

IOM
INSTALLATION OPERATION
& MAINTENANCE

A025

PLASTIC 1/4 INCH
AIR-OPERATED DOUBLE-DIAPHRAGM PUMP



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CAUTIONS – READ FIRST!

READ THESE WARNINGS AND SAFETY PRECAUTIONS PRIOR TO INSTALLATION OR OPERATION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE.

WARNING

= Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage

CAUTION

= Hazards or unsafe practices which could result in minor personal injury, product or property damage.

CAUTION Always wear safety glasses when operating a pump to avoid eye injury. If diaphragm rupture occurs, material being pumped may be forced out of the air exhaust.

CAUTION Do not connect a compressed air source to the exhaust port of the pump.

CAUTION Do not lubricate air supply.

CAUTION Do not exceed 120 psig (8.3 bar) air-inlet pressure.

CAUTION Do not exceed 10 psig (0.7 bar) or 23 ft-H₂O suction pressure.

CAUTION The temperature of the process fluid and air input must be no more than the maximum temperature allowed for the appropriate non-metallic material. See the list of temperatures below for each material's maximum recommended temperature:

Buna-N (Nitrile):	10°F to 180°F (-12°C to 82°C)
Geolast®:	10°F to 180°F (-12°C to 82°C)
Bunalast™:	-40°F to 266°F (-40°C to 130°C)
EPDM:	-40°F to 280°F (-40°C to 138°C)
FKM:	-40°F to 350°F (-40°C to 177°C)
Hytrel®:	-20°F to 220°F (-29°C to 104°C)
Nylon:	0°F to 200°F (-18°C to 93°C)
PTFE:	40°F to 220°F (4°C to 104°C)
Polyethylene:	32°F to 158°F (0°C to 70°C)
Polypropylene:	32°F to 180°F (0°C to 82°C)
Polyurethane:	10°F to 150°F (-12°C to 66°C)
PVDF:	0°F to 250°F (-18°C to 121°C)
Santoprene®:	-40°F to 225°F (-40°C to 107°C)
Urethane:	-65°F to 220°F (-54°C to 104°C)

Temperature limits are solely based upon mechanical stress and certain chemicals will reduce the maximum operating temperature. The allowable temperature range for the process fluid is determined by the materials in contact with the fluid being pumped. Consult a chemical resistance guide for chemical compatibility and a more precise safe temperature limit.

Aways use minimum air pressure when pumping at elevated temperatures.

CAUTION It is the end user's responsibility to maintain the process fluid's temperature during use.

CAUTION Ensure all wetted components are chemically compatible with the process fluid and the cleaning fluid.

WARNING Prior to servicing the pump, ensure that the air and fluid lines are closed and disconnected. While wearin fe manner.

WARNING The A025 pump is not designed for the wet end or air end to be field serviceable.

WARNING Maintenance must not be performed when a hazardous atmosphere is present.

CAUTION The equipment must be inspected for visible damage prior to use.

CAUTION Ensure pump is thoroughly cleaned and flushed prior to installation into a process line.

CAUTION Blow out all compressed air lines in order to remove any debris, prior to pump installation. Ensure that the muffler is properly installed prior to pump operation.

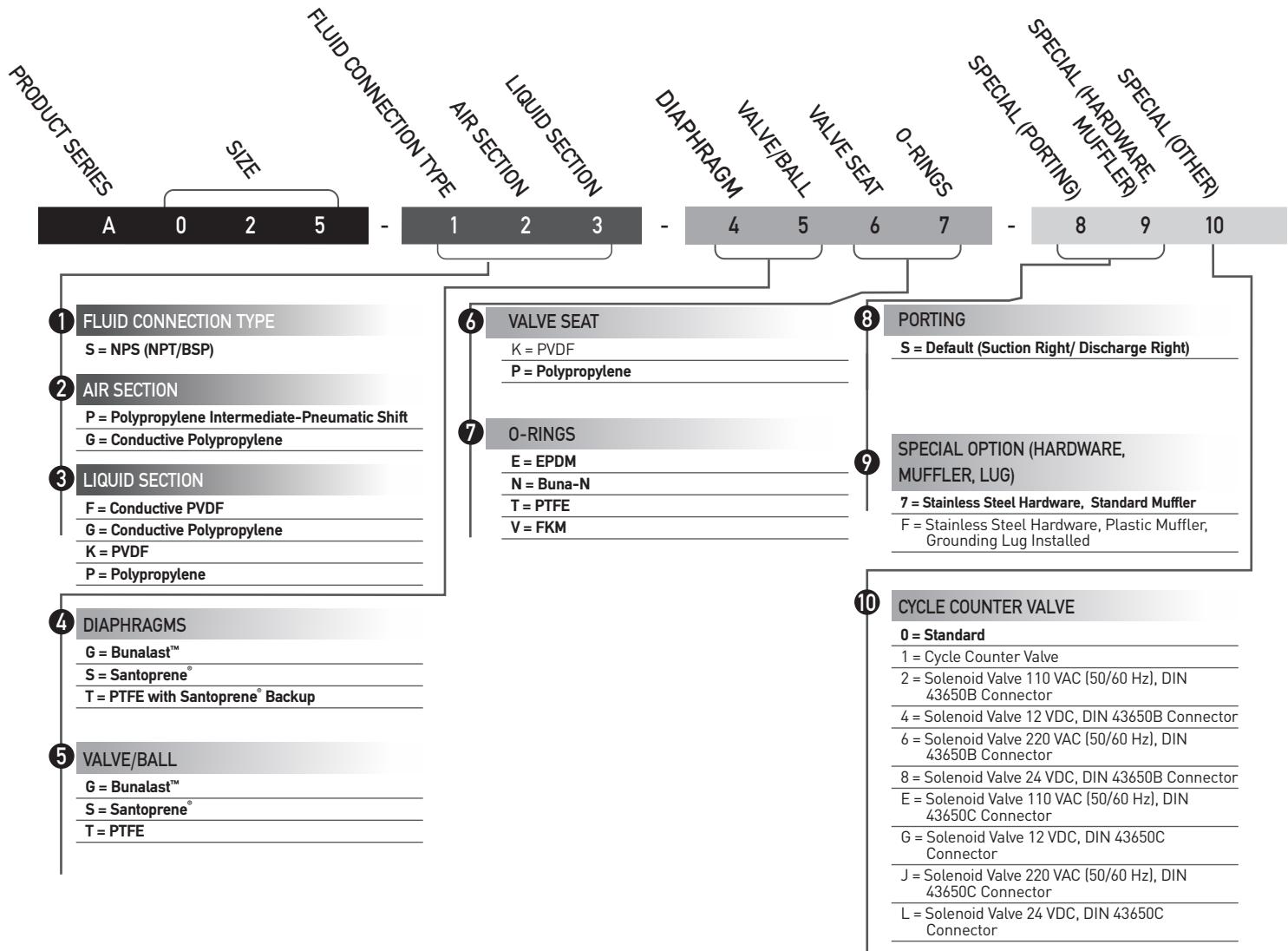
CAUTION Ensure air exhaust is piped to atmosphere prior to a submerged installation.

CAUTION Ensure all hardware is set to correct torque values prior to operation.

WARNING Pump, valves and all containers must be properly grounded prior to handling flammable fluids and/or whenever static electricity is a hazard.

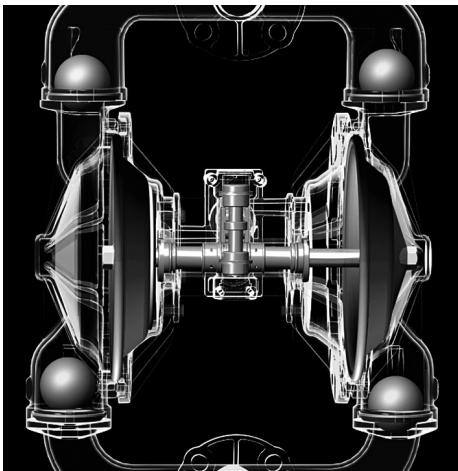
WARNING This product can expose you to chemicals including Nickel, Chromium, Cadmium, or Cobalt, which are known to the State of California to cause cancer and/or birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

MODEL DESIGNATION MATRIX - BOLTED PLASTIC



PRINCIPLES OF OPERATION

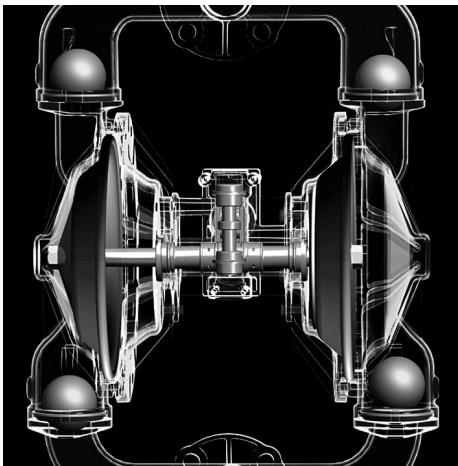
HOW AN AIR OPERATED DOUBLE DIAPHRAGM PUMP WORKS



The air-valve directs pressurized air behind the diaphragm on the right, causing the diaphragm on the right to move outward (to the right).

Since both the right diaphragm and the left diaphragm are connected via a diaphragm rod, when the right diaphragm moves to the right, the left diaphragm (through the action of the diaphragm rod) moves to the right also.

When the diaphragm on the left side is moving to the right, it is referred to as suction stroke. When the left diaphragm is in its suction stroke, the left suction ball moves upward (opens) and the left discharge ball moves downward (closes). This action creates suction and draws liquid into the left side chamber.



The air-valve directs pressurized air behind the left diaphragm, causing the left diaphragm to move outward (to the left).

Since both the left diaphragm and the right diaphragm are connected via a diaphragm rod, when the left diaphragm moves to the left, the right diaphragm (through the action of the diaphragm rod) moves to the left also.

When the diaphragm on the left side moves outward, the left discharge ball moves upward (opens) and the left suction ball moves downward (closes). This causes the liquid to leave the left side liquid outlet of the pump.

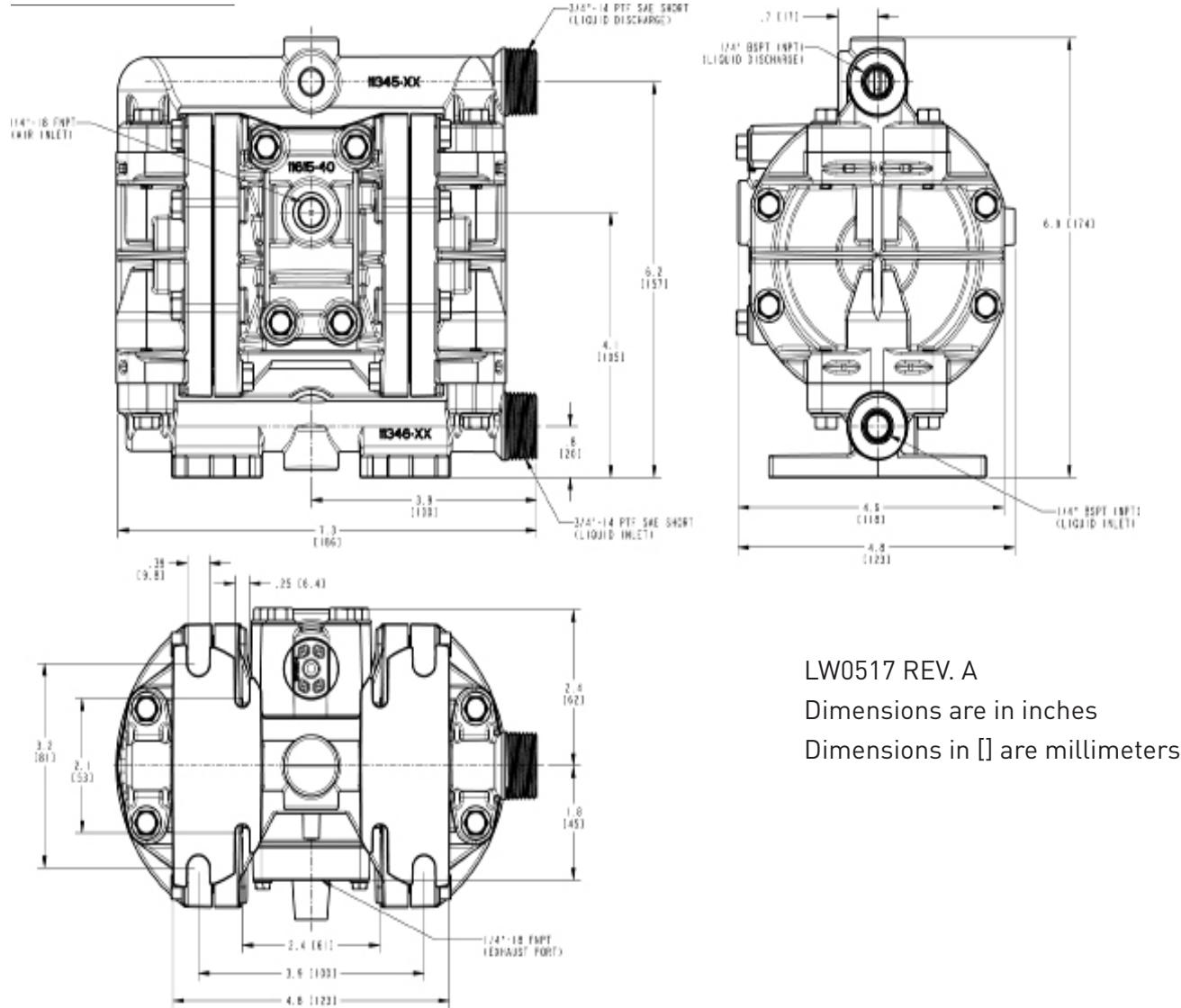
Simultaneously, the right diaphragm moves inward (to the left), which causes the right suction ball to open and the right discharge to close, which in turn causes suction, drawing liquid into the right chamber.

The process of alternating right suction / left discharge (and vice-versa) continues as long as compressed air is supplied to the pump.

1/4" PUMP DIMENSIONS

BOLTED PLASTIC

Standard Models



LW0517 REV. A

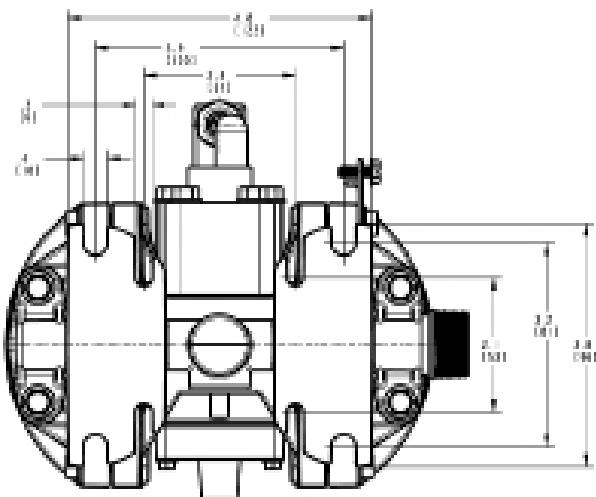
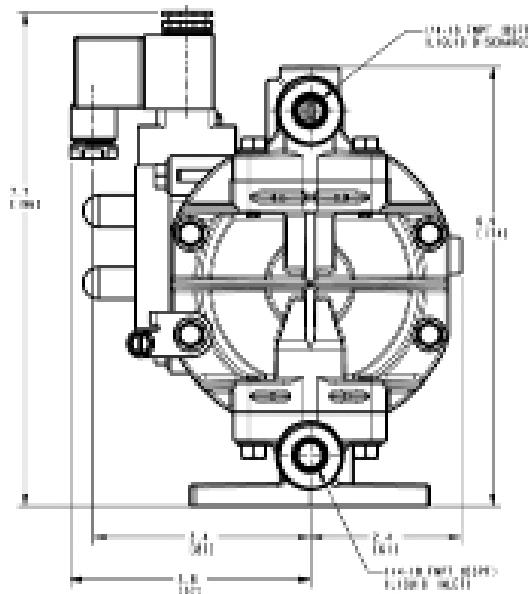
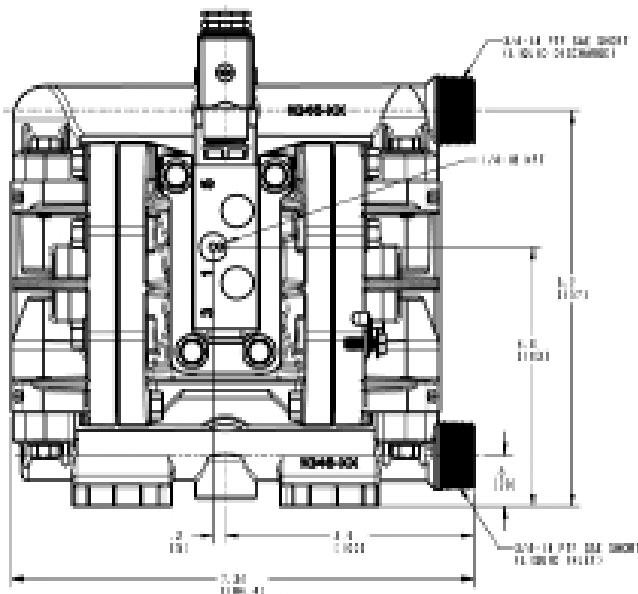
Dimensions are in inches

Dimensions in [] are millimeters

1/4" PUMP DIMENSIONS

BOLTED PLASTIC

Solenoid Models

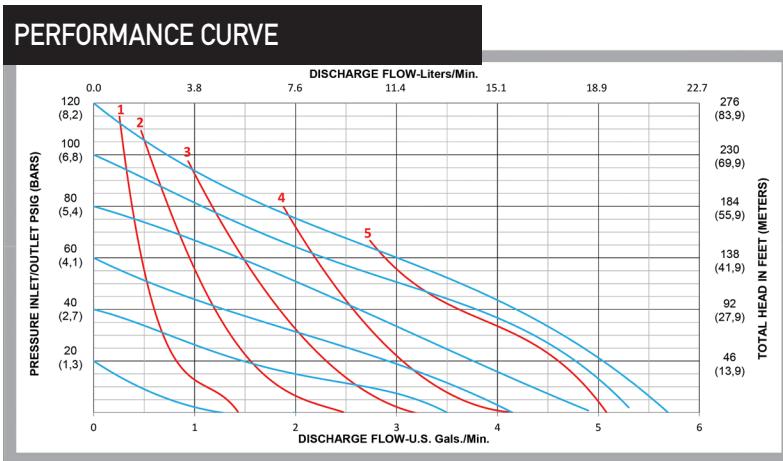


LA0024 REV. A

Dimensions are in inches

Dimensions in [] are millimeters

PERFORMANCE CURVES



Performance Specifications

Max. Flow:	5.7 gpm (21.6 lpm)
Max. Air Pressure:	120 psi (8.3 bar)
Max. Solids:	$\frac{1}{16}$ " (1.6 mm)
Max. Suction Lift Dry:	14 ft-H ₂ O (4.2 m-H ₂ O)
Max. Suction Lift Dry w/PTFE:	10 ft-H ₂ O (3.0 m-H ₂ O)
Max. Suction Lift Wet:	28 ft-H ₂ O (8.5 m-H ₂ O)
Avg. Displacement Per Stroke:	0.0105 gallons (0.0397 l)
Weight Polypropylene:	2.6 lbs (1.2 kg)
Weight PVDF	3.8 lbs (1.7 kg)
Weight Conductive Polypropylene:	2.6 lbs (1.2 kg)
Weight Conductive PVDF	3.8 lbs (1.7 kg)
Air Inlet:	$\frac{1}{4}$ " FNPT
Liquid Inlet:	$\frac{1}{4}$ " internal (NPT/BSP), $\frac{3}{4}$ " external (NPT)
Liquid Outlet:	$\frac{1}{4}$ " internal (NPT/BSP), $\frac{3}{4}$ " external (NPT)
Height:	6.8" (173 mm)
Width:	7.3" (186 mm)

*Flow rates indicated on the chart(s) shown were determined by pumping water at flooded suction. For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

INSTALLATION, TROUBLESHOOTING AND MAINTENANCE

INSTALLATION PIPING

Whenever possible ensure the pump is installed using the shortest possible pipe lengths with the minimum amount of pipe fittings. Ensure all piping is supported independent of the pump.

Suction and discharge piping should not be smaller than the connection size of the pump. When pumping liquids of high viscosity, larger piping may be used, in order to reduce frictional pipe loss.

Employ flexible hoses in order to eliminate the vibration caused by the pump. Mounting feet can also be used to reduce vibration effects.

All hoses should be reinforced, non-collapsible and be capable of high vacuum service. Ensure that all piping and hoses are chemically compatible with the process and cleaning fluid.

For processes where pulsation effects should be reduced, employ a pulsation dampener on the discharge side of the pump.

For self-priming applications, ensure all connections are airtight and the application is within the pumps dry-lift capability. Refer to product specifications for further details.

For flooded suction applications, install a gate valve on the suction piping in order to facilitate service.

For unattended flooded suction operation, it is recommended to pipe the exhaust air above the liquid source. In the event of a diaphragm failure this will reduce or eliminate the possibility of liquid discharging through the exhaust onto the ground.

LOCATION

Ensure that the pump is installed in an accessible location, in order to facilitate future service and maintenance.

AIR

Ensure that the air supply is sufficient for the volume of air required by the pump. Refer to product specifications for further details. For reliable operation, install a 5 micron air filter, air-valve and pressure regulator. Do not exceed the pumps maximum operating pressure of 120 psig.

REMOTE OPERATION

Utilize a three way solenoid valve for remote operation. This ensures that air between the solenoid and the pump is allowed to "bleed off," ensuring reliable operation. Liquid transfer volume is estimated by multiplying displacement per stroke times the number of strokes per minute

NOISE

Correct installation of the muffler reduces sound levels. Refer to product specifications for further details.

SUBMERGED OPERATION

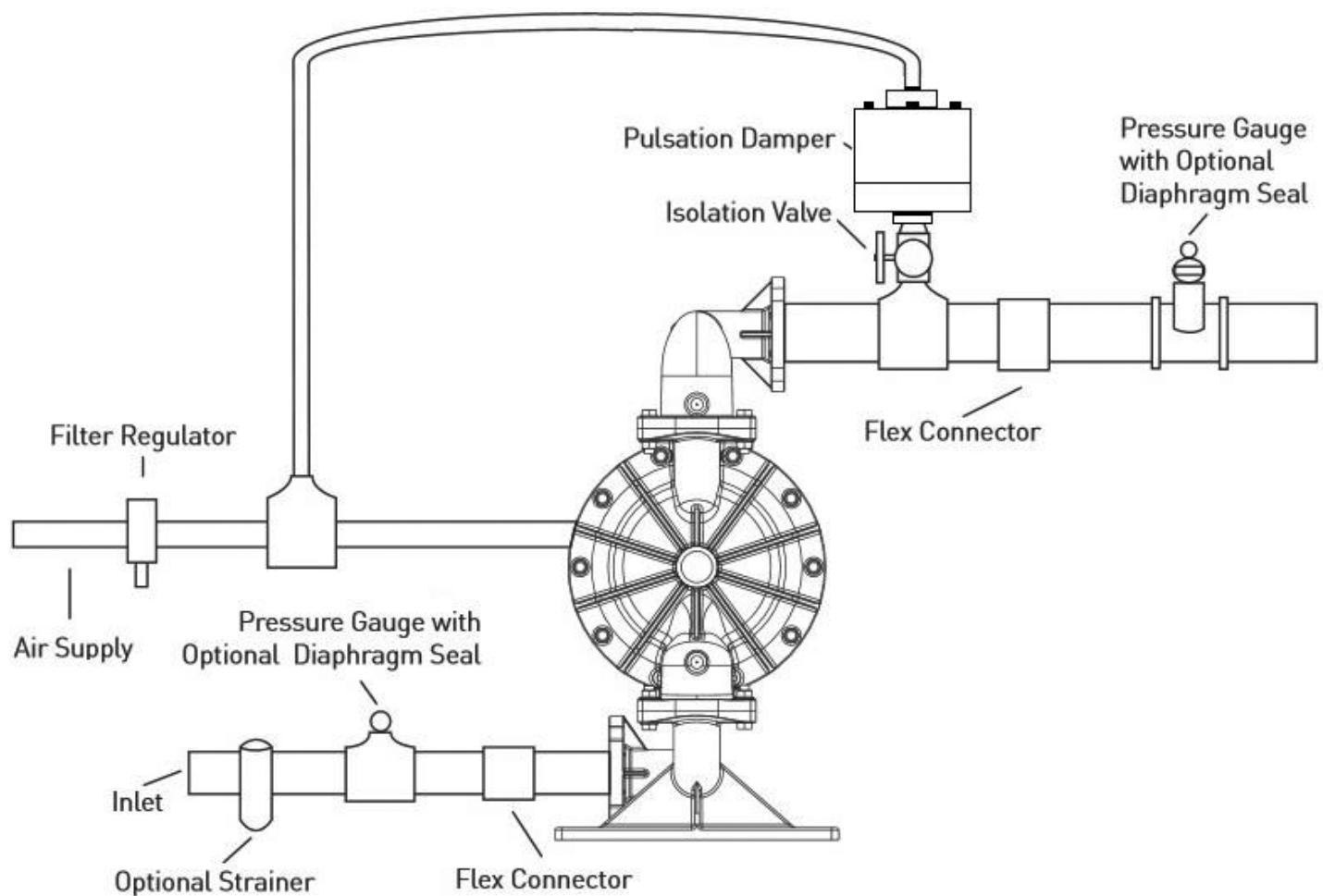
For submersible operation, pipe the air exhaust to atmosphere

GROUNDING THE PUMP

Loosen grounding screw and install a grounding wire. Tighten grounding screw. Wire size should be a 12 gauge wire or larger. Connect the other end of the wire to a true earth ground. Equipment must be grounded to achieve ATEX rating and it is recommended to configure the pump with a grounding lug option.



SUGGESTED INSTALLATION



This illustration is a generic representation of an air operated double-diaphragm pump.

TROUBLESHOOTING

PROBLEM

EFFECT/SOLUTION

Pump Will Not Cycle

- Discharge line closed or plugged
- Discharge filter blocked
- Check valve stuck
- Air filter blocked
- Air supply valve closed
- Air supply hooked up to muffler side of pump
- Compressor not producing air or turned off
- Muffler iced or blinded
- Diaphragm ruptured
- Plant air supply line ruptured
- Air valve wear/debris
- Pilot sleeve wear/debris
- Diaphragm rod broken
- Diaphragm plate loose

Pumped Fluid Coming Out of Muffler

- Diaphragm ruptured
- Diaphragm plate loose
- Inlet liquid pressure excessive (above 10 psig)

Pump Cycles but no Flow

- Inlet strainer clogged
- Suction valve closed
- Suction line plugged
- No liquid in the suction tank
- Suction lift excessive
- Debris stuck in valves
- Excessive wear of check valves
- Air leak on suction side with suction lift

Pump Cycles with Closed Discharge Valve

- Debris stuck in check valve
- Excessive wear of check valves

Pump Running Slowly/Not Steady

- Air compressor undersized
- Leak in air supply
- Air-line, filter regulator or needle valve undersized
- Muffler partially iced or blinded
- Air valve gasket leak or misalignment
- Air valve wear/debris
- Pilot sleeve wear/debris
- Liquid fluid filter blocked
- Pump may be cavitating, reduce speed of operation
- Suction strainer clogged

Pump Will Not Prime

- Air leak in suction pipe
- Air leak in pump manifold connections
- Suction strainer and lines clogged
- Excessive lift conditions
- Check valve wear
- Debris in check valve

OPERATION

The Air-Operated Double Diaphragm Pump requires a minimum of 20 psig of air to operate, with some variation according to diaphragm material. Increasing the air pressure results in a more rapid cycling of the pump and thus a higher liquid flow rate. In order to not exceed 120 psig of inlet air pressure, and for accurate control of the pump, it is suggested to use a pressure regulator on the air inlet.

An alternate means of controlling the flow-rate of the pump is to use an inlet air valve and partially open or close accordingly. When the air valve is completely in the closed position, the pump will cease to operate.

A third method of controlling the flow rate of the pump is to use a liquid discharge valve. Closing the liquid discharge valve will cause a decrease in the flow rate since the pump will operate against a higher discharge pressure.

Solenoid control of the inlet air may also be used in order to facilitate remote operation. A three way solenoid valve is recommended, in order to allow the air to "bleed off" between the solenoid and the pump.

Do not use valves for flow control on the suction side of the pump. (Closing or partially closing a liquid suction valve restrict the suction line and may cause damage to the diaphragms.) Suction strainers may be employed to reduce or eliminate larger solids, but routine maintenance is necessary in order to prevent a restriction on the suction.

MAINTENANCE

Due to the unique nature of each application, periodic inspection of the pump is the best method to determine a proper maintenance schedule. A record should be kept of all repairs made to an installed pump. This will serve as the best predictor of future maintenance.

The A025 pump is not designed for the wet end or air end to be field serviceable.

 **WARNING** Maintenance must not be performed when a hazardous atmosphere is present.

MAINTENANCE SCHEDULE

WEEKLY (OR DAILY)

Make a visual check of the pump. If pumped fluid is leaking out of the pump, pipe fittings or muffler turn off pump and schedule maintenance.

EVERY THREE MONTHS

Inspect fasteners and tighten any loose fasteners to recommended torque settings.

Schedule pump service based on pump's service history.

TORQUE SPECIFICATION CHART

RECOMMENDED TORQUE SPECIFICATIONS

	1/4" Pumps	Wrench Size
Manifold Bolts	55 in-lbs (6.2 N-m)	3/8 in
Polypropylene Chamber	50 in-lbs (5.7 N-m)	3/8 in
Polypropylene Chamber with PTFE Diaphragms	62.5 in-lbs (7.1 N-m)	3/8 in
PVDF Chamber	72.5 in-lbs (8.2 N-m)	3/8 in
PVDF Chamber with PTFE Diaphragms	80 in-lbs (9.0 N-m)	3/8 in
Air Valve	40 in-lbs (4.5 N-m)	3/8 in
Diaphragm Plates	40 in-lbs (4.5 N-m)	3/4 in

REPAIR AND ASSEMBLY

SUBMERSION-MUFFLER KIT INSTALLATION

TOOLS NEEDED

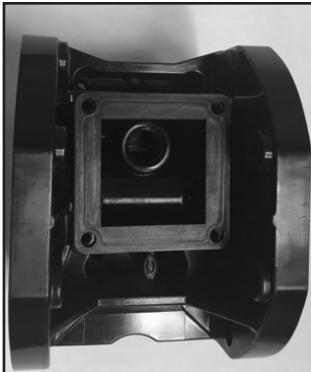
- 1) 1/4 Inch socket
- 2) 1/4 Inch socket wrench

⚠️ WARNING

Prior to servicing the pump, ensure that the air and fluid lines are closed and disconnected. While wearing personal protective equipment, flush and drain process liquid from the pump in a safe manner.

⚠️ WARNING

Maintenance must not be performed when a hazardous atmosphere is present.



STEP 1

Place “Submersion/Muffler Plate Gasket” onto back of intermediate and line up screw holes.

STEP 2

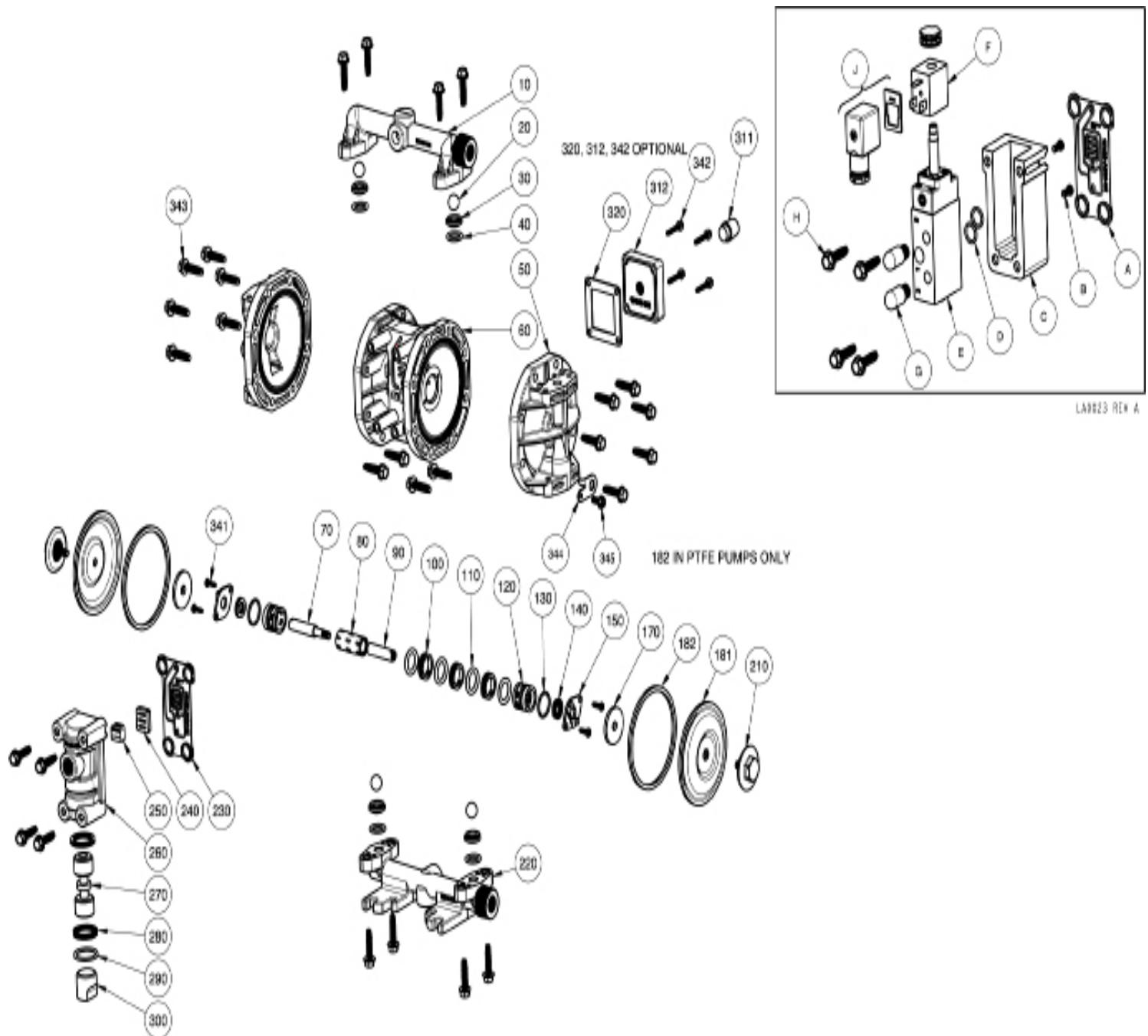
Place “Submersion/Muffler Plate” onto “Submersion/Muffler Plate Gasket” and line up screw holes.

STEP 3

Insert screws into screw holes. Tighten screws using a 1/4” socket and socket wrench (recommended), 1/4” wrench, or flathead screw driver.

EXPLODED VIEW & PARTS LIST

A025-S**-****-*** BOLTED PLASTIC



PARTS LIST - BOLTED PLASTIC

A025-S**-****_***

NO.	DESCRIPTION	QTY	PUMP MODEL	PART NO.	MATERIAL
10	DISCHARGE MANIFOLD	1	A025-S*P-****_*** A025-S*K-****_*** A025-S*G-****_*** A025-S*F-****_***	11345-40 11345-56 11345-97 11345-47	Polypropylene PVDF Conductive Polypropylene Conductive PVDF
20	BALL	4	A025-S**-*G**_*** A025-S**-*S**_*** A025-S**-*T**_***	11001-19 11001-23 11001-59	Bunalast™ Santoprene® PTFE
30	VALVE SEAT	4	A025-S*P-**P*-*** A025-S*K-**K*-***	10924-ROD-40 10924-ROD-56	Polypropylene PVDF
40	O-RING (Valve Seat)	4	A025-S**-***N_*** A025-S**-***V_*** A025-S**-***E_*** A025-S**-***T_***	11954-11 11954-13 11954-15 11954-17	Nitrile FKM EPDM PTFE
50	OUTER CHAMBER	2	A025-S*P-****_*** A025-S*K-****_*** A025-S*G-****_*** A025-S*F-****_***	10728-40 10728-56 10728-97 10728-47	Polypropylene PVDF Conductive Polypropylene Conductive PVDF
60	INTERMEDIATE	1	A025-S**-****_*** A025-S**-****_***	11502-40 11502-97	Polypropylene Conductive Polypropylene
70 & 90	DIAPHRAGM ROD ASSEMBLY	1	ALL MODELS	35008-00	Stainless Steel
80	PILOT SLEEVE	1	ALL MODELS	10109-31	Acetal
100	INNER SPACER (Pilot Sleeve)	3	ALL MODELS	10211-40	Polypropylene
110	O-RING (Pilot Sleeve)	4	ALL MODELS	11929-16	Urethane
120	END SPACER (Pilot Sleeve)	2	ALL MODELS	10210-40	Polypropylene
130	O-RING (End Spacer)	2	ALL MODELS	11955-11	Nitrile
140	LIP SEAL (Diaphragm Rod)	2	ALL MODELS	12005-76	Nitrile
150	RETAINING PLATE	2	ALL MODELS	12710-A025-60	Polypropylene
170	INNER DIAPHRAGM PLATE	2	ALL MODELS	11105-25	Plated Steel
181	DIAPHRAGM	2	A025-S**-G**_*** A025-S**-S**_*** A025-S**-T**_***	10604-19 10604-23 10604-59	Bunalast™ Santoprene® PTFE
182	DIAPHRAGM O-RING (PTFE ONLY)	2	A025-S**-T**_***	10606-23	Santoprene®
210	OUTER DIAPHRAGM PLATE W/ THREADED STUD	2	A025-S*X-****_*** A025-S*Z-****_***	11205-A025-40 11205-A025-56	Polypropylene PVDF
			X = P & G / Z = K & F		
220	SUCTION MANIFOLD	1	A025-S*P-****_*** A025-S*K-****_*** A025-S*G-****_*** A025-S*F-****_***	11346-40 11346-56 11346-97 11346-47	Polypropylene PVDF Conductive Polypropylene Conductive PVDF
230	AIR VALVE GASKET	1	ALL MODELS	12128-A025-11	Nitrile
240	SHUTTLE PLATE	1	ALL MODELS	10419-A025-77	Ceramic

PARTS LIST - BOLTED PLASTIC

A025-S**-****-***

NO.	DESCRIPTION	QTY	PUMP MODEL	PART NO.	MATERIAL
250	SHUTTLE	1	ALL MODELS	10432-35	Special
260	AIR VALVE BODY	1	A025-S**-****-***	11615-40	Polypropylene
			A025-S**-****-***	11615-97	Conductive Polypropylene
270	AIR VALVE SPOOL	1	ALL MODELS	10484-31	Acetal
280	LIP SEAL (Air Valve)	2	ALL MODELS	12002-76	Nitrile
290	O-RING (Valve Plug)	1	ALL MODELS	11904-11	Nitrile
300	AIR VALVE END PLUG	1	ALL MODELS	11707-40	Polypropylene
311	MUFFLER	1	ALL MODELS	13003-00	Polypropylene
312	MUFFLER PLATE	1	OPTIONAL*	13105-40	Polypropylene
320	GASKET (Muffler Plate)	1	OPTIONAL*	12129-11	Nitrile
341	SCREW (#6 x 1/2")	4	ALL MODELS	12510-26	Stainless Steel
342	SCREW (#8 x 1")	4	OPTIONAL*	12525-26	Stainless Steel
343	SCREW (1/4" - 10 x 1")	28	ALL MODELS	12562-26	Stainless Steel
344	GROUNDING TAB	1	CONDUCTIVE MODELS	00-8306-03	Stainless Steel
345	GROUNDING SCREW (1/4" - 10 x 1")	1	CONDUCTIVE MODELS	04-6345-08	Mild Steel

* Sold as part of 56000-00, Submersion Kit

OPTIONAL SOLENOID CONTROL VALVE

Part Number	Description	QTY
A 12128-A025-11	Gasket-Air Valve-A025-Buna	1
B 12560-375-25	Bolt-SHCS-8-32X3/8-Low Profile	2
C 13459-31	Adapter-Plate-Solenoid-A025	1
D 11957-11	O-Ring-013-.438IDX.063W-Buna	2
E 13432-00	Valve-Solenoid-4-Way-A025	1
F 13431-10	Coil-Solenoid-A025 - 110 VAC	1
13431-12	Coil-Solenoid-A025 - 12 VDC	1
13431-20	Coil-Solenoid-A025 - 220 VAC	1
13431-24	Coil-Solenoid-A025 - 24 VDC	1
G 13117-00	Muffler-1/8" NPT POLY	2
H 12562-26	Screw-HWHSTF-1/4-10x1.00"-SS	4
J 00-2130-99	Connector, Solenoid Coil	1

SOLENOID CONTROL FOR AIR OPERATED DOUBLE DIAPHRAGM PUMPS

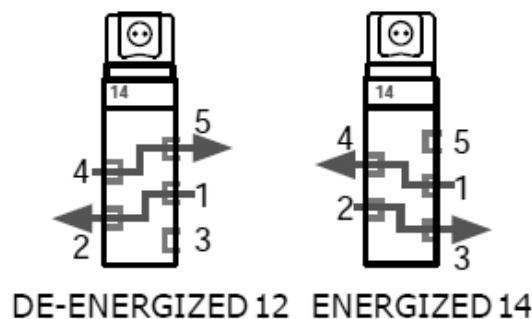
The A025 can be configured with solenoid pulse control to enable metering and dispensing application. The solenoid is available in 4 voltages, 110 VAC, 220 VAC, 12 VDC and 24 VDC. All solenoid equipped pumps have a standard DIN 43650B male connector. The A025 has an optional DIN 43650C male connector that can replace the standard DIN 43650B male connector. See pump product manual for configuration codes.



SOLENOID ELECTRICAL PROPERTIES

Voltage +/- 10%	Current (Amps) Inrush	Resist. (OHMS @ 25° C)	Power (AC = VA, DC = Watts)
110/50	.02	.02	2310
110/60			2.4
220/50	.01	.01	9515
220/60			2.4
12 VDC	.15	.15	78
24 VDC	.09	.09	283
			2.0

Valve Operation



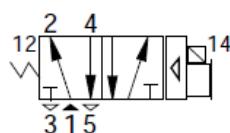
5/2 SINGLE

De-Energized:

Pressure from Port 1 to Port 2
Exhaust from Port 4 to Port 5

Energized:

Pressure from Port 1 to Port 4
Exhaust from Port 2 to Port 3



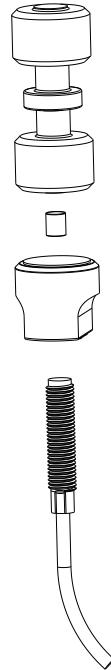
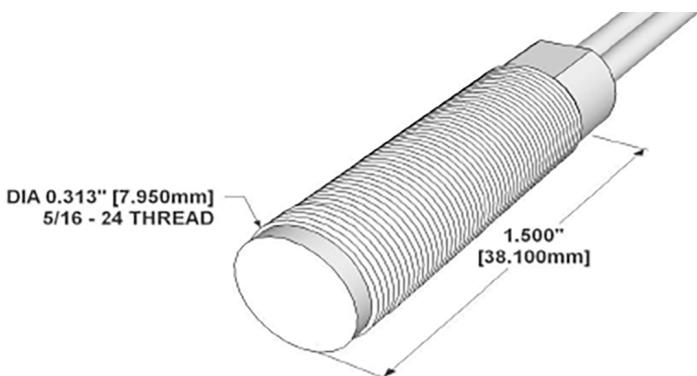
OPTIONAL ACCESSORIES

PART NO.	DESCRIPTION
13465-00	Illuminated Connector with 6' cord for 110/220 VAC Solenoid
13466-00	Illuminated Connector with 6' cord for 12/24 VDC Solenoid

CYCLE COUNTER FOR AIR OPERATED DOUBLE DIAPHRAGM PUMPS

OPERATIONAL DESCRIPTION:

The cycle counter model operates via a magnetically actuated proximity-switch installed into the main air-valve. The switch closes when the spool is in the down position, thus allowing open loop metering applications.



Physical	Configuration*	SPST
	Form*	A
	Contact Position	CENTER
	Glass L	14.50 mm
	Glass D	2.54 mm
	Total L*	46.00 mm
	Wire D	0.60 mm
	Gap Location	CENTER
	Mount Spec*	THRU
	Contact Material	RUTHENIUM
	Max Vibration Resistance	10 G
	Max Shock Resistance	150 G
Operating	Lead Tensile Strength	N/A KG
	Pull in (+/- 2AT)*	15 - 23 AT
	Drop out*	7.5-17.5 AT
	Operate Time	0.10 ms
	Bounce Time	0.15 ms
	Release Time	30 μ s
	Resonant Frequency	5100 Hz
	Max Operating Frequency	N/A Hz
	Operating Temperature Range	-55 - 105 °C
	Storage Temperature	N/A °C
Electrical	DC Contact Rating	15 W
	AC Contact Rating	N/A VA
	DC Switching Voltage	200 VDC
	AC Switching Voltage	140 VAC
	DC Switching Current	1.00 A
	AC Switching Current	1.00 A
	DC Max Carry Current	1.75 A
	AC Max Carry Current	1.75 A
	Min Breakdown Voltage	275 VDC
	Max Initial Contact Resistance	100 mOhm
	Typical Initial Contact Resistance	70 mOhm
	Max Contact Capacitance	0.30 pF
	Min Insulation Resistance	10^6 Ohm

* Pre-processed, bare reed element

Assembly Characteristics		
Housing	2250	
Housing Material	CELANEX 3316	
Reed	1051	
Configuration	SPST	
Form	A	
Wire/Cable Characteristics		
Type	WIRES	
Length	6.0/152.4	in/mm
Conductor Count	2	
Colors	BLK	
Insulation Material & Description	PVC	
Gauge	24	AWG
Stranded Copper	7	STR-TC
Maximum temperature	105 °C	
Standard Actuator/Minimum Make Distance		
2250-4002-000 - Alnico 5 - Cylinder	.13/3.3	in/mm
Assembly Certifications		
UL RECOGNIZED (File #: E102207)	Y	
RoHS	Y	

ELASTOMERS & REPAIR KITS

WETTED ELASTOMERS

BUNA-N (NITRILE)

is a general purpose elastomer used with water and many oils. Temperature range 10°F to 180°F (-12°C to 82°C).

EPDM

is a general purpose elastomer with good resistance to many acids and bases. Temperature range -40°F to 280°F (-40°C to 138°C).

FKM

is an elastomer with good corrosion resistance to a wide variety of chemicals. Temperature range -40°F to 350°F (-40°C to 177°C).

Most of the above elastomers are available in FDA approved formulations.

BUNALAST™

is an injection molded thermoplastic material with characteristics similar to Santoprene®. Has excellent abrasion resistance. Temperature range -40°F to 266°F (-40°C to 130°C).

SANTOPRENE®

is an injection molded material with characteristics similar to EPDM. Has excellent abrasion resistance. Temperature range -40°F to 225°F (-40°C to 107°C).

PTFE (POLYTETRAFLUOROETHYLENE)

is a thermoplastic polymer that is inert to most chemicals. Temperature range 40°F to 220°F (4°C to 104°C).

Geolast® is a registered trademark of ExxonMobil Chemical Co.

Santoprene® is a registered trademark of ExxonMobil Chemical Co.

Hytrel® is a registered trademark of DuPont Performance Elastomers L.L.C.

Magnalube® is a registered trademark of Carleton-Stuart Corp.

WARRANTY AND REGISTRATION

WARRANTY. All All-Flo products shall be covered by the standard All-Flo Limited Warranty in effect at the time of shipment. This warranty (which may be modified by All-Flo at any time) provides:

MATERIALS SOLD ARE WARRANTED TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE (RENTAL USE EXCLUDED) FOR FIVE YEARS AFTER PURCHASE DATE. ANY PUMP WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL AND WORKMANSHIP AND RETURNED TO ALL-FLO, SHIPPING COSTS PREPAID, WILL BE REPAIRED OR REPLACED AT ALL-FLO'S OPTION. CUSTOMER SHALL NOTIFY ALL-FLO IN WRITING WITHIN 30 DAYS OF ANY CLAIMED DEFECTS. NO MATERIALS CAN BE RETURNED WITHOUT THE PRIOR CONSENT OF ALL-FLO, AND IF APPROVED SHALL BE RETURNED TO ALL-FLO FREIGHT PREPAID. ALL-FLO'S LIABILITY FOR ANY BREACH OF THIS WARRANTY SHALL BE LIMITED TO EITHER REPLACEMENT OF THE MATERIALS OR, AT ALL-FLO'S SOLE OPTION, THE REFUND OF THE PURCHASE PRICE. ALL-FLO SHALL NOT BE HELD LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY BREACH OF THIS WARRANTY. THIS EXCLUSION APPLIES WHETHER SUCH DAMAGES WERE SOUGHT BASED ON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT, OR ANY OTHER LEGAL THEORY. FURTHER, ALL-FLO SHALL NOT BE LIABLE FOR LOSSES, DELAYS, LABOR COSTS, OR ANY OTHER COST OR EXPENSE DIRECTLY OR INDIRECTLY ARISING FROM THE USE OF MATERIALS. ALL-FLO'S LIABILITY IS EXPRESSLY LIMITED TO THE REPLACEMENT OR REPAIR OF DEFECTIVE GOODS, OR THE TOTAL VALUE OF SUCH GOODS. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, OR ORAL INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM A COURSE OF DEALING OR TRADE. All-Flo will not, in ANY event, be liable for any loss of profit, interruption of business or any other special, consequential or incidental damages suffered or sustained by Customer. All-Flo's total maximum liability to the customer in respect of sale of materials or services rendered by All-Flo is limited to the total monies received by All-Flo from the customer for the particular materials described in Customer's order.

All-Flo does not warrant any part or component that it does not manufacture, but will assign to the original end-user purchaser of any warranty received by it from the manufacturer, to extent such pass through is permitted by the manufacturer.



REGISTRATION FORM

Pump Model _____

Pump Serial Number _____

Company Name _____

Name _____

Email _____

Phone # _____

City _____

State _____ Zip _____

Qty of Pumps _____

Fluid Pumping _____

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Where Innovation Flows