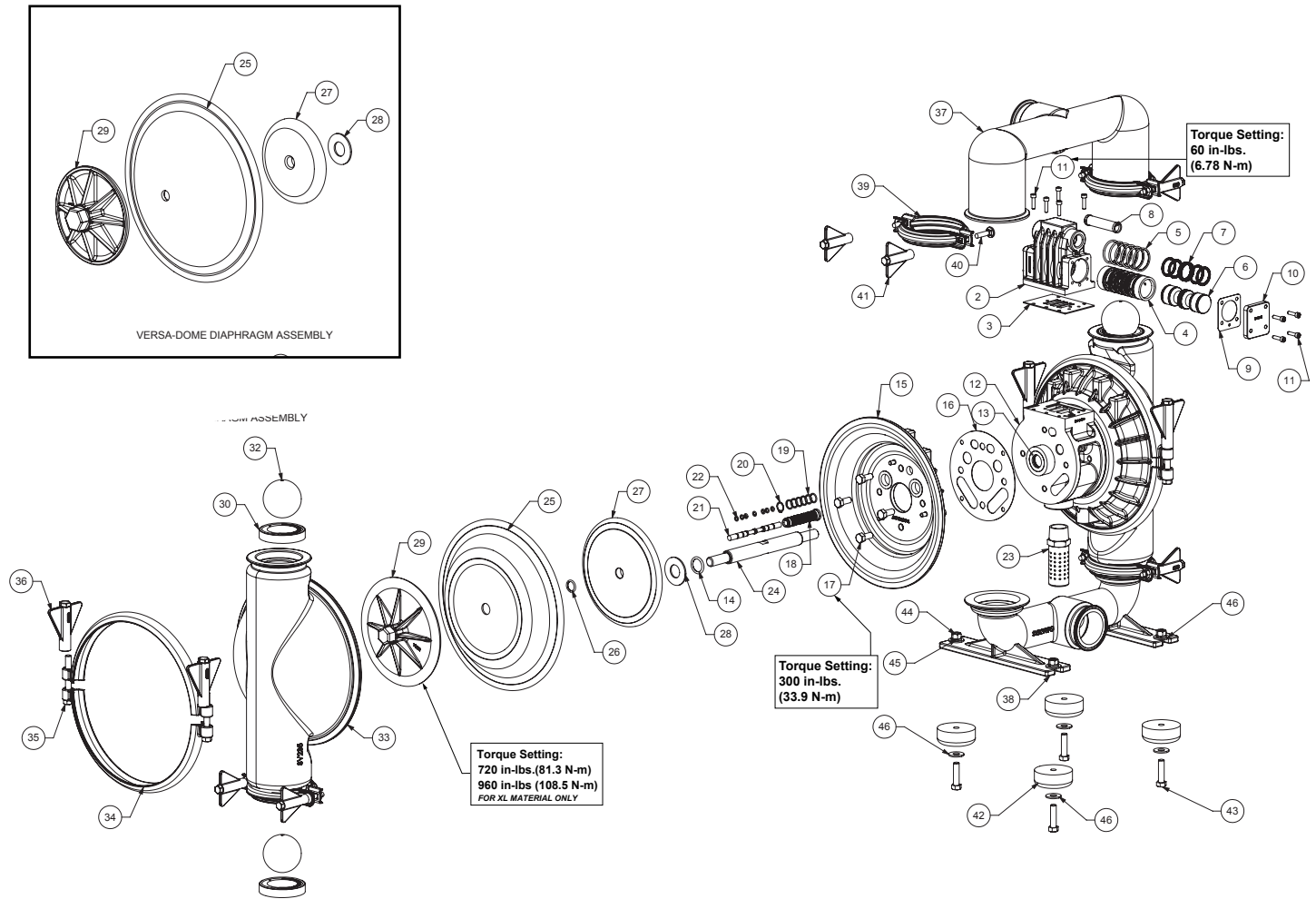
# Troubleshooting Guide

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](mailto:service.warrenrupp@idexcorp.com) or 419-524-8388

# Composite Repair Parts Drawing - TPE Fitted

3: EXP VIEW



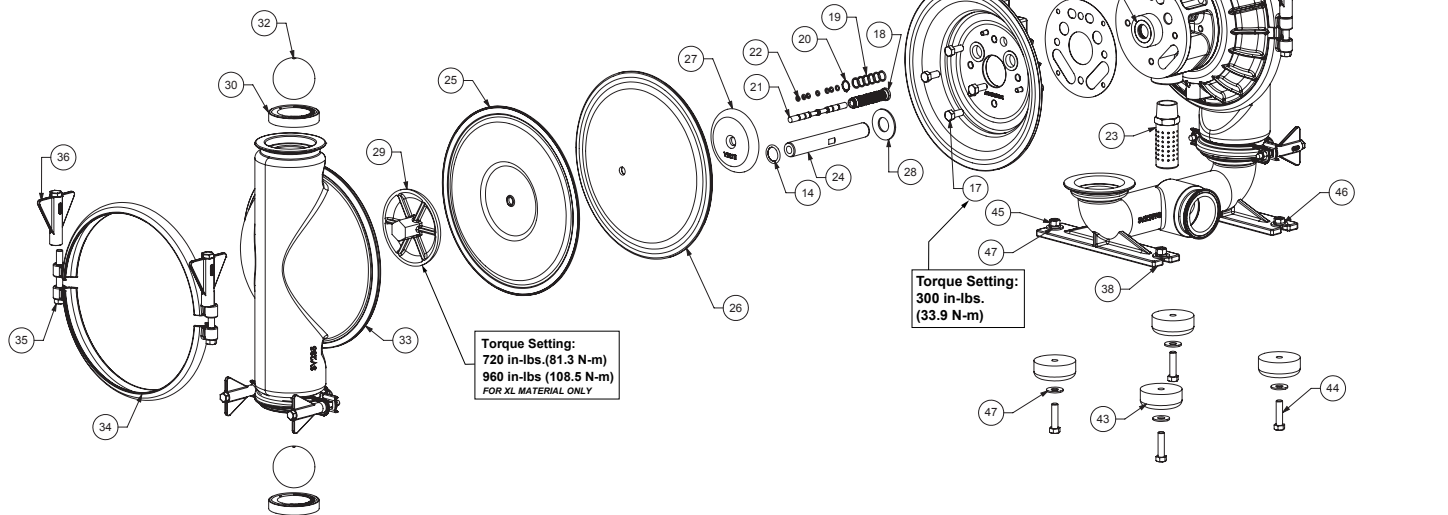
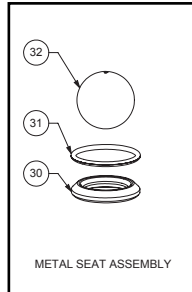
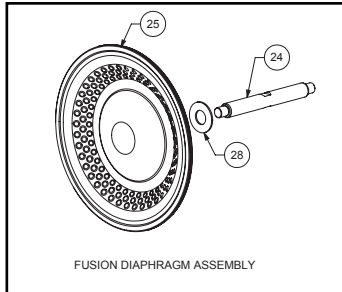
# Composite Repair Parts List - TPE Fitted

Air Valve Assembly				
Item #	Qty.	Description	Part Number	
			Stainless Steel	Nickle Plated
		Air Side Repair Kit (Includes Items 3,5,7,9,14,16,18-22)	476.V019.000	
1	1	Valve Body (includes items 2-11)	031.V002.110	031.V002.332
2	1	Valve Body	095.V001.110	095.V001.332
3	1	Valve Body Gasket	P24-202	
4	1	Valve Sleeve	755.V006.148	
5	6	O-ring	560.206.360	
6	1	Valve Spool Assembly (Includes items 7)	775.V001.000	
7	6	Glyde Ring Assembly	P34-204F	
8	1	Air Valve Screen	P34-210	P24-210
9	2	End Cap Gasket	P24-205	
10	2	End Cap	SP34-300	
11	13	Mounting Screws (8 included on item 1)	S1001	
Center Section Assembly				
Item #	Qty.	Description	Part Number	
			Stainless Steel	Nickle Plated
12	1	Center Block Assembly (Includes item 13 & 14)	SP24-400	P24-400-NP
13	2	Bearing Sleeve	P31-403	
14	2	Main Shaft O-Ring	P24-403	
15	2	Air Chamber	196.V002.110	
16	2	Air Chamber Gasket	360.V001.360	
17	8	Bolt	SP24-110	
		Pilot Repair Kit (Includes Items 18-22)	476.V018.000	
18	1	Pilot Sleeve Assembly (include item 19)	755.V002.000	
19	6	O-ring	560.101.358	
20	1	Retaining Ring	675.037.080	
21	1	Pilot Spool Assembly (Includes item 22)	775.V002.000	
22	8	O-ring	560.023.358	
23	1	Muffler	530.033.000	
Diaphragm Assembly / Elastomers				
Item #	Qty.	Description	Part Number	
			Versa-Rugged	
			FDA Hytrel	FDA Santoprene
24	1	Main Shaft	P24-103	
25	2	Diaphragm	V224TPEFG	V224TPEXLFG
26	2	O-ring	V221D	
27	2	Inner Diaphragm Plate (See Note 1 Below)	V221BNP, SV221B	V221BNP
28	2	Bumper Washer	P24-501	
29	2	Outer Diaphragm Plate	SVB221FG	SVB221FG
30	4	Valve Seat	V240TPEFG	V240TPEXLFG
32	4	Valve Ball	V241TPEFG	V241TPEXLFG
Wet End Assembly				
Item #	Qty.	Description	Part Number	
33	2	Water Chamber	SV235FG	
34	4	Large Clamp Half	SV230A	
35	4	Bolt	SV230C	
36	4	Wing Nut	FG30D	
37	1	Discharge Manifold	SV236FG	
38	1	Suction Manifold	SV237FFG	
39	8	Small Clamp Half	SV239A	
40	8	Bolt	SV239B	
41	8	Wing Nut	FG39C	
Parts For Rubber Mounting Feet				
Item #	Qty.	Description	Part Number	
42	4	Foot Mounting	350.001.360	
43	4	Capscrew, Hex Head	170.061.115	
44	4	Nut, Hex	545.005.115	
45	4	Lockwasher	900.005.115	
46	8	Flatwasher	901.005.115	

## Notes:

- 1.) The inner diaphragm plate material is to match the air chamber material (Ref. Note 2)
- 2.) SVxxx=Stainless Steel, xxxNP=Nickle Plated

# Composite Repair Parts Drawing - PTFE Fitted



## Service & Repair Kits

- 476.380.351 Wet End Kit**  
FDA Santoprene Diaphragms, FDA Santoprene Check Balls,  
FDA Santoprene Seats
- 476.380.350 Wet End Kit**  
FDA Hytrel Diaphragms, FDA Hytrel Check Balls,  
FDA Hytrel Seats
- 476.384.663 Wet End Kit**  
Hytrel Diaphragms, PTFE Diaphragms,  
PTFE Check Balls, PTFE Seat O-Rings

- 476.380.659 Wet End Kit**  
1-Piece PTFE Diaphragms, PTFE Check Balls,  
PTFE Seat O-Rings
- 476.375.000 Air End Kit**  
Pilot Spacer, Buna O-Rings, Nylon Lock Nut,  
Gaskets, Glyd-Ring Set



# Composite Repair Parts List - PTFE Fitted

Air Valve Assembly			
Item #	Qty.	Description	Part Number
			Stainless Steel      Nickle Plated
		Air Side Repair Kit (Includes Items 3,5,7,9,14,16,18-22)	476.V019.000
1	1	Valve Body (includes items 2-11)	031.V002.110      031.V002.332
2	1	Valve Body	095.V001.110      095.V001.332
3	1	Valve Body Gasket	P24-202
4	1	Valve Sleeve	755.V006.148
5	6	O-ring	560.206.360
6	1	Valve Spool Assembly (Includes items 7)	775.V001.000
7	6	Glyde Ring Assembly	P34-204F
8	1	Air Valve Screen	P34-210      P24-210
9	2	End Cap Gasket	P24-205
10	2	End Cap	SP34-300
11	13	Mounting Screws (8 included on item 1)	S1001
Center Section Assembly			
Item #	Qty.	Description	Part Number
			Stainless Steel      Nickle Plated
12	1	Center Block Assembly (Includes item 13 & 14)	SP24-400      P24-4003ANP ASY
13	2	Bearing Sleeve	P31-403
14	2	Main Shaft O-Ring	P24-403
15	2	Air Chamber	196.V002.110
16	2	Air Chamber Gasket	360.V001.360
17	8	Bolt	SP24-110
		Pilot Repair Kit (Includes Items 18-22)	476.V018.000
18	1	Pilot Sleeve Assembly (include item 19)	755.V002.000
19	6	O-ring	560.101.358
20	1	Retaining Ring	675.037.080
21	1	Pilot Spool Assembly (Includes item 22)	775.V002.000
22	8	O-ring	560.023.358
23	1	Muffler	530.033.000
Diaphragm Assembly / Elastomers			
Item #	Qty.	Description	Part Number
			PTFE Two Piece      Fusion
24	1	Main Shaft	P24-102      P24-103F
25	2	Diaphragm	V224TF      V224F
26	2	Back-Up Diaphragm	V224TFB      N/A
27	2	Inner Diaphragm Plate (see note 3)	V221TINP, SV221TI      N/A
28	2	Bumper Washer	P24-501
29	2	Outer Diaphragm Plate	SV221TOFG      N/A
30	4	Valve Seat (See Below Material Chart)	V240xx
31	4	Valve Seat O-Ring	V240T (See note 2)
32	4	Valve Ball	V241TF
Wet End Assembly			
Item #	Qty.	Description	Part Number
33	2	Water Chamber	SV235FG
34	4	Large Clamp Half	SV230A
35	4	Bolt	SV230C
36	4	Wing Nut	FG30D
37	1	Discharge Manifold	SV236FG
38	1	Suction Manifold	SV237FFG
39	8	Small Clamp Half	SV239A
40	8	Bolt	SV239B
41	8	Wing Nut	FG39C
42	2	Diaphragm Seal Tape Kit (Not Pictured)	720.V005.000
Parts For Rubber Mounting Feet			
Item #	Qty.	Description	Part Number
43	4	Foot, Mounting	350.001.360
44	4	Capscrew, Hex Head	170.061.115
45	4	Nut, Hex	545.005.115
46	4	Lockwasher	900.005.115
47	4	Flatwasher	901.005.115
Material Specifications			
Material		"Ball P/N"	Seat P/N
PTFE		V241TF	V240TF
Stainless Steel		N/A	SV240 (See Note 1 Below)

## Notes:

- 1.) In addition to this seat, (4) o-rings are needed.
- 2.) These (4) o-rings are only used with metallic fitted seats.
- 3.) The inner diaphragm plate material is to match the air chamber material (Ref. Note 4)
- 4.) SVxxxx=Stainless Steel, xxxNP=Nickle Plated

# 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](http://sandpiperpump.com/content/warranty-certifications) for complete warranty, including terms and conditions, limitations and exclusions. ~

**WARREN  
RUPP, INC.**

## Declaration of Conformity

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

Certifies that Air-Operated Double Diaphragm Pump Series: HDB, HDF, M Non-Metallic, S Non-Metallic, M Metallic, S Metallic, T Series, G Series, U Series, EH and SH High Pressure, RS Series, W Series, F Series, SMA and SPA Submersibles, and Tranquilizer® Surge Suppressors 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.

David Roseberry  
Signature of authorized person

October 20, 2005  
Date of issue

Authorised Representative:  
IDEX Pump Technologies  
R79 Shannon Industrial Estate  
Shannon, Co. Clare, Ireland

Director of Engineering  
Title

February 27, 2017  
Date of revision

Attn: Barry McMahon



Revision Level: F





# **WARREN RUPP, INC.**

## **Declaration of Conformity**

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

certifies that SANDPIPER® Air-Operated Double Diaphragm Food Processing Pump Models and Tranquilizer® Surge Suppressor Models comply with the European Community Regulations:

(EC) No 1935/2004 for Food Contact Materials

(EC) No 2023/2006 Good Manufacturing Practice

(EU) No 10/2011 on plastic materials and articles intended to come in contact with food

### **Food Processing Pump Models:**

T1FB1SASWTS600.	T15B1SSTSTS600.	T30B1SDSWTS600.	F10B1SZSNTF600.	F20B1SHHNTF600.
T1FB1S9SWTS600.	T20B1SASWTS600.	T30B1SASSTS600.	F10B1SDSNTF600.	F20B1SKSNTF600.
T1FB1SDSWTS600.	T20B1SDSWTS600.	T30B1SDSSTS600.	F15B1SKSNTF600.	F20B1SZSNTF600.
T1FB1SLSWTS600.	T20B1SASSTS600.	SSB2, TD3SS.	F15B1SKTNTF600.	F20B1SDDNTF600.
T1FB1S9TWTS600.	T20B1SDSSTS600.	F05B1SGSPTF000.	F15B1SZSNTF600.	F20B1SHSNTC600.
T15B1SDSWTS600.	T20B1SASWTS600.	F05B1SZSPTF000.	F15B1SHHNTF600.	F20B1SKSNTC600.
T15B1SSSWTS600.	T20B1SDSWTS600.	F05B1SHSPTF000.	F15B1SDDNTF600.	F20B1SZSNTC600.
T15B1SDSSTS600.	T20B1SASSTS600.	F05B1SDSPTF000.	F15B1SKSNTC600.	F30B1SHHNTF600.
T15B1SSSSTS600.	T20B1SDSSTS600.	F10B1SHSNTF600.	F15B1SZSNTC600.	F30B1SDDNTF600.
T15B1SSTWTS600.	T30B1SASWTS600.	F10B1SKSNTF600.	F15B1SHSNTC600.	F30B1SKSNTF600.
				F30B1SZSNTF600.

### **Tranquilizer® Surge Suppressors:**

TA1,NG1SS	TA2,NG2SS
TA25,NG1SS	TA50,NG2SS
TA1-1/2,NG1SS	TA3,NG2SS
TA40,NG1SS	TA80,NG2SS

- Materials used in equipment intended for food contact (Annex I (EC) No 1935/2004) :
  - Rubber • Metals & Alloys • Plastics

Plastic Materials: PTFE and FKM/ PTFE coated

The plastic components are suitable to come in contact with multiple food types, provided that storage contact time does not exceed 1/2 hour, contact temperature does not exceed 40°C and maximum operating temperatures within the instructions manual are not exceeded. Diaphragm failure may allow process fluids to come in contact with nonconforming materials. Regular inspections are recommended.

- This Declaration is based on :
  - Declaration of Conformities from raw material suppliers
  - Total Migration Analysis per (EU) No 10/2011
- Supporting document will be made available to competent authorities to demonstrate compliance

David Roseberry  
Signature of authorized person

David Roseberry  
Printed name of authorized person

February 8, 2013  
Date of issue

Director of Engineering  
Title

February 25, 2019  
Date of revision



# EU Declaration of Conformity

**Manufacturer:**


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

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 all applicable standards.

**Applicable Standards**

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


**1. AODD Pumps and Surge Suppressors** - Technical File No.: 20310400-1410/MERHazardous Location Applied:

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

- Metallic pump models with external aluminum components (S Series, HD Series, G Series, DMF Series, MSA Series, U Series, F Series, T Series, EH Series, SH Series, GH Series )
- Conductive plastic pump models with integral muffler (S Series, PB Series)
- Tranquilizer® surge suppressors

**2. AODD Pumps** - EU Type Examination Certificate No.: DEKRA 18ATEX0094X - DEKRA Certification B.V. (0344)Hazardous Location Applied:

Meander 1051  
6825 MJ Arnhem  
The Netherlands

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  
 II 2 G Ex h ia IIC T5 Gb  
II 2 D Ex h ia IIIC T100°C Db  
II 2 G Ex h mb IIC T5 Gb  
II 2 D Ex mb tb IIIC T100° Db

- Metallic pump models with no external aluminum (S series, HD Series, G series)
- Conductive plastic pumps equipped with metal muffler (S series, PB Series)
- ATEX pump models equipped with ATEX rated pulse output kit or solenoid kit

➤ See "ATEX Details" page in user's manual for more information  
➤ See "Safety Information" page for conditions of safe use

DATE/APPROVAL/TITLE:  
26 SEP 2018

  
David Roseberry, Director of Engineering