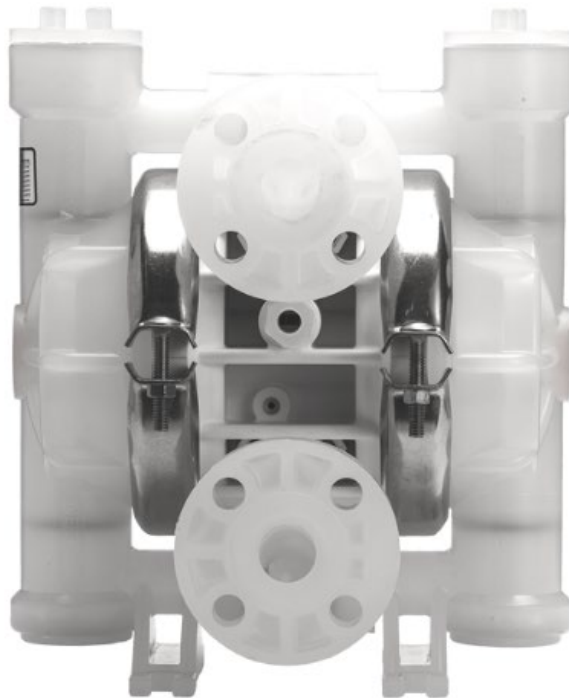


# EOM

ENGINEERING OPERATION  
& MAINTENANCE

# A2 Accu-Flo Clamped Plastic Pump



Where Innovation Flows

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## WILDEN®

WIL-10070-E-03

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## Warranty

Each and every product manufactured by Wilden is built to meet the highest standards of quality. Every pump is functionally tested to insure integrity of operation. Wilden warrants that pumps, accessories and parts manufactured or supplied by it to be free from defects in material and workmanship for a period of five (5) years from date of installation or six (6) years from date of manufacture, whichever comes first.

For more information, and to register your Wilden pump for warranty, please visit <https://www.psgdover.com/wilden/support/warranty-registration>.

## Certifications



## Section 1

### Precautions - Read First!



#### TEMPERATURE LIMITS:

Polypropylene	0°C to 79°C	32°F to 175°F
PVDF	-12°C to 107°C	10°F to 225°F
Neoprene	-17.8°C to 93.3°C	0°F to 200°F
Buna-N	-12.2°C to 82.2°C	10°F to 180°F
EPDM	-51.1°C to 137.8°C	-60°F to 280°F
FKM	-40°C to 176.7°C	-40°F to 350°F
Wil-Flex®	-40°C to 107.2°C	-40°F to 225°F
Polyurethane	-12.2°C to 65.6°C	10°F to 150°F
Saniflex™	-28.9°C to 104.4°C	-20°F to 220°F
PTFE	4.4°C to 104.4°C	40°F to 220°F
Polypropylene	0°C to 79°C	32°F to 175°F
PVDF	-12°C to 107°C	10°F to 225°F

**NOTE:** Not all materials are available for all models. See "Wilden Pump Designation System on page 5 for material options for your pump.



**CAUTION:** When choosing pump materials, be sure to check the temperature limits for all wetted components. Example: FKM® has a maximum limit of 176.7°C (350°F) but polypropylene has a maximum limit of only 79°C (175°F).



**CAUTION:** Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult engineering guide for chemical compatibility and temperature limits.



**CAUTION:** Always wear safety glasses when operating pump. If diaphragm rupture occurs, material being pumped may be forced out air exhaust.



**WARNING:** Prevention of static sparking — If static sparking occurs, fire or explosion could result. Pump, valves, and containers must be properly grounded when handling flammable fluids and whenever discharge of static electricity is a hazard.



**CAUTION:** Do not exceed 8.6 bar (125 psig) air supply pressure.



**CAUTION:** Plastic series pumps are made of virgin plastic and are not UV stabilized. Direct sunlight for prolonged periods can cause deterioration of plastics.



**CAUTION:** Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from pump. Disconnect all intake, discharge and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container.



**CAUTION:** Blow out air line for 10 to 20 seconds before attaching to pump to make sure all pipe line debris is clear. Use an in-line air filter. A 5μ (micron) air filter is recommended.



**NOTE:** Tighten clamp bands and retainers prior to installation. Fittings may loosen during transportation.



**NOTE:** When installing PTFE diaphragms, it is important to tighten outer pistons simultaneously (turning in opposite directions) to ensure tight fit.



**NOTE:** Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.



**CAUTION:** Verify the chemical compatibility of the process and cleaning fluid to the pump's component materials in the Chemical Resistance Guide (see RBG E4).



**CAUTION:** Only explosion proof (NEMA 7) solenoid valves should be used in areas where explosion proof equipment is required



**CAUTION:** Do not lubricate lube-free pumps.



**CAUTION:** The A2 pump is not submersible.



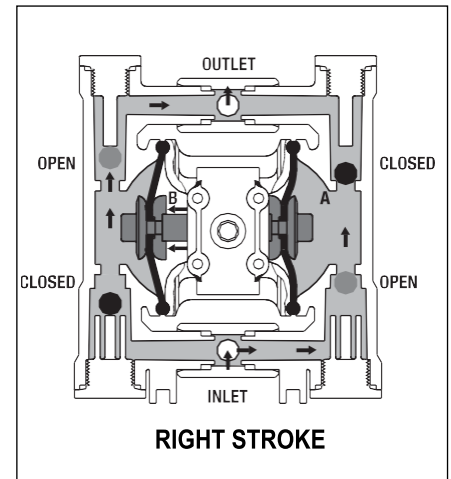
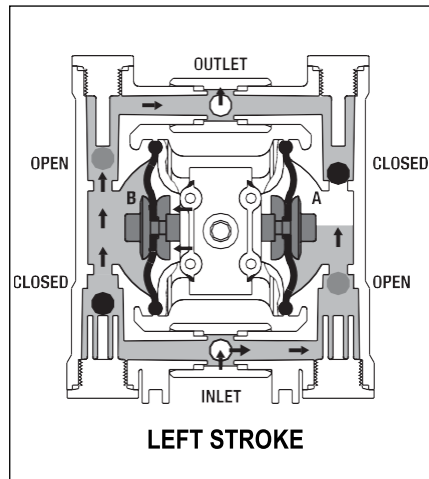
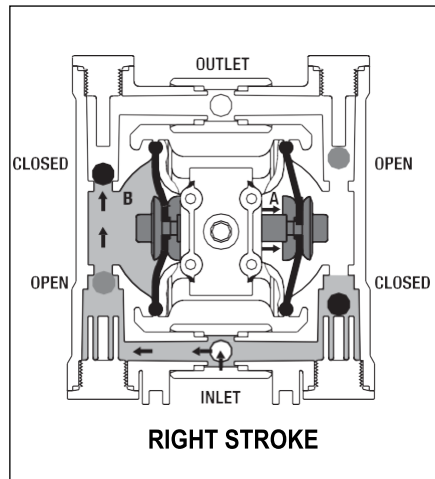
**NOTE:** When reinstalling the outer pistons, apply two (2) drops of Loctite® 246 to the shaft internal threads before the diaphragm assembly.



## Section 3

## HOW IT WORKS — PUMP

*The Wilden diaphragm pump is an air-operated, positive displacement, self-priming pump. These drawings show the flow pattern through the pump upon its initial stroke. It is assumed the pump has no fluid in it prior to its initial stroke.*



**FIGURE 1** When the solenoid is energized, the air valve directs pressure to the back side of diaphragm A. The compressed air is applied directly to the liquid column separated by elastomeric diaphragms. The diaphragm acts as a membrane between the compressed air and the liquid, balancing the load and removing mechanical stress from the diaphragm. The compressed air moves the diaphragm away from the center section of the pump. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port. The movement of diaphragm B toward the center section of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off of its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber (see shaded area).

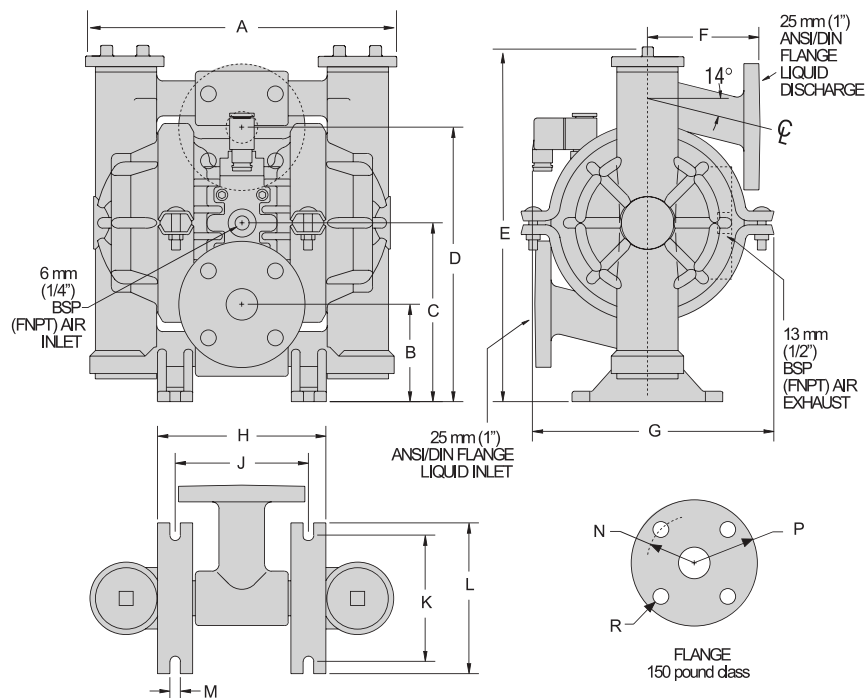
**FIGURE 2** When the solenoid valve is deenergized, the air valve redirects pressurized air to the back side of diaphragm B. The pressurized air forces diaphragm B away from the center section while pulling diaphragm A to the center section. Diaphragm B is now on its discharge stroke. Diaphragm B forces the inlet valve ball onto its seat due to the hydraulic forces developed in the liquid chamber and manifold of the pump. These same hydraulic forces lift the discharge valve ball off of its seat, forcing fluid to flow through the pump discharge. The movement of diaphragm A toward the center section of the pump creates a vacuum within liquid chamber A. Atmospheric pressure forces fluid into the inlet manifold of the pump. The inlet valve ball is forced off of its seat allowing the fluid being pumped to fill the liquid chamber.

**FIGURE 3** Once the solenoid valve is reenergized, the air is directed to the back side of diaphragm A, which starts diaphragm B on its exhaust stroke. As the pump reaches its original starting point, each diaphragm has gone through one intake and one discharge stroke. This constitutes one complete pumping cycle. The pump may take several cycles to completely prime depending on the conditions of the application.

## Section 4

## DIMENSIONAL DRAWING

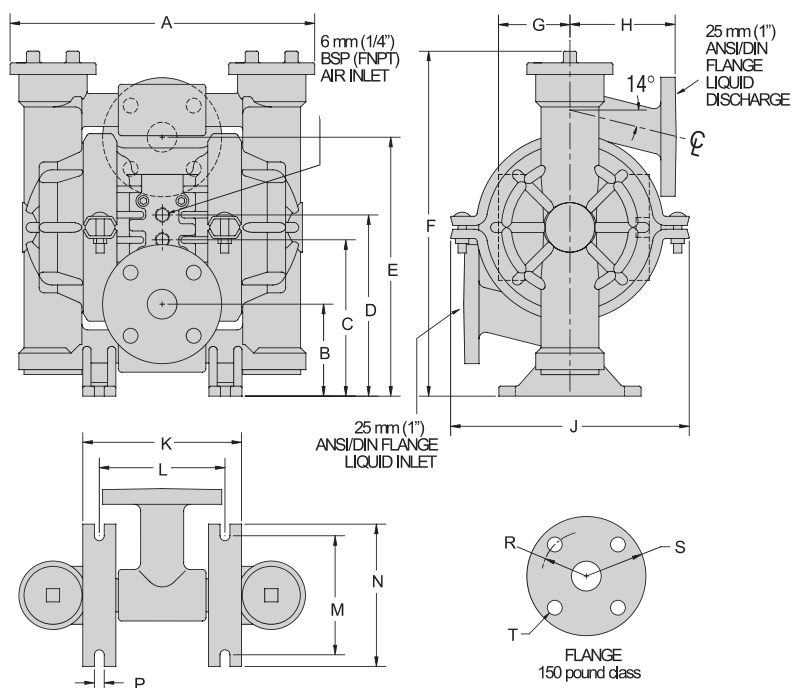
### A2T Plastic Accu-Flo™



### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	297	11.7
B	74	2.9
C	163	6.4
D	251	9.9
E	335	13.2
F	107	4.2
G	229	9.0
H	157	6.2
J	124	4.9
K	114	4.5
L	137	5.4
M	10	0.4
N	79 DIA.	3.1 DIA.
P	109 DIA.	4.3 DIA.
R	15 DIA.	0.6 DIA.

### A2B Plastic (T-Series Center Section)

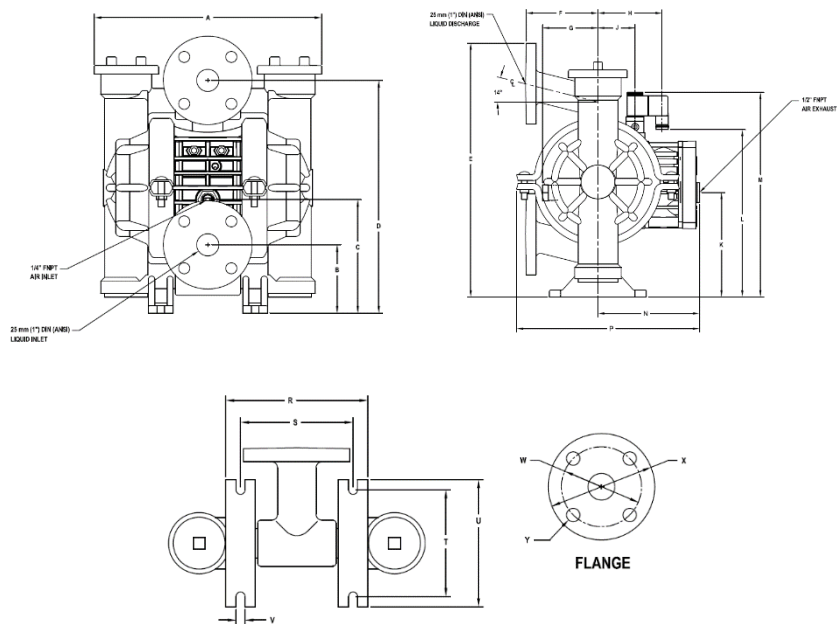


### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	297	11.7
B	74	2.9
C	150	5.9
D	173	6.8
E	251	9.9
F	335	13.2
G	69	2.7
H	107	4.2
J	239	9.4
K	114	4.5
L	137	5.4
M	124	4.9
N	157	6.2
P	10	0.4
R	79 DIA.	3.1 DIA.
S	109 DIA.	4.3 DIA.
T	15 DIA.	0.6 DIA.

## DIMENSIONAL DRAWING

### A2P Plastic Accu-Flo™

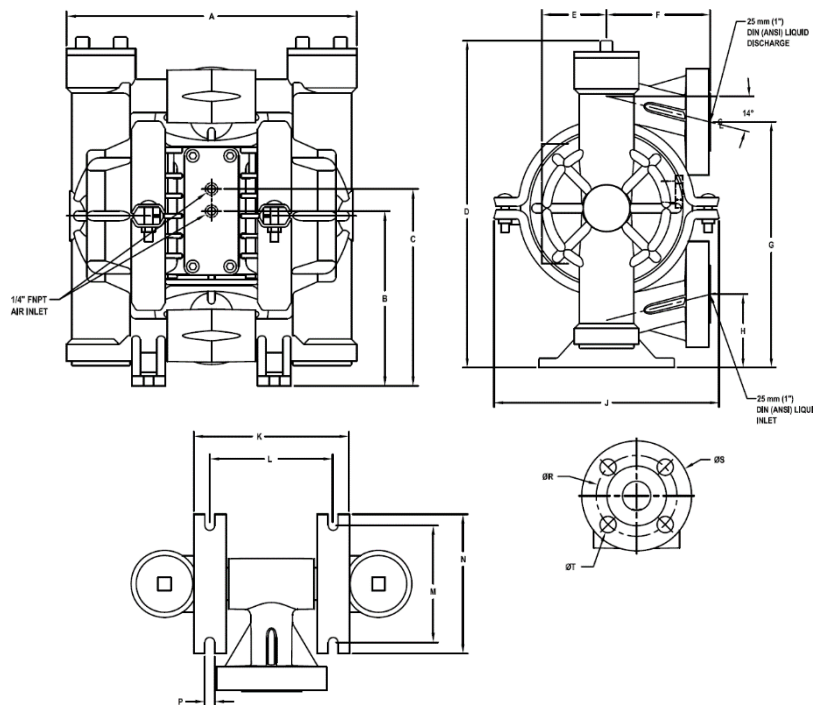


### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	297	11.7
B	74	2.9
C	147	5.8
D	308	12.1
E	356	14.0
F	107	4.2
G	69	2.7
H	91	3.6
J	53	2.1
K	147	5.8
L	236	9.3
M	287	11.3
N	142	5.6
P	259	10.2
R	157	6.2
S	125	4.9
T	115	4.5
U	138	5.4
V	10	.4
	DIN	ANSI
W	85 DIA.	3.1 DIA.
X	115 DIA.	4.3 DIA.
Y	14 DIA.	.6 DIA.

LW0409 REV. A

### A2B Plastic (P-Series Center Section)



### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	277	10.9
B	166	6.5
C	187	7.4
D	333	13.1
E	66	2.6
F	107	4.2
G	249	9.8
H	76	3.0
J	124	4.9
K	152	6.0
L	122	4.8
M	114	4.5
N	137	5.4
P	10	0.4
DIN		
R	84 DIA.	3.3 DIA.
S	114 DIA.	4.5 DIA.
T	15 DIA.	.6 DIA.
ANSI		
R	79 DIA.	3.1 DIA.
S	109 DIA.	4.3 DIA.
T	15 DIA.	0.6 DIA.

LW0474 REV. A



## Section 5

### A2T PLASTIC RUBBER-FITTED

Height ..... 335 mm (13.2")  
Width ..... 297 mm (11.7")  
Depth ..... 239 mm (9.4")  
Est. Ship Weight .....  
Polypropylene 8 kg (18 lbs)  
PVDF 10 kg (23 lbs)  
Air Inlet ..... 6 mm (1/4")  
Inlet ..... 25 mm (1")  
Outlet ..... 25 mm (1")  
Suction Lift ..... 4.5 m Dry ( 14.7')  
9.3 m Wet ( 30.6')  
Disp. Per Stroke<sup>1</sup> ..... 0.06 l (0.015 gal.)  
Max. Flow Rate ..... 95 lpm (25 gpm)  
Max. Size Solids ..... 3.2 mm (1/8")

<sup>1</sup>Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

**Example:** To pump 37.9 lpm (10 gpm) against a discharge pressure head of 3.0 bar (44 psig) requires 4.1 bar (60 psig) and 20.4 Nm<sup>3</sup>/h (12.0 scfm) air consumption. (See dot on chart.)

**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

### A.025T PLASTIC PTFE-FITTED

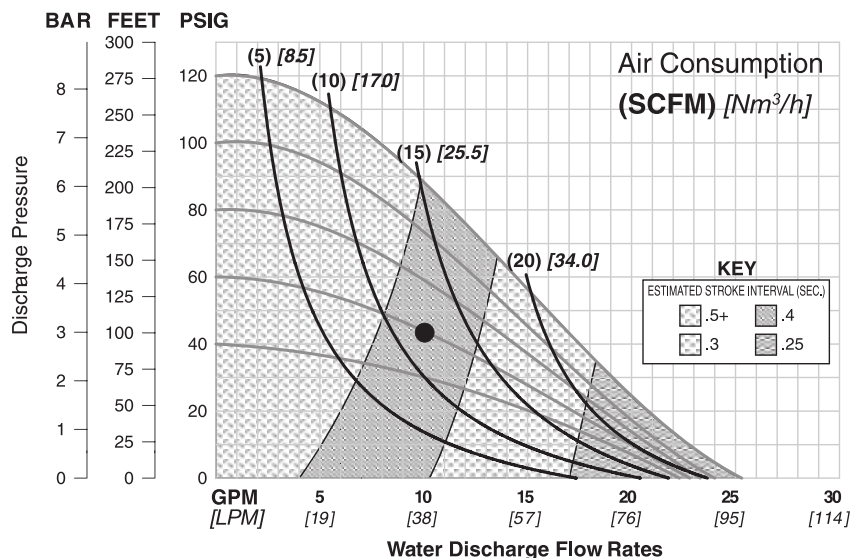
Height ..... 335 mm (13.2")  
Width ..... 297 mm (11.7")  
Depth ..... 239 mm (9.4")  
Est. Ship Weight .....  
Polypropylene 8 kg (18 lbs)  
PVDF 10 kg (23 lbs)  
Air Inlet ..... 6 mm (1/4")  
Inlet ..... 25 mm (1")  
Outlet ..... 25 mm (1")  
Suction Lift ..... 3.5 m Dry (11.3')  
9.3 m Wet ( 30.6')  
Disp. Per Stroke<sup>1</sup> ..... 0.05 l (0.014 gal.)  
Max. Flow Rate ..... 61 lpm (16 gpm)  
Max. Size Solids ..... 3.2 mm (1/8")

<sup>1</sup>Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

**Example:** To pump 18.95 lpm (5 gpm) against a discharge pressure head of 2.8 bar (40 psig) requires 4.1 bar (60 psig) and 15.3 Nm<sup>3</sup>/h (9 scfm) air consumption. (See dot on chart.)

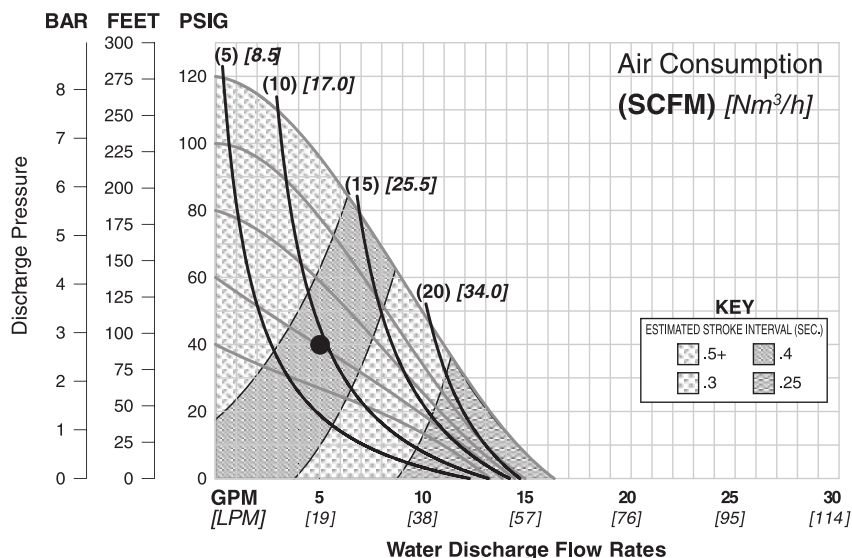
**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

## PERFORMANCE



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

## A2P PLASTIC RUBBER-FITTED

Height ..... 356 mm (14.0")  
Width ..... 297 mm (11.7")  
Depth ..... 259 mm (10.2")  
Est. Ship Weight .....  
Polypropylene 8 kg (18 lbs)  
PVDF 10 kg (23 lbs)  
Air Inlet ..... 6 mm (1/4")  
Inlet ..... 25 mm (1")  
Outlet ..... 25 mm (1")  
Suction Lift ..... 6.2 m Dry (20.4')  
9.0 m Wet (29.5')  
Disp. Per Stroke<sup>1</sup> ..... 0.12 l (0.030 gal.)  
Max. Flow Rate ..... 136 lpm (36 gpm)  
Max. Size Solids ..... 3.2 mm (1/8")

<sup>1</sup>Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

**Example:** To pump 75.7 lpm (20 gpm) against a discharge pressure head of 2.6 bar (37 psig) requires 4.1 bar (60 psig) and 40.8 Nm<sup>3</sup>/h (24 scfm) air consumption. (See dot on chart.)

**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

## A2P PLASTIC PTFE-FITTED

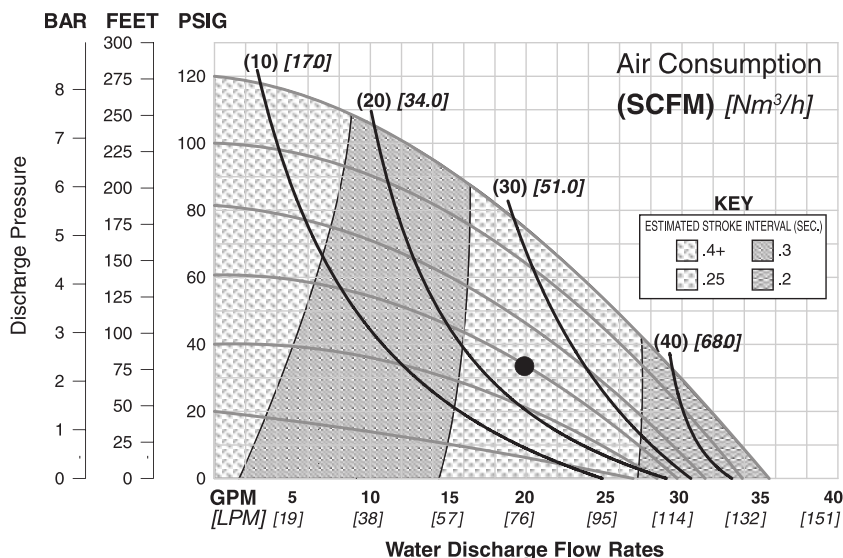
Height ..... 356 mm (14.0")  
Width ..... 297 mm (11.7")  
Depth ..... 259 mm (10.2")  
Est. Ship Weight .....  
Polypropylene 8 kg (18 lbs)  
PVDF 10 kg (23 lbs)  
Air Inlet ..... 6 mm (1/4")  
Inlet ..... 25 mm (1")  
Outlet ..... 25 mm (1")  
Suction Lift ..... 5.2 m Dry ( 17.0')  
9.0 m Wet (29.5')  
Disp. Per Stroke<sup>1</sup> ..... 0.11 l (0.028 gal.)  
Max. Flow Rate ..... 110 lpm (29 gpm)  
Max. Size Solids ..... 3.2 mm (1/8")

<sup>1</sup>Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

**Example:** To pump 37.9 lpm (10 gpm) against a discharge pressure head of 3.2 bar (48 psig) requires 4.1 bar (60 psig) and 32.3 Nm<sup>3</sup>/h (19 scfm) air consumption. (See dot on chart.)

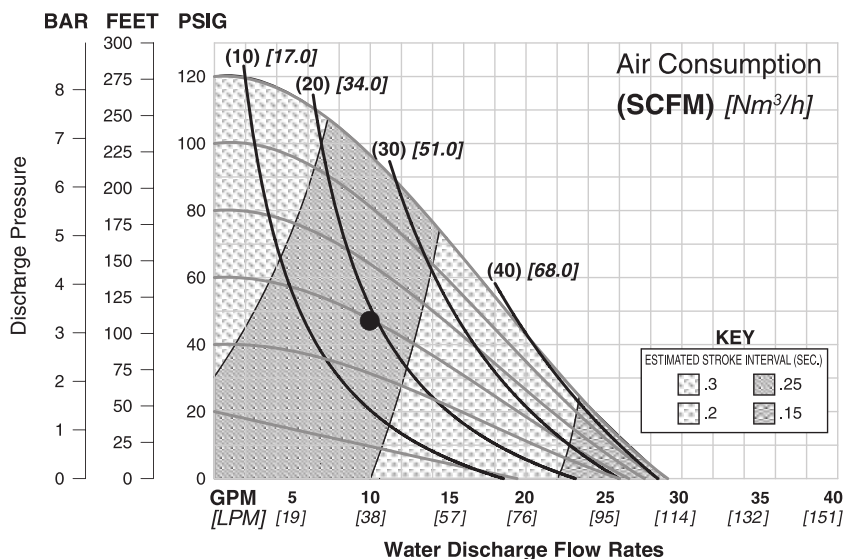
**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

## PERFORMANCE



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.



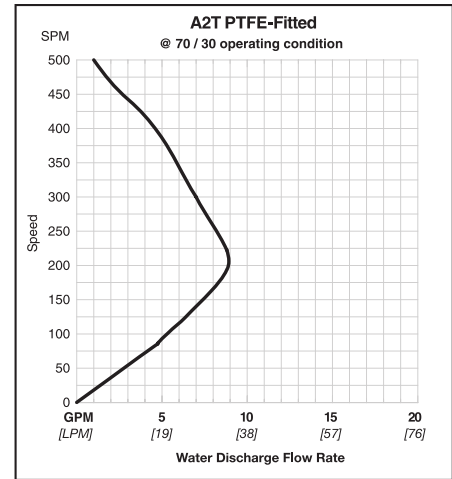
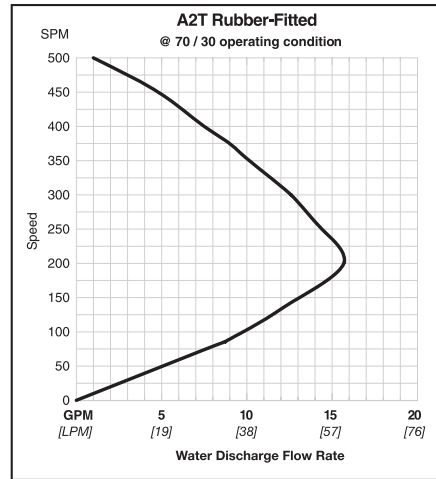
Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

## 70/30 OPERATING CONDITIONS

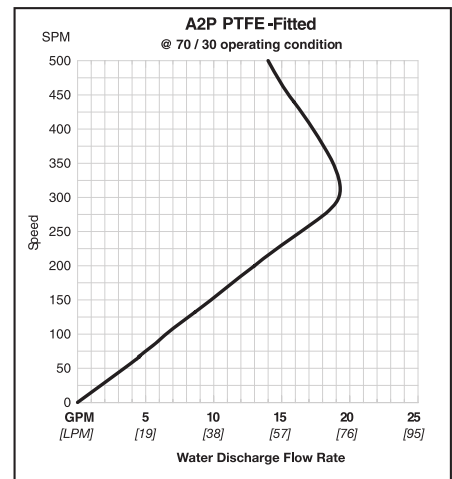
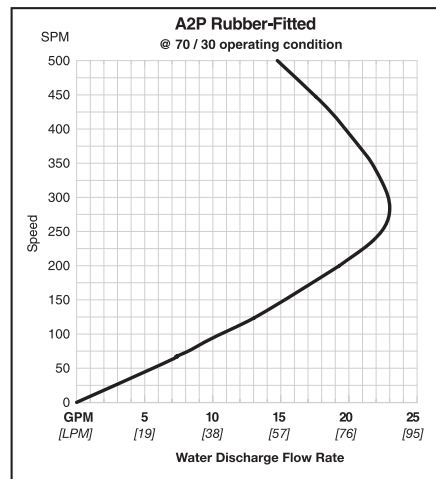
### A2T PLASTIC ACCU-FLO™

These curves demonstrate the flow created when the stroke rate is modified under static air and fluid pressure condition. This curve can be applied to different pressure conditions to estimate the change in flow due to stroke rate.



### A2P PLASTIC ACCU-FLO™

These curves demonstrate the flow created when the stroke rate is modified under static air and fluid pressure condition. This curve can be applied to different pressure conditions to estimate the change in flow due to stroke rate.



## Section 6

# Suggested Installation, Operation, Maintenance and Troubleshooting

All Wilden pumps are manufactured with a variety of materials for the air distribution system, liquid path and elastomers. This variety is offered to satisfy the temperature, chemical compatibility, abrasion and flex life requirements for most applications. Consult manual for available materials and temperature limitations for this pump model.

For Accu-Flo™ models only, all wiring used to operate the pump should be placed and connected according to all applicable electrical codes. It is important that the wiring be of adequate gauge to carry the current required to operate the pump. In addition, it is necessary that the electrical power supply be large enough to supply the current required to operate the pump. Wiring should be above ground level if possible (in case of fluid spill or leakage), and all wiring and connections which could become wet or damp should be made watertight.

The suction pipe used for installation should be sized equal to, or greater than, the pump liquid inlet connection. This will minimize pump cavitation and potential blockages of the pump inlet. The discharge piping should also be sized equal to, or greater than, the pump liquid discharge connection. If the pump is to be used in a self-priming application, be sure that all connections are airtight and that the suction lift is within the pump's ability. (Consult manual for suction lift information.)



**NOTE:** Materials of construction and elastomer materials have an effect on suction lift parameters.

## Installation

Months of careful planning, study and selection efforts can result in unsatisfactory pump performance if installation details are left to chance. Premature failure and long term dissatisfaction can be avoided if reasonable care is exercised throughout the installation process.

## Location

Noise, safety, and other logistical factors usually dictate that "utility" equipment be situated away from the production floor. Multiple installations with conflicting requirements can result in congested utility areas, leaving few choices for siting additional pumps.

Within the framework of these and other existing conditions, every pump should be located in such a way that four key factors are balanced against each other to maximum advantage:

- **Access:** First of all, the location should be accessible. If it is easy to reach the pump, maintenance personnel will have an easier time carrying out routine inspections and adjustments. Should major repairs become necessary, ease of access can play a key role in speeding the repair process and reducing total downtime.
- **Air Supply:** Every pump location should have an air line large enough to supply the volume of air necessary to achieve the desired pumping rate. (Consult manual for performance information.) The use of an air filter before the pump will ensure that the majority of pipeline contaminants will be eliminated. For best results, the pump should use an air filter, regulator system.  
Sound levels are reduced below OSHA specifications using the standard Wilden muffler.
- **Elevation:** Selecting a site that is well within the pump's dynamic lift capability will assure that a loss-of-prime condition will be avoided. In addition, pump efficiency can be adversely effected if proper attention is not given to site location.

- **Piping:** Final determination of the pump site should not be made until the piping problems of each possible location have been evaluated. The impact of current and future installations should be considered ahead of time to make sure that inadvertent restrictions are not created for any remaining sites.

The best choice possible will be a site involving the shortest and straightest hook-up of suction and discharge piping. Unnecessary elbows, bends, and fittings should be avoided. Pipe sizes should be selected so as to keep friction losses within practical limits. All piping should be supported independently of the pump to avoid damage. In addition, the piping should be aligned so as to avoid placing stress on the pump fittings.

Flexible hose can be installed to aid absorbing the forces created by the natural reciprocating action of the pump. If the pump is to be bolted down to a solid location, a mounting pad placed between the pump and the foundation will assist in minimizing pump vibration. Flexible connections between the pump and rigid piping will also assist in minimizing pump vibration. If quick-closing valves are installed at any point in the discharge system, or if pulsation within a system becomes a problem, a Wilden Equalizer® surge dampener should be installed to protect the pump, piping and gauges from surges and water hammer. Installation of a tee at the discharge of the pump will allow the addition of an Equalizer to the system at a later date without requiring piping modifications. Installation of inlet and discharge isolation valves are also recommended to make service and repair easier.

Pumps in service with a positive suction head are most efficient when pressure is limited to 0.4-0.7 bar (7-10 psig). Premature diaphragm failure may occur if positive suction exceeds these recommended pressures.

**A STRAINER SHOULD BE USED ON THE SUCTION LINE OF THE SYSTEM IF THERE IS A POSSIBILITY THAT SOLIDS ENTERING THE PUMP MAY EXCEED THE PUMP'S SOLIDS HANDLING CAPABILITIES.**

**PLEASE READ AND FOLLOW ALL CAUTIONS NOTED IN THIS MANUAL.**

**Pump should be thoroughly flushed before installing into process line.**

**Blow out air line for 10 to 20 seconds before attaching pump to clear all pipe line debris.**

# Suggested Installation, Operation, Maintenance and Troubleshooting

## Operating Principles Behind Accu-Flo™ Pumps

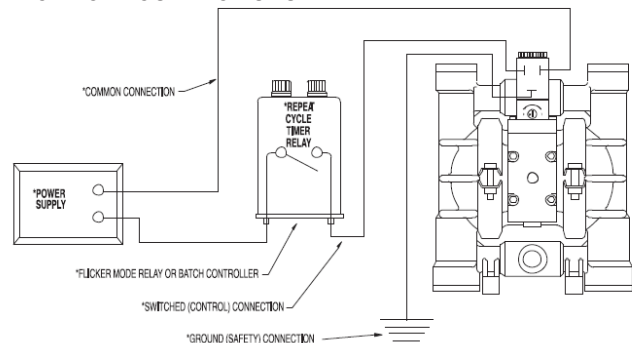
When the solenoid is unpowered, one air chamber is pressurized with air, while the opposite chamber is exhausted. When electric power is applied, the solenoid shifts, and the pressurized air chamber is exhausted while the opposite chamber is pressurized. By alternately applying and removing power, the solenoid-operated pump runs like a standard Wilden pump.

The speed of the pump is controlled electrically. Since each stroke is controlled by an electrical signal, the pump is ideal for batching and other electrically controlled dispensing applications.

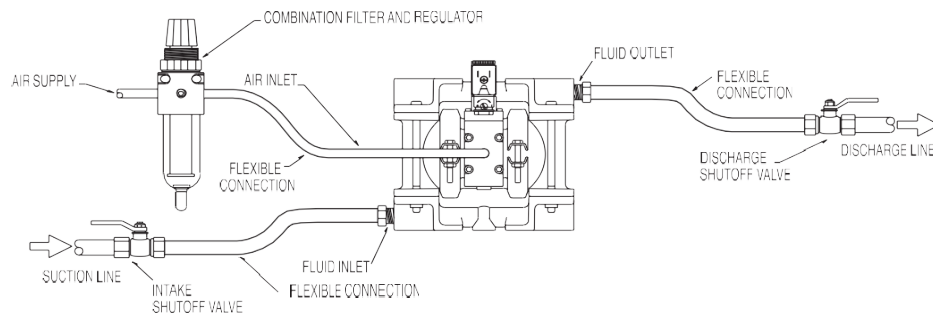
Although the speed of the pump is controlled electrically, the air pressure is important. Air pressure displaces the fluid, and if the pressure is insufficient to complete the physical stroke before an electronic impulse signals the pump to shift, the stroke will not be completed, and the displacement per stroke will be reduced. This does not harm the unit in any way, but it may cause inaccuracy when attempting to batch specific quantities with high precision if this effect is not taken into account.

There are three coil voltage options available. One coil allows for 24V DC operation. The second coil option allows for operation with either 12V DC or 24V AC at 60 Hz and the third coil option allows for 110V AC operation.

## ELECTRICAL CONNECTIONS



## Plumbing Connections



The speed of the pump is controlled electrically. Since each stroke is controlled by an electrical signal, the pump is ideal for batching and other electrically controlled dispensing applications. The pump will not shift reliably unless the minimum supply pressure is supplied. For the A2T the minimum supply pressure for reliable operation is 2.7 bar (40 psig). The solenoid operated pump is permanently lubricated during assembly, and requires no additional lubrication under normal operation. If the unit runs under extreme conditions (continuous operation at high speeds), it may be necessary to relubricate the center block with a Buna-N compatible NLGI Grade 2 grease every 50 million cycles. Continuous lubrication with a compatible oil is not harmful, and will provide longer seal life, but it may flush all grease out of the unit. A red button on the side of the air valve is a manual override; when actuated it will shift the valve as if an electric current had actuated the solenoid.



**NOTE:** In the event of a power failure, the shutoff valve should be closed, if the restarting of the pump is not desirable once power is regained.



**NOTE:** Wilden 6 mm (1/4") metal pumps come standard side ported with 2 NPT or BSP pipe plugs for side inlet and discharge porting. Center, top and bottom inlet and discharge porting are optional. Simply drill flat areas provided with a 7/16" drill bit for NPT or 11 mm drill bit for BSP and tap with NPT or BSP tap as appropriate.



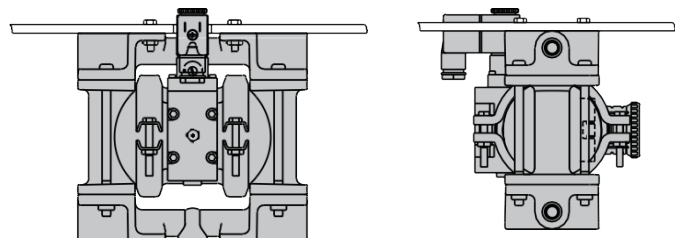
**NOTE:** Wilden offers drum pump kits for the Metal P.025/A.025 pump (bung base and pick-up tube) for convenient drum pumping (P/N 50-9290-20/23/55).



**NOTE:** This pump can be mounted from the underside of a flat surface providing you more flexibility in tight areas/ systems.



**CAUTION:** Pump performance will be seriously hampered if pump is installed upside down





# Suggested Installation, Operation, Maintenance and Troubleshooting

## Operation

For best results, the pumps should use an air filter and a regulator. The use of an air filter before the pump inlet will ensure that the majority of pipeline contaminants will be eliminated. The solenoid operated pump is permanently lubricated during assembly, and requires no additional lubrication under normal operation. If the unit runs under extreme conditions (continuous operation at high speeds), it may be necessary to relubricate the center block with a Buna-N compatible NLGI Grade 2 grease every 50 million cycles. Continuous lubrication with a compatible oil is not harmful, and will provide longer seal life, but it may flush all grease out of the unit.

The pump will not shift reliably unless the minimum supply pressure is provided. For the A.025T the minimum supply pressure for reliable operation is 2.7 bar (40 psig).

A muffler can be installed to reduce the amount of noise generated by the pump. Use of the specified Wilden muffler will reduce noise levels below OSHA specifications.

## Maintenance and Inspections

**INSPECTIONS:** Since each application is unique, maintenance schedules may be different for every pump. Frequency of use, line pressure, viscosity and abrasiveness of process fluid all effect the parts life of a Wilden pump. Periodic inspections have been found to offer the best means for preventing unscheduled pump downtime. Personnel familiar with the pump's construction and service should be informed of any abnormalities that are detected during operation. Internal maintenance is not recommended for Accu-Flo™ solenoid air valves. When worn or damaged, a new air valve body, coil or terminal connector must be purchased. Please consult section 9 for part numbers.

**RECORDS:** When service is required, a record should be made of all necessary repairs and replacements. Over a period of time, such records can become a valuable tool for predicting and preventing future maintenance problems and unscheduled downtime. In addition, accurate records make it possible to identify pumps that are poorly suited to their applications.

# Suggested Installation, Operation, Maintenance and Troubleshooting

## Troubleshooting

### ***Pump will not run.***

1. Check for pressurized air at the inlet.
2. Check air inlet and filter for debris.
3. Connect a test lamp to the two wires which run to pump and ensure that the lamp cycles on and off.
4. Make sure that the air valve manual override (small red knob on front of valve) is switched to the "0" position.
5. Check pilot pressure vent at the top of the operator/coil assembly to ensure that it is not clogged.
6. Check for a worn out air valve. If air continually blows out the exhaust in very large quantities, the air valve seals may be worn beyond their ability to function. In this case, the valve must be replaced.
7. NOTE: Before the valve is scrapped, it is possible that it may be saved by completely disassembling the valve, cleaning all components and relubricating the valve.
4. Check for sticking ball check valves. If the material being pumped is not compatible with the pump elastomers, swelling may occur. Replace ball check valves and o-ring with the proper elastomers.
5. Check to make sure that all suction connections are air tight, and that the clamp bands are properly tightened.

### ***Pump rattles.***

1. See E9 Troubleshooting Guide.
2. Create false discharge head or suction lift.

### ***Solenoid buzzes or solenoid burnout.***

1. Incorrect voltage, faulty or dirty solenoid.

### ***Solenoid valve fails to shift electrically but shifts with manual override.***

1. Incorrect voltage, defective coil or wiring.

### ***Solenoid valve fails to shift electrically or with manual override.***

1. Inadequate air supply, contamination, inadequate or improper lubrication, mechanical binding in the valve.

### ***Valve shifts but fails to return.***

1. Solenoid buzzes or solenoid burnout. Incorrect voltage, faulty or dirty solenoid. Solenoid valve fails to shift electrically but shifts with manual override. Incorrect voltage, defective coil or wiring.

### ***Excessive leaking from air valve vent.***

1. Worn seals in air valve.

### ***Pump runs but little or no fluid comes out.***

1. Check that the discharge isolation valve is not closed.
2. Check that the electronic signal is slow enough that the pump is able to complete each physical stroke before it is signaled to change direction. The time required to complete the stroke is determined by a variety of factors which include fluid viscosity and head pressure.
3. Check for pump cavitation; slow pump speed down to match the thickness of the material being pumped.

## Section 7

# Disassembly / Reassembly

## Pump Disassembly

### Tools Required:

- 1/2" Box Wrench
- 1/2" Socket
- 3/16" Allen Wrench
- 1/2" Socket Drive
- 2 – 1" Sockets or Adjustable Wrench
- Adjustable Wrench
- Vise equipped with soft jaws (such as plywood, plastic or other suitable material)



**CAUTION:** Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from the pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container. Be aware of any hazardous effects of contact with your process fluid.

The Wilden model A2 has a 25 mm (1") inlet and 25 mm (1") outlet and is designed for flows up to 136 lpm (36 gpm). The wetted path comes in both PVDF and polypropylene. The single-piece center section, consisting of center block and air chambers, is molded of polypropylene. All o-rings used in the pump are of a special material and shore hardness that should only be replaced with factory-supplied parts.

PLEASE read all directions before starting disassembly.



**NOTE:** The model used for these instructions incorporates PTFE diaphragms, balls, and seats. Models with rubber diaphragms, balls and seats are the same except where noted.



**NOTE:** Replace worn parts with genuine Wilden parts for reliable performance.



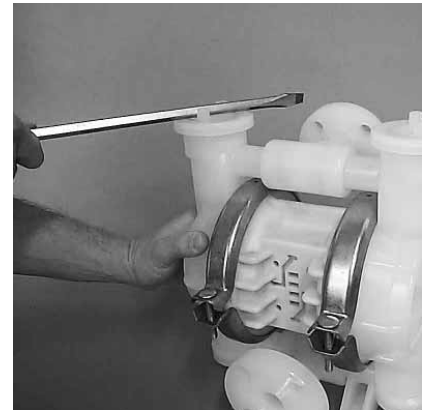
### Step 1

Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.



### Step 2

Using the 3/16" Allen Wrench, remove air valve bolts. Inspect air valve assembly for wear or damage.



### Step 3

Using a screwdriver or other long, slim object, loosen the top liquid retainers from the liquid chambers.



## Disassembly / Reassembly



### Step 4

Remove the top liquid retainer to expose the valve balls, valve seats and valve seat o-rings.



### Step 5

Remove the top liquid retainer and retainer o-rings, discharge valve balls, seats and valve seat o-rings from the liquid chamber and inspect for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance.



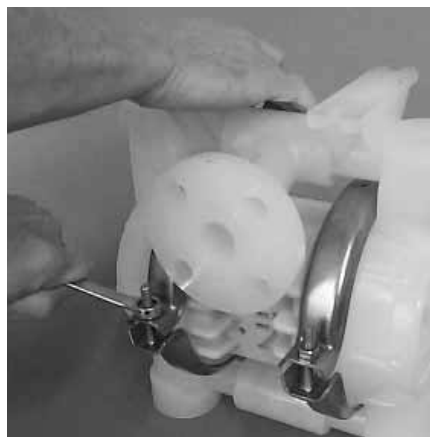
### Step 6

Using a 1/2" socket driver, loosen the bottom retainers.



### Step 7

Remove the bottom liquid retainer and retainer o-rings, discharge valve balls, seats and valve seat o-rings from the liquid chamber and inspect for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance.



### Step 8

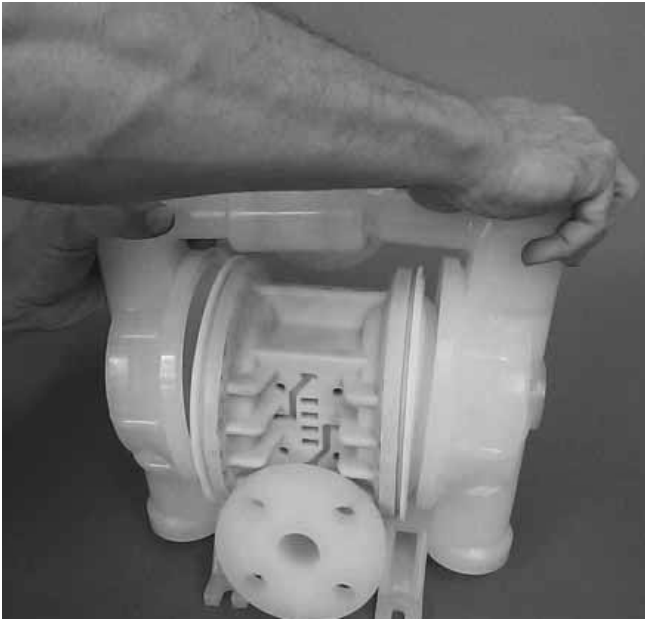
With a 1/2" box wrench, loosen the large clamp bands that secure the liquid chambers to the center section.



### Step 9

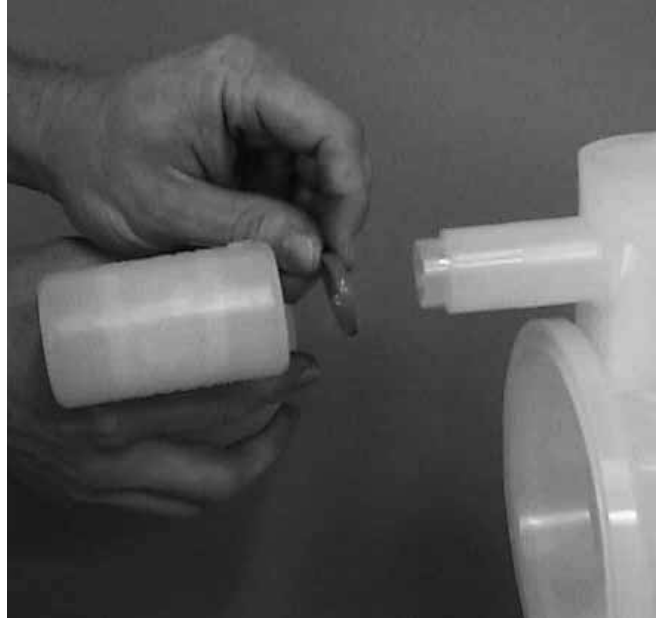
Rotate the clamp bands so that they can be removed.

## Disassembly / Reassembly



### Step 10

After clamp bands are removed, pull liquid chambers apart.



### Step 11

Remove tee section from liquid chamber and inspect o-rings for signs of wear. Replace worn parts with genuine Wilden parts for reliable performance.



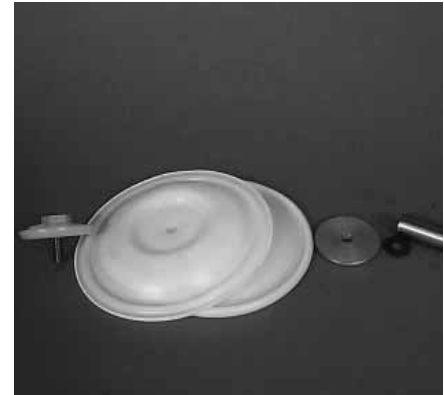
### Step 12

Using two 1" sockets, remove diaphragm assembly from center section assembly.



### Step 13

To remove the remaining diaphragm assembly from the shaft, secure shaft with soft jaws (a vise fitted with plywood or other suitable material) to ensure shaft is not nicked, scratched, or gouged. Using hands or an adjustable wrench, remove diaphragm assembly from shaft. Inspect all parts for wear and replace with genuine Wilden parts if necessary.



### Step 14

Inspect diaphragms, outer and inner pistons and disc spring (not shown) for signs of wear. Replace with genuine Wilden parts if necessary.

## Disassembly / Reassembly

### Reassembly Hints & Tips

Upon performing applicable maintenance to the air distribution system, the pump can now be reassembled. Please refer to the disassembly instructions for photos and parts placement. To reassemble the pump, follow the disassembly instructions in reverse order. The air distribution system needs to be assembled first, then the diaphragms and finally the wetted path. Please find the applicable torque specifications on this page. The following tips will assist in the assembly process.

- Clean the inside of the center section shaft bushing to ensure no damage is done to new seals.
- Stainless bolts should be lubed to reduce the possibility of seizing during tightening.
- Be sure to tighten outer pistons simultaneously on PTFE-fitted pumps to ensure proper torque values.
- Apply two (2) drops of Loctite® 246 to the shaft internal threads before the diaphragm assembly.

### MAXIMUM TORQUE SPECIFICATIONS

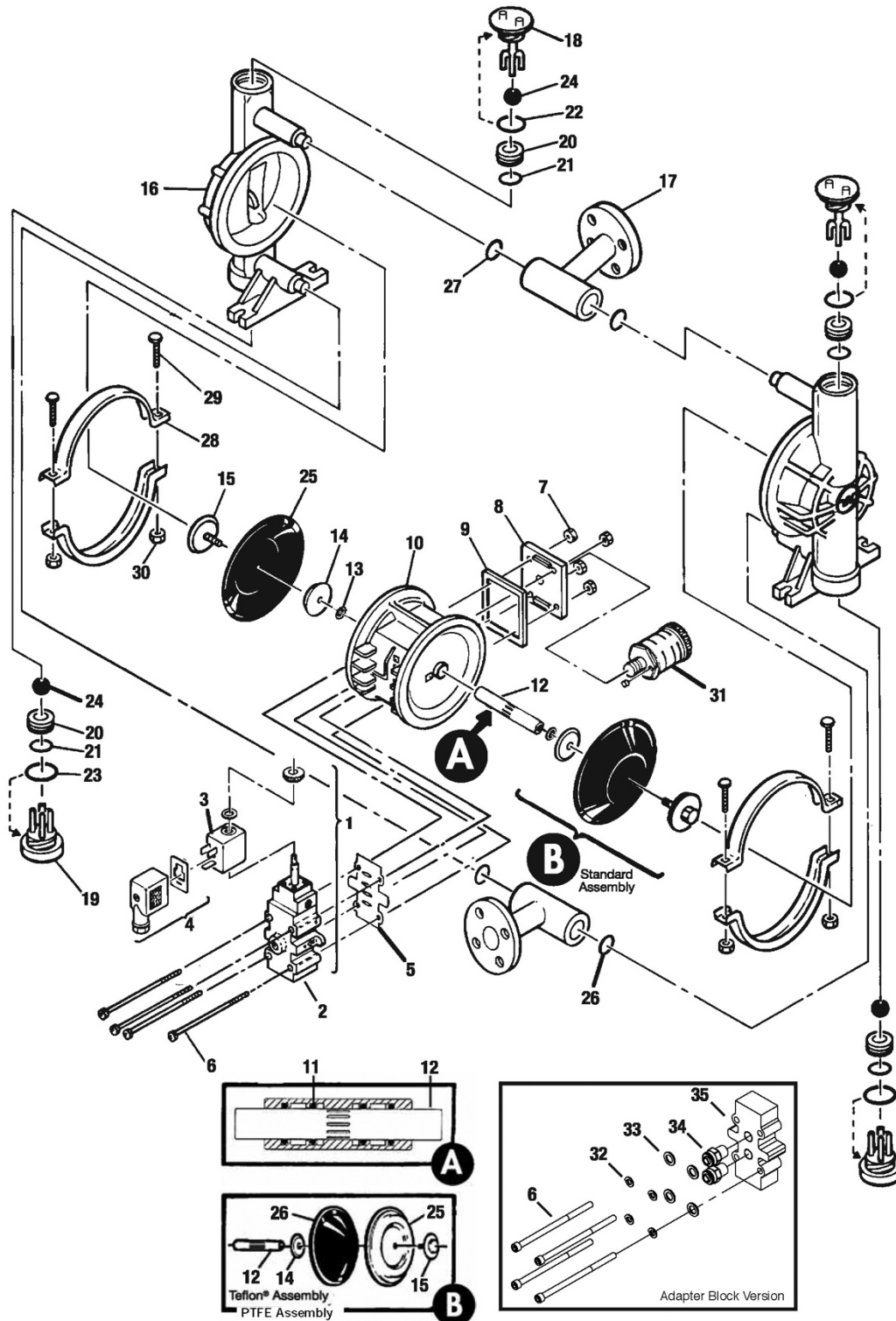
Description of Part	Plastic Pumps
Solenoid Air Valve (Turbo-Flo™)	2.3 N•m (20 in-lbs)
Solenoid Air Valve (Pro-Flo®)	3.1 N•m (27 in-lbs)
Adapter Block Air Valve	3.1 N•m (27 in-lbs)
Outer Piston—Rubber- and PTFE-fitted	27.1 N•m (20 ft-lbs)
Top and Bottom Retainers	14.1 N•m (125 in-lbs)
Large Clamp Band — Rubber-fitted	10.7 N•m (95 in-lbs)
Large Clamp Band — PTFE-fitted	14.1 N•m (125 in-lbs)

**Section 8**

**EXPLODED VIEW AND PARTS LISTING**

**A2T PLASTIC**

**EXPLODED VIEW**



## Exploded View and Parts List

Item No.	Part Description	Qty. Per Pump	RUBBER-FITTED		PTFE-FITTED	
			A2T/PKPPA/0263 P/N	A2T/KKPPA/0263 P/N	A2T/PKPPA/0263 P/N	A2T/KKPPA/0263 P/N
1	Solenoid Valve Assembly	1	02-2000-99-150	02-2000-99-150	02-2000-99-150	02-2000-99-150
2	Main Valve Body	1	02-2000-01-150	02-2000-01-150	02-2000-01-150	02-2000-01-150
3	Coil	1	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150
4	Terminal Connector <sup>2</sup>	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99
5	Air Valve Gasket — Buna-N	1	02-2600-52	02-2600-52	02-2600-52	02-2600-52
6	Air Valve Bolt 1/4"-20 x 6-1/4"	4	02-6000-03	02-6000-03	02-6000-03	02-6000-03
7	Air Valve Nut 1/4"-20	4	04-6400-03	04-6400-03	04-6400-03	04-6400-03
8	Muffler Plate	1	02-3180-20	02-3180-20	02-3180-20	02-3180-20
9	Muffler Plate Gasket — Buna-N	1	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500
10	Center Section	1	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225
11	<b>Center Section Glyd™ Ring</b>	<b>4</b>	<b>02-3210-55-225</b>	<b>02-3210-55-225</b>	<b>02-3210-55-225</b>	<b>02-3210-55-225</b>
12	Shaft	1	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07
13	Disc Spring	2	02-6802-08	02-6802-08	02-6802-08	02-6802-08
14	Inner Piston	2	02-3750-01	02-3750-01	02-3750-01	02-3750-01
15	Outer Piston	2	02-4550-21-500	02-4550-21-500	02-4600-21-500	02-4600-21-500
16	Liquid Chamber	2	02-5001-20-400	02-5001-21-400	02-5001-20-400	02-5001-21-400
17	Manifold Tee Section <sup>1</sup>	2	02-5160-20-400	02-5160-21-400	02-5160-20-400	02-5160-21-400
18	<b>Top Retainer</b>	<b>2</b>	<b>02-5411-20-400</b>	<b>02-5411-21-400</b>	<b>02-5411-20-400</b>	<b>02-5411-21-400</b>
19	<b>Bottom Retainer</b>	<b>2</b>	<b>02-5420-20-400</b>	<b>02-5420-21-400</b>	<b>02-5420-20-400</b>	<b>02-5420-21-400</b>
20	<b>Valve Seat</b>	<b>4</b>	<b>02-1120-20-400</b>	<b>02-1120-21-400</b>	<b>02-1120-20-400</b>	<b>02-1120-21-400</b>
21	<b>Valve Seat O-Ring*</b>	<b>4</b>	*	*	<b>02-1200-60-400</b>	<b>02-1200-60-400</b>
22	<b>Top Retainer O-Ring*</b>	<b>2</b>	*	*	<b>02-1220-60</b>	<b>02-1220-60</b>
23	<b>Bottom Retainer O-Ring</b>	<b>2</b>	*	*	<b>02-1230-60</b>	<b>02-1230-60</b>
24	<b>Valve Ball*</b>	<b>4</b>	*	*	<b>02-1080-55</b>	<b>02-1080-55</b>
25	<b>Diaphragm*</b>	<b>2</b>	*	*	<b>02-1010-55</b>	<b>02-1010-55</b>
26	<b>Back-up Diaphragm</b>	<b>2</b>			<b>02-1060-51</b>	<b>02-1060-51</b>
27	<b>Tee Section O-Ring*</b>	<b>4</b>	*	*	<b>02-1300-60-400</b>	<b>02-1300-60-400</b>
28	Clamp Band Assembly	2	02-7300-03-400	02-7300-03-400	02-7300-03-400	02-7300-03-400
29	Clamp Band Bolt 5/16"-18 x 1-3/4"	4	08-6050-03-500	08-6050-03-500	08-6050-03-500	08-6050-03-500
30	Clamp Band Nut 5/16"-18	4	08-6400-03	08-6400-03	08-6400-03	08-6400-03
31	Muffler	1	02-3510-99	02-3510-99	02-3510-99	02-3510-99
32	Lock Washer	4	50-6760-03	50-6760-03	50-6760-03	50-6760-03
33	Flat Washer	4	01-6730-03	01-6730-03	01-6730-03	01-6730-03
34	Air Fitting	2	00-2170-20	00-2170-20	00-2170-20	00-2170-20
35	Adapter Block	1	02-2150-XX	02-2150-XX	02-2150-XX	02-2150-XX
	Vent Plug (not shown)	1	02-7020-17	02-7020-17	02-7020-17	02-7020-17
	Expanded PTFE Gasket Kit (Not Shown)	1			02-9500-99	02-9500-99

<sup>1</sup>DIN Flange: Polypropylene = 02-5160-20-404, PVDF = 02-5160-21-404

<sup>2</sup>N/A for explosion proof.

<sup>\*</sup>Refer to corresponding elastomer chart in Section 10 for correct part number.

0263 Pump Specialty Code = Solenoid-Operated, 24V DC

All boldface items are primary wear parts.

### Solenoid-Operated Valve Assembly Options (consists of valve body, coil and connector)

Pump Models Designating Specialty Code #	Part Number	Description
151	02-2000-99-151	24V AC / 12V DC Valve Assembly
153	02-2000-99-153	24V AC / 12V DC Valve Assembly (Nema 7)
150	02-2000-99-150	24V DC Valve Assembly
154	02-2000-99-154	24V DC Valve Assembly (Nema 7)
157	02-2000-99-157	International 24V DC Valve Assembly <sup>1</sup>
155	02-2000-99-155	110V AC Valve Assembly
156	02-2000-99-156	110V AC Valve Assembly (Nema 7)

### Item 2 Main Valve Body Options

Part Number	Description
02-2000-01-150	Main Valve Body
02-2000-01-154	Main Valve Body (Nema 7)

### Item 34 Adapter Block Options

Part Number	Description
01-2150-20	Polypropylene
01-2150-32	UHMW PE

### Item 3 Coil Options

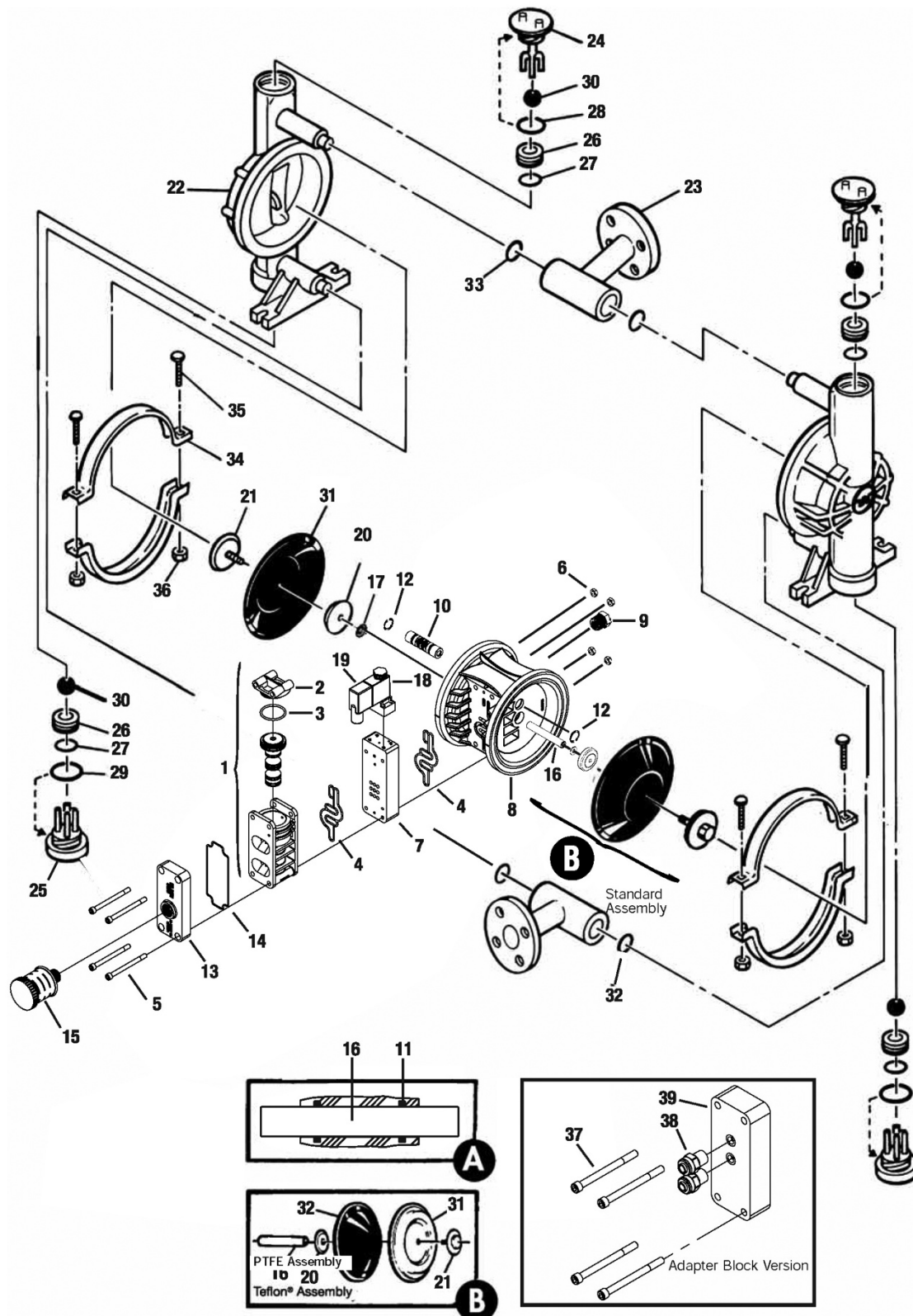
Pump Models Designating Specialty Code #	Part Number	Description
150	00-2110-99-150	24V DC Coil
151	00-2110-99-151	24V AC Coil
153	00-2110-99-153	24V AC, Nema 7 Coil
154	00-2110-99-154	24V DC, Nema 7 Coil
155	00-2110-99-155	110V AC Coil
156	00-2110-99-156	110V AC Nema 7 Coil
157	00-2110-99-157	International 24V DC Coil <sup>1</sup>

<sup>1</sup>Meets European standards and regulations; CENELEC/PTB File #EX-91.C.2027.



**A25P PLASTIC**

**EXPLODED VIEW**



## Exploded View and Parts List

A2P ACCU-FLO™			RUBBER-FITTED		PTFE-FITTED	
Item No.	Part Description	Qty. Per Pump	A2P/PKPPP/0263 P/N	A2P/KKPPP/0263 P/N	A2P/PKPPP/0263 P/N	A2P/KKPPP/0263 P/N
1	Pro-Flo® Air Valve Assembly	1	01-2010-20	01-2010-20	01-2010-20	01-2010-20
2	End Cap	1	01-2332-20	01-2332-20	01-2332-20	01-2332-20
3	O-Ring, End Cap	1	01-2395-52	01-2395-52	01-2395-52	01-2395-52
4	Gasket, Air Valve	2	01-2615-52	01-2615-52	01-2615-52	01-2615-52
5	Screw, HSHC, Air Valve	4	01-6000-03	01-6000-03	01-6000-03	01-6000-03
6	Nut, Hex	4	04-6400-03	04-6400-03	04-6400-03	04-6400-03
7	Pro-Flo® Solenoid Spacer	1	01-2160-20	01-2160-20	01-2160-20	01-2160-20
8	Center Section Assembly	1	02-3140-20	02-3140-20	02-3140-20	02-3140-20
9	Bushing Reducer	1	01-6950-20	01-6950-20	01-6950-20	01-6950-20
10	Pilot Sleeve Plug	1	02-2285-99	02-2285-99	02-2285-99	02-2285-99
11	Glyd™ Ring II	2	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225
12	Retaining Ring	2	00-2650-03	00-2650-03	00-2650-03	00-2650-03
13	Muffler Plate	1	01-3181-20	01-3181-20	01-3181-20	01-3181-20
14	Gasket, Muffler Plate	1	01-3505-52	01-3505-52	01-3505-52	01-3505-52
15	Muffler	1	02-3510-99	02-3510-99	02-3510-99	02-3510-99
16	Shaft Pro-Flo®	1	02-3810-09	02-3810-09	02-3810-09	02-3810-09
17	Disc Spring	2	02-6802-08	02-6802-08	02-6802-08	02-6802-08
18	Coil	1	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150
19	Terminal Connector	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99
20	Inner Piston	2	02-3701-01	02-3701-01	02-3751-01	02-3751-01
21	Outer Piston	2	02-4550-21-500	02-4550-21-500	02-4600-21-500	02-4600-21-500
22	Liquid Chamber	2	02-5001-20-400	02-5001-20-400	02-5001-20-400	02-5001-20-400
23	Manifold Tee Section²	2	02-5160-20-400	02-5160-21-400	02-5160-20-400	02-5160-21-400
24	Top Retainer	2	02-5411-20-400	02-5411-21-400	02-5411-20-400	02-5411-21-400
25	Bottom Retainer	2	02-5420-20-400	02-5420-21-400	02-5420-20-400	02-5420-21-400
26	Valve Seat	4	02-1120-20-400	02-1120-21-400	02-1120-20-400	02-1120-21-400
27	Valve Seat O-Ring*	4	*	*	02-1200-60-400	02-1200-60-400
28	Top Retainer O-Ring*	2	*	*	02-1220-60	02-1220-60
29	Bottom Retainer O-Ring	2	*	*	02-1230-60	02-1230-60
30	Valve Ball*	4	*	*	02-1080-55	02-1080-55
31	Diaphragm*	2	*	*	02-1010-55	02-1010-55
32	Back-up Diaphragm	2			02-1060-51	02-1060-51
33	Tee Section O-Ring*	4	*	*	02-1300-60-400	02-1300-60-400
34	Clamp Band Assembly	2	02-7300-03-400	02-7300-03-400	02-7300-03-400	02-7300-03-400
35	Clamp Band Bolt 5/16"-18 x 1-3/4"	4	08-6050-03-500	08-6050-03-500	08-6050-03-500	08-6050-03-500
36	Clamp Band Nut 5/16"-18	4	08-6400-03	08-6400-03	08-6400-03	08-6400-03
37	Air Valve Bolt	4	04-6000-03	04-6000-03	04-6000-03	04-6000-03
38	Fitting, Air Inlet	2	00-2170-20	00-2170-20	00-2170-20	00-2170-20
39	Adapter Block	1	00-2155-20	00-2155-20	00-2155-20	00-2155-20
	Expanded PTFE Gasket Kit (Not Shown)	1			02-9500-99	02-9500-99

¹DIN Flange: Polypropylene = 02-5160-20-404, PVDF = 02-5160-21-404

0263 Pump Specialty Code = Solenoid-Operated, 24V DC

\*Refer to corresponding elastomer chart in Section 10 for correct part number.

All boldface items are primary wear parts.

### Solenoid-Operated Valve Assembly Options (consists of valve body, coil and connector)

Pump Models Designating Specialty Code #	Part Number	Description
151	02-2000-99-151	24V AC / 12V DC Valve Assembly
153	02-2000-99-153	24V AC / 12V DC Valve Assembly (Nema 7)
150	02-2000-99-150	24V DC Valve Assembly
154	02-2000-99-154	24V DC Valve Assembly (Nema 7)
157	02-2000-99-157	International 24V DC Valve Assembly¹
155	02-2000-99-155	110V AC Valve Assembly
156	02-2000-99-156	110V AC Valve Assembly (Nema 7)

### Item 1 Main Valve Body Options

Part Number	Description
02-2000-01-150	Main Valve Body
02-2000-01-154	Main Valve Body (Nema 7)

### Item 2 Coil Options

Pump Models Designating Specialty Code #	Part Number	Description
150	00-2110-99-150	24V DC Coil
151	00-2110-99-151	24V AC Coil
153	00-2110-99-153	24V AC, Nema 7 Coil
154	00-2110-99-154	24V DC, Nema 7 Coil
155	00-2110-99-155	110V AC Coil
156	00-2110-99-156	110V AC Nema 7 Coil
157	00-2110-99-157	International 24V DC Coil¹

¹Meets European standards and regulations; CENELEC/PTB File #EX-91.C.2027.

## Section 9

### Elastomer Options

#### A2 PUMPS

Material	Color Code	Diaphragm P/N (2)	Valve Ball P/N (4)	Valve Seat* O-Ring P/N (4)	Tee Section O-Ring P/N (4)	Top Retainer O-Ring P/N (2)	Bottom Retainer O-Ring P/N (2)
Polyurethane	Natural	02-1010-50	02-1080-50	02-1200-50-400	02-1300-50-400	02-1220-50	02-1230-50
Buna-N	Red	02-1010-52	02-1080-52	08-2390-52	04-2390-52	04-2390-52-700	02-1230-52
PTFE Encapsulated FKM®	None			02-1200-60-400	02-1300-60-400	02-1220-60	02-1230-60
Neoprene	Green	02-1010-51	02-1080-51				
FKM®	Silver	02-1010-53	02-1080-53				
EPDM	Blue	02-1010-54	02-1080-54				
PTFE	White	02-1010-55	02-1080-55				
Saniflex™	Off-White	02-1010-56	02-1080-56				
Wil-Flex™	Orange	02-1010-58	02-1080-58	02-1200-58-400	02-1300-58-400	02-1220-58	02-1230-58
Neoprene Backup	Black	02-1060-51					

1. Saniflex™ back-up diaphragms, P/N 02-1060-56, are available upon request. Please consult your local distributor.

\*NOTE: Rubber valve seats do not require an O-ring.

### Electrical Information

#### NEMA 4 / UL / CSA

Part Number	Voltage ±10%			Power (W) ±10%	Current (A)			Resistivity (Ω)
	DC	AC			DC	AC		
		60 Hz	50 Hz			Inrush	Holding	
00-2110-99-150	24	48	44	4.8	.20	.20	.20	121
00-2110-99-151	12	24	22	4.8	.40	.40	.40	32
00-2110-99-155	60	120	110	4.8	.08	.08	.06	840

#### NEMA 7 / UL / CSA

Part Number	Voltage ±10%			Power (W) ±10%	Current (A)			Resistivity (Ω)
	DC	AC			DC	AC		
		60 Hz	50 Hz			Inrush	Holding	
00-2110-99-153	12	24	22	7	.60	.55	.32	19
00-2110-99-154	24	48	44	7	.30	.30	.18	75
00-2110-99-156	60	120	110	7	.12	.13	.06	475

#### INTERNATIONAL EXPLOSION PROOF / CENELEC / PTB FILE # EX-91.C.2027

Part Number	DC Voltage ±10%	Power (W) ±10%	Current (A)		Resistivity (Ω)
			Inrush	Holding	
00-2110-99-157	24	3.3	.135	.135	177



## Notes

## Notes

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