

# EOM

ENGINEERING OPERATION  
& MAINTENANCE

# A2 Accu-Flo Clamped Metal Pump



Where Innovation Flows

**WILDEN®**

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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
PFA	7°C to 107°C	20°F to 225°F
Neoprene	-18°C to 93°C	0°F to 200°F
Buna-N	-12°C to 82°C	10°F to 180°F
EPDM	-51°C to 138°C	-60°F to 280°F
FKM®	-40°C to 177°C	-40°F to 350°F
Wil-Flex™	-40°C to 107°C	-40°F to 225°F
Saniflex™	-29°C to 104°C	-20°F to 220°F
Polyurethane	-12°C to 66°C	10°F to 150°F
Polytetrafluoroethylene (PTFE) <sup>1</sup>	4°C to 104°C	40°F to 220°F
Nylon	-18°C to 93°C	0°F to 200°F
Acetal	-29°C to 82°C	-20°F to 180°F
SIPD PTFE with Neoprene-backed	4°C to 104°C	40°F to 220°F
SIPD PTFE with EPDM-backed	-10°C to 137°C	14°F to 280°F
Polyethylene	0°C to 70°C	32°F to 158°F
Geolast®	-40°C to 82°C	-40°F to 180°F


<sup>1</sup>4°C to 149°C (40°F to 300°F) - 13 mm (1/2") and 25 mm (1") models only.


**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.


 **CAUTION:** Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult the Chemical Resistance 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:** Prevent 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:** 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. Thoroughly flushed before installing into process lines. FDA- and USDA-approved pumps should be cleaned and/or sanitized before being used.


 **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 all fasteners 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.

 **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.

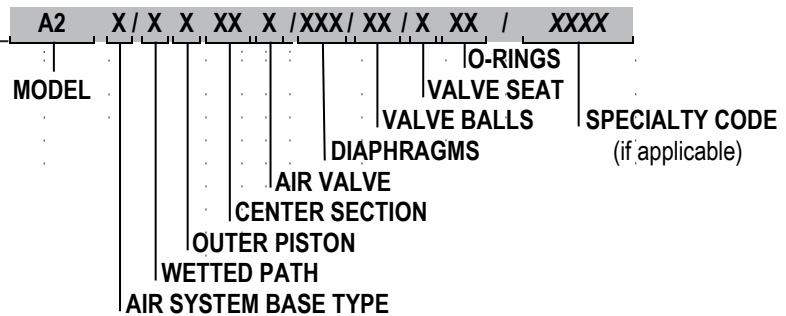
**Section 2**

**WILDEN PUMP DESIGNATION SYSTEM**

**A2 METAL**

**38 mm (1-1/2") Pump**  
**Maximum Flow Rate:**  
**507 lpm (134 gpm)**

**LEGEND**



**MATERIAL CODES**

**MODEL**  
A2 = METAL ACCU-FLO™

**AIR SYSTEM BASE TYPE**  
B = ADAPTER BLOCK  
P = PRO-FLO®  
T = TURBO-FLO™

**WETTED PATH**  
A = ALUMINUM  
H = ALLOY C  
S = STAINLESS STEEL

**OUTER PISTON**  
A = ALUMINUM  
H = ALLOY C  
S = STAINLESS STEEL

**CENTER SECTION**  
AA = ALUMINUM  
CC = PTFE-COATED ALUMINUM  
NN = NICKEL-PLATED ALUMINUM  
PP = POLYPROPYLENE

**AIR VALVE**  
A = ALUMINUM (available on A2T only)  
L = ACETAL (available on A2P AND A2B only)  
P = POLYPROPYLENE (available on A2P AND A2B only)  
U = UHMW PE (available on A2B only)

**DIAPHRAGMS**  
BNS = BUNA-N (Red Dot)  
EPS = EPDM (Blue Dot)  
FSS = SANIFLEX™ [Hytre® (Cream)]  
NES = NEOPRENE (Green Dot)  
PUS = POLYURETHANE (Clear)  
TEU = PTFE W/EPDM BACK-UP (White)  
TNU = PTFE W/NEOPRENE BACK-UP (White)  
TSU = PTFE W/SANIFLEX™ BACK-UP (White)  
VTS = FKM (White Dot)  
WFS = WIL-FLEX™ [Santoprene® (Orange Dot)]

**VALVE BALLS**  
BN = BUNA-N (Red Dot)  
EP = EPDM (Blue Dot)  
FS = SANIFLEX™ [Hytre® (Cream)]  
FV = SANITARY FKM (Two White Dots)  
NE = NEOPRENE (Green Dot)  
PU = POLYURETHANE (Brown)  
TF = PTFE (White)  
VT = FKM (White Dot)  
WF = WIL-FLEX™ [Santoprene® (Orange Dot)]

**VALVE SEATS**  
A = ALUMINUM  
H = ALLOY C  
S = STAINLESS STEEL

**VALVE SEAT O-RINGS**  
BN = BUNA-N  
EP = EPDM (Blue Dot)  
FS = SANIFLEX™ [Hytre® (Cream)]  
PU = POLYURETHANE (Brown)  
TF = PTFE (White)  
WF = WIL-FLEX™ [Santoprene®]

**SPECIALTY CODES**

0100 Wil-Gard II™ 110V  
0102 Wil-Gard II™ Sensor Cables Only  
0103 Wil-Gard II™ 220V  
0206 PFA-coated hardware, Wil-Gard II™ sensor wires only  
0502 PFA-coated hardware  
0520 Ultrapure II, w/Female Connections  
0521 Ultrapure II, PFA-coated hardware, w/Female Connections  
0522 Ultrapure II, w/Male Bondable Connections  
0523 Ultrapure II, PFA-coated hardware, w/Male Bondable Connections  
0524 Ultrapure II, w/Wil-Gard II™ 110V, Male Bondable Connections

0525 Ultrapure II, Female Connections, PFA-coated hardware, Wil-Gard II™ sensor wires ONLY  
0530 Ultrapure II, w/Wil-Gard II™ 110V, Female Connections  
0531 Ultrapure II, Female Connections, Wil-Gard II™ sensor wires only  
0532 Ultrapure II, PFA-coated hardware, w/Wil-Gard II™ 110V, Male Bondable Connections  
0533 Ultrapure II, PFA-coated hardware, w/Wil-Gard II™ 220V, Male Bondable Connections  
0560 Split Manifold  
0561 Split Manifold, PFA Coated hardware  
0563 Split Manifold, discharge only

0564 Split Manifold, Inlet Only  
0603 PFA-coated hardware, Wil-Gard II™ 110V  
0608 PFA-coated hardware, Wil-Gard II™ 220V  
0612 Ultrapure, PFA-coated hardware, Male Connection  
0618 Ultrapure, PFA-coated hardware, w/Wil-Gard II™ 110V, Male Connections  
0622 Ultrapure, w/Male Connections  
0623 Ultrapure, Adapter Block, No Muffler, Male Connections  
0624 Ultrapure, w/Wil-Gard II™ 110V, Male Connections  
0660 Split Manifold, Wil-Gard II™ 110V  
0661 Split manifold, PFA-coated hardware, Wil-Gard II™ 110V

**THE THREE ACCU-FLO™ OPTIONS AVAILABLE:**

1. AxT: This is the same Accu-Flo™ configuration that has been available from Wilden since March 1994. An aluminum solenoid valve is attached directly to a T-series center section and the shaft/inner piston configuration is altered.
2. AxP: This option uses a plastic (polypropylene or acetal) spacer that is assembled between the Pro-Flo® air valve and the Pro-Flo® center section. The same solenoid operator – coil assembly that is found on AxT pumps is assembled on the plastic spacer discussed above for electronic interface. This spacer together with the Pro-Flo® air valve replaces the aluminum air valve used in the AxT with a more chemically resistant option. Spacers will be available in the 1/4", 1/2", and 1" sizes.

**NOTE:** Most elastomeric materials use colored dots for identification.  
**NOTE:** Not all models are available with all material options.  
 FKM® is a registered trademarks of DuPont Dow Elastomers.

3. AxB: This option uses an Adapter Block in place of an air valve. A user supplied, 4-way pneumatic valve must be used in conjunction with this technology. This configuration enables the solenoid valve to be remotely installed, preventing chemical attack in very aggressive environments. Adapter Blocks are available for both the T and P-series center sections in all pump sizes. (See EOM AxB for details.)

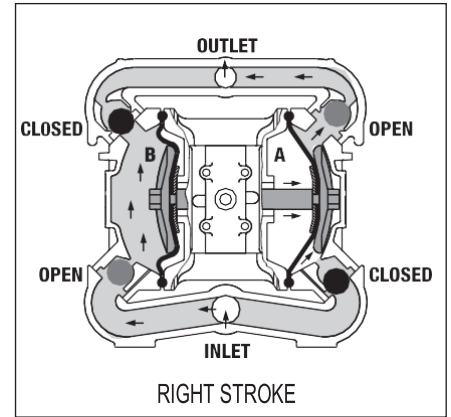
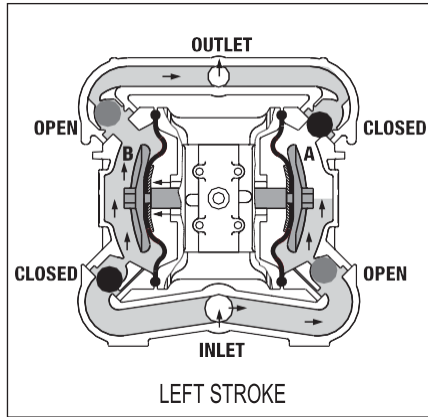
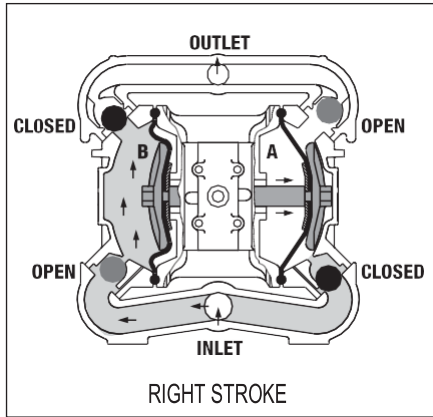
**NOTE:** The "x" in the above Accu-Flo™ descriptions are used in place of a pump model size. See Pump Designation System chart above.

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**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 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).

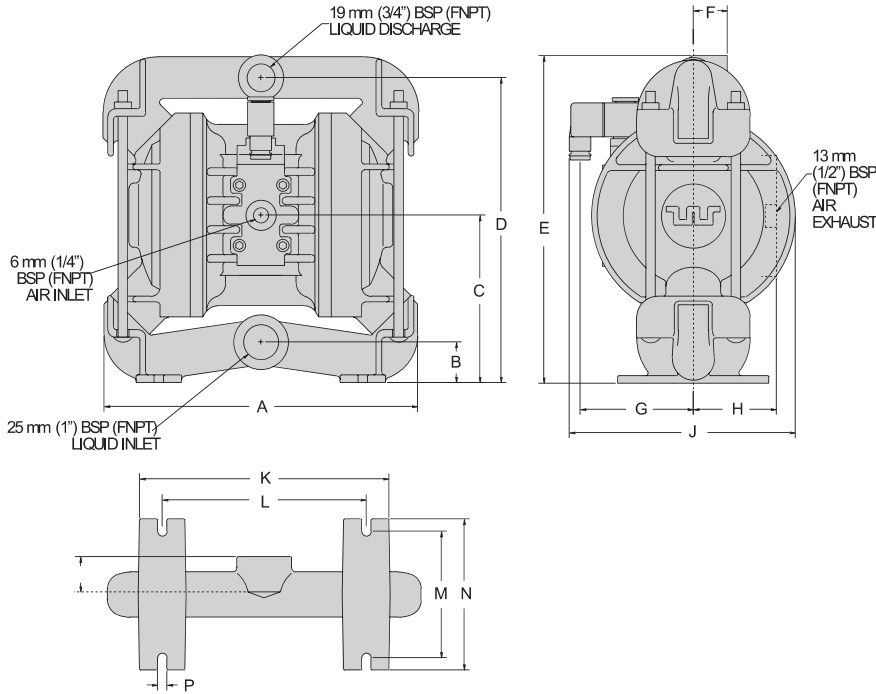
**FIGURE 2** When the solenoid valve is deenergized, the air valve redirects pressurized air to the back side of diaphragm B. The pressurized air forces diaphragm B away from the center section while pulling diaphragm A to the center section. Diaphragm B is now on its discharge stroke. Diaphragm B forces 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, while the opposite discharge valve ball is forced onto 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**

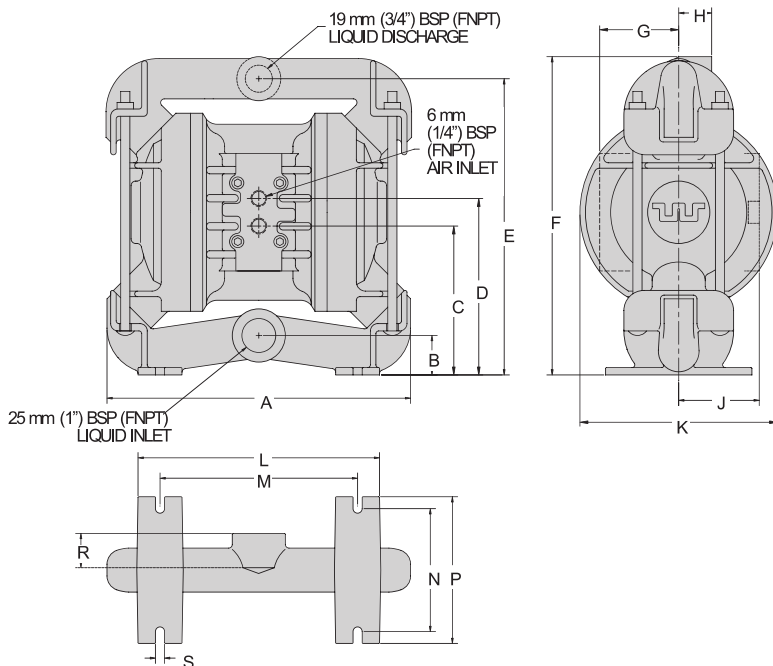
**A2T Metal**



**DIMENSIONS**

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	137	5.4
D	254	10.0
E	279	11.0
F	28	1.1
G	97	3.8
H	76	3.0
J	191	7.5
K	211	8.3
L	173	6.8
M	107	4.2
N	127	5.0
P	8	0.3
R	33	1.3

**A2B Metal (T-Series Center Section)**

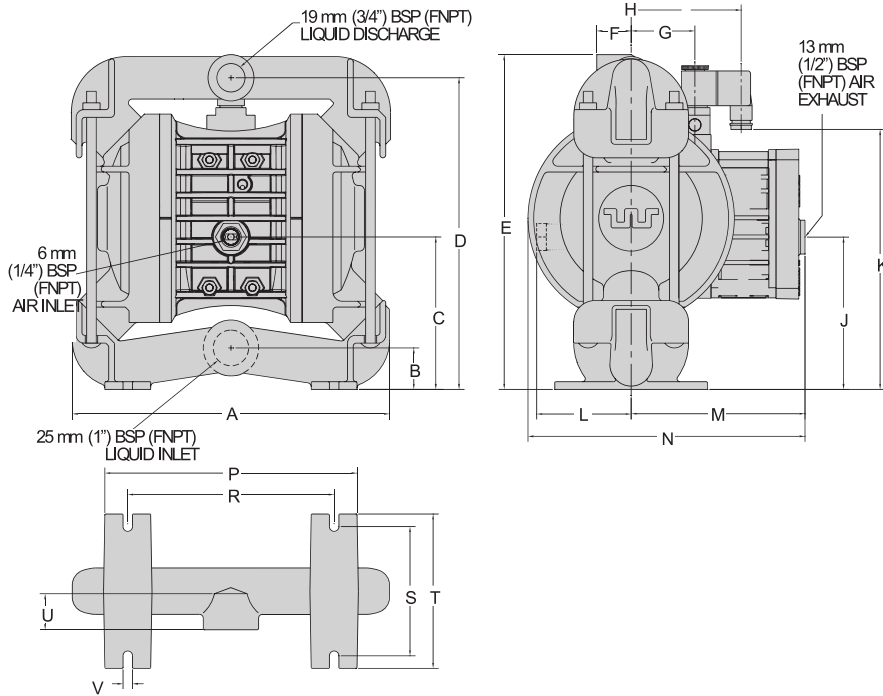


**DIMENSIONS**

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	130	5.1
D	152	6.0
E	254	10.0
F	279	11.0
G	69	2.7
H	28	1.1
J	76	3.0
K	173	6.8
L	211	8.3
M	173	6.8
N	107	4.2
P	127	5.0
R	33	1.3
S	8	0.3

## DIMENSIONAL DRAWING

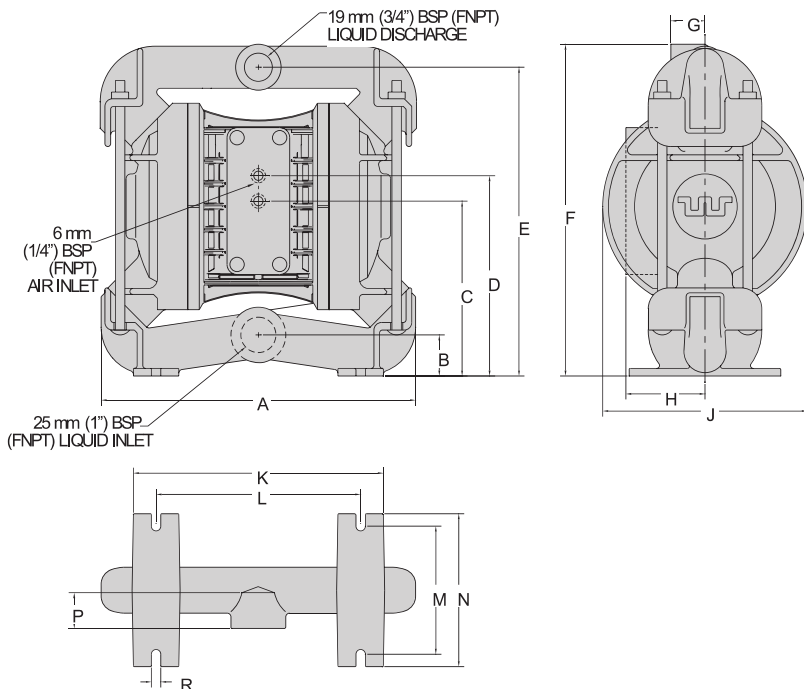
### A2P Metal



### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	124	4.9
D	254	10.0
E	279	11.0
F	28	1.1
G	53	2.1
H	91	3.6
J	124	4.9
K	213	8.4
L	76	3.0
M	142	5.6
N	229	9.0
P	211	8.3
R	173	6.8
S	107	4.2
T	127	5.0
U	33	1.3
V	8	0.3

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

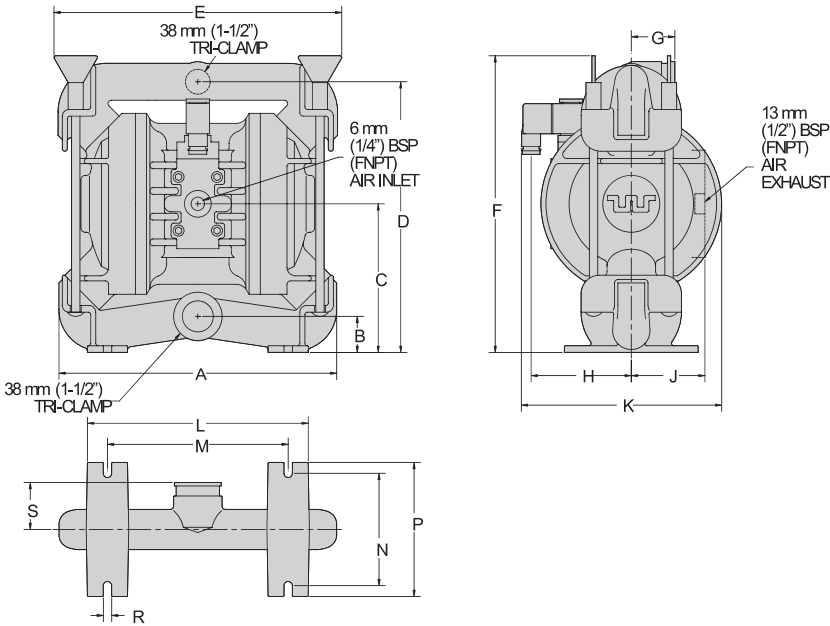


### DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	145	5.7
D	168	6.6
E	254	10.0
F	279	11.0
G	28	1.1
H	66	2.6
J	173	6.8
K	211	8.3
L	173	6.8
M	107	4.2
N	127	5.0
P	33	1.3
R	8	0.3

**DIMENSIONAL DRAWING**

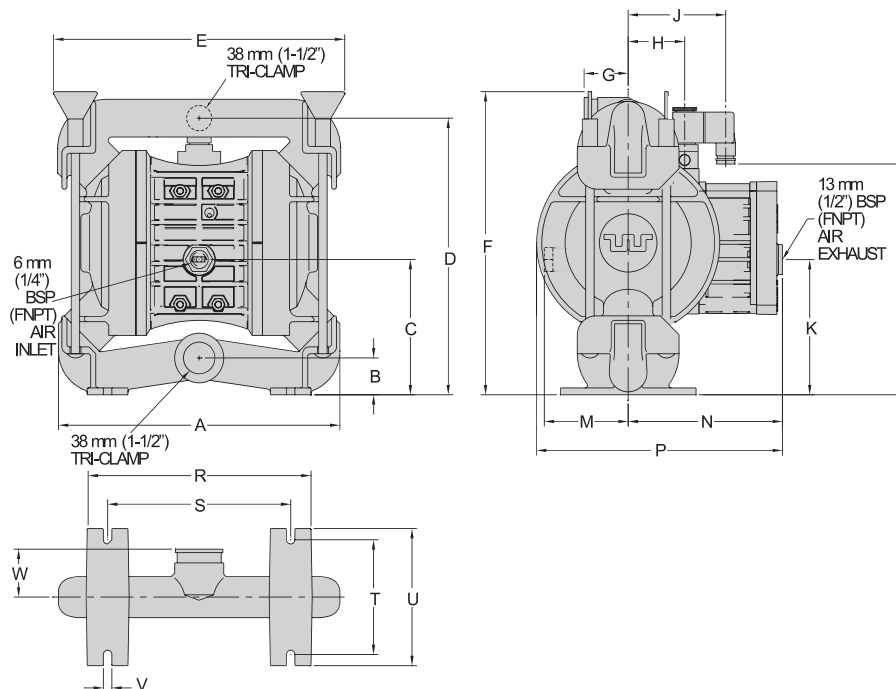
**A2T Saniflo FDA Metal**



**DIMENSIONS**

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	137	5.4
D	254	10.0
E	267	10.5
F	295	11.6
G	41	1.6
H	97	3.8
J	76	3.0
K	191	7.5
L	211	8.3
M	173	6.8
N	107	4.2
P	127	5.0
R	8	0.3
S	43	1.7

**A2P Metal Saniflo FDA**



**DIMENSIONS**

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	124	4.9
D	254	10.0
E	267	10.5
F	295	11.6
G	41	1.6
H	53	2.1
J	91	3.6
K	124	4.9
L	213	8.4
M	76	3.0
N	117	4.6
P	203	8.0
R	211	8.3
S	173	6.8
T	107	4.2
U	127	5.0
V	8	0.3
W	43	1.7

**Section 5**

**A2T METAL  
RUBBER-FITTED**

Height ..... 279 mm (11.0")  
 Width ..... 267 mm (10.5")  
 Depth ..... 191 mm (7.5")  
 Est. Ship Weight... Aluminum 12 kg (26 lb)  
                           Stainless Steel 16 kg (36 lb)  
                           Alloy C 18 kg (40 lb)  
 Air Inlet.....6 mm (1/4")  
 Inlet..... 25 mm (1")  
 Outlet ..... 19 mm (3/4")  
 Suction Lift .....7.25 m Dry (23.8')  
                           8.66 m Wet (28.4')  
 Disp. Per Stroke<sup>1</sup> ..... 0.33 L (0.087 gal)  
 Max. Flow Rate..... 102 lpm (27 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 head pressure of 2.7 bar (39 psig) requires 4.1 bar (60 psig) and 17.9 Nm<sup>3</sup>/h (10.5 scfm) air consumption. (See dot on chart.)

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

**A2T METAL  
PTFE-FITTED**

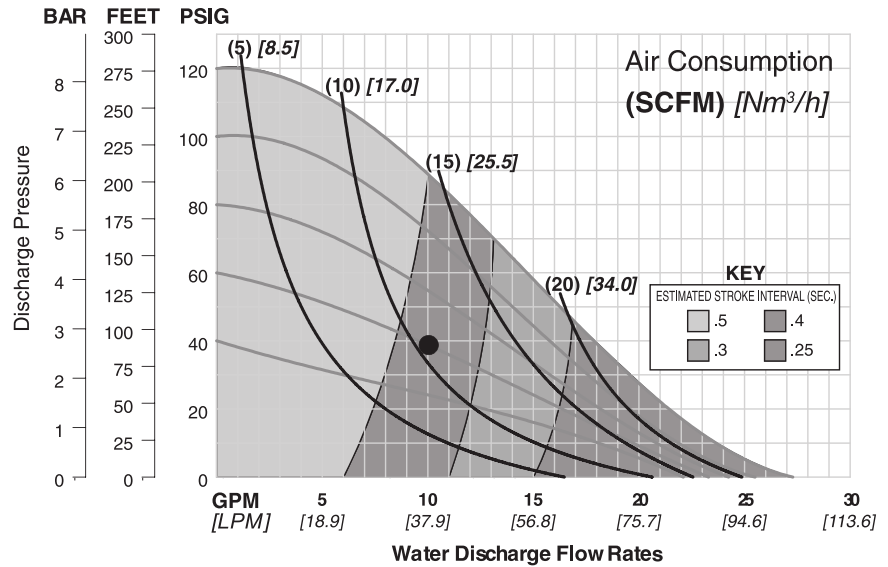
Height ..... 279 mm (11.0")  
 Width ..... 267 mm (10.5")  
 Depth ..... 191 mm (7.5")  
 Est. Ship Weight... Aluminum 12 kg (26 lb)  
                           Stainless Steel 16 kg (36 lb)  
                           Alloy C 18 kg (40 lb)  
 Air Inlet.....6 mm (1/4")  
 Inlet..... 25 mm (1")  
 Outlet ..... 19 mm (3/4")  
 Suction Lift .....4.85 m Dry (15.9')  
                           8.66 m Wet (28.4')  
 Disp. Per Stroke<sup>1</sup> ..... 0.15 L (0.039 gal)  
 Max. Flow Rate..... 68 lpm (18 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 1.03 bar (15 psig) requires 4.1 bar (60 psig) and 21.3 Nm<sup>3</sup>/h (12.5 scfm) air consumption. (See dot on chart.)

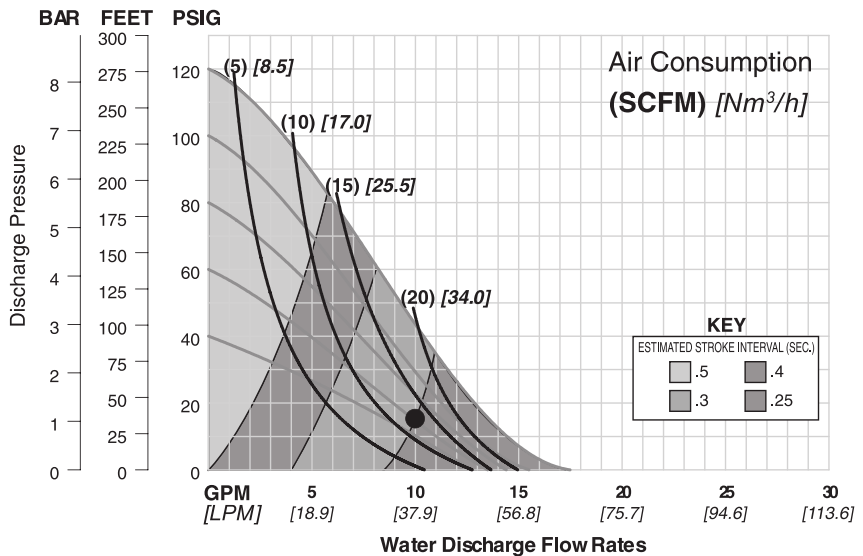
**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

**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's 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's performance curve.

**PERFORMANCE**

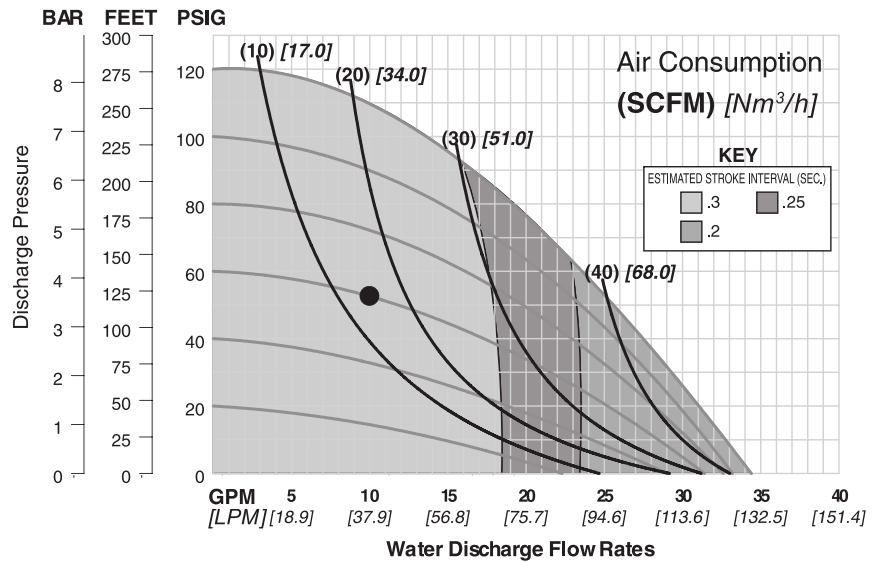
**A2P METAL RUBBER-FITTED**

Height ..... 279 mm (11.0")  
 Width ..... 267 mm (10.5")  
 Depth ..... 229 mm (9.0")  
 Est. Ship Weight... Aluminum 12 kg (26 lb)  
                                   Stainless Steel 16 kg (36 lb)  
                                   Alloy C 18 kg (40 lb)  
 Air Inlet..... 6 mm (1/4")  
 Inlet..... 25 mm (1")  
 Outlet ..... 19 mm (3/4")  
 Suction Lift ..... 7.43 m Dry (24.4')  
                                   9.68 m Wet (31.8')  
 Disp. Per Stroke<sup>1</sup> ..... 0.35 L (0.092 gal)  
 Max. Flow Rate..... 129 lpm (34 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 3.6 bar (52 psig) requires 4.1 bar (60 psig) and 23.8 Nm<sup>3</sup>/h (14 scfm) air consumption. (See dot on chart.).

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



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's performance curve.

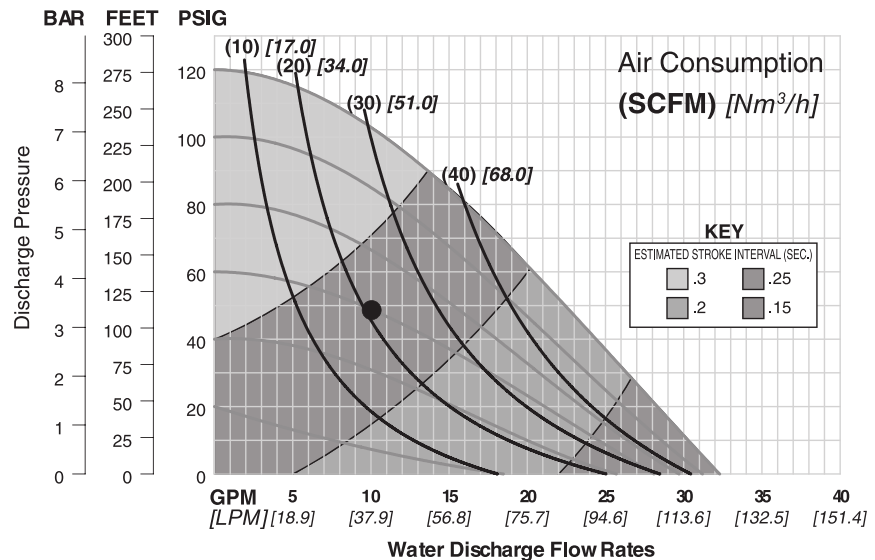
**A2P METAL PTFE-FITTED**

Height ..... 279 mm (11.0")  
 Width ..... 267 mm (10.5")  
 Depth ..... 229 mm (9.0")  
 Est. Ship Weight... Aluminum 12 kg (26 lb)  
                                   Stainless Steel 16 kg (36 lb)  
                                   Alloy C 18 kg (40 lb)  
 Air Inlet..... 6 mm (1/4")  
 Inlet..... 25 mm (1")  
 Outlet ..... 19 mm (3/4")  
 Suction Lift ..... 6.55 m Dry (21.5')  
                                   8.99 m Wet (29.5')  
 Disp. Per Stroke<sup>1</sup> ..... 0.20 L (0.054 gal)  
 Max. Flow Rate..... 121 lpm (32 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 3.4 bar (49 psig) requires 4.1 bar (60 psig) and 35.7 Nm<sup>3</sup>/h (21 scfm) air consumption. (See dot on chart.).

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



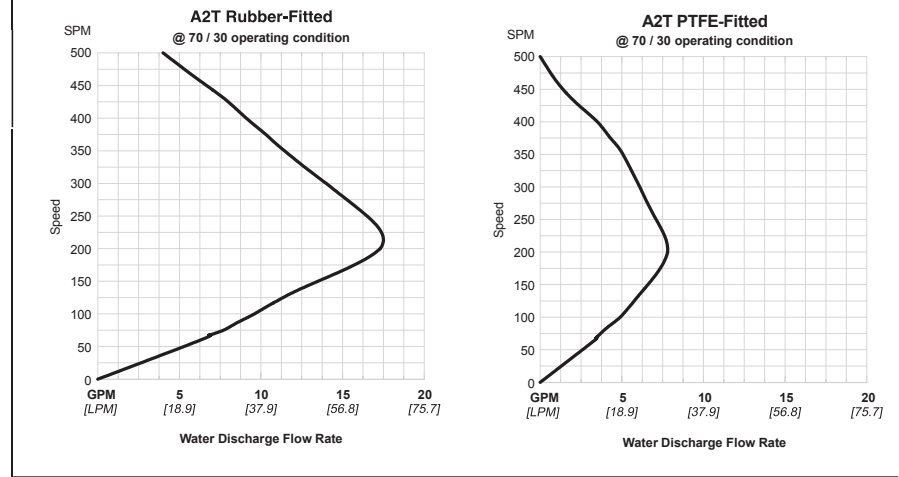
Flow rates indicated on chart were determined by pumping water.

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

## 70/30 OPERATING CONDITIONS

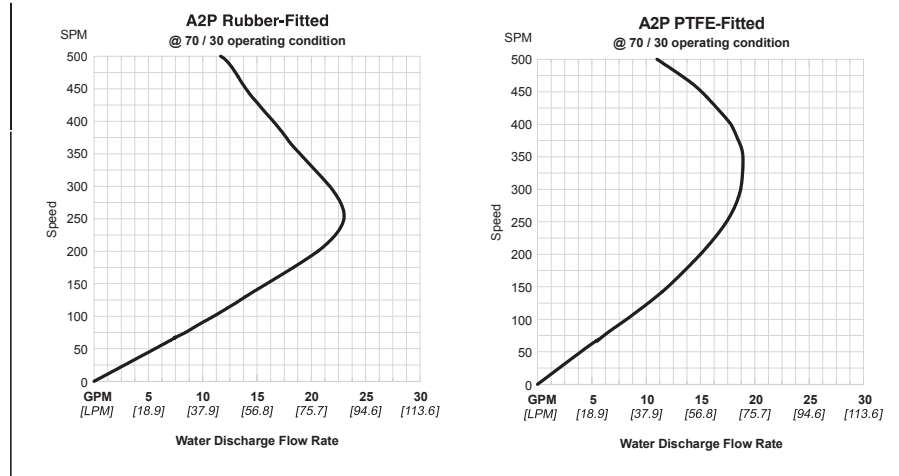
### A2T METAL ACCU-FLO™

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 METAL 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

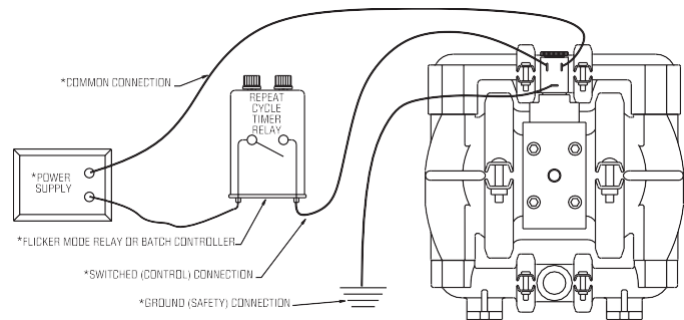
When the solenoid is unpowered, one air chamber is pressurized with air, while the opposite chamber is exhausted. When electric power is applied, the solenoid shifts, and the pressurized air chamber is exhausted while the opposite chamber is pressurized. By alternately applying and removing power, the 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.

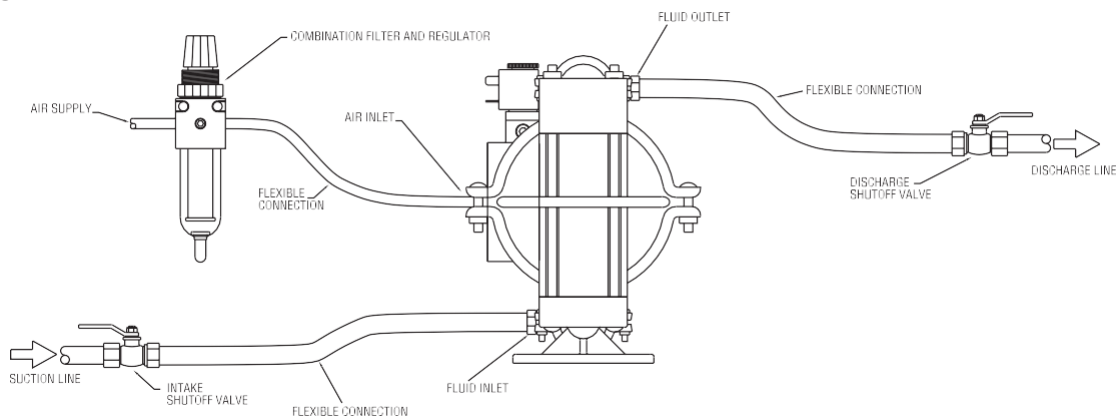
Although the speed of the pump is controlled electrically, the air pressure is important. Air pressure displaces the fluid, and if the pressure is insufficient to complete the physical stroke before an electronic impulse signals the pump to shift, the stroke will not be completed, and the displacement 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



## Suggested Operation and Maintenance

The pump will not shift reliably unless the minimum supply pressure is provided. 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.

**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.

### ***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.
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 air passages blocked with ice.***

Check for excessive moisture in compressed air line. As the air expands out the exhaust during the operation of the pump, water vapor entrapped in the compressed air can freeze and block the air passageways in the pump. If this occurs, it may be necessary to install a coalescing filter, an air dryer, or a hot air generator for the compressed air.

### ***Air bubbles in pump discharge.***

1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.

### ***Product comes out of the air exhaust.***

1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.

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

1. 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. Broken spring, mechanical binding.

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

1. Worn seals in air valve.

## Section 7

# Disassembly / Reassembly

## Pump Disassembly

### Tools Required:

- Adjustable Wrench
- 9/16" Box Wrench
- 3/4" Box Wrench
- 3/16" Hex Wrench
- Vice 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 is an air-operated, double-diaphragm pump with wetted parts of aluminum, stainless steel and Alloy C. The single-piece center section, consisting of center block and air chambers, is molded of polypropylene or aluminum. 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.



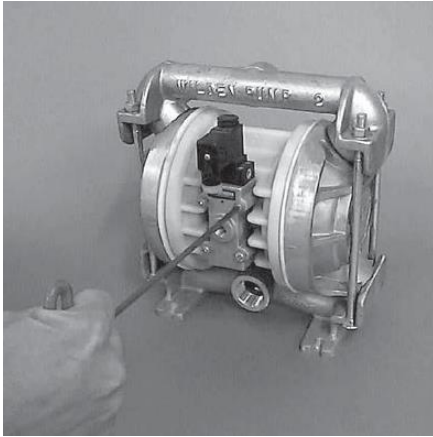
**NOTE:** Replace worn parts with genuine Wilden parts for reliable performance.



### Step 1

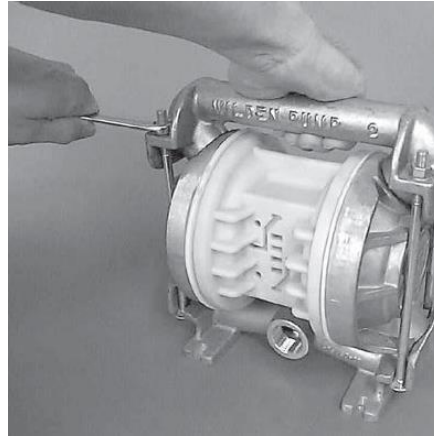
Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.

## Disassembly / Reassembly



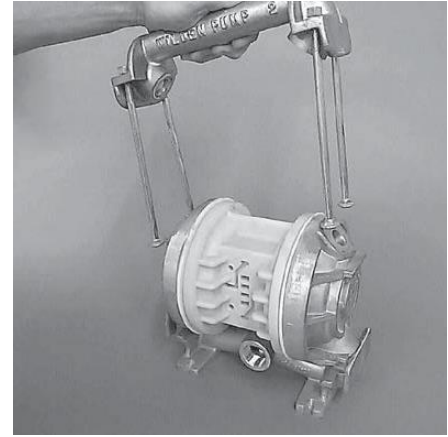
### Step 2

Using a 3/16" Hex wrench, remove air valve bolts. Inspect air valve assembly for wear or damage.



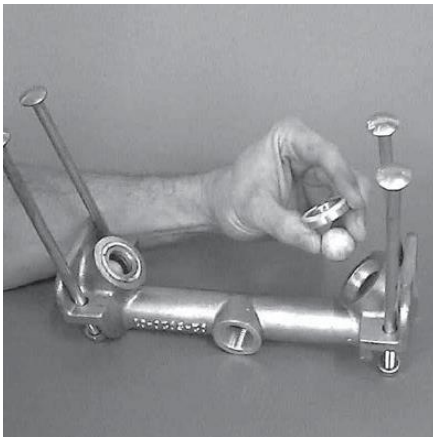
### Step 3

Utilizing the 9/16" box wrench, start by removing the four long carriage bolts that secure the top and bottom manifolds to the center section.



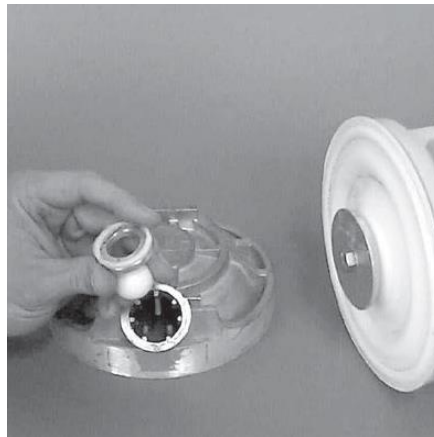
### Step 4

Remove the top manifold and lift the center section off the inlet manifold.



### Step 5

Remove the discharge valve balls, seats and O-rings from the discharge manifold and inspect for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance. PTFE O-rings should be replaced when reassembled.



### Step 6

Inspect the valve seat, valve seat O-ring and valve ball from intake manifold. Check for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance. PTFE O-rings should be replaced when reassembled.



### Step 7

With the 3/4" box wrench or by rotating the diaphragm by hand, remove the diaphragm assembly.

## Disassembly / Reassembly



### Step 8A

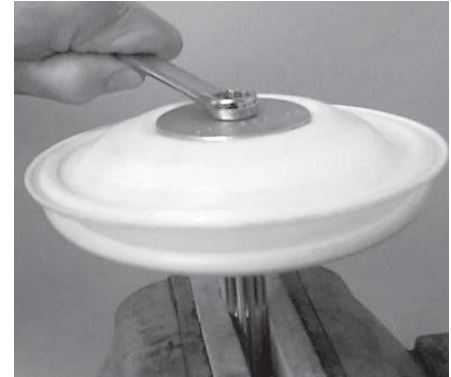


**NOTE:** Due to varying torque values, one of the following two situations may occur: 1) The outer piston, diaphragm and inner piston remain attached to the shaft and the entire assembly can be removed from the center section.



### Step 8B

2) The outer piston, diaphragm, inner piston, and disc spring separate from the shaft which remains connected to the opposite side diaphragm assembly PTFE-fitted pumps come standard with back-up diaphragms (not shown).



### Step 9

To remove the 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 a wrench, remove diaphragm assembly from shaft. Inspect all parts for wear and 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.
- Place one liquid chamber on its side and align center section with chamber using alignment marks made during disassembly. Push down on diaphragm assembly until diaphragm is inverted. Place opposite liquid chamber on center section and align.

- Position valve balls, seats, and o-rings in discharge manifold. Place vertical bolts through discharge manifold with threads pointing up. Install washer and start threads of bolt (about 1 1/2 turns).
- Place center section and liquid chambers on intake manifold.
- Position discharge manifold and bolt assembly on liquid chambers. Ensure proper alignment of mating surfaces between liquid chambers and manifolds before tightening bolts.
- Apply a small amount of Loctite 242 to the steel bore of the shaft from the diaphragm assembly.

### MAXIMUM TORQUE SPECIFICATIONS

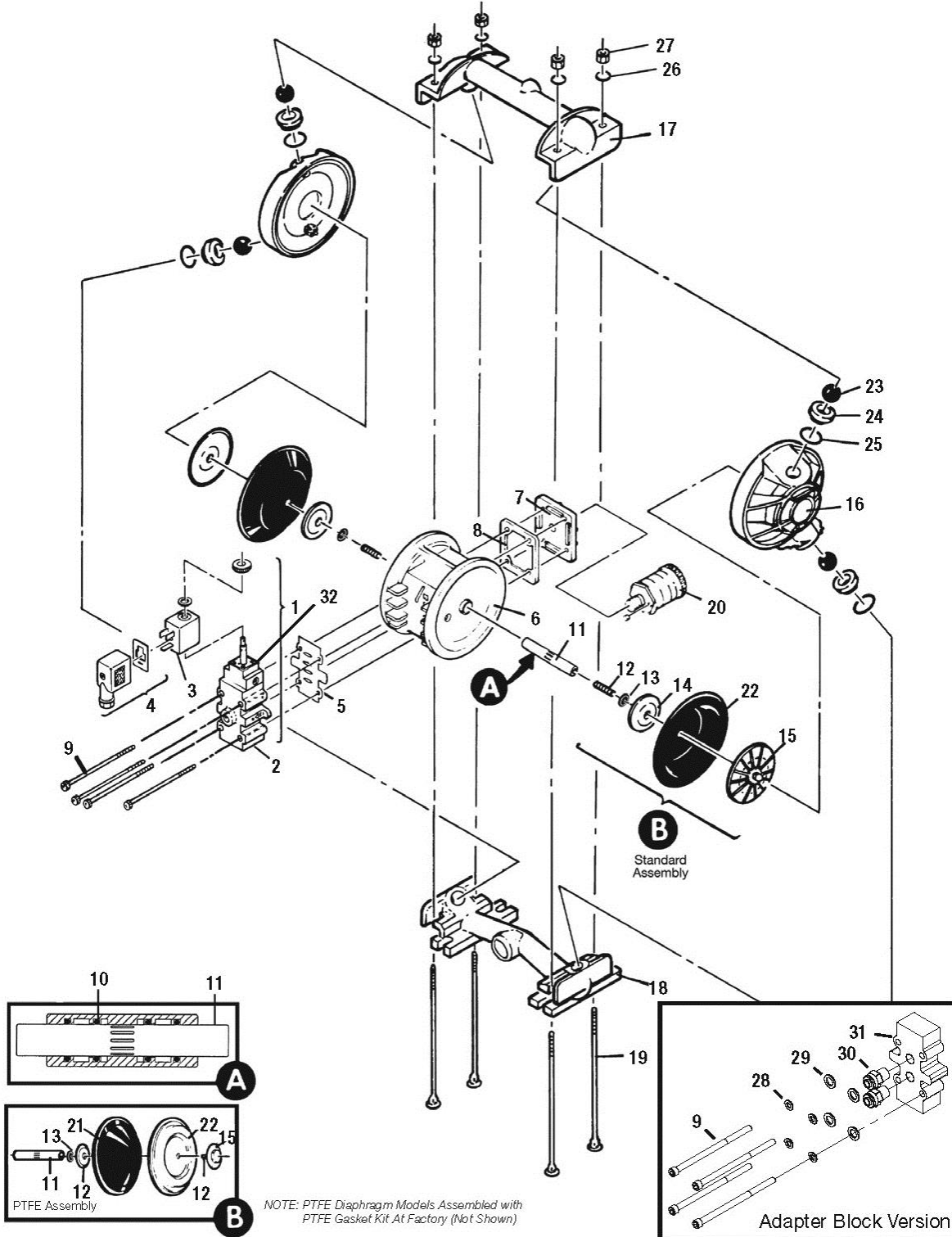
Description of Part	Metal Pumps
Solenoid Air Valve (Turbo-Flo™)	3.4 N•m (30 in-lb)
Solenoid Air Valve (Pro-Flo®)	3.1 N•m (27 in-lb)
Adapter Block Air Valve	3.1 N•m (27 in-lb)
Outer Piston, Rubber and PTFE-Fitted	40.7 N•m (30 ft-lb)
Vertical Bolts	13.0 N•m (115 in-lb)

**Section 8**

**EXPLODED VIEW AND PARTS LISTING**

**A2T METAL**

**EXPLODED VIEW**



# Exploded View and Parts List

Item	Description	Qty. Per Pump	Rubber-Fitted Pumps					PTFE-Fitted Pumps				
			A2T/ AAPPA/0150 P/N	A2T/ AAPPA/0194 P/N	A2T/ SSPPA/0150 P/N	A2T/ HHPPA/0150 P/N	A2T/ SSPPA/0125 P/N	A2T/ AAPPA/0150 P/N	A2T/ AAPPA/0194 P/N	A2T/ SSPPA/0150 P/N	A2T/ HHPPA/0150 P/N	A2T/ SSPPA/0125 P/N
1	Solenoid Valve Assembly	1	02-2000-99-150	02-2000-99-150	02-2000-99-150	02-2000-99-150	02-2000-99-150	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	02-2000-01-150	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	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	
4	Terminal Connector	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	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	02-2600-52	02-2600-52	02-2600-52	02-2600-52	02-2600-52	
6	Center Section	1	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	02-3151-20-225	
7	Muffler Plate	1	02-3180-20	02-3180-20	02-3180-20	02-3180-20	02-3180-20	02-3180-20	02-3180-20	02-3180-20	02-3180-20	
8	MufflerPlateGasket—Buna-N	1	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	02-3500-52-500	
9	Air Valve Screws, 1/4-20 x 6	4	02-6000-08	02-6000-03	02-6000-03	02-6000-03	02-6000-03	02-6000-08	02-6000-03	02-6000-03	02-6000-03	
10	Center Section Glyd™ Ring	4	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	
11	Shaft	1	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	02-3820-03-07	
12	Stud	2			02-6150-08	02-6150-08	02-6150-08	15-6130-08	15-6130-08	02-6150-08	02-6150-08	
13	Disc Spring	2	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	
14	Pistons — Inner	2	02-3750-01	02-3750-01	02-3750-01	02-3750-01	02-3750-01	02-3750-01	02-3750-01	02-3750-01	02-3750-01	
15	Pistons — Outer	2	02-4550-01	02-4550-01	02-4550-03	02-4550-04	02-4550-03	02-4600-01	02-4600-01	02-4600-03	02-4600-04	
16	Liquid Chamber	2	02-5000-01	02-5000-01	02-5000-03	02-5000-04	02-5000-03	02-5000-01	02-5000-01	02-5000-03	02-5000-04	
17	Discharge Manifold	1	02-5020-01	02-5020-01	02-5020-03	02-5020-04	02-5020-03-70	02-5020-01	02-5020-01	02-5020-03	02-5020-04	
18	Inlet Housing	1	02-5080-01	02-5080-01	02-5080-03	02-5080-04	02-5080-03-70	02-5080-01	02-5080-01	02-5080-03	02-5080-04	
19	Manifold Bolt, 3/8-16 x 8 1/2	4	02-6080-08	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	
20	Muffler	1	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	
21	Back-up Diaphragm**	2						02-1060-51	02-1060-51	02-1060-51	02-1060-51	
22	Diaphragm*	2	*	*	*	*	*	02-1010-55	02-1010-55	02-1010-55	02-1010-55	
23	Valve Balls*	4	*	*	*	*	*	02-1080-55	02-1080-55	02-1080-55	02-1080-55	
24	Valve Seat	4	02-1120-01	02-1120-01	02-1120-03	02-1120-04	02-1120-03	02-1120-01	02-1120-01	02-1120-03	02-1120-04	
25	Valve Seat O-Ring*	4	*	*	*	*	*	02-1200-55	02-1200-55	02-1200-55	02-1200-55	
	HexNut1/4-20, S.S.*** (Not Shown)	4	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-08	04-6400-08	04-6400-03	04-6400-03	
26	Manifold Bolt Washer	4	15-6720-08	02-6730-03	02-6730-03	02-6730-03	08-6720-07-70	15-6720-03	15-6720-03	02-6730-03	02-6730-03	
27	Manifold Bolt Nut, 3/8-16	4	02-6430-03	02-6430-03	02-6430-03	02-6430-03	02-6680-03-70	02-6430-08	02-6430-03	02-6430-03	02-6430-03	
28	Lock Washer, 1/4	4	50-6760-03	50-6760-03	50-6760-03	50-6760-03	50-6760-03	50-6760-03	50-6760-03	50-6760-03	50-6760-03	
29	Flat Washer	4	01-6730-03	01-6730-03	01-6730-03	01-6730-03	01-6730-03	01-6730-03	01-6730-03	01-6730-03	01-6730-03	
30	Fitting, Air Inlet	2	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	
31	Adapter Block	1	02-2150-XX	02-2150-XX	02-2150-XX	02-2150-XX	02-2150-XX	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	02-7020-17	02-7020-17	02-7020-17	02-7020-17	02-7020-17	
32	Solenoid Operator	1	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	

\* Refer to corresponding elastomer chart for metal pumps in Section 10.  
 \*\*Required only for PTFE fitted pumps.  
 \*\*\* Part to be used with P/N 02-6000-03 to secure air valve and muffler plate.  
 NOTE: Models A2/SPPE-125 rubber-fitted and A2/SPPE-125 PTFE-fitted have 1.5" cast tri-clamp inlet and outlet ports and use wing nut type fasteners on manifold bolts. (Food Processing pumps.)  
**All boldface items are primary wear parts.**  
**NOTE: For pumps fitted with wing nuts and tri-clamp connection please contact factory for exploded view drawing and part numbers.**

## Item 1 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 32 Adapter Block Options

Part Number	Description
02-2150-20	Polypropylene
02-2150-32	UHMW PE

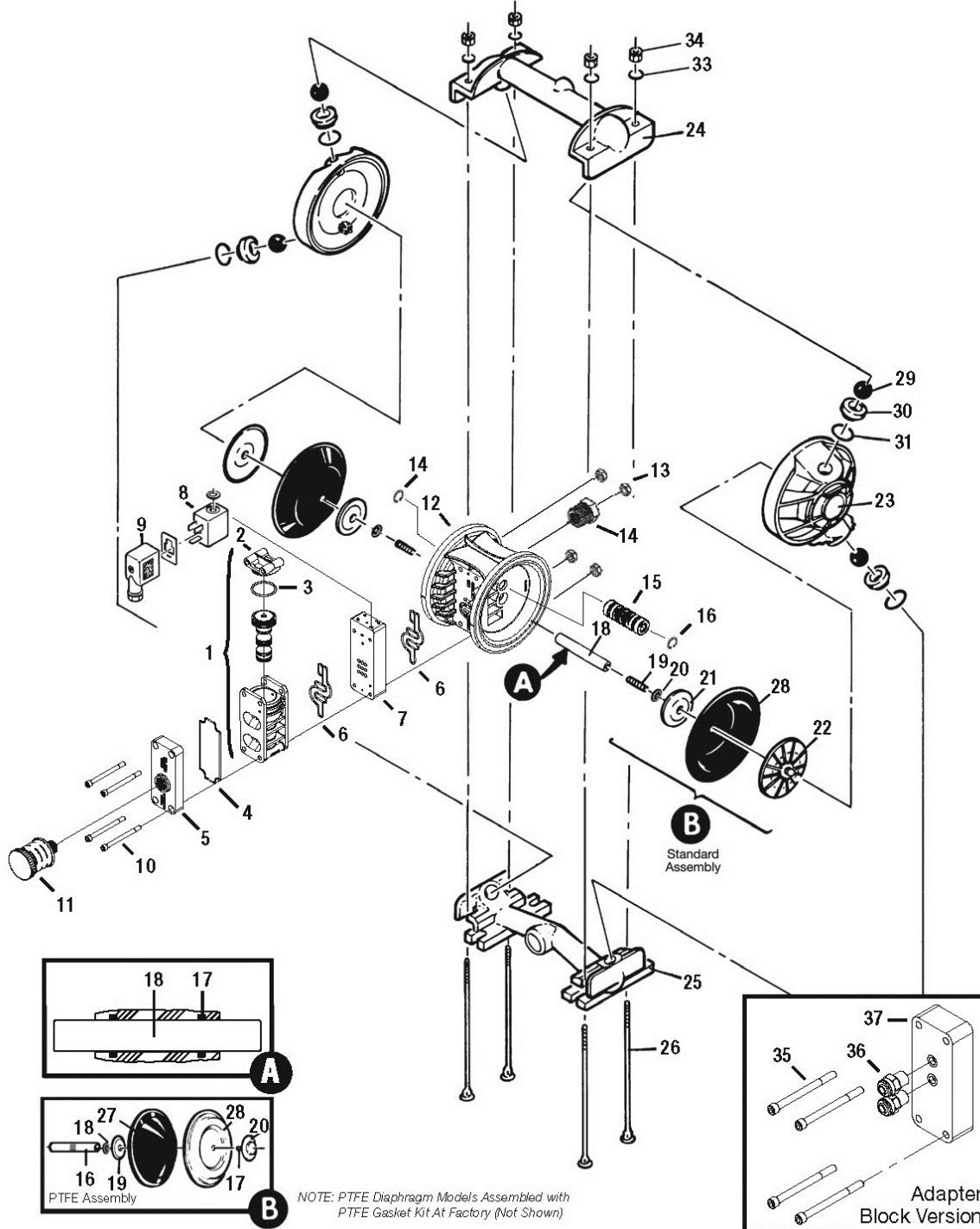
## Item 3 Coil Options

Pump Models Designating Specialty Code #	Part Number	Description	Operator
151	00-2110-99-151	24V AC / 12V DC Coil	00-2120-99
153	00-2110-99-153	24V AC / 12V DC Coil (NEMA 7)	00-2121-99
150	00-2110-99-150	24V DC Coil	00-2120-99
154	00-2110-99-154	24V DC Coil (NEMA 7)	00-2121-99
155	00-2110-99-155	110V AC Coil	00-2120-99
156	00-2110-99-156	110V AC Coil (NEMA 7)	00-2121-99
157	00-2110-99-157	International 24V DC Coil <sup>1</sup>	00-2120-99

<sup>1</sup>Meet European standards and regulations; CENELEC/PTB file # EX-9.C.2027

**A2P METAL**

**EXPLODED VIEW**



## Exploded View and Parts List

Item	Description	Qty. Per Pump	Rubber-Fitted Pumps					PTFE-Fitted Pumps				
			A2P/ AAPP/0150 P/N	A2P/ AAPP/0194 P/N	A2P/ SSPPA/0150 P/N	A2P/ HHPPA/0150 P/N	A2P/ SSPPA/0125 P/N	A2P/ AAPP/0150 P/N	A2P/ AAPP/0194 P/N	A2P/ SSPPA/0150 P/N	A2P/ HHPPA/0150 P/N	A2P/ SSPPA/0125 P/N
1	Pro-Flo® Air Valve Assembly	1	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20	01-2010-20
2	Pro-Flo® Air Valve End Cap	1	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20	01-2332-20
3	End Cap O-Ring	1	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52	01-2395-52
4	Gasket, Muffler Plate	1	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52	01-3505-52
5	Muffler Plate	1	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20	01-3181-20
6	Gasket, Air Valve	2	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52	01-2615-52
7	Pro-Flo® Solenoid Spacer	1	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20	01-2160-20
8	Coil	1	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150	00-2110-99-150
9	Connector	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99	00-2130-99
10	Air Valve Bolt, 1/4-20 x 4 1/2	4	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03	01-6000-03
11	Muffler	1	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99	02-3510-99
12	Pro-Flo® Center Section	1	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18	02-3140-18
13	Nut, 1/4-20	4	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03	04-6400-03
14	Reducer Bushing	1	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20	01-6950-20
15	Pilot Spool Assembly	1	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99	02-2285-99
16	Retaining Ring	2	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03	00-2650-03
17	Center Section Glyd™ Ring	2	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225	02-3210-55-225
18	Shaft	1	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03	02-3810-03
19	Stud	2			02-6150-08	02-6150-08	02-6150-08	15-6130-08	15-6130-08	02-6150-08	02-6150-08	02-6150-08
20	Disc Spring	2	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08	02-6802-08
21	Pistons — Inner	2	02-3701-01	02-3701-01	02-3701-01	02-3701-01	02-3701-01	02-3751-01	02-3751-01	02-3751-01	02-3751-01	02-3751-01
22	Pistons — Outer	2	02-4550-01	02-4550-01	02-4550-03	02-4550-04	02-4550-03	02-4550-01	02-4550-01	02-4550-03	02-4550-04	02-4550-03
23	Liquid Chamber	2	02-5000-01	02-5000-01	02-5000-03	02-5000-04	02-5000-03	02-5000-01	02-5000-01	02-5000-03	02-5000-04	02-5000-03
24	Discharge Manifold	1	02-5020-01	02-5020-01-03	02-5020-03	02-5020-04	02-5020-03-70	02-5020-01	02-5020-01-03	02-5020-03	02-5020-04	02-5020-03-70
25	Inlet Manifold	1	02-5080-01	02-5080-01-03	02-5080-03	02-5080-04	02-5080-03-70	02-5080-01	02-5080-01-03	02-5080-03	02-5080-04	02-5080-03-70
26	Manifold Bolt, 3/8-16 x 8 1/2	4	02-6080-08	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03	02-6080-03
27	Back-up Diaphragm <sup>2</sup>	2						<b>02-1060-56</b>	<b>02-1060-56</b>	<b>02-1060-56</b>	<b>02-1060-56</b>	<b>02-1060-56</b>
28	Diaphragm <sup>1</sup>	2	*	*	*	*	*	<b>02-1010-55</b>	<b>02-1010-55</b>	<b>02-1010-55</b>	<b>02-1010-55</b>	<b>02-1010-55</b>
29	Valve Balls <sup>1</sup>	4	*	*	*	*	*	<b>02-1080-55</b>	<b>02-1080-55</b>	<b>02-1080-55</b>	<b>02-1080-55</b>	<b>02-1080-55</b>
30	Valve Seat	4	<b>02-1120-01</b>	<b>02-1120-01</b>	<b>02-1120-03</b>	<b>02-1120-04</b>	<b>02-1120-03</b>	<b>02-1120-01</b>	<b>02-1120-01</b>	<b>02-1120-03</b>	<b>02-1120-04</b>	<b>02-1120-03</b>
31	Valve Seat O-Ring <sup>1</sup>	4	*	*	*	*	*	<b>02-1200-55</b>	<b>02-1200-55</b>	<b>02-1200-55</b>	<b>02-1200-55</b>	<b>02-1200-55</b>
32	Solenoid Operator	1	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99	00-2120-99
33	Manifold Bolt Washer, 3/8	4	15-6720-08	15-6720-08	02-6730-03	02-6730-03	08-6720-07-70	02-6730-03	02-6730-03	02-6730-03	02-6730-03	08-6720-07-70
34	Manifold Bolt Nut, 3/8-16	4	02-6430-08	02-6430-08	02-6430-03	02-6430-03	02-6680-03-70	02-6430-03	02-6430-03	02-6430-03	02-6430-03	02-6680-03-70
35	Air Valve Bolt, 1/4-20 x 2 <sup>3</sup>	4	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03	04-6000-03
36	Fitting, Air Inlet <sup>3</sup>	2	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20	00-2170-20
37	Adapter Block <sup>3</sup>	1	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX	00-2155-XX

<sup>1</sup> Refer to corresponding elastomer chart for metal pumps in Section 10.

<sup>2</sup> Saniflex™ diaphragms required only for PTFE-fitted A2P pumps.

<sup>3</sup> Part used only on adapter block version.

NOTE: Models A2/SPPE-125 rubber-fitted and A2/SPPE-125 PTFE-fitted have 1.5" cast tri-clamp inlet and outlet ports and use wing nut type fasteners on manifold bolts. (Food Processing pumps.)

All boldface items are primary wear parts.

NOTE: For pumps fitted with wing nuts and tri-clamp connection please contact factory for exploded view drawing and part numbers.

### Item 37 Adapter Block Options

Part Number	Description
01-2155-20	Polypropylene
01-2155-13	Acetal

### Item 8 Coil Options

Pump Models Designating Specialty Code #	Part Number	Description	Operator P/N
151	00-2110-99-151	24V AC / 12V DC Coil	00-2120-99
153	00-2110-99-153	24V AC / 12V DC Coil (NEMA 7)	00-2121-99
150	00-2110-99-150	24V DC Coil	00-2120-99
154	00-2110-99-154	24V DC Coil (NEMA 7)	00-2121-99
155	00-2110-99-155	110V AC Coil	00-2120-99
156	00-2110-99-156	110V AC Coil (NEMA 7)	00-2121-99
157	00-2110-99-157	International 24V DC Coil <sup>1</sup>	00-2120-99

<sup>1</sup> Meet European standards and regulations; CENELEC/PTB file # EX-9.C.2027.

**Section 9**

**Elastomer Options**

**A2 Metal Pumps**

Material	Diaphragm P/N	Valve Ball P/N	Valve Seat O-Ring P/N	Valve Seat P/N
Polyurethane	02-1010-50	02-1080-50	02-1200-50	
BUNA-N	02-1010-52	02-1080-52	02-1200-52	
Neoprene	02-1010-51	02-1080-51	N/A	
EPDM	02-1010-54	02-1080-54	02-1200-54	
FKM®	02-1010-53	02-1080-53	N/A	
Wil-Flex™	02-1010-58	02-1080-58	02-1200-58	
Saniflex™	02-1010-56	02-1080-56	02-1200-56	
PTFE	02-1010-55	02-1080-55	02-1200-55	
Stainless Steel				02-1120-03
Aluminum				02-1120-01
Alloy C				02-1120-04

**Electrical Information**

**NEMA 4<sup>1</sup> / 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

<sup>1</sup> NEMA 4 and IEC 144/855420 I.P. 66 for dust-tight, watertight corrosion resistant.

**Notes**

**Notes**

**Notes**

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