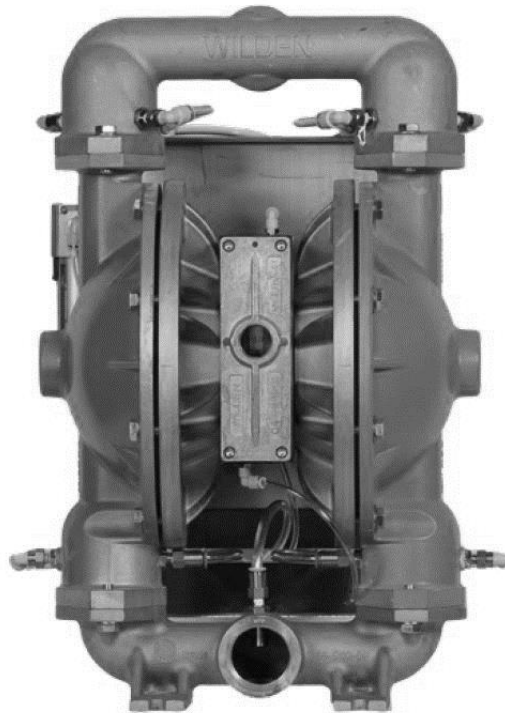


EOM

ENGINEERING OPERATION
& MAINTENANCE MANUAL

XPR860P/XPR1560P Powder Transfer Pump



WILDEN®



Where Innovation Flows

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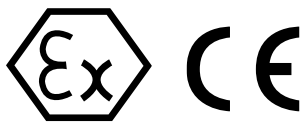
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Warranty

Each and every product manufactured by Wilden is built to meet the highest standards of quality. Every pump is functionally tested to ensure 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

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SAFETY AND PRECAUTIONS

SECTION 1



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



CAUTION: Do not apply compressed air to the exhaust port – pump will not function.



CAUTION: Do not over-lubricate air supply– excess lubrication will reduce pump performance. Pump is pre-lubed.



Powder properties: The Wilden powder transfer diaphragm pump is suitable for transporting lightweight, dry, and non-sticky industrial powders, such as carbon black, silica powder, silica gel, resin, and pharmaceutical powders. To ensure efficient and safe transfer, it is recommended that the bulk density of the powder does not exceed 800 kg/m³ and that the particle diameter does not exceed 150 microns.

**TEMPERATURE LIMITS:**

Acetal	-29°C to 82°C	-20°F to 180°F
Buna-N	-12°C to 82°C	10°F to 180°F
Geolast®	-40°C to 82°C	-40°F to 180°F
Neoprene	-18°C to 93°C	0°F to 200°F
Nordel EPDM	-51°C to 138°C	-60°F to 280°F
Nylon	-18°C to 93°C	0°F to 200°F
PFA	-7°C to 107°C	45°F to 225°F
Polypropylene	0°C to 79°C	32°F to 175°F
Polyurethane	-12°C to 66°C	10°F to 150°F
PVDF	-12°C to 107°C	10°F to 225°F
Saniflex™	-29°C to 104°C	-20°F to 220°F
SIPD PTFE with EPDM-backed	4°C to 137°C	40°F to 280°F
SIPD PTFE with Neoprene-backed	4°C to 93°C	40°F to 200°F
PTFE*	4°C to 104°C	40°F to 220°F
FKM	-40°C to 177°C	-40°F to 350°F
Wil-Flex™	-40°C to 107°C	-40°F to 225°F

*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. Refer to "Wilden Pump Designation System" 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 177°C (350°F), but polypropylene has a maximum limit of only 79°C (175°F).



CAUTION: Pump surfaces may exceed 80°C (176°F), contact will result in burns, scalds, and other injuries. Surface temperature is dependent on the temperature of the process fluid.



CAUTION: Prevent static sparking. If static sparking occurs, fire or explosion could result. Pump, valves and containers must be grounded to a proper grounding point when handling flammable fluids and whenever discharge of static electricity is a hazard.



CAUTION: Maximum temperature limits are based on mechanical stress only. Certain chemicals will reduce maximum safe operating temperatures significantly. Consult the Chemical Resistance Guide for chemical compatibility and temperature limits.



CAUTION: All Wilden pumps are capable of passing solids. Use a strainer on the pump intake to ensure that the pump's rated solids capacity is not exceeded.



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



CAUTION: Do not exceed 82°C (180°F) air inlet temperature for all models.



CAUTION: Before attempting any maintenance or repair, disconnect the compressed air line to the pump and allow all air pressure 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.



CAUTION: Before attaching the air line to the pump, blow out the air line for 10 to 20 seconds to make sure all pipeline debris is clear. Use an in-line air filter. A 5µ (micron) air filter is recommended.



CAUTION: Before installation, tighten all hardware.



NOTE: Materials of construction and elastomer material may influence suction lift parameters. Please refer to "Performance" for specifics.



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



NOTE: Some PTFE-fitted pumps come standard from the factory with expanded PTFE gaskets installed in the diaphragm bead of the liquid chamber. PTFE gaskets cannot be re-used.



NOTE: In the event of a power failure, close the shut-off valve if you do not want the pump to restart when the power returns.



NOTE: The Safety Supplement document is a part of the manual. Please refer to the Safety Supplement document for a complete list of safety considerations including considerations for safe operation and maintenance of pumps marked for ATEX environments before starting the pump.

WILDEN PUMP DESIGNATION SYSTEM

MATERIAL CODES

MODEL XPR860P = 2" NPT XPR1560P = 3" NPT	AIR VALVE A = ALUMINUM	VALVE BALLS TF = PTFE (WHITE) VT = FKM (WHITE DOT) WF = WIL-FLEX™ [SANTOPRENE® (THREE BLACK DOTS)]
WETTED PATH A = ALUMINUM S = STAINLESS STEEL	DIAPHRAGMS TNU = PTFE w/NEOPRENE BACKUP VTS = FKM (WHITE DOT) ZWS = WIL-FLEX™ EZ-INSTALL [SANTOPRENE® (THREE BLACK DOTS)]	VALVE SEATS A = ALUMINUM S = STAINLESS STEEL WF = WIL-FLEX™ [SANTOPRENE® (THREE BLACK DOTS)]
OUTER PISTON A = ALUMINUM S = STAINLESS STEEL		VALVE SEAT O-RINGS TF = PTFE (WHITE)
AIR CHAMBER A = ALUMINUM		
CENTER BLOCK A = ALUMINUM		

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Wilden®

SECTION 3

HOW IT WORKS – AIR-OPERATED DOUBLE-DIAPHRAGM PUMP

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

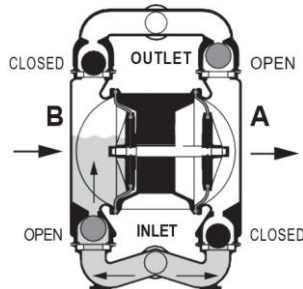


FIGURE 1 The air valve directs pressurized air to the back side of diaphragm A. The compressed air is applied directly to the liquid column separated by elastomeric diaphragms. The diaphragm acts as a separation membrane between the compressed air and liquid; a balanced load removes mechanical stress from the diaphragm. The compressed air moves the diaphragm away from the center 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 atmosphere through the exhaust port of the pump. The movement of diaphragm B toward the center of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber (see shaded area).

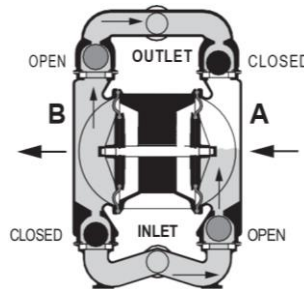


FIGURE 2 When the pressurized diaphragm, diaphragm A, reaches the limit of its discharge stroke, the air valve redirects pressurized air to the back side of diaphragm B. The pressurized air forces diaphragm B away from the center while pulling diaphragm A to the center. Diaphragm B is now on its discharge 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 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 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 its seat allowing the fluid being pumped to fill the liquid chamber.

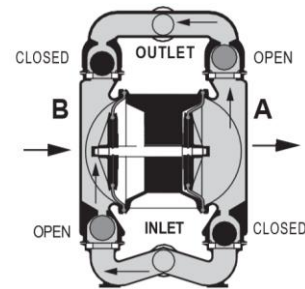
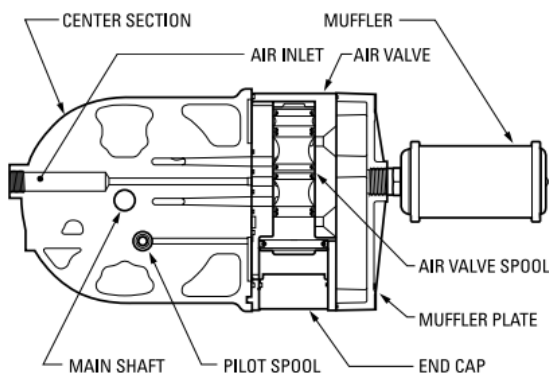


FIGURE 3 At completion of the stroke, the air valve again redirects air to the back side of diaphragm A, which starts diaphragm B on its exhaust stroke. As the pump reaches its original starting point, each diaphragm has gone through one exhaust and one discharge stroke. This constitutes one complete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

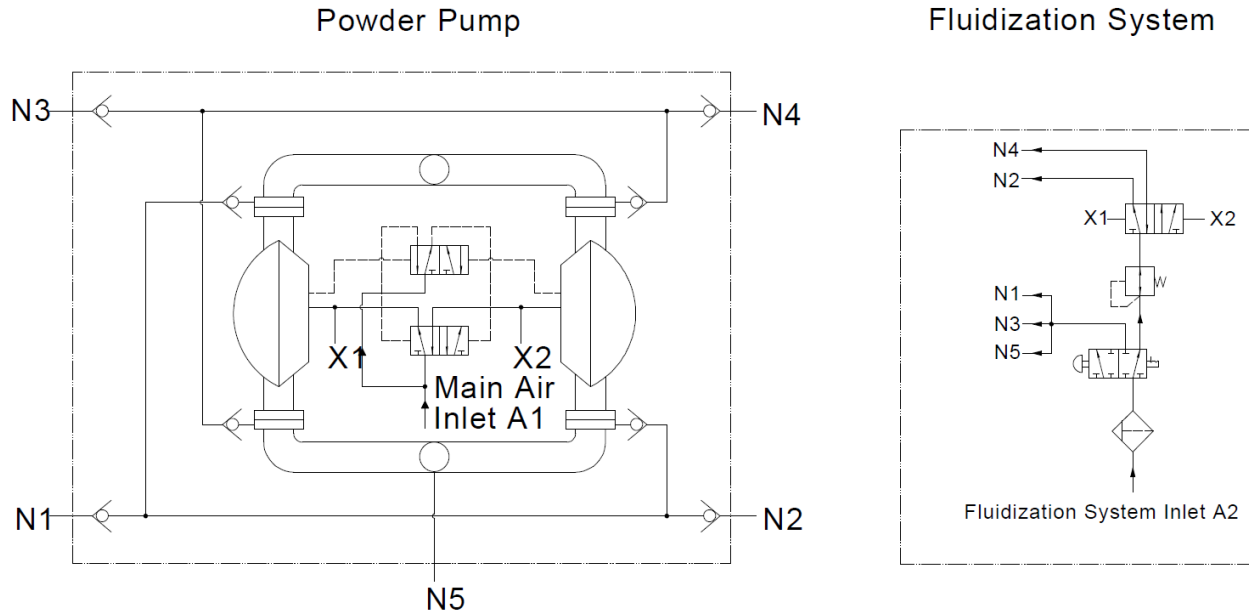
HOW IT WORKS – AIR DISTRIBUTION SYSTEM



The Pro-Flo® R air distribution system incorporates two moving parts: the air valve spool and the pilot spool. The heart of the system is the air valve spool and air valve. This valve design incorporates an unbalanced spool. The smaller end of the spool is pressurized continuously, while the large end is alternately pressurized then exhausted to move the spool. The spool directs pressurized air to one air chamber while exhausting the other. The air causes the main shaft/diaphragm assembly to shift to one side — discharging liquid on that side and pulling liquid in on the other side. When the shaft reaches the end of its stroke, the inner piston actuates the pilot spool, which pressurizes and exhausts the large end of the air valve spool. The repositioning of the air valve spool routes the air to the other air chamber.

SECTION 3

HOW IT WORKS – POWDER FLUIDIZATION SYSTEM



In the main pump design, each of the four valve balls is equipped with two purging points, and an additional purging point has been added at the inlet. This configuration aims to enhance the cleaning efficiency of the pump, ensuring no residual materials affect the pump's performance. For this purpose, compressed air is used as the purging medium. The use of compressed air is not only clean and efficient but also helps maintain the cleanliness inside the pump, ensuring stable operation of the equipment.

The fluidization system consists of two operating modes: comprehensive purge mode and synchronous purge mode, which can be selected by the user through the operation of the switching valve.

In comprehensive purge mode, the fluidization system distributes compressed air to all purging points simultaneously. This mode is primarily aimed at dispersing accumulated powder to the maximum extent, reducing resistance when starting the pump. This is especially important after a long period of inactivity, as it effectively cleans residual powders, ensuring the pump starts normally and operates efficiently.

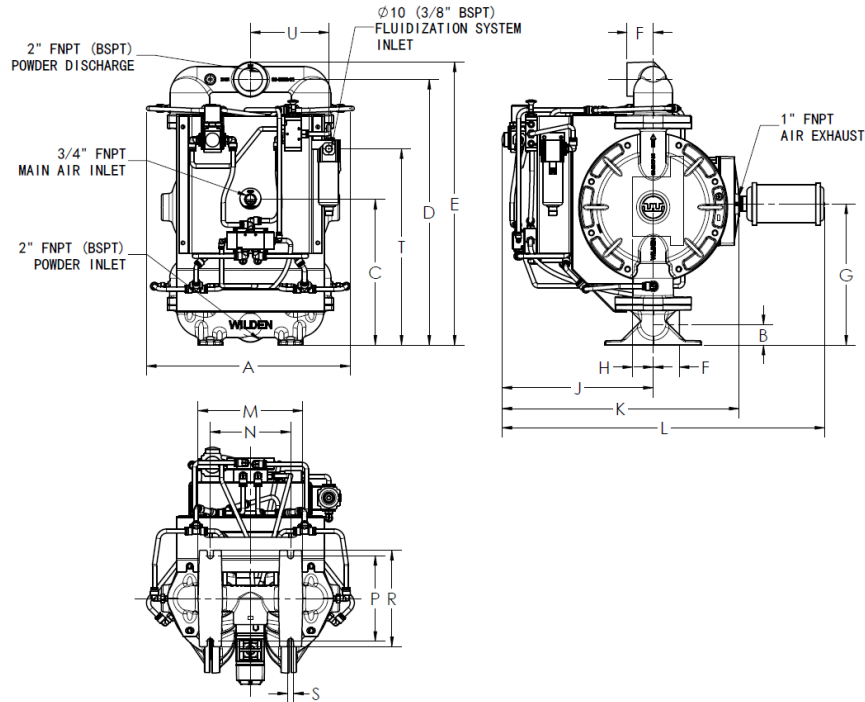
In synchronous purge mode, with the diaphragm pump operating normally, the fluidization system automatically alternately distributes compressed air to each purging point. This mode is designed to effectively prevent the accumulation of powder in different parts of the pump, thereby maintaining continuous operation and efficiency.

If the pump needs to be restarted after a period, it is recommended that shut off the main air let, connect the fluidization system to compressed air line, and keep in the comprehensive purge mode for 3 to 5 minutes. This process helps disperse the accumulated powder in the pump, thus reducing resistance at startup and ensuring that the pump reaches optimal operational status during the startup process. This preparatory step can significantly enhance the pump's performance and reliability.

SECTION 4

DIMENSIONAL DRAWING

XPR860P ALUMINUM

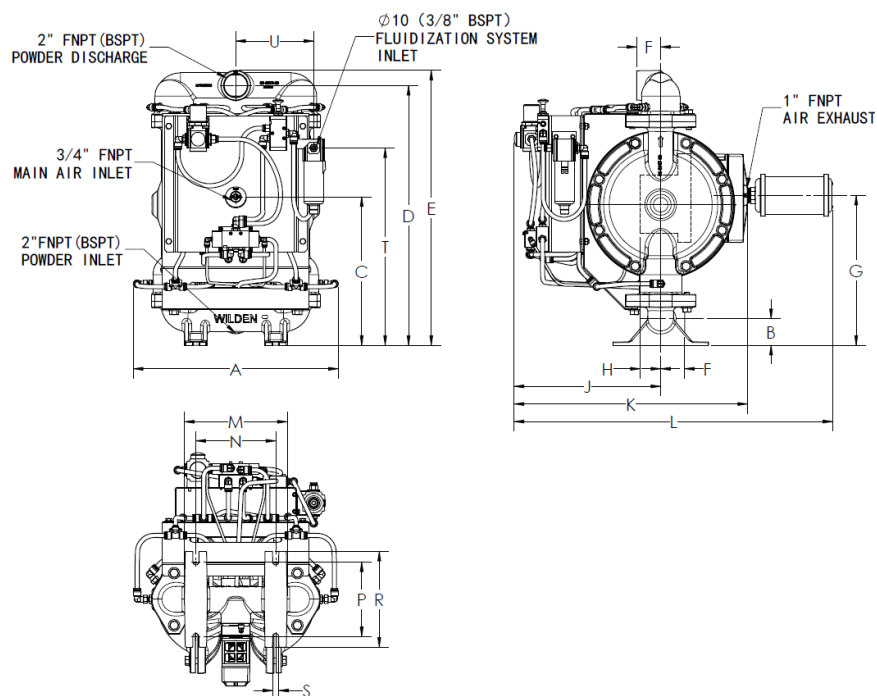


DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	490	19.3
B	48	1.9
C	346	13.6
D	630	24.8
E	670	26.4
F	62	2.4
G	349	13.8
H	49	1.9
J	360	14.1
K	562	22.1
L	765	30.1
M	249	9.8
N	191	7.5
P	203	8.0
R	229	9.0
S	14	0.6
T	465	18.3
U	186	7.3

TJPR860P-01 REV.A

XPR860P STAINLESS STEEL



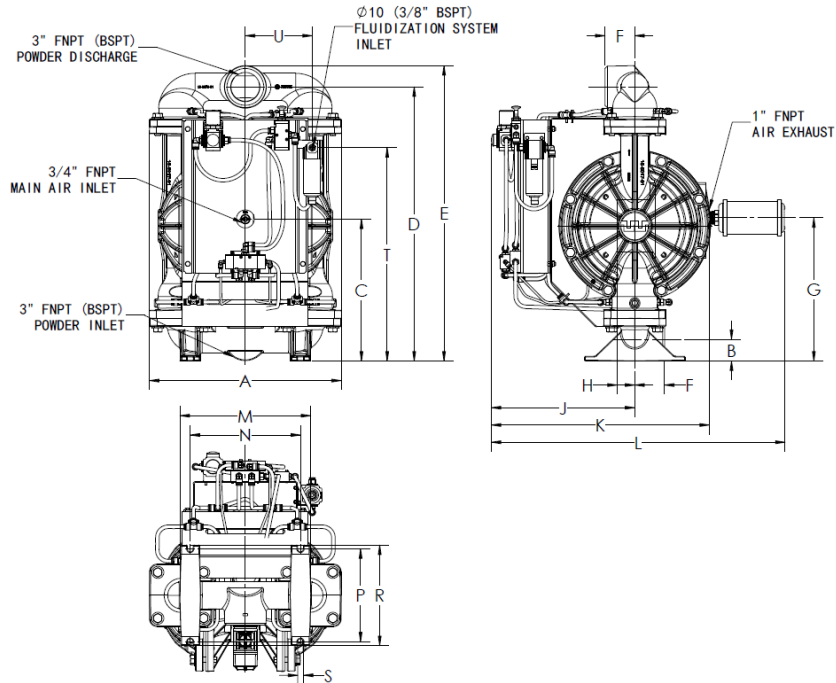
DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	490	19.3
B	64	2.5
C	356	14.0
D	620	24.4
E	655	25.8
F	58	2.3
G	358	14.1
H	49	1.9
J	350	13.8
K	557	21.9
L	760	29.9
M	244	9.6
N	191	7.5
P	178	7.0
R	229	9.0
S	15	0.6
T	471	18.5
U	186	7.3

TJPR860P-02 REV.A

DIMENSIONAL DRAWING

XPR1560P ALUMINUM

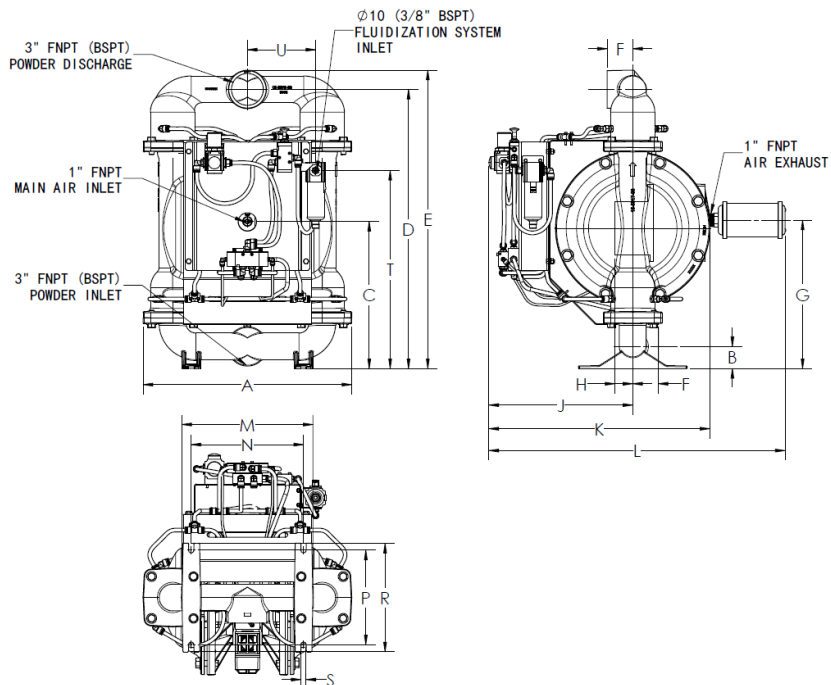


DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	532	21.0
B	60	2.4
C	394	15.5
D	762	30.0
E	821	32.3
F	83	3.3
G	398	15.7
H	49	1.9
J	399	15.7
K	606	23.9
L	817	32.2
M	363	14.3
N	306	12.1
P	258	10.2
R	279	11.0
S	17	0.7
T	471	18.5
U	186	7.3

TJPR1560P-01 REV.A

XPR1560P ALUMINUM



DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	568	22.4
B	60	2.4
C	401	15.8
D	762	30.0
E	815	32.1
F	70	2.8
G	405	15.9
H	49	1.9
J	392	15.4
K	602	23.7
L	808	31.8
M	357	14.1
N	306	12.1
P	258	10.2
R	279	11.0
S	15	0.6
T	541	21.3
U	186	7.3

TJPR1560P-02 REV.A

SECTION 5

PERFORMANCE

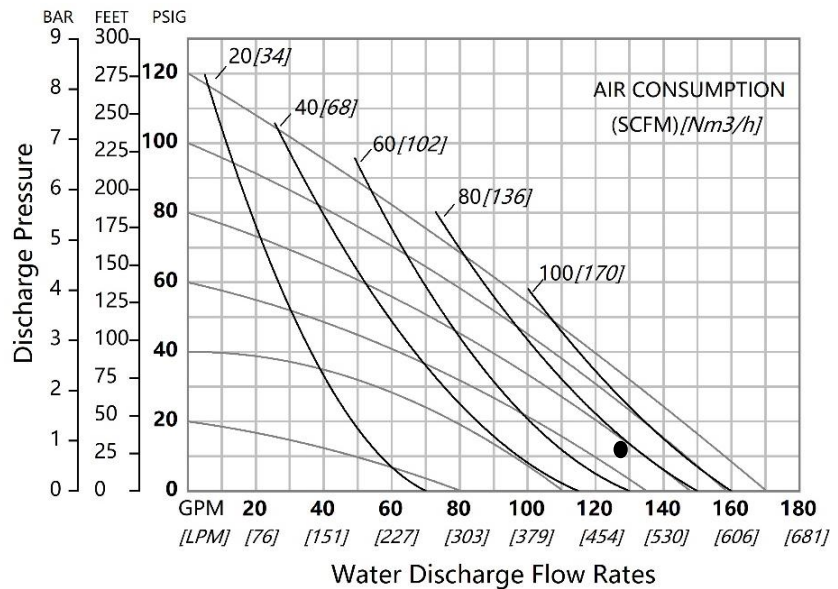
XPR860P METAL RUBBER-FITTED

Ship Weight..... Aluminum 37.5kg (82lb)
316 Stainless Steel Threaded 60.5kg (132 lb)

Air Inlet..... 3/4"
Inlet..... 51 mm (2")
Outlet..... 51 mm (2")
Suction Lift..... 5.9 m Dry (19.5')
8.7 m Wet (29.4')
Disp. per Stroke¹..... 2.8 L (0.74 gal)
Max. Flow Rate..... 651 lpm (172 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR860P metal rubber-fitted pump achieved a flow rate of 511 lpm (135 gpm) using 136 Nm³/h (80 scfm) of air when run at 5.6 bar (80 psig) air inlet pressure and 0.7 bar (10 psig) discharge 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.

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

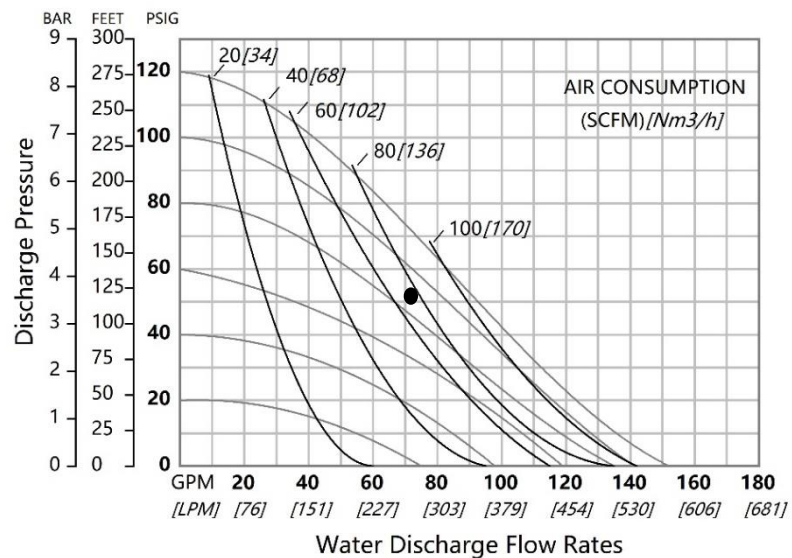
XPR860P METAL EZ-INSTALL TPE-FITTED

Ship Weight..... Aluminum 37.5kg (82lb)
316 Stainless Steel Threaded 60.5kg (132 lb)

Air Inlet..... 3/4"
Inlet..... 51 mm (2")
Outlet..... 51 mm (2")
Suction Lift..... 7.6 m Dry (25.0')
9.7 m Wet (31.8')
Disp. per Stroke¹..... 2.5 L (0.67 gal)
Max. Flow Rate..... 625 lpm (165 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR860P metal EZ INSTAL TPE-fitted pump achieved a flow rate of 288 lpm (76gpm) using 102 Nm³/h (60 scfm) of air when run at 5.6 bar (80psig) air inlet pressure and 3.5 bar (50 psig) discharge 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.

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

SECTION 5

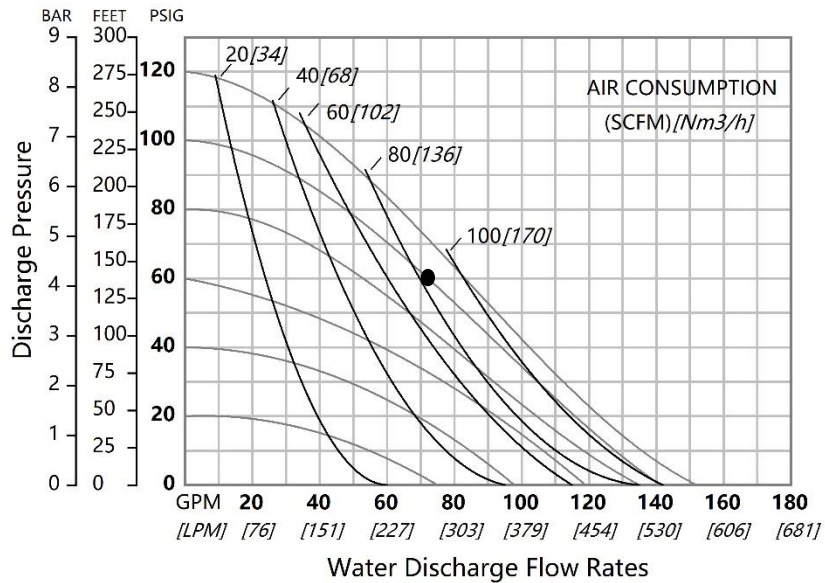
**XPR860P METAL
REDUCED-STROKE
PTFE-FITTED**

Ship Weight.....Aluminum 37.5kg (82lb)
316 Stainless Steel Threaded 60.5kg (132 lb)

Air Inlet.....3/4"
Inlet.....51 mm (2")
Outlet.....51 mm (2")
Suction Lift.....4.4 m Dry (14.5')
9.0 m Wet (29.5')
Disp. per Stroke¹.....1.7 L (0.45 gal)
Max. Flow Rate.....575 lpm (152 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR860 metal reduced-stroke PTFE-fitted pump achieved a flow rate of 273 lpm (72 gpm) using 139 Nm³/h (82 scfm) of air when run at 7 bar (100 psig) air inlet pressure and 4.2 bar (60 psig) discharge 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.

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

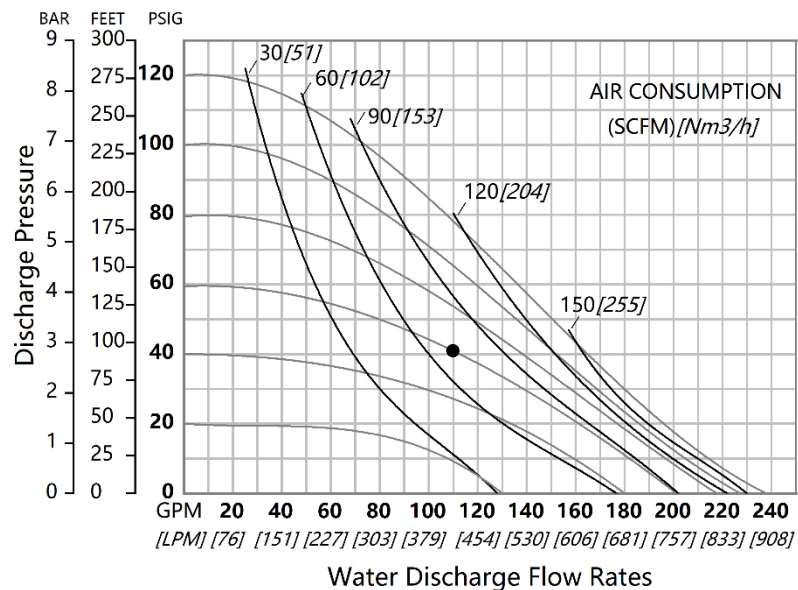
**XPR1560P METAL
RUBBER-FITTED**

Ship Weight.....Aluminum 64.5kg (141lb)
316 Stainless Steel Threaded 107.5kg (235 lb)

Air Inlet.....3/4"
Inlet.....76 mm (3")
Outlet.....76mm (3")
Suction Lift.....6.8 m Dry (22.2')
9.0 m Wet (29.5')
Disp. per Stroke¹.....5.4 L (1.42 gal)
Max. Flow Rate.....893 lpm (236 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR1560P metal rubber-fitted pump achieved a flow rate of 416 lpm (110 gpm) using 127.5 Nm³/h (75 scfm) of air when run at 4.1 bar (60 psi) air inlet pressure and 2.7 bar (40 psi) discharge 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.

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

SECTION 5

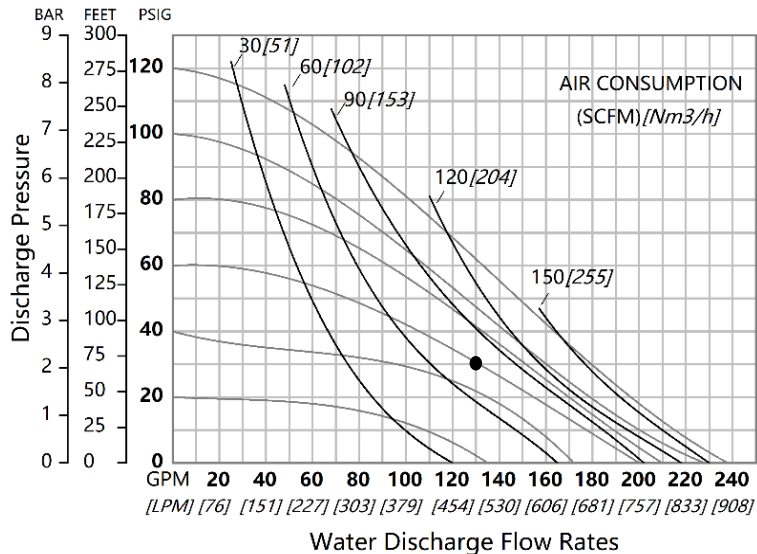
XPR1560P METAL EZ INSTALL TPE-FITTED

Ship Weight.....Aluminum 64.5kg (141lb)
316 Stainless Steel Threaded 107.5kg (235 lb)

Air Inlet.....3/4"
Inlet.....76 mm (3")
Outlet.....76mm (3")
Suction Lift.....6.4 m Dry (20.9')
9.0 m Wet (29.5')
Disp. per Stroke¹.....5.8 L (1.55 gal)
Max. Flow Rate.....900 lpm (238 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR1560P metal TPE-fitted pump achieved a flow rate of 492lpm (130 gpm) using 127.5Nm³/h (75 scfm) of air when run at 4.1bar (60 psi) air inlet pressure and 2.7 bar (40 psi) discharge pressure.



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

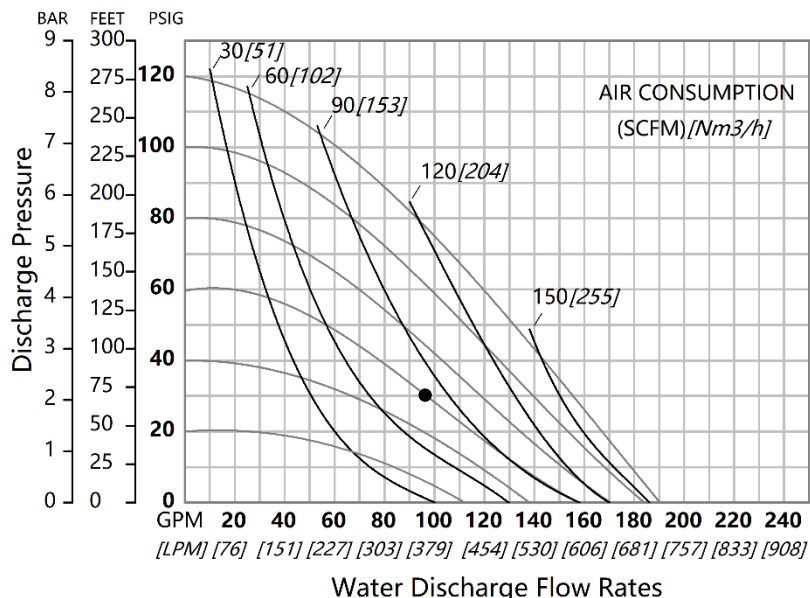
XPR1560P METAL REDUCED STROKE PTFE-FITTED

Ship Weight.....Aluminum 64.5kg (141lb)
316 Stainless Steel Threaded 107.5kg (235 lb)

Air Inlet.....3/4"
Inlet.....76 mm (3")
Outlet.....76mm (3")
Suction Lift.....5.5 m Dry (17.9')
9.0 m Wet (29.5')
Disp. per Stroke¹.....3.0 L (0.8 gal)
Max. Flow Rate.....719 lpm (190 gpm)

¹Displacement per stroke was calculated at 4.8 bar (70 psi) air inlet pressure against a 2.1 bar (30 psi) head pressure.

Example: A PR1560P metal reduced-stroke PTFE-fitted pump achieved a flow rate of 360 lpm (95gpm) using 144 Nm³/h (85 scfm) of air when run at 4.1 bar (60 psi) air inlet pressure and 2.1 bar (30 psi) discharge pressure.



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

SECTION 6

SUGGESTED INSTALLATION, OPERATION, MAINTENANCE
AND TROUBLESHOOTING

Wilden pumps are designed to meet the performance requirements of even the most demanding pumping applications. They have been designed and manufactured to the highest standards and are available in a variety of liquid path materials to meet your chemical resistance needs. Refer to "Performance" for an in-depth analysis of the performance characteristics of your pump. Wilden offers the widest variety of elastomer options in the industry to satisfy temperature, chemical compatibility, abrasion resistance and flex concerns.

The suction pipe size should be at least equal to or larger than the diameter size of the suction inlet on your Wilden pump. The suction hose must be a non-collapsible, reinforced type because these pumps are capable of pulling a high vacuum. Discharge piping should also be equal to or larger than the diameter of the pump discharge, which will help reduce friction losses.



CAUTION: All fittings and connections must be airtight. Otherwise, pump suction capability will be reduced or lost.

Months of careful planning, study and selection efforts can result in unsatisfactory pump performance if installation details are left to chance. You can avoid premature failure and long-term dissatisfaction by exercising reasonable care throughout the installation process.

Location

Noise, safety and other logistical factors usually dictate where equipment will be situated on the production floor. Multiple installations with conflicting requirements can result in congestion of utility areas, leaving few choices for additional pumps. Within the framework of these and other existing conditions, locate every pump in such a way that the following six key factors are balanced against each other to maximum advantage:

- **Access:** First, the location should be accessible. If it's easy to reach the pump, maintenance personnel will be able to perform routine inspections and adjustments more easily. If 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. For best results, the pumps should use a 5µ (micron) air filter, needle valve and regulator. The use of an air filter before the pump will ensure that the majority of any pipeline contaminants will be eliminated.
- **Solenoid Operation:** When operation is controlled by a solenoid valve in the air line, three-way valves should be used. This valve allows trapped air between the valve and the pump to bleed off, which improves pump performance. You can estimate pumping volume by counting the number of strokes per minute, and then multiplying that figure by the displacement per stroke.
- **Muffler:** Using the standard Wilden muffler, sound levels are reduced below OSHA specifications. You can use other mufflers to reduce sound levels farther, but they usually reduce pump performance.
- **Elevation:** Selecting a site that is well within the pump's dynamic lift capability will assure that loss-of-prime issues will

be eliminated. In addition, pump efficiency can be adversely affected if proper attention is not given to site location.

- **Piping:** Final determination of the pump site should not be made until the piping challenges 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 to keep friction losses within practical limits. All piping should be supported independently of the pump. In addition, the piping should be aligned to avoid placing stress on the pump fittings.

Flexible hose can be installed to aid in 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 surge suppressor (SD Equalizer) should be installed to protect the pump, piping and gauges from surges and water hammer.

If the pump is to be used in a self-priming application, make sure that all connections are airtight and that the suction lift is within the model's ability.



NOTE: Materials of construction and elastomer material have an effect on suction lift parameters. Please refer to "Performance" for specifics.

When pumps are installed in applications involving flooded suction or suction head pressures, a gate valve should be installed in the suction line to permit closing of the line for pump service.

Pumps in service with a positive suction head are most efficient when inlet pressure is limited to 0.5–0.7 bar (7–10 psi). Premature diaphragm failure may occur if positive suction is 0.7 bar (10 psi) and higher.

Single-Point Exhaust

Pro-Flo R pumps can be used for submersible applications when using the Pro-Flo R's single-point exhaust.

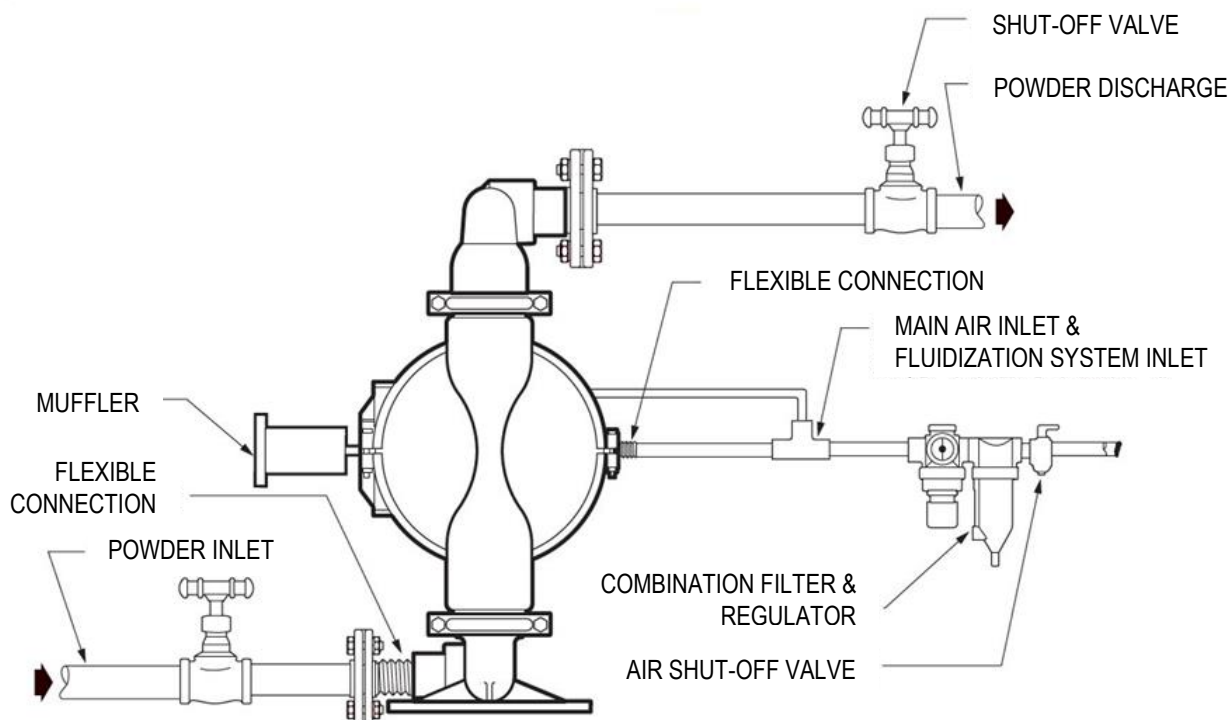


CAUTION: All Wilden pumps are capable of passing solids. Use a strainer on the pump intake to ensure that the pump's rated solids capacity is not exceeded.



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

SUGGESTED INSTALLATION, OPERATION, MAINTENANCE AND TROUBLESHOOTING



NOTE: In the event of a power failure, close the shut-off valve if you do not want the pump to restart when the power returns.

Air-Operated Pumps: To stop the pump from operating in an emergency, simply close the shut-off valve (user-supplied) installed in the air supply line. A properly functioning valve will stop the air supply to the pump, therefore stopping output. This shut-off valve should be located far enough away from the pumping equipment such that it can be reached safely in an emergency.

Operation

The Pro-Flo R pumps are pre-lubricated and do not require in-line lubrication. Additional lubrication will not damage the pump. However, if the pump is heavily lubricated by an external source, the pump's internal lubrication may be washed away. If the pump is then moved to a nonlubricated location, it may need to be disassembled and re-lubricated as described in "Disassembly/ Reassembly".

Pump discharge rate can be controlled by limiting the volume and/or pressure of the air supply to the pump. An air regulator is used to regulate air pressure. A needle valve is used to regulate volume. Pump discharge rate also can be controlled by throttling the pump discharge by partially closing a valve in the discharge line of the pump. This action increases friction loss, which reduces flow rate. (Refer to "Performance") This is useful when the need exists

to control the pump from a remote location. When the pump discharge pressure equals or exceeds the air supply pressure, the pump will stop. No bypass or pressure relief valve is needed, and pump damage will not occur. The pump has reached a "deadhead" situation and can be restarted by reducing the fluid discharge pressure or increasing the air inlet pressure. Wilden Pro-Flo SHIFT pumps run solely on compressed air and do not generate heat. Therefore, your process fluid temperature will not be affected.

Maintenance and Inspections

Because each application is unique, maintenance schedules may be different for every pump. Frequency of use, line pressure, viscosity and abrasiveness of process fluid all affect 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.

SUGGESTED INSTALLATION, OPERATION, MAINTENANCE AND TROUBLESHOOTING

Troubleshooting

Pump will not run or runs slowly.

1. Remove plug from pilot spool exhaust.
2. Ensure that the air inlet pressure is at least 0.4 bar (5 psi) above startup pressure and that the differential pressure (the difference between air inlet and liquid discharge pressures) is not less than 0.7 bar (10 psi).
3. Check air inlet filter for debris.
4. Check for extreme air leakage (blow by) that would indicate worn seals/bore in the air valve, pilot spool and main shaft.
5. Disassemble the pump and check for obstructions in the air passageways or objects that would obstruct the movement of internal parts.
6. Check for sticking ball check valves.
 - a. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace ball check valves and seals with proper elastomers.
 - b. Also, as the check valve balls wear out, they become smaller and can become stuck in the seats. In this case, replace balls and seats.
7. Check for any broken inner piston that would cause the air valve spool to be unable to shift.
8. Powder material clumping or mixing with large diameter particles can block the ball valve orifices or the pump's suction or discharge ports.
9. Powder material deposits around the ball valve, preventing the valve balls from opening and closing normally.

Pump runs, but little or no product flows.

1. Check for pump cavitation. Slow pump speed down to allow thick material to flow into liquid chambers.
2. Verify that vacuum required to lift liquid is not greater than the vapor pressure of the material being pumped (cavitation).
3. Check for sticking ball check valves.
 - a. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace ball check valves and seals with proper elastomers.

- b. Also, as the check valve balls wear out, they become smaller and can become stuck in the seats. In this case, replace balls and seats.

4. Checking if the valve balls are sticking:

- a. If powder material accumulates around the valve balls, comprehensive purge mode should be activated or the pressure of compressed air connected to fluidization system should be increased to remove the accumulation.
- b. If the pumped powder has high water absorption rate, it is recommended to use dry compressed air (with a dew point temperature below -20°C). This is to prevent the powder from absorbing moisture from the compressed air, which could lead to clumping or adhering inside the pump, potentially reducing pump efficiency or causing malfunction.

Pump air valve freezes.

1. Check for excessive moisture in the compressed air.
 - a. Either install a dryer or a hot air generator for compressed air.
 - b. Alternatively, you may use coalescing filter to remove the water from the compressed air in some applications.

Product comes out air exhaust.

1. Check for a diaphragm rupture.
2. Check the tightness of the outer pistons to the shaft.

SECTION 7

DISASSEMBLY / ASSEMBLY

FLUIDIZATION SYSTEM DISASSEMBLY

Tools Required:

- Socket Wrench
- Adjustable Wrench
- Vise equipped with soft jaws (such as plywood, plastic or other suitable material)



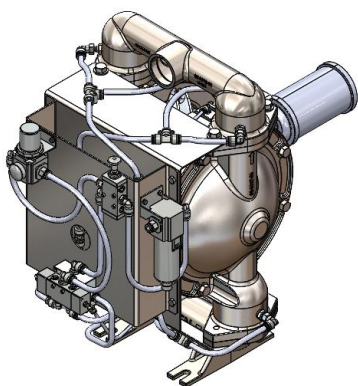
CAUTION: Before attempting any maintenance or repair, disconnect the compressed air line to the pump and allow all air pressure to bleed from the pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container. Be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



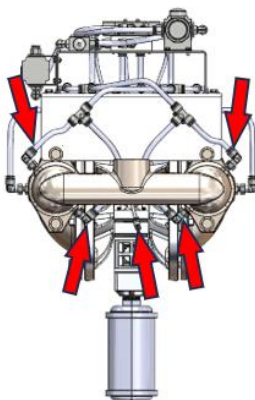
NOTE: Your specific pump model may vary from the configuration shown; however, pump disassembly procedure will be the same.



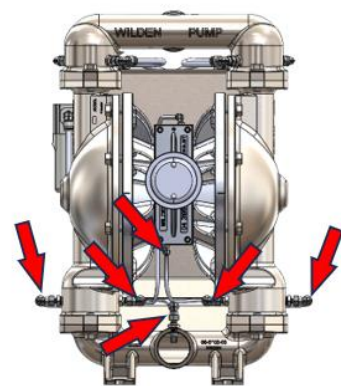
NOTE: Replace worn parts with genuine Wilden parts for reliable performance.

**Step 1**

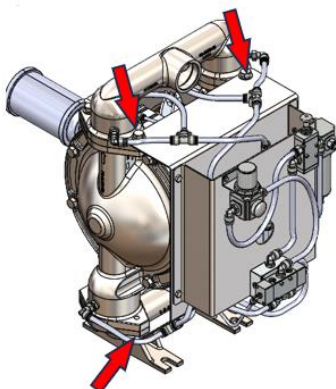
Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.

**Step 2**

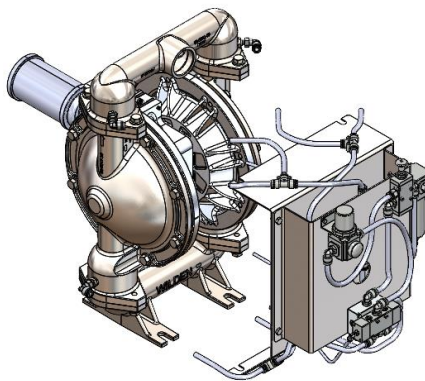
Disconnect the air pipe at the purge junction on the discharge pipe and the top of the fluidization valve plate.

**Step 3**

Disconnect the air pipe at the purge junction on both liquid chambers, suction pipe and the bottom of the fluidization valve plate.

**Step 4**

Use a wrench to loosen the bolts of the inner protection plate of the fluidization system connected to the suction pipe and the discharge pipe.

**Step 5**

Remove the fluidization system from pump.

DISASSEMBLY / ASSEMBLY

PUMP DISASSEMBLY

Tools Required:

- Socket Wrench
- Adjustable Wrench
- Vise equipped with soft jaws (such as plywood, plastic or other suitable material)



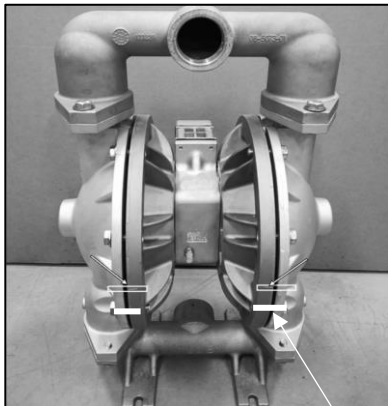
CAUTION: Before attempting any maintenance or repair, disconnect the compressed air line to the pump and allow all air pressure to bleed from the pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container. Be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



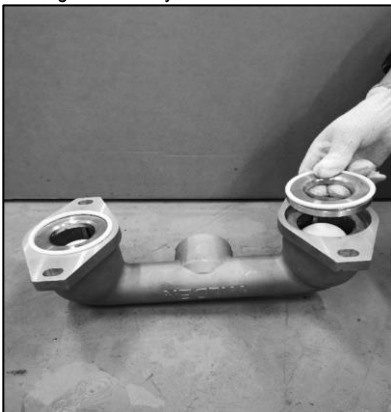
NOTE: Your specific pump model may vary from the configuration shown; however, pump disassembly procedure will be the same.



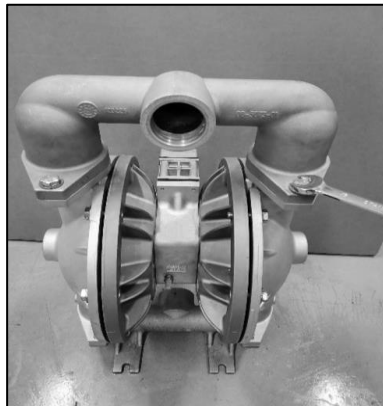
NOTE: Replace worn parts with genuine Wilden parts for reliable performance.

**Step 1**

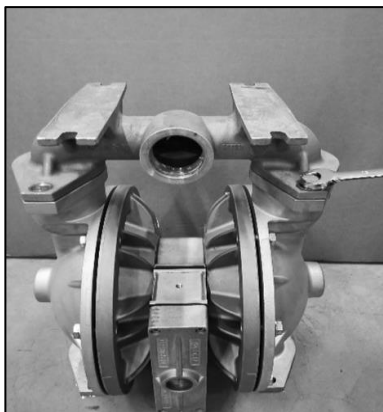
Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.

**Step 4**

Remove the discharge valve balls and valve seats from the liquid chambers and inspect for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance.

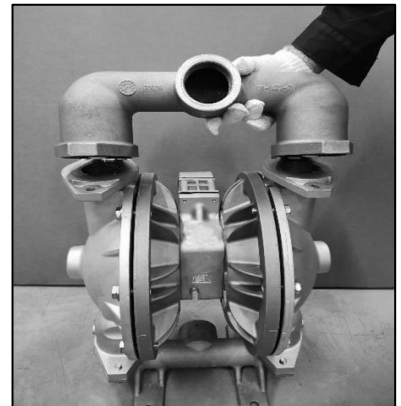
**Step 2**

Using the appropriate-sized wrench, loosen the discharge manifold from the liquid chambers.

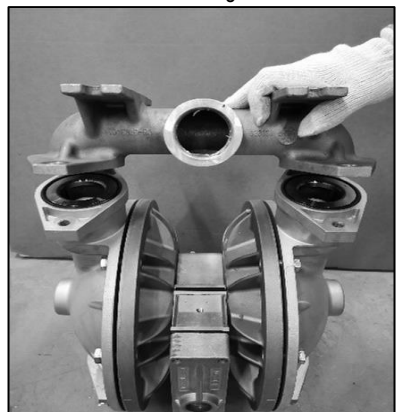
**Step 5**

Using the appropriate-sized wrench, loosen the inlet manifold from the liquid chambers.

NOTE: Inverting the pump will facilitate removal of inlet manifold.

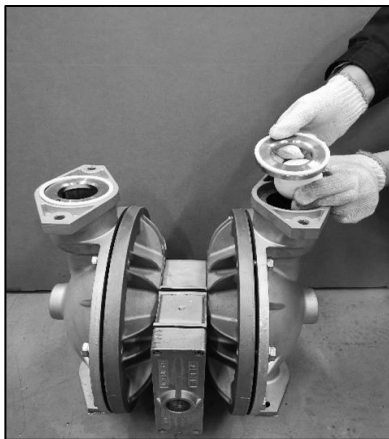
**Step 3**

Lift the discharge manifold to expose discharge valve balls and valve seats. Inspect ball cage area of manifold for excessive wear or damage.

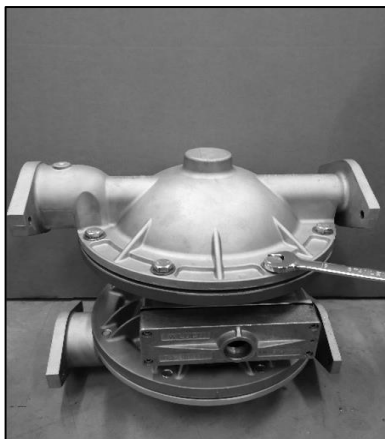
**Step 6**

Remove the inlet manifold to expose the valve balls and valve seats. Inspect ball cage area of manifold for excessive wear or damage.

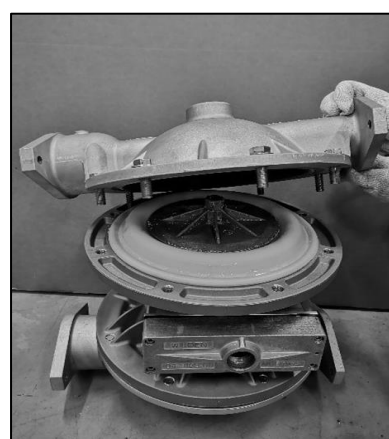
DISASSEMBLY / ASSEMBLY

**Step 7**

Remove the inlet valve balls and valve seats from the inlet manifold and liquid chambers and inspect for nicks, gouges, chemical attack or abrasive wear. Replace worn parts with genuine Wilden parts for reliable performance.

**Step 8**

Using the appropriate-sized wrench, remove the liquid chamber from the center section.

**Step 9**

The liquid chamber should be removed to expose the diaphragm and outer piston. Rotate center section and remove the opposite liquid chamber.

**Step 10**

After loosening and removing the outer piston the diaphragm assembly can be disassembled.

**Step 11**

To remove the diaphragm assembly from shaft, secure shaft with soft jaws (aluminum, plastic, or plywood) to ensure the shaft is not damaged. Using an adjustable wrench, remove the diaphragm assembly from the shaft.

DISASSEMBLY / ASSEMBLY

AIR VALVE / CENTER SECTION DISASSEMBLY

Tools Required:

- 5 mm (3/16") Hex-Head Wrench
- 1/4" Hex-Head Wrench
- Snap-Ring Pliers
- O-Ring Pick



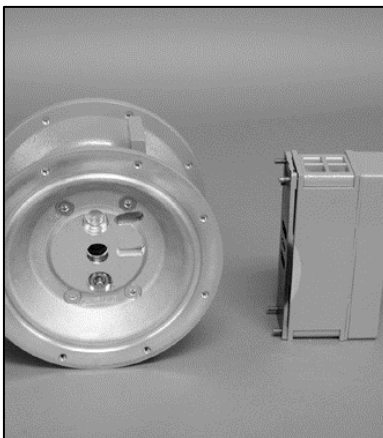
CAUTION: Before attempting any maintenance or repair, disconnect the compressed air line to the pump and allow all air pressure to bleed from the pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container. Be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



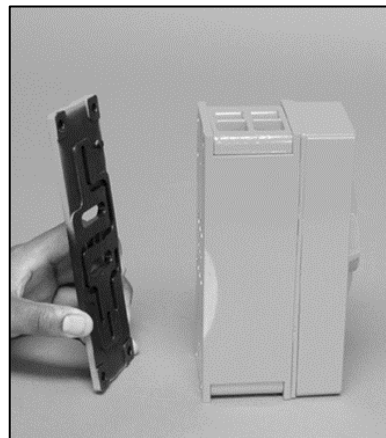
NOTE: Replace worn parts with genuine Wilden parts for reliable performance.

**Step 1**

Loosen the air valve bolts utilizing a 5 mm (3/16") Allen wrench.

**Step 2**

Remove muffer plate and air valve bolts from air valve assembly exposing muffer gasket for inspection. Replace if necessary.

**Step 3**

Lift away air valve assembly and remove air valve gasket for inspection. Replace if necessary.

DISASSEMBLY / ASSEMBLY

**Step 4**

Remove air valve end cap to expose air valve spool by simply lifting up on end cap once air valve bolts are removed.

NOTE: Pro-Flo R air valve incorporates an end cap at both ends of the air valve.

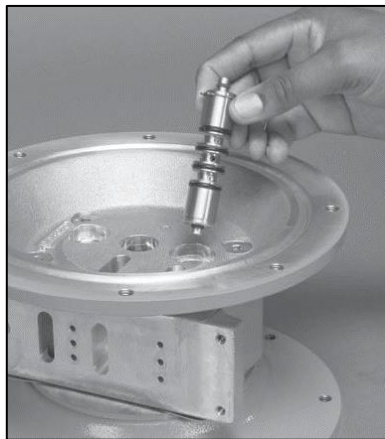
**Step 5**

Remove air valve spool from air valve body by threading one air valve bolt into the end of the spool and gently sliding the spool out of the air valve body. Inspect seals for signs of wear and replace entire assembly if necessary. Use caution when handling air valve spool to prevent damaging seals.

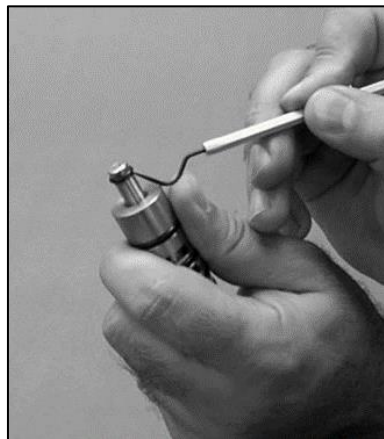
NOTE: Seals should not be removed from assembly. Seals are not sold separately

**Step 6**

Remove pilot spool sleeve retaining snap ring on both sides of center section with snap ring pliers.

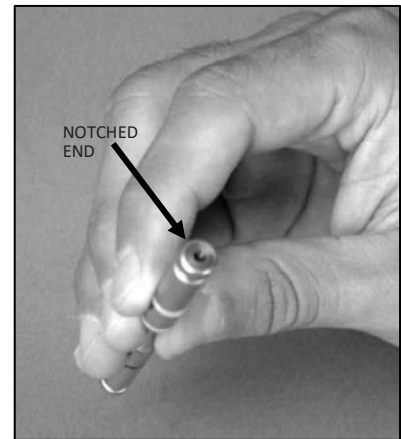
**Step 7**

Remove pilot spool sleeve from center section.

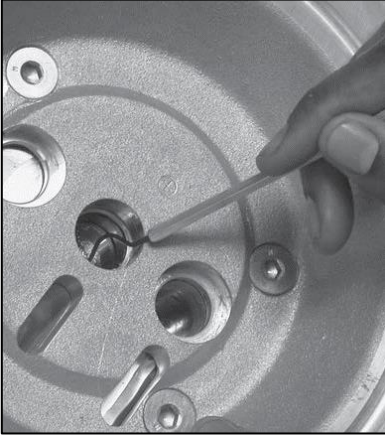
**Step 8**

With O-ring pick, gently remove the O-ring from the opposite side of the center hole cut on the spool. Gently remove the pilot spool from sleeve and inspect for nicks, gouges or other signs of wear. Replace pilot sleeve assembly or outer sleeve O-rings if necessary. During reassembly never insert the pilot spool into the sleeve with the center cut side first, this end incorporates the urethane O-ring and will be damaged as it slides over the ports cut in the sleeve.

NOTE: Do not remove seals from the pilot spool. Seals are not sold separately.



DISASSEMBLY / ASSEMBLY

**Step 9**

Check center section shaft seals for signs of wear. If necessary, remove the shaft seals with O-ring pick and replace.

REASSEMBLY HINTS AND 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. The applicable torque specifications are on this page.

The following tips will assist in the assembly process:

- Lubricate the air valve bore, center section shaft and pilot spool bore with NLGI grade 2 white EP bearing grease or equivalent.
- Clean the inside of the center section shaft bore to ensure no damage is done to new shaft seals.
- A small amount of NLGI grade 2 white EP bearing grease can be applied to the muffler and air valve gaskets to lubricate gaskets during assembly.
- Make sure that the exhaust port on the muffler plate is centered between the two exhaust ports on the center section.
- Stainless bolts should be lubed to reduce the possibility of seizing during tightening.

Maximum Torque Specifications

Description	XPR860P	XPR1560P
Air Valve	13.6 N•m (120 in-lbs)	13.6 N•m (120 in-lbs)
Air Chamber/Center Block	27.1 N•m (20 ft-lbs)	27.1 N•m (20 ft-lbs)
Liquid Chamber/Air Chamber Only for Aluminum Pump	27.1 N•m (20 ft-lbs)	45.0 N•m (33 ft-lbs)
Liquid Chamber/Air Chamber Only for Stainless Steel Pump	54.2 N•m (40 ft-lbs)	68.1 N•m (50 ft-lbs)
Outer Pistons, All	109 N•m (80 ft-lbs)	136 N•m (100 ft-lbs)

DISASSEMBLY / ASSEMBLY

SHAFT SEAL INSTALLATION

Pre-Installation

After all the old seals have been removed, the inside of the bushing should be cleaned to ensure no debris is left that may cause premature damage to the new seals.

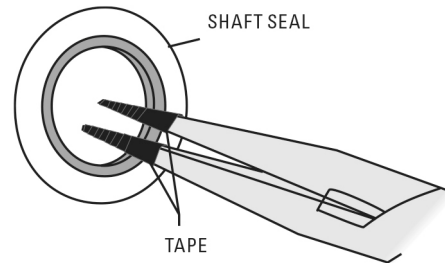
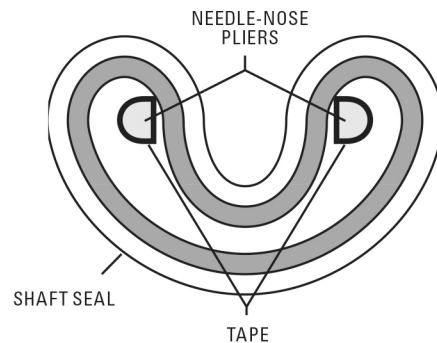
Installation

1. To prevent damaging the inside surface of the new seal, wrap electrical tape around each leg of the needle-nose pliers. (Heat shrink tubing may also be used.)
2. With a new seal in hand, place the two legs of the needle-nose pliers inside the seal ring. (See Figure A.)
3. Open the pliers as wide as the seal diameter will allow, then with two fingers pull down on the top portion of the seal to form a kidney bean shape. (See Figure B.)
4. Lightly clamp the pliers together to hold the seal into the kidney shape. Be sure to pull the seal into as tight of a kidney shape as possible. This will allow the seal to travel down the bushing bore with greater ease.
5. With the seal clamped in the pliers, insert the seal into the bushing bore and position the bottom of the seal into the correct groove. When the bottom of the seal is seated in the groove, release the clamp pressure on the pliers. This will allow the seal to partially snap back to its original shape.
6. After removing the pliers, you will notice a slight bump in the seal shape. Before the seal can be resized properly, the bump in the seal should be removed as much as possible. This can be done with either a Phillips screwdriver or your finger. With the side of the screwdriver or your finger, apply light pressure to the peak of the bump. This pressure will cause the bump to be eliminated almost completely.
7. Lubricate the edge of the shaft with NLGI grade 2 white EP bearing grease.
8. Slowly insert the center shaft with a rotating motion. This will complete the resizing of the seal.
9. Repeat these steps for the remaining seals.

Tools

The following tools can be used to aid in the installation of the new seals:

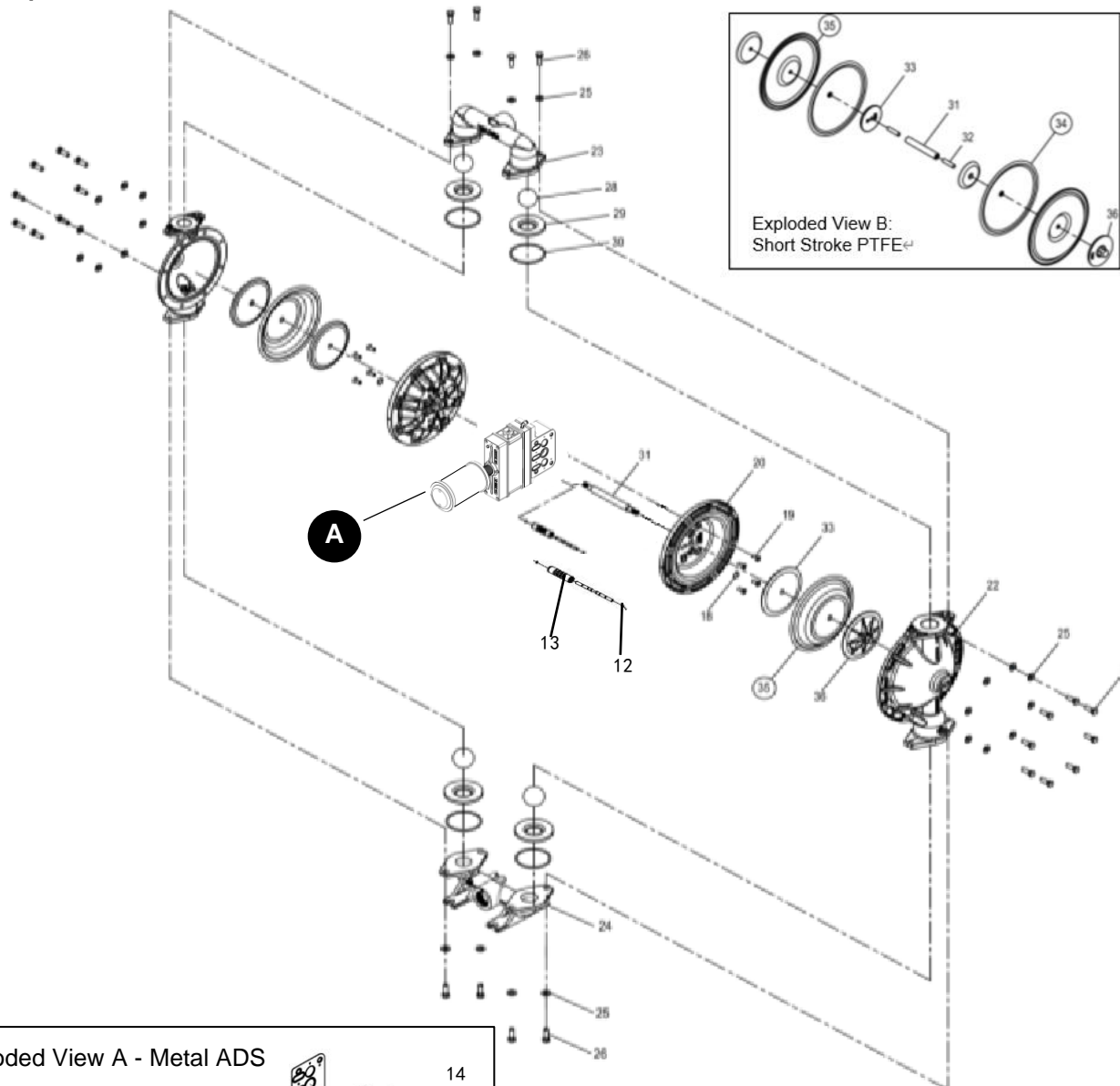
- Needle-Nose Pliers
- Phillips Screwdriver
- Electrical Tape

Figure A**Figure B**

SECTION 8

EXPLODED VIEW AND PARTS LIST

Exploded View and Parts List -XPR860P



No.	Description	Qty.	XPR860P/AAAAA/.../ P/N	XPR860P/SSAAA/.../ P/N
AIR DISTRIBUTION COMPONENTS				
1	Pro-Flo V™ Assembly, Air Valve ¹	1	04-2030-01	04-2030-01
2	O-Ring (-225), End Cap (Ø1.859 x Ø.139)	2	04-2390-52-700	04-2390-52-700
3	End Cap	2	04-2340-01	04-2340-01
4	Screw, SHC, Air Valve (1/4"-20 x 4-1/2")	4	02-6000-08	02-6000-08
6	Muffler Plate, Pro-Flo V™	1	04-3185-01	04-3185-01
7	Gasket, Muffler Plate, Pro-Flo V™	1	04-3502-52	04-3502-52
8	Gasket, Air Valve, Pro-Flo V™	2	04-2620-52	04-2620-52
9	Center Block Assembly, Pro-Flo® R	1	T08-3126-01	T08-3126-01
10	Fluidization Valve Plate	1	08P-0001-01	08P-0001-01
12	O-Ring (-009) Pilot Spool Retaining (Ø.208 x Ø.070)	2	04-2650-49-700	04-2650-49-700
13	Pilot Sleeve Assembly	1	04-3880-99	04-3880-99
14	Shaft Seal	2	08-3210-55-225	08-3210-55-225
15	Bushing, Shaft	2	08-3306-13	08-3306-13
16	Gasket, Center Block Pro-Flo® R	2	04-3529-56	04-3529-56
17	Screw, 10-32 X .50 Self-Tapping Grounding	1	04-6345-08	04-6345-08
18	Retaining Ring	2	04-3890-03	04-3890-03
19	Screw, HSFHS (3/8"-16 x 1")	8	71-6250-08	71-6250-08
20	Air Chamber, Pro-Flo® R Drop-In	2	08-3694-01	08-3694-01
21	Muffler 1"	1	15-3510-99R	15-3510-99R
	Muffler, Bronze, 1/4" (Not Shown)	1	04-3240-07	04-3240-07
WETTED PATH COMPONENTS				
22	Liquid Chamber, Bolted	2	08P-5017-01	08P-5017-03
23	Manifold, Discharge (NPT)	1	08P-5072-01	08P-5072-03
	Manifold, Discharge (BSPT)	1	08P-5073-01	08P-5073-03
24	Manifold, Inlet (NPT)	1	08P-5102-01	08P-5102-03
	Manifold, Inlet (BSPT)	1	08P-5103-01	08P-5103-03
25	Washer, Flat (Ø.531" x Ø1.062" x .095")	24	04-6730-08	04-6730-03
26	Screw, HHC (1/2"-13 x 1-1/2")	8	04-6180-08	04-6180-03
27	Screw, HHC (1/2"-13 x 1-1/2")	16	04-6180-08	04-6180-03
VALVE BALLS/VALVE SEATS/VALVE O-RINGS				
28	Ball, Valve	4	*	*
29	Seat, Valve	4	*	*
30	O-ring, Valve Seat	4	08-1204-55	08-1204-55
FULL-STROKE RUBBER COMPONENTS				
31	Shaft	1	08-3810-03	08-3810-03
33	Piston, Inner (Non-PTFE)	2	08-3700-01	08-3700-01
35	Diaphragm, Full Stroke PTFE Back-up	2	*	*
36	Diaphragm, Full Stroke PTFE Primary	2	08-4550-01	08-4550-03
FULL-STROKE TPE COMPONENTS				
31	Shaft	1	08-3812-03	08-3812-03
33	Piston, Inner (Non-PTFE)	2	08-3700-01	08-3700-01

35	Diaphragm, Primary	2	*	*
36	Piston, Outer (Non-PTFE)	2	08-4550-01	08-4550-03
REDUCED-STROKE PTFE COMPONENTS				
31	Shaft, Pro-Flo™	1	08-3840-03	08-3840-03
32	Shaft Stud, 1/2"-20 X 2-1/8"	2	08-6152-08	08-6152-08
33	Piston, Inner, PTFE	2	08-3700-01	08-3700-01
34	Diaphragm, Back-up	2	*	*
35	Diaphragm, Primary PTFE	2	08-1010-55-42	08-1010-55-42
36	Piston, Outer, PTFE	2	08-4550-01	08-4550-03

TJPR860P-04 REV.A

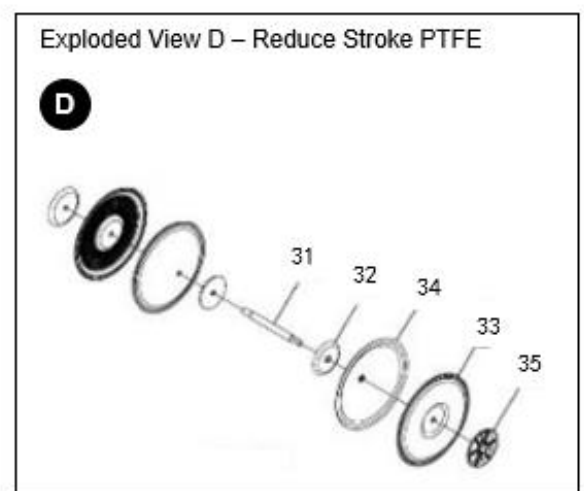
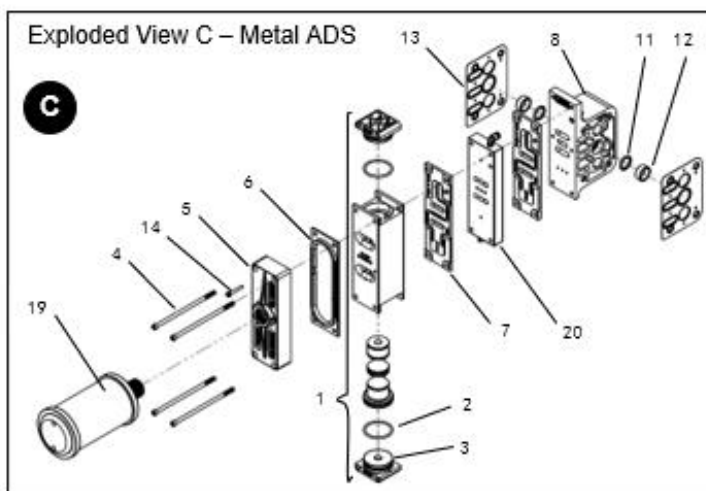
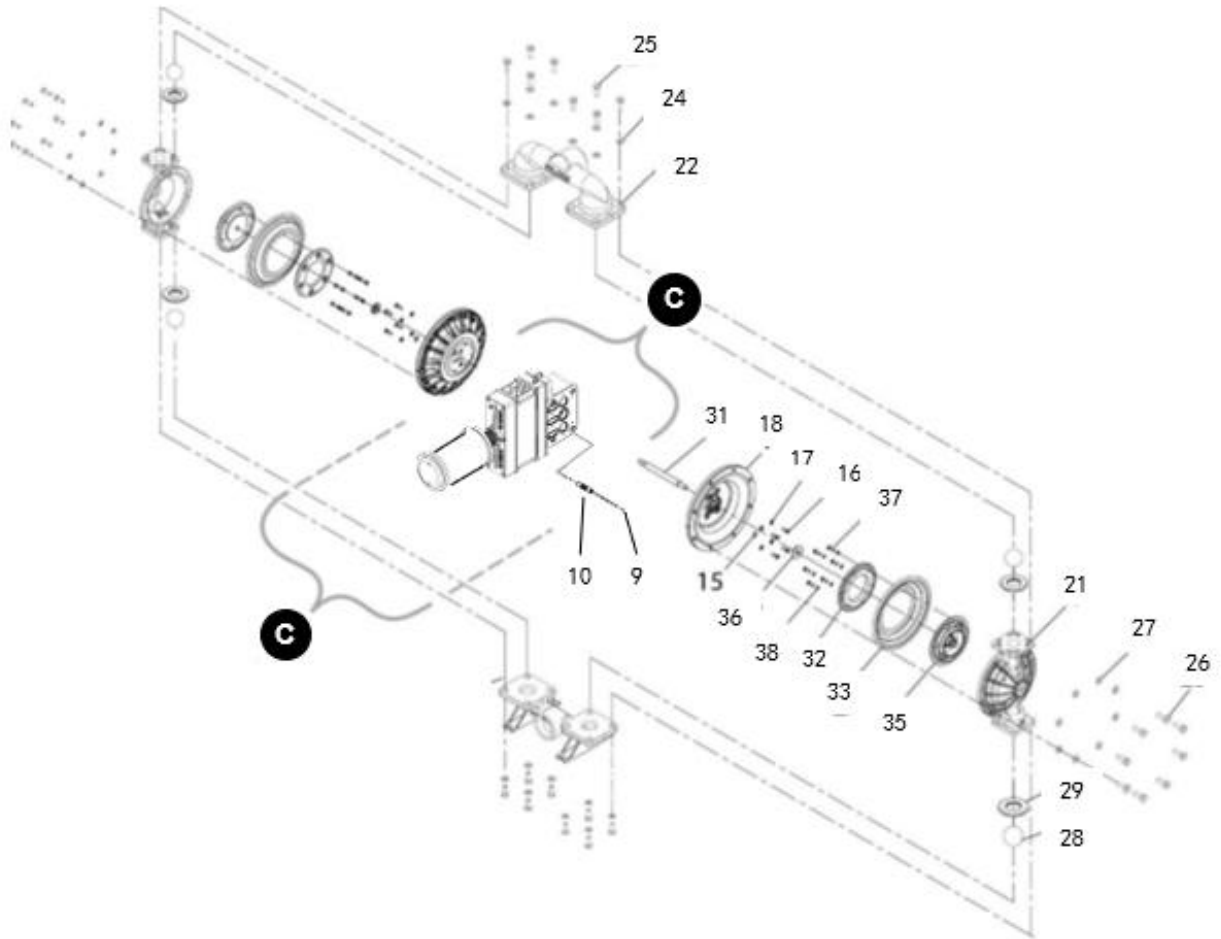
* See elastomer chart - Section 9

¹ Air Valve Assembly includes items 2 and 3.

All boldface items are primary wear parts

EXPLODED VIEW AND PARTS LIST

Exploded View and Parts List - XPR1560P



No.	Description	Qty.	XPR1560P/AAAAA/.../ P/N	XPR1560/SSAAA/.../ P/N
AIR DISTRIBUTION COMPONENTS				
1	Pro-Flo V™ Assembly, Air Valve 1	1	04-2030-01	04-2030-01
2	O-Ring (-225), End Cap (Ø1.859 x Ø.139)	2	04-2390-52-700	04-2390-52-700
3	End Cap	2	04-2340-01	04-2340-01
4	Screw, SHC, Air Valve (1/4"-20 x 4-1/2")	4	02-6000-08	02-6000-08
5	Muffler cover plate, Pro-Flo V™	1	04-3185-01	04-3185-01
6	Gasket, Muffler Plate, Pro-Flo V™	1	04-3502-52	04-3502-52
7	Gasket, Air Valve, Pro-Flo V™	2	04-2620-52	04-2620-52
8	Center Block Assembly, Pro-Flo® R	1	T15-3126-01	T15-3126-01
9	Pilot Spool Retaining (Ø.208 x Ø.070) O-ring	2	04-2650-49-700	04-2650-49-700
10	Pilot Sleeve Assembly	1	04-3880-99	04-3880-99
11	Shaft Seal	2	15-3210-55-225	15-3210-55-225
12	Shaft Sleeve	2	15-3306-13	15-3306-13
13	Gasket, Flat, Center Block Pro-Flo® R	2	04-3529-56	04-3529-56
14	Screw, 10-32 X .50 Self-Tapping Grounding	1	04-6345-08	04-6345-08
15	Retaining Ring	2	04-3890-03	04-3890-03
16	Bolt (3/8"-16 x 1-1/8")	8	15-6130-08	15-6130-08
17	Gasket (Ø.406" x Ø.812" x .065")	8	15-6740-08-50	15-6740-08-50
18	Air Chamber, Pro-Flo® R Drop-In	2	15-3691-01	15-3691-01
19	Muffler	1	15-3510-99R	15-3510-99R
	Muffler, 1/4" (Now Shown)	1	04-3240-07	04-3240-07
20	Fluidization Valve Plate	1	08P-0001-01	08P-0001-01
WETTED PATH COMPONENTS				
21	Liquid Chamber	2	15P-5017-01	15P-5017-03
22	Manifold, Discharge (NPT)	1	15P-5072-01	15P-5072-03
	Manifold, Discharge (BSPT)	1	15P-5073-01	15P-5073-03
23	Manifold, Inlet (NPT)	1	15P-5102-01	15P-5102-03
	Manifold, Inlet (BSPT)	1	15P-5103-01	15P-5103-03
24	Washer, Flat (Ø.656" x Ø1.312" x .095")	8	15-6732-08	N/A
	Spring Washer (.505" X 1.00")	8	N/A	15-6810-03
25	Screw, HHC (5/8"-11 x 2")	8	15-6180-08	N/A
	Screw, HHC (1/2"-13 x 1-1/2")	8	N/A	04-6180-03
26	Screw, HHC (5/8"-11 x 2")	16	15-6180-08	15-6180-03
27	Washer, Flat (Ø.656" x Ø1.312" x .095")	16	15-6732-08	15-6732-03
VALVE BALLS/VALVE SEATS/VALVE O-RINGS				
28	Ball, Valve	4	*	*
29	Seat, Valve	4	*	*
30	O-ring, Valve Seat	4	15-1204-55	15-1200-55
FULL-STROKE RUBBER / TPE COMPONENTS				
31	Shaft, Pro-Flo™	1	15-3805-03	15-3805-03
32	Piston, Inner	2	15-3700-01	15-3700-01
33	Diaphragm, Primary	2	*	*

35	Piston, Outer	2	15-4550-01	15-4550-03
36	Washer, Inner Piston	2	15-6850-08	15-6850-08
37	Screw (3/8"-16 x 1-1/8")	12	15-6130-08	15-6130-08
38	Washer, Flat (Ø.406" x Ø.812" x .065")	12	15-6740-08-50	15-6740-08-50
REDUCED-STROKE PTFE COMPONENTS				
31	Shaft, Pro-Flo™	1	15-3805-03	15-3805-03
32	Piston, Inner	2	15-3750-01	15-3750-01
33	Diaphragm, Primary	2	15-1010-55-42	15-1010-55-42
34	Diaphragm, Back	2	*	*
36	Piston, Outer, PTFE	2	15-4600-03	15-4600-03

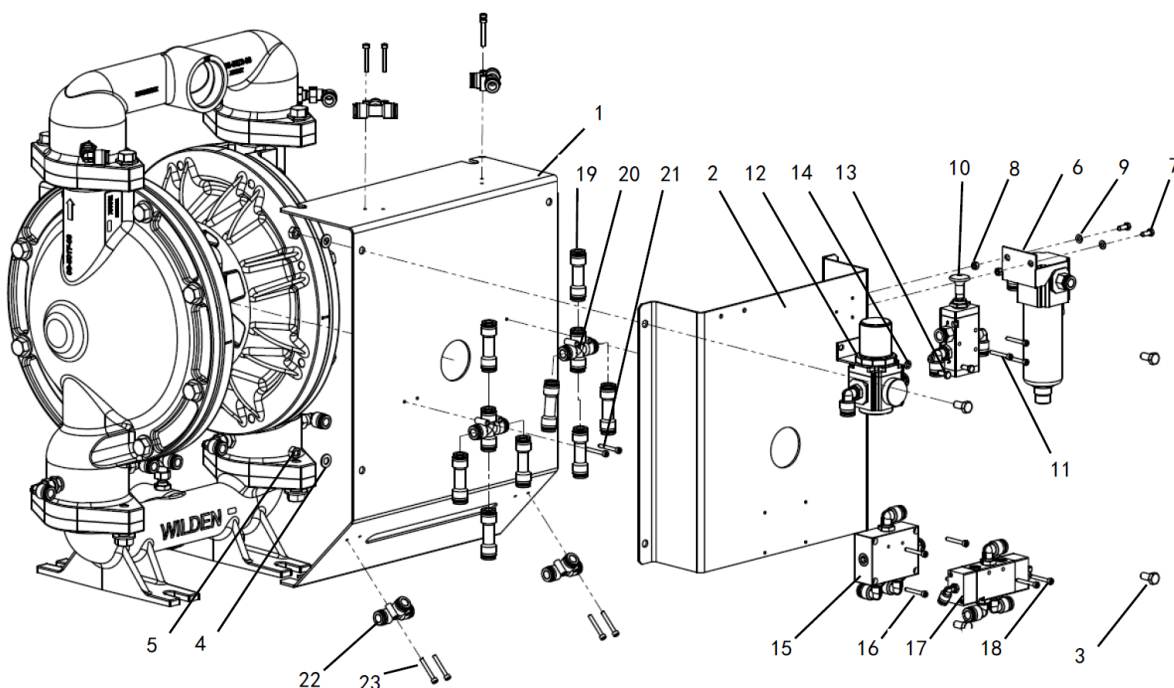
TJPR1560P-04 REV.A

* See elastomer chart - Section 9

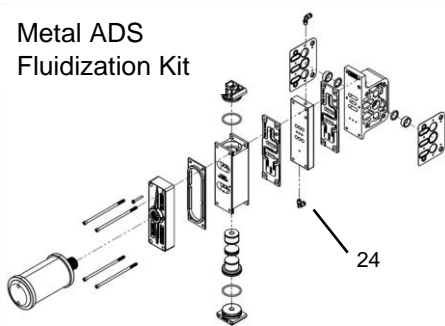
¹ Air Valve Assembly includes items 2 and 3.² Metal Center Block Assembly includes item 10, 14 and 15.

All boldface items are primary wear parts.

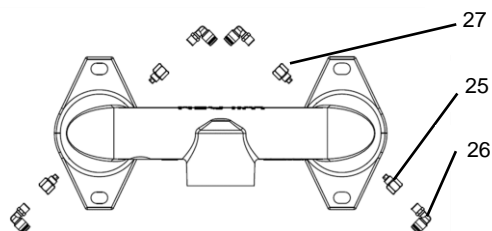
Exploded View and Parts List - XPR860P/XPR1560P Fluidization System



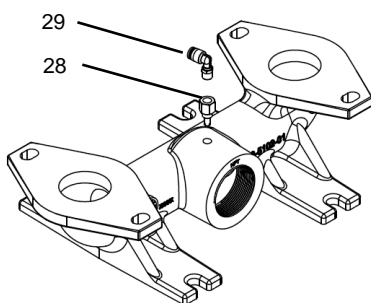
Metal ADS
Fluidization Kit



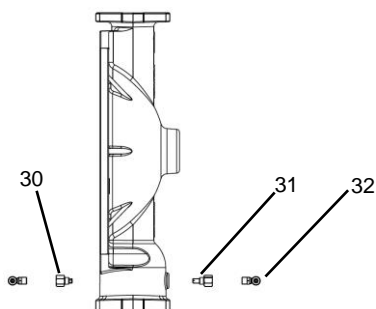
Discharge Manifold – Fluidization Components



Inlet Manifold – Fluidization Components



Liquid Chamber – Fluidization Components



Exploded View and Parts List - XPR860P/XPR1560P Fluidization System

No.	Description	Qty.	XPR860P/AAAAA/.../ P/N	XPR860P/SSAAA/.../ P/N	XPR1560P/AAAAA/.../ P/N	XPR1560P/SSAAA/.../ P/N
1	Inner guard plate	1	08P-0002-03-01	08P-0002-03-03	15P-0002-03-01	15P-0002-03-03
2	Outer guard plate	1	08P-0003-03-01	08P-0003-03-01	15P-0003-03-01	15P-0003-03-03
3	Bolt	4	08P-1001-03			
4	Nut	4	08P-1002-03			
5	Flat washer	4	08P-1003-03			
6	Air source filter assembly, 5µm	1	08P-2001-99K			
7	Bolt	2	08P-1004-03			
8	Nut	2	08P-1005-03			
9	Flat washer	2	08P-1006-03			
10	Switch valve assembly	1	08P-2002-99K			
11	Screw	3	08P-1007-03			
12	Pressure regulator assembly	1	08P-2003-99K			
13	Bolt	2	08P-1004-03			
14	Flat washer	2	08P-1006-03			
15	Distribution valve assembly A	1	08P-0004-99K			
16	Screw	4	08P-1007-03			
17	Distribution valve assembly B	1	08P-2004-99K			
18	Screw	2	08P-1007-03			
19	Check valve	13	08P-3001-20			
20	Equal diameter four-way connector	2	08P-3002-20			
21	Screw	4	08P-1008-03			
22	Equal diameter three-way connector	4	08P-3003-20			
23	Screw	8	08P-1008-03			
24	Male thread right-angle quick connector	2	08P-3004-20			
25	Fluidization nozzle A	4	08P-0005-03			
26	Male thread straight quick connector	2	08P-3004-20	N/A	08P-3004-20	N/A
	Male thread right-angle quick connector	2	N/A	08P-3009-20	N/A	08P-3009-20
27	Male thread right-angle quick connector	2	08P-3004-20			
28	Fluidization nozzle B	1	08P-0006-03			
29	Male thread right-angle quick connector	1	08P-3004-20			
30	Fluidization nozzle A	2	08P-0005-03			
31	Fluidization nozzle B	2	08P-0006-03			
32	Female thread right-angle quick connector	4	08P-3004-20			
33	Air tube assembly (not shown)	1	08P-4001-49			
34	Air tube assembly (not shown)	1	08P-4002-49			

SECTION 9

ELASTOMER OPTIONS

XPR860P

MATERIAL	DIAPHRAGMS	REDUCED-STROKE BACKUP DIAPHRAGMS	VALVE BALLS	VALVE SEATS
Neoprene	N/A	08-1060-51	N/A	N/A
FKM	08-1010-53	N/A	N/A	N/A
PTFE	08-1010-55-42	N/A	08-1080-55	N/A
Wil-Flex™	08-1022-58	NA	08-1080-58	08-1147-58
Stainless Steel	N/A	N/A	N/A	08-1147-03
Aluminum	N/A	N/A	N/A	08-1147-01

Backup diaphragms used with PTFE diaphragms only.

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XPR1560P

MATERIAL	DIAPHRAGMS	REDUCED-STROKE BACKUP DIAPHRAGMS	VALVE BALLS	VALVE SEATS XPR1560/AA	VALVE SEATS XPR1560/SS
Neoprene	N/A	15-1060-51	N/A	N/A	N/A
FKM	15-1010-53	N/A	N/A	N/A	N/A
PTFE	15-1010-55-42	N/A	15-1080-55	N/A	N/A
Wil-Flex™	15-1022-58	NA	15-1080-58	15-1147-58	15-1120-58
Stainless Steel	N/A	N/A	N/A	N/A	15-1121-03
Aluminum	N/A	N/A	N/A	15-1147-01	N/A

Backup diaphragms used with PTFE diaphragms only.

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Where Innovation Flows

