

SERVICE & OPERATING MANUAL

ORIGINAL INSTRUCTIONS

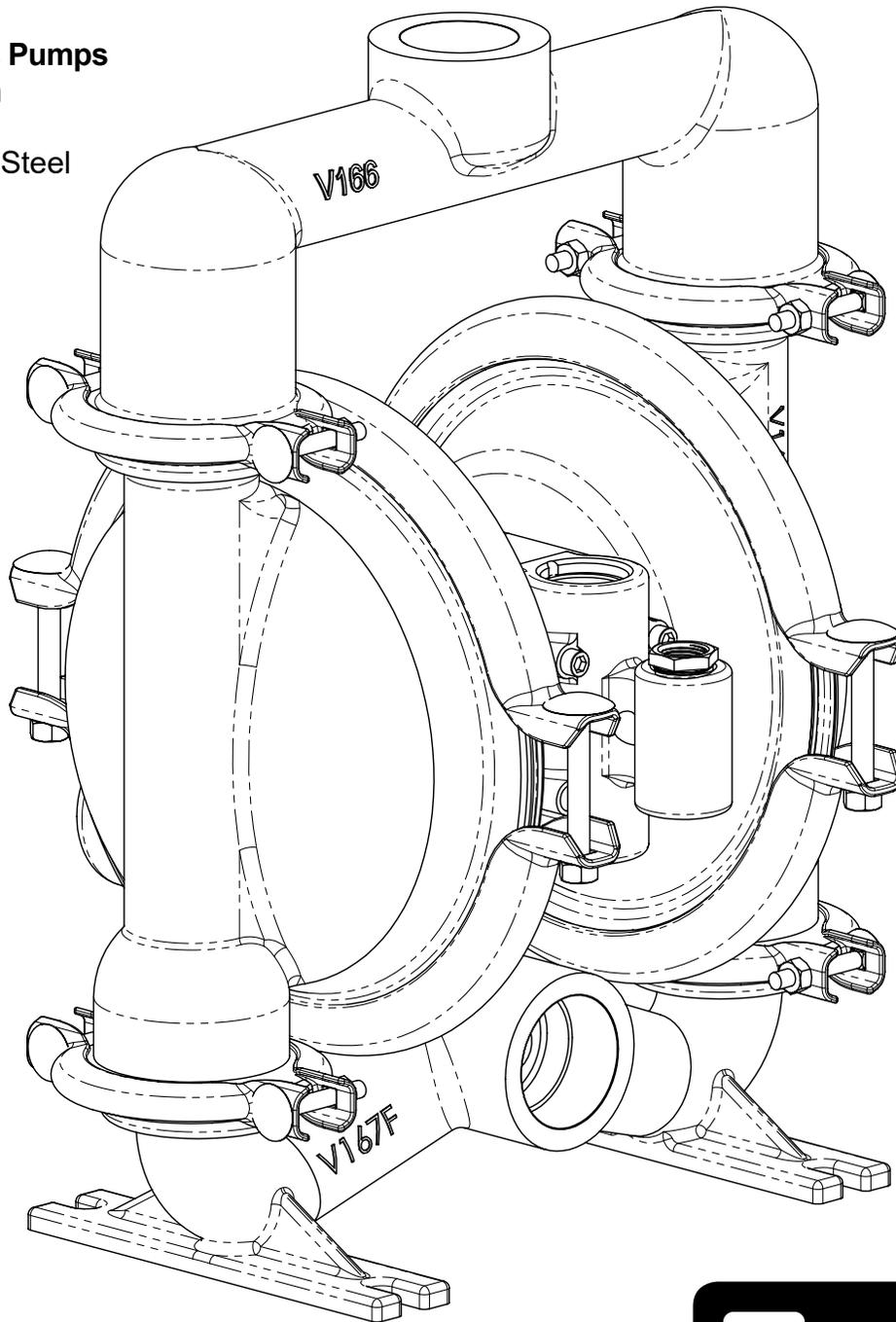
V4

1 1/4" V Series Clamped Metallic with Metallic Center Section

V4 Metallic Pumps

- Aluminum
- Cast Iron
- Stainless Steel

EAC CE



1: PUMP SPECS

2: INSTAL & OP

3: EXP VIEW

4: WARRANTY



VERSAMATIC®

Safety Information

IMPORTANT



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



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

CAUTION



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



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



WARNING

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



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 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.

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1: PUMP SPECS

2: INSTAL & OP

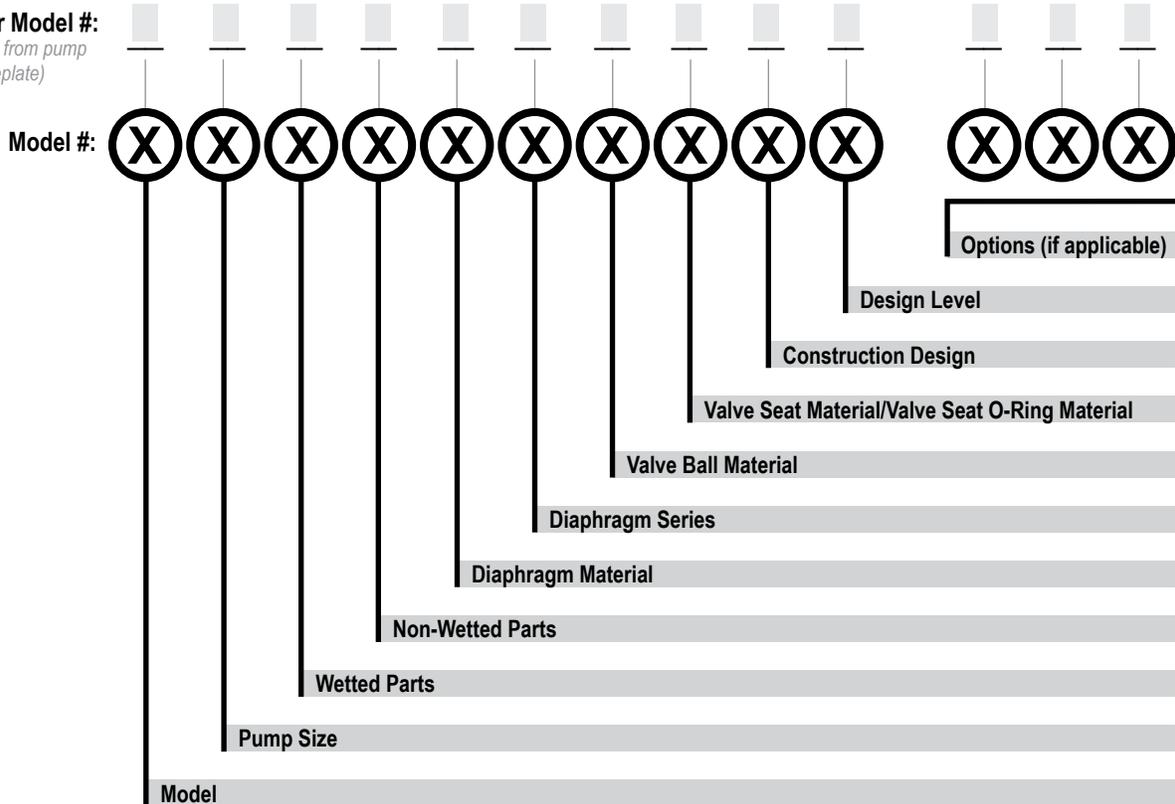
3: EXP VIEW

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

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
Y FDA Santoprene

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
A Acetal
S Stainless Steel
Y FDA Santoprene

Seat/Valve Seat O-Ring Material

1 Neoprene
2 Nitrile
3 (FKM) Fluorocarbon
4 EPDM
5 PTFE
6 Santoprene XL
7 Hytrel
8 Polyurethane
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
Y FDA Santoprene

Construction Design

9 Bolted
0 Clamped

Design Level

A
C

Miscellaneous Options

B BSP Tapered Thread
CP Center Port
ATEX ATEX Compliant
FP Food Processing
SP Sanitary Pump
HP High Pressure
OE Original Elima-Matic
F Flap Valve
HD Horizontal Discharge
3A 3-A Certified
UL UL Listed
OB Oil Bottle

*More than one option may be specified for a particular pump model.

Materials

Material Profile:	Operating Temperatures:	
	Max.	Min.
CAUTION! Operating temperature limitations are as follows:		
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 solvents; especially all aliphatic, aromatic and halogenated hydrocarbons, acids, animal and vegetable oils. Hot water or hot aqueous solutions (over 70°F) will attack FKM.	350°F 177°C	-40°F -40°C
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 strong 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
<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>		
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 applications. Commonly referred to as 316 Stainless Steel in the pump industry.		

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.

1: PUMP SPECS

Performance

V4 - 1 1/4" Clamped Pump – Metallic Center PTFE FITTED

Flow Rate

Adjustable to 0-61 gpm (230.9 lpm)

Port Size

Suction 1 1/4" NPT

Discharge 1 1/4" NPT

Air Inlet 3/8" NPT

Air Exhaust 3/4" NPT

Suction Lift

Dry20' (6.09 m)

Wet25' (7.62 m)

Max Solid Size (Diameter)

. 3/16" (4.76 mm)

Max Noise Level 100 dB(A)

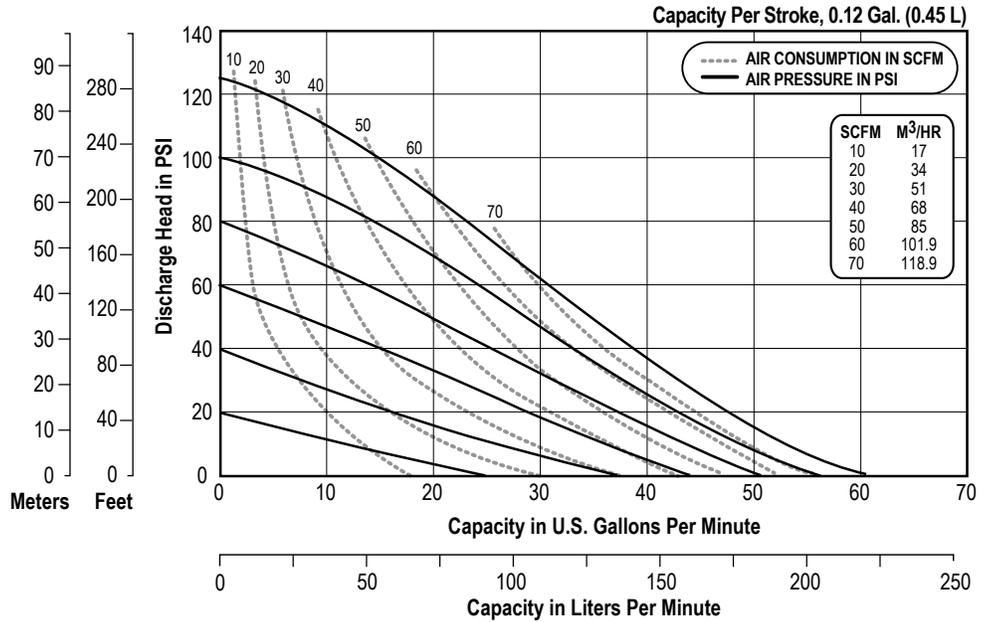
Shipping Weights

Aluminum41 lbs (18.6 kg)

Cast Iron57 lbs (25.9 kg)

Stainless Steel57 lbs (25.9 kg)

1: PUMP SPECS



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%.

V4 - 1 1/4" Clamped Pump – Metallic Center RUBBER FITTED

Flow Rate

Adjustable to 0-84 gpm (318 lpm)

Port Size

Suction 1 1/4" NPT

Discharge 1 1/4" NPT

Air Inlet 3/8" NPT

Air Exhaust 3/4" NPT

Suction Lift

Dry20' (6.09 m)

Wet25' (7.62 m)

Max Solid Size (Diameter)

. 3/16" (4.76 mm)

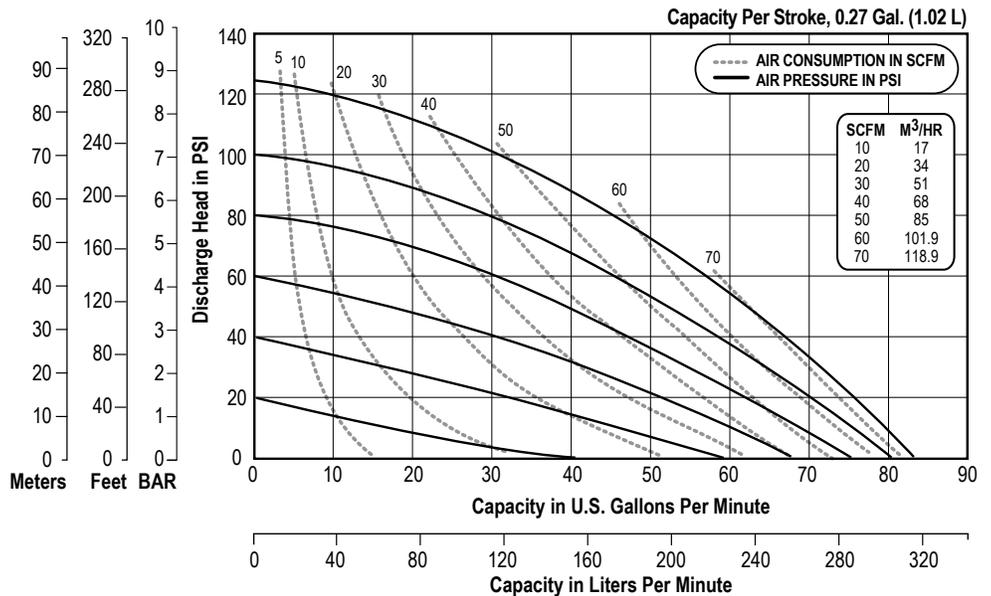
Max Noise Level 95 dB(A)

Shipping Weights

Aluminum41 lbs (18.6 kg)

Cast Iron57 lbs (25.9 kg)

Stainless Steel57 lbs (25.9 kg)

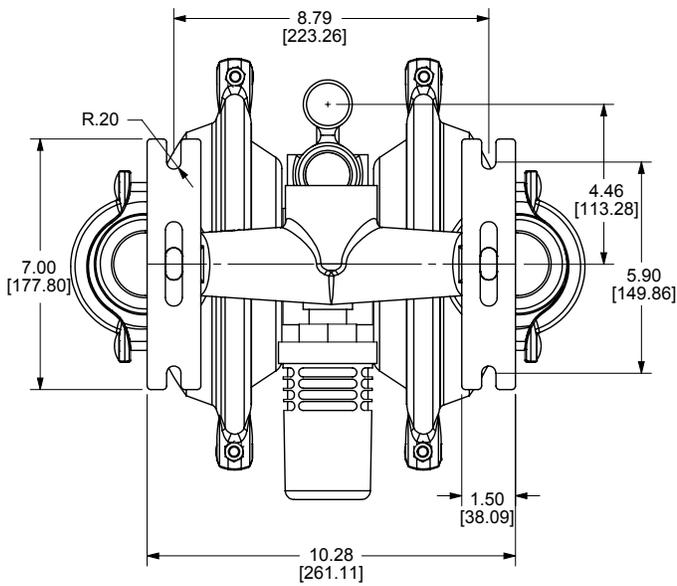
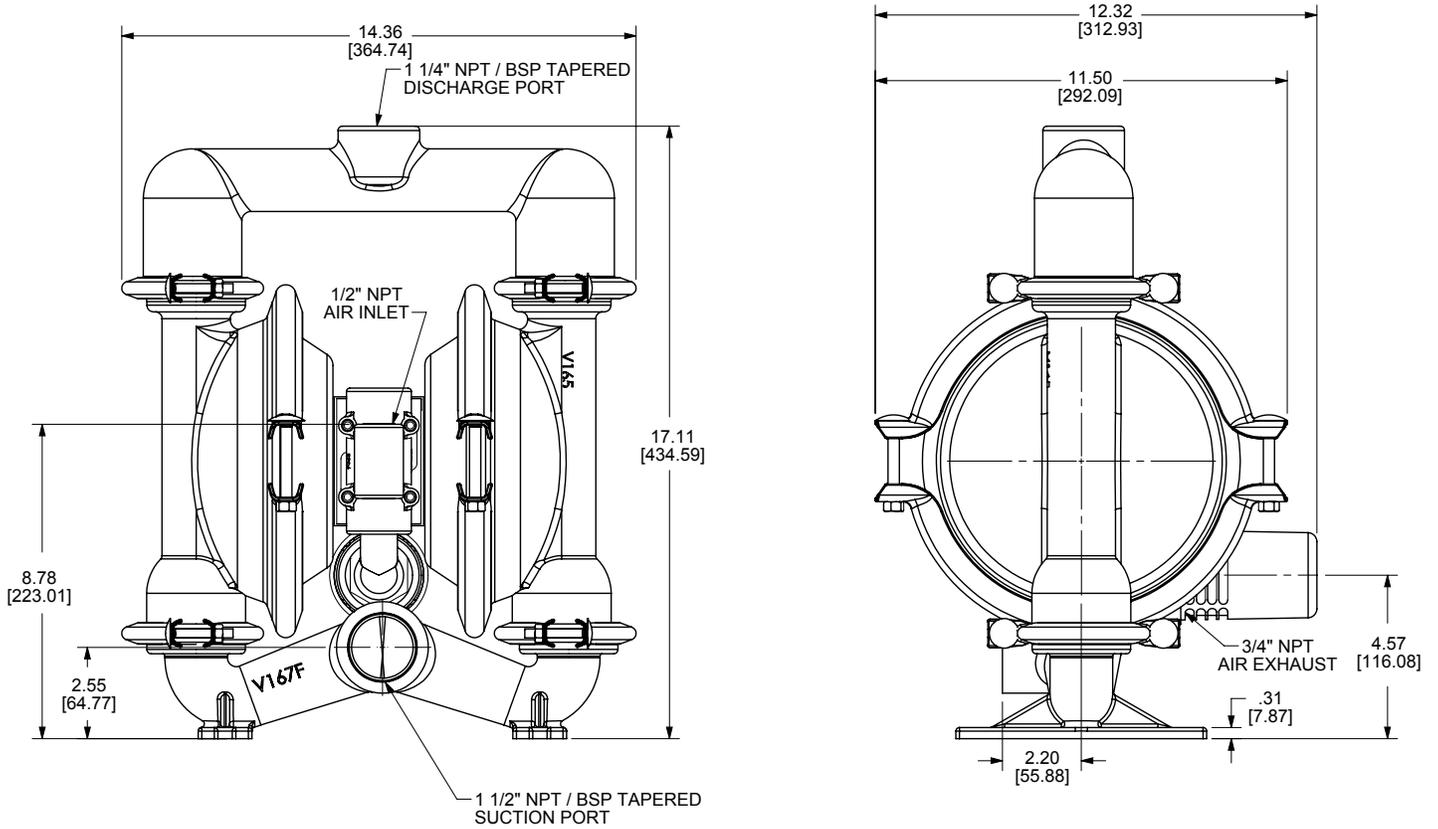


Dimensional Drawings

V4 Aluminum Clamped

Dimensions in inches (mm dimensions in brackets)

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



BOTTOM VIEW

1: PUMP SPECS

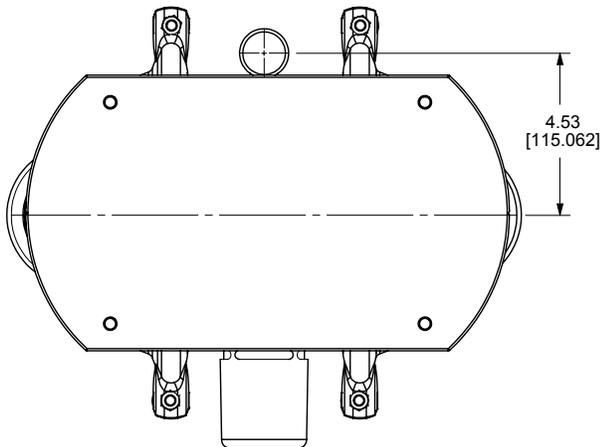
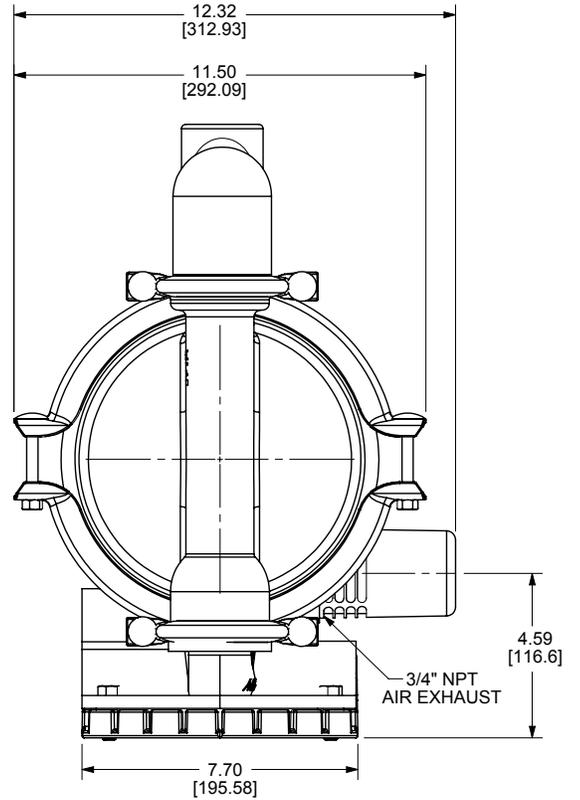
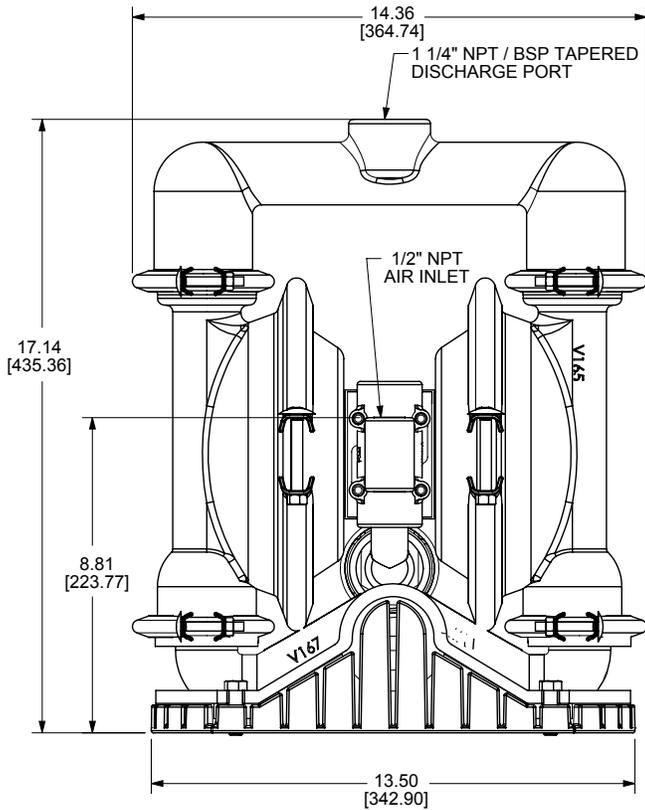
Dimensional Drawings

V4 Screen Mounted

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



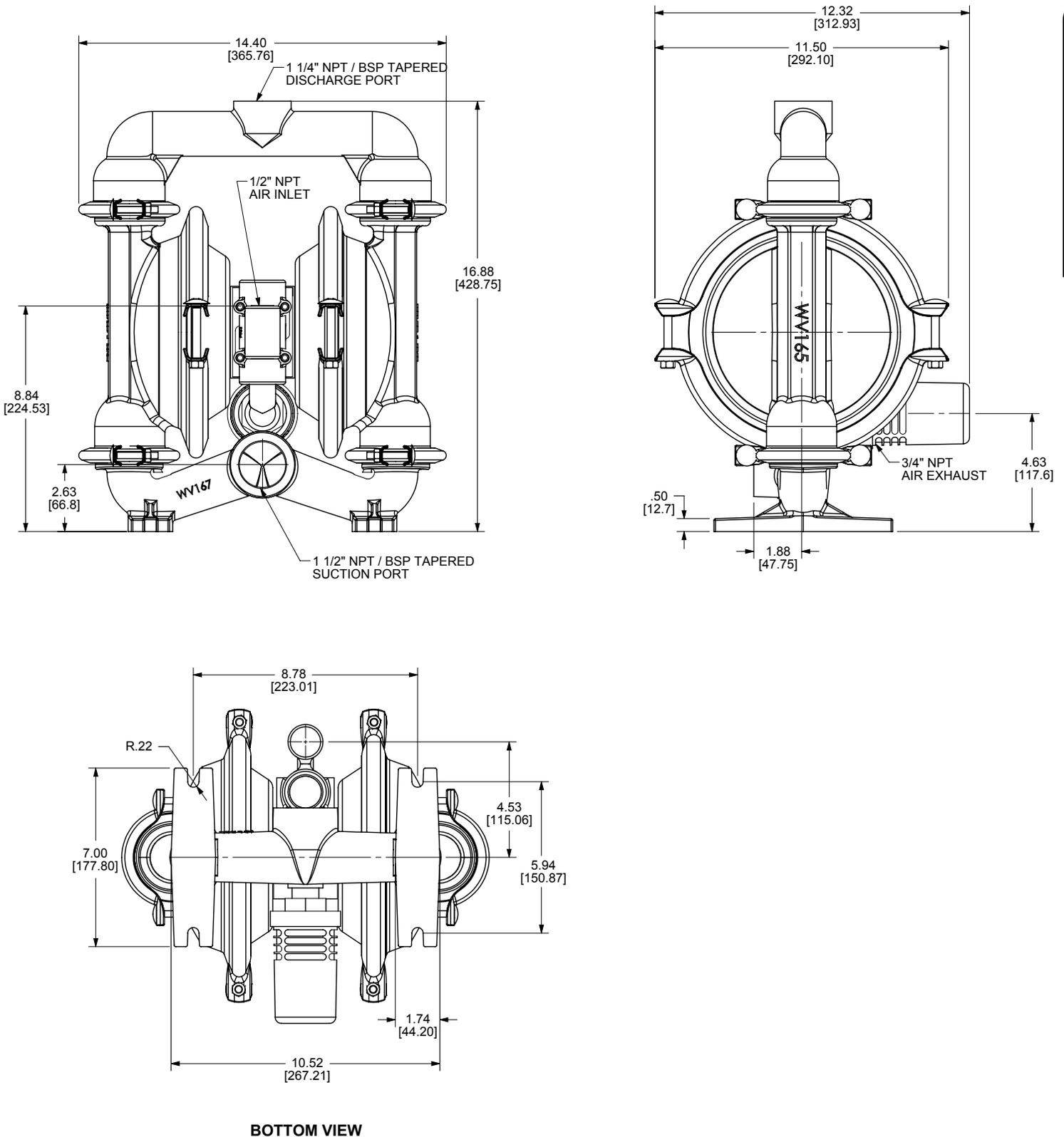
BOTTOM VIEW

Dimensional Drawings

V4 Cast Iron Clamped

Dimensions in inches (mm dimensions in brackets)

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



1: PUMP SPECS

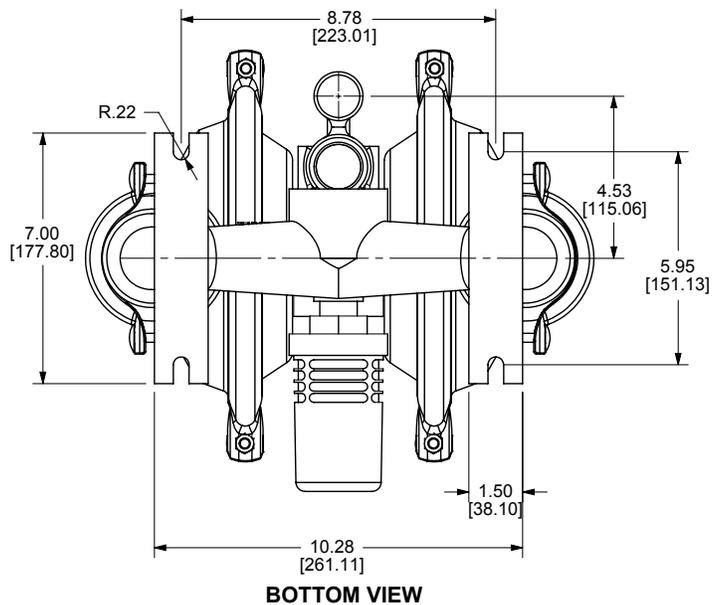
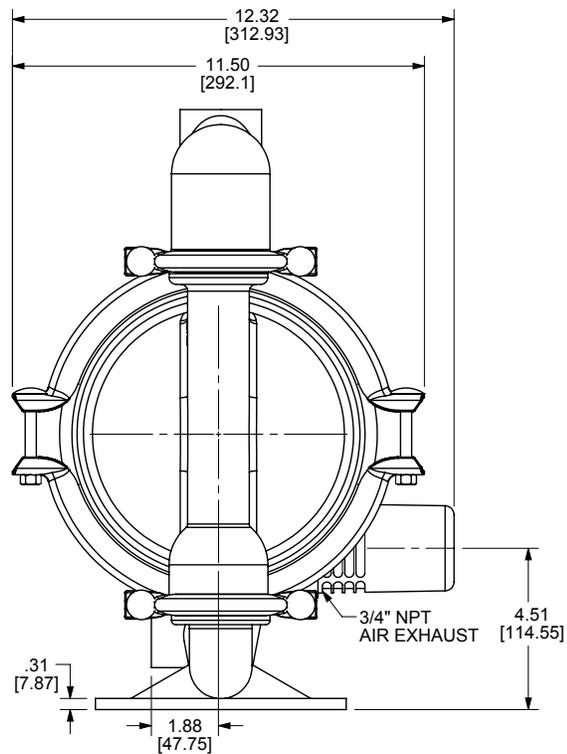
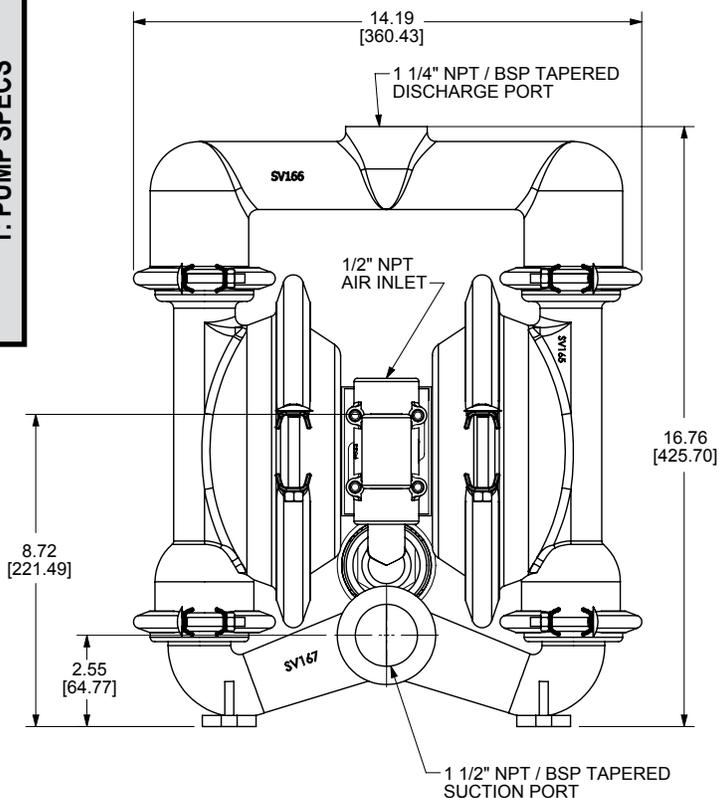
Dimensional Drawings

V4 Stainless Clamped

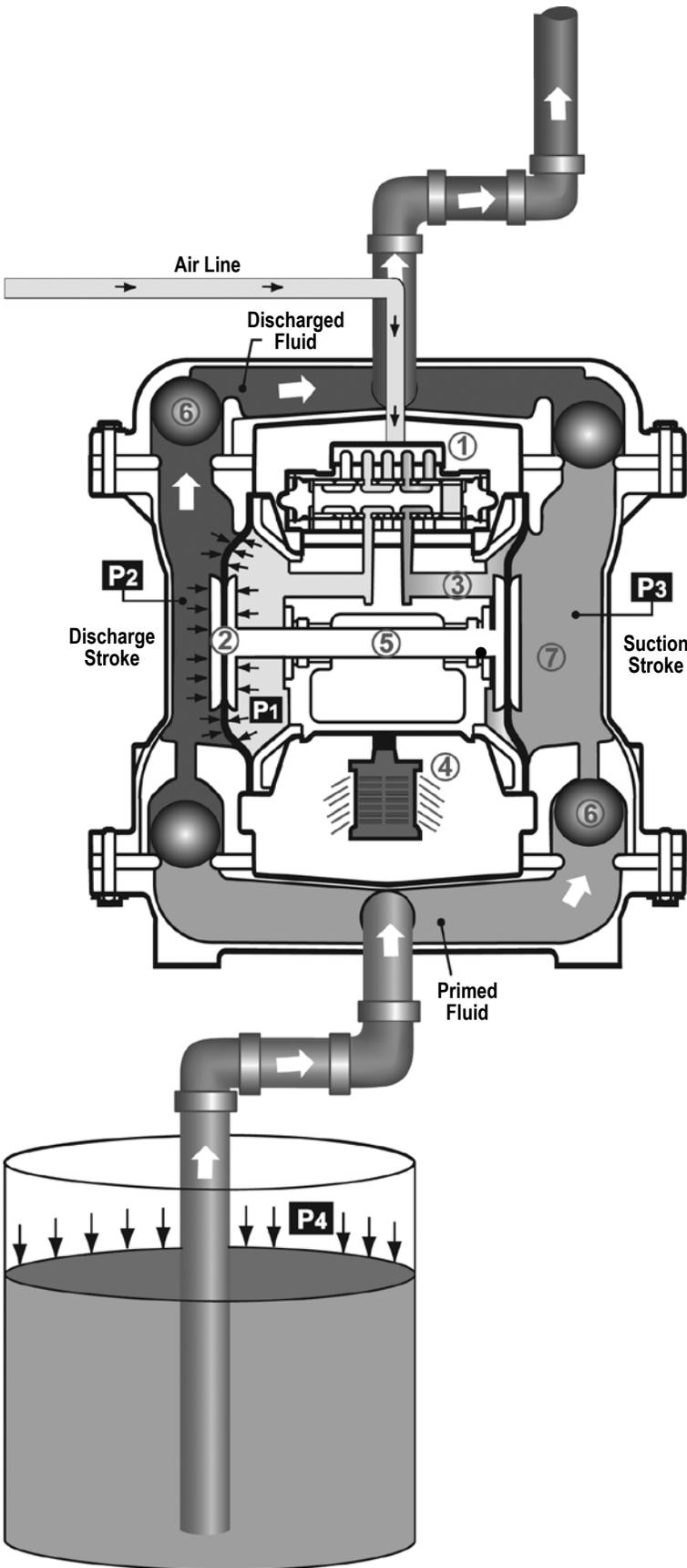
Dimensions in inches (mm dimensions in brackets)

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

1: PUMP SPECS



Principle of Pump Operation



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

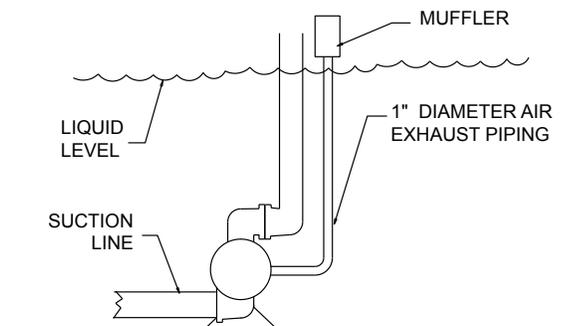
The main directional (air) control valve ① distributes compressed air to an air chamber, exerting uniform pressure over the inner surface of the diaphragm ②. At the same time, the exhausting air ③ from behind the opposite diaphragm is directed through the air valve assembly(s) to an exhaust port ④.

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

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

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

SUBMERGED ILLUSTRATION



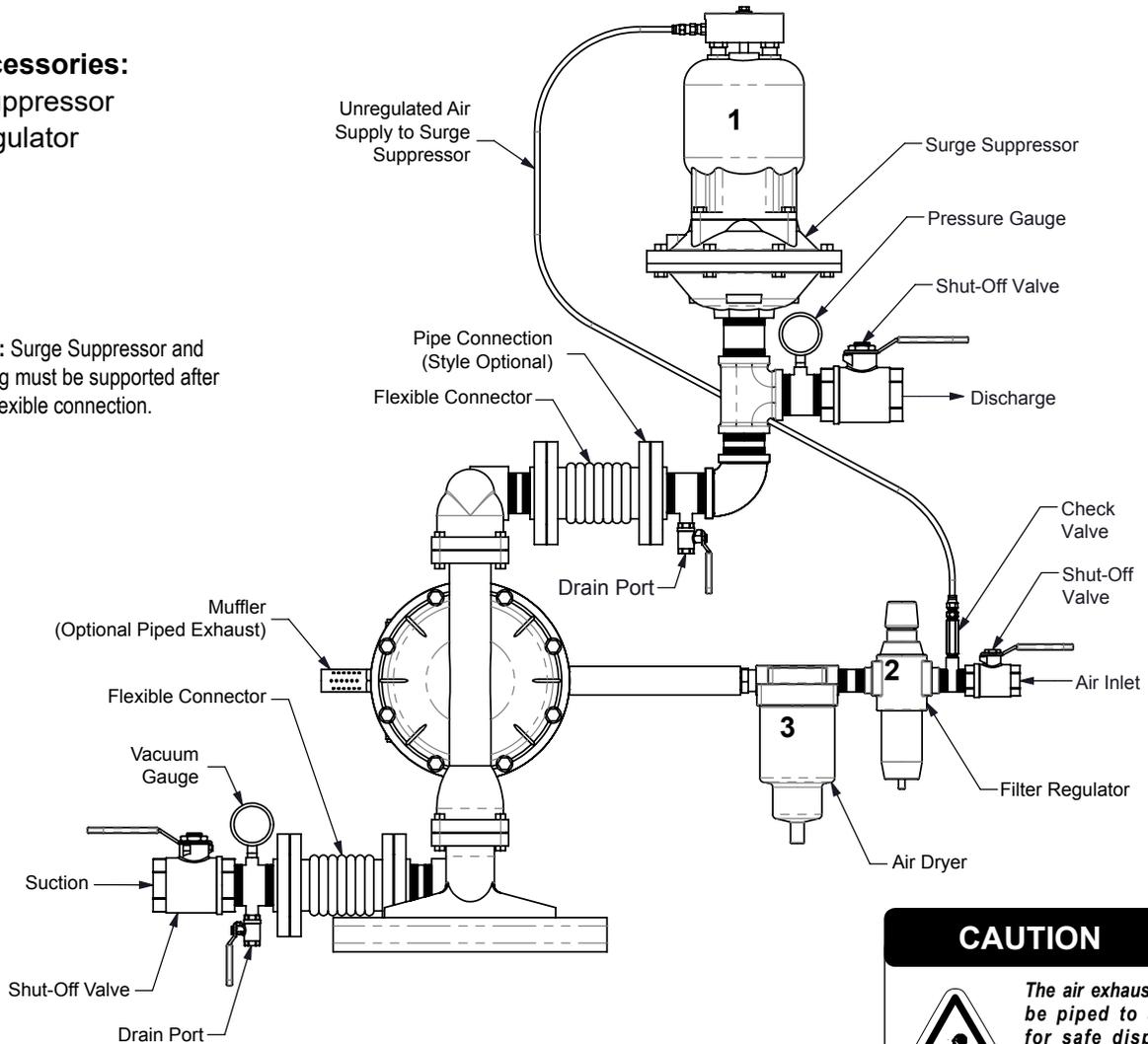
Pump can be submerged if the pump materials of construction are compatible with the liquid being pumped. The air exhaust must be piped above the liquid level. When the pumped product source is at a higher level than the pump (flooded suction condition), pipe the exhaust higher than the product source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

Recommended Installation Guide

Available Accessories:

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

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



CAUTION



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

Installation And Start-Up

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

Air Supply

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

Air Valve Lubrication

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

Air Line Moisture

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

Air Inlet And Priming

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

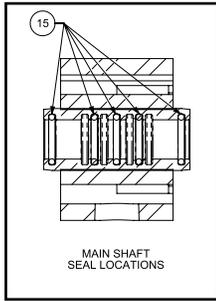
Troubleshooting Guide

Symptom:	Potential Cause(s):	Recommendation(s):
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.	

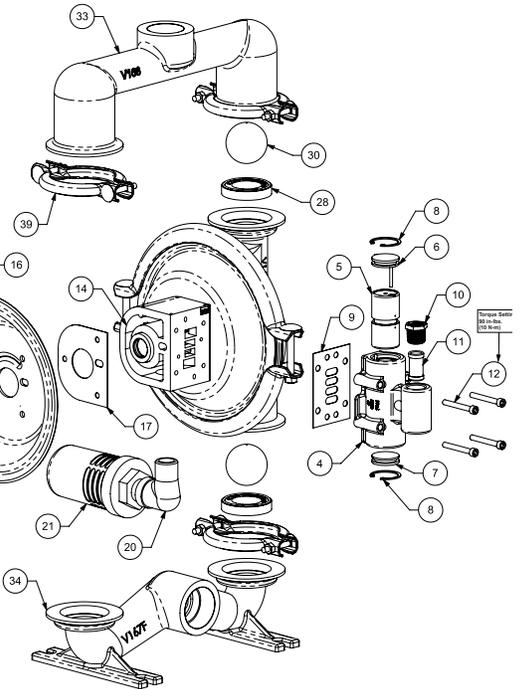
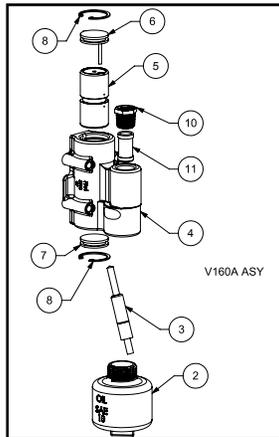
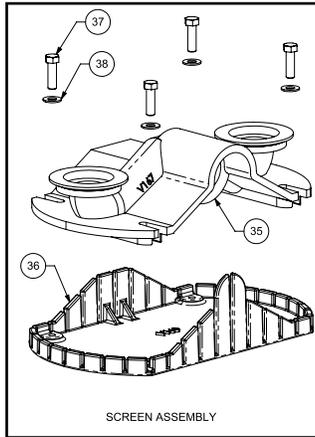
2: INSTAL & OP

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

Composite Repair Parts Drawing - PTFE



13

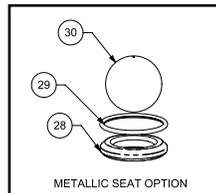


Torque Setting:
480 in.-lbs.
(54 N-m)

Torque Setting:
350 in.-lbs.
(39 N-m)

Minimum Torque:
20 in.-lbs.
(2.3 N-m)

3: EXP VIEW



Composite Repair Parts List - PTFE

Air Valve Assembly						
Item #	Qty.	Description	Part Number			
			Without Oil Bottle		With Oil Bottle	
1	-	Valve Body ASY (includes items 4-11)	V60ALF		V160A	
2	1	Oil Bottle	N/A		V160D	
3	1	Lubricator Rod	N/A		V160C	
4	1	Valve Body	60ALF		160A	
5	1	Valve Spool	V160PST			
6	1	End Cap with Guide	PV160R			
7	1	End Cap without Guide	PV160S			
8	2	Snap Ring	V160T			
9	1	Air Valve Gasket	V160B			
10	1	Reducer Bushing	V160AP			
11	1	Air Valve Screen	V160E			
12	4	Air Valve Mounting Bolt	V160AS			
Center Section Assembly						
Item #	Qty.	Description	Part Number			
13	-	Center Block ASY (Includes items 13-15)	V160H			
14	1	Center Block	160H-F			
15	5	Main Shaft O-Ring	V220J			
16	2	Air Chamber	V162			
17	2	Center Block Gasket	V160P			
18	3	Bolt	V162B			
19	3	Nut (not pictured)	V169C			
20	1	Muffler Elbow	PV220G			
21	1	Muffler	VTM-6			
Diaphragm Assembly / Elastomers						
Item #	Qty.	Description	Part Number			
22	1	Main Shaft	V161AT			
23	2	Diaphragm (See Below Material Chart)	V163TF			
24	2	Back-Up Diaphragm	163TFB			
25	2	Inner Diaphragm Plate	V161TI			
26	2	Outer Diaphragm Plate (See Note 1 Below)	VB161TO, WV161TO, SV161TO, HVB161TO			
27	2	Threaded Stud	V221F			
28	4	Valve Seat (See Below Material Chart)	V170xx			
29	4	Valve Seat O-Ring (See Below Material Chart)	V170T (See Note 3)			
30	4	Valve Ball (See Below Material Chart)	V171xx			
Wet End Assembly						
Item #	Qty.	Description	Part Number			
			Aluminum	Cast Iron	Stainless Steel	Hastelloy
31	1	Water Chamber	V165	WV165	SV165	HV165
32	2	Large Clamp Assembly	V164		SV164	
33	1	Discharge Manifold	V166	WV166	SV166	HV166
	1	Discharge Manifold (BSP Option)	V166BSP	WV166BSP	SV166BSP	HV166BSP
34	1	Suction Manifold (Footed Option)	V167F	WV167	SV167	HV167
	1	Suction Manifold (BSP Footed Option)	V167FBSP	WV167BSP	SV167BSP	HV167BSP
35	1	Suction Manifold (Screen Mount Option)	V167	N/A	N/A	N/A
36	1	Screen (Screen Mount Only)	V168	N/A	N/A	N/A
37	4	Bolt (Screen Mount Only)	P34-110	N/A	N/A	N/A
38	4	Washer	V302GA	N/A	N/A	N/A
39	4	Small Clamp Assembly	V169		SV169	
Elastomer Material Specifications						
Material	"Ball P/N"	Seat P/N				
PTFE	V171TF	V170TF				
Aluminum	N/A	V170A (See Note 2 Below)				
Carbon Steel	N/A	V170CS (See Note 2 Below)				
Stainless Steel	V171SS	SV170 (See Note 2 Below)				
Hastelloy	N/A	HV170 (See Note 2 Below)				

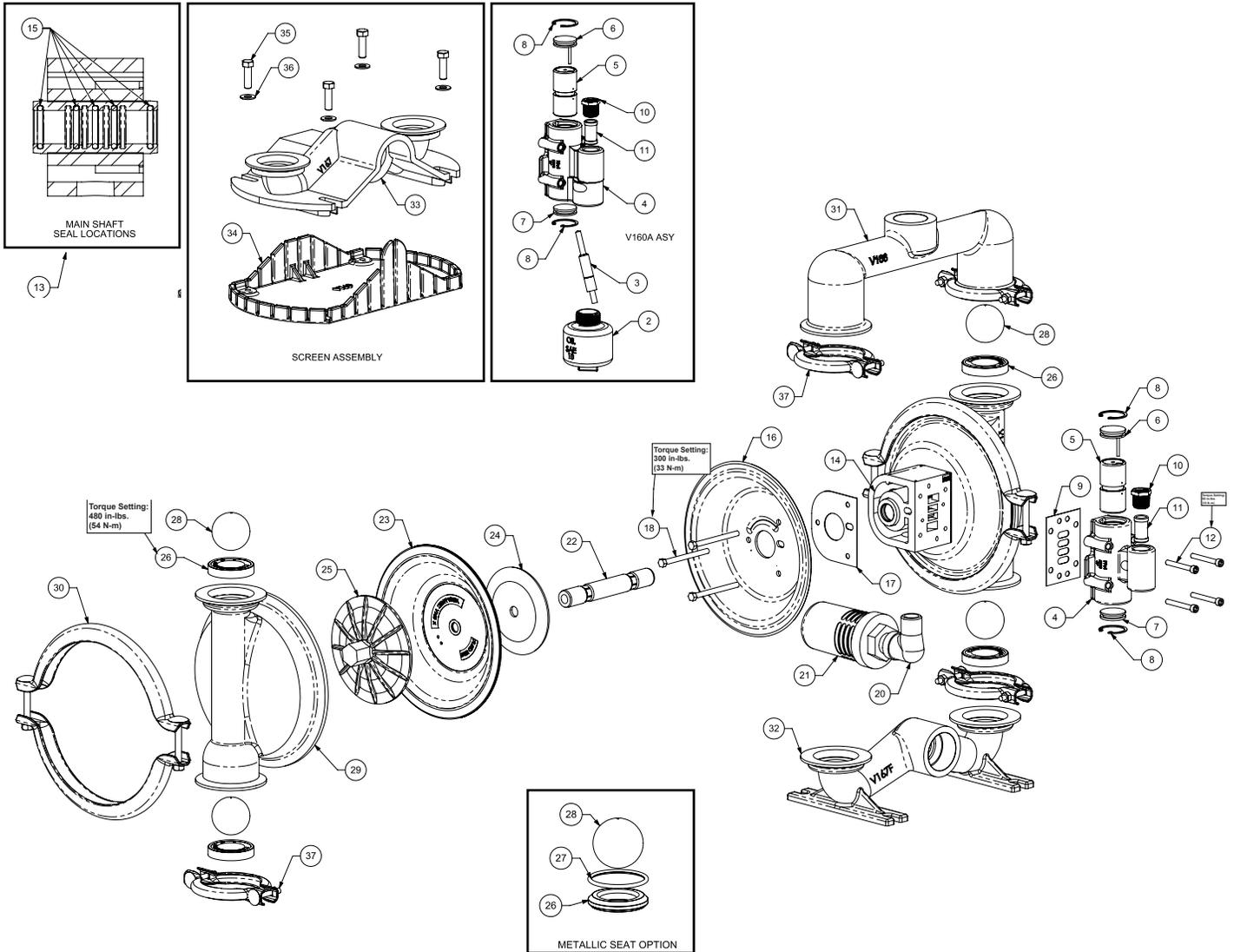
Notes:

- 1.) The outer diaphragm plate material is to match the water chamber material (Cast Iron Uses SV161TO)
- 2.) This metallic seat material is to match the water chamber material. In addition to this seat, (4) o-rings are needed. (Ref Note 3)
- 3.) These (4) o-rings are only used with metallic fitted seats.
- 4.) V=Aluminum, SV=Stainless Steel, WV=Cast Iron, H =Hastelloy

3: EXP VIEW



Composite Repair Parts Drawing - Rubber



3: EXP VIEW

Composite Repair Parts List - Rubber

Air Valve Assembly						
Item #	Qty.	Description	Part Number			
			Without Oil Bottle	With Oil Bottle		
1	-	Valve Body ASY (includes items 4-11)	V60ALF	V160A		
2	1	Oil Bottle	N/A	V160D		
3	1	Lubricator Rod	N/A	V160C		
4	1	Valve Body	60ALF	160A		
5	1	Valve Spool		V160PST		
6	1	End Cap with Guide		PV160R		
7	1	End Cap without Guide		PV160S		
8	2	Snap Ring		V160T		
9	1	Air Valve Gasket		V160B		
10	1	Reducer Bushing		V160AP		
11	1	Air Valve Screen		V160E		
12	4	Air Valve Mounting Bolt		V160AS		
Center Section Assembly						
Item #	Qty.	Description	Part Number			
13	-	Center Block ASY (Includes items 14-15)	V160H			
14	1	Center Block	160H-F			
15	5	Main Shaft O-Ring	V220J			
16	2	Air Chamber	V162			
17	2	Center Block Gasket	V160P			
18	3	Bolt	V162B			
19	3	Nut (not pictured)	V169C			
20	1	Muffler Elbow	PV220G			
21	1	Muffler	VTM-6			
Diaphragm Assembly / Elastomers						
Item #	Qty.	Description	Part Number			
22	1	Main Shaft	V161A			
23	2	Diaphragm (See Below Material Chart)	V163xx			
24	2	Inner Diaphragm Plate	V161C			
25	2	Outer Diaphragm Plate (See Note 1 Below)	VB161, WV161, SV161, HV161			
26	4	Valve Seat (See Below Material Chart)	V170xx			
27	4	Valve Seat O-Ring (See Below Material Chart)	V170T (See Note 2)			
28	4	Valve Ball (See Below Material Chart)	V171xx			
Wet End Assembly						
Item #	Qty.	Description	Part Number			
			Aluminum	Cast Iron	Stainless Steel	Hastelloy
29	1	Water Chamber	V165	WV165	SV165	HV165
30	2	Large Clamp Assembly	V164		SV164	
31	1	Discharge Manifold	V166	WV166	SV166	HV166
	1	Discharge Manifold (BSP Option)	V166BSP	WV166BSP	SV166BSP	HV166BSP
32	1	Suction Manifold (Footed Option)	V167F	WV167	SV167	HV167
	1	Suction Manifold (BSP Footed Option)	V167FBSP	WV167BSP	SV167BSP	HV167BSP
33	1	Suction Manifold (Screen Mount Option)	V167	N/A	N/A	N/A
34	1	Screen (Screen Mount Only)	V168	N/A	N/A	N/A
35	4	Bolt (Screen Mount Only)	P34-110	N/A	N/A	N/A
36	4	Washer	V302GA	N/A	N/A	N/A
37	4	Small Clamp Assembly	V169		SV169	
Elastomer Material Specifications						
Material	Diaphragm	Ball P/N	Seat P/N	Seat O-Ring		
Neoprene	V163N	V171N	V170N	N/A		
Buna Nitrile	V163BN	V171BN	V170BN	N/A		
Viton	V163VT	V171VT	V170VT	N/A		
Nordel	V163ND	V171ND	V170ND	N/A		
PTFE	V163TF	V171TF	V170TF	V170T		
Santoprene	V163TPEXL	V171TPEXL	V170TPEXL	N/A		
Hytrel	V163TPEFG	V171TPEFG	V170TPEFG	N/A		
Aluminum	N/A	N/A	V170A (See Note 2)	N/A		
Carbon Steel	N/A	N/A	V170CS (See Note 2)	N/A		
Stainless Steel	N/A	V171SS	SV170 (See Note 2)	N/A		
Hastelloy	N/A	N/A	HV170 (See Note 2)	N/A		

Notes:

- 1.) The outer diaphragm plate material is to match the water chamber material (Cast Iron dome fitted pumps are to use SVB161 outer diaphragm plate)
- 2.) This metallic seat material is to match the water chamber material. In addition to this seat, (4) V170T o-rings are needed.
- 3.) V=Aluminum, SV=Stainless Steel, WV=Cast Iron, H =Hastelloy

Material Codes - The Last 3 Digits of Part Number

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

5 - YEAR Limited Product Warranty

Quality System ISO9001 Certified • Environmental Management Systems ISO14001 Certified

Versamatic warrants to the original end-use purchaser that no product sold by Versamatic that bears a Versamatic 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 Versamatic's factory.

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 complete warranty at http://vm.salesmrc.com/pdfs/VM_Product_Warranty.pdf

DECLARATION OF CONFORMITY

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

MANUFACTURED BY:

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

VERSAMATIC®
Warren Rupp, Inc.
A Unit of IDEX Corporation
800 North Main Street
P.O. Box 1568
Mansfield, OH 44901-1568 USA
Tel: 419-526-7296
Fax: 419-526-7289



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

This product complies with the following European Community Directives:

Ce produit est conforme aux directives de la Communauté européenne suivantes:

Este producto cumple con las siguientes Directrices de la Comunidad Europea:

Dieses produkt erfüllt die folgenden Vorschriften der Europäischen Gemeinschaft:

Questo prodotto è conforme alle seguenti direttive CEE:

Dir produkt voldoet aan de volgende EG-richtlijnen:

Denna produkt överensstämmer med följande EU direktiv:

Versamatic, Inc., erklærer herved som fabrikant, at ovennævnte produkt er i overensstemmelse med bestemmelserne i Direktive:

Tämä tuote täyttää seuraavien EC Direktiivien vaatimukset:

Dette produkt oppfyller kravene til følgende EC Direktiver:

Este produto está de acordo com as seguintes Directivas comunitárias:

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

This product has used the following harmonized standards to verify conformance:

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

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

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

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

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

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

Harmoniserede standarder, der er benyttet:

Tässä tuotteessa on sovellettu seuraavia yhdenmukaistettuja standardeja:

Dette produkt er produsert i overensstemmelse med følgende harmoniserte standarder:

Este produto utilizou os seguintes padrões harmonizados para verificar conformidade:

EN809:2012

AUTHORIZED/APPROVED BY:

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

David Roseberry

Dave Roseberry
Director of Engineering

Authorized Representative:
IDEX Pump Technologies
R79 Shannon Industrial Estate,
Shannon, Co. Clare Ireland
Attn: Barry McMahon

DATE: February 27, 2017

FECHA:
DATUM:
DATA:
DATO:
PÄIVÄYS:



VMQR 044FM

06/14/2017 REV 08

