

H38

Advanced™ Series **METAL** Pumps

EOM

Engineering
Operation &
Maintenance



Advance your process

High
Pressure

PROFLO[®]
PROGRESSIVE PUMP TECHNOLOGY

WILDEN[®]

A **DOVER** COMPANY



WIL-11181-E-03
REPLACES WIL-11181-E-02

TABLE OF CONTENTS

SECTION 1 CAUTIONS—READ FIRST! 1

SECTION 2 WILDEN PUMP DESIGNATION SYSTEM 2

SECTION 3 HOW IT WORKS—PUMP & AIR DISTRIBUTION SYSTEM 3

SECTION 4 DIMENSIONAL DRAWINGS 4

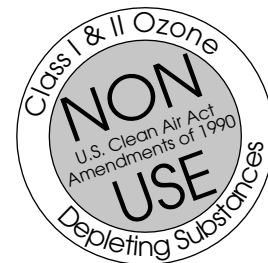
SECTION 5 INSTALLATION & OPERATION

- A. Installation 5
- B. Operation & Maintenance..... 6
- C. Troubleshooting 7

SECTION 6 DIRECTIONS FOR DISASSEMBLY / REASSEMBLY

- A. Model H38 / 3200D Wetted Path Disassembly..... 8
- B. Pro-Flo[®] Air Distribution System 12
- C. Reassembly Hints & Tips, Torque Specs 13

SECTION 7 EXPLODED VIEW / PARTS LISTING..... 14



SECTION 1

WILDEN MODEL H38/3200D PUMP CAUTIONS — READ FIRST!



PUMP TEMPERATURE LIMITS

-12.2°C to 65.6°C 10°F to 150°F



CAUTION: The discharge pressure generated by this pump is approximately 26 times the inlet air pressure supplied.



CAUTION: Do not apply compressed air to the exhaust ports — pump will not function.



CAUTION: The model H38/3200D is designed to pump clean fluid such as hydraulic fluid and should not be used for pumping solid objects or particles. Whenever the possibility exists that solid objects or particles may be sucked into the pump, a strainer should be used on the suction line.



CAUTION: Do not over-lubricate air supply — excess lubrication will reduce pump performance. Pump is pre-lubed with NLGI Grade 2 molybdenum grease.



CAUTION: The H38/3200D is designed for open loop systems.



CAUTION: Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult Wilden's Chemical Resistance Guide (see publication E-4) for chemical compatibility and temperature limits.



WARNING: Prevention of 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: Do not exceed 8.6 bar (125 psig) air supply pressure.



CAUTION: The process fluid and cleaning fluids must be chemically compatible with all wetted pump components (see publication E-4).



CAUTION: Pumps should be thoroughly flushed with water before installation.



CAUTION: Always wear safety glasses and proper protection when operating and maintaining pump.



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.



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



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: Pump is not rated for UL 79 service.



CAUTION: H38 pumps are not submersible.



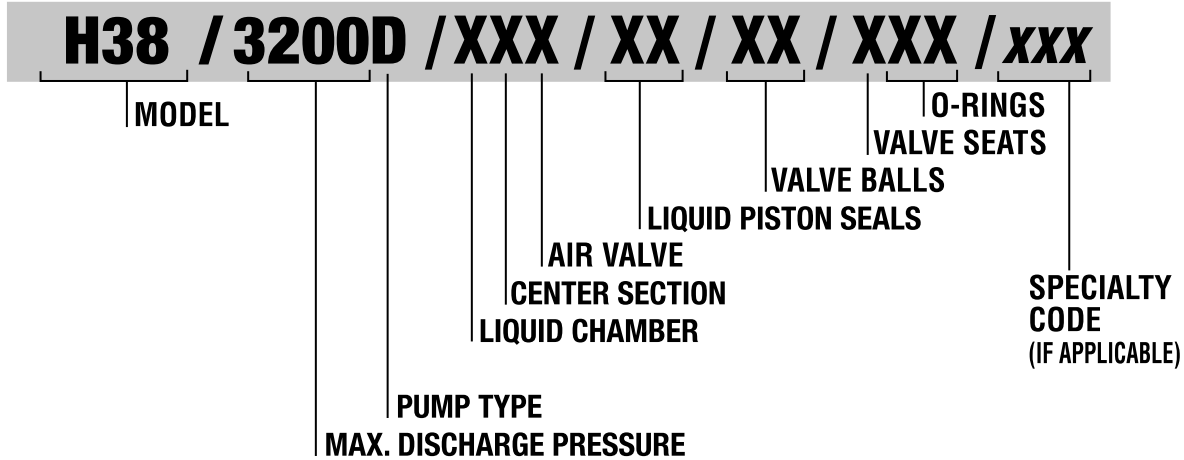
CAUTION: Tighten all hardware prior to installation.



CAUTION: All piping valves, gauges and other components installed on the liquid discharge must have a minimum pressure rating of 220.6 bar (3,200 psig).

SECTION 2

WILDEN PUMP DESIGNATION SYSTEM



MODEL H38/3200D MATERIAL CODES

MODEL

H38 = 10 mm (3/8") CONNECTIONS

AIR VALVE

P = POLYPROPYLENE

VALVE SEATS

S = STAINLESS STEEL

MAX. DISCHARGE PRESSURE

3200 = 220.6 BAR (3,200 PSIG)

LIQUID PISTON SEALS

PU = POLYURETHANE

VALVE SEAT O-RINGS

BN = BUNA-N

PUMP TYPE

D = DUPLEX

VALVE BALLS

SS = STAINLESS STEEL

LIQUID CHAMBERS

A = ALUMINUM

CENTER SECTION

A = ALUMINUM

SECTION 3

H38/3200D — HOW IT WORKS

The Wilden piston 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.

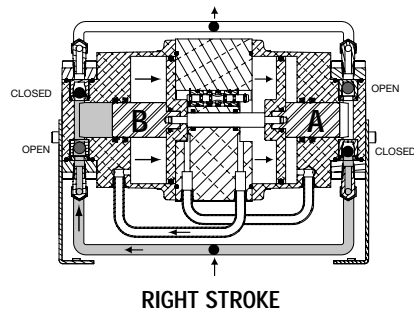


FIGURE 1: When air pressure is supplied to the pump, the air valve directs pressure to the back side of power piston A. The compressed air moves the power/liquid piston A away from the center section of the pump. At the same time, air is directed to the front of power piston B by means of tubing connected to the pressurized air in side A. Power piston/liquid piston B is on its suction stroke; air behind the piston has been forced out to atmosphere through the exhaust port of the pump. The movement of power/liquid piston B toward the center section of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet port forcing the inlet valve ball, on side B, off its seat. Liquid is then free to move past the inlet valve ball and fill liquid chamber B (see shaded area).

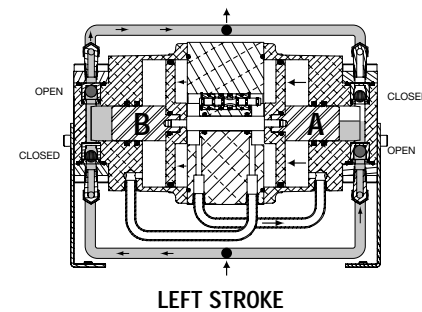


FIGURE 2: When piston A reaches the limit of its discharge stroke, the air valve redirects pressurized air to the back side of the power/liquid piston B and the front side of power/liquid piston A. The pressurized air forces power/liquid piston B away from the center section while pressurized air forces power/liquid piston A toward the center section. Power/liquid piston B is now on its discharge stroke. Liquid piston B forces the inlet valve ball, on side B, onto its seat due to the hydraulic forces developed within the liquid chamber. 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 combined force created by both power pistons being pressurized and the smaller size of the liquid piston area relative to the total area of the power piston creates the amplified liquid discharge pressure. The movement of power/liquid piston A toward the center section of the pump creates a vacuum within liquid chamber A. Atmospheric pressure forces fluid into the inlet port. The inlet valve ball, on side B, is forced off its seat allowing the fluid being pumped to fill liquid chamber A.

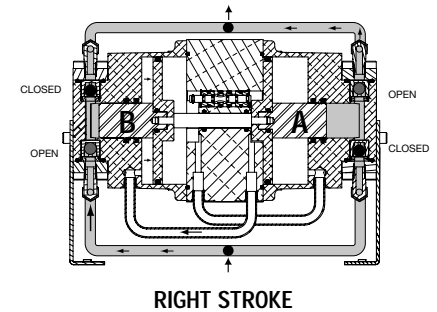
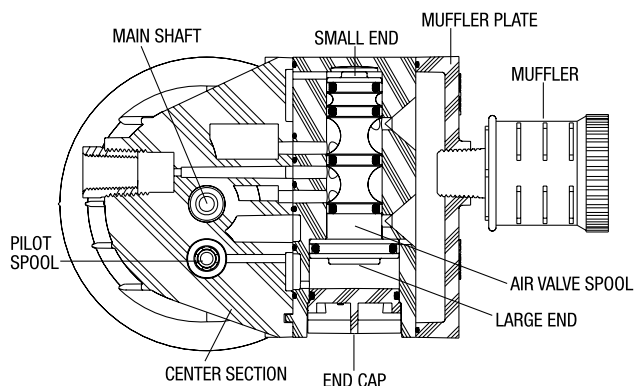


FIGURE 3: At completion of the stroke, the air valve again redirects air to the back side of power/liquid piston A, which starts power/liquid piston B on its suction stroke. As the pump reaches its original starting point, each power/liquid piston has gone through one suction and one discharge stroke.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

PRO-FLO® AIR DISTRIBUTION SYSTEM OPERATION — HOW IT WORKS

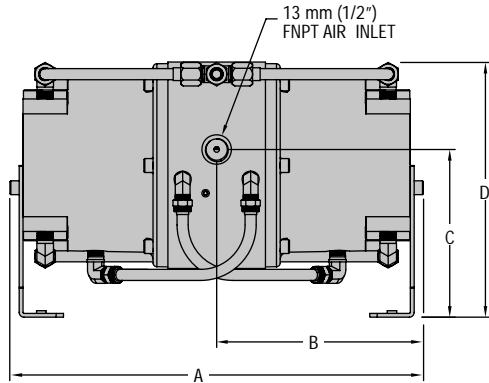


The Pro-Flo® patented air distribution system incorporates three moving parts: the air valve spool, the pilot spool, and the main shaft/piston assembly. The heart of the system is the air valve spool and air valve. As shown in this figure, this valve design incorporates an unbalanced spool. The smaller 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/piston 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 power 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.

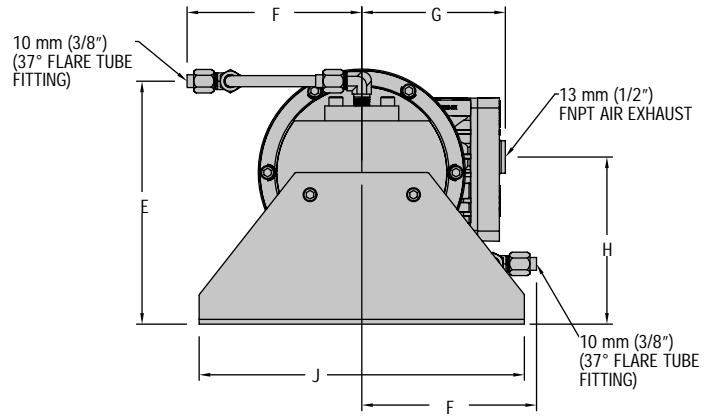
SECTION 4

DIMENSIONAL DRAWING WILDEN MODEL H38/3200D PUMP

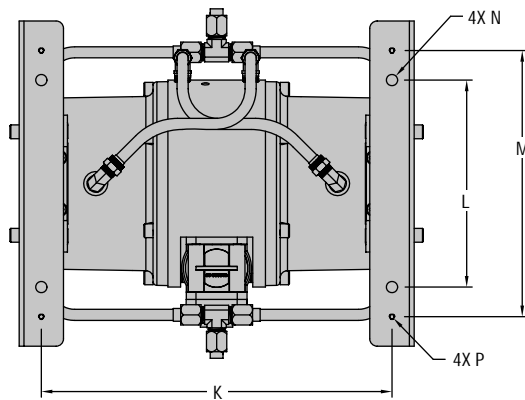
Front View



Side View



Bottom View



DIMENSIONS - H38/3200D		
ITEM	METRIC (mm)	STANDARD (inch)
A	356	14.0
B	178	7.0
C	145	5.7
D	218	8.6
E	208	8.2
F	150	5.9
G	119	4.7
H	145	5.7
J	279	11.0
K	302	11.9
L	178	7.0
M	229	9.0
N	10	0.4
P	N/A	#10-32UNF-2B THRU

SECTION 5A

SUGGESTED INSTALLATION

The H38/3200D has a 10 mm (3/8") 37° flared tube fitting inlet and outlet and is designed for discharge pressure to 220.6 bar (3,200 psig). Refer to Section 5 for performance characteristics. The H38/3200D pump is manufactured with wetted parts of aluminum. The H38/3200D is available with a polypropylene air valve and aluminum center section.

The suction pipe size should be at least 10 mm (3/8") diameter or larger if highly viscous material is being pumped. The suction hose must be non-collapsible, reinforced type as the H38/3200D is capable of pulling a high vacuum. Discharge piping should be at least 10 mm (3/8") and must have a minimum pressure rating of 220.6 bar (3,200 psig); larger diameter can be used to reduce friction losses. It is critical that all fittings and connections are airtight or a reduction of pump suction capability will result.

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 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, every pump should be located in such a way that five key factors are balanced against each other to maximum advantage.

ACCESS: First of all, the location should be accessible. If it's 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 (see Section 5). Use air pressure up to a maximum of 8.6 bar (125 psig) depending on pumping requirements.

For best results, the pumps should use a 5 μ (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.

MUFFLER: Sound levels are reduced below OSHA specifications using the standard Wilden muffler. Other mufflers can be used to further reduce sound levels, 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 troubles 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 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. In addition, the piping should be aligned so as to avoid placing stress on the pump fittings.

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.

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 model's ability.

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.

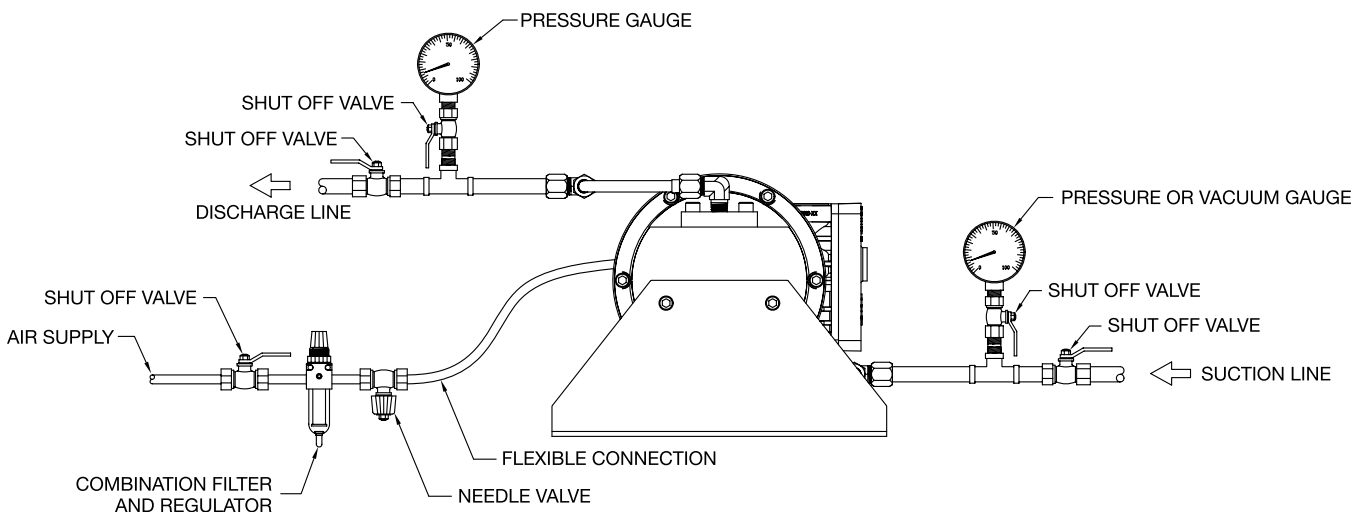
THE MODEL H38/3200D SHOULD NOT BE USED WITH MEDIA CONTAINING SOLIDS. WHENEVER THE POSSIBILITY EXISTS THAT SOLID OBJECTS MAY BE SUCKED INTO THE PUMP, A STRAINER SHOULD BE USED ON THE SUCTION LINE.

CAUTION: THE H38/3200D PUMP IS DESIGNED FOR OPEN LOOP SYSTEMS.

CAUTION: DO NOT EXCEED 8.6 BAR (125 PSIG) AIR SUPPLY PRESSURE.

SECTION 5A CONT.

SUGGESTED INSTALLATION



SECTION 5B

SUGGESTED OPERATION AND MAINTENANCE INSTRUCTIONS

OPERATION: The H38/3200D is pre-lubricated and does 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 operation may be affected. It may need to be disassembled and re-lubricated as described in the ASSEMBLY/DISASSEMBLY INSTRUCTIONS.

Pump discharge rate can be controlled by limiting the volume and/or pressure of the air supply to the pump (preferred method). A regulator is used to control air pressure while a needle valve is used to control volume. Pump discharge rate can also 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. (See Section 5.) This is useful when the need exists to control the pump from a remote location. When the pump discharge pressure equals or exceeds approximately 26 times the air inlet 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. The H38/3200D pump runs solely on compressed air and generates little heat, therefore your process fluid temperature will not be affected.

MAINTENANCE AND 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 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.

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.

SECTION 5C

TROUBLESHOOTING

Pump will not run or runs slowly.

1. Ensure that the air inlet pressure is at least 0.4 bar (5 psig) above startup pressure and that the discharge pressure is at least 0.7 bar (10 psig) lower than 26 times the air inlet pressure.
2. Check air inlet filter for debris (see recommended installation).
3. Check for extreme air leakage (blow by) which would indicate worn seals/bores in the air valve, pilot spool, main shaft.
4. Disassemble pump and check for obstructions in the air passageways or objects which would obstruct the movement of internal parts.
5. Check for sticking ball check valves. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace seals with proper elastomers. 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.
6. Check for broken liquid piston stud which will cause the air valve spool to be unable to shift.
7. Remove plug from pilot spool exhaust.

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. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace seals with proper elastomers. 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.

Pump air valve freezes.

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

Air bubbles in pump discharge.

1. Check tightness of fasteners and integrity of O-rings and seals, especially at intake manifold.
2. Ensure pipe/tube connections are airtight.

Product comes out air exhaust.

1. Check for liquid piston seal failure.
2. Check tightness of liquid pistons to shaft.

SECTION 6A

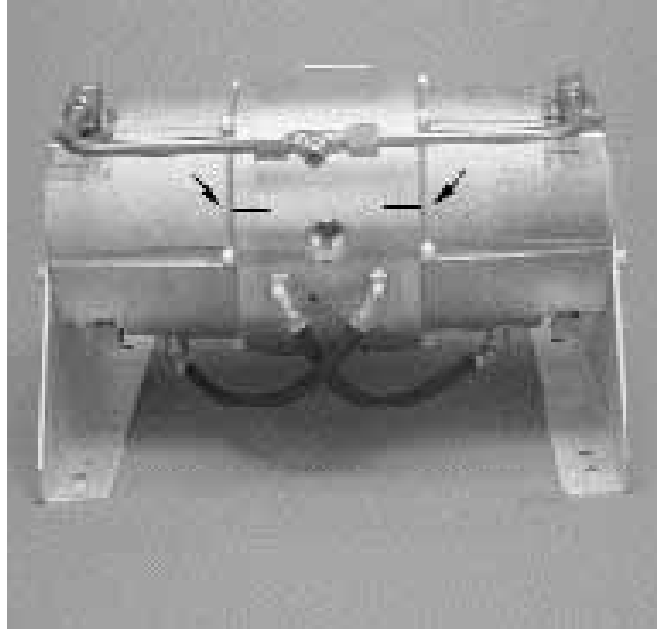
MODEL H38/3200D PUMP DIRECTIONS FOR DISASSEMBLY/REASSEMBLY

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 the hazardous effects associated with contact with your process fluid.

The Wilden H38/3200D metal pump has a 10 mm (3/8") inlet and outlet and is designed for flows up to 7.6 lpm (2.0 gpm). Its air distribution system is based on a revolutionary design which increases reliability and performance. The H38/3200D is available in aluminum wetted parts. The center section is available in aluminum. The air valve is available in polypropylene.

TOOLS REQUIRED:

6 mm (1/4") Hex Head Wrench 6mm
5 mm (3/16") Hex Head Wrench
14 mm (9/16") Wrench
17 mm (11/16") Wrench
O-ring Pick
Air Nozzle
Adjustable Wrench
Vise equipped w/soft jaws
(such as plywood, plastic or other suitable material)

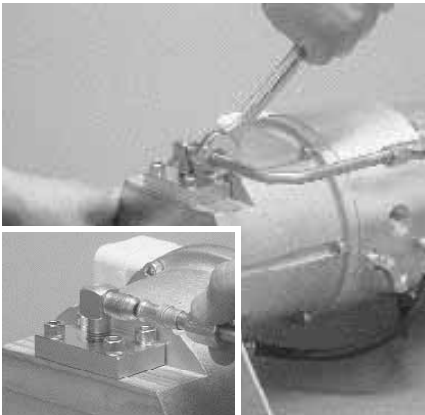


DISASSEMBLY:

Step 1.

Figure 1

Before starting disassembly, mark a line from each liquid chamber to the center section. This line will assist in proper alignment during reassembly.



Step 2.

Figure 2

Using an 17 mm (11/16") wrench, loosen both fasteners that connect the discharge manifold to the manifold plate elbows and pull discharge manifold away from pump.



Step 3.

Figure 3

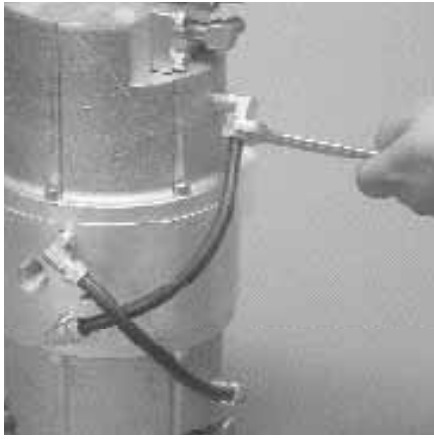
Using a 6 mm (1/4") hex head wrench, remove the bolts connecting the pump feet to both liquid chambers.



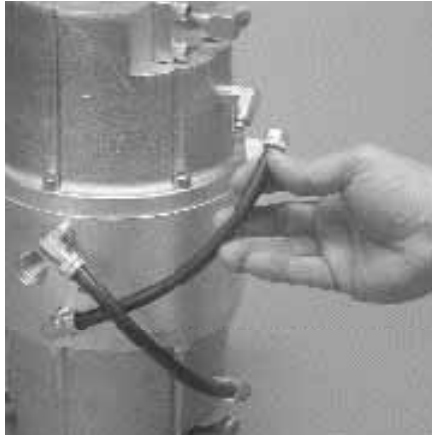
Step 4.

Figure 4

Using an 17 mm (11/16") wrench, loosen both fasteners that connect the inlet manifold to the manifold plate elbows and pull inlet manifold away from pump.



Step 5. *Figure 5*
Using a 14 mm (9/16") wrench, loosen fasteners connecting both nylon tubes to each liquid chamber by turning counter clockwise.



Step 6. *Figure 6*
Disconnect nylon tubing by pulling nylon tubing away from brass elbow.



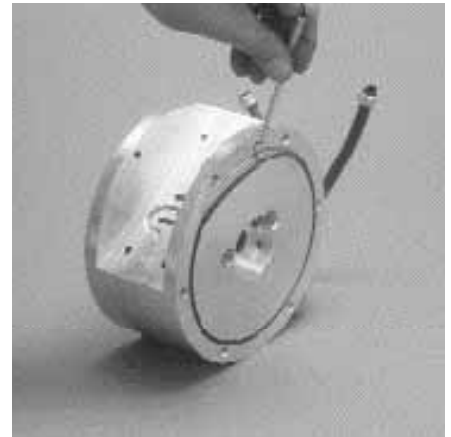
Step 7. *Figure 7*
Using a 6 mm (1/4") hex head wrench, remove the liquid chamber bolts that connect the liquid chamber to the center section.



Step 8. *Figure 8*
To lift the liquid chamber away from the center section, apply 1.0 bar (15 psig) of air pressure, via a rubber tipped air nozzle into the brass elbow located at the top of the liquid chamber.



Step 9. *Figure 9*
The air pressure will force the liquid chamber away from the power piston to allow for easy removal. To remove the opposite liquid chamber repeat Step 9.



Step 10. *Figure 10*
Inspect center section flange O-rings on each side of the center section and replace if necessary.



Step 11. *Figure 11*

To remove the shaft assembly, secure either power/liquid piston into a vice equipped with soft jaws. Next, remove the opposite power/liquid piston by turning counter clockwise.



Step 12. *Figure 12*

To remove the shaft from the power/liquid piston assembly, first secure shaft in vise equipped with soft jaws. Next, remove power/liquid piston assembly by turning counter clockwise.



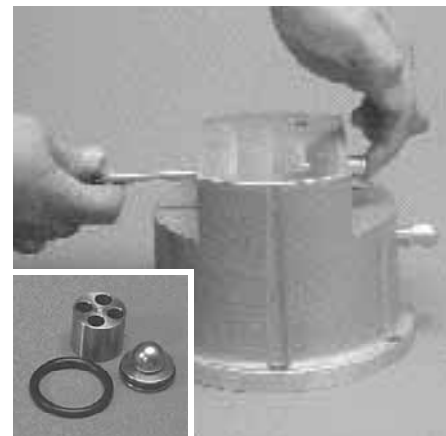
Step 13. *Figure 13*

Using a 6 mm (1/4") hex head wrench, loosen the discharge manifold bolts by turning counter clockwise.



Step 14. *Figure 14*

Next, inspect the manifold O-ring for nicks, gouges, chemical attack or abrasive wear. Replace if necessary.



Step 15. *Figure 15*

Using an O-ring pick, remove the manifold O-ring, valve seat O-ring, valve seat, valve ball and ball cage. Inspect and replace worn parts if necessary. Repeat process for the three remaining valve ball/valve seat locations.

NOTE: When reinstalling valve balls and valve seats, the valve seat should be positioned at the bottom of the assembly with the valve ball positioned in the center and the ball cage positioned at the top.

SECTION 6B

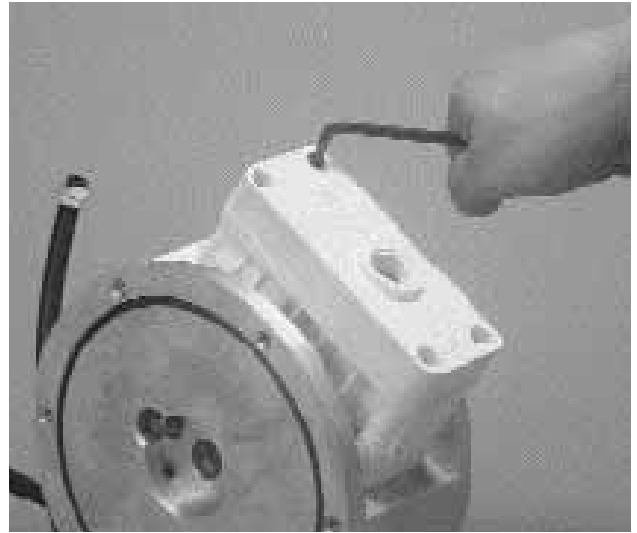
PRO-FLO® AIR DISTRIBUTION SYSTEM DIRECTIONS FOR DISASSEMBLY/REASSEMBLY

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.

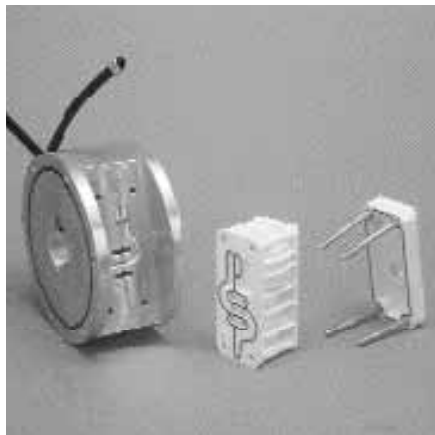
The H38/3200D has a 10 mm (3/8") inlet and outlet and is designed for flows up to 7.6 lpm (2 gpm). The single piece center section is made of aluminum. The air valve is made of polypropylene. Its air distribution system is based on a revolutionary design, which offers economical reliability and performance.

TOOLS REQUIRED:

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



Step 1. *Figure 1*
Using a 5 mm (3/16") hex head wrench, loosen air valve bolts.



Step 2. *Figure 2*
Remove muffer plate and air valve bolts from air valve assembly exposing muffer gasket for inspection. Replace if necessary.



Step 3. *Figure 3*
Inspect air valve gasket and replace if necessary.



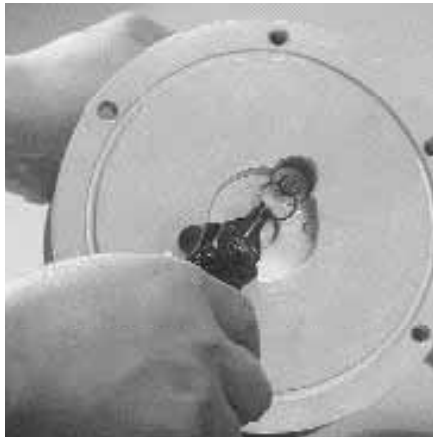
Step 4. *Figure 4*
Remove air valve end cap to expose air valve spool by simply lifting up on air valve end cap, once air valve bolts are removed.



Step 5. *Figure 5*

Remove air valve spool from air valve body by threading one of the air valve bolts into the end of the spool and gently slide the spool from 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. *Figure 6*

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



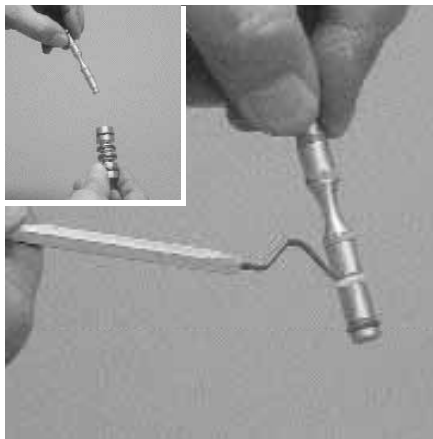
Step 7. *Figure 7*

Remove pilot spool assembly from center section.



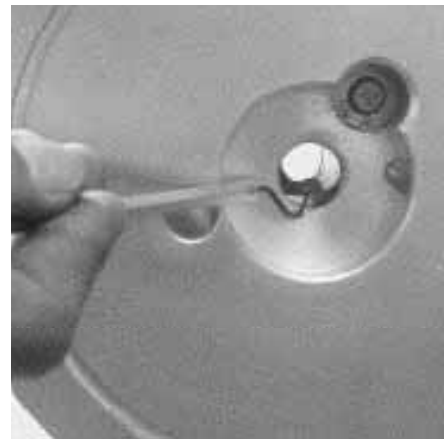
Step 8. *Figure 8*

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



Step 9. *Figure 9*

Using an O-ring pick, remove the anti-double shifting O-ring located at the "notched end" of the pilot spool and replace, if necessary. **CAUTION:** When installing a new anti-double shifting O-ring, be sure to do so promptly. Leaving the pilot spool out of the sleeve for more than a few minutes may allow the "energized" seals to grow in size, making reinsertion impossible.



Step 10. *Figure 10*

Check center section Glyd™ rings for signs of wear. If necessary, remove Glyd™ rings with O-ring pick and replace.

SECTION 6C

REASSEMBLY HINTS & TIPS

ASSEMBLY:

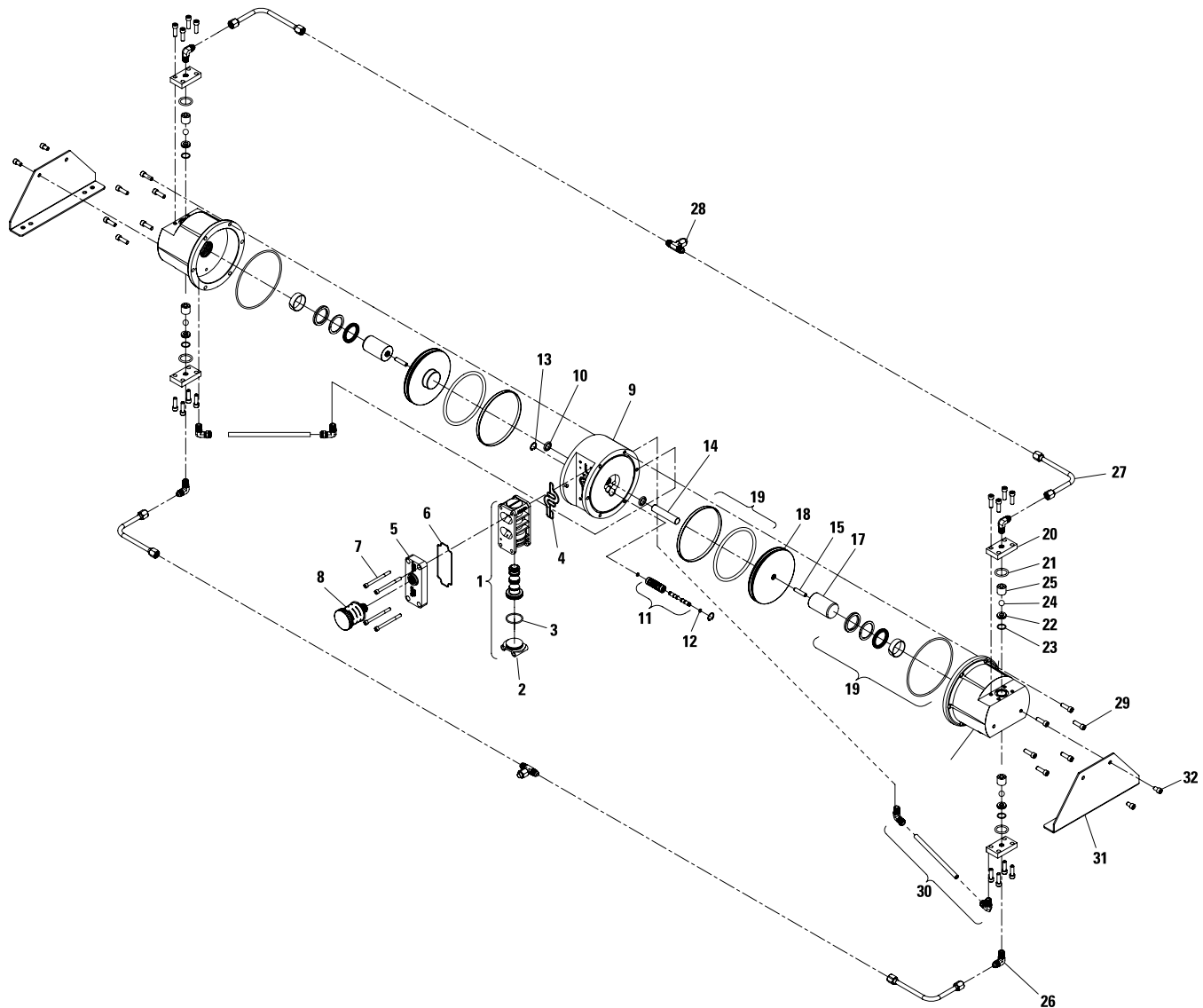
Upon performing applicable maintenance to the air distribution system, the pump can now be reassembled. Please refer to the disassembly instructions for photos and parts placement. To reassemble the pump, follow the disassembly instructions in reverse order. The air distribution system needs to be assembled first, then the 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 bore to ensure no damage is done to new seals.
- Stainless bolts should be lubed to reduce the possibility of seizing during tightening.
- Apply a small amount of Loctite-242 to the shaft stud threads.
- To aid in removal of the liquid chambers, place pump on its side.

MAXIMUM TORQUE SPECIFICATIONS

Description of Part	Torque
Air Valve, Pro-Flo	2.8 N•m [25 in.-lbs.]
Combo Manifold Plate	13.5 N•m [10 ft.-lbs.]
Liquid Chamber	13.5 N•m [10 ft.-lbs.]

H38/ 3200D



H38/3200D Pump

Item #	Part Description	Qty. per Pump	Part Number
1	Assembly, Pro-Flo Air Valv	1	01-2010-20
2	End Cap, Air Valve	1	01-2332-20
3	O-Ring -126 (Ø1.364 x Ø.103) End Cap	1	01-2395-52
4	Gasket, Air Valve	1	01-2615-52
5	Plate, Muffler	1	01-3181-20
6	Gasket, Muffler Plate	1	01-3505-52
7	Screw, SHC 1/4-20 x 3"	4	01-6001-03
8	Muffler	1	02-3510-99
9	Assembly, Center Section	1	95-3144-01
10	Ring II, Glyd	2	01-3220-55
11	Assembly, Pilot Spool	1	01-3880-99
12	O-Ring -009 (Ø.208 x Ø.070) Pilot Spool	2	04-2650-49-700
13	Ring ,Retaining	2	00-2650-03
14	Shaft	1	95-3800-03
15	Stud, 5/16-18 x 1.38" Threaded	2	01-6150-03
16	Chamber, Liquid	2	95-5001-01
17	Piston, Liquid	2	95-3728-09
18	Piston, Power R3200D	2	95-3725-01
19	Kit, Piston Seal	2	95-9211-99
20	Plate, Combo Manifold	4	95-5050-01
21	O-Ring -214 (Ø.984 x Ø.139) Manifold O-ring	4	04-2390-52
22	Seat, Valve	4	95-1120-03
23	O-Ring -017 (Ø.676 x Ø.070) Valve Seat O-ring	4	00-2390-52-700
24	Ball, Valve	4	95-1080-03
25	Cage, Ball	4	95-5350-03
26	Fitting, 37° Flared Elbow	4	95-7831-08
27	Assembly, 3/8" O.D. SS Tube	4	95-7511-03
28	Fitting, 37° Flared Tee	2	95-7870-08
29	Screw, 5/16-18 x 1" SHC	28	95-6011-08
30	Assembly, Tube & Fitting	2	95-9231-99
31	Foot	2	95-5540-01
32	Screw, 5/16-18 x 1/2" SHC	4	08-6031-08-60R

ALL BOLDFACE ITEMS ARE PRIMARY WEAR ITEMS

NOTES

WARRANTY

Each and every product manufactured by Wilden Pump and Engineering, LLC is built to meet the highest standards of quality. Every pump is functionally tested to insure integrity of operation.

Wilden Pump and Engineering, LLC 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. Failure due to normal wear, misapplication, or abuse is, of course, excluded from this warranty.

Since the use of Wilden pumps and parts is beyond our control, we cannot guarantee the suitability of any pump or part for a particular application and Wilden Pump and Engineering, LLC shall not be liable for any consequential damage or expense arising from the use or misuse of its products on any application. Responsibility is limited solely to replacement or repair of defective Wilden pumps and parts.

All decisions as to the cause of failure are the sole determination of Wilden Pump and Engineering, LLC.

Prior approval must be obtained from Wilden for return of any items for warranty consideration and must be accompanied by the appropriate MSDS for the product(s) involved. A Return Goods Tag, obtained from an authorized Wilden distributor, must be included with the items which must be shipped freight prepaid.

The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied (whether written or oral) including all implied warranties of merchantability and fitness for any particular purpose. No distributor or other person is authorized to assume any liability or obligation for Wilden Pump and Engineering, LLC other than expressly provided herein.

PLEASE PRINT OR TYPE AND FAX TO WILDEN

PUMP INFORMATION			
Item # _____		Serial # _____	
Company Where Purchased _____			
YOUR INFORMATION			
Company Name _____			
Industry _____			
Name _____		Title _____	
Street Address _____			
City _____		State _____	Postal Code _____
Country _____			
Telephone _____		Fax _____	E-mail _____
Web Address _____			
Number of pumps in facility? _____		Number of Wilden pumps? _____	
Types of pumps in facility (check all that apply): <input type="checkbox"/> Diaphragm <input type="checkbox"/> Centrifugal <input type="checkbox"/> Gear <input type="checkbox"/> Submersible <input type="checkbox"/> Lobe			
<input type="checkbox"/> Other _____			
Media being pumped? _____			
How did you hear of Wilden Pump? <input type="checkbox"/> Trade Journal <input type="checkbox"/> Trade Show <input type="checkbox"/> Internet/E-mail <input type="checkbox"/> Distributor			
<input type="checkbox"/> Other _____			

ONCE COMPLETE, FAX TO (909) 783-3440

NOTE: WARRANTY VOID IF PAGE IS NOT FAXED TO WILDEN

WILDEN PUMP & ENGINEERING, LLC